

**START**



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OF COMMERCE

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and  
Trademark  
Office

Vol. 1211 Number 4

# OFFICIAL GAZETTE

of the  
UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

June 23, 1998



PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

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OFFICIAL GAZETTE of the  
UNITED STATES PATENT AND TRADEMARK OFFICE

June 23, 1998

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1205 O.G. 4, on December 2, 1997.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was increased, effective January 1, 1998, and was announced in the *Official Gazette* at 1205 O.G. 3, on December 2, 1997.

International fees were changed, effective on May 1, 1997, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1197 O.G. 69, on April 22, 1997. The basic fee and the designation fee were further changed effective January 1, 1998 and were announced in the *Official Gazette* at 1205 O.G. 3, on December 2, 1997.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1997, and were announced in the *Official Gazette* at 1201 O.G. 63, on August 19, 1997.

The schedule of PCT fees (in U.S. dollars), effective January 1, 1998, is as follows:

International Application (PCT Chapter I) fees:	
Transmittal fee.....	240.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
— No corresponding prior U.S. national application filed under 35 U.S.C. 111(a).....	
— Corresponding prior U.S. national application filed under 35 U.S.C. 111(a).....	
— Supplemental search fee, per additional invention (payable only upon invitation).....	
European Patent Office as ISA.....	
International fees	
Basic fee.....	
Basic supplemental fee (for each page over 30).....	
Designation fee per country or region	
— For the first 11 national or regional offices designated.....	
— For each designation in excess of 11 offices.....	
Precautionary designation fee and confirmation fee for each precautionary designation confirmed (PCT Rule 15.5)	
— Designation fee.....	
— Confirmation fee.....	
International Application (PCT Chapter II) fees associated with filing a Demand for Preliminary Examination:	
Handling fee.....	
Preliminary examination fee.....	

USPTO as International Preliminary Examining Authority (IPEA)	
— USPTO was ISA in PCT Chapter I.....	
— Additional examination fee, per additional invention (payable only upon invitation).....	
— USPTO was not ISA in PCT Chapter I	
— Additional examination fee, per additional invention (payable only upon invitation).....	

U.S. National Stage Fees	Small Entity	Regular
Basic National fee		
USPTO was IPEA		
— All claims presented satisfied provisions of PCT Article 33(2) to (4).....		
— All claims presented did not satisfy provisions of PCT Article 33(2) to (4).....		
USPTO was ISA but not IPEA.....		
USPTO was neither ISA nor IPEA		
— Search report has not been prepared by the European Patent Office or the Japanese Patent Office.....		
— Search report has been prepared by the European Patent Office or the Japanese Patent Office.....		
Other National fees		
— For each independent claim in excess of 3.....		
— For each claim in excess of 20.....		
— For each application containing a multiple dependent claim.....		
— Surcharge for filing oath or declaration after the time limit applicable under PCT Article 22 or 39(1).....		
— Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1).....		

Nov. 10, 1997  
BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on June 20, 1995 for which maintenance fees due at 3 years and six



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months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,425,142 through 5,426,785  
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on June 18, 1991 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,023,952 through 5,025,500  
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on June 16, 1987 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,672,689 through 4,674,129  
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1997, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$525.00  
By other than a small entity .....\$1,050.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$1,050.00  
By other than a small entity .....\$2,100.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on applications filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$1,580.00  
By other than a small entity .....\$3,160.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) .....\$65.00  
By other than a small entity .....\$130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable .....\$700.00  
(2) unintentional .....\$1,640.00

Notice of Expiration of Patents  
Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED April 15, 1998  
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,581,771	06/587,075	04/15/86
4,581,772	06/594,257	04/15/86
4,581,782	06/577,547	04/15/86
4,581,783	06/691,383	04/15/86
4,581,792	06/467,683	04/15/86
4,581,801	06/559,847	04/15/86
4,581,808	06/345,752	04/15/86
4,581,810	06/574,263	04/15/86
4,581,811	06/713,074	04/15/86
4,581,816	06/605,020	04/15/86
4,581,820	06/500,659	04/15/86
4,581,822	06/681,482	04/15/86
4,581,827	06/680,919	04/15/86
4,581,836	06/516,834	04/15/86
4,581,842	06/705,477	04/15/86
4,581,848	06/718,202	04/15/86
4,581,855	06/694,633	04/15/86
4,581,877	06/732,620	04/15/86
4,581,896	06/621,904	04/15/86
4,581,901	06/628,156	04/15/86
4,581,912	06/739,038	04/15/86
4,581,915	06/635,160	04/15/86
4,581,917	06/590,459	04/15/86
4,581,918	06/569,154	04/15/86
4,581,923	06/633,328	04/15/86
4,581,926	06/671,657	04/15/86
4,581,930	06/645,746	04/15/86
4,581,939	06/620,021	04/15/86
4,581,954	06/623,898	04/15/86
4,581,964	06/704,474	04/15/86
4,581,981	06/451,636	04/15/86
4,581,982	06/382,283	04/15/86
4,581,987	06/739,205	04/15/86
4,581,994	06/629,637	04/15/86
4,582,002	06/703,715	04/15/86
4,582,007	06/706,995	04/15/86
4,582,029	06/530,740	04/15/86
4,582,032	06/657,818	04/15/86
4,582,033	06/713,265	04/15/86
4,582,038	06/699,884	04/15/86
4,582,042	06/357,523	04/15/86
4,582,049	06/531,256	04/15/86
4,582,051	06/578,125	04/15/86
4,582,054	06/616,486	04/15/86
4,582,060	06/673,277	04/15/86
4,582,068	06/637,461	04/15/86
4,582,080	06/636,861	04/15/86
4,582,081	06/684,782	04/15/86
4,582,086	06/602,855	04/15/86
4,582,088	06/653,646	04/15/86
4,582,101	06/592,090	04/15/86
4,582,110	06/580,147	04/15/86
4,582,117	06/534,577	04/15/86
4,582,127	06/562,220	04/15/86
4,582,135	06/467,657	04/15/86
4,582,136	06/672,516	04/15/86
4,582,140	06/650,313	04/15/86
4,582,156	06/640,968	04/15/86
4,582,162	06/681,050	04/15/86
4,582,169	06/654,978	04/15/86

Patent Number	Serial Number	Issue Date	4,582,547	06/607,889	04/15/86
4,582,174	06/649,460	04/15/86	4,582,552	06/653,225	04/15/86
4,582,177	06/611,810	04/15/86	4,582,561	06/369,911	04/15/86
4,582,180	06/440,176	04/15/86	4,582,578	06/762,111	04/15/86
4,582,183	06/499,722	04/15/86	4,582,582	06/660,242	04/15/86
4,582,184	06/596,178	04/15/86	4,582,586	06/761,690	04/15/86
4,582,184	06/596,178	04/15/86	4,582,600	06/661,566	04/15/86
4,582,198	06/703,232	04/15/86	4,582,601	06/594,669	04/15/86
4,582,200	06/600,379	04/15/86	4,582,605	06/607,435	04/15/86
4,582,201	06/585,581	04/15/86	4,582,611	06/639,247	04/15/86
4,582,202	06/698,255	04/15/86	4,582,625	06/558,295	04/15/86
4,582,204	06/510,113	04/15/86	4,582,628	06/736,876	04/15/86
4,582,205	06/736,391	04/15/86	4,582,631	06/526,834	04/15/86
4,582,213	06/670,892	04/15/86	4,582,634	06/656,662	04/15/86
4,582,215	06/690,560	04/15/86	4,582,636	06/682,972	04/15/86
4,582,220	06/747,457	04/15/86	4,582,638	06/248,195	04/15/86
4,582,221	06/598,493	04/15/86	4,582,639	06/621,641	04/15/86
4,582,224	06/643,561	04/15/86	4,582,653	06/706,847	04/15/86
4,582,228	06/634,288	04/15/86	4,582,655	06/554,864	04/15/86
4,582,240	06/578,008	04/15/86	4,582,658	06/633,737	04/15/86
4,582,252	06/718,223	04/15/86	4,582,659	06/692,089	04/15/86
4,582,254	06/617,911	04/15/86	4,582,674	06/343,827	04/15/86
4,582,260	06/551,947	04/15/86	4,582,676	06/468,743	04/15/86
4,582,266	06/688,267	04/15/86	4,582,678	06/653,011	04/15/86
4,582,274	06/609,780	04/15/86	4,582,682	06/636,371	04/15/86
4,582,275	06/606,620	04/15/86	4,582,685	06/691,953	04/15/86
4,582,279	06/570,339	04/15/86	4,582,687	06/396,881	04/15/86
4,582,281	06/501,203	04/15/86	4,582,697	06/624,669	04/15/86
4,582,282	06/525,153	04/15/86	4,582,698	06/533,332	04/15/86
4,582,285	06/700,542	04/15/86	4,582,699	06/333,713	04/15/86
4,582,291	06/694,901	04/15/86	4,582,703	06/552,052	04/15/86
4,582,292	06/505,373	04/15/86	4,582,704	06/539,907	04/15/86
4,582,316	06/623,314	04/15/86	4,582,706	06/678,577	04/15/86
4,582,320	06/652,943	04/15/86	4,582,709	06/699,692	04/15/86
4,582,324	06/567,910	04/15/86	4,582,710	06/709,607	04/15/86
4,582,325	06/609,223	04/15/86	4,582,712	06/667,185	04/15/86
4,582,326	06/697,836	04/15/86	4,582,721	06/701,645	04/15/86
4,582,334	06/541,132	04/15/86	4,582,722	06/666,954	04/15/86
4,582,336	06/576,122	04/15/86	4,582,726	06/561,477	04/15/86
4,582,340	06/579,812	04/15/86	4,582,728	06/523,440	04/15/86
4,582,349	06/384,839	04/15/86	4,582,730	06/695,302	04/15/86
4,582,352	06/676,397	04/15/86	4,582,752	06/753,849	04/15/86
4,582,357	06/512,019	04/15/86	4,582,759	06/667,512	04/15/86
4,582,358	06/596,158	04/15/86	4,582,767	06/709,174	04/15/86
4,582,361	06/556,483	04/15/86	4,582,776	06/425,397	04/15/86
4,582,365	06/631,629	04/15/86	4,582,781	06/636,764	04/15/86
4,582,380	06/528,761	04/15/86	4,582,787	06/454,880	04/15/86
4,582,388	06/485,612	04/15/86	4,582,801	06/438,930	04/15/86
4,582,399	06/525,823	04/15/86	4,582,806	06/627,320	04/15/86
4,582,405	06/644,796	04/15/86	4,582,810	06/537,737	04/15/86
4,582,414	06/605,963	04/15/86	4,582,816	06/704,107	04/15/86
4,582,420	06/539,185	04/15/86	4,582,817	06/586,585	04/15/86
4,582,421	06/684,771	04/15/86	4,582,820	06/452,493	04/15/86
4,582,431	06/540,245	04/15/86	4,582,821	06/552,255	04/15/86
4,582,434	06/602,844	04/15/86	4,582,826	06/634,802	04/15/86
4,582,435	06/541,735	04/15/86	4,582,842	06/536,104	04/15/86
4,582,438	06/585,343	04/15/86	4,582,847	06/504,049	04/15/86
4,582,443	06/461,482	04/15/86	4,582,851	06/689,058	04/15/86
4,582,447	06/506,039	04/15/86	4,582,853	06/693,448	04/15/86
4,582,451	06/600,499	04/15/86	4,582,858	06/742,634	04/15/86
4,582,452	06/616,375	04/15/86	4,582,860	06/561,716	04/15/86
4,582,453	06/641,157	04/15/86	4,582,870	06/689,277	04/15/86
4,582,454	06/566,729	04/15/86	4,582,877	06/635,038	04/15/86
4,582,456	06/578,614	04/15/86	4,582,884	06/646,069	04/15/86
4,582,458	06/639,227	04/15/86	4,582,887	06/645,599	04/15/86
4,582,468	06/677,239	04/15/86	4,582,891	06/699,058	04/15/86
4,582,475	06/446,796	04/15/86	4,582,892	06/737,955	04/15/86
4,582,482	06/638,612	04/15/86	4,582,895	06/677,935	04/15/86
4,582,508	06/655,367	04/15/86	4,582,897	06/605,989	04/15/86
4,582,509	06/698,147	04/15/86	4,582,900	06/682,414	04/15/86
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4,582,512	06/622,604	04/15/86	4,582,908	06/652,018	04/15/86
4,582,519	06/638,580	04/15/86	4,582,922	06/697,533	04/15/86
4,582,522	06/715,567	04/15/86	4,582,923	06/735,249	04/15/86
4,582,523	06/678,930	04/15/86	4,582,924	06/586,946	04/15/86
4,582,534	06/532,281	04/15/86	4,582,925	06/263,900	04/15/86
4,582,536	06/679,423	04/15/86	4,582,929	06/686,174	04/15/86
4,582,540	06/691,530	04/15/86	4,582,935	06/685,006	04/15/86
4,582,544	06/595,445	04/15/86	4,582,937	06/722,422	04/15/86

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OFFICIAL GAZETTE

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Patent Number	Serial Number	Issue Date	4,914,810	06/803,378	04/10/90
4,582,938	06/544,918	04/15/86	4,914,816	07/327,724	04/10/90
4,582,940	06/221,619	04/15/86	4,914,818	07/235,079	04/10/90
4,582,946	06/358,739	04/15/86	4,914,820	07/293,926	04/10/90
4,582,955	06/592,879	04/15/86	4,914,830	07/261,397	04/10/90
4,582,965	06/643,587	04/15/86	4,914,832	07/308,304	04/10/90
4,582,966	06/555,559	04/15/86	4,914,836	07/350,304	04/10/90
4,582,968	06/590,274	04/15/86	4,914,838	07/233,469	04/10/90
4,582,970	06/656,002	04/15/86	4,914,839	07/126,337	04/10/90
4,582,971	06/698,393	04/15/86	4,914,847	07/390,240	04/10/90
4,582,981	06/701,642	04/15/86	4,914,857	07/294,775	04/10/90
4,582,991	06/476,952	04/15/86	4,914,858	07/242,337	04/10/90
4,582,993	06/619,915	04/15/86	4,914,859	07/248,133	04/10/90
4,582,994	06/554,401	04/15/86	4,914,862	07/237,093	04/10/90
4,583,009	06/551,651	04/15/86	4,914,863	07/340,304	04/10/90
4,583,011	06/547,639	04/15/86	4,914,864	07/243,980	04/10/90
4,583,031	06/713,815	04/15/86	4,914,865	07/311,450	04/10/90
4,583,040	06/594,625	04/15/86	4,914,871	07/244,540	04/10/90
4,583,046	06/505,623	04/15/86	4,914,875	07/229,607	04/10/90
4,583,050	06/733,497	04/15/86	4,914,880	07/220,525	04/10/90
4,583,051	06/668,721	04/15/86	4,914,881	07/242,193	04/10/90
4,583,052	06/601,519	04/15/86	4,914,882	06/465,206	04/10/90
4,583,053	06/619,093	04/15/86	4,914,884	07/274,891	04/10/90
4,583,056	06/650,673	04/15/86	4,914,885	07/237,958	04/10/90
4,583,057	06/656,023	04/15/86	4,914,886	07/155,529	04/10/90
4,583,059	06/454,250	04/15/86	4,914,895	07/192,557	04/10/90
4,583,063	06/505,603	04/15/86	4,914,898	07/344,193	04/10/90
4,583,069	06/655,652	04/15/86	4,914,911	07/322,544	04/10/90
4,583,070	06/595,380	04/15/86	4,914,916	07/177,312	04/10/90
4,583,081	06/566,938	04/15/86	4,914,917	07/198,033	04/10/90
4,583,083	06/625,821	04/15/86	4,914,919	07/294,111	04/10/90
4,583,088	06/497,534	04/15/86	4,914,921	07/232,869	04/10/90
4,583,093	06/523,553	04/15/86	4,914,924	07/217,857	04/10/90
4,583,098	06/646,422	04/15/86	4,914,927	07/301,567	04/10/90
4,583,106	06/754,698	04/15/86	4,914,929	07/324,706	04/10/90
4,583,110	06/620,591	04/15/86	4,914,933	07/251,127	04/10/90
4,583,112	06/665,820	04/15/86	4,914,943	07/312,864	04/10/90
4,583,117	06/631,894	04/15/86	4,914,948	07/275,687	04/10/90
4,583,118	06/650,643	04/15/86	4,914,949	07/266,229	04/10/90
4,583,122	06/498,134	04/15/86	4,914,952	07/215,752	04/10/90
4,583,123	06/704,360	04/15/86	4,914,954	07/248,115	04/10/90
4,583,126	06/639,549	04/15/86	4,914,966	07/284,889	04/10/90
4,583,134	06/326,008	04/15/86	4,914,973	07/399,035	04/10/90
4,583,141	06/430,977	04/15/86	4,914,974	07/399,034	04/10/90
4,583,147	06/726,187	04/15/86	4,914,975	07/399,036	04/10/90
4,583,149	06/639,833	04/15/86	4,914,986	07/357,293	04/10/90
4,583,152	06/681,403	04/15/86	4,914,991	07/321,520	04/10/90
4,583,159	06/494,558	04/15/86	4,914,996	07/293,137	04/10/90
4,583,165	06/394,053	04/15/86	4,915,011	07/241,501	04/10/90
4,583,175	06/502,946	04/15/86	4,915,013	07/217,613	04/10/90
4,583,184	06/453,950	04/15/86	4,915,017	07/256,976	04/10/90
4,583,188	06/474,938	04/15/86	4,915,019	07/050,128	04/10/90
4,583,193	06/350,681	04/15/86	4,915,025	07/296,891	04/10/90
4,583,197	06/509,740	04/15/86	4,915,029	07/271,553	04/10/90
4,583,201	06/530,451	04/15/86	4,915,030	07/090,006	04/10/90
4,583,208	06/578,149	04/15/86	4,915,033	07/227,099	04/10/90
4,583,214	06/591,191	04/15/86	4,915,037	07/270,931	04/10/90
4,583,217	06/520,383	04/15/86	4,915,050	07/270,959	04/10/90
4,583,220	06/606,804	04/15/86	4,915,057	06/930,844	04/10/90
4,583,221	06/545,539	04/15/86	4,915,060	07/247,701	04/10/90
4,583,223	06/475,158	04/15/86	4,915,062	07/281,850	04/10/90
4,583,230	06/647,700	04/15/86	4,915,072	07/219,013	04/10/90
4,583,235	06/546,124	04/15/86	4,915,076	07/289,450	04/10/90
4,583,243	06/609,615	04/15/86	4,915,089	07/296,291	04/10/90
4,914,752	07/303,539	04/10/90	4,915,090	06/465,311	04/10/90
4,914,757	07/294,105	04/10/90	4,915,091	07/300,616	04/10/90
4,914,765	07/247,378	04/10/90	4,915,093	07/397,062	04/10/90
4,914,768	07/280,977	04/10/90	4,915,097	07/195,565	04/10/90
4,914,770	07/178,020	04/10/90	4,915,101	07/125,973	04/10/90
4,914,776	07/293,180	04/10/90	4,915,104	07/294,779	04/10/90
4,914,779	07/248,840	04/10/90	4,915,107	07/316,299	04/10/90
4,914,780	07/227,191	04/10/90	4,915,108	07/202,251	04/10/90
4,914,786	07/320,478	04/10/90	4,915,111	07/170,342	04/10/90
4,914,792	07/285,019	04/10/90	4,915,113	07/285,529	04/10/90
4,914,793	07/118,084	04/10/90	4,915,116	07/329,535	04/10/90
4,914,798	07/360,542	04/10/90	4,915,117	07/228,616	04/10/90
4,914,800	07/143,433	04/10/90	4,915,119	06/853,860	04/10/90
4,914,807	07/308,290	04/10/90	4,915,121	07/369,112	04/10/90
			4,915,122	07/342,330	04/10/90

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Patent Number	Serial Number	Issue Date	4,915,443	07/231,002	04/10/90
4,915,127	07/357,752	04/10/90	4,915,448	07/217,368	04/10/90
4,915,130	07/263,110	04/10/90	4,915,449	07/348,705	04/10/90
4,915,137	07/231,958	04/10/90	4,915,452	07/339,136	04/10/90
4,915,138	07/233,459	04/10/90	4,915,453	07/183,020	04/10/90
4,915,139	07/259,462	04/10/90	4,915,456	07/346,086	04/10/90
4,915,141	07/248,074	04/10/90	4,915,461	07/362,751	04/10/90
4,915,142	07/340,746	04/10/90	4,915,466	07/244,986	04/10/90
4,915,144	07/209,898	04/10/90	4,915,471	07/210,889	04/10/90
4,915,148	07/315,931	04/10/90	4,915,478	07/254,552	04/10/90
4,915,156	07/247,363	04/10/90	4,915,482	07/263,743	04/10/90
4,915,160	07/268,050	04/10/90	4,915,483	07/293,407	04/10/90
4,915,164	07/211,862	04/10/90	4,915,488	06/841,252	04/10/90
4,915,167	07/228,409	04/10/90	4,915,489	07/227,047	04/10/90
4,915,170	07/322,330	04/10/90	4,915,491	06/915,179	04/10/90
4,915,172	07/357,173	04/10/90	4,915,492	07/306,973	04/10/90
4,915,182	07/374,362	04/10/90	4,915,498	07/183,619	04/10/90
4,915,188	07/104,997	04/10/90	4,915,499	07/143,357	04/10/90
4,915,194	07/265,483	04/10/90	4,915,506	07/233,803	04/10/90
4,915,219	07/261,493	04/10/90	4,915,510	07/354,434	04/10/90
4,915,220	07/320,525	04/10/90	4,915,515	07/192,073	04/10/90
4,915,222	07/226,916	04/10/90	4,915,529	07/237,899	04/10/90
4,915,224	07/369,317	04/10/90	4,915,534	07/346,417	04/10/90
4,915,230	07/276,808	04/10/90	4,915,537	07/090,078	04/10/90
4,915,231	07/169,589	04/10/90	4,915,538	07/286,189	04/10/90
4,915,234	07/322,365	04/10/90	4,915,539	07/285,613	04/10/90
4,915,238	07/235,034	04/10/90	4,915,554	07/258,462	04/10/90
4,915,245	07/193,861	04/10/90	4,915,566	07/067,462	04/10/90
4,915,249	07/260,730	04/10/90	4,915,570	07/315,823	04/10/90
4,915,252	07/329,912	04/10/90	4,915,571	07/129,296	04/10/90
4,915,254	07/280,304	04/10/90	4,915,572	07/049,939	04/10/90
4,915,259	07/351,132	04/10/90	4,915,573	07/240,677	04/10/90
4,915,261	07/296,665	04/10/90	4,915,591	07/191,687	04/10/90
4,915,266	06/527,040	04/10/90	4,915,594	07/252,695	04/10/90
4,915,271	07/355,801	04/10/90	4,915,595	07/207,347	04/10/90
4,915,273	07/314,845	04/10/90	4,915,598	07/306,329	04/10/90
4,915,276	07/247,490	04/10/90	4,915,599	07/254,979	04/10/90
4,915,285	07/378,751	04/10/90	4,915,603	07/226,686	04/10/90
4,915,286	07/377,417	04/10/90	4,915,615	07/121,274	04/10/90
4,915,289	07/354,315	04/10/90	4,915,616	07/165,997	04/10/90
4,915,299	07/260,176	04/10/90	4,915,627	07/335,944	04/10/90
4,915,306	07/323,578	04/10/90	4,915,635	07/298,212	04/10/90
4,915,309	07/283,636	04/10/90	4,915,636	07/224,173	04/10/90
4,915,315	07/276,058	04/10/90	4,915,639	07/268,896	04/10/90
4,915,316	06/775,458	04/10/90	4,915,657	07/325,452	04/10/90
4,915,318	07/157,213	04/10/90	4,915,658	07/398,411	04/10/90
4,915,320	07/361,269	04/10/90	4,915,661	07/152,440	04/10/90
4,915,332	07/345,096	04/10/90	4,915,666	07/239,776	04/10/90
4,915,334	07/387,509	04/10/90	4,915,669	07/325,163	04/10/90
4,915,336	07/234,348	04/10/90	4,915,670	07/197,380	04/10/90
4,915,346	07/292,840	04/10/90	4,915,671	07/150,698	04/10/90
4,915,349	07/280,934	04/10/90	4,915,678	07/224,843	04/10/90
4,915,351	07/374,053	04/10/90	4,915,679	07/269,764	04/10/90
4,915,363	07/372,028	04/10/90	4,915,683	07/024,150	04/10/90
4,915,369	07/229,147	04/10/90	4,915,700	07/221,294	04/10/90
4,915,371	07/266,833	04/10/90	4,915,711	07/354,182	04/10/90
4,915,375	07/378,657	04/10/90	4,915,712	07/228,980	04/10/90
4,915,377	07/258,772	04/10/90	4,915,724	07/201,211	04/10/90
4,915,378	07/236,594	04/10/90	4,915,727	07/137,703	04/10/90
4,915,380	07/280,875	04/10/90	4,915,733	07/298,995	04/10/90
4,915,382	07/202,520	04/10/90	4,915,741	06/927,553	04/10/90
4,915,384	07/222,047	04/10/90	4,915,743	07/250,447	04/10/90
4,915,386	07/261,884	04/10/90	4,915,746	07/232,284	04/10/90
4,915,393	07/324,107	04/10/90	4,915,750	07/163,670	04/10/90
4,915,394	07/282,444	04/10/90	4,915,751	07/240,285	04/10/90
4,915,396	07/332,437	04/10/90	4,915,752	07/335,799	04/10/90
4,915,401	07/165,583	04/10/90	4,915,753	07/252,840	04/10/90
4,915,404	07/367,575	04/10/90	4,915,761	06/467,720	04/10/90
4,915,405	07/052,414	04/10/90	4,915,781	07/224,803	04/10/90
4,915,407	07/064,113	04/10/90	4,915,796	07/362,817	04/10/90
4,915,417	07/227,289	04/10/90	4,915,808	07/203,920	04/10/90
4,915,422	07/294,151	04/10/90	4,915,812	06/876,925	04/10/90
4,915,423	07/362,318	04/10/90	4,915,816	07/240,736	04/10/90
4,915,424	07/227,287	04/10/90	4,915,819	07/242,689	04/10/90
4,915,430	07/264,301	04/10/90	4,915,821	07/097,566	04/10/90
4,915,437	07/328,879	04/10/90	4,915,825	07/353,935	04/10/90
4,915,438	07/305,609	04/10/90	4,915,828	07/336,833	04/10/90
4,915,441	07/393,799	04/10/90	4,915,838	07/289,466	04/10/90
			4,915,843	07/276,627	04/10/90



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4,915,848	07/304,133	04/10/90	4,916,236	07/270,067	04/10/90
4,915,849	07/233,165	04/10/90	4,916,240	07/199,056	04/10/90
4,915,850	07/251,661	04/10/90	4,916,251	07/000,223	04/10/90
4,915,851	07/237,996	04/10/90	4,916,261	06/648,304	04/10/90
4,915,859	07/245,106	04/10/90	4,916,264	07/304,221	04/10/90
4,915,867	07/199,409	04/10/90	4,916,266	07/363,280	04/10/90
4,915,873	07/172,048	04/10/90	4,916,278	07/402,090	04/10/90
4,915,874	07/085,856	04/10/90	4,916,282	07/274,221	04/10/90
4,915,875	06/926,693	04/10/90	4,916,284	07/348,749	04/10/90
4,915,877	07/353,605	04/10/90	4,916,294	07/223,311	04/10/90
4,915,885	07/210,261	04/10/90	4,916,303	07/351,218	04/10/90
4,915,888	07/210,036	04/10/90	4,916,311	07/166,074	04/10/90
4,915,892	06/937,915	04/10/90	4,916,312	07/164,254	04/10/90
4,915,893	06/597,159	04/10/90	4,916,313	07/238,910	04/10/90
4,915,899	07/299,335	04/10/90	4,916,329	07/104,725	04/10/90
4,915,901	06/803,284	04/10/90	4,916,330	07/249,157	04/10/90
4,915,910	07/030,722	04/10/90	4,916,331	07/224,829	04/10/90
4,915,915	07/256,867	04/10/90	4,916,342	07/317,723	04/10/90
4,915,920	07/281,771	04/10/90	4,916,349	07/192,200	04/10/90
4,915,928	07/331,360	04/10/90	4,916,351	07/229,931	04/10/90
4,915,932	07/257,384	04/10/90	4,916,352	07/268,124	04/10/90
4,915,941	06/940,510	04/10/90	4,916,359	07/181,075	04/10/90
4,915,942	07/115,634	04/10/90	4,916,365	07/237,908	04/10/90
4,915,943	07/244,384	04/10/90	4,916,373	07/363,225	04/10/90
4,915,971	07/081,828	04/10/90	4,916,380	07/315,637	04/10/90
4,915,974	07/312,618	04/10/90	4,916,394	07/315,930	04/10/90
4,915,980	07/379,670	04/10/90	4,916,407	07/291,600	04/10/90
4,915,986	07/165,235	04/10/90	4,916,411	07/354,544	04/10/90
4,915,991	07/243,442	04/10/90	4,916,412	07/299,667	04/10/90
4,915,995	07/338,621	04/10/90	4,916,416	07/167,714	04/10/90
4,915,996	07/228,292	04/10/90	4,916,429	07/353,954	04/10/90
4,916,007	06/789,026	04/10/90	4,916,438	07/348,114	04/10/90
4,916,014	07/115,154	04/10/90	4,916,441	07/246,520	04/10/90
4,916,016	07/015,894	04/10/90	4,916,445	07/269,136	04/10/90
4,916,020	07/160,796	04/10/90	4,916,454	07/361,851	04/10/90
4,916,021	07/048,522	04/10/90	4,916,461	07/379,683	04/10/90
4,916,033	07/014,442	04/10/90	4,916,465	07/209,443	04/10/90
4,916,036	07/260,477	04/10/90	4,916,466	07/276,358	04/10/90
4,916,062	06/921,632	04/10/90	4,916,471	07/392,588	04/10/90
4,916,065	07/208,330	04/10/90	4,916,480	07/373,990	04/10/90
4,916,067	07/321,968	04/10/90	4,916,482	07/309,828	04/10/90
4,916,072	07/031,671	04/10/90	4,916,487	07/219,999	04/10/90
4,916,075	07/087,087	04/10/90	4,916,496	07/256,125	04/10/90
4,916,076	07/208,332	04/10/90	4,916,500	07/078,987	04/10/90
4,916,078	07/093,136	04/10/90	4,916,528	07/291,202	04/10/90
4,916,079	07/193,965	04/10/90	4,916,536	07/268,337	04/10/90
4,916,088	07/187,939	04/10/90	4,916,545	07/272,592	04/10/90
4,916,094	07/222,279	04/10/90	4,916,546	07/232,766	04/10/90
4,916,095	07/219,091	04/10/90	4,916,561	07/246,599	04/10/90
4,916,099	07/237,324	04/10/90	4,916,579	07/301,596	04/10/90
4,916,100	07/235,885	04/10/90	4,916,591	07/383,937	04/10/90
4,916,107	07/272,311	04/10/90	4,916,592	07/394,916	04/10/90
4,916,109	07/220,796	04/10/90	4,916,594	07/292,016	04/10/90
4,916,115	07/209,496	04/10/90	4,916,600	07/355,058	04/10/90
4,916,116	07/190,352	04/10/90	4,916,608	06/869,084	04/10/90
4,916,117	07/181,706	04/10/90	4,916,612	07/115,853	04/10/90
4,916,118	07/084,636	04/10/90	4,916,613	07/257,240	04/10/90
4,916,123	07/357,495	04/10/90	4,916,618	07/242,925	04/10/90
4,916,127	07/261,289	04/10/90	4,916,624	07/169,047	04/10/90
4,916,129	07/299,709	04/10/90	4,916,626	07/174,756	04/10/90
4,916,132	07/171,545	04/10/90	4,916,627	07/127,323	04/10/90
4,916,143	07/228,150	04/10/90	4,916,631	06/947,099	04/10/90
4,916,145	07/072,386	04/10/90	4,916,632	06/926,628	04/10/90
4,916,146	07/288,556	04/10/90	4,916,634	07/169,046	04/10/90
4,916,149	07/295,925	04/10/90	4,916,636	07/049,860	04/10/90
4,916,153	07/024,469	04/10/90	4,916,637	07/122,295	04/10/90
4,916,170	07/224,938	04/10/90	4,916,657	06/808,315	04/10/90
4,916,172	07/248,086	04/10/90	4,916,658	07/135,170	04/10/90
4,916,175	07/117,778	04/10/90	4,916,659	07/161,566	04/10/90
4,916,182	07/284,667	04/10/90	4,916,663	07/157,544	04/10/90
4,916,189	07/214,965	04/10/90	4,916,664	07/292,898	04/10/90
4,916,195	07/199,265	04/10/90	4,916,680	07/230,389	04/10/90
4,916,213	07/206,968	04/10/90	4,916,681	07/253,381	04/10/90
4,916,217	07/001,281	04/10/90	4,916,688	07/175,835	04/10/90
4,916,223	07/306,138	04/10/90	4,916,702	07/207,811	04/10/90
4,916,230	06/627,156	04/10/90	4,916,703	07/276,736	04/10/90
4,916,233	07/342,798	04/10/90	4,916,715	07/180,926	04/10/90
			4,916,716	06/233,956	04/10/90

JUNE 23, 1998

U.S. PATENT AND TRADEMARK OFFICE

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Patent Number	Serial Number	Issue Date	4,916,738	06/927,306	04/10/90
4,916,722	07/066,093	04/10/90	4,916,740	07/361,716	04/10/90
			4,916,745	06/827,253	04/10/90

Patents Reinstated Due to the Acceptance of a  
Late Maintenance Fee From 04/24/98

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
RE32,744	07/045,017	09/24/86	09/06/88	04/27/98
4,509,346	06/541,674	10/13/83	04/09/85	04/30/98
4,515,734	06/461,847	01/28/83	05/07/85	04/28/98
4,528,200	06/485,201	04/15/83	07/09/85	04/27/98
4,538,482	06/433,220	10/07/82	09/03/85	04/28/98
4,550,452	06/575,072	01/30/84	11/05/85	04/28/98
4,560,824	06/731,423	05/07/85	12/24/85	04/30/98
4,565,270	06/454,890	12/30/82	01/21/86	04/28/98
4,723,733	06/853,124	04/17/86	02/09/88	04/30/98
4,733,737	06/770,729	08/29/85	03/29/88	04/30/98
4,738,175	06/813,121	12/24/85	04/19/88	04/30/98
4,740,777	06/944,216	12/22/86	04/26/88	04/29/98
4,764,144	06/892,277	08/04/86	08/16/88	04/29/98
4,788,156	06/911,270	09/24/86	11/29/88	04/27/98
4,802,387	06/934,102	11/24/86	02/07/89	04/28/98
4,809,850	07/174,192	03/28/88	03/07/89	04/28/98
4,819,986	07/217,823	07/12/88	04/11/89	04/30/98
4,850,272	07/163,822	02/22/88	07/25/89	04/30/98
4,870,966	07/150,594	02/01/88	10/03/89	04/28/98
4,874,381	07/211,229	06/24/88	10/17/89	04/30/98
4,880,638	07/235,378	08/23/88	11/14/89	04/29/98
4,884,363	07/281,921	12/05/88	12/05/89	04/30/98
4,896,967	07/167,682	03/11/88	01/30/90	04/30/98
4,901,261	07/265,110	10/31/88	02/13/90	04/24/98
4,908,814	07/135,029	10/06/87	03/13/90	04/29/98
4,910,242	07/230,802	08/10/88	03/20/90	04/24/98
5,087,048	07/552,089	07/13/90	02/11/92	04/29/98
5,093,400	07/453,174	12/26/89	03/03/92	04/29/98
5,099,888	07/532,322	06/04/90	03/31/92	04/30/98
5,105,034	07/529,487	05/29/90	04/14/92	04/29/98
5,124,141	07/538,126	06/14/90	06/23/92	04/30/98
5,129,756	07/577,456	09/04/90	07/14/92	04/29/98
5,141,758	07/791,183	11/13/91	08/25/92	04/30/98
5,143,589	07/648,328	01/29/91	09/01/92	04/30/98
5,157,089	07/699,439	05/13/91	10/20/92	04/29/98
5,159,660	07/596,056	10/11/90	10/27/92	04/28/98
5,165,066	07/782,894	10/22/91	11/17/92	04/28/98
5,168,638	07/512,763	04/20/90	12/08/92	04/30/98
5,173,346	07/540,576	06/18/90	12/22/92	04/29/98
5,180,516	07/727,022	07/08/91	01/19/93	04/30/98
5,190,681	07/715,692	06/17/91	03/02/93	04/28/98
5,195,828	07/851,064	03/13/92	03/23/93	04/30/98
5,204,259	07/344,237	04/26/89	04/20/93	04/27/98
5,241,110	07/727,700	07/10/91	08/31/93	04/28/98
5,241,285	07/770,515	10/03/91	08/31/93	04/29/98
5,261,875	07/818,045	01/08/92	11/16/93	04/29/98
5,261,911	07/911,105	07/09/92	11/16/93	04/24/98
5,268,183	07/519,395	05/04/90	12/07/93	04/29/98
5,275,553	07/881,181	05/11/92	01/04/94	04/30/98
5,278,048	07/708,121	05/29/91	01/11/94	04/28/98
5,280,791	07/963,057	10/19/92	01/25/94	04/28/98
5,285,873	07/836,898	02/19/92	02/15/94	04/30/98
5,292,447	07/946,227	09/18/92	03/08/94	04/20/98

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

**4,989,114**, Re. S.N. 08/405,435, Mar. 16, 1995, Cl. 361/84, BRIDGE CIRCUIT HAVING POLARITY INVERSION PROTECTION MEANS ENTAILING A REDUCED VOLTAGE DROP, Sandro Stori, et. al., Owner of Record:

SGS-Thomson Microelectronics SRL, Milano, Italy, Attorney or Agent: Kenneth C. Hill, Ex. Gp.: 2836

**5,220,117**, Re. S.N. 08/724,968, Oct. 3, 1996, Cl. 84/600, ELECTRONIC MUSICAL INSTRUMENT, Hideo Yamada, et. al., Owner of Record: Yamaha Corp., Hamamatsu-Shi, Japan, Attorney or Agent: N. Kenneth Burraston, Ex. Gp.: 2837

**5,387,167**, Re. S.N. 08/794,081, Feb. 4, 1997, Cl. 482/57, FOOT OPERATED ROTATIONAL ASSEMBLY, Gary John-



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ston, Owner of Record: *Inventor*, Attorney or Agent: None, Ex. Gp.: 3302

**5,452,352**, Re. S.N. 08/933,951, Sep. 19, 1997, Cl. 379/355, AUTOMATIC DIALING SYSTEM, David Talton, Owner of Record: *Inventor*, Attorney or Agent: Kenyon And Kenyon, Ex. Gp.: 2472

**5,465,146**, Re. S.N. 08/755,814, Nov. 26, 1996, Cl. 399/285, FIXING DEVICE FOR ELECTROPHOTOGRAPHIC APPARATUS, Yuichiro Higashi, et. al., Owner of Record: *Nitto Kogyo Co., LTD, Tokyo, Japan*, Attorney or Agent: Eric J. Kraus, Ex. Gp.: 2105

**5,470,825**, Re. S.N. 08/977,843, Nov. 25, 1997, Cl. 514/002, BASOPHIL GRANULE PROTEINS, Randy W. Scott, et. al., Owner of Record: *Incyte Pharmaceuticals Inc., Redwood City, Calif.*, Attorney or Agent: Carol L. Francis, Ex. Gp.: 1814

**5,536,501**, Re. S.N. 09/977,644, Nov. 24, 1997, Cl. 424/405, USE OF AROMATIC ALDEHYDES AS INSECTICIDES AND FOR KILLING ARACHNIDS, Ralph Emerson, Owner of Record: *Proguard Inc., Suisin City, Calif.*, Attorney or Agent: Viola T. Rung, Ex. Gp.: 1512

**5,597,734**, Re. S.N. 09/067,471, Apr. 27, 1998, Cl. 436/161, ION CHROMATOGRAPHY USING FREQUENT REGENERATION OF BATCH-TYPE SUPPRESSOR, Hamish Small, et. al., Owner of Record: *Dionex Corp., Sunnyvale, Calif.*, Attorney or Agent: David J. Brezner, Ex. Gp.: 1313

**5,599,409**, Re. S.N. 09/067,623, Apr. 28, 1998, Cl. 152/454, RADIAL TIRE/WHEEL ASSEMBLY FOR HIGH BRAKE HEAT GENERATED SERVICE, Traian Benchea, Owner of Record: *Bridgestone/Firestone, Inc., Akron, Ohio*, Attorney or Agent: Michael Sand, Ex. Gp.: 1301

## Requests for Reexaminations Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

**4,499,255**, Reexam. No. 90/004,973, Apr. 23, 1998, Cl. 528/095, PREPARATION OF EPOXY RESINS, Chun S. Wang, et. al., Owner of Record: *The Dow Chemical Co., Midland, Mich.*, Attorney or Agent: Richard G. Waterman, James G. Carter, and William D. Miller, The Dow Chemical Co., Midland, Mich., Ex. Gp.: 1712, Requester: Kenneth J. Burchfiel, Sughrue Mion Zinn MacPeak and Seas, Washington, D.C.

**5,008,511**, Reexam. No. 90/004,979, Apr. 29, 1998, Cl. 219/121.48, PLASMA TORCH WITH AXIAL REACTANT FEED, Douglas A. Ross, Owner of Record: *University of British Columbia, Vancouver, Canada*, Attorney or Agent: C. E. Rowley, Frankfurt, Canada, Ex. Gp.: 3742, Requester: Lucian B. Delcea, Port Moody, Canada

**5,176,654**, Reexam. No. 90/004,975, Apr. 23, 1998, Cl. 604/181, METHOD AND APPARATUS FOR OTOLOGIC ADMINISTRATION OF MEDICAMENT, Simeon B. Schreiber, Owner of Record: *Inventor*, Attorney or Agent: Sterne Kessler Goldstein and Fox, Washington, D.C., Ex. Gp.: 3734, Requester: King Pharmaceuticals, c/o Jon L. Roberts, Roberts and Brownell, Vienna, Va.

**5,223,844**, Reexam. No. 90/004,974, Apr. 22, 1998, Cl. 342/357, VEHICLE TRACKING AND SECURITY SYSTEM, John P. Mansell, Owner of Record: *E-Systems, Inc., Dallas, Tex.*, Attorney or Agent: Harold E. Meier, Baker and Botts, Dallas, Tex., Ex. Gp.: 3642, Requester: Owner

**5,455,346**, Reexam. No. 90/004,976, Apr. 27, 1998, Cl. 540/540, OBTAINING CAPROLACTAM BY CLEAVAGE OF MOLTEN POLYCAPROLACTAM, Michael Kopietz, et. al., Owner of Record: *BASF Corp., Mt. Olive, N.J.*, Attorney or Agent: Nixon and Vanderhye, Arlington, Va., Ex. Gp.: 1611, Requester: Owner

**5,523,540**, Reexam. No. 90/004,977, Apr. 28, 1998, Cl. 219/137WM, WELDING ELECTRONICS FOR PRODUCING LOW CARBON BAINITIC FERRITE WELD DEPOSITS, Phillip A. Coldren, et. al., Owner of Record: *Alloy Rods Global Inc., Hanover, Pa.*, Attorney or Agent: Mark R. Leslie, Kirkpatrick and Lockhart, Pittsburgh, Pa., Ex. Gp.: 1742, Requester: Draughton Professional Association, Jacksonville, Fla.

**5,719,329**, Reexam. No. 90/004,978, Apr. 28, 1998, Cl. 073/61.49, ULTRASONIC MEASURING SYSTEM AND METHOD OF OPERATION, William Paul Jepson, et. al., Owner of Record: *Ohio University, Athens, Ohio*, Attorney or Agent: James E. Beyer, Killworth, Gottman, Hagan and Schaeff, Dayton, Ohio, Ex. Gp.: 2855, Requester: Owner

## Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

TRADEMARK REGISTRATIONS WHICH EXPIRED  
APRIL 27, 1998  
DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
115,209	71/098,314	01/30/1917
117,667	71/101,742	07/24/1917
117,680	71/102,693	07/24/1917
117,681	71/102,696	07/24/1917
117,698	71/096,255	07/24/1917
348,141	71/378,357	07/20/1937
348,172	71/387,054	07/20/1937
348,204	71/388,699	07/20/1937
348,211	71/388,975	07/20/1937
348,244	71/389,599	07/20/1937
348,259	71/389,894	07/20/1937
348,274	71/390,105	07/20/1937
348,310	71/390,377	07/20/1937
628,705	71/695,918	06/12/1956
630,136	71/699,374	07/03/1956
641,674	72/010,084	02/19/1957
648,477	72/001,583	07/16/1957
648,728	72/017,185	07/23/1957
648,732	72/008,698	07/23/1957
648,737	72/019,517	07/23/1957
648,738	72/019,558	07/23/1957
648,739	72/019,702	07/23/1957
648,745	72/016,773	07/23/1957
648,747	72/020,805	07/23/1957
648,750	72/007,311	07/23/1957
648,754	71/692,814	07/23/1957
648,756	72/004,918	07/23/1957
648,760	72/006,857	07/23/1957
648,762	72/014,288	07/23/1957
648,764	72/015,862	07/23/1957
648,777	72/004,897	07/23/1957
648,781	72/012,182	07/23/1957
648,786	72/017,964	07/23/1957

Reg. Number	Serial Number	Reg. Date	1,069,661	73/107,013	07/19/1977
648,803	72/002,495	07/23/1957	1,069,663	73/108,000	07/19/1977
648,806	72/021,572	07/23/1957	1,069,664	73/108,013	07/19/1977
648,810	71/697,973	07/23/1957	1,069,665	73/108,014	07/19/1977
648,816	72/014,360	07/23/1957	1,069,669	73/109,976	07/19/1977
648,827	72/019,257	07/23/1957	1,069,672	73/110,579	07/19/1977
648,829	72/019,570	07/23/1957	1,069,676	73/105,595	07/19/1977
648,849	72/008,669	07/23/1957	1,069,678	73/109,476	07/19/1977
648,851	72/010,589	07/23/1957	1,069,681	73/046,691	07/19/1977
648,856	72/018,100	07/23/1957	1,069,688	73/080,375	07/19/1977
648,859	72/019,083	07/23/1957	1,069,689	73/080,663	07/19/1977
648,862	72/019,298	07/23/1957	1,069,690	73/081,285	07/19/1977
648,867	71/689,123	07/23/1957	1,069,691	73/083,833	07/19/1977
648,871	72/006,179	07/23/1957	1,069,692	73/084,248	07/19/1977
648,884	71/697,930	07/23/1957	1,069,694	73/090,145	07/19/1977
648,891	72/014,488	07/23/1957	1,069,695	73/090,330	07/19/1977
648,925	71/698,890	07/23/1957	1,069,696	73/090,428	07/19/1977
648,944	72/015,868	07/23/1957	1,069,709	73/077,890	07/19/1977
648,948	72/018,290	07/23/1957	1,069,710	73/086,524	07/19/1977
648,949	72/018,386	07/23/1957	1,069,711	73/089,930	07/19/1977
648,950	72/018,387	07/23/1957	1,069,712	73/092,651	07/19/1977
648,952	72/004,382	07/23/1957	1,069,714	73/095,828	07/19/1977
648,954	72/009,839	07/23/1957	1,069,716	73/097,151	07/19/1977
648,955	72/010,789	07/23/1957	1,069,721	73/105,965	07/19/1977
648,956	72/013,535	07/23/1957	1,069,724	73/108,669	07/19/1977
648,957	72/016,157	07/23/1957	1,069,725	73/108,670	07/19/1977
648,959	72/020,174	07/23/1957	1,069,727	73/109,047	07/19/1977
648,974	72/013,861	07/23/1957	1,069,728	73/110,365	07/19/1977
648,975	72/014,148	07/23/1957	1,069,729	73/110,366	07/19/1977
648,981	72/016,235	07/23/1957	1,069,735	73/071,037	07/19/1977
649,008	72/003,792	07/23/1957	1,069,738	73/084,240	07/19/1977
649,013	71/695,563	07/23/1957	1,069,740	73/086,843	07/19/1977
649,025	72/011,777	07/23/1957	1,069,741	73/096,965	07/19/1977
649,027	72/013,296	07/23/1957	1,069,742	73/013,637	07/19/1977
649,028	72/013,755	07/23/1957	1,069,755	73/063,479	07/19/1977
649,030	72/014,051	07/23/1957	1,069,758	73/104,229	07/19/1977
649,031	72/014,523	07/23/1957	1,069,759	73/046,658	07/19/1977
649,034	72/016,883	07/23/1957	1,069,764	73/078,300	07/19/1977
649,040	72/017,101	07/23/1957	1,069,767	73/085,964	07/19/1977
649,041	72/017,748	07/23/1957	1,069,769	73/086,452	07/19/1977
649,043	72/017,773	07/23/1957	1,069,776	73/098,994	07/19/1977
649,044	72/017,774	07/23/1957	1,069,778	73/103,903	07/19/1977
649,045	72/017,775	07/23/1957	1,069,780	73/105,706	07/19/1977
649,047	72/017,972	07/23/1957	1,069,785	73/091,254	07/19/1977
649,062	71/685,958	07/23/1957	1,069,787	73/104,962	07/19/1977
649,063	71/694,776	07/23/1957	1,069,797	73/093,537	07/19/1977
649,065	72/000,160	07/23/1957	1,069,803	73/092,643	07/19/1977
649,069	72/004,824	07/23/1957	1,069,804	73/105,949	07/19/1977
649,086	71/684,816	07/23/1957	1,069,806	73/077,605	07/19/1977
649,088	71/691,596	07/23/1957	1,069,808	73/100,856	07/19/1977
649,089	71/696,864	07/23/1957	1,069,810	73/025,903	07/19/1977
649,100	72/008,138	07/23/1957	1,069,811	73/035,613	07/19/1977
1,041,195	73/001,895	06/15/1976	1,069,814	73/049,494	07/19/1977
1,055,631	73/076,734	01/04/1977	1,069,816	73/065,262	07/19/1977
1,056,988	73/069,379	01/25/1977	1,069,817	73/075,199	07/19/1977
1,061,733	73/072,807	03/22/1977	1,069,818	73/077,352	07/19/1977
1,066,764	73/101,850	05/31/1977	1,069,820	73/078,612	07/19/1977
1,069,610	73/001,115	07/19/1977	1,069,827	73/059,293	07/19/1977
1,069,611	73/018,410	07/19/1977	1,069,829	73/087,953	07/19/1977
1,069,620	73/074,900	07/19/1977	1,069,830	75/109,492	07/19/1977
1,069,623	73/076,803	07/19/1977	1,069,832	73/110,324	07/19/1977
1,069,626	73/080,139	07/19/1977	1,069,834	73/095,614	07/19/1977
1,069,628	73/083,218	07/19/1977	1,069,837	73/109,553	07/19/1977
1,069,630	73/084,028	07/19/1977	1,069,839	73/090,361	07/19/1977
1,069,633	73/085,511	07/19/1977	1,069,851	73/104,416	07/19/1977
1,069,636	73/087,324	07/19/1977	1,069,857	73/089,684	07/19/1977
1,069,637	73/087,449	07/19/1977	1,069,862	73/100,709	07/19/1977
1,069,640	73/089,487	07/19/1977	1,069,873	73/088,410	07/19/1977
1,069,644	73/095,193	07/19/1977	1,069,874	73/096,009	07/19/1977
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Notice Regarding Technical Center  
Box Issue Fee Mailings

The Office will begin mailing address labels with the PTOL-85, "Notice of Allowance and Issue Fee Due" for patent applications allowed in all Technology Centers. These address labels should be used to ensure proper routing of post-allowance correspondence. This directive supersedes the "Special Boxes for Patent Mail" instruction. Any Notice of Allowance and Issue Fee Due received without the accompanying address labels should continue to be addressed to Box Issue Fee.

March 11, 1998

NICHOLAS P. GODICI  
Deputy Assistant Commissioner  
for Patents (Acting)

DEPARTMENT OF COMMERCE  
Patent and Trademark Office  
37 CFR Part I

[Docket #: 980511124-8124-01]

Revision of Patent Cooperation Treaty  
Application Procedure

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Interim rule with request for public comments.

**SUMMARY:** The Patent and Trademark Office (Office or USPTO) is amending its rules of practice relating to applications filed under the Patent Cooperation Treaty (PCT) to conform the United States rules of practice with the corresponding changes to the Regulations under the PCT which become effective July 1, 1998. The result will be more streamlined procedures for filing and prosecuting international applications under the PCT.

**DATES: EFFECTIVE DATE:** July 1, 1998.

**COMMENT DEADLINE DATE:** To be ensured of consideration, written comments must be received on or before July 31, 1998. No public hearing will be held.

**ADDRESSES:** Address written comments to: Box Comments-Patents, Assistant Commissioner for Patents, Washington, D.C. 20231, or by facsimile to (703) 308-6459, marked to the attention of Richard Lazarus. Comments submitted by facsimile should be followed by a copy of the comments submitted by mail. The Office would also prefer that comments submitted by mail be accompanied by a copy of the comments in a standard word processing format on a 3 1/4 inch disk.

The comments will be available for public inspection in Crystal Plaza Two, room 7A04, 2011 South Clark Place, Arlington, Virginia, and will be available through anonymous file transfer protocol (ftp) via the Internet (address: ftp.uspto.gov). Since comments will be made available for public inspection, information that is not desired to be made public, such as an address or phone number, should not be included in the comments.

**FOR FURTHER INFORMATION CONTACT:** Richard Lazarus, PCT Legal Office Supervisor, by telephone at (703) 308-6451; or by mail addressed to: Box PCT, Assistant Commissioner for Patents, Washington, DC 20231; or by facsimile to (703) 308-6459, marked to the attention of Richard Lazarus.

**SUPPLEMENTARY INFORMATION:** During a September-October 1997 meeting of the Governing Bodies of the World Intellectual Property Organization (WIPO), the PCT Assembly adopted amendments to the PCT Regulations, which will take effect on July 1, 1998. The amended PCT Regulations were published in the Official Gazette at 1210 *Off. Gaz. Pat. Office* 29 (May 12, 1998). The resulting changes to PCT practice will improve filing and processing procedures for applicants filing international applications.

This interim rule amends the United States rules of practice to conform them to corresponding changes made to the PCT Regulations that will take effect on July 1, 1998. The interim rules will also be effective on July 1, 1998. The Office will publish a final rule either confirming the adoption of these interim rules as final rules or adopting final rules which reflect changes made based upon the public comments received in response to this interim rule.

Applicants are hereby notified that PCT Rules 20.4(c) and 26.3ter(a) and (c) as amended are not compatible with the national law of the United States, and thus the USPTO has taken a reservation on adherence to these Rules through its notification to the Director General of WIPO to such effect. See PCT Rules 20.4(d) and 26.3ter(b) and (d). Applicants of international applications in the United States need to be aware of these differences to avoid the consequences of failing to comply with the requirements of United States law. For example, PCT Rules 20.4(c) and 26.3ter(a) and (c) permit an international filing date to be accorded notwithstanding that portions of the international application are in a language not acceptable to the Receiving Office. 35 U.S.C. 361 does not permit this practice and a filing date will not be accorded by the USPTO under these provisions or circumstances. However, if any portion of the international application is not in English, but is in a language of filing accepted by the International Bureau, it will be forwarded to the International Bureau pursuant to the provisions of PCT Rule 19.4. The International Bureau will act as a Receiving Office and accord a receipt date as of the receipt date in the USPTO.

Similarly, the USPTO continues not to adhere to the unchanged provisions of PCT Rule 49.5(cbis) and (k) with respect to the translation requirements for United States national stage applications (35 U.S.C. 371(c)(2)). See PCT Rule 49.5(l).

The above noted changes to the PCT Regulations include the addition of new PCT Rules 89bis and 89ter (directed to electronic filing and processing of international applications) which will enter into force at the same time as the modifications to the Administrative Instructions implementing those PCT Rules. Implementation of PCT Rules 89bis and 89ter is optional with

each national office. In the event that the USPTO decides to implement PCT Rules 89bis and 89ter, the USPTO will provide notice to that effect in the *Federal Register* and *Official Gazette*.

**Discussion of Specific Rules:**

Title 37 of the Code of Federal Regulations, Part 1, is amended as follows:

Section 1.14(g) is added to comply with the amendments to PCT Rule 94. After international publication and establishment of the international preliminary examination report, third parties are permitted access to documents from the file of the International Preliminary Examining Authority in the USPTO's elected office file (not the international preliminary examination file) to the same extent as access to United States national applications.

Section 1.412(c)(6) is amended to conform to the changes to PCT Rule 19.4(a). The change relates to the procedures for the filing of international applications and their processing by the Receiving Office. The change broadens the circumstances in which an international application may be transmitted to the International Bureau as the Receiving Office and adds more flexibility for applicants and the United States Receiving Office in determining whether to forward the international application to the International Bureau as the Receiving Office. When the international application is filed with the USPTO and the language in which the application is filed is not accepted by the USPTO, or if the applicant does not have the requisite residence or nationality, the application may be forwarded to the International Bureau for receiving Office processing.

Section 1.416(c) is amended to reflect the addition of new PCT Rule 59.3. The change provides a safeguard in the case of a Demand filed with the USPTO which is not competent as the International Preliminary Examining Authority. The Office forwards the Demand and the competent International Preliminary Examining Authority processes the Demand based on the date of receipt in the USPTO. This section is rewritten to: (1) redesignate current paragraphs (c)(2) through (c)(6) as paragraphs (c)(3) through (c)(7), respectively; and (2) add "[f]orwarding Demands in accordance with PCT Rule 59.3" as a new paragraph (c)(2).

Section 1.419 is added pursuant to 44 U.S.C. 3512(a) and 5 CFR 1320.5(b). As the Office cannot add the information specified in 5 CFR 1320.5(b) to the forms prescribed by the International Bureau, the Office is adopting § 1.419 to provide the information display required by 5 CFR 1320.5(b)(2)(i). See 5 CFR 1320.5(b)(2)(ii)(D). Section 1.419 specifically provides: (1) that the collection of information in 37 CFR Part 1, Subpart C, has been reviewed and approved by the Office of Management and Budget under control number 0651-0021; (2) that § 1.419 constitutes the display required by 44 U.S.C. 3512(a) and 5 CFR 1320.5(b)(2)(i) for the collection of information under Office of Management and Budget control number 0651-0021; and (3) a notice under 5 CFR 1320.5(b)(2)(i) that:

Notwithstanding any other provision of law, no person is required to respond to nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid Office of Management and Budget control number.

Section 1.431 is amended to reflect corresponding changes to PCT Rules 14, 15, 16 and 16bis. This section is amended to: (1) provide in paragraph (c) that the basic, transmittal, and search fee payable is the basic, transmittal, and search fee in effect on the filing date of the international application (see PCT Rule 14.1(c), 15.4(a), and 16.1(f)); (2) eliminate the unassociated text following former paragraph (c)(2); (3) add "prior to the sending of a notice of deficiency"; and (4) add a reference to PCT Rule 16bis.1(e) in paragraph (d). These changes will reduce mistakes in paying fees where different fees have different times for payment. The change simplifies the fees due to be the fee amounts (basic, transmittal and search) in effect on the date of receipt of the international application. Additionally, the change provides the additional benefit of delaying the

effect of the sanction until the sending of the notice of such sanction.

Section 1.432 is amended to reflect corresponding changes to PCT Rules 15 and 16bis. The changes relate to the time periods and amounts due for the payment of designation and confirmation fees. Paragraph (b) has been rewritten, for the purposes of clarity, as paragraphs (b)(1) and (b)(2), with paragraph (b)(2) comprising the unassociated text following former paragraph (b)(3). Additionally, former paragraph (b)(3), now paragraph (b)(1)(iii), has been amended to include the timeliness provision of new PCT Rule 16bis.1(e).

Section 1.432 is further amended to designate paragraph (c) as paragraphs (d), (d)(1) and (d)(2) for better clarity.

Section 1.432 is further amended to add a new paragraph (c) providing the amount payable for the designation fee set forth in § 1.432(b). Section 1.432(c)(1) provides that if the designation fee is paid in full within one month from the date of receipt of the international application, the amount payable for the designation fee is the designation fee in effect on the filing date of the international application. Section 1.432(c)(2) provides that if the designation fee is paid in full later than one month from the date of receipt of the international application, but within one year from the priority date, the amount payable for the designation fee is the designation fee in effect on the date such fee is paid in full. Section 1.432(c)(3) provides that if the designation fee was due one year from the priority date, and such fee is paid in full later than one month from the date of receipt of the international application and later than one year from the priority date, the amount payable for the designation fee is the designation fee in effect on the date one year from the priority date. Section 1.432(c)(4) provides that if the designation fee was due one month from the international filing date and after one year from the priority date, and such fee is paid in full later than one month from the date of receipt of the international application and later than one year from the priority date, the amount payable for the designation fee is the designation fee in effect on the international filing date.

The addition of new paragraph (c) reflects the corresponding changes to PCT Rules 15.4(b), 15.4(c) and 16bis.1.

Section 1.435 is amended to conform to the change to PCT Rule 13ter incorporating the common computer readable form standard prescribed by the Administrative Instructions. The amendments to Section 1.435 change "Administrative Instruction 204" to "sections 204 and 208 of the Administrative Instructions."

Section 1.445 is amended to re-insert paragraphs (a)(4) and (a)(5) that were inadvertently deleted. Section 1.445(a)(4) was inadvertently omitted in *Revision of Patent Fees*: Final Rule Notice, 59 FR 43736 (August 25, 1994), 1165 *Off. Gaz. Pat. Office* 132 (August 30, 1994), and § 1.445(a)(5) was inadvertently omitted in *Revision of Patent and Trademark Fees*: Final Rule Notice, 60 FR 41018 (August 11, 1995), 1177 *Off. Gaz. Pat. Office* 171 (August 29, 1995).

Section 1.451 is amended to conform to the changes made to PCT Rule 4.10 and the addition of new PCT Rule 26bis. The changes reflect the ability of applicants to now add or correct priority claims after the filing of the international application. This section is amended to: (1) add a new paragraph (d) which provides that the applicant may correct or add a priority claim in accordance with PCT Rule 26bis.1; and (2) add the phrase "subject to paragraph (d)" to paragraph (a).

Section 1.461 is amended to reflect the corresponding change to PCT Rule 19.4 wherein an international application filed in error with the USPTO may be forwarded to the International Bureau for processing as Receiving Office. The new provisions expand the flexibility for forwarding an international application which is filed with, but not accepted by, the USPTO.

Section 1.465 is amended to conform to the changes made to PCT Rule 4.10 and the addition of new PCT Rule 26bis concerning the time period in which applicant may add or correct a priority claim. Under the new provisions, an applicant may add or correct a priority claim until sixteen months from the



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priority date, or where the priority date is changed, sixteen months from the priority date as so changed, whichever period expires first. All priority claim additions or changes must, however, be submitted no later than four months from the international filing date. Section 1.465(b) is amended to change the phrase "cancelled under PCT Rule 4.10(d), or considered not to have been made under PCT Rule 4.10(b)" to "corrected or added under PCT Rule 26bis.1(a), or withdrawn under PCT Rule 90bis.3, or considered not to have been made under PCT Rule 26bis.2." Section 1.465(b) is further amended to change the phrase "computing time limits" to "computing any non-expired time limits" to be in accord with the provision of new PCT Rules 26bis.1(c). As suggested by the latter amendment to Section 1.465(b), time limits which have already expired at the time of the addition, correction, or withdrawal of a priority claim are not subject to recomputation. Section 1.465(c) is amended to change the reference to PCT "Rule 4.10(d)" to "PCT Rule 26bis.2(b)."

Section 1.471 is amended to clarify the rule to conform it to amended PCT Rule 12. Section 1.471 is amended to: (1) indicate that it also applies to corrections submitted to the United States International Searching Authority; (2) explicitly require that corrections be in English and in compliance with PCT Rules 10 and 11; (3) provide that one "appropriate" addition or change of not more than five words per sheet may be stated in a letter; and (4) provide that amendments that do not comply with PCT Rules 10 and 11 may not be entered. PCT Rule 12 was amended to allow the Receiving Office to accept an international application in any language. In these instances, a translation may be required for the International Searching Authority, and any corrections are required to be submitted in both the language of the application and the language of the translation. 35 U.S.C. 361(c) reflects that the United States Receiving Office only accepts international applications in English and, in accordance with the agreement between the United States and the International Bureau, the United States International Searching and Examining Authorities will only process international applications in English. Thus, any changes under § 1.471 must be in English. Section 1.471 is also clarified to reflect that PCT Rules 10 and 11 apply to any later submitted documents.

Section 1.480 is amended to clarify the rule to conform it to amended PCT Rule 59.3. Section 1.480 is amended to change "Demand and payment of the fees for international preliminary examination (§ 1.482)" to "proper Demand in an application for which the United States International Preliminary Examining Authority is competent and for which the fees for international preliminary examination (§ 1.482) have been paid." PCT Rule 59.3 was amended to allow a non-competent authority to forward a Demand either to the International Bureau or the competent international preliminary examining authority. Section 1.480 is changed to clarify that the United States International Preliminary Examining Authority only conducts international preliminary examinations in international applications where the United States is the competent International Preliminary Examining Authority.

Section 1.481(a) is added to reflect the corresponding changes to PCT Rules 57 and 58, as well as the addition of PCT Rule 58bis. PCT Rule 57.3 sets the time limit for paying and the amount of the handling fee, and PCT Rule 58.1(b) provides that the provisions of PCT Rule 57.3 apply to the time limit for paying and the amount of the preliminary examination fee. Section 1.481(a) provides that the handling and preliminary examination fees shall be paid within the time period set in PCT Rule 57.3, and that the handling fee or preliminary examination fee payable is the handling fee or preliminary examination fee in effect on the date of receipt of the Demand in the United States International Preliminary Examining Authority. PCT Rule 58bis.1(c) was added to consider the handling fee and examination fee to have been received before the expiration of the time period set in PCT Rule 57.3 if the fees were submitted prior to the sending of an invitation to pay the fees. PCT Rule 58bis.1(a) was added to now allow the International Preliminary Examining Authority to collect a late payment fee, if the fees for preliminary examination are not paid prior to the sending of the invitation. PCT Rule 58bis.2 sets the amount of the late payment fee. Section 1.481(a) reflects changes to

PCT Rule 58bis by providing that if the handling and preliminary fees are not paid within the time period set in PCT Rule 57.3, applicants will be notified and given one month within which to pay the deficient fees plus a late payment fee equal to the greater of: (1) fifty percent of the amount of the deficient fees, but not exceeding an amount equal to double the handling fee, or (2) an amount equal to the handling fee (PCT Rule 58bis.2). Section 1.481 also provides that the one-month time limit set in § 1.481(a) to pay deficient fees may not be extended.

Section 1.481(b) is added to reflect the addition of PCT Rule 58bis.1(d). Section 1.481(b) provides that if the payment needed to cover the handling and preliminary examination fees, pursuant to § 1.481(a), is not timely made in accordance with added PCT Rule 58bis.1(d), the United States International Preliminary Examination Authority will declare the Demand to be considered as if it had not been submitted. In this regard, where the Authority sends a notification that the Demand is considered not to have been made and applicant's payment is received, both on that same date, the fee is considered to be late and the notification remains effective. The fee must antedate the notice in order for the notice not to be effective.

Section 1.484(b) is amended to clarify the rule in conformance with amended PCT Rule 59.3. Section 1.484(b) is amended to: (1) change "Demand" to "proper Demand in an application for which the United States International Preliminary Examining Authority is competent and for which the fees for international preliminary examination (§ 1.482) have been paid and"; and (2) eliminate the unassociated text following former paragraph (b)(3). PCT Rule 59.3 was amended to allow a non-competent receiving Office or international authority to forward a Demand either to the International Bureau or the competent International Preliminary Examining Authority. This change has the consequence of providing a safeguard for applicants who are filing a Demand at the end of nineteen months from the priority date and through error deposit the Demand with a receiving Office or an international authority that is not competent. Section 1.484(b) is changed to reflect that the United States International Preliminary Examining Authority only conducts international preliminary examination where the United States is the competent International Preliminary Examining Authority.

Section 1.485(a) is amended by adding that the replacement sheets must be "in compliance with PCT Rules 10 and 11." The amendment incorporates the change to PCT Rule 11.14 which makes the formal requirements of PCT Rules 10 and 11 applicable to amendments during the international preliminary examination phase.

Sections 1.494(c) and 1.495(c) are amended to provide that a "Sequence Listing" need not be translated if the "Sequence Listing" complies with PCT Rule 12.1 and the description complies with PCT Rule 5.2(b).

#### Review Under the Paperwork Reduction Act of 1995.

Notwithstanding any other provision of law, no person is required to respond to nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act (PRA) unless that collection of information displays a currently valid OMB control number.

This rule contains collections of information requirements subject to the PRA. The principal impact of this interim rule is to conform the United States rules of practice relating to applications filed under the PCT to the corresponding amendments made to the Regulations under the PCT.

The public reporting burden for these collections of information have been approved by the Office of Management and Budget (OMB) under OMB control number 0651-0021. The public reporting burden for this collection of information is estimated to average .954 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the information. Send comments regarding this burden estimate or any other aspect of the data requirements, including suggestions for reducing this burden, to Richard Lazarus at the address specified above or to the

Office of Information and Regulatory Affairs of OMB, New Executive Office Bldg., 725 17th St. NW, rm. 10235, Washington, DC 20230, Attn: Desk Officer for the Patent and Trademark Office.

#### Other Considerations.

The United States rules of practice contained in title 37, CFR, must conform to the PCT Articles and the Regulations annexed to the PCT. See PCT Article 27(1). This interim rule implements corresponding changes required to conform United States rules for international applications to the amendments to the PCT Regulations which become effective on July 1, 1998. Thus, this interim rule is covered by the foreign affairs function exception of 5 U.S.C. 553(a)(1), and may be adopted without prior notice and opportunity for public comment. See *International Brotherhood of Teamsters v. Pena*, 17 F.3d 1478, 1486 (D.C. Cir. 1994).

In addition, the Commissioner of Patents and Trademarks, pursuant to authority at 5 U.S.C. 553(b)(B), finds good cause to adopt the changes made in this interim rule without prior notice and an opportunity for public comment, as such procedures are timing-wise infeasible. The PCT Regulations take effect on July 1, 1998. Delay in the promulgation of these interim rules to provide notice and public comment procedures would effectively preclude the required adoption in the United States of the PCT Regulations by their effective date of July 1, 1998. See *Petry v. Block*, 737 F.2d 1193, 1200-02 (D.C. Cir. 1984).

As prior notice and an opportunity for public comment are not required pursuant to 5 U.S.C. 553, or any other law, the analytical requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, are inapplicable.

This interim rule does not contain policies with federalism implications sufficient to warrant preparation of a Federalism Assessment under Executive Order 12612 (October 26, 1987).

This interim rule has been determined not to be significant for purposes of Executive Order 12866 (September 30, 1993).

#### List of Subjects

##### 37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Reporting and record keeping requirements, Small Businesses.

For the reasons set forth in the preamble, 37 CFR Part 1 is amended as follows:

#### PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR Part 1 continues to read as follows:

Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.14 is amended by adding paragraph (g) to read as follows:

##### § 1.14 Patent applications preserved in confidence.

\*\*\*\*\*

(g) Copies of an application file for which the United States acted as the International Preliminary Examining Authority, or copies of a document in such an application file, will be furnished in accordance with Patent Cooperation Treaty Rule 94.2 or 94.3, upon payment of the appropriate fee (§ 1.19(b)(2) or § 1.19(b)(3)).

3. Section 1.12 is amended by revising paragraph (c)(6) to read as follows:

##### § 1.412 The United States Receiving Office.

\*\*\*\*\*

(c) \*\*\*

(6) Reviewing and, unless prescriptions concerning national

security prevent the application from being so transmitted (PCT Rule 19.4), transmitting the international application to the International Bureau for processing in its capacity as a Receiving Office:

(i) Where the United States Receiving Office is not the competent Receiving Office under PCT Rule 19.1 or 19.2 and § 1.421(a); or

(ii) Where the international application is not in English but is in a language accepted under PCT Rule 12.1(a) by the International Bureau as a Receiving Office; or

(iii) Where there is agreement and authorization in accordance with PCT Rule 19.4(a)(iii).

4. Section 1.416 is amended by revising paragraph (c) to read as follows:

##### § 1.416 The United States International Preliminary Examining Authority.

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(c) The major functions of the International Preliminary Examining Authority include:

(1) Receiving and checking for defects in the Demand;

(2) Forwarding Demands in accordance with PCT Rule 59.3;

(3) Collecting the handling fee for the International Bureau and the preliminary examination fee for the United States International Preliminary Examining Authority;

(4) Informing applicant of receipt of the Demand;

(5) Considering the matter of unity of invention;

(6) Providing an international preliminary examination report which is a non-binding opinion on the questions of whether the claimed invention appears: to be novel, to involve an inventive step (to be nonobvious), and to be industrially applicable; and

(7) Transmitting the international preliminary examination report to applicant and the International Bureau.

5. A new § 1.419 is added before the undesignated center heading "Who May File an International Application" to read as follows:

##### § 1.419 Display of currently valid control number under the Paperwork Reduction Act.

(a) Pursuant to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*), the collection of information in this Subpart has been reviewed and approved by the Office of Management and Budget under control number 0651-0021.

(b) Notwithstanding any other provision of law, no person is required to respond to nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid Office of Management and Budget control number. This section constitutes the display required by 44 U.S.C. 3512(a) and 5 CFR 1320.5(b)(2)(i) for the collection of information under Office of Management and Budget control number 0651-0021 (see 5 CFR 1320.5(b)(2)(ii)(D)).

6. Section 1.431 is amended by revising paragraphs (c) and (d) to read as follows:

##### § 1.431 International application requirements.

\*\*\*\*\*

(c) Payment of the basic portion of the international fee (PCT Rule 15.2) and the transmittal and search fees (§ 1.445) may be made in full at the time the international application papers required by paragraph (b) of this section are deposited or within one month thereafter. The basic, transmittal, and search fee payable is the basic, transmittal, and search fee in effect on

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the receipt date of the international application. (1) If the basic, transmittal and search fees are not paid within one month from the date of receipt of the international application and prior to the sending of a notice of deficiency, applicant will be notified and given one month within which to pay the deficient fees plus a late payment fee equal to the greater of:

(i) Fifty percent of the amount of the deficient fees up to a maximum amount equal to the basic fee; or

(ii) An amount equal to the transmittal fee (PCT Rule 16bis).

(2) The one-month time limit set pursuant to this paragraph to pay deficient fees may not be extended.

(d) If the payment needed to cover the transmittal fee, the basic fee, the search fee, one designation fee and the late payment fee pursuant to paragraph (c) of this section is not timely made in accordance with PCT Rule 16bis.1(e), the Receiving Office will declare the international application withdrawn under PCT Article 14(3)(a).

7. Section 1.432 is amended by revising its heading, paragraphs (b) and (c) and adding paragraphs (d) to read as follows:

**§ 1.432 Designation of States and payment of designation and confirmation fees.**

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(b) If the fees necessary to cover all the national and regional designations specified in the Request are not paid by the applicant within one year from the priority date or within one month from the date of receipt of the international application if that month expires after the expiration of one year from the priority date, applicant will be notified and given one month within which to pay the deficient designation fees plus a late payment fee. The late payment fee shall be equal to the greater of fifty percent of the amount of the deficient fees up to a maximum amount equal to the basic fee, or an amount equal to the transmittal fee (PCT Rule 16bis). The one-month time limit set in the notification of deficient designation fees may not be extended. Failure to timely pay at least one designation fee will result in the withdrawal of the international application.

(1) The one designation fee must be paid:

(i) Within one year from the priority date;

(ii) Within one month from the date of receipt of the international application if that month expires after the expiration of one year from the priority date; or

(iii) With the late payment fee defined in this paragraph within the time set in the notification of the deficient designation fees or in accordance with PCT Rule 16bis.1(e).

(2) If after a notification of deficient designation fees the applicant makes timely payment, but the amount paid is not sufficient to cover the late payment fee and all designation fees, the Receiving Office will, after allocating payment for the basic, search, transmittal and late payment fees, allocate the amount paid in accordance with PCT Rule 16bis.1(c) and withdraw the unpaid designations. The notification of deficient designation fees pursuant to this paragraph may be made simultaneously with any notification pursuant to § 1.431(c).

(c) The amount payable for the designation fee set forth in paragraph (b) is:

(1) The designation fee in effect on the filing date of the international application, if such fee is paid in full within one month from the date of receipt of the international application;

(2) The designation fee in effect on the date such fee is paid in full, if such fee is paid in full later than one month from the date of receipt of the international application but within one year from the priority date;

(3) The designation fee in effect on the date one year from the priority date, if the fee was due one year from the priority date, and such fee is paid in full later than one month from

the date of receipt of the international application and later than one year from the priority date; or

(4) The designation fee in effect on the international filing date, if the fee was due one month from the international filing date and after one year from the priority date, and such fee is paid in full later than one month from the date of receipt of the international application and later than one year from the priority date.

(d) On filing the international application, in addition to specifying at least one national or regional designation under PCT Rule 4.9(a), applicant may also indicate under PCT Rule 4.9(b) that all other designations permitted under the Treaty are made.

(1) Indication of other designations permitted by the Treaty under PCT Rule 4.9(b) must be made in a statement on the Request that any designation made under this paragraph is subject to confirmation (PCT Rule 4.9(c)) not later than the expiration of 15 months from the priority date by:

(i) Filing a written notice with the United States Receiving Office specifying the national and/or regional designations being confirmed;

(ii) Paying the designation fee for each designation being confirmed; and

(iii) Paying the confirmation fee specified in § 1.445(a)(4).

(2) Unconfirmed designations will be considered withdrawn. If the amount submitted is not sufficient to cover the designation fee and the confirmation fee for each designation being confirmed, the Receiving Office will allocate the amount paid in accordance with any priority of designations specified by applicant. If applicant does not specify any priority of designations, the allocation of the amount paid will be made in accordance with PCT Rule 16bis.1(c).

8. Section 1.435 is amended by revising paragraph (a) to read as follows:

**§ 1.435 The description.**

(a) The application must meet the requirements as to the content and form of the description set forth in PCT Rules 5, 9, 10, and 11 and sections 204 and 208 of the Administrative Instructions.

\*\*\*\*\*

9. Section 1.445 is amended by revising paragraph (a) to read as follows:

**§ 1.445 International application filing, processing and search fees.**

(a) The following fees and charges for international applications are established by the Commissioner under the authority of 35 U.S.C. 376:

(1) A transmittal fee (see 35 U.S.C. 361(d) and PCT Rule 14).....\$240.00

(2) A search fee (see 35 U.S.C. 361(d) and PCT Rule 16):

(i) Where a corresponding prior United States National application filed under 35 U.S.C. 111(a) with the filing fee under § 1.16(a) has been filed.....450.00

(ii) For all situations not provided for in paragraph (a)(2)(i) of this section.....700.00

(3) A supplemental search fee when required, per additional invention.....210.00

(4) A confirmation fee (PCT Rule 96) equal to fifty percent of the sum of designation fees for the national and regional designations being confirmed (§ 1.432(d)).

(5) A fee equivalent to the transmittal fee in paragraph (a)(1) of this section for transmittal of an international application to the International Bureau for processing in its capacity as a Receiving Office (PCT Rule 19.4).

\*\*\*\*\*

10. Section 1.451 is amended by revising paragraph (a) and adding a paragraph (d) to read as follows:

**§ 1.451 The priority claim and priority document in an international application.**

(a) The claim for priority must, subject to paragraph (d) of this section, be made on the Request (PCT Rule 4.10) in a manner complying with sections 110 and 115 of the Administrative Instructions.

\*\*\*\*\*

(d) The applicant may correct or add a priority claim in accordance with PCT Rule 26bis.1.

11. Section 1.461 is amended by revising paragraph (a) to read as follows:

**§ 1.461 Procedures for transmittal of record copy to the International Bureau.**

(a) Transmittal of the record copy of the international application to the International Bureau shall be made by the United States Receiving Office or as provided by PCT Rule 19.4.

\*\*\*\*\*

12. Section 1.465 is amended by revising paragraphs (b) and (c) to read as follows:

**§ 1.465 Timing of application processing based on the priority date.**

\*\*\*\*\*

(b) When a claimed priority date is corrected or added under PCT Rule 26bis.1(a), or withdrawn under PCT Rule 90bis.3, or considered not to have been made under PCT Rule 26bis.2, the priority date for the purposes of computing any non-expired time limits will be the date of the earliest valid remaining priority claim of the international application, or if none, the international filing date.

(c) When corrections under PCT Art. 11(2), Art. 14(2) or PCT Rule 20.2(a) (i) or (iii) are timely submitted, and the date of receipt of such corrections falls later than one year from the claimed priority date or dates, the Receiving Office shall proceed under PCT Rule 26bis.2.

13. Section 1.471 is amended by revising paragraph (a) to read as follows:

**§ 1.471 Corrections and amendments during international processing.**

(a) Except as otherwise provided in this paragraph, all corrections submitted to the United States Receiving Office or United States International Searching Authority must be in English, in the form of replacement sheets in compliance with PCT Rules 10 and 11, and accompanied by a letter that draws attention to the differences between the replaced sheets and the replacement sheets. Replacement sheets are not required for the deletion of lines of text, the correction of simple typographical errors, and one addition or change of not more than five words per sheet. These changes may be stated in a letter and, if appropriate, the United States Receiving Office will make the deletion or transfer the correction to the international application, provided that such corrections do not adversely affect the clarity and direct reproducibility of the application (PCT Rule 26.4). Amendments that do not comply with PCT Rules 10 and 11.1 to 11.13 may not be entered.

14. Section 1.480 is amended by revising paragraph (a) to read as follows:

**§ 1.480 Demand for international preliminary examination.**

(a) On the filing of a proper Demand in an application for which the United States International Preliminary Examining Authority is competent and for which the fees have been paid, the international application shall be the subject of an international preliminary examination. The preliminary examination fee (§ 1.482(a)(1)) and the handling fee (§ 1.482(b)) shall be due at the time of filing the Demand.

\*\*\*\*\*

15. Section 1.481 is added to read as follows:

**§ 1.481 Payment of international preliminary examination fees.**

(a) The handling and preliminary examination fees shall be paid within the time period set in PCT Rule 57.3. The handling fee or preliminary examination fee payable is the handling fee or preliminary examination fee in effect on the date of receipt of the Demand except under PCT Rule 59.3(a) where the fee payable is the fee in effect on the date of arrival of the Demand at the United States International Preliminary Examining Authority.

(1) If the handling and preliminary fees are not paid within the time period set in PCT Rule 57.3, applicant will be notified and given one month within which to pay the deficient fees plus a late payment fee equal to the greater of:

(i) Fifty percent of the amount of the deficient fees, but not exceeding an amount equal to double the handling fee; or

(ii) An amount equal to the handling fee (PCT Rule 58bis.2).

(2) The one-month time limit set in this paragraph to pay deficient fees may not be extended.

(b) If the payment needed to cover the handling and preliminary examination fees, pursuant to paragraph (a) of this section, is not timely made in accordance with PCT Rule 58bis.1(d), the United States International Preliminary Examination Authority will declare the Demand to be considered as if it had not been submitted.

16. Section 1.484 is amended by revising paragraph (b) to read as follows:

**§ 1.484 Conduct of international preliminary examination.**

\*\*\*\*\*

(b) International preliminary examination will begin promptly upon receipt of a proper Demand in an application for which the United States International Preliminary Examining Authority is competent, for which the fees for international preliminary examination (§ 1.482) have been paid, and which requests examination based on the application as filed or as amended by an amendment which has been received by the United States International Preliminary Examining Authority. Where a Demand requests examination based on a PCT Article 19 amendment which has not been received, examination may begin at 20 months without receipt of the PCT Article 19 amendment. Where a Demand requests examination based on a PCT Article 34 amendment which has not been received, applicant will be notified and given a time period within which to submit the amendment.

(1) Examination will begin after the earliest of:

(i) Receipt of the amendment;

(ii) Receipt of applicant's statement that no amendment will be made; or

(iii) Expiration of the time period set in the notification.

(2) No international preliminary examination report will be established prior to issuance of an international search report.



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17. Section 1.485 is amended by revising paragraph (a) to read as follows:

**§ 1.485 Amendment by applicant during international preliminary examination.**

(a) The applicant may make amendments at the time of filing the Demand. The applicant may also make amendments within the time limit set by the International Preliminary Examining Authority for reply to any notification under § 1.484(b) or to any written opinion. Any such amendments must:

(1) Be made by submitting a replacement sheet in compliance with PCT Rules 10 and 11.1 to 11.13 for every sheet of the application which differs from the sheet it replaces unless an entire sheet is cancelled; and

(2) Include a description of how the replacement sheet differs from the replaced sheet. Amendments that do not comply with PCT Rules 10 and 11.1 to 11.13 may not be entered.

\*\*\*\*\*

18. Section 1.494 is amended by revising paragraph (c) to read as follows:

**§ 1.494 Entering the national stage in the United States of America as a Designated Office.**

\*\*\*\*\*

(c) If applicant complies with paragraph (b) of this section before expiration of 20 months from the priority date but omits:

(1) A translation of the international application, as filed, into the English language, if it was originally filed in another language (35 U.S.C. 371(c)(2)) and/or

(2) The oath or declaration of the inventor (35 U.S.C. 371(c)(4); see § 1.497), applicant will be so notified and given a period of time within which to file the translation and/or oath or declaration in order to prevent abandonment of the application. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than the expiration of 20 months after the priority date. The payment of the surcharge set forth in § 1.492(e) is required for acceptance of the oath or declaration of the inventor later than the expiration of 20 months after the priority date. A "Sequence Listing" need not be translated if the "Sequence Listing" complies with PCT Rule 12.1(d) and the description complies with PCT Rule 5.2(b).

\*\*\*\*\*

19. Section 1.495 is amended by revising paragraph (c) to read as follows:

**§ 1.495 Entering the national stage in the United States of America as an Elected Office.**

\*\*\*\*\*

(c) If applicant complies with paragraph (b) of this section before expiration of 30 months from the priority date but omits:

(1) A translation of the international application, as filed, into the English language, if it was originally filed in another language (35 U.S.C. 371(c)(2)) and/or

(2) The oath or declaration of the inventor (35 U.S.C. 371(c)(4); see § 1.497), applicant will be so notified and given a period of time within which to file the translation and/or oath or declaration in order to prevent abandonment of the application. The payment of the processing fee set forth in § 1.492(f) is required for acceptance of an English translation later than the expiration of 30 months after the priority date. The payment of the surcharge set forth in § 1.492(e) is required for acceptance of the oath or declaration of the inventor later than the expiration of 30 months after the priority date. A

"Sequence Listing" need not be translated if the "Sequence Listing" complies with PCT Rule 12.1(d) and the description complies with PCT Rule 5.2(b).

\*\*\*\*\*

May 22, 1998

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

**DEPARTMENT OF COMMERCE  
Patent and Trademark Office**

37 CFR Part 1  
[Docket No: 960828235-8109-02]  
RIN: 0651-AA88

**Requirements for Patent Applications  
Containing Nucleotide Sequence and/or  
Amino Acid Disclosures**

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Final Rule

**SUMMARY:** The Patent and Trademark Office (PTO) is amending the rules for submitting nucleotide or amino acid sequences in computer readable form (CRF) for patent applications. These amendments simplify the requirements of the rules, rearrange portions of the rules for better understanding and establish consistent rules to permit a single internationally acceptable computer readable form. Sequence Listings will be presented in an international, language neutral format using numeric identifiers rather than the current subject headings. The Paper Sequence Listing will preferably be a separately numbered section of the patent application. Sequences which contain fewer than four specifically identified nucleotides or amino acids will no longer be required to be submitted in computer readable form.

**DATES: EFFECTIVE DATE:** July 1, 1998.

The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of July 1, 1998.

**APPLICABILITY DATE:** Sections 1.821 through 1.825 as amended apply to applications filed on or after July 1, 1998, except for: (1) applications that claim the benefit of a prior application under 35 U.S.C. 120 filed before July 1, 1998, and which do not add subject matter involving a sequence listing subject to §§ 1.821 through 1.825; and (2) reissue applications in which the application for the patent sought to be reissued was filed before July 1, 1998. Sections 1.821 through 1.825 apply during a reexamination proceeding if the application for the patent sought to be reexamined was filed on or after July 1, 1998.

**FOR FURTHER INFORMATION CONTACT:** Esther M. Kepplinger, by telephone at (703) 308-1495; by mail addressed to: Box Comments - Patents, Assistant Commissioner for Patents, Washington, DC 20231 marked to her attention; by facsimile to (703) 305-3935; or by electronic mail at esther.kepplinger@uspto.gov.

**SUPPLEMENTAL INFORMATION:** Sections 1.821 through 1.825 of title 37 provide a standardized format for the description of nucleotide and amino acid sequence data in patent applications and require the submission of such sequences in computer readable form (CRF). Sections 1.821 through 1.825 provide the following benefits to the PTO: (1) improved search capabilities; (2) improved interference detection; (3) more efficient examination; (4) cost savings for the input of the sequence data; (5) more efficient and accurate printing of sequences in patents; (6) exchange of the sequence data with other patent offices electronically; and (7) improved public access to the sequences electronically.

**REASONS FOR THE CHANGES**

In response to the needs of our customers, the procedural requirements found in former §§ 1.821 through 1.825 have been reduced. Sections 1.821 through 1.825 are being amended to be consistent with World Intellectual Property Organization (WIPO) Standard ST.25 (signed in 1998 and effective July 1, 1998). ST.25 replaces WIPO Standards ST.23 and ST.24 which deal with paper and electronic submissions of sequence listings.

A Meeting of International Authorities (MIA) under the Patent Cooperation Treaty (PCT) was held in November of 1994 to discuss simplification of sequence listing submission requirements.

Under the previous PCT Regulations, each International Searching Authority, each International Preliminary Examining Authority and each designated/elected office was free to set the requirements for submission of sequence listings in paper and electronic form. This imposed a burden on applicants by requiring them to prepare sequence listings in many different formats. In addition, sequence listings were required to be translated for consideration in the national stage at considerable cost to applicants and at the risk that the information could be inaccurately translated.

After the November 1994 MIA, the PTO, the European Patent Office (EPO) and the Japanese Patent Office (JPO) worked together with WIPO to create a new international standard which forms the basis of WIPO Standard ST.25 (1998). Sections 1.821 through 1.825 of 37 CFR, as amended herein, are consistent with WIPO Standard ST.25 (1998) and the PCT sequence listing requirements. Sequence listings prepared in accordance with §§ 1.821 through 1.825 as amended generally will be acceptable in all countries which adhere to WIPO Standard ST.25 (1998). In addition, a sequence listing prepared in accordance with the §§ 1.821 through 1.825 as amended will be acceptable for the national stage in all PCT member countries which require the submission of a sequence listing. As a result of this rule change, applicants will experience a reduction in cost since only one sequence listing in paper and electronic form will need to be prepared and translations of this listing will not be needed.

All necessary changes to the text of §§ 1.821 through 1.825 to reflect the new WIPO Standard ST.25 (1998), have been made. Each change is described below.

**OVERVIEW OF THE CHANGES**

The changes in this Final Rule include:

- (1) use of numeric identifiers to replace the language subject headings within the submission;
- (2) elimination of unnecessary and confusing data elements;
- (3) movement of the paper Sequence Listing to the end of the application, preferably with separately numbered pages;
- (4) elimination of the requirement to provide a submission for sequences with fewer than four specifically defined nucleotides or amino acids;
- (5) use of lower-case one-letter codes for nucleotide bases;
- (6) rearrangement of portions of the rules to improve their context;
- (7) clarification and simplification of the rules to aid in understanding; and
- (8) minor changes to accomplish harmonization with WIPO Standard ST.25 (1998) as well as the EPO and the JPO standards.

Amended §§ 1.821 through 1.825 are not mandatory for: (1) applications that claim the benefit of a prior application under 35 U.S.C. 120 filed before July 1, 1998, and which do not add subject matter involving a sequence listing subject to §§ 1.821 through 1.825; (2) reissue applications in which the application for the patent sought to be reissued was filed before July 1, 1998; and (3) reexamination proceedings if the application for the patent sought to be reexamined was filed before July 1, 1998. The PTO will accept and encourages the submission of sequence listings in compliance with amended §§ 1.821 through 1.825 for any application or reexamination proceeding. All

sequence listings (including the entire computer readable form) must be submitted in compliance with either §§ 1.821 through 1.825 as amended in this Final Rule or (when permitted) former §§ 1.821 through 1.825.

If the CRF for a new application would be identical to a compliant CRF already on file in the PTO, the applicant may make reference to the other application and the CRF in lieu of filing a duplicate CRF in the new application by following the procedures set forth in § 1.821(e). If exceptional circumstances do arise and certain applicants experience specific hardships in attempting to comply with amended §§ 1.821 through 1.825, the PTO will consider a petition under § 1.183 to waive certain requirements of §§ 1.821 through 1.825.

A Notice of Proposed Rulemaking entitled "Changes Implementing Nucleotide and/or Amino Acid Sequence Listings" (Notice of Proposed Rulemaking) was published in the *Federal Register* at 61 FR 51855 (October 4, 1996), and in the *Official Gazette of the Patent and Trademark Office*, at 1191 *Off. Gaz. Pat. Office* 168 (October 29, 1996). Sections 1.821 through 1.825 as adopted contain several changes from these sections. This Final Rule provides a discussion of the content of the specific rules being amended, description of the changes in the text of the proposed rules, and explanation of the reasons supporting the changes. In addition, comments received in response to the Notice of Proposed Rulemaking are analyzed.

**Discussion of Specific Rules and Changes from the Proposed Rules:**

Title 37 of the Code of Federal Regulations, Part 1, is amended as follows.

**SECTION 1.77**

The proposed change to 37 CFR 1.77 was previously adopted. See *Miscellaneous Changes to Patent Practice*; Final Rule, 61 FR 42790 (August 19, 1996), 1190 *Off. Gaz. Pat. Office* 67 (September 17, 1996).

**Section 1.821**

Section 1.821 incorporates by reference the World Intellectual Property Organization (WIPO) Handbook on Industrial Property Information and Documentation, Standard ST.25 (1998), including Tables 1 through 6 of Appendix 2, in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be obtained from the World Intellectual Property Organization; 34 chemin des Colombettes; 1211 Geneva 20 Switzerland. Copies may be inspected at the Patent Search Room; Crystal Plaza 3, Lobby Level; 2021 South Clark Place; Arlington, VA 22202. Copies may also be inspected at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC 20408. These Tables are reproduced below.

WIPO Standard ST.25 (1998), Appendix 2, Table 1, provides that the bases of a nucleotide sequence should be represented using the following one-letter code for nucleotide sequence characters:

**Table 1: one letter codes for nucleotide sequences**

Symbol	Meaning	Origin of designation
a	a	adenine
g	g	guanine
c	c	cytosine
t	t	thymine
u	u	uracil
r	g or a	purine
y	t/u or c	pyrimidine
m	a or c	amino
k	g or t/u	keto
s	g or c	strong interactions 3
w	a or t/u	H-bonds
b	g or c or t/u	weak interactions 2
d	a or g or t/u	H-bonds
		not a
		not c

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Symbol	Meaning	Origin of designation
h	a or c or t/u	not g
v	a or g or c	not t, not u
n	(a or g or c or t/u) or (unknown or other)	any

WIPO Standard ST.25 (1998), Appendix 2, Table 2, provides that modified bases may be represented as the corresponding unmodified bases in the sequence itself, if the modified base is one of those listed below and the modification is further described in the Feature section of the Sequence Listing. The codes from the list below may be used in the description (i.e., the specification and drawings, or in the Sequence Listing) but these codes may not be used in the sequence itself.

Table 2: modified bases

Symbol	Meaning
ac4c	4-acetyl cytidine
chm5u	5-(carboxyhydroxymethyl)uridine
cm	2-O-methylcytidine
cmnm5s2u	5-carboxymethylaminomethyl-2-thiouridine
cmnm5u	5-carboxymethylaminomethyluridine
d	dihydrouridine
fm	2-O-methylpseudouridine
gal q	beta, D-galactosylqueosine
gm	2-O-methylguanosine
l	inosine
i6a	N6-isopentenyladenosine
m1a	1-methyladenosine
m1f	1-methylpseudouridine
m1g	1-methylguanosine
m1i	1-methylinosine
m22g	2,2-dimethylguanosine
m2a	2-methyladenosine
m2g	2-methylguanosine
m3c	3-methylcytidine
m5c	5-methylcytidine
m6a	N6-methyladenosine
m7g	7-methylguanosine
mam5u	5-methylaminomethyluridine
mam5s2u	5-methoxyaminomethyl-2-thiouridine
man q	beta, D-mannosylqueosine
mcm5s2u	5-methoxycarbonylmethyl-2-thiouridine
mcm5u	5-methoxycarbonylmethyluridine
mo5u	5-methoxyuridine
ms2i6a	2-methylthio-N6-isopentenyladenosine
ms2i6a	N-((9-beta-D-ribofuranosyl-2-methylthiopurine-6-yl) carbamoyl) threonine
mt6a	N-((9-beta-D-ribofuranosylpurine-6-yl)N- methylcarbamoyl) threonine
mv	uridine-5-oxyacetic acid-methylester
o5u	uridine-5-oxyacetic acid
osyw	wybutoxosine
p	pseudouridine
q	queosine
s2c	2-thiocytidine
s2t	5-methyl-2-thiouridine
s2u	2-thiouridine
s4u	4-thiouridine
t	5-methyluridine
t6a	N-((9-beta-D-ribofuranosylpurine-6-yl)-carbamoyl)threonine
tm	2-O-methyl-5-methyluridine
um	2-O-methyluridine
yw	wybutosine
x	3-(3-amino-3-carboxy-propyl)uridine, (acp3)u

WIPO Standard ST.25 (1998), Appendix 2, Table 3, provides that the amino acids should be represented using the following three-letter code with the first letter as a capital.

Table 3: amino acid three-letter codes

Symbol	Meaning
Ala	Alanine
Cys	Cysteine
Asp	Aspartic Acid
Glu	Glutamic Acid
Phe	Phenylalanine
Gly	Glycine
His	Histidine
Ile	Isoleucine
Lys	Lysine
Leu	Leucine
Met	Methionine
Asn	Asparagine
Pro	Proline
Gln	Glutamine
Arg	Arginine
Ser	Serine
Thr	Threonine
Val	Valine
Trp	Tryptophan
Tyr	Tyrosine
Asx	Asp or Asn
Glx	Glu or Gln
Xaa	unknown or other

WIPO Standard ST.25 (1998), Appendix 2, Table 4, provides that modified and unusual amino acids may be represented as the corresponding unmodified amino acids in the sequence itself if the modified or unusual amino acid is one of those listed below and the modification is further described in the Feature section of the Sequence Listing. The codes from the list below may be used in the description (i.e., the specification and drawings, or in Sequence Listing) but these codes may not be used in the sequence itself.

Table 4: modified and unusual amino acid codes

Symbol	Meaning
Aad	2-Aminoadipic acid
bAad	3-aminoadipic acid
bAla	beta-Alanine, beta-Aminopropionic acid
Abu	2-Aminobutyric acid
4Abu	4-Aminobutyric acid, piperidine acid
Acp	6-Aminocaproic acid
Ahe	2-Aminoheptanoic acid
Aib	2-Aminoisobutyric acid
bAib	3-Aminoisobutyric acid
Apm	2-Aminopimelic acid
Dbu	2,4-Diaminobutyric acid
Des	Desmosine
Dpm	2,2-Diaminopimelic acid
Dpr	2,3-Diaminopropionic acid
EtGly	N-Ethylglycine
EtAsn	N-Ethylasparagine
Hyl	Hydroxylysine
aHyl	allo-Hydroxylysine
3Hyp	3-Hydroxyproline
4Hyp	4-Hydroxyproline
Ide	Isodesmosine
alle	allo-Isoleucine
MeGly	N-Methylglycine, sarcosine
Melle	N-Methylisoleucine
MeLys	6-N-Methyllysine
MeVal	N-Methylvaline
Nva	Norvaline
Nle	Norleucine
Orn	Ornithine

WIPO Standard ST.25 (1998), Appendix 2, Table 5 provides for feature keys related to DNA sequences.

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Table 5: Feature keys related to nucleotide sequences

Key	Description
allele	a related individual or strain contains stable, alternative forms of the same gene which differs from the presented sequence at this location (and perhaps others)
attenuator	1) region of DNA at which regulation of termination of transcription occurs, which controls the expression of some bacterial operons; 2) sequence segment located between the promoter and the first structural gene that causes partial termination of transcription
C <sub>2</sub> region	constant region of immunoglobulin light and heavy chains, and T-cell receptor alpha, beta, and gamma chains. Includes one or more exons depending on the particular chain
CAAT_signal	CAAT box; part of a conserved sequence located about 75 bp up-stream of the start point of eukaryotic transcription units which may be involved in RNA polymerase binding; consensus=GG (C or T) CAATCT
CDS	coding sequence; sequence of nucleotides that corresponds with the sequence of amino acids in a protein (location includes stop codon). Feature includes amino acid conceptual translation
conflict	independent determinations of the same sequence differ at this site or region
D-loop	displacement loop; a region within mitochondrial DNA in which a short stretch of RNA is paired with one strand of DNA, displacing the original partner DNA strand in this region; also used to describe the displacement of a region of one strand of duplex DNA by a single stranded invader in the reaction catalyzed by RecA protein
D-segment	diversity segment of immunoglobulin heavy chain, and T-cell receptor beta chain
enhancer	a cis-acting sequence that increases the utilization of (some) eukaryotic promoters, and can function in either orientation and in any location (upstream or downstream) relative to the promoter
exon	region of genome that codes for portion of spliced mRNA; may contain 5'UTR, all CDSs, and 3'UTR
GC_signal	GC box; a conserved GC-rich region located upstream of the start point of eukaryotic transcription units which may occur in multiple copies or in either orientation; consensus=GGGCGG
gene	region of biological interest identified as a gene and for which a name has been assigned
iDNA	Intervening DNA; DNA which is eliminated through any of several kinds of recombination
intron	a segment of DNA that is transcribed, but removed from within the transcript by splicing together the sequences (exons) on either side of it
J <sub>2</sub> segment	joining segment of immunoglobulin light and heavy chains, and T-cell receptor alpha, beta, and gamma chains
LTR	long terminal repeat, a sequence directly repeated at both ends of a defined sequence, of the sort typically found in retroviruses
mat_peptide	mature peptide or protein coding sequence; coding sequence for the mature or final peptide or protein product following post-translational modification. The location does not include the stop codon (unlike the corresponding CDS)
misc_binding	site in nucleic acid which covalently or non-covalently binds another moiety that cannot be described by any other Binding key (primer_bind or protein_bind)
misc_difference	feature sequence is different from that presented in the entry and cannot be described by any other Difference key (conflict, unsure, old_sequence, mutation, variation, allele, or modified_base)
misc_eature	region of biological interest which cannot be described by any other feature key; a new or rare feature
misc_recomb	site of any generalized, site-specific or replicative recombination event where there is a breakage and reunion of duplex DNA that cannot be described by other recombination keys (iDNA and virion) or qualifiers of source key (/insertion_seq/transposon/proviral)
misc_RNA	any transcript or RNA product that cannot be defined by other RNA keys (prim_transcript, precursor RNA, mRNA, 5'clip, 3'clip, 5'UTR, 3'UTR, exon, CDS, sig_peptide, transit_peptide, mat_peptide, intron, polyA_site, rRNA, tRNA, scrRNA, and snRNA)
misc_signal	any region containing a signal controlling or altering gene function or expression that cannot be described by other Signal keys (promoter, CAAT_signal, TATA_signal, -35_signal, -10_signal, GC_signal, RBS, polyA_signal, enhancer, attenuator, terminator, and rep_origin)
misc_structure	any secondary or tertiary structure or conformation that cannot be described by other Structure keys (stem_loop and D-loop)
modified_base	the indicated nucleotide is a modified nucleotide and should be substituted for by the indicated molecule (given in the mod_base qualifier value)
mRNA	messenger RNA; includes 5'untranslated region (5'UTR), coding sequences (CDS, exon) and 3'untranslated region (3'UTR)
mutation	a related strain has an abrupt, inheritable change in the sequence at this location
N <sub>2</sub> region	Extra nucleotides inserted between rearranged immunoglobulin segments
old_sequence	the presented sequence revises a previous version of the sequence at this location
polyA_signal	recognition region necessary for endonuclease cleavage of an RNA transcript that is followed by polyadenylation; consensus=AATAAA
polyA_site	site on an RNA transcript to which will be added adenine residues by post-transcriptional polyadenylation



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precursor_RNA	any RNA species that is not yet the mature RNA product; may include 5'clipped region (5'clip), 5'untranslated region (5'UTR), coding sequences (CDS, exon), intervening sequences (intron), 3'untranslated region (3'UTR), and 3'clipped region (3'clip)
prim_transcript	primary (initial, unprocessed) transcript; includes 5'clipped region (5'clip), 5' untranslated region (5'UTR), coding sequences (CDS, exon), intervening sequences (intron), 3'untranslated region (3'UTR), and 3'clipped region (3'clip)
primer_bind	Non-covalent primer binding site for initiation of replication, transcription, or reverse transcription. Includes site(s) for synthetic e.g., PCR primer elements
promoter	region on a DNA molecule involved in RNA polymerase binding to initiate transcription
protein_bind	non-covalent protein binding site on nucleic acid
RBS	ribosome binding site
repeat_region	region of genome containing repeating units
repeat_unit	single repeat element
rep_origin	origin of replication; starting site for duplication of nucleic acid to give two identical copies
rRNA	mature ribosomal RNA; the RNA component of the ribonucleoprotein particle (ribosome) which assembles amino acids into proteins
S_region	Switch region of immunoglobulin heavy chains. Involved in the rearrangement of heavy chain DNA leading to the expression of a different immunoglobulin class from the same B-cell
satellite	many tandem repeats (identical or related) of a short basic repeating unit; many have a base composition or other property different from the genome average that allows them to be separated from the bulk (main band) genomic DNA
scRNA	small cytoplasmic RNA; any one of several small cytoplasmic RNA molecules present in the cytoplasm and (sometimes) nucleus of a eukaryote
sig_peptide	signal peptide coding sequence; coding sequence for an N-terminal domain of a secreted protein; this domain is involved in attaching nascent polypeptide to the membrane; leader sequence
snRNA	small nuclear RNA; any one of many small RNA species confined to the nucleus; several of the snRNAs are involved in splicing or other RNA processing reactions
source	identifies the biological source of the specified span of the sequence. This key is mandatory. Every entry will have, as a minimum, a single source key spanning the entire sequence. More than one source key per sequence is permissible
stem_loop	hairpin; a double-helical region formed by base-pairing between adjacent (inverted) complementary sequences in a single strand of RNA or DNA
STS	Sequence Tagged Site. Short, single-copy DNA sequence that characterizes a mapping landmark on the genome and can be detected by PCR. A region of the genome can be mapped by determining the order of a series of STSs
TATA_signal	TATA box; Goldberg-Hogness box; a conserved AT-rich septamer found about 25 bp before the start point of each eukaryotic RNA polymerase II transcript unit which may be involved in positioning the enzyme for correct initiation; consensus=TATA(A or T)A(A or T)
terminator	sequence of DNA located either at the end of the transcript or adjacent to a promoter region that causes RNA polymerase to terminate transcription; may also be site of binding of repressor protein
transit_peptide	transit peptide coding sequence; coding sequence for an N-terminal domain of a nuclear-encoded organellar protein; this domain is involved in post- translational import of the protein into the organelle
tRNA	mature transfer RNA, a small RNA molecule (75-85 bases long) that mediates the translation of a nucleic acid sequence into an amino acid sequence
unsure	author is unsure of exact sequence in this region
V_region	Variable region of immunoglobulin light and heavy chains, and T-cell receptor alpha, beta, and gamma chains. Codes for the variable amino terminal portion.Can be made up from V_segments, D_segments, N_regions, and J_segments
V_segment	variable segment of immunoglobulin light and heavy chains, and T-cell receptor alpha, beta, and gamma chains. Codes for most of the variable region (V_region) and the last few amino acids of the leader peptide
variation	a related strain contains stable mutations from the same gene (e.g., RFLPs, polymorphisms, etc.) which differ from the presented sequence at this location (and possibly others)
3'clip	3'-most region of a precursor transcript that is clipped off during processing
3'UTR	region at the 3' end of a mature transcript (following the stop codon) that is not translated into a protein
5'clip	5'-most region of a precursor transcript that is clipped off during processing
5'UTR	region at the 5' end of a mature transcript (preceding the initiation codon) that is not translated into a protein
-10_signal	pribnow box; a conserved region about 10 bp upstream of the start point of bacterial transcription units which may be involved in binding RNA polymerase; consensus=TATAAT
-35_signal	a conserved hexamer about 35 bp upstream of the start point of bacterial transcription units; consensus=TTGACA [ ] or TGTTGACA [ ]

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WIPO Standard ST.25 (1998). Appendix 2, Table 6 provide for feature keys related to protein sequences.

Table 6: Feature keys related to Protein sequences

Key	Description
CONFLICT	Different papers report differing sequences
VARIANT	Authors report that sequence variants exist
VARSPLIC	Description of sequence variants producedby alternative splicing
MUTAGEN	Site which has been experimentally altered
MOD_RES	Post-translational modification of a residue
ACETYLATION	N-terminal or other
AMIDATION	Generally at the C-terminal of a mature active peptide
BLOCKED	Undetermined N- or C-terminal blocking group
FORMYLATION	Of the N-terminal methionine
GAMMA-CARBOXYGLUTAMIC ACID HYDROXYLATION	Of asparagine, aspartic acid, proline or lysine
METHYLATION	Generally of lysine or arginine
PHOSPHORYLATION	Of serine, threonine, tyrosine, aspartic acidor histidine
PYRROLIDONE CARBOXYLIC ACID	N-terminal glutamate which has formed an internal cyclic lactam
SULFATATION	Generally of tyrosine
LIPID	Covalent binding of a lipidic moiety
MYRISTATE	Myristate group attached through an amide bond to the N- terminal glycine residue of the mature form of a protein or to an internal lysine residue
PALMITATE	Palmitate group attached through a thioether bond to a cysteine residue or throughan ester bond to a serine or threonine residue
FARNESYL	Farnesyl group attached through a thioether bond to a cysteine residue
GERANYL-GERANYL	Geranyl-geranyl group attached through a thioether bond to a cysteine residue
GPI-ANCHOR	Glycosyl-phosphatidylinositol (GPI) group linked to the alpha- carboxyl group of the C-terminal residue of the mature form of a protein
N-ACYL DIGLYCERIDE	N-terminal cysteine of the mature form of a prokaryotic lipoprotein with an amide-linked fatty acid and a glyceryl group to which two fatty acids are linked by ester linkages
DISULFID	Disulfide bond. The 'FROM' and 'TO' endpoints represent the two residues which are linked by an intra-chain disulfide bond. If the 'FROM' and 'TO' endpoints are identical, the disulfide bond is an interchain one and the description field indicates the nature of the cross-link
THIOLEST	Thiolester bond. The 'FROM' and 'TO' endpoints represent the two residues which are linked by the thiolester bond
THIOETH	Thioether bond. The 'FROM' and 'TO' endpoints represent the two residues which are linked by the thioether bond
CARBOHYD	Glycosylation site. The nature of the carbohydrate (if known) is given in the description field
METAL	Binding site for a metal ion. The description field indicates the nature of the metal
BINDING	Binding site for any chemical group (co-enzyme, prosthetic group, etc.). The chemical nature of the group is given in the description field
SIGNAL	Extent of a signal sequence (prepeptide)
TRANSIT	Extent of a transit peptide (mitochondrial, chloroplastic, or for a microbody)
PROPEP	Extent of a propeptide
CHAIN	Extent of a polypeptide chain in the mature protein
PEPTIDE	Extent of a released active peptide
DOMAIN	Extent of a domain of interest on the sequence. The nature of that domain is given in the description field
CA_BIND	Extent of a calcium-binding region
DNA_BIND	Extent of a DNA-binding region
NP_BIND	Extent of a nucleotide phosphate binding region. The nature of the nucleotide phosphate is indicated in the description field
TRANSMEM	Extent of a transmembrane region
ZN_FING	Extent of a zinc finger region

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SIMILAR	Extent of a similarity with another protein sequence. Precise information, relative to that sequence is given in the description field
REPEAT	Extent of an internal sequence repetition
HELIX	Secondary structure - Helices, e.g., Alpha-helix, 3(10) helix, or Pi-helix
STRAND	Secondary structure - Beta-strand, e.g., Hydrogen bonded beta- strand, or Residue in an isolated beta-bridge
TURN	Secondary structure - Turns, e.g., H-bonded turn (3-turn, 4- turn, or 5-turn)
ACT_SITE	Amino acid(s) involved in the activity of an enzyme
SITE	Any other interesting site on the sequence
INIT_MET	The sequence is known to start with an initiator methionine
NON_TER	The residue at an extremity of the sequence is not the terminal residue. If applied to position 1, this signifies that the first position is not the N-terminus of the complete molecule. If applied to the last position, it signifies that this position is not the C-terminus of the complete molecule. There is no description field for this key
NON_CONS	Non consecutive residues. Indicates that two residues in a sequence are not consecutive and that there are a number of unsequenced residues between them
UNSURE	Uncertainties in the sequence. Used to describe region(s) of a sequence for which the authors are unsure about the sequence assignment

In paragraph (a) of § 1.821, the reference to "Standard ST.23: Recommendation for the presentation of Nucleotide and Amino Acid Sequence Listings in Patent Applications and in Published Patent Documents, paragraphs 8 through 12, April 1994" has been replaced by "Standard ST.25: Standard for the Presentation of Nucleotide and Amino Acid Sequence Listings in Patent Applications (1998), including Tables 1 through 6 in Appendix 2." These changes reflect the correct information with regard to the incorporated WIPO standard and the lists of symbols for nucleotide and amino acid sequence characters.

Further in paragraph (a) of § 1.821, "(Hereinafter "WIPO Standard ST.23 (April, 1994)")" has been changed to "(Hereinafter "WIPO Standard ST.25 (1998))." This change is necessary to indicate the correct abbreviation for new standard ST.25.

Further in paragraph (a) of § 1.821, both occurrences of "Copies of ST.23" have been changed to "Copies of WIPO Standard ST.25 (1998)." This change is necessary to reflect the new standard number.

In paragraph (a)(1) of § 1.821, "ST.23 (April 1994), paragraph 8" has been changed to "ST.25 (1998), Appendix 2, Table 1." This change reflects the correct information with regard to the incorporated WIPO standard and the list of symbols to be used for nucleotide sequence characters.

Further in paragraph (a)(1) of § 1.821, "ST.23 (April 1994), paragraph 9" has been changed to "ST.25 (1998), Appendix 2, Table 2." This change reflects the correct information with regard to the incorporated WIPO standard and the list of modified bases which can be presented as unmodified nucleotide sequence characters.

In paragraph (a)(2) of § 1.821, all three occurrences of "ST.23 (April 1994), paragraph 11" have been changed to "ST.25 (1998), Appendix 2, Table 3." This change reflects the correct information with regard to the incorporated WIPO standard and the list of symbols to be used for amino acid sequence characters.

Further in paragraph (a)(2) of § 1.821, "ST.23 (April 1994), paragraph 12" has been changed to "ST.25 (1998), Appendix 2, Table 4." This change reflects the correct information with regard to the incorporated WIPO standard and the list of modified or unusual amino acids which can be presented as unmodified amino acid sequence characters.

In paragraph (c) of § 1.821, each of the three occurrences of the words "integer identifier" or "integer identifiers" has been changed to "sequence identifier" or "sequence identifiers" as appropriate. WIPO Standard ST.25 (1998), uses the term "sequence identifier" rather than "integer identifier." Thus, this change is necessary to achieve harmonization with the international standard.

In the last sentence of paragraph (c) of § 1.821, the phrase "The sequence omitted shall appear following the integer identifier" of the proposed rule has been replaced by the code "000" shall be used in place of the sequence." The response for the numeric identifier <160> shall include the total number of SEQ ID NOs, whether followed by a sequence or by the code "000". The code <000> should be put into <400>. This change permits flexibility in the preparation and amendment of Sequence Listings. It also makes the rule language-neutral and is consistent with WIPO Standard ST.25 (1998).

In paragraph (d) of § 1.821, the words "integer identifier" have been changed to "sequence identifier." WIPO Standard ST.25 (1998) uses the term "sequence identifier" rather than "integer identifier." Thus, this change is necessary to achieve harmonization with the international standard.

In paragraphs (f), (g) and (h) of § 1.821, the sentence "Such a statement must be a verified statement if made by a person not registered to practice before the Office" has been deleted. The separate verification requirements in § 1.821 have been eliminated in view of the recent amendment to §§ 1.4(d) and 10.18. See *Changes to Patent Practice and Procedure*: Final Rule, 62 FR 53131 (October 10, 1997), 1203 *Off. Gaz. Pat. Office* 63 (October 21, 1997). Paragraph (g) of § 1.821 has also been amended to provide that the Office will provide a "period of time" (rather than one month) within which the applicant must comply with the requirements of § 1.821(b) through (f) in order to avoid abandonment.

Further in paragraph (f) of § 1.821, the following has been added at the end of the first sentence, ", e.g., the information recorded in computer readable form is identical to the written sequence listing." WIPO Standard ST.25 (1998), paragraph 39, requires the language which has been added as an acceptable example for phrasing the required statement that the computer readable form and the written sequence listing are the same.

#### Section 1.822

In paragraph (b) of § 1.822, both references to WIPO Standard ST.23 (April 1994), paragraphs 8 and 11, as proposed have been changed to "WIPO Standard ST.25 (1998), Appendix 2, Tables 1 and 3." These changes reflect the correct information with regard to the incorporated WIPO standard and the lists of symbols for nucleotide and amino acid sequence characters.

Further in paragraph (b) of § 1.822, "WIPO Standard ST.23 (April 1994), paragraphs 9 and 12" as proposed has been changed to "WIPO Standard ST.25 (1998), Appendix 2, Tables 2 and 4." This change reflects the correct information with regard to the incorporated WIPO standard and the lists of modified bases and modified or unusual amino acids which can be depicted in the Sequence Listing via the symbols for a corresponding unmodified base or amino acid.

Further in paragraph (b) of § 1.822, the symbol designating an unknown nucleotide base or a nucleotide base other than those listed in the WIPO standard was proposed as an upper case letter "N." This symbol has been changed to a lower case letter "n." This change is consistent with the use of lower case letters for the symbols representing the nucleotide bases. Further in paragraph (b) of § 1.822, the language has been clarified to specifically state that each "n" or "Xaa" represents only a single residue. Thus, for example, a single "Xaa" may not be used to designate a string of four amino acids, each of which is unknown. This represents a codification of existing practice.

Further in paragraph (b) of § 1.822, the information required in the Feature section to explain the use of "n" or "Xaa" in a given sequence is referred to "as appropriate." Additional instruction is added at the end of paragraph (b) of § 1.822 following "the Feature section" indicating ", preferably by including one or more feature keys listed in WIPO Standard ST.25 (1998), Appendix 2, Tables 5 and 6." This change specifies the preference for using the feature keys listed in the WIPO standard in order to aid applicants in filing a CRF which will comply with WIPO Standard ST.25 (1998). These feature keys are controlled vocabulary and are considered language neutral. Their use is required in a PCT patent application or a patent application in a foreign country which has adopted WIPO Standard ST.25 (1998).

In paragraph (c)(1) of § 1.822, "WIPO Standard ST.23 (April 1994), paragraph 8" as proposed has been changed to WIPO Standard ST.25 (1998), Appendix 2, Table 1." This change reflects the correct information with regard to the incorporated WIPO standard and the list of symbols to be used for nucleotide sequence characters.

In paragraph (d)(1) of § 1.822, "WIPO Standard ST.23 (April 1994), paragraph 11, as proposed has been changed to "WIPO Standard ST.25 (1998), Appendix 2, Table 3." This change reflects the correct information with regard to the incorporated WIPO standard and the list of symbols to be used for amino acid sequence characters.

In paragraph (d)(4) of § 1.822, the section notes that enumeration requirements are applicable to amino acid sequences that are circular in configuration. The following language has been added to the end of the paragraph ", with the exception that the designation of the first amino acid of the sequence may be made at the option of the applicant." This change is necessary to provide consistency with its counterpart of circular nucleotide sequences as provided in paragraph (c)(7) of § 1.822. This change is also consistent with WIPO Standard ST.25 (1998), paragraph 21. In paragraph (e) of § 1.822, the words "integer identifiers" have been changed to "sequence identifiers." WIPO Standard ST.25 (1998) uses the term "sequence identifier" rather than "integer identifier." Thus, this change is necessary to achieve harmonization with the international standard.

#### Section 1.823

In paragraph (a) of § 1.823, the entire second sentence which read "On a separate page of the application specification, immediately prior to the claims, there shall be a reference to the presence of the 'Sequence Listing' in a 'Sequence Listing Annex.'" has been eliminated. The designation of the Sequence Listing as an annex to the specification was initially proposed in an early version of the international standard. This terminology is not used in WIPO Standard ST.25 (1998), however, and so it has also been eliminated from paragraph (a) of § 1.823, as proposed. Simplification results as well by the elimination of the requirement that the Sequence Listing must be designated as an annex to the specification.

In paragraph (a) of § 1.823, the third sentence has been modified by deleting the words "shall appear in the 'Sequence Listing Annex,' which is." As explained above, the current version of the international standard does not require designating the Sequence Listing as an annex to the specification.

In paragraph (a) of § 1.823, the words "preferably should be" have been added to the third sentence, before "numbered independently of the numbering of the remainder of the application" to describe the independent page numbering of the

Sequence Listing in paper copy form. The term "preferably" was added for purposes of harmonization with WIPO Standard ST.25 (1998). In paragraph (a) of § 1.823, the last clause of the third sentence "and shall be placed in the application file" has been deleted as unnecessary and potentially confusing now that the reference to a "Sequence Listing Annex" has been removed from this paragraph. In paragraph (a) of § 1.823, the fourth sentence has been eliminated in its entirety. As explained above, the current version of the international standard does not require designating the Sequence Listing as an annex to the specification.

In paragraph (a) of § 1.823, in both occurrences in the fifth sentence and in the single occurrence in the sixth sentence, the word "shall" has been changed to "should." These changes are necessary for purposes of achieving consistency with WIPO Standard ST.25 (1998). In paragraph (b) of § 1.823, the first sentence has been modified by the deletion of the words "in addition to and immediately preceding." This change is consistent with WIPO Standard ST.25 (1998).

In paragraph (b) of § 1.823, the fifth sentence has been deleted, eliminating the prohibition of any item of information occupying more than one line. This change is consistent with WIPO Standard ST.25 (1998).

In paragraph (b) of § 1.823, the last sentence has been deleted to eliminate the "rep" designation for data elements of the "Sequence Listing." Certain data elements may still be repeated within the listing but this change was made for harmonization of the table with WIPO Standard ST.25 (1998).

In paragraph (b) of § 1.823, the eighth sentence has been modified to reflect the new numeric numbering scheme, for harmonization with WIPO Standard ST.25 (1998). Specifically, "<100> through <193>" of the proposed rule has been changed to "<110> through <170>." The table in paragraph (b) of § 1.823, has been changed to reflect the revised numbering scheme and data elements used in WIPO Standard ST.25 (1998). The specific changes are as follows:

Numeric identifier "<100>, General Information," has been deleted from the proposed rules, as it is not present in WIPO Standard ST.25 (1998).

Numeric identifier "<110>, Applicant," in the proposed rule, has been changed to indicate that "preferably" a maximum of ten names may be indicated. This change allows for more than ten names in the Applicant field for those instances in which such would be appropriate. This change is consistent with WIPO Standard ST.25 (1998).

Numeric identifier "<120>, Title of Invention," in the proposed rule, has been changed to eliminate the limitation that the title be a maximum of four lines. This change allows applicants more flexibility with respect to the title. This change is consistent with WIPO Standard ST.25 (1998).

Numeric identifier "<130>, Number of Sequences," in the proposed rule, has been changed to reflect "<130>, File Reference," as stated in WIPO Standard ST.25 (1998). This numeric identifier was indicated as "<183>, File Reference/Docket Number", in the rule as proposed. As proposed this was an optional numeric identifier. The numeric identifier remains optional once the application has been assigned an application number, e.g., a serial number. This numeric identifier is now MANDATORY when an application number has not yet been assigned to the application, such as on the day the application is initially filed. This change will assist in the matching of sequence information submissions with an application in the event that either the paper copy or the computer readable form were to become separated from the remainder of the application. This change is consistent with WIPO Standard ST.25 (1998).

The Number of Sequences field identified as "<130>" in the proposed rule is now numbered "<160>" in § 1.823 as adopted and redefined as "Number of SEQ ID NOs." The information associated with numeric identifiers "<140>" through "<153>" "Correspondence Address" through "Operating System" of the proposed rule, has been eliminated to reduce the burden on the applicant and to harmonize with WIPO Standard ST.25



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(1998). Some of these numeric identifiers have been used in the new numbering scheme and have been associated with different information as indicated herein and in the Table of §1.823. One remaining numeric identifier within the Computer Readable Form section, "<154>, Software," of the proposed rule, will remain, with the exception that it has been reassigned the numeric identifier of "<170>" to reflect the numbering scheme presented in WIPO Standard ST.25 (1998).

The main headings "<160>, Current Application Data" and "<170>, Prior Application Data," of the proposed rules, have been eliminated to harmonize with WIPO Standard ST.25 (1998) and reduce the number of fields in the Sequence Listing. The information that was to appear under these main headings remains in the rules but has been reassigned numeric identifiers <140> through <151>. The specific changes are as follows: "<160>" has been redefined as "Number of SEQ ID NOs"; "<161>, Application Number," of the proposed rule is now numbered as "<140>," and is defined as "Current Application Number"; "<162>, Filing Date," of the proposed rule is now numbered "<141>," and is defined as "Current Filing Date"; "<170>" has been redefined as "Software"; "<171>, Application Number," of the proposed rule is now numbered as "<150>," and is defined as "Prior Application Number"; "<172>, Filing Date," of the proposed rule is now numbered as "<151>," and is defined as "Prior Application Filing Date."

The numeric identifiers now numbered "<150>, Prior Application Number," and "<151>, Prior Application Filing Date," are now mandatory only in those instances in which a claim for priority with respect to those prior applications is being made under either 35 U.S.C. 119 or 120. This change will provide information in this regard when it is most useful and was necessary to harmonize these rules with WIPO Standard ST.25 (1998). Throughout the Sequence Listing, application numbers must be set forth as a combination of the two digit country code, as set forth in WIPO Standard ST.3, as well as an application number in accordance with WIPO Standard ST.13 or for an international application, the numbering system as set out in Section 307(a) of the Administrative Instructions under the PCT.

Numeric identifiers "<180>, Attorney/Agent Information," through "<182>, Registration Number," of the proposed rule, have been eliminated to harmonize with WIPO Standard ST.25 (1998) and reduce the number of fields in the Sequence Listing.

Numeric identifier "<183>, File Reference/Docket Number" of the proposed rule has been reassigned as numeric identifier "<130>," and redefined as "File Reference" in an effort to harmonize with WIPO Standard ST.25 (1998).

The Telecommunication Information section, "<190>" through "<193>" of the proposed rules, has been eliminated in order to reduce the number of fields in the Sequence Listing and harmonize with WIPO Standard ST.25 (1998).

Numeric identifier "<200>, Information for SEQ ID NO: #," has been reassigned the numeric identifier "<210>, SEQ ID NO: #." This numeric identifier indicates the integer, referred to in these final rules as the sequence identifier for both the sequence information and the actual sequence which follows the information.

Numeric identifier "<210>, Sequence Characteristics," of the proposed rule has been eliminated in order to reduce the number of required elements in the Sequence Listing and harmonize with WIPO Standard ST.25 (1998).

The valid responses for the mandatory numeric identifier "<212>, Type," have been changed from "N" and "A," as stated in the proposed rule, to "DNA," "RNA," and "PRT" (protein) in order to harmonize with WIPO Standard ST.25 (1998). A compound that is a mixture of DNA and RNA should be represented by "DNA." This change is consistent with WIPO Standard ST.25 (1998).

Numeric identifier "<213>, Organism," has been added to the Sequence Listing of these final rules in an effort to harmonize with WIPO Standard ST.25 (1998). A response for the Organism identifier is MANDATORY. The valid responses

are the scientific name, i.e. "Genus species", "Artificial Sequence", or "Unknown."

Numeric identifier "<214>, Topology," of the proposed rule, has been eliminated to harmonize with WIPO Standard ST.25 (1998), and to reduce the burden on the applicant.

Numeric identifier "<290>, Feature," has become numeric identifier "<220>, Feature." This numeric identifier has become MANDATORY for those sequences in which numeric identifier "<213>, Organism," is completed with either "Artificial Sequence" or "Unknown." This numeric identifier is also required if the compound sequence is a mixture of DNA and RNA. Numeric identifier "<220>, Feature" is a header only. No data are added immediately following this numeric identifier. These changes are required to achieve harmonization with WIPO Standard ST.25 (1998).

Numeric identifier "<291>, Name/Key," has become numeric identifier "<221>, Name/Key." As proposed, the information provided was restricted to a maximum of four lines. The four line restriction has been removed to reduce the limitations on this field. The comment section of this numeric identifier has been changed in that it now indicates that the selection of a feature name or feature key is preferably made from those listed in Tables 5 and 6 of WIPO Standard ST.25 (1998). These tables are reproduced above and this preference for the listed feature names and keys is consistent with the requirement of WIPO Standard ST.25 (1998). Numeric identifier "<292>, Location," has become "<222>, Location," so as to be consistent with the numeric identifiers contained in WIPO Standard ST.25 (1998).

Numeric identifier "<294>, Other Information," has become numeric identifier "<223>, Other Information," so as to be consistent with the numeric identifiers contained in WIPO Standard ST.25 (1998). This numeric identifier has become MANDATORY for those sequences in which numeric identifier "<213>, Organism," is completed with either "Artificial Sequence" or "Unknown." Numeric identifier "<223>, Other Information," should contain source information in those instances when the organism is unknown or is an artificial sequence. For example, the source may be unknown because the material was isolated from a mixed bacterial culture rather than a pure culture. In such a case, numeric identifier "<223>, Other Information," should be completed by explaining the mixed culture source of the sequenced material. If a sequence is completely synthesized this should be indicated in numeric identifier "<223>, Other Information," while numeric identifier "<213>, Organism," would indicate "Artificial Sequence." This change has been made to accomplish harmonization between these rules and WIPO Standard ST.25 (1998) which contains the same mandatory requirement in this regard. Numeric identifiers "<308>" through "<310>," referring to the "Patent Document Number," "Filing Date" and "Publication Date," of the proposed rule, have been moved to numeric identifiers "<310>" to "<312>," respectively, of this Final Rule in order to harmonize with the numeric numbering scheme of WIPO Standard ST.25 (1998). Citations in the Sequence Listing must comply with WIPO Standard ST.6 for publication numbers and WIPO Standard ST.16 for document codes.

New numeric identifiers "<308>, Database Accession Number," and "<309>, Database Entry Date," have been added to the final rules to harmonize with WIPO Standard ST.25 (1998). These fields were added to the publication information section of WIPO Standard ST.25 (1998) to give an applicant more opportunity to further identify a published citation.

Numeric identifier "<400>, Sequence Description: SEQ ID NO: #," has been changed to "Sequence" for clarity. Also for clarity, the explanation in the table has been changed to "SEQ ID NO shall follow the numeric identifier and should appear on the line preceding the sequence." The format of the date fields has been changed throughout the Sequence Listing to accommodate for international conventions. All date fields referenced in the Sequence Listing shall conform to WIPO Standard ST.2. Because compliance with §§ 1.821 through 1.825 as amended should produce Sequence Listings that are acceptable to all

receiving offices, a standardized date field convention was required.

#### Section 1.824

In paragraph (a)(6) of § 1.824, "the date on which the data were recorded on the computer readable form" was added after "title of the invention" to harmonize with WIPO Standard ST.25 (1998) requirements. While this requirement of § 1.824 was proposed to be eliminated, that proposal is not adopted for purposes of harmonization with WIPO Standard ST.25 (1998). Also in paragraph (a)(6) of § 1.824, "name and type of computer and" was deleted to reduce the requirements.

#### Section 1.825

In paragraphs (a), (b), and (d) of § 1.825, the sentence "Such a statement must be a verified statement if made by a person not registered to practice before the Office" has been deleted. The separate verification requirements in § 1.825 have been eliminated in view of the recent amendment to §§ 1.4(d) and 10.18. See *Changes to Patent Practice and Procedure*; Final Rule, 62 FR 53131 (October 10, 1997), 1203 *Off. Gaz. Pat. Office* 63 (October 21, 1997).

#### Response to and Analysis of Comments

Six written comments were received in response to the Notice of Proposed Rulemaking. Several of these comments address the three specific queries set forth in the Notice of Proposed Rulemaking.

The first query posed in the Notice of Proposed Rulemaking was: (1) Should the PTO accept voluntary submissions of computer readable forms and Sequence Listings where a D-amino acid is contained in the sequence? If such voluntary submissions are accepted, should there be a restriction on the choice of identifying a D-amino acid by an Xaa or by its L-amino acid counterpart abbreviation?

*Comment:* One comment indicated that not only should the PTO accept voluntary submissions under these rules where a D-amino acid is contained in the sequence, the Office should make such submissions mandatory and designated by an Xaa. One comment indicated that sequences containing D-amino acids should not be in the PTO databases.

*Response:* Upon careful consideration, the PTO has decided to accept voluntary submissions of protein sequences containing D-amino acids. The PTO strongly encourages anyone making such voluntary submissions to identify a D-amino acid with an Xaa, describing the D-amino acid in the Features section of the Sequence Listing. This section is indicated by numeric identifiers <220> through <223> in 37 CFR 1.823. Procedural concerns compel this acceptance of voluntary submissions. Computer readable forms are processed prior to examination. It is cumbersome to establish a viable procedure to redact any voluntary submissions out of the PTO database. The use of Xaa to indicate a D-amino acid, should such sequence information be submitted in accordance with these rules, is encouraged so as to alert anyone reviewing the sequence that a particular amino acid is other than a naturally occurring L-amino acid and to more accurately depict the extent of similarities between such a sequence and the L-amino acid containing sequences present in a database being searched for examination or other purposes.

Because the sequence databases do not currently include D-amino acids in sequences and thus are not searchable for such sequences, the submission of those sequences containing D-amino acids will not be made mandatory.

The second query posed in the proposed rules was: (2) Should the provisions of 37 CFR 1.821(c) be altered to exclude some prior art sequences from inclusion in the Sequence Listing even though they are presented in a patent application disclosure as sequences? Should the reference to an accession number of an admitted prior art sequence in a publicly available, electronic, sequence database suffice and exclude that sequence from the requirements of the sequence rules?

*Comment:* Four comments indicated that known "prior art" sequences should not be required in the Sequence Listing. A referral to a publicly available, electronic, sequence database for access to such "prior art" sequences would be an acceptable alternative to two of those commenting on this aspect; the other two did not address this point. The reasons given for excluding such sequences are the expense and time required by applicants and their representatives in the inclusion of "prior art" sequences that are considered to be "non-inventive". Reducing the bulk of the paper copy of the Sequence Listing was also mentioned.

*Response:* The requirement to submit all disclosed sequences in the format required by §§ 1.821 through 1.825 is maintained. This point was discussed with officials from the JPO and EPO. The offices have considered the stated concerns with regard to costs to applicants. Sections 1.821 through 1.825 do not require any information to be disclosed in the form of a sequence, but rather require a particular format whenever information is presented in the form of a sequence. Those applicants for whom compliance with the rules remains a significant hardship may petition under § 1.183 for a waiver of the applicable requirement of §§ 1.821 through 1.825.

The technical and legal concerns mentioned in the Notice of Proposed Rulemaking still exist concerning the use of an alternative reference to a publicly available, electronic, sequence database. These concerns are: (1) What constitutes a publicly available, electronic, sequence database? (2) Would the USPTO and the other patent offices which have similar rules be required to produce a list of internationally accepted databases? (3) What would be the criteria for such acceptance? (4) An additional issue would exist involving electronic records maintenance: is there any assurance that once information is contained in a database that it will be retained and available indefinitely without alteration? Changes to the information in nucleic acid sequence databases resulting from the discovery of sequencing errors are well-known. (5) Does the mere existence of the sequence information in such a record constitute reasonable means of retrieval? In other words, would one need some text basis or other identifier to retrieve the information?

Additional reasons for the inclusion of these prior art sequences remain relevant. These reasons are: (1) the assessment of whether a particular sequence falls within the requirements of the current rules is simple; (2) the general public is assured that all patents which contain any sequence information contain all of the sequence information in the Sequence Listing and all sequences are available in a computer accessible form; and (3) as a publication, the contextual association of new and old information is potentially unique to the patent and very valuable to anyone assessing the state of the art at the time of a patented invention, and thus are desirable to be present in electronic form in association with that patent.

The third query posed in the proposed rules was: (3) Should Sequence Listings filed in an international application filed under the PCT be published only electronically and made available for retrieval electronically by an accession number from several sequence repositories?

*Comment:* Two comments were received in response to this query, one in favor and one opposed to limiting the publication of the Sequence Listing to an electronic form for published PCT applications in the international phase.

*Response:* At this time paper copies of the Sequence Listings filed as part of the description will continue to be published in applications filed under PCT. The PTO together with the EPO, JPO and WIPO will continue to discuss the possibility of electronic publication. However, any implementation of such electronic publication in lieu of publication in paper form will not be undertaken until further study has been completed.

*Comment:* One comment suggested that informative English words be placed next to the numerical headings in the Sequence Listing as printed in a U.S. patent.

*Response:* The PTO will provide English words corresponding to the numeric identifiers in the printed U.S. patents.



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*Comment:* One comment suggested addition of a descriptive comment line to the Sequence Listing.

*Response:* The "Other Information" line in the Features section, which is numeric identifier <223> in § 1.823, provides for a description of a sequence. While completion of this section is only mandatory when the sequence contains "n", "Xaa", a modified or unusual L-amino acid or a modified base, it is frequently completed in other circumstances.

*Comment:* One comment requested we harmonize §§ 1.821 through 1.825 with PCT, EPO and other authorities such that the differences in the requirements for Sequence Listing submissions are minimal.

*Response:* This change to §§ 1.821 through 1.825 is the result of such an effort to harmonize the PTO, PCT, EPO and JPO Sequence Listing requirements to the extent possible. The requirements of newly developed WIPO ST.25 are substantially identical to the requirements of amended §§ 1.821 through 1.825. PatentIn Version 2.0 software, now available, is drafted to meet all of the requirements of WIPO Standard ST.25 (1998). The requirements of §§ 1.821 through 1.825, however, are less stringent than the requirements of WIPO Standard ST.25 (1998). Thus, applicants who wish to file in countries which adhere to WIPO Standard ST.25 (1998) should consider the following when not using PatentIn Version 2.0:

1. The WIPO Standard ST.25 (1998) does not permit submissions using a Macintosh computer.

2. The WIPO Standard ST.25 (1998) does not accept the range of media permitted by amended §§ 1.821 through 1.825.

3. The answers in field <221> and <222> must use selections from Tables 5 and 6 of WIPO Standard ST.25 (1998) to comply with that standard. The terms from these Tables are considered language neutral vocabulary.

4. Any free text in numeric identifier <223> of a Sequence Listing will not be translated and thus must also appear in the specification of applications filed under WIPO Standard ST.25 (1998) for compliance.

5. A CRF filed after the filing of an application under the PCT does not form part of the disclosure and will not be published in the pamphlet.

6. Paragraph 39 of WIPO Standard ST.25 (1998) requires the specific wording "the information recorded on the form is identical to the written sequence listing."

7. WIPO Standard ST.25 (1998), paragraph 24, requires spaces between specified numeric identifiers in the Sequence Listing.

*Comment:* One comment requested a WINDOWS® based version of PatentIn.

*Response:* A WINDOWS® based version of PatentIn, PatentIn 2.0, has been developed through a Trilaterally-sponsored joint initiative and is being made available.

*Comment:* One comment expressed concern over application of the doctrine of equivalents by the courts to sequence-based claim language.

*Response:* Sections 1.821 through 1.825 do not establish a disclosure requirement, nor do they alter the requirements of 35 U.S.C. § 112. They merely require a particular format whenever information is presented in the form of a sequence. The use of sequence identification numbers (SEQ ID NO: #) only provides a shorthand way for applicants to refer to sequence information. These identification numbers do not in any way restrict the manner in which an invention can be claimed. Similarly, the use of this format does not impact the potential interpretations and legal determinations that could be made with respect to claims containing information in the form of a nucleotide or amino acid sequence.

*Comment:* One comment requested the flexibility to use single-letter amino acid codes.

*Response:* Sections 1.821 through 1.825 as amended do not constrain an applicant from using single letter codes in the disclosure. The requirements of the sequence searching and the sequence storage mechanisms include only the three-letter codes, thus the need for the constraint on the Sequence Listing information. There is no such restriction on the sequence format in the body of the disclosure or in the figures imposed by §§ 1.821 through 1.825, or any of the rules of practice; only the format for the Sequence Listing is specified by §§ 1.821 through 1.825.

#### Review Under the Paperwork Reduction Act of 1995.

Notwithstanding any other provision of law, no person is required to respond to nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act (PRA) unless that collection of information displays a currently valid OMB control number.

This rule contains collections of information requirements subject to the PRA. The principal impact of this Final Rule is: (1) elimination of certain requirements of §§ 1.821 through 1.825; and (2) revision of §§ 1.821 through 1.825 for consistency with WIPO Standard ST.25 (1998), which will permit Sequence Listings to be presented in an international, language neutral format. The public reporting burden for these collections of information have been approved by the Office of Management and Budget (OMB) under OMB control number 0651-0024. The public reporting burden for this collection of information is estimated to average 80 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the information. Send comments regarding this burden estimate or any other aspect of the data requirements, including suggestions for reducing this burden, to Esther M. Kepplinger at the address specified above or to the Office of Information and Regulatory Affairs of OMB, New Executive Office Bldg., 725 17th St. NW, rm. 10235, Washington, DC 20230, Attn: Desk Officer for the Patent and Trademark Office.

#### Other Considerations.

This Final Rule is in conformity with the requirements of the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*), Executive Order 12612 (October 26, 1987), and the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*). It has been determined that this rulemaking is not significant for the purposes of Executive Order 12866 (September 30, 1993).

The Assistant General Counsel for Legislation and Regulation of the Department of Commerce has certified to the Chief Counsel for Advocacy, Small Business Administration that this Final Rule would not have a significant impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)). The principal impact of this Final Rule is: (1) elimination of certain requirements of §§ 1.821 through 1.825; and (2) revision of §§ 1.821 through 1.825 for consistency with WIPO Standard ST.25 (1998), which will permit Sequence Listings to be presented in an international, language neutral format.

The Office has determined that this Final Rule has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

#### List of Subjects

37 CFR Part 1

Administrative practice and procedure, Courts, Freedom of Information, Inventions and patents, Incorporation by reference, Reporting and record-keeping requirements, Small businesses.

For the reasons set forth in the preamble and under the authority granted to the Commissioner of Patents and Trademarks by 35 U.S.C. 6, Title 37 of the Code of Federal Regulations, part 1, is amended as follows:

#### PART 1 - RULES OF PRACTICE IN PATENT CASES

1. The authority citation for 37 CFR part 1 continues to read as follows: Authority: 35 U.S.C. 6, unless otherwise noted.

2. Section 1.821 is revised to read as follows:

#### § 1.821 Nucleotide and/or amino acid sequence disclosures in patent applications.

(a) Nucleotide and/or amino acid sequences as used in §§ 1.821 through 1.825 are interpreted to mean an unbranched sequence of four or more amino acids or an unbranched sequence of ten or more nucleotides. Branched sequences are specifically excluded from this definition. Sequences with fewer than four specifically defined nucleotides or amino acids are specifically excluded from this section. "Specifically defined" means those amino acids other than "Xaa" and those nucleotide bases other than "n" defined in accordance with the World Intellectual Property Organization (WIPO) Handbook on Industrial Property Information and Documentation, Standard ST.25: Standard for the Presentation of Nucleotide and Amino Acid Sequence Listings in Patent Applications (1998), including Tables 1 through 6 in Appendix 2, herein incorporated by reference. (Hereinafter "WIPO Standard ST.25 (1998)"). This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of WIPO Standard ST.25 (1998) may be obtained from the World Intellectual Property Organization: 34 chemin des Colombettes; 1211 Geneva 20 Switzerland. Copies of ST.25 may be inspected at the Patent Search Room: Crystal Plaza 3, Lobby Level; 2021 South Clark Place; Arlington, VA 22202. Copies may also be inspected at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC. Nucleotides and amino acids are further defined as follows:

(1) **Nucleotides:** Nucleotides are intended to embrace only those nucleotides that can be represented using the symbols set forth in WIPO Standard ST.25 (1998), Appendix 2, Table 1. Modifications, e.g., methylated bases, may be described as set forth in WIPO Standard ST.25 (1998), Appendix 2, Table 2, but shall not be shown explicitly in the nucleotide sequence.

(2) **Amino acids:** Amino acids are those L-amino acids commonly found in naturally occurring proteins and are listed in WIPO Standard ST.25 (1998), Appendix 2, Table 3. Those amino acid sequences containing D-amino acids are not intended to be embraced by this definition. Any amino acid sequence that contains post-translationally modified amino acids may be described as the amino acid sequence that is initially translated using the symbols shown in WIPO Standard ST.25 (1998), Appendix 2, Table 3 with the modified positions; e.g., hydroxylations or glycosylations, being described as set forth in WIPO Standard ST.25 (1998), Appendix 2, Table 4, but these modifications shall not be shown explicitly in the amino acid sequence. Any peptide or protein that can be expressed as a sequence using the symbols in WIPO Standard ST.25 (1998), Appendix 2, Table 3 in conjunction with a description in the Feature section to describe, for example, modified linkages, cross links and end caps, non-peptidyl bonds, etc., is embraced by this definition.

(b) Patent applications which contain disclosures of nucleotide and/or amino acid sequences, in accordance with the definition in paragraph (a) of this section, shall, with regard to the manner in which the nucleotide and/or amino acid sequences are presented and described, conform exclusively to the requirements of §§ 1.821 through 1.825.

(c) Patent applications which contain disclosures of nucleotide and/or amino acid sequences must contain, as a separate part of the disclosure, a paper copy disclosing the nucleotide and/or amino acid sequences and associated information using the symbols and format in accordance with the requirements of §§ 1.822 and 1.823. This paper copy is hereinafter referred

to as the "Sequence Listing." Each sequence disclosed must appear separately in the "Sequence Listing." Each sequence set forth in the "Sequence Listing" shall be assigned a separate sequence identifier. The sequence identifiers shall begin with 1 and increase sequentially by integers. If no sequence is present for a sequence identifier, the code "000" shall be used in place of the sequence. The response for the numeric identifier <60> shall include the total number of SEQ ID NOs, whether followed by a sequence or by the code "000."

(d) Where the description or claims of a patent application discuss a sequence that is set forth in the "Sequence Listing" in accordance with paragraph (c) of this section, reference must be made to the sequence by use of the sequence identifier, preceded by "SEQ ID NO:" in the text of the description or claims, even if the sequence is also embedded in the text of the description or claims of the patent application.

(e) A copy of the "Sequence Listing" referred to in paragraph (c) of this section must also be submitted in computer readable form in accordance with the requirements of § 1.824. The computer readable form is a copy of the "Sequence Listing" and will not necessarily be retained as a part of the patent application file. If the computer readable form of a new application is to be identical with the computer readable form of another application of the applicant on file in the Patent and Trademark Office, reference may be made to the other application and computer readable form in lieu of filing a duplicate computer readable form in the new application if the computer readable form in the other application was compliant with all of the requirements of these rules. The new application shall be accompanied by a letter making such reference to the other application and computer readable form, both of which shall be completely identified. In the new application, applicant must also request the use of the compliant computer readable "Sequence Listing" that is already on file for the other application and must state that the paper copy of the "Sequence Listing" in the new application is identical to the computer readable copy filed for the other application.

(f) In addition to the paper copy required by paragraph (c) of this section and the computer readable form required by paragraph (e) of this section, a statement that the content of the paper and computer readable copies are the same must be submitted with the computer readable form, e.g., a statement that "the information recorded in computer readable form is identical to the written sequence listing."

(g) If any of the requirements of paragraphs (b) through (f) of this section are not satisfied at the time of filing under 35 U.S.C. 111(a) or at the time of entering the national stage under 35 U.S.C. 371, applicant will be notified and given a period of time within which to comply with such requirements in order to prevent abandonment of the application. Any submission in reply to a requirement under this paragraph must be accompanied by a statement that the submission includes no new matter.

(h) If any of the requirements of paragraphs (b) through (f) of this section are not satisfied at the time of filing an international application under the Patent Cooperation Treaty (PCT), which application is to be searched by the United States International Searching Authority or examined by the United States International Preliminary Examining Authority, applicant will be sent a notice necessitating compliance with the requirements within a prescribed time period. Any submission in reply to a requirement under this paragraph must be accompanied by a statement that the submission does not include matter which goes beyond the disclosure in the international application as filed. If applicant fails to timely provide the required computer readable form, the United States International Searching Authority shall search only to the extent that a meaningful search can be performed without the computer readable form and the United States International Preliminary Examining Authority shall examine only to the extent that a meaningful examination can be performed without the computer readable form.

3. Section 1.822 is revised to read as follows:

#### § 1.822 Symbols and format to be used for nucleotide and/or amino acid sequence data.

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(a) The symbols and format to be used for nucleotide and/or amino acid sequence data shall conform to the requirements of paragraphs (b) through (e) of this section.

(b) The code for representing the nucleotide and/or amino acid sequence characters shall conform to the code set forth in the tables in WIPO Standard ST.25 (1998), Appendix 2, Tables 1 and 3. This incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies of ST.25 may be obtained from the World Intellectual Property Organization; 34 chemin des Colombettes; 1211 Geneva 20 Switzerland. Copies of ST.25 may be inspected at the Patent Search Room; Crystal Plaza 3, Lobby Level; 2021 South Clark Place; Arlington, VA 22202. Copies may also be inspected at the Office of the Federal Register, 800 North Capitol Street, NW, Suite 700, Washington, DC. No code other than that specified in these sections shall be used in nucleotide and amino acid sequences. A modified base or modified or unusual amino acid may be presented in a given sequence as the corresponding unmodified base or amino acid if the modified base or modified or unusual amino acid is one of those listed in WIPO Standard ST.25 (1998), Appendix 2, Tables 2 and 4, and the modification is also set forth in the Feature section. Otherwise, each occurrence of a base or amino acid not appearing in WIPO Standard ST.25 (1998), Appendix 2, Tables 1 and 3, shall be listed in a given sequence as "n" or "Xaa," respectively, with further information, as appropriate, given in the Feature section, preferably by including one or more feature keys listed in WIPO Standard ST.25 (1998), Appendix 2, Tables 5 and 6.

(c) Format representation of nucleotides:

(1) A nucleotide sequence shall be listed using the lower-case letter for representing the one-letter code for the nucleotide bases set forth in WIPO Standard ST.25 (1998), Appendix 2, Table 1.

(2) The bases in a nucleotide sequence (including introns) shall be listed in groups of 10 bases except in the coding parts of the sequence. Leftover bases, fewer than 10 in number, at the end of noncoding parts of a sequence shall be grouped together and separated from adjacent groups of 10 or 3 bases by a space.

(3) The bases in the coding parts of a nucleotide sequence shall be listed as triplets (codons). The amino acids corresponding to the codons in the coding parts of a nucleotide sequence shall be typed immediately below the corresponding codons. Where a codon spans an intron, the amino acid symbol shall be typed below the portion of the codon containing two nucleotides.

(4) A nucleotide sequence shall be listed with a maximum of 16 codons or 60 bases per line, with a space provided between each codon or group of 10 bases.

(5) A nucleotide sequence shall be presented, only by a single strand, in the 5 to 3 direction, from left to right.

(6) The enumeration of nucleotide bases shall start at the first base of the sequence with number 1. The enumeration shall be continuous through the whole sequence in the direction 5 to 3. The enumeration shall be marked in the right margin, next to the line containing the one-letter codes for the bases, and giving the number of the last base of that line.

(7) For those nucleotide sequences that are circular in configuration, the enumeration method set forth in paragraph (c)(6) of this section remains applicable with the exception that the designation of the first base of the nucleotide sequence may be made at the option of the applicant.

(d) Representation of amino acids:

(1) The amino acids in a protein or peptide sequence shall be listed using the three-letter abbreviation with the first letter as an upper case character, as in WIPO Standard ST.25 (1998), Appendix 2, Table 3.

(2) A protein or peptide sequence shall be listed with a maximum of 16 amino acids per line, with a space provided between each amino acid.

(3) An amino acid sequence shall be presented in the amino to carboxy direction, from left to right, and the amino and carboxy groups shall not be presented in the sequence.

(4) The enumeration of amino acids may start at the first amino acid of the first mature protein, with the number 1. When presented, the amino acids preceding the mature protein, *e.g.*, pre-sequences, pro-sequences, pre-pro-sequences and signal sequences, shall have negative numbers, counting backwards starting with the amino acid next to number 1. Otherwise, the enumeration of amino acids shall start at the first amino acid at the amino terminal as number 1. It shall be marked below the sequence every 5 amino acids. The enumeration method for amino acid sequences that is set forth in this section remains applicable for amino acid sequences that are circular in configuration, with the exception that the designation of the first amino acid of the sequence may be made at the option of the applicant.

(5) An amino acid sequence that contains internal terminator symbols (*e.g.*, "Ter", "\*", or ".", etc.) may not be represented as a single amino acid sequence, but shall be presented as separate amino acid sequences.

(e) A sequence with a gap or gaps shall be presented as a plurality of separate sequences, with separate sequence identifiers, with the number of separate sequences being equal in number to the number of continuous strings of sequence data. A sequence that is made up of one or more noncontiguous segments of a larger sequence or segments from different sequences shall be presented as a separate sequence.

4. Section 1.823 is revised to read as follows:

**§ 1.823 Requirements for nucleotide and/or amino acid sequences as part of the application papers.**

(a) The "Sequence Listing" required by § 1.821(c), setting forth the nucleotide and/or amino acid sequences and associated information in accordance with paragraph (b) of this section, must begin on a new page and must be titled "Sequence Listing". The "Sequence Listing" preferably should be numbered independently of the numbering of the remainder of the application. Each page of the "Sequence Listing" should contain no more than 66 lines and each line should contain no more than 72 characters. A fixed-width font should be used exclusively throughout the "Sequence Listing."

(b) The "Sequence Listing" shall, except as otherwise indicated, include the actual nucleotide and/or amino acid sequence, the numeric identifiers and their accompanying information as shown in the following table. The numeric identifier shall be used only in the "Sequence Listing." The order and presentation of the items of information in the "Sequence Listing" shall conform to the arrangement given below. Each item of information shall begin on a new line and shall begin with the numeric identifier enclosed in angle brackets as shown. The submission of those items of information designated with an "M" is mandatory. The submission of those items of information designated with an "O" is optional. Numeric identifiers <110> through <170> shall only be set forth at the beginning of the "Sequence Listing." The following table illustrates the numeric identifiers.

Numeric Identifier	Definition	Comments and Format	Mandatory (M) or Optional (O)
<110>	Applicant	Preferably max. of 10 names; one name per line; preferable format: Surname, Other Names and/or Initials	M
<120>	Title of Invention		M
<130>	File Reference	Personal file reference	M when filed prior to assignment of appl. number
<140>	Current Application Number	Specify as: US 07/999,999 or PCT/US96/99999	M, if available
<141>	Current Filing Date	Specify as: yyyy-mm-dd	M, if available
<150>	Prior Application Number	Specify as: US 07/999,999 or PCT/US96/99999	M, if applicable include priority documents under 35 USC 119 and 120
<151>	Prior Application Filing Date	Specify as: yyyy-mm-dd	M, if applicable
<160>	Number of SEQ ID NOs	Count includes total number of SEQ ID NOs	M
<170>	Software	Name of software used to create the Sequence Listing	O
<210>	SEQ ID NO:#	Response shall be an integer representing the SEQ ID NO shown	M
<211>	Length	Respond with an integer expressing the number of bases or amino acid residues	M
<212>	Type	Whether presented sequence molecule is DNA, RNA, or PRT (protein). If a nucleotide sequence contains both DNA and RNA fragments, the type shall be "DNA." In addition, the combined DNA/RNA molecule shall be further described in the <220> to <223> feature section.	M
<213>	Organism	Scientific name, <i>i.e.</i> Genus/species, Unknown or Artificial Sequence. In addition, the "Unknown" or "Artificial Sequence" organisms shall be further described in the <220> to <223> feature section.	M
<220>	Feature	Leave blank after <220>. <221>-<223> provide for a description of points of biological significance in the sequence.	M, under the following conditions: if "n," "Xaa," or a modified or unusual L-amino acid or modified base was used in a sequence; if ORGANISM is "Artificial Sequence" or "Unknown"; if molecule is combined DNA/RNA.
<221>	Name/Key	Provide appropriate identifier for feature, preferably from WIPO Standard ST.25 (1998), Appendix 2, Tables 5 and 6	M, under the following conditions: if "n," "Xaa," or a modified or unusual L-amino acid or modified base was used in a sequence



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Numeric Identifier	Definition	Comments and Format	Mandatory (M) or Optional (O)
<222>	Location	Specify location within sequence; where appropriate state number of first and last bases/amino acids in feature	M, under the following conditions: if "n," "Xaa," or a modified or unusual L-amino acid or modified base was used in a sequence
<223>	Other Information	Other relevant information; four lines maximum	M, under the following conditions: if "n," "Xaa," or a modified or unusual L-amino acid or modified base was used in a sequence; if ORGANISM is "Artificial Sequence" or "Unknown"; if molecule is combined DNA/RNA.
<300>	Publication Information	Leave blank after <300>	O
<301>	Authors	Preferably max of ten named authors of publication; specify one name per line; preferable format: Surname, Other Names and/or Initials	O
<302>	Title		O
<303>	Journal		O
<304>	Volume		O
<305>	Issue		O
<306>	Pages		O
<307>	Date	Journal date on which data published; specify as yyyy-mm-dd, MMM-yyyy or Season-yyyy	O
<308>	Database Accession Number	Accession number assigned by database including database name	O
<309>	Database Entry Date	Date of entry in database; specify as yyyy-mm-dd or MMM-yyyy	O
<310>	Patent Document Number	Document number; for patent-type citations only. Specify as, for example, US 07/999,999	O
<311>	Patent Filing Date	Document filing date, for patent-type citations only; specify as yyyy-mm-dd	O
<312>	Publication Date	Document publication date, for patent-type citations only; specify as yyyy-mm-dd	O
<313>	Relevant Residues	FROM (position) TO (position)	O
<400>	Sequence	SEQ ID NO should follow the numeric identifier and should appear on the line preceding the actual sequence	M

5. Section 1.824 is revised to read as follows:

**§ 1.824 Form and format for nucleotide and/or amino acid sequence submissions in computer readable form.**

(a) The computer readable form required by § 1.821(e) shall meet the following specifications:

(1) The computer readable form shall contain a single "Sequence Listing" as either a diskette, series of diskettes, or other permissible media outlined in paragraph (c) of this section.

(2) The "Sequence Listing" in paragraph (a) (1) of this section

shall be submitted in American Standard Code for Information Interchange (ASCII) text. No other formats shall be allowed.

(3) The computer readable form may be created by any means, such as word processors, nucleotide/amino acid sequence editors or other custom computer programs; however, it shall conform to all specifications detailed in this section.

(4) File compression is acceptable when using diskette media, so long as the compressed file is in a self-extracting format that will decompress on one of the systems described in paragraph (b) of this section.

(5) Page numbering shall not appear within the computer readable form version of the "Sequence Listing" file.

(6) All computer readable forms shall have a label permanently affixed thereto on which has been hand-printed or typed: the name of the applicant, the title of the invention, the date on which the data were recorded on the computer readable form, the operating system used, a reference number, and an application serial number and filing date, if known.

(b) Computer readable form submissions must meet these format requirements:

(1) Computer: IBM PC/XT/AT, or compatibles, or Apple Macintosh;

(2) Operating System: MS-DOS, Unix or Macintosh;

(3) Line Terminator: ASCII Carriage Return plus ASCII Line Feed;

(4) Pagination: Continuous file (no "hard page break" codes permitted);

(c) Computer readable form files submitted may be in any of the following media:

(1) Diskette:

3.50 inch, 1.44 Mb storage;  
3.50 inch, 720 Kb storage;  
5.25 inch, 1.2 Mb storage;  
5.25 inch, 360 Kb storage.

(2) Magnetic tape:

0.5 inch, up to 24000 feet;  
Density: 1600 or 6250 bits per inch, 9 track;  
Format: Unix tar command; specify blocking factor (not "block size");  
Line Terminator: ASCII Carriage Return plus ASCII Line Feed.

(3) 8mm Data Cartridge:

Format: Unix tar command; specify blocking factor (not "block size");  
Line Terminator: ASCII Carriage Return plus ASCII Line Feed.

(4) CD-ROM:

Format: ISO 9660 or High Sierra Format

(5) Magneto Optical Disk:

Size/Storage Specifications: 5.25 inch, 640 Mb.

(d) Computer readable forms that are submitted to the Office will not be returned to the applicant.

6. Section 1.825 is revised to read as follows:

**§ 1.825 Amendments to or replacement of sequence listing and computer readable copy thereof.**

(a) Any amendment to the paper copy of the "Sequence Listing" (§ 1.821(c)) must be made by the submission of substitute sheets. Amendments must be accompanied by a statement that indicates support for the amendment in the application, as filed, and a statement that the substitute sheets include no new matter.

(b) Any amendment to the paper copy of the "Sequence Listing," in accordance with paragraph (a) of this section, must

be accompanied by a substitute copy of the computer readable form (§ 1.821(e)) including all previously submitted data with the amendment incorporated therein, accompanied by a statement that the copy in computer readable form is the same as the substitute copy of the "Sequence Listing."

(c) Any appropriate amendments to the "Sequence Listing" in a patent; e.g., by reason of reissue or certificate of correction, must comply with the requirements of paragraphs (a) and (b) of this section.

(d) If, upon receipt, the computer readable form is found to be damaged or unreadable, applicant must provide, within such time as set by the Commissioner, a substitute copy of the data in computer readable form accompanied by a statement that the substitute data is identical to that originally filed.

7. Appendix A to Subpart G to Part 1 is revised to read as follows:

Appendix A To Subpart G to Part 1 - Sample Sequence Listing

<110> Smith, John  
Smith, Jane

<120> Example of a Sequence Listing

<130> 01-00001

<140> US 08/999,999

<141> 1998-02-28

<150> EP 91000000

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<160> 2

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<301> Doe, Richard

<302> Isolation and Characterization of a Gene Encoding a  
Protease from Paramecium sp.

<303> Journal of Fictional Genes

<304> 1

<305> 4

<306> 1 - 7

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ctttcgcg	agcggcgcg	ctttccggcg	cgcgccgtc	cgcctctaga	cctgagaggt	300
cttctcttcc	ctctcttca	ctagagaggt	ctatatatac	atg gtt tca atg ttc		355
				Met Val Ser Met Phe		

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OFFICIAL GAZETTE

JUNE 23, 1998

1	5
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<400> 2

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Phe Val			

May 22, 1998

BRUCE A. LEHMAN  
Assistant Secretary of Commerce and  
Commissioner of Patents and Trademarks

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Gene Knutson dba National Golf Charities Hole in One Association, Mishawaka, Ind., Reg. No. 1,736,990 for the mark "NGC HOLE IN ONE ASSOCIATION AND DESIGN", Cancellation No. 24,913.

JEAN BROWN  
Technical Support Manager,  
Trademark Trial  
and Appeal Board, for  
ROBERT M. ANDERSON  
Deputy Assistant Commissioner  
for Trademarks

Service by Publication

A petition to cancel the registrations identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

Berkeley Farms, Inc., La Jolla, Calif., Reg. No. 1,105,729 for the mark "GOLDEN STATE", Canc. No. 27,032.

Heckler Manufacturing and Investment Group, Inc., New York, N.Y., Reg. No. 650,128 for the mark "NEXT TO NOTHING NEXT TO YOU", Canc. No. 26,330.

KATRINA PETERSON  
Supervisory Legal Assistant  
Trademark Trial and Appeal Board, for  
Robert M. Anderson  
Deputy Assistant Commissioner  
for Trademarks

Registration To Practice

The following person successfully passed the registration examination that was held August 27, 1997, and has been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until applicant's registration certificate is mailed to applicant. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of the following applicant on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before August 7, 1998.

Chang, Otto K., 9 S. Wickom Dr., Westfield, N.J. 07090

May 29, 1998 KAREN L. BOVARD, Director  
Office of Enrollment and Discipline

Registration To Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office who have been given provisional recognition pursuant to 37 CFR 10.9(a) to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. [37 CFR 10.7(a)]. Accordingly, any information tending to affect the eligibility of any of the following applicants on moral, ethical, or other grounds should be furnished to the Director, Office of Enrollment and Discipline on or before August 7, 1998.

Schofer, Joseph L., 903 Nora Dr., Silver Spring, Md. 20904

Vales, Phillip F., 14916 Emory Ln., Rockville, Md. 20853

May 29, 1998 KAREN L. BOVARD, Director  
Office of Enrollment and Discipline

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JUNE 23, 1998

U.S. PATENT AND TRADEMARK OFFICE

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Fax: (703) 306-2737

May 29, 1998

WESLEY H. GEWEHR  
Administrator for Information  
Dissemination

Certificates of Correction  
for June 23, 1998

D. 391,317	5,482,318	5,567,168	5,607,964
D. 392,986	5,517,220	5,567,558	5,612,200
D. 393,105	5,519,973	5,573,780	5,618,720
D. 393,505	5,522,734	5,580,533	5,621,659
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5,679,516	5,705,505	5,724,720	



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## Summary of Final Decisions Issued by the Trademark Trial and Appeal Board

May 4-8, 1998

Date Issued	Type of Case <sup>(1)</sup>	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney TTAB	Citable as Precedent of TTAB
5-5	EX	74/407,685	Sisson Group Inc.	2(e)(1)	Refusal Affirmed		"STREET HOCKEY" [clothing, namely, shirts, crew shirts, turtleneck shirts, mock turtleneck shirts, pants, shorts, jackets, sweatshirts, sweatpants, sweaters, vests, t-shirts, tank tops, socks, caps, ties, and athletic shoes]		No
5-5	EX	74/637,379	Wright's Knitwear Corp.	2(d)	Refusal Affirmed		"ACME UNDERWEAR COMPANY" [men's underwear and loungewear]	"ACME" [in stylized lettering] (t-shirts featuring the depictions of Looney Tunes cartoon characters)	No
5-6	CANC	21,735	Brewski Beer Co., Inc. v. Brewski Brothers, Inc.	2(d); abandonment (non-use); counterclaim asserting abandonment (failure to police, assignment in gross)	Petition to Cancel Denied; Counter-claim Denied	"BREWISKY'S" [bar services]	"BREWSKI BROTHERS" [sportswear, namely, pants, shirts, sweaters, and jackets]		Yes

(1) EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (S)=SUMMARY JUDGMENT;(R)=REQ FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN

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Box 313b Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.  
Box AF Expedited procedure for processing amendments and other responses after final rejection.  
Box Comments Public comments regarding patent related regulations and procedures.  
Box CPA Requests for Continued Prosecution Applications (CPA's) under 37 CFR 1.53(d).  
Box DAC Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.  
Box DD Disclosure Documents or materials related to the Disclosure Document Program.  
Box Design The filing of all design patent applications and any communications relating thereto.  
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Box Patent Ext. Applications for patent term extension and any communications relating thereto.  
Box PCT Mail related to applications filed under the Patent Cooperation Treaty.  
Box Provisional The filing of all provisional patent applications and any communications relating thereto.  
Box Patent Application  
Box Reconstruction Correspondence pertaining to the reconstruction of lost patent files.  
Box Reexam Requests for Reexamination for *original* request papers *only*.  
Box Sequence Submission of diskette for biotechnical application.  
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Box STATUS NO Written status inquiries.  
FEE  
Box POST REG Affidavits, renewals, corrections and amendments.  
FEE  
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Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
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Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
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Box M Fee	Correspondence regarding patent maintenance fees and related matter.
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Partnership PTDLs provide enhanced and expanded services for which fees are charged. They offer on-line patent text and image searching, on-line trademark searching, and videoconferencing for examiner interviews and workshops. They accept disclosure documents on site, order file wrappers, assignment documents and certified copies for their customers, and host a variety of seminars aimed at specific audiences, including practitioners, paralegals, and independent inventors. Currently, partnerships are located at the Great Lakes Patent and Trademark Center (GLPTC) at the Detroit Public Library in Detroit, Michigan and the Sunnyvale Center for Innovation, Invention and Ideas (SCI<sup>3</sup>) in Sunnyvale, California.

State	Name of Library	Telephone Contact
Alabama	Auburn University Libraries .....	(334) 844-1747
	Birmingham Public Library .....	(205) 226-3620
	Anchorage: Z.J. Loussac Public Library .....	(907) 562-7323
	Tempe: Noble Library, Arizona State University .....	(602) 965-7010
	Little Rock: Arkansas State Library .....	(501) 682-2053
	Los Angeles Public Library .....	(213) 228-7220
	Sacramento: California State Library .....	(916) 654-0069
	San Diego Public Library .....	(619) 236-5813
	San Francisco Public Library .....	(415) 557-4500
	Sunnyvale Center for Innovation, Invention and Ideas .....	(408) 730-7290
Colorado	Denver Public Library .....	(303) 640-6220
Connecticut	Hartford Public Library .....	Not Yet Operational
	New Haven Free Public Library .....	Not Yet Operational
Delaware	Newark: University of Delaware Library .....	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries .....	(202) 806-7252
	Fort Lauderdale: Broward County Main Library .....	(954) 357-7444
Florida	Miami-Dade Public Library .....	(305) 375-2665
	Orlando: University of Central Florida Libraries .....	(407) 823-2562
	Tampa Campus Library, University of South Florida .....	(813) 974-2726
	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology .....	(404) 894-4508
	Honolulu: Hawaii State Public Library System .....	(808) 586-3477
Hawaii	Moscow: University of Idaho Library .....	(208) 885-6235
Idaho	Chicago Public Library .....	(312) 747-4450
Illinois	Springfield: Illinois State Library .....	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library .....	(317) 269-1741
	West Lafayette Siegesmund Engineering Library, Purdue University .....	(765) 494-2872
	Des Moines: State Library of Iowa .....	(515) 281-4118
Iowa	Wichita: Ablah Library, Wichita State University .....	(316) 978-3155
Kansas	Louisville Free Public Library .....	(502) 574-1611
Kentucky	Baton Rouge: Troy H. Middleton Library, Louisiana State University .....	(504) 388-8875
Louisiana	Orono: Raymond H. Fogler Library, University of Maine .....	(207) 581-1678
Maine	College Park: Engineering and Physical Sciences Library, University of Maryland .....	(301) 405-9157
Maryland	Amherst: Physical Sciences Library, University of Massachusetts .....	(413) 545-1370
Massachusetts	Boston Public Library .....	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Media Union Library, University of Michigan .....	(313) 647-5735
	Big Rapids: Abigail S. Timme Library, Ferris State University .....	(616) 592-3602
	Detroit: Great Lakes Patent and Trademark Center .....	(313) 833-3379
	Minneapolis Public Library and Information Center .....	(612) 630-6120
	Jackson: Mississippi Library Commission .....	(601) 359-1036
Minnesota	Kansas City: Linda Hall Library .....	(816) 363-4600
Mississippi	St. Louis Public Library .....	(314) 241-2288 Ext. 390
Missouri	Butte: Montana College of Mineral Science and Technology Library .....	(406) 496-4281
Montana	Lincoln: Engineering Library, University of Nebraska-Lincoln .....	(402) 472-3411
Nebraska	Reno: University of Nevada, Reno Library .....	(702) 784-6500 Ext. 257
Nevada	Concord: New Hampshire State Library .....	(603) 271-2239
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Reference Collections of U.S. Patents and Trademarks Available for Public Use in Patent and Trademark Depository Libraries—(continued)

State	Name of Library	Telephone Contact
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-5355
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 592-7000
	Stony Brook: Engineering Library, State University of New York	Not Yet Operational
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Akron - Summit County Public Library	(330) 643-9075
	Cincinnati and Hamilton County, Public Library of	(513) 369-6971
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	(503) 768-6786
Pennsylvania	Philadelphia: The Free Library of	(215) 686-5331
	Pittsburgh: Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaguez General Library, University of Puerto Rico	(787) 832-4040 Ext. 3459
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(864) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-1275
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8877
	Nashville: Stevenson Science Library, Vanderbilt University	(615) 322-2717
Texas	Austin: McKinney Engineering Library, University of Texas at Austin	(512) 495-4500
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-3826
	Dallas Public Library	(214) 670-1468
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
	Lubbock: Texas Tech University	(806) 742-2282
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Vermont	Burlington: Bailey/Howe Library, University of Vermont	(802) 656-2542
Virginia	Richmond: James Branch Cabell Library, Virginia Commonwealth University	(804) 828-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510 Ext. 113
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin-Madison	(608) 262-6845
	Milwaukee Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner  
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents  
NICHOLAS P. GODICI, (Acting) Deputy Assistant Commissioner for Patents  
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
<b>CHEMICAL EXAMINING GROUPS</b>		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100— THEODORE MORRIS, Director	308-0661	01/09/96
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200/2900—JOHN E. KITTLE, Director	308-1235	06/11/96
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—RICHARD V. FISHER, Director	308-0651	07/01/96
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—MARY LEE, Acting Director	308-2351	05/13/96
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director	308-0196	10/26/95
<b>ELECTRICAL EXAMINING GROUPS</b>		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director	308-1782	10/31/95
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director	308-0511	03/29/96
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300— JOSEPH J. ROLLA, Director	305-3900	03/29/96
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director	305-3900	12/11/95
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500— JANICE A. HOWELL, Director	308-0956	09/16/96
TELECOMMUNICATIONS, GROUP 2600—JIN F. NG, Director	305-3900	09/12/95
DESIGN, GROUP 2900—JOHN E. KITTLE, Director	305-3293	05/17/96
<b>MECHANICAL EXAMINING GROUPS</b>		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—JOHN F. TERAPANE, JR., Director	308-1113	12/04/95
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—ETHEL CROSS, Director	308-1148	12/31/96
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director	308-0858	01/24/96
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director	308-0861	01/30/96
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director	308-2168	12/24/96

\*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows:

- (1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(c)(1).
- (2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).
- (3) All design patents are granted for a term of 14 years from the date of the grant. However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.



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## TRADEMARK OPERATION

Bruce A. Lehman, Commissioner  
Philip G. Hampton, II, Assistant Commissioner  
Robert M. Anderson, Deputy Assistant Commissioner  
David E. Bucher, Director, Trademark Examining Office  
Condition of Trademark Applications as of May 1, 1998

	Oldest Date	
	New*	Amendment Filed
Law Office		
Law Office 101—Ron Williams, Managing Attorney, (703) 308-9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	12/10/97	01/29/98
Law Office 102—Thomas Shaw, Acting Managing Attorney, (703) 308-9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	09/19/97	02/09/98
Law Office 103—Michael A. Szoke, Acting Managing Attorney, (703) 308-9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	09/02/97	04/20/98
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308-9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	08/01/97	01/20/98
Law Office 105—Thomas Howell, Managing Attorney, (703) 308-9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	09/17/97	01/26/98
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308-9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	09/29/97	01/28/98
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308-9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	12/12/97	01/22/98
Law Office 108—David Shallant, Managing Attorney, (703) 308-9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yams, Fabrics, Clothing & Notions— Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	08/27/97	01/21/98
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308-9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yams, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42	07/21/97	02/13/98
**Collective Marks—Class 200		
**Certification Marks—Classes A & B		
Office of Trademark Services—Terron Simms, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use—(ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126 Affidavits Under Sections 8 & 15 (All Classes)	02/19/98	—0—
Renewals (All Classes)	02/19/98	—0—
Section 12(c) Publications (All Classes)	02/02/98	—0—

1. \*\* Assigned to all Law Office

2. Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305-8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.

3. \* These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.

## REEXAMINATIONS

JUNE 23, 1998

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

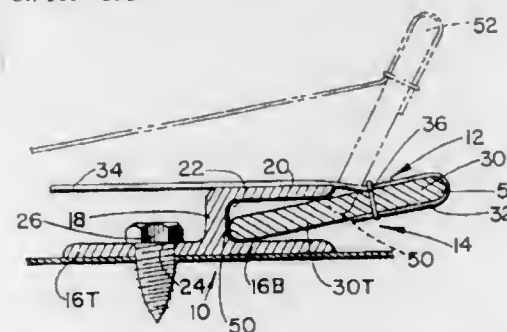
B1 4,757,854 (3552nd)

APPARATUS FOR DETACHABLY FASTENING A  
STRETCHABLE FABRIC PANEL TO A RIGID FRAMEGary R. Ripberger, Boulder, Colo., assignor to Bestop, Inc.,  
Longmont, Colo.

Reexamination Request No. 90/004,871, Dec. 15, 1997.

Reexamination Certificate for Patent 4,757,854, issued Jul. 19,  
1988, Ser. No. 19,438, Feb. 26, 1987.Int. Cl.<sup>6</sup> A47H 13/00

U.S. Cl. 160—391

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETER-  
MINED THAT:

The patentability of claims 1-7 is confirmed.

1. In a fastener for detachably connecting a stretchable fabric cover to a rigid frame and which includes a groove-forming means attachable to the rigid frame and which has a first leg attached to the rigid frame and a second leg spaced from the first leg and attached thereto by a web to define a groove with a bottom and an entryway, the second leg having a front edge, the groove in said groove-forming means having a depth as measured between the front edge and the web considerably greater than its width as measured between the first and second legs opening in the direction which the fabric is stretched the improvement in combination therewith comprising: a tongue-forming means comprising an elongate strap sized for edgewise insertion into the groove of said groove-forming means, said strap having a thickness adapted to effectively resist bending along a line extending in the direction of the length thereof, and said strap being of width substantially greater than the depth of said groove to define an insertable portion having a free edge, a trailing edge, and a projecting portion adjacent to said trailing edge, said projecting portion projecting beyond the entryway into the groove when the free edge of the insertable portion is seated in the bottom thereof; and fabric-attaching means attaching the fabric cover to the strap, said attaching means being positioned at a location between said strap trailing and free edges, the fabric cover being folded around said trailing edge and attached to said strap by said attaching means so that the fabric cover forms two portions which are in face-to-face relation to one another with said projecting portion therebetween along an area extending lengthwise of the projecting portion trailing edge, said attaching means being located outside the entryway into the groove when said strap is positioned in the groove with said strap free edge abutting the web, said strap projecting portion defining a handhold for stretching the fabric cover to where the free edge of the strap insertable portion is in position for release into the entryway into the groove whereby stretching of the fabric cover and insertion of said strap into the groove are facilitated.

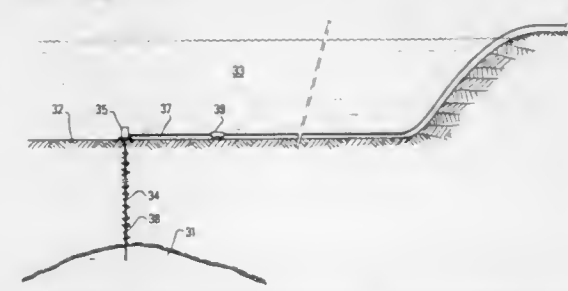
B1 4,915,176 (3553rd)

METHOD OF TRANSPORTING A HYDRATE FORMING  
FLUIDAndré Sugier; Paul Bourgmayor, both of Rueil Malmaison;  
Emmanuel Behar, Cergy, and Edouard Freund, Rueil Mal-  
maison, all of France, assignors to Institut Francais du  
Petrole, Rueil Malmaison, France

Reexamination Request No. 90/004,366, Sep. 13, 1996.

Reexamination Certificate for Patent 4,915,176, issued Apr.  
10, 1990, Ser. No. 288,985, Dec. 23, 1988.Claims priority, application France, Dec. 30, 1987, 87 18435  
Int. Cl.<sup>6</sup> E21B 37/06; 41/02; 43/01; F17D 1/14

U.S. Cl. 166—371

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETER-  
MINED THAT:

The patentability of claims 1-3, 5, 6, 10, 12 and 13 is confirmed.

Claims 4, 7, 9, 11 and 14 are determined to be patentable as  
amended.Claim 8, dependent on an amended claim, is determined to be  
patentable.

New claims 15-38 are added and determined to be patentable.

1. A method of transporting in a duct a fluid comprising gas and water, and being under conditions where at least one hydrate is formed, the hydrates being formed from said gas and said water, wherein, before or during the formation of the hydrate or hydrates, an additive is injected into said fluid for reducing the tendency to agglomeration of the hydrate so as to obtain one or more hydrates in dispersed form, and said fluid is transported containing said hydrate or hydrates in dispersed form.

B1 5,054,902 (3554th)

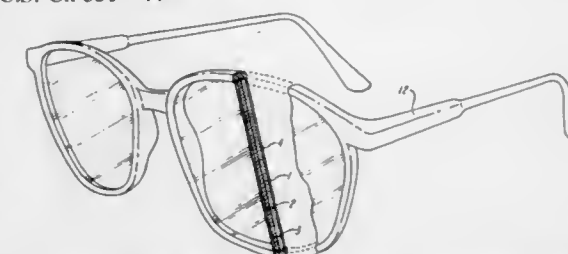
## LIGHT CONTROL WITH COLOR ENHANCEMENT

William J. King, 9 Putnam Rd., Reading, Mass. 01867

Reexamination Request No. 90/004,651, Jun. 2, 1997.

Reexamination Certificate for Patent 5,054,902, issued Oct. 8,  
1991, Ser. No. 430,080, Nov. 1, 1989.Continuation of Ser. No. 921,312, Oct. 21, 1986, abandoned,  
which is a continuation of Ser. No. 645,262, Dec. 29, 1975,  
abandoned.Int. Cl.<sup>6</sup> G02C 7/10; G02B 5/28; 1/10

U.S. Cl. 351—44

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETER-  
MINED THAT:

3485

New claims 54-69 are added and determined to be patentable.

[the synchronous random access memory including] input and output data latches arranged for latching data directly in response to the system clock signal.

New claims 54-69 are added and determined to be patentable.

response to the system clock signal.

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## REISSUES

JUNE 23, 1998

Matter enclosed in heavy brackets [] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

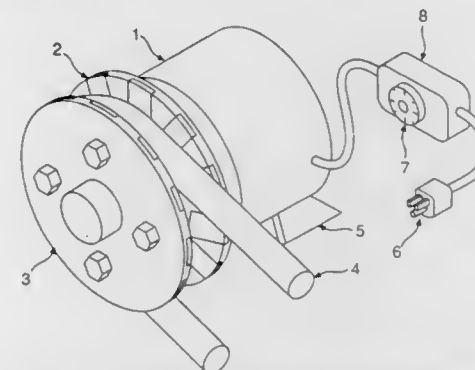
Re. 35,826  
METHOD AND APPARATUS FOR APPLYING MAGNETIC  
FIELDS TO FLUIDS

Michael S. Spiegel, Miami Beach, Fla., assignor to Advatech Research & Development, Inc., West Palm Beach, Fla.  
Original No. 5,200,071, dated Apr. 6, 1993, Ser. No. 818,516, Jan. 9, 1992. Application for reissue Apr. 5, 1995, Ser. No. 417,143

Int. Cl.<sup>6</sup> C02F 1/48

U.S. Cl. 210—695

32 Claims



22. A method of treating crystalline solids within a fluid using a rotatable assembly having an axis of rotation, a pair of disks separated along the axis of rotation to form a gap, and a magnet device associated with the disks forming a unidirectional magnetic field across the gap generally parallel to the axis of rotation, said method comprising the steps of:

generating a non-reversing moving magnetic field in said gap by rotating the rotatable assembly; and  
flowing said fluid through said gap through a non-magnetic conduit portion in a flow direction, said flow direction being generally perpendicular to said field, and being unidirectional in said gap relative to a rotational direction of said disks.

Re. 35,827  
SURFACE FIELD EFFECT TRANSISTOR WITH  
DEPRESSED SOURCE AND/OR DRAIN AREAS FOR ULSI  
INTEGRATED DEVICES

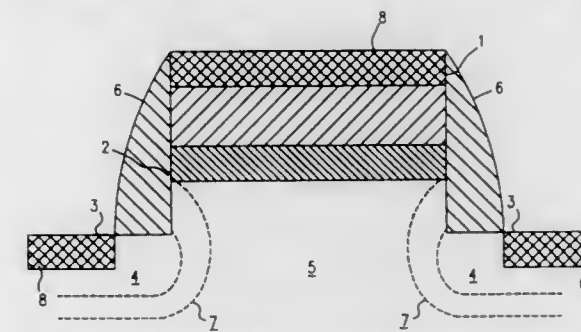
Fabio Gualandris, Segrate, and Aldo Maggis, Vimercate, both of Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy  
Original No. 5,041,885, dated Aug. 20, 1991, Ser. No. 518,070, May 2, 1990. Continuation of Ser. No. 110,045, Aug. 20, 1993, abandoned. Application for reissue Dec. 21, 1995, Ser. No. 575,846

Claims priority, application Italy, May 2, 1989, 83621A/89

Int. Cl.<sup>6</sup> H01L 29/76; 29/80; 29/94

U.S. Cl. 257—285

22 Claims



1. A [surface] field effect [integrated] transistor structure, comprising:

[formed in] a semiconducting substrate having a [surface] region, near a first surface thereof, with an electrical conductivity of a first type;

[constituting] a channel region [of the transistor] within said substrate, [which] said channel region [is] being confined from one side by a source region and from an opposite side by a drain region, both said source region and said drain region having a second conductivity [of] type opposite to said first type, and said drain region having a graded diffusion boundary, corresponding to multiple diffusions within said drain region with dopants of said second type, adjacent said channel;

[in respect to said channel region and being formed by implanting and diffusing a dopant in the semiconductor through respective drain and source areas of the surface of said semiconducting substrate.] said channel region being topped with a gate electrode formed above [the] said semiconducting substrate and electrically isolated therefrom by a dielectric gate layer[.];

said source and said drain regions being electrically contacted through contacts between the semiconducting substrate and a conducting material deposited [on said respective areas] thereon,

wherein the surface of the semiconducting substrate [in the area of] over said drain region has a level lower than the level of the surface of the semiconducting substrate in the area of said channel region [which is topped with] under said dielectric gate layer and said gate electrode, the difference between the levels of the surface of the semiconducting substrate in the gate area and in the drain area being between 50 and 500 nanometers.

Re. 35,828  
ANTI-FUSE CIRCUIT AND METHOD WHEREIN THE  
READ OPERATION AND PROGRAMMING OPERATION  
ARE REVERSED

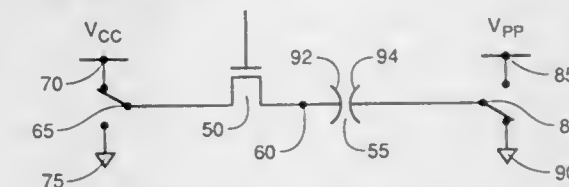
Ruojia Lee, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Original No. 5,301,159, dated Apr. 5, 1994, Ser. No. 13,896, Feb. 5, 1993. Application for reissue Apr. 5, 1996, Ser. No. 628,496

Int. Cl.<sup>6</sup> G11C 17/00

U.S. Cl. 365—225.7

63 Claims



25. A semiconductor memory device, comprising:  
an anti-fuse element having a resistance, wherein the anti-fuse element is biased for a current to flow in a first direction or the current is flowing in said first direction during a first operation of the memory circuit, and said anti-fuse element is biased for current to flow in a second direction or the current flows in said second direction during a second operation of the memory circuit, said first and second directions being opposite of one another.

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PATENTS

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ERRATA

For CLASS	See PATENT NO.
038—088 .....	5,768,808
074—048 .....	5,768,933
081—177 .....	5,768,960
081—128 .....	5,768,961
082—129 .....	5,768,962
099—374 .....	5,768,994
109—007 .....	5,769,011
030—161 .....	5,769,094
150—160 .....	5,769,141
279—002 .....	5,769,487
405—052 .....	5,769,566
492—050 .....	5,769,771
065—182 .....	5,769,910
420—434 .....	5,769,971
204—157 .....	5,770,018
428—402 .....	5,770,216
428—036 .....	5,770,276
607—104 .....	5,770,423
526—066 .....	5,770,660
523—429 .....	5,770,706
023—302 .....	5,770,730
514—304 .....	5,770,738
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## PATENTS

GRANTED JUNE 23, 1998

## GENERAL AND MECHANICAL

5,768,702

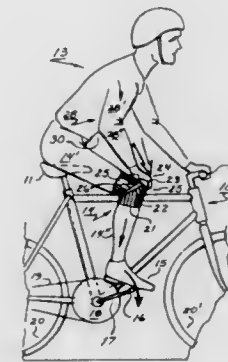
UPPER-EXTREMITY DIRECT POWER-INPUT DEVICE  
FOR BICYCLISTS

Sinil Kim, 548 Ford Ave., Solana Beach, Calif. 92075

Continuation-in-part of Ser. No. 214,228, Mar. 17, 1994,  
abandoned. This application Nov. 30, 1995, Ser. No. 565,066  
Int. Cl.<sup>6</sup> A41D 13/00

U.S. Cl. 2—1

20 Claims



1. A method for use of a bicycle, whereby its cyclist can exert upper-extremity musclepower upon the footpedals via the lower extremities without frictional loss from intervening mechanism, the method comprising:

- a) application of a hand-held device upon the right knee of said cyclist and/or left knee region of said cyclist
- b) grasping of said knee region fast while exerting an appropriately timed downward and/or appropriately timed upward force thereupon said knee;
- c) repetitive operation of said application, grasping, and exerting of upper-extremity muscle-power to achieve cycling propulsive thrust.

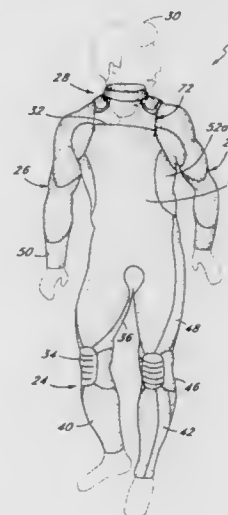
5,768,703

## ZIPPERLESS WETSUIT

Mark R. Machado, Newport Beach, and Bradford D. Bissell,  
San Jose, both of Calif., assignors to Billy International,  
Ltd., Costa Mesa, Calif.Continuation of Ser. No. 544,013, Oct. 17, 1995, Pat. No.  
5,630,229. This application Nov. 27, 1996, Ser. No. 757,297  
Int. Cl.<sup>6</sup> A41D 7/00

U.S. Cl. 2—2.15

69 Claims



1. A wetsuit, comprising:

a body portion including an entryway between shoulders of the wetsuit made at least in part of material adapted to stretch to allow a human to enter the wetsuit therethrough;  
a bib extending from a front or rear side of said body portion and adapted to pivot in a generally vertical plane with respect to said body portion, said bib having a circular portion adapted to stretch over the head of a wearer and overlie and form a closure for said entryway; and  
a tubular neck attached to and formed of material more stretchy than said circular portion, said neck adapted to snugly conform to a human neck and prevent water ingress to the wetsuit at that location.

5,768,704

## CUSHION FOR ATHLETIC GLOVE

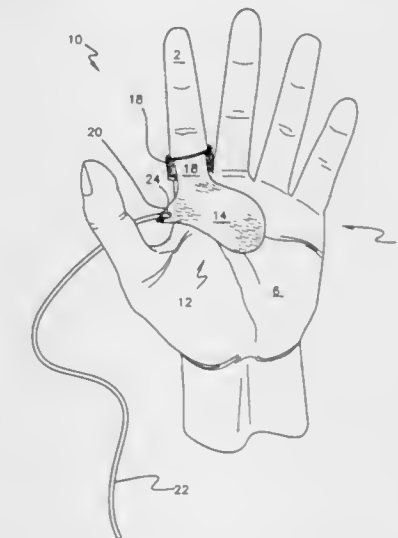
Jeffrey L. Greenhalgh, 3315 Korina La., Tampa, Fla. 33618

Filed Apr. 15, 1997, Ser. No. 839,647

Int. Cl.<sup>6</sup> A41D 13/00

U.S. Cl. 2—16

12 Claims



1. A cushion for an athletic glove, comprising:

- a base panel fabricated from a flexible material, said base panel having a first section dimensioned and configured to cover a portion of the palm of a user's hand and a second coplanar section dimensioned and configured to project along one finger of the hand;
- a second panel abutting and fastened to said base panel, said second panel fabricated from a shock absorbent material;
- a band disposed upon said second section of said base panel, forming a loop for encircling the finger; and
- a tether for tethering said cushion to the athletic glove, said cushion having means for fastenably engaging said tether.

5,768,705

## INFLATABLE SAFETY APPARATUS

Nedra McCloud, 3005 Beverly Rd., Austin, Tex. 78703

Filed Mar. 11, 1997, Ser. No. 821,968

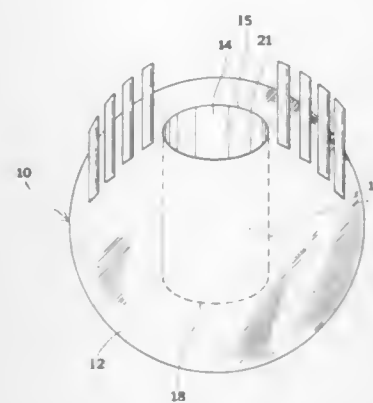
Int. Cl.<sup>6</sup> B63B 35/58; A41D 1/00; B54C 25/00

U.S. Cl. 2—69

2 Claims

1. An inflatable safety apparatus, for providing an individual with a safe means of escape from a high altitude location in an emergency situation, comprising:

- a) an exterior shell, said exterior shell having a shell opening located thereupon;



- b) a chamber, said chamber having an open end and a bottom end located opposite therefrom, the open end of the chamber joined to and in communication with the shell opening, such that the entire chamber, from the bottom end to the open end, is positioned entirely within the exterior shell;
- c) an interior chamber region, formed by the co-joining of the open end of the chamber to the shell opening of the exterior shell, said interior chamber region in communication with the environment outside of the exterior shell via the shell opening and open end of the chamber;
- d) an interior shell region which surrounds the chamber and is bounded by the exterior shell;
- e) inflation means, located within the exterior shell, capable of inflating said exterior shell by filling the interior chamber region with gas, thus providing a safe deformable cushion of gas between the exterior shell and the interior chamber region, wherein the individual may, in the event of an emergency at high altitude, enter the interior chamber region via the shell opening, inflate the exterior shell via the inflation means, and free-fall towards the ground, the individual unharmed by the abrupt contact of the exterior shell with the ground because the individual is encapsulated within the chamber and protected by the surrounding volume of gas which fills the interior shell region, said volume of gas absorbing the impact of the abrupt contact with the ground;
- f) a tether, said tether having an interior end and an exterior end located opposite therefrom, the interior end secured to the inflation means such that upon disengagement from said inflation means, the inflation means will inflate the exterior shell, whereby the individual employing the apparatus to escape from a high altitude danger first secures the exterior end of the tether to a fixed object, enters the chamber and then begins descent, thus causing the tether to soon become taught and disengage the inflation means, hence actuating said inflation means; and
- g) a plurality of stabilizing streamers secured to and extending from the periphery of the exterior shell, said stabilizing streamers forcing the apparatus to decrease velocity and descend in an upright orientation so that the open end of the chamber remains upright, thus preventing the individual contained within said chamber from falling out.

5,768,706

## MIDI WEIGHTED JACKET

Charles L. Griffith, and Antoinette Bacchus Griffith, both of 4316 Saugus Dr., Grand Prairie, Tex. 75052

Filed May 6, 1996, Ser. No. 643,382

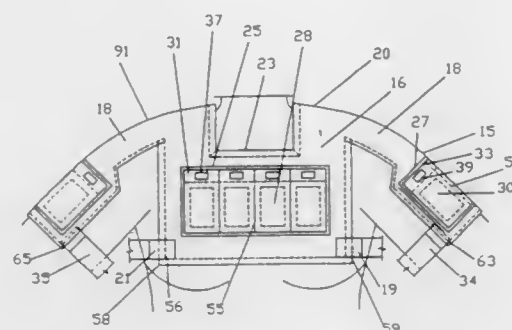
Int. Cl.<sup>6</sup> A41D 1/04

U.S. Cl. 2—102

20 Claims

1. A midi weighted jacket adapted to be worn above the breast-line by athletes and healthy persons during various exercises comprising:

- a. a front panel, a back panel, and two shoulder panels for improving the physical fitness and general posture of a wearer over time through specific exercises, the jacket having open sides;



- b. a plurality of pockets in the front panel, back panel and shoulder panels, with each of the said pockets comprising secured openings for admitting and removing weight packets;
- c. a rectangular opening about the neck of the wearer where the front panel integrally connects to the back panel, to facilitate easy access for head and neck entry, during attachment and removal of the said jacket from the shoulders;
- d. joining means comprising shoulder pieces that are integrally connected to the front panel and the back panel and are also integrally connected to the shoulder panels;
- e. joining means for connecting the front panel and the back panel, said joining means extending across the open sides above and around the bustline;
- f. a plurality of weight packets for insertion into said pockets which comprise lead and lead alloy material, which are permanently sealed in enclosed polymer based bags, said bags being completely surrounded and secured by multi-stitched sealed fabric sacks;
- g. wherein each said shoulder panel is secured on the arm and placed at the outside of the arm immediately below the deltoid muscle and above the elbow.

5,768,707

## EXAMINATION GOWN

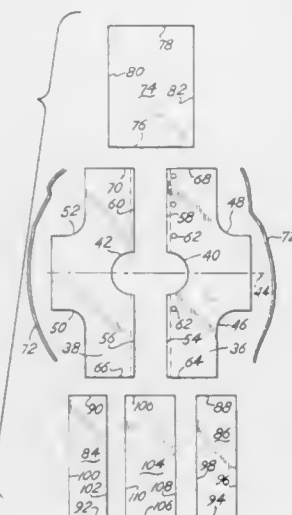
Bonnie L. Lederer, Clarinda, Iowa, assignor to Bonnie Lederer, Clarinda, Iowa

Filed Mar. 19, 1997, Ser. No. 820,101

Int. Cl.<sup>6</sup> A41D 1/00

U.S. Cl. 2—114

3 Claims



1. An examination gown for a female patient comprising in combination:

an upper bodice comprised of two panels and a lower skirt comprised of four panels, said upper bodice having a top with a neck scallop and arm scallops, and a horizontal waist line; said gown including the six joined panels:

- (a) a right-hand bodice panel with a median shoulder line, a neck scallop on one side of the shoulder line generally

5,768,709

## PET THERAPEUTIC MASSAGER GLOVE

James C. Newkirk, and Donna M. Newkirk, both of 506 E. Fourth St., Apt. 200, Cincinnati, Ohio 45202

Continuation-in-part of Ser. No. 346,013, Nov. 29, 1994, Pat.

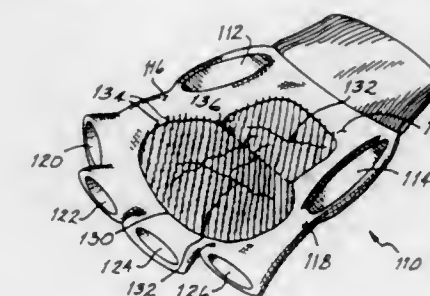
No. 5,577,273. This application Nov. 22, 1996, Ser. No.

754,994

Int. Cl.<sup>6</sup> A41D 19/00

U.S. Cl. 2—160

10 Claims



centered on the shoulder line, right bodice panel extensions in opposite directions from the shoulder line defining examination slit sides of the right bodice panel, said panel extensions extending from the shoulder line a generally equal extent to a front and back waist line, arm scallops on the side of the right bodice panel opposite the neck scallop, said arm scallops extending from the waist line partially toward the median shoulder line defining at least seamed sides;

- (b) a left-hand bodice panel which is substantially a mirror image of the right-hand bodice panel;
- (c) a generally rectangular back skirt panel having an upper waist line side, a left access side, a right access side, and a bottom side, said waist line side joined to the back waist line of the two bodice panels, said back skirt panel not seamed at the access sides;
- (d) a generally rectangular front skirt panel having an upper waist line side, a left seamed side, a right seamed side and a bottom side, said waist line side positioned at the front waist line of the two bodice panels;

- (e) left and right generally rectangular side skirt panels, each of side skirt panels having a waist line side, a bottom side and sides connecting the waist and bottom sides, said left seamed side panel seamed on one side to the left seamed side of the front skirt panel, the right seamed side panel seamed on one side to the right seamed side of the front skirt panel, said waist line sides including a connected waist string;

said waist string connected to said left and right rectangular sided skirt panels at the waist line sides; and

bodice examination slits defined medially along the front and back of the bodice by the said left and right examination slit sides of the said left and right bodice panels above the waist line and access slits are defined between the said left and right rectangular side skirt panels and said rectangular back skirt panel below the waist line.

5,768,708

## GARMENT WITH DISPLAY FEATURE

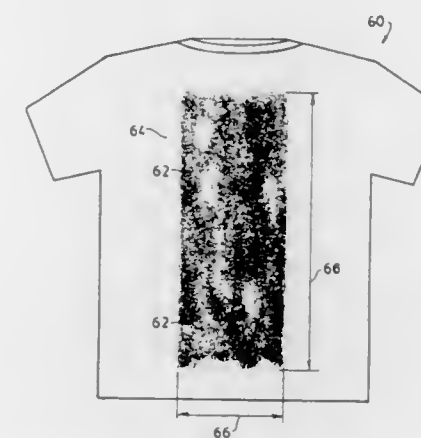
Wyatt Earp, IV, 2932 Rte. 96, Waterloo, N.Y. 13165

Filed Jan. 31, 1997, Ser. No. 791,938

Int. Cl.<sup>6</sup> A41B 1/00

U.S. Cl. 2—115

12 Claims



1. A garment comprised of an article of clothing, wherein said article of clothing comprises at least about 50 weight percent of cotton, wherein a strip of tire rubber is durably affixed to at least one surface of said article of clothing, and wherein said strip of tire rubber has a length of at least about 20 inches, a width of from about 8 to about 14 inches, and an aspect ratio of at least about 2.5/1.

5,768,710

## WEIGHTED FINGER EXERCISE/REHABILITATION GLOVE

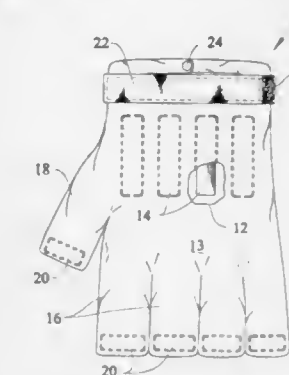
James H. Williams, 18490 SE. Wood Haven La., Prestwick E, Tequesta, Fla. 33469

Filed Sep. 24, 1996, Ser. No. 718,685

Int. Cl.<sup>6</sup> A41D 19/00

U.S. Cl. 2—161.1

6 Claims



1. An exercise and rehabilitation device comprising: a glove having individual finger sleeves and a thumb sleeve, said glove having a back-hand side and a palm side; at least one weight bar affixed to said back-hand side; a first plurality of contoured weights operatively paired with a second plurality of contoured weights to thereby encircle each fingered sleeve and thumb sleeve, each of said weights having ends tapered to facilitate natural spacing between fingers placed within said fingered sleeves, thereby allowing said fingers to form a fist;

a hook-and-pile attachment strip on said palm side of said glove, and a corresponding hook-and-pile covered cylindrical weight which is detachably secured to said strip; and

a securing strap including a flexible weight member, said flexible weight member sized to selectively encircle an individual's wrist, said weight member allowing said securing strap to



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be placed alternately in an glove-securing orientation or a glove-removal orientation.

5,768,711

## SPORTS GLOVE

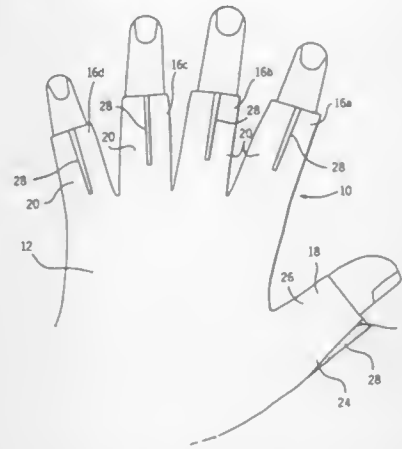
Daniel E. Wissink, Oshkosh, Wis., assignor to Schiek Sports, Oshkosh, Wis.

Filed Jan. 9, 1997, Ser. No. 781,317

Int. Cl.<sup>6</sup> A41D 19/00

U.S. Cl. 2—161.1

9 Claims



1. A sports glove having partially clad fingers said glove for receipt of a hand having a palm, a back, and fingers, the top of the fingers having a nail portion, the glove comprising:

- at least two partial finger sheaths, said partial finger sheaths each having a top and bottom portion and an open end through which a finger extends such that a portion of the finger is exposed;
- a palm covering disposed adjacent the palm of the hand;
- a back covering disposed adjacent the back of the hand;
- at least two tabs, each attached directly on a separate single, partial finger sheaths, wherein said tabs do not extend beyond the end of the exposed fingers.

5,768,712

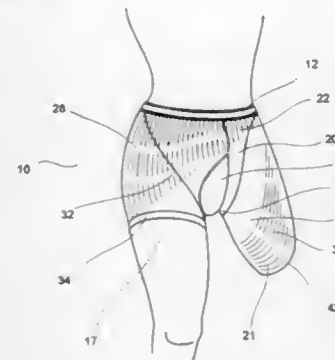
SPORTSWEAR UNDERGARMENT FOR RESIDUAL LEG  
Blake Barlow, 3011 N. Hudson Ave., Oklahoma City, Okla. 73103

Filed May 13, 1997, Ser. No. 855,292

Int. Cl.<sup>6</sup> A41B 9/02; A61F 2/78

U.S. Cl. 2—400

3 Claims



1. A sportswear undergarment and prosthetic leg device for a residual leg of an amputee, which includes:  
sportswear undergarment for a residual leg of the amputee having at least one leg surgically severed to terminate in a

residual leg, the sportswear undergarment constructed substantially of a single unitary fabric having  
an expansible waist band encircling a waist of the amputee,  
a fabric seat portion connected to the waist band,  
a fabric abdomen portion connected to said seat portion and said waist band in a manner such that said seat portion and said abdomen portion substantially enclose a seat and an abdomen of the amputee while defining a pair of generally oppositely disposed open surfaces;

a first leg portion connected to one of said open surfaces and extending in an encircling manner therefrom to a predetermined region about one thigh of the amputee and includes an enclosed end configured to conformingly receive the residual leg portion of the amputee and seat in the prosthetic leg device,

a second leg portion connected to another of said open surfaces and extending in an encircling manner therefrom to a predetermined region about another thigh of the amputee sufficient to aid in the retention of said sportswear undergarment from undesirable bunching and displacement of said undergarment during use.

5,768,713

## HOSIERY ARTICLE WITH MOISTURE ABSORBING PADS

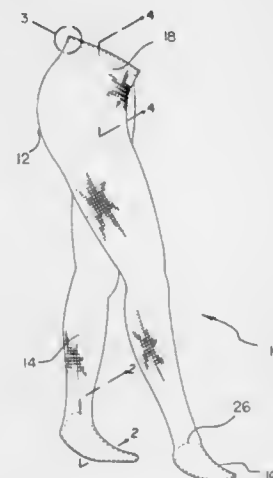
Elsa Crick, 237 E. 91st St., Brooklyn, N.Y. 11212

Filed Feb. 21, 1997, Ser. No. 804,390

Int. Cl.<sup>6</sup> A41B 11/04

U.S. Cl. 2—409

1 Claim



1. A hosiery article with moisture absorbing pads for absorbing perspiration from a wearer's feet comprising, in combination:

a pair of panty hose fabricated of a nylon material, the pair of panty hose including a pair of leg portions, a pair of foot portions extending from lower ends of the leg portions, a waist portion, and a crotch portion, the waist portion having an elastic band secured therein for retention of the pair of panty hose to a wearer;

a pair of cotton foot pads, the cotton foot pads dimensioned for securement to an interior lower surface of the pair of foot portions of the pair of panty hose, the foot pads being disposed under the wearer's feet when wearing the pair of panty hose, the foot pads having a front end extending to a point on a toe portion of the foot portions above a wearer's toes, the foot pads having a back end extending to a point on a heel portion of the foot portions above a wearer's heel, wherein the foot pads are fabricated of a soft, absorbent cotton; and

a cotton crotch pad dimensioned for securement to an interior surface of the crotch portion of the panty hose.

5,768,714

## TOY AND HELMET COMBINATION

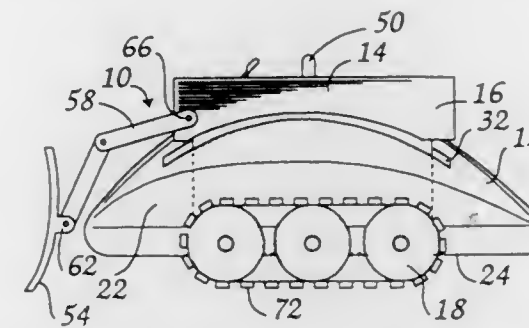
Ian Larry David Bowhey, 2233 Hurontario Street, Apt. 1204, Mississauga, Ontario L5A 2E9, Canada

Filed Mar. 7, 1997, Ser. No. 812,513

Int. Cl.<sup>6</sup> A42B 1/24; 1/06

U.S. Cl. 2—410

23 Claims



1. A toy vehicle and helmet combination comprising:

a protective helmet suitable for wearing on a user's head, said helmet including a rigid shell with an open bottom, an upper section with at least one opening formed therein, and a lower section extending around said open bottom;

a toy body section with an upper body member adapted for mounting on top of said upper section of the shell and for combining with the shell to form a toy vehicle and at least one connecting member joined to said upper body member and sized to extend through said at least one opening in order to detachably connect said body section to said shell; and  
toy wheels and at least one supporting mechanism for mounting said wheels,

wherein said lower section of the helmet includes means for detachably attaching said at least one supporting mechanism to said shell.

5,768,715

## PADDED HEAD PROTECTOR

Eugene Stuart Gregg, III, 20 Sally Port Rd., Hilton Head Island, and Thomas Wood, 100 Forest Garden, Hilton Head, both of S.C. 29928

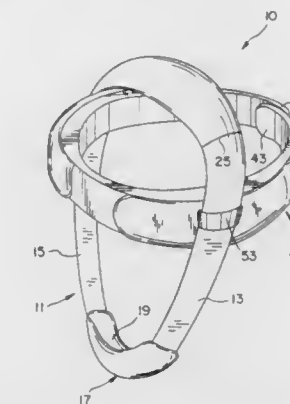
Continuation of Ser. No. 431,415, May 1, 1995, abandoned.

This application Mar. 13, 1997, Ser. No. 816,593

Int. Cl.<sup>6</sup> A42B 3/00

U.S. Cl. 2—411

9 Claims



1. An improved padded head protector, comprising:

a) a vertically extending band adapted to be placed around a user's head between a crown of a head thereof and either a chin thereof or under a jaw thereof, said vertically extending band being entirely made of a stretchable material to accommodate to user heads of differing dimensions;

b) a horizontally extending band connected to said vertically extending band and adapted to be placed around a user's head between a forehead thereof and a rear portion thereof;

c) each of said bands including a chamber having at least one opening and a resilient padding removably received in said chamber, said resilient padding comprising silastic gelatin material.

5,768,716

## GOGGLES, IN PARTICULAR FOR SPORTS AND/OR LEISURE WEAR

Ferdinand A. Porsche, Zell am See, Austria, assignor to Porsche Design GmbH, Zell am See, Austria

PCT No. PCT/EP95/03456, § 371 Date Jul. 9, 1996, § 102(e) Date Jul. 9, 1996, PCT Pub. No. WO96/07948, PCT Pub. Date Mar. 14, 1996

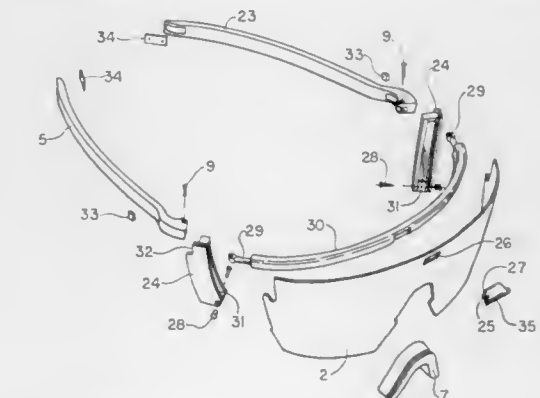
PCT Filed Sep. 2, 1995, Ser. No. 637,658

Claims priority, application Germany, Sep. 2, 1994, 44 31 328.4

Int. Cl.<sup>6</sup> A61F 9/02

U.S. Cl. 2—454

19 Claims



1. Goggles, comprising:

a side piece, a curved front piece and at least one visor section having a bridge for a nose, wherein the side piece and the at least one visor section can pivot in relation to one another and the side piece and the at least one visor section are in different planes in an operating position, standing at an angle to one another and are in planes lying substantially parallel to one another in a non-operating position, characterized by the fact that the at least one visor section is elastic and is connected to the side piece via joining structures so that when the side piece is pivoted in relation to the at least one visor section, the at least one visor section is deformed elastically and adjusted to the approximate curvature of the front piece.

5,768,717

## SEGMENTED SPINE PROTECTOR

Alexandra Catherine Le Sueur, Normanton House, Wilsford-cum-Lake, Salisbury, Wiltshire, SP4 7BJ, United Kingdom

PCT No. PCT/GB94/00972, § 371 Date Jan. 22, 1996, § 102(e) Date Jan. 22, 1996, PCT Pub. No. WO94/24893, PCT Pub. Date Nov. 10, 1994

PCT Filed May 5, 1994, Ser. No. 545,627

Claims priority, application United Kingdom, May 5, 1993, 9309253

Int. Cl.<sup>6</sup> A41D 13/00

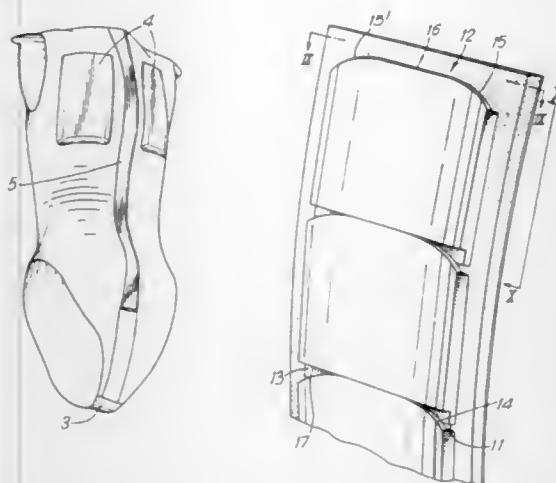
U.S. Cl. 2—467

15 Claims

1. A segmented member for use as a spine protector when held tightly against the spine of a wearer, comprising:

a generally linear array of segments arranged along an axis; each segment having an upper edge and a lower edge and having a height defined as the spacing between the upper and lower edges;



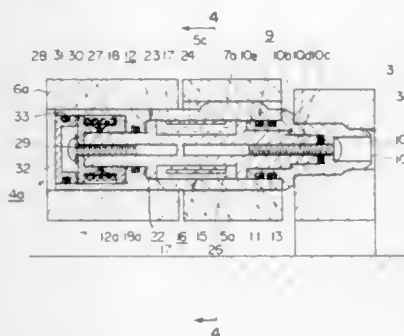


the upper and lower edges of each segment being stepped in a generally complementary manner so that the upper edge of one segment can mesh with the lower edge of a segment next above along the axis and so that the lower edge of said one segment can mesh with the upper edge of a segment next below along the axis; wherein the segments and the upper and lower edges of the segments are dimensioned so as to permit differing degrees of flexion and extension along the axis of the segmented member such that the segmented member may flex in the manner of a human spinal column.

5,768,718  
CONTROL DEVICE FOR CONTROLLING THE SEAT OR THE SEAT LID OF A TOILET BOWL  
Akira Sorimachi, Yokohama, Japan, assignor to Katoh Electrical Machinery Co., Ltd., Yokohama, Japan  
Filed Jul. 26, 1995, Ser. No. 506,951  
Int. Cl.<sup>6</sup> A47K 13/12

U.S. Cl. 4-236

9 Claims



1. A hinge mechanism for supporting a knuckle of at least one of a seat lid and a seat of a toilet bowl, said hinge mechanism comprising:

- a bracket adapted to be fixedly mounted on a toilet bowl;
- a stationary shaft having one end fixedly supported on the bracket, and extended in a horizontal position;
- a rotary drum having one closed end and an outer circumference, a securing projection on the outer circumference of the rotary drum, the rotary drum being axially slidably and rotatably mounted on the stationary shaft, and holding the knuckle so as to be turned when the at least one of the seat lid and the seat is turned;
- a fluid damping mechanism having at least two valves and being connected between the stationary shaft and the rotary drum, the rotary drum having an inner flange with a side surface and the rotary drum defining a cylindrical chamber for receiving a fluid, each of the valves comprising: a first valve ridge and a second valve ridge, the valve ridges being connected to and extending radially from the stationary shaft into the cylindri-

cal chamber and sliding over the side surface of the rotary drum with rotation of the rotary drum with respect to the stationary shaft; each valve having an axial groove between the first valve ridge and the second valve ridge; each second valve ridge having an axial slot therethrough; each first valve ridge having an outer edge with a recess therein; a valve element mounted for movement in each axial groove, between a closing position against the second valve ridge for closing the axial slot, and an open position spaced from the second valve ridge for opening the axial slot for passage of fluid in the chamber; and an arcuate groove adjacent the first and second valve ridges of each valve, each arcuate groove being in the side surface of the inner flange; and

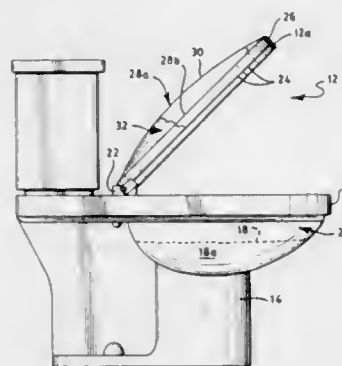
a compression spring wound around the stationary shaft and compressed in an annular space between the stationary shaft and the rotary drum to bias the rotary drum in one direction so that the valve ridges are pressed against the side surface of the inner flange of the rotary drum; the rotary drum being movable in an opposite direction for allowing passage of fluid in the chamber along each arcuate groove.

5,768,719  
APPARATUS AND METHODS FOR UNCLOGGING A TOILET

Neil Harvey, 21 Ellsmere St., Worcester, Mass. 01604  
Continuation of Ser. No. 523,133, Sep. 5, 1995, abandoned.  
This application Jul. 18, 1997, Ser. No. 897,071  
Int. Cl.<sup>6</sup> E03D 9/00

U.S. Cl. 4-255.01

8 Claims



1. Apparatus for unclogging a toilet selectively, the toilet being of the type having a bowl for containing flushable water therein, the bowl having a rim that is higher than the surface of the water within the bowl, comprising:

- a substantially rigid lid for covering the bowl, the lid having a first one-way valve extending therethrough, the lid bowl and water surface forming a pressure-adjustable cavity within the bowl once the lid covers the bowl, and
- a compliant lid top substantially covering said lid and having a substantially pliant outer surface with a second one-way valve extending therethrough, the lid top and the lid forming a pump pressure cavity therebetween which increases in pressure when a user presses on the outer surface, thereby injecting air into the pressure-adjustable cavity, the second one-way valve providing a passageway for air to replenish the pump pressure cavity,
- wherein air injected through the first one-way valve and into the pressure-adjustable cavity selectively raises the pressure of the pressure-adjustable cavity to a level which causes the water to flush and unclog the toilet.

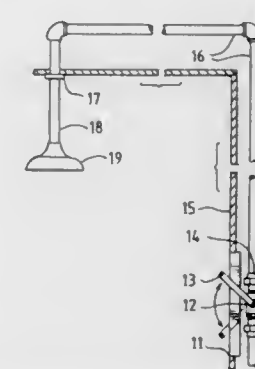
5,768,720

Patent Not Issued For This Number

5,768,721  
EMERGENCY SHOWER  
Steven A. Kersten, Chicago, Ill., assignor to Guardian Equipment, Inc., Chicago, Ill.  
Filed Apr. 1, 1996, Ser. No. 626,039  
Int. Cl.<sup>6</sup> A47K 3/22

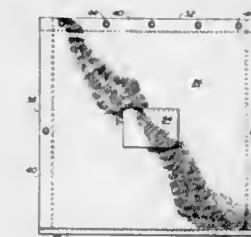
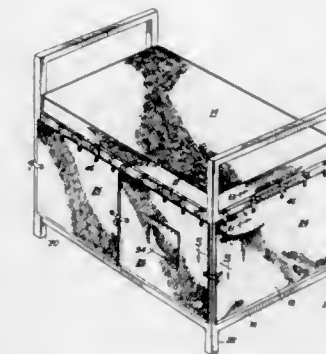
U.S. Cl. 4-614

8 Claims



1. An emergency shower apparatus for use inside a building comprising:

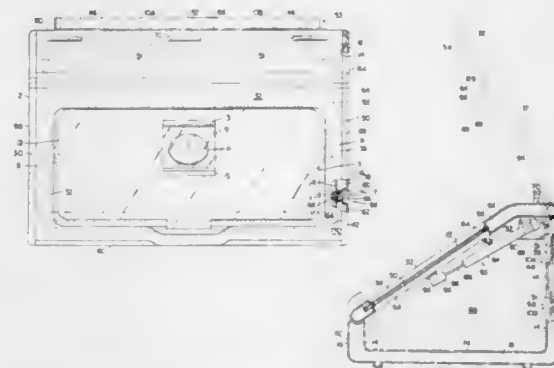
- a wall inside a building;
- a recessed area in said wall;
- a deluge shower positioned in the vicinity of said wall;
- a valve having an open position, in which fluid flows through said valve to said deluge shower, and a closed position, in which fluid does not generally flow through said valve; and
- a shower control means comprised of a pivoting lever having one end pivotally mounted within said recessed area and a second end extending outwardly from said recessed area wherein said second end can be raised and lowered between an open position, in which said valve is open, and a closed position, in which said valve is closed, wherein said second means does not project substantially from said wall when said shower control means is in the closed position.



5,768,723  
AUDIOMETRIC CRIB FOR INFANTS  
Alan Eckel, 10 Hildreth St., Westford, Mass. 01886  
Filed May 21, 1996, Ser. No. 650,979  
Int. Cl.<sup>6</sup> A61B 5/12

U.S. Cl. 5-93.1

2 Claims



2. A audiometric crib for infants, said crib comprising:
- a housing made of a plastic material and having a floor for supporting a prostrate infant, and walls upstanding from said floor; said upstanding walls including front and back walls and first and second side walls, said front wall being substantially less in height than said back wall, and said side walls having an upper edge surface that declines from proximate said back wall to said front wall, said front wall, said back wall and said side walls forming an opening through which an infant may be moved into and out of said housing;
  - a door connected to said housing for closing off said opening, said door being adapted to move between an open position whereby an infant may be moved into and out of said housing via said opening and a closed position wherein said opening is

closed off by said door so as to isolate an infant in said housing from ambient noise for the purpose of conducting auditory tests on the infant, said door comprising a frame portion having an inner wall and an outer wall, said inner and outer walls being spaced from each other and at an inner periphery thereof extending toward each other with a portion of each extending within a void defined by said inner and outer walls and toward an outer periphery of said frame to form an inner edge groove with parallel upper and lower walls comprising extensions of said outer and inner walls and a bottom wall connecting said upper and lower walls, and a transparent window pane mounted in said groove, said door and said transparent window pane when said door is in said closed position declining such that an infant in said crib may be viewed through said window pane from positions in front of said crib and over said crib; and

ventilation means for passing air into said housing and exhausting air from said housing, said ventilation means comprising an air inlet and an air outlet communicating with the interior of said housing through recesses in said back wall, a first air channel fixed to an outer surface of said back wall in communication with said air inlet and a second air channel fixed to said outer surface of said back wall in communication with said air outlet.

5,768,724

## MODULAR RV FURNITURE AND METHOD

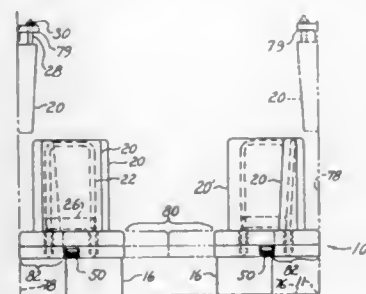
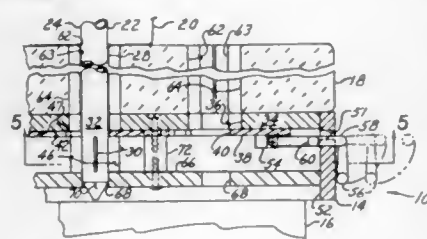
V. Donald Buell, 12427 Squaw Valley La., Victorville, Calif. 92392-8843

Filed May 15, 1997, Ser. No. 857,369

Int. Cl. A41C 17/34; B60R 1/10

U.S. Cl. 5-118

19 Claims



1. A modular furniture apparatus for supporting occupants of a recreational vehicle, comprising:

- a platform member having a horizontally disposed supporting surface, a plurality of socket openings being formed in the supporting surface;
- a frame member having shank portion and a free end, an enlargement being formed on the frame member between at least a portion of the shank portion and the free end, the enlargement being insertable through a selected socket opening of the platform member;
- a key member movably supported relative to the platform member opposite the socket openings from supporting surface and having a plurality of key openings formed therein, each key opening having an entry portion for passing the enlargement of the frame member and a lock portion for blocking passage of the enlargement while receiving the shank portion, the key member having an open position wherein the entry portion of each key opening is aligned with a corresponding

socket opening of the platform member, and a locked position wherein the lock portion of each key opening is aligned with the corresponding socket opening; and means for holding the key member in the locked position, wherein the frame member is rigidly supported in upstanding relation to the platform member when the enlargement is locked by the key member.

5,768,725

## SURGERY PATIENT HEADREST

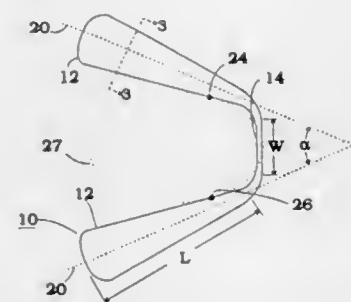
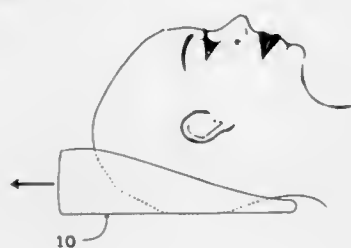
Bruce Randall Brenn, Landenberg, Pa., assignor to The Nemours Foundation, Jacksonville, Fla.

Division of Ser. No. 621,894, Mar. 26, 1996, Pat. No. 5,596,780, which is a continuation of Ser. No. 346,406, Nov. 29, 1994, abandoned. This application Oct. 15, 1996, Ser. No. 731,417

Int. Cl. A47C 20/00; A61B 19/00

U.S. Cl. 5-636

2 Claims



1. A headrest to hold a head of an unconscious human surgical patient lying supinely on a horizontal table in a selected position, the headrest comprising

- two elongated lobes, each lobe having a broad end, a narrow end, and a cross section perpendicular to an axis of elongation, the cross section defined by a convexly curved top adapted to form a top surface to contact the head at a point of convex curvature, and a substantially straight bottom adapted to form a flat surface to rest on a flat support, and the axis of elongation being defined by the top surface in a direction from the broad end to the narrow end, each lobe also having a tapered shape defined by a reduction of height of the top surface along the axis of elongation from the broad end to the narrow end; and
- a connecting means for maintaining the lobes in a fixed spatial relationship wherein the axes of elongation are in horizontal V-shape orientation converging at an acute angle, and wherein each lobe is disposed on an opposite side of the head from the other lobe so that the two lobes are more distant from each other at the broad ends than at the narrow ends, said connecting means being a rigid, slender bar having a long dimension between two bar ends, each lobe being fixedly attached at the narrow end to an opposite bar end, the bar adapted to dispose each lobe on an opposite side of the head from the other lobe so that the narrow ends of the lobes are distant from each other by the long dimension of the bar and the broad ends are distant from each other by a distance greater than the long dimension, the bar also having cross section dimensions small enough to fit the bar within an opening between the patient's neck and the table.

5,768,726

## MATTRESS SPRING CORE ASSEMBLY COVER

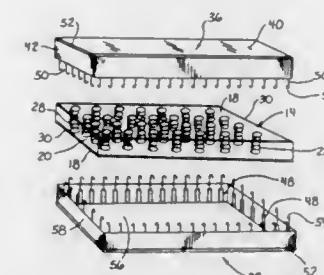
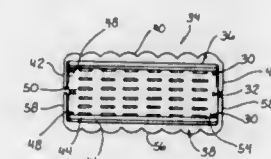
Eddie Lee Myles, 3101 S. Fairview St., #58, Santa Ana, Calif. 92704

Filed Jul. 29, 1996, Ser. No. 681,839

Int. Cl. A47C 27/045

U.S. Cl. 5-737

20 Claims



1. A cover for a mattress spring core assembly having a spring core top, a spring core bottom and a plurality of spring core sides, said cover comprising:

- a first panel having a plurality of peripheral edges, said first panel for placement on the spring core top;
- a plurality of first flexible strips attached in a spaced apart fashion to each of the peripheral edges of said first panel, said first strips extending away from said first panel such that at least two of said first strips extend along each of said spring core sides;
- a generally opposing second panel having a plurality of second peripheral edges, said second panel for placement on the spring core bottom;
- a plurality of second flexible strips attached in a spaced apart fashion to each of the peripheral edges of said second panel, said second strips extending away from said second panel such that at least two of said second strips extend along each of said spring core sides;
- a plurality of fasteners, each of which has a proximal end attached to one of said first and second strips, and a distal end for connection with said spring core such that said fasteners attach said first and second panels irrespectively, to the spring core;
- an annular skirt connecting said first and second panels, said annular skirt extending around the first and second panels such that said spring core may be placed between said first and second panels; and
- a slit along at least a portion of the annular skirt and extending generally parallel to said first and second panels.

5,768,727

## INTEGRATED MODULAR ICE AXE HEAD

Charles Brainerd, Salt Lake City, Utah, assignor to Black Diamond Equipment, Ltd., Salt Lake City, Utah

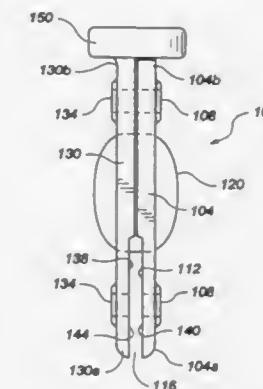
Filed Jan. 19, 1996, Ser. No. 587,730

Int. Cl. B25D 13/10

U.S. Cl. 7-145

25 Claims

1. An integrated modular ice axe comprising:
- an elongate handle;
  - a first base member fixedly attached to the handle, the base member having first and second ends;
  - a second base member releasably attached to the first base member, the second base member comprising first and second ends and a tool head disposed so as to extend from the second



end, the second base member being configured so that when the second base member is attached to the first base member, the first end of the second base member is disposed adjacent to the first end of the first base member, and the second end of the second base member is disposed adjacent to the second end of the first base member;

attachment means for securely connecting the second base member to the first base member;

at least one off-set portion formed in at least one of the first ends of the first and second base members so as to form a receiving slot when the first and second base members are connected; and

an ice pick disposable within the receiving slot.

5,768,728

## WATER LEVEL DETERMINATION FOR LAUNDRY WASHING MACHINE

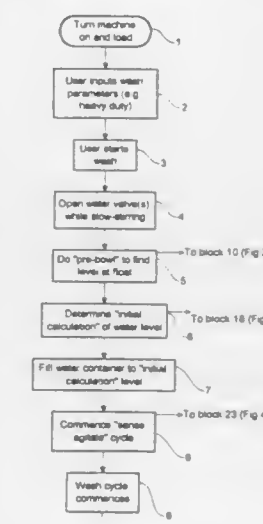
Jonathan David Harwood, and Paul Stephen Hood, both of Auckland, New Zealand, assignors to Fisher & Paykel Limited, Auckland, New Zealand

Filed Jul. 25, 1996, Ser. No. 687,192

Int. Cl. D06F 33/02

U.S. Cl. 8-158

21 Claims



1. A method of determining a suitable fluid level for washing a load of laundry in a laundry washing machine having a rotatable spin tub which receives said laundry and is situated within a stationary water container, an agitator rotatable within said spin tub which is rotatable with said spin tub during a spinning phase of said laundry washing machine or rotatable independently of said spin tub during an agitation phase, said agitation phase defined by a desired agitator velocity versus time profile having a first ramp portion of substantially linear acceleration from substantially zero velocity up to a desired plateau velocity, a second plateau portion of substantially constant velocity lasting for a predetermined time



period and a third coast period in which motor power is removed and rotational velocity drops to substantially zero, a motor connected to drive said agitator and said spin tub when required and control means automating operation of said laundry washing machine, said method comprising the step of:

- obtaining an initial indication of the load of said laundry within said spin tub and transmitting said initial indication to said control means;
- admitting washing fluid to said water container upon instruction by said control means to an initial level influenced by said initial indication of the load;
- setting a threshold velocity above said plateau velocity;
- supplying power to said motor to produce agitator velocity in accordance with said desired agitation velocity versus time profile and determining the difference between said threshold velocity and the actual motor velocity after a predetermined time after the start of said plateau period;
- adding said difference to one of two accumulators depending on whether said actual motor velocity after said predetermined time is greater than or less than said threshold velocity;
- reversing direction of said motor and repeating steps (iv) to (vi) until either of said two accumulators reach predetermined threshold values; and
- determining whether said suitable fluid level has been reached based on the contents of said accumulators.

13. A laundry washing machine having a rotatable spin tub which receives a laundry load for washing within a stationary water container, an agitator rotatable within said spin tub which is rotatable with said spin tub during a spinning phase of said laundry washing machine or rotatable independently of said spin tub during an agitation phase, said agitation phase defined by a desired agitator velocity versus time profile having a first ramp portion of substantially linear acceleration from substantially zero velocity up to a desired plateau velocity, a second plateau portion of substantially constant velocity lasting for a predetermined time period and a third coast period in which motor power is removed and rotational velocity drops to substantially zero, a motor connected to drive said agitator and said spin tub when required and control means automating operation of said laundry washing machine and storing a program which causes the controller to:

- obtain an initial indication of the load of said laundry within said spin tub and transmitting said initial indication to said control means;
- admit washing fluid to said water container upon instruction by said control means to an initial level influenced by said initial indication of the load;
- set a threshold velocity above said plateau velocity;
- supply power to said motor to produce agitator velocity in accordance with said desired agitation velocity versus time profile and determine the difference between said threshold velocity and the actual motor velocity after a predetermined time after the start of said plateau period;
- add said difference to one of two accumulators depending on whether said actual motor velocity after said predetermined time is greater than or less than said threshold velocity;
- reverse direction of said motor and repeating steps (iv) to (vi) until either of said two accumulators reach predetermined threshold values; and
- determine whether said suitable fluid level has been reached based on the contents of said accumulators.

5,768,729

**ADAPTIVE FILL CONTROL FOR AN AUTOMATIC WASHER**

Mark A. Cracraft, Urbandale, Iowa, assignor to Maytag Corporation, Newton, Iowa

Filed Dec. 19, 1996, Ser. No. 770,940

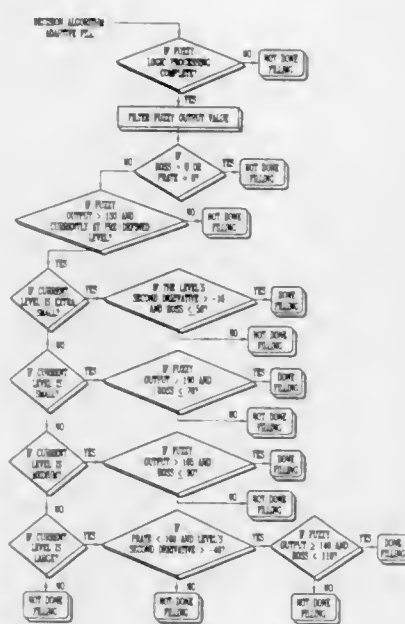
Int. Cl.<sup>6</sup> D06F 33/02

U.S. Cl. 8—158

28 Claims

1. A method of automatically filling a clothes washing machine comprising the steps of:

initiating water flow into the washing machine;



sensing the water level in the washing machine over time; determining a plurality of values indicative of the conditions in the washing machine based on the sensed water level; determining a proper fill level based on the plurality of values; and stopping the flow of water when the water level reaches the proper fill level.

18. An apparatus for automatically filling a clothes washing machine comprising:

- a water flow valve for controlling the flow of water into the washing machine;
- a level sensor for sensing the water level in the washing machine over time;
- a microprocessor operatively connected to the water flow valve and the level sensor, the microprocessor performing the processing steps of:
  - using the sensed water level over time to derive a number of values relating to various conditions in the washing machine;
  - determining a desired fill level based on the number of values; and
  - controlling the operation of the water flow valve so that the washing machine is filled to the desired fill level.

5,768,730

**DRUM TYPE WASHING MACHINE AND DRYER**

Tsuyoshi Matsumoto, Kitakatsuragi-gun; Hiroyuki Tanaka, Sakai, and Masanobu Tanigawa, Takatsuki, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 30, 1995, Ser. No. 565,243

Claims priority, application Japan, Dec. 6, 1994, 6-301874; Jul. 31, 1995, 7-194779; Aug. 29, 1995, 7-220376; Aug. 30, 1995, 7-221491

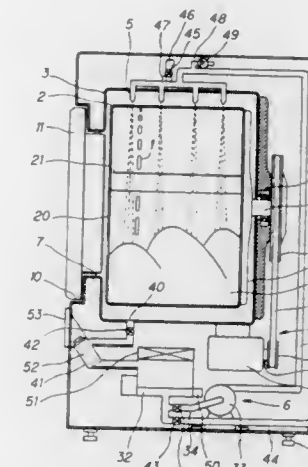
Int. Cl.<sup>6</sup> D06F 37/22

U.S. Cl. 8—159

29 Claims

13. A method of correcting localization of laundry in a washing machine, the washing machine having a drum for accommodating the laundry and a water tank for supporting the drum to be rotatable, the method comprising the steps of:

- driving the drum in a first rotational direction at a predetermined low rotational speed;
- determining if vibration of the water tank during rotation of the drum in the first rotational direction is less than or equal to a first predetermined value;



- driving the drum in a second rotational direction at the predetermined low rotational speed upon determination in said step b) that the vibration is greater than the first predetermined value;
- determining if vibration of the water tank during rotation of the drum in the second rotational direction is less than or equal to the first predetermined value; and
- driving the drum in the second rotational direction at a predetermined high rotational speed upon determination in said step d) that the vibration is equal to or less than the first predetermined value.

5,768,731

**DRYING METHOD FOR DRUM-TYPE WASHING MACHINE**

Gi Hyeon Do, Changwon-si, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

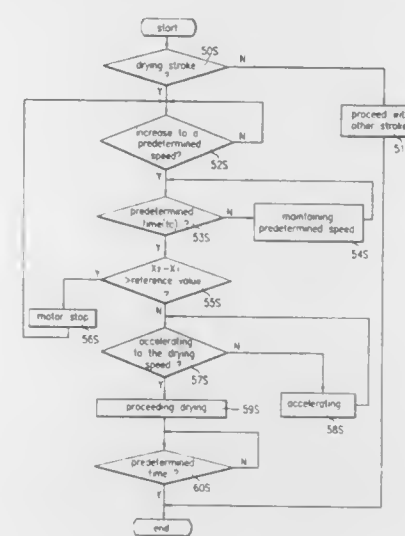
Filed Jul. 16, 1996, Ser. No. 680,875

Claims priority, application Rep. of Korea, Aug. 25, 1995, 26654/1995

Int. Cl.<sup>6</sup> D06F 33/02

U.S. Cl. 8—159

16 Claims



1. A drying method for a drum-type washing machine, the method comprising the steps of:

- draining water from a load of laundry while maintaining a predetermined drying speed for a predetermined time in an initial drying step performed during a drying stroke of the drum-type washing machine; and

sensing whether an eccentricity exists after expiration of the predetermined time and, if the eccentricity is not sensed, accelerating the drying speed to accomplish drying of the laundry.

5,768,732

**DEVICE FOR ASSEMBLING THE UPPER AND SOLE OF A SHOE**

Roger Blanc, Route de Virieu, 38730 Le Pin, France

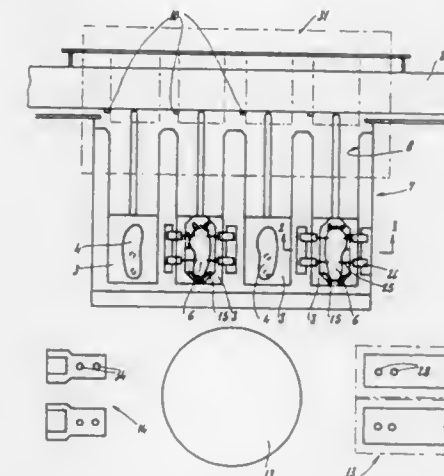
Filed Dec. 17, 1996, Ser. No. 761,076

Claims priority, application France, Dec. 18, 1995, 95 15207

Int. Cl.<sup>6</sup> A43D 11/00

U.S. Cl. 12—1 A

8 Claims



1. Device for assembling an upper and a sole of a shoe, in an at least partially automated shoe-manufacturing facility, comprising: a conveyor designed to transport trays some of which have lasts covered by uppers and others have soles, a table having several tracks perpendicular to the conveyor, each of said tracks being provided with a device for transferring a tray between conveyor and a reference position remote therefrom, said tracks being designed to receive trays carrying the uppers and the soles to make several pairs of shoes, a transfer robot located on the side of the table opposite the conveyor, a press located on one side of the robot, and a manual station for assembling the uppers and the soles, located on the other side of the robot.

5,768,733

**RAMP SECURING DEVICE**

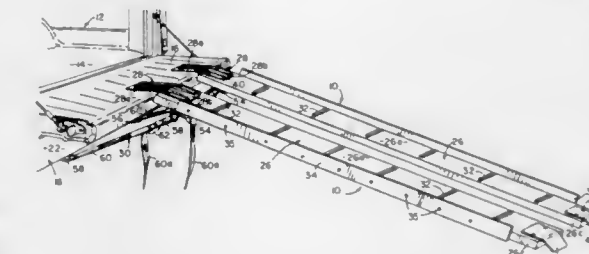
Ken L. Kneebone, Neodesha, Kans., assignor to Easy-Up Industries, Inc., Neodesha, Kans.

Filed Feb. 7, 1996, Ser. No. 597,814

Int. Cl.<sup>6</sup> E01D 1/00; B65G 67/02

U.S. Cl. 14—69.5

37 Claims



16. A conversion kit for converting an elongated runner, having a substantially flat, top support face and a bottom face, into a ramp



for spanning between a first lower surface and a second relatively elevated upper surface defined by a structure, said kit comprising: a support member configured for attachment to the runner and having a first portion thereof configured for engaging the upper surface for supporting the runner in an inclined orientation, wherein the runner extends between the upper and lower surfaces at an angle relative to the lower surface, and an adjustable retainer for releasably securing the runner in its inclined orientation, said retainer being connectable between the runner and the structure, said retainer including a first coupling element for releasably coupling with the runner, a second coupling element for releasably coupling with the structure, and an extendable and retractable member interconnecting the elements.

5,768,734

## SWIMMING POOL VACUUM

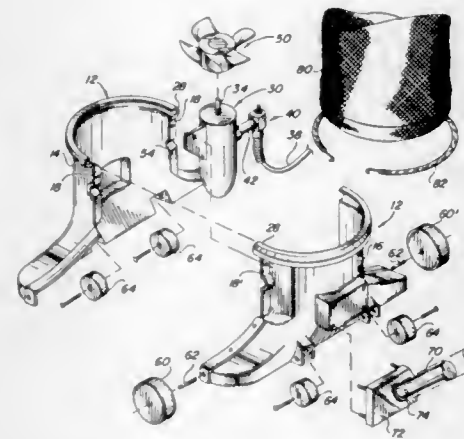
Dan Dietrich, 238 SE. 7th Ave., Delray Beach, Fla. 33483

Filed Dec. 4, 1996, Ser. No. 759,558

Int. Cl.<sup>6</sup> E04H 4/16

U.S. Cl. 15—1.7

15 Claims



1. A pool vacuum head assembly attachable to an elongate pole for picking up debris within a body of water, comprising: a housing having first and second half portions, means for removably attaching said half portions in joined relation to form an integral housing unit, said housing unit, with said half portions joined together, including a discharge opening at a top end surrounded by an annular rim, an open elongate vacuum mouth at an opposite bottom end and a surrounding wall structure defining a thrust channel extending from said open elongate vacuum mouth to said discharge opening, thrust means for creating a forced flow of water through said thrust channel from said vacuum mouth to said discharge opening when said housing is submerged in the body of water, resulting in a negative pressure at said vacuum mouth to create a suction force sufficient to pull water and debris through said vacuum mouth and said thrust channel and out from said discharge opening, catch means at said discharge opening for catching and retaining the debris exiting said discharge opening, and a yoke on said housing, said yoke being structured for removable attachment of the elongate pole thereto so that said housing can be manipulated within the body of water.

5,768,735

## SWITCH MECHANISM WITH MECHANICAL LOCK OUT

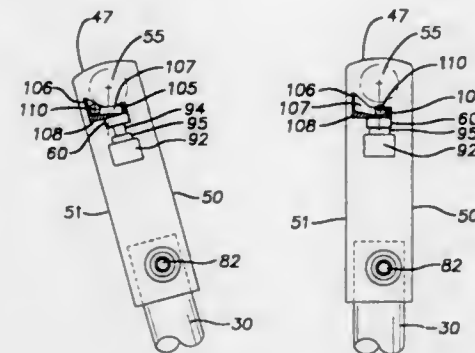
Martin Wiese, South Bend, and Thomas R. Nyborg, Mishawaka, both of Ind., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jun. 25, 1996, Ser. No. 668,298

Int. Cl.<sup>6</sup> A47L 11/62

U.S. Cl. 15—49.1

22 Claims



1. A rotary floor machine comprising: a base having a front and a rear; a pole handle pivotally secured to the base and movable between first and second positions; a pole structure secured to the pole handle; a handlebar secured to the pole structure so as to be substantially perpendicular to the pole handle; a trigger bar for controlling the starting and stopping of the rotary floor machine, said trigger bar being mounted to the handlebar so as to be movable between proximate and distal positions relative to the handlebar, said trigger bar starting the rotary floor machine when in the proximate position and stopping the rotary floor machine when in the distal position; a lock-out device having an element movable between a blocking position and an un-blocking position in response to movement of the pole handle between the first and second positions, said element blocking the movement of the trigger bar from the distal position to the proximate position when the element is in the blocking position, said element not blocking the movement of the trigger bar from the distal position to the proximate position when the element is in the un-blocking position and thereby preventing the starting of the rotary floor machine when the pole handle is in the first position, said element being in the un-blocking position and thereby permitting the starting of the rotary floor machine when the pole handle is in the second position.

5,768,736

## MOP HEAD AND HOLDING MEANS

Renee Preston, 1813 S. Hull St., F-1, Montgomery, Ala. 36104

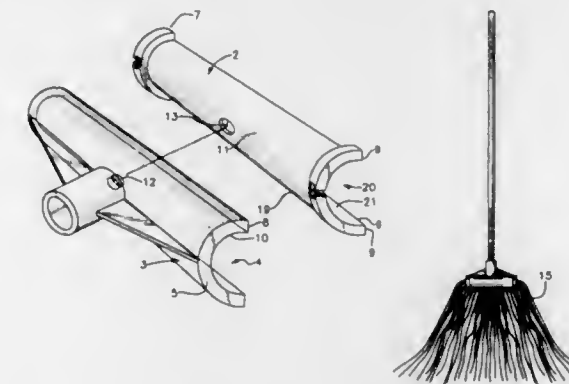
Filed Sep. 20, 1995, Ser. No. 531,104

Int. Cl.<sup>6</sup> A47L 13/24

U.S. Cl. 15—147.1

13 Claims

1. A mop comprising: an elongated mop handle having a U-shaped band of resilient flexible material secured to an end thereof, said band defining a longitudinal slot having an inner curve passing through the longitudinal axis of said mop handle, said band having a left outside curved surface and a right outside curved surface, said left and right outside curved surfaces each defining a diameter thereof, said outside surfaces are adjacent to and outside of the longitudinal slot and substantially flat; an elongated, U-shaped mop head of approximately equal length to said band and defining an outer curve complementary to the inner curve of the band so as to fit tightly within said band



and be secured thereto within said longitudinal slot by interference fit, said mop head having cleaning means secured thereto; and wherein said mop head further comprises a right ridge on a right side of the mop head and a left ridge on a left side of the mop head so that the left and right ridges are outside of the longitudinal slot when the mop head is inserted within the band, each said ridge having a diameter greater than the diameter of a respective outside surface so that the right ridge contacts the right outside surface and the left ridge contacts the left outside surface when the mop head is inserted within the band, said ridges preventing longitudinal movement of the mop head within the band.

5,768,737

## MECHANICAL-TYPE TOOTHBRUSH HAVING A REMOVABLE BRUSHHEAD

Robert Leutwyler, Boppelsen, and Werner Leutwyler, Zurich, both of Switzerland, assignors to Johnson &amp; Johnson Consumer Products, Inc., Skillman, N.J.

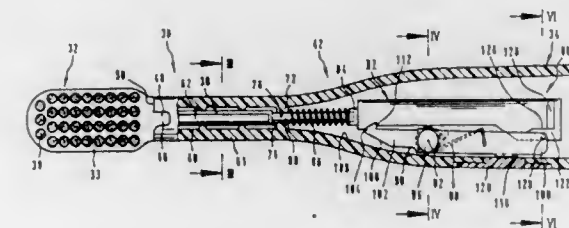
Continuation of Ser. No. 667,761, Jun. 21, 1996, abandoned, which is a continuation of Ser. No. 359,665, Dec. 20, 1994, abandoned. This application Jun. 9, 1997, Ser. No. 871,311

Claims priority, application Germany, Dec. 30, 1993, 43 45 003.2

Int. Cl.<sup>6</sup> A46B 9/04

U.S. Cl. 15—167.1

14 Claims



1. A toothbrush comprising: an elongated brush part, which has a coupling end having a coupling opening; an elongated hollow handle part, having a front coupling end and an axial bearing within the handle part, the hollow handle part having a wall; a coupling device, having a coupling rod defining a longitudinal axis, said coupling rod exhibiting a first longitudinal segment, which is slidably mounted within the axial bearing of the handle part and which is removably connected to the brush part, and having a second longitudinal segment which extends from said first longitudinal segment to an outside of the axial bearing within the hollow handle part; a return spring, which is disposed on the second longitudinal segment, the second longitudinal segment having two ends which are supported between bearings, so that the coupling

rod is pretensioned in a direction opposite the brush part, said direction being parallel to the longitudinal axis of the coupling rod; a latching device for rotationally locking the coupling end of the brush part and the coupling end of the handle part; a securing device for preventing axial motion of the coupling rod, a first part of the securing device in contact with the coupling rod and a second part being movable between a securement setting and a release setting and being pretensioned by a spring towards the securement setting; and an actuating device in the wall of the hollow handle part for actuating the second part of the securing device.

5,768,738

## OPTICAL CONNECTOR CLEANER

Ho-Kyung Lee, Incheon, Rep. of Korea, assignor to Daewoo Telecom Ltd., Rep. of Korea

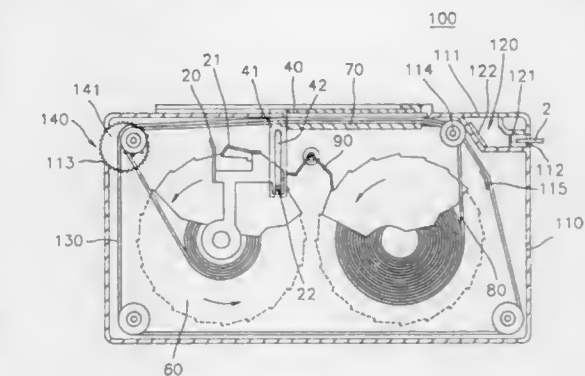
Filed Aug. 14, 1996, Ser. No. 702,408

Claims priority, application Rep. of Korea, Aug. 14, 1995, 95-20923

Int. Cl.<sup>6</sup> A47L 25/00

U.S. Cl. 15—210.1

12 Claims



1. An optical connector cleaner for cleaning a ferrule end surface of an optical connector, which comprises: a cloth for cleaning the ferrule end surface; a casing for protecting the cleaning cloth, the casing being formed with an opening; a guide member provided with a plurality of various-shaped holes into which the ferrule end surface can be inserted and moved therealong in contact with part of one surface of the cleaning cloth, the guide member being rotatably arranged in the casing in such a way that a part thereof is allowed to be exposed through the opening of the casing and the cloth is permitted exposed through the holes thereof; and means for moving the guide member.

5,768,739

## CONNECTOR MEMBER OF WINDSHIELD WIPER

Tomonori Iso, Kazo, Japan, assignor to Nippon Wiperblade Co., Ltd., Saitama-ken, Japan

Continuation of Ser. No. 651,674, May 21, 1996, abandoned.

This application Jun. 6, 1997, Ser. No. 870,556

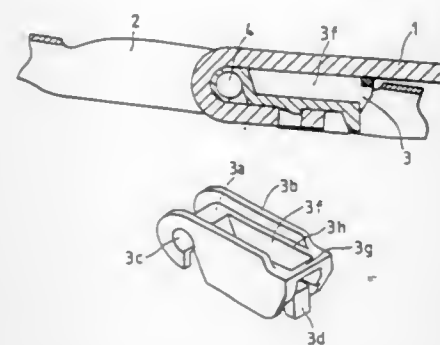
Claims priority, application Japan, May 22, 1995, 7-156598

Int. Cl.<sup>6</sup> B60S 1/40

U.S. Cl. 15—250.32

2 Claims

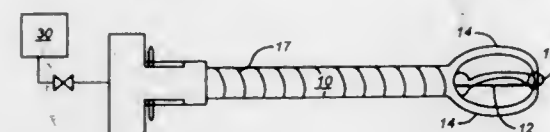
1. A connector member for coupling a U-shaped end of a wiper arm to a wiper blade having a pivot pin extending between spaced parallel sidewalls of the wiper blade, the connector member comprising: laterally spaced parallel connector sidewalls for slidably engaging with the sidewalls of the wiper blade; a first body portion integrally joining first ends of the connector sidewalls, the first body portion including a first opening for receiving the pivot pin;



5,768,741  
**FLEXIBLE PIPE CLEANING DEVICE AND SYSTEM**  
Basil C. Leiman, P.O.Box 79711, Houston, Tex. 77279, and  
Bruce D. Butler, 1609 Milford, Houston, Tex. 77006  
Filed Sep. 27, 1996, Ser. No. 720,351  
Int. Cl.<sup>6</sup> B08B 9/00

U.S. Cl. 15—304

20 Claims

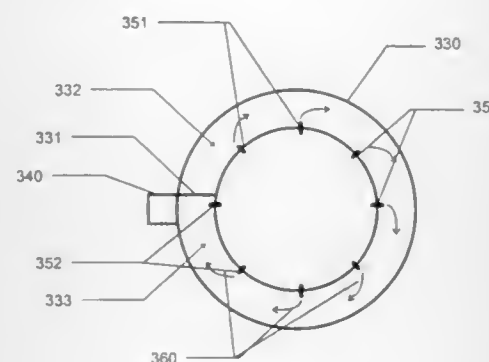


18. A pipe cleaning system comprising:
- a flexible conduit having a proximal end and a distal end;
  - a flexible connecting member slidably housed within said conduit, said connecting member comprising a proximal connecting end protruding beyond the proximal end of said conduit and a distal connecting end protruding beyond the distal end of said conduit;
  - at least two elastic strands having proximal and distal ends, the proximal end of each strand attached to the distal end of said conduit, such that when said conduit is rotated, said strands rotate, and the distal ends of said strands fastened to the distal end of said connecting member such that when said connecting member is retracted, said strands are displaced outward, and when said connecting member is not retracted, said strands are displaced in a substantially closed configuration with respect to each other;
  - a retraction handle attached to the proximal end of said connecting member such that pushing and pulling said handle results in a reciprocating motion of said connecting member; and
  - a pressure/suction source coupled to the proximal end of said conduit, said pressure/suction source capable of either injecting pressurized fluid into said conduit or creating a pressure or suction in said conduit.

5,768,740  
**DEBRIS EXHAUST SYSTEM**  
Donald D. McBride, Albuquerque, N. Mex.; Dominic Bua, Lynnfield, Mass.; Yacov Domankevitz, Brookline, Mass., and Norman Nishioka, Wayland, Mass., assignors to Sandia Corporation, Albuquerque, N. Mex.  
Filed May 16, 1995, Ser. No. 442,537  
Int. Cl.<sup>6</sup> A47L 5/36

U.S. Cl. 15—301

9 Claims



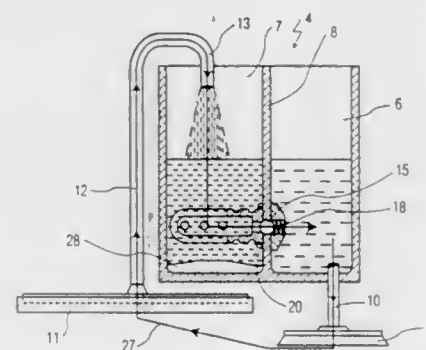
1. An exhaust system for removing debris from a surface of a work site distinct from the exhaust system comprising:
- a structure at least partially enclosing a work volume adjacent to the work site, wherein the structure comprises a bottom edge proximal to the work site and an upper portion above the work site;
  - supply means for introducing fluid into the structure; and
  - removal means for removing debris and fluid from the structure at a fluid flow rate that is substantially uniform across the periphery of the work site surface in directions substantially parallel to the work site surface and substantially normal to the periphery of the work site surface.

5,768,742  
**MOBILE FLOOR CLEANER**  
Albert Kohl, and Thomas Moser, both of Bern, Switzerland, assignors to Henkel-Ecolab GmbH & Co. OHG, Duesseldorf, Germany  
PCT No. PCT/EP95/03206, § 371 Date Mar. 18, 1997, § 102(e) Date Mar. 18, 1997, PCT Pub. No. WO96/05763, PCT Pub. Date Feb. 29, 1996  
PCT Filed Aug. 12, 1995, Ser. No. 793,378  
Claims priority, application Germany, Aug. 20, 1994, 44 29 617.7

Int. Cl.<sup>6</sup> A47L 11/283

U.S. Cl. 15—320

6 Claims



1. A mobile automatic floor cleaner comprising:
- a fresh-liquid compartment;
  - a soiled-liquid compartment integrated with said fresh-liquid compartment;

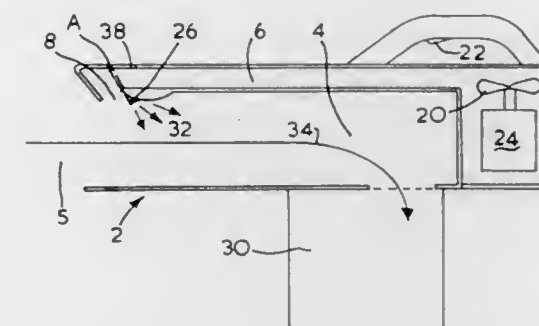
- a fixed partition separating said fresh-liquid compartment from said soiled-liquid compartment; said partition including a through-flow opening there between;
- a cleaning rotor including means for receiving liquid from said fresh-liquid compartment;
- a suction nozzle including means for sucking liquid from a floor into said soiled-liquid compartment;
- an operable closure element rigidly connected to said through-flow opening of said partition for selectively blocking or opening the throughflow opening, said operable closure element including on a side of said partition opposing and forming a wall of said fresh-liquid compartment, a valve body, and return means for applying a force urging said valve body tightly against a rim of said throughflow opening for closing said throughflow opening to prevent the flow of liquid between said fresh-liquid compartment and said soiled-liquid compartment;
- said closure element further including a coupling connector portion on the opposite side of said partition;
- a filter; and
- a tubular coupling including one end portion for receiving said filter, and another end portion opposite said one end portion, the another end portion being configured for removable connecting to said coupling connector, the another end portion including a stop arranged in a liquid throughflow region of said tubular coupling opposing said throughflow opening, whereby whenever said another end portion is connected to said coupling connector, said stop presses against said valve body, forcing it away from said rim of said throughflow opening for placing said closure element in an open position permitting liquid to flow through said through-flow opening of said partition between said soiled-liquid and said fresh-liquid compartments.

5,768,743  
**DEBRIS COLLECTING APPARATUS**  
Craig Webster, Jesmond, United Kingdom, assignor to Black & Decker Inc., Newark, Del.  
Filed Feb. 9, 1996, Ser. No. 598,774  
Claims priority, application United Kingdom, Feb. 11, 1995, 9502682

Int. Cl.<sup>6</sup> A47L 5/18

U.S. Cl. 15—330

7 Claims



1. A debris collecting apparatus comprising:
- a collecting duct having a debris collecting mouth at one end, means for creating an air stream, an air inlet into the collecting duct located adjacent to the debris collecting mouth for discharging the air stream into the collecting duct, in a flow direction towards the end of the duct away from the debris collecting mouth, and static air directing means arranged to disperse the air stream in the collecting duct in a plurality of directions, predominantly in the flow direction, wherein the static air directing means comprises a series of spatially separated vanes.

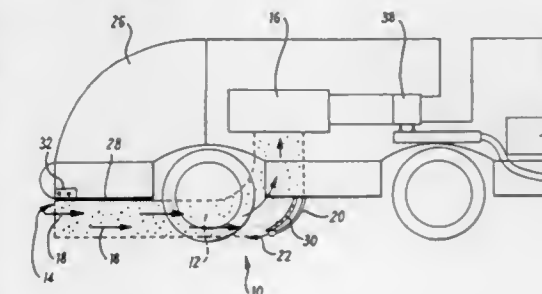
5,768,744  
**SELF-PROPELLED WASTE COLLECTION VEHICLE**  
Robin Hamilton, Ashton Close Farm, Snelston, Ashbourne Derbyshire, DE65DL, United Kingdom  
Continuation of Ser. No. 434,068, May 3, 1995, abandoned, which is a continuation of Ser. No. 954,010, Sep. 30, 1992, Pat. No. 5,452,492. This application Oct. 10, 1996, Ser. No. 728,788

Claims priority, application United Kingdom, Sep. 26, 1992, 9220382

Int. Cl.<sup>6</sup> E01H 1/08

U.S. Cl. 15—340.1

9 Claims



1. A self-propelled waste collection vehicle for being moved in at least a forward direction over a ground surface for collecting and processing wind-blown litter, said vehicle comprising:
- (a) a fluid duct defined by walls and having an inlet communicating with the ground surface for receiving the wind-blown litter into the vehicle, and an upwardly-turned feed section downstream of the inlet for directing the litter upwardly into a body of the vehicle, and said inlet extending across substantially the full width of the vehicle;
  - (b) fluid flow means communicating with said fluid duct, and operable for creating a fluid flow path along the fluid duct from the inlet to the upwardly turned feed section, thereby drawing the litter into the inlet for collection as the vehicle passes over the ground surface;
  - (c) compactor means carried by the vehicle and located downstream of said inlet for compacting the litter received through said fluid duct into a self-contained bale; and
  - (d) release means located downstream of said compactor means for automatically releasing the bales from the vehicle as they are formed and while collection continues, whereby the weight of the vehicle remains substantially constant as more waste material is collected.

5,768,745  
**SUCTION TUBE MOUNTED WITH AN AUXILIARY BRUSH OF A VACUUM CLEANER**  
Nam-Ho Lee, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea  
Continuation of Ser. No. 578,484, Dec. 26, 1995, Pat. No. 5,621,946. This application Nov. 4, 1996, Ser. No. 740,897  
Claims priority, application Rep. of Korea, Dec. 26, 1994, 94-36826; Dec. 29, 1994, 94-38982

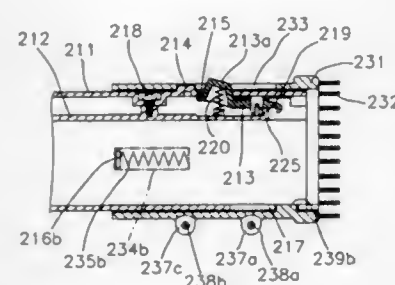
Int. Cl.<sup>6</sup> A47L 9/06

U.S. Cl. 15—573

12 Claims

1. A suction tube mounted with an auxiliary brush of a vacuum cleaner comprising:
- a first extension pipe formed with a slot;
  - a second extension pipe having a neck inserted into the interior of said first extension pipe;
  - an auxiliary brush mounted to the outer periphery of said first extension pipe to be slidably moved in the lengthwise direction of said first extension pipe, having a brush body and a dust brush integrally formed with said brush body in one piece;
  - means for biasing said auxiliary brush toward an opening of said first extension pipe;





latching means for latching said second extension pipe into said first extension pipe when said second extension pipe is inserted within said first extension pipe, and maintaining said auxiliary brush at a position retreating from the opening end of said first extension pipe, and releasing the latching by the manipulation of a press button;

a pair of juts formed adjacent to a slit formed on said auxiliary brush to be reciprocated within the slot; and

a protrusion formed at an outer side of said neck of said second extension pipe to be reciprocated within the slot.

5,768,746

## ELECTRIC VACUUM CLEANER

Kazumasa Kamatani; Sadao Fukushima; Kazuyoshi Yoshimi, all of Hyogo-ken; Shuzo Ueyama, Kasai; Tomonari Kawaguchi, Ohtsu; Isao Yoneda, Himeji, and Kazuhiko Fujii, Hyogo-ken, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Continuation of Ser. No. 536,268, Sep. 29, 1995, abandoned.

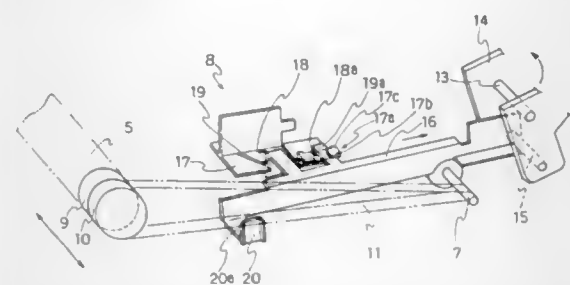
This application Jun. 19, 1997, Ser. No. 878,549

Claims priority, application Japan, Oct. 28, 1994, 6-265857

Int. Cl.<sup>6</sup> A47L 9/00

U.S. Cl. 15—390

5 Claims

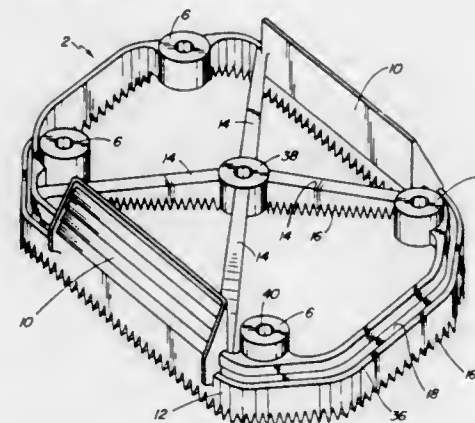


1. An electric vacuum cleaner comprising a floor nozzle connected to a lower part of a main body of the vacuum cleaner and having a suction opening on a lower surface of a floor nozzle; a rotary brush disposed in the suction opening; a drive source; a power transmission system including a belt for transmitting power from the drive source to the rotary brush; and a changeover unit which selectively connects and disconnects power transmission of the power transmission system wherein the changeover unit includes an operating pedal which is manipulated to selectively connect and disconnect the transmitting belt and is provided on a rear portion of the floor nozzle; a long slide lever manipulated by the operating pedal and having a belt guide formed at a front end portion of the slide lever; and means on said slide lever for guiding and restricting movement of the slide lever.

5,768,747  
VACUUM CLEANER ACCESSORY  
Arthur Shawn Dwight Smith, R.R. #3, Mouth of Keswick, New Brunswick, Canada, E0H 1N0  
Filed Sep. 18, 1995, Ser. No. 529,451  
Int. Cl.<sup>6</sup> A47L 9/06

U.S. Cl. 15—402

4 Claims



1. A vacuum cleaner accessory for use in grooming animals and cleaning fabric substrates comprising:

- (a) a body having a back, downwardly-projecting sides and a nozzle for attachment to a vacuum source; and,
- (b) a brush component comprising a circumferential element defining a wall a skirt extending downwardly from said circumferential element, a plurality of spaced cross-members extending inwardly from the sides of said circumferential element and joining together in the interior thereof, and means to attach said body to said brush component, said skirt and cross-members having a plurality of downwardly-projecting, closely-spaced, flexible teeth comprised of a suitable thermoplastic material having a sufficiently high co-efficient of friction to adhere to loose hair to be suctioned and sufficient strength for said brush component to achieve brushing action, wherein said body has two recesses on opposed sides thereof and said brush component has two upwardly extending flanges on opposed sides thereof for engagement with said recesses, said flanges being adapted to be gripped by a user of said accessory.

5,768,748

## VACUUM ATTACHMENT FOR GROOMING CATS AND DOGS

Curtis Silvera, 750 Broadview Ave., Toronto, Ontario, Canada, M4K 2P1; Robert Silvera, 128 Bronte Road, Apt. 201, Oakville, Ontario, Canada, L6L 3C1, and Tanya Silvera, 709 22nd Ave. North, Cranbrook, B.C., Canada, V1C 5J1

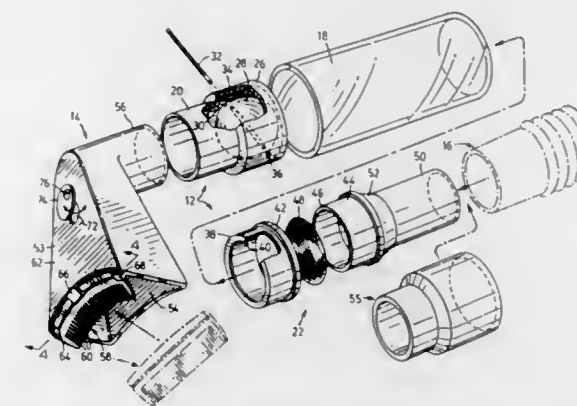
Filed May 16, 1996, Ser. No. 645,800

Int. Cl.<sup>6</sup> A01M 1/06

U.S. Cl. 15—402

8 Claims

1. A vacuum head for grooming cats and dogs comprising:
- a hollow housing providing a passageway therethrough from an inlet at one first upstream end and an outlet at a second downstream end,
- the second end connectable to a vacuum system for air flow into the housing via the inlet and through the passageway downstream to the outlet to exit the housing via the outlet,
- the housing about the inlet comprising a containment shroud, the shroud having front, rear and opposite side walls defining the passageway therebetween with the walls having leading edges defining a perimeter of the inlet,
- the leading edges of each of the front wall and rear wall disposed in an arcuate shape, arching from one side wall to the other such that middle portions of the leading edges of each of the front wall and rear wall are, with increased



distance from the side walls, increasingly farther downstream from the leading edges of the side walls,

a comb member carried on the rear wall having a spline carrying a plurality of tines each extending from the spline to a distal end thereof,

the spline of the comb member extending across the rear wall from substantially one side wall to the other side wall,

the tines extending from the spline towards their distal ends at an angle towards the front wall and upstream,

the distal ends of the tines disposed in an arcuate shape such that tines are, with increased distance from the side walls, increasingly farther downstream.

5,768,749

## PORTABLE AIR BLOWER

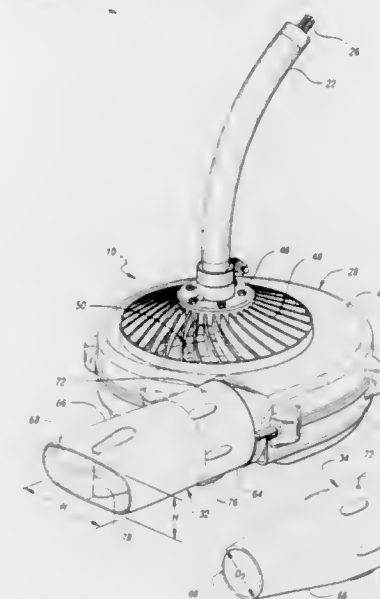
Taku Ohi, Chandler; Kenneth M. Brazell, Phoenix, and Naoki Kikuchi, Chandler, all of Ariz., assignors to Ryobi North America, Inc., Easley, S.C.

Filed Jul. 26, 1996, Ser. No. 690,366

Int. Cl.<sup>6</sup> A47L 5/14

U.S. Cl. 15—405

9 Claims



1. A blower system for use with an operator carried power tool having a drive motor with a motor housing and rotary output, an elongated tubular boom extending between the motor housing and the blower, and a drive shaft oriented within the tubular boom coupling the drive motor rotary output to the blower, the blower comprising:

- a blower housing having a central axis and an internal cavity bounded by a top wall, a bottom wall and a circumferential wall, the top wall having a hub formed therein aligned with the central axis and an air inlet extending through the top wall

allowing air to enter the internal cavity, the circumferential wall having a tubular section formed therein defining an air outlet for air to exit from the internal cavity;

an impeller oriented within the internal cavity of the blower housing and pivotally mounted thereto for rotation about the central axis, the rotation of the impeller relative to the blower housing causing air to enter the internal cavity of the blower housing through the air inlet and be discharged through the air outlet; and

a plurality of tubular nozzles each removably attachable to the tubular section of the blower housing, each of the tubular nozzles having a tubular connector for engagement with the tubular section of the blower housing, a tubular body providing an air passageway, and a discharge outlet for controlling the velocity and pattern of the discharged air, wherein the operator of the power tool can easily vary the air discharge pattern as a result of installing a selected one of the plurality of tubular nozzles on the tubular section of the blower housing.

5,768,750

## APPARATUS AND METHOD FOR OPENING MULTIPLE FIBER BALES

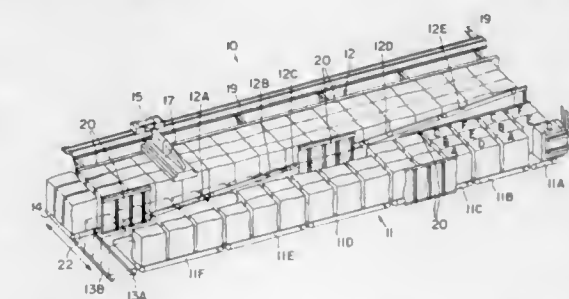
Joseph R. Williams, Kings Mountain, N.C., assignor to Preparation Machinery Services, Inc., Kings Mountain, N.C.

Filed Nov. 9, 1995, Ser. No. 552,508

Int. Cl.<sup>6</sup> D01B 1/00

U.S. Cl. 19—80 R

10 Claims



1. A multiple bale opening apparatus for opening fiber bales, comprising:

- (a) an inclined conveyor for supporting a longitudinally-extending rank-and-file array of bales in a single, uniformly inclined plane along the entire length of the inclined conveyor, and including a bale-receiving end for receiving bales to be opened;
- (b) a fiber plucking head carried by a fiber conveyor truck for moving along the length of the inclined conveyor and plucking a layer of fibers from a top surface of the array of bales supported by the inclined conveyor, said fiber plucking head mounted for movement in a horizontal plane to maintain the top surface of the bales in a horizontal plane along the length of the inclined conveyor as the fiber is plucked from the top surface and the depth of the bales is progressively reduced along the length of the inclined conveyor by the movement of the fiber plucking head;
- (c) drive means for moving the bales in a forward direction up the incline in increments correlated with the rate of fiber plucking to maintain the plane of the top surface of the bales in fiber-plucking contact with the fiber plucking head;
- (d) a reserve conveyor for storing bales in preparation for loading onto the inclined conveyor, said reserve conveyor having a receiving end for receiving fiber bales in a prearranged sequence and a discharge end for discharging fiber bales in the same prearranged sequence; and
- (e) a bale transfer vehicle for receiving bales from the discharge end of the reserve conveyor and transporting the bales to the bale receiving end of the inclined conveyor in the same prearranged sequence for optimizing uniform fiber blending of the opened fiber.



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JUNE 23, 1998

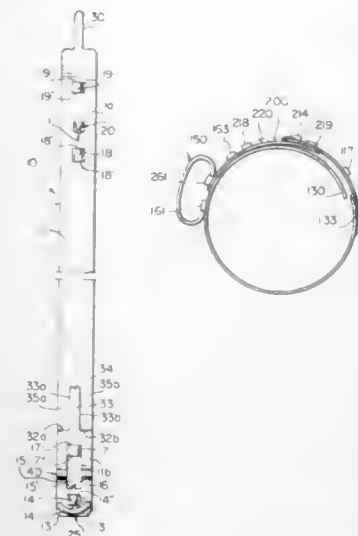
5,768,751

## LOW PROFILE EARLESS CLAMP

Hans Oetiker, Horgen, Switzerland, assignor to Hans Oetiker  
AG Maschinen- und Apparatefabrik, Horgen, Switzerland  
Filed Dec. 12, 1996, Ser. No. 766,177  
Int. Cl.<sup>6</sup> B65D 63/00

U.S. Cl. 24—20 R

40 Claims



1. An earless clamp structure, comprising clamping band means having overlapping inner and outer band portions in the installed condition of the clamp, and means for tightening said clamp structure about an object to be fastened by the application of a tool at tool-engaging surface means and for mechanically connecting the overlapping band portions in the completely tightened condition of the clamp structure, said means for tightening the clamp structure and for mechanically connecting overlapping band portions of the clamping band means including tool-engaging surface means formed at least in part by tunnel-shaped embossment means and hook-like means in the inner band portion operable to engage in hook-receiving means in the outer band portion,

characterized in that the hook-like means comprises a hook-like member in the inner band portion in the area near the free end thereof, said hook-like member being deep drawn after an at least approximately part-circular cut in the area thereof away from the free end of the inner band portion, said hook-like member being substantially integral with the clamping band means except within the area of said cut and forming by deep-drawing a substantially ramp-like rear surface extending obliquely upwardly in the direction away from the free end of the inner band portion and provided at its tip with a small flat top portion whose free end is in the shape of said cut and extends substantially in the longitudinal direction of the clamping band means to engage over an edge formed by a transverse cut in the outer band portion.

5,768,752

## PUZZLE-LOCK COMPRESSION RING

Hans Oetiker, Horgen, Switzerland, assignor to Hans Oetiker  
AG Maschinen- und Apparatefabrik, Horgen, Switzerland  
Filed Feb. 21, 1997, Ser. No. 804,080  
Int. Cl.<sup>6</sup> F16B 2/08; B65D 63/02

U.S. Cl. 24—20 R

25 Claims

1. A compression ring with a mechanical connection having complementary male and female parts in respective end portions of the ring, which comprises in the male part a tongue-like extension with an enlarged head portion adapted to engage with its head portion from behind in a recess of complementary shape in the female portion, characterized in that the head portion includes substantially transversely extending abutment surfaces extending at substantially right angles to substantially longitudinally extending abutment surfaces of the tongue-like extension, in that the trans-

versely extending abutment surfaces adjoin lateral abutment surfaces of the head portion extending substantially in the longitudinal direction of the compression ring by way of substantially right angles, and in that the lateral longitudinally extending abutment surfaces of the head portion adjoin into a transversely extending end abutment surface of the head portion by way of curved portions.

5,768,753

## DEFLECTION FITTING FOR A SAFETY BELT

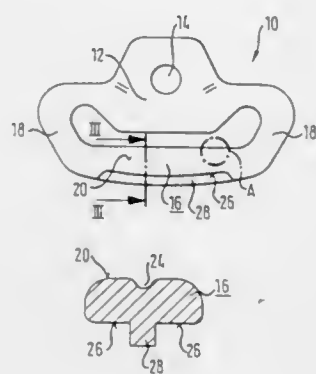
Karl Mündel, Schwäbisch Gmünd, Germany, assignor to TRW  
Occupant Restraint Systems GmbH, Alfdorf, Germany  
Filed Jan. 23, 1997, Ser. No. 786,895

Claims priority, application Germany, Jan. 30, 1996, 296 01  
566 U

Int. Cl.<sup>6</sup> A44B 11/00

U.S. Cl. 24—265 BC

14 Claims



1. A deflection fitting for a safety belt, comprising an attachment section having an eyelet, a deflection web, and bent connection sections provided at each axial end of said deflection web and connecting said deflection web to said attachment section so that a closed ring is formed which surrounds a feed-through slot for a safety belt, said attachment section, said deflection web and said bent connection sections being formed integrally as a diecast part made from a material selected from the group consisting of aluminum and aluminum alloys, said deflection fitting further including a deflection surface for a safety belt formed directly on said deflection web.

JUNE 23, 1998

GENERAL AND MECHANICAL

3513

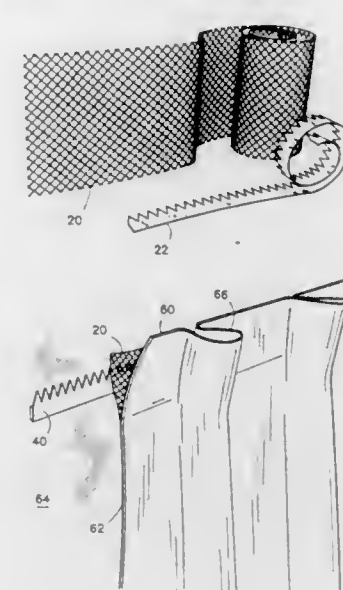
5,768,754

## FABRIC FASTENING KIT

Peter E. Armstrong, Box 4, Site 1A, Black Point, Nova Scotia,  
Canada, BOJ 1B0  
Filed Nov. 8, 1996, Ser. No. 747,106  
Int. Cl.<sup>6</sup> A47H 23/00

U.S. Cl. 24—442

20 Claims



1. A fabric fastening kit for fastening a piece of fabric to a structure, comprising:

an elongated pronged element for mounting on said structure, having a nominal width, a longitudinal measure, an uniform thickness, a backside, a foreside and a plurality of juxtaposed prongs defined therein; each of said prongs having a narrow tip, a wide base and a length between said tip and said base being substantially at least equivalent to a width of said base, and

a mounting means for mounting on said fabric, said mounting means including a strip of netting material, having a nominal width and a plurality of open meshes, each of said meshes having a perimeter being at least twice as long as said width of said base of said prong,

wherein said netting material is repeatedly tangentially attachable to and removable from said prongs without mangling said netting material.

5,768,755

## TENTER CLIP HAVING A ROLLER BEARING

Guenter Hemmerich, St. Ingbert, Germany, assignor to  
Hoechst Trespaphan GmbH, Neunkirchen, Germany  
Filed Mar. 31, 1997, Ser. No. 831,006

Claims priority, application Germany, Apr. 4, 1996, 196 13  
562.1

Int. Cl.<sup>6</sup> D06C 3/04

U.S. Cl. 26—93

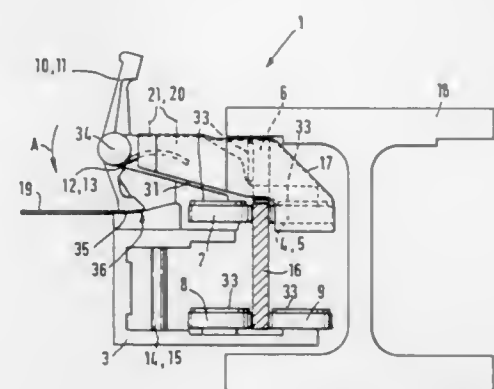
15 Claims

1. A tenter clip for use in a film stretching machine having a web support onto which a vertical guide strip is clamped and onto which the tenter clip is fastened, the tenter clip comprising:

a rolling part including at least one vertical roller bearing;  
a clamping body including at least two horizontal roller bearings; and

a protective hood covering a substantial portion of the clamping body, the shape of the protective hood being substantially similar to the geometry of the at least two roller bearings of the clamping body,

wherein the protective hood includes two holes on a top side, and the clamping body includes two threaded holes, and wherein the protective hood is fastened to the clamping body



5,768,756

## PROCESS AND DEVICE FOR MANUFACTURING A NON-WOVEN UNPATTERNED TEXTILE

Frédéric Noelle, Grenoble, France, assignor to ICBT Perfojet,  
France

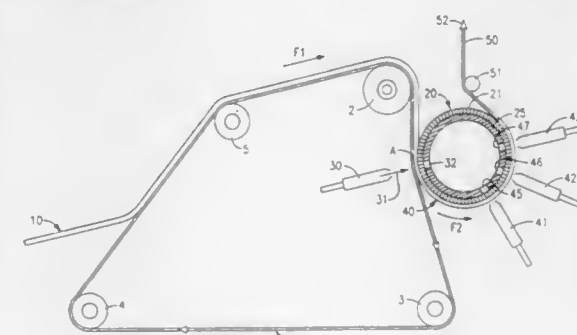
PCT No. PCT/FR96/00654, § 371 Date Dec. 24, 1996, § 102(e)  
Date Dec. 24, 1996, PCT Pub. No. WO96/36756, PCT Pub.  
Date Nov. 21, 1996

PCT Filed Apr. 30, 1996, Ser. No. 765,319

Claims priority, application France, May 17, 1995, 9506079  
Int. Cl.<sup>6</sup> D04H 13/00

U.S. Cl. 28—104

12 Claims



1. A device for the manufacture of non-woven, unpatterned cloth using pressurized water jets; the device comprising:

conveying means for supporting and conveying a continuous fibrous base cloth produced from elementary fibers;

a rotating cylindrical, perforated drum having a surface provided with a plurality of micro-holes and positioned adjacent said conveying means;

vacuum take-up means for allowing said drum to take-up said base cloth from said conveying means; and

a plurality of water jets for directing a pressurized stream of water onto said base cloth on said drum, wherein said micro-holes of said rotating drum are distributed on the surface of the drum in a random manner,

wherein said conveying means includes a porous, continuous belt adapted to receive said fibrous base cloth and means for driving said belt, said device further comprising means for rotating said drum, wherein said rotating means is synchronized with the speed of movement of said porous conveyor belt, said belt being arranged tangentially to said rotating drum.

5,768,757

## TOOL TURRET FOR MACHINE TOOLS

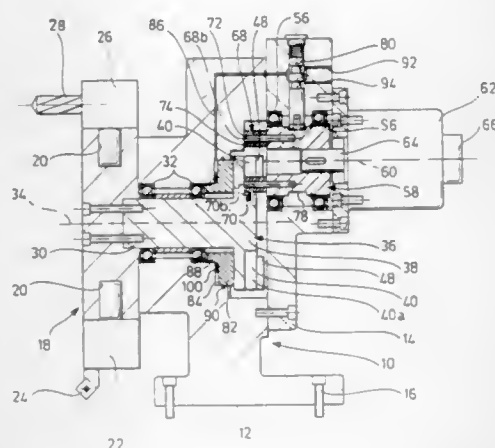
Helmut Friedrich Link, Aichwald, Germany, assignor to Index-Werke GmbH & Co. KG Hahn & Tessky, Esslingen, Germany

Continuation of Ser. No. 653,869, May 28, 1996, abandoned.  
This application Feb. 21, 1997, Ser. No. 804,058  
Claims priority, application Germany, Nov. 27, 1993, 43 40 512.6

Int. Cl.<sup>6</sup> B23B 3/16; F16H 55/00

U.S. Cl. 29—48.5 R

24 Claims



1. Tool turret device for machine tools, comprising a turret head bearing device, a turret head having a plurality of tool stations being attached to said bearing device for rotation about an indexing axis, a turret head indexing device for rotating thus turret head out of one indexing position, in which one of its tool stations is in an operating position, into a different indexing position, in which a different tool station is in an operating position, as well as locking means for holding the turret head in its indexing positions and for the rotary release of the turret head during indexing, wherein the turret head indexing device has an indexing disk similar to a Maltese cross and a driver, said indexing disk being rotatable about the indexing axis together with the turret head, non-rotatably connected to the turret head and having for each tool station of the turret head a slot open at the circumference the indexing disk and provided with two longitudinal flanks, said driver being drivable for rotation about a drive axis parallel to the indexing axis and bearing eccentrically to the drive axis at least two driver fingers for insertion into an indexing disk slot for indexing the indexing disk further and for removal from the indexing disk slot, said driver fingers being arranged at equal radial distances from the driver drive axis and at an angle of rotation distance from one another, characterized in that the drive fingers are formed by rollers mounted on the driver so as to be freely rotatable about axes parallel to the driver drive axis and each driver finger has a locking roller segment with a first outer diameter as well as an indexing roller segment with a second, smaller outer diameter, the latter being smaller than the transverse distance of the two longitudinal flanks of the indexing disk slots from one another, and that a curve convex towards a longitudinal center line of the relevant slot is associated with each longitudinal flank of each of the indexing disk slots, wherein the indexing roller segments are insertable into the indexing disk slot and the locking roller segments are adapted to rest against the convex curves, said curves being set back in relation to the longitudinal flanks of the indexing disk slots and staggered in the direction of the indexing axis, and wherein the slots, the curves and the driver fingers are designed and arranged in such a manner that, proceeding from a rest position of the driver, in which one the turret head tool stations is in an operating position and the locking roller segments of two driver fingers rest free of clearance against the two adjacent curves of two adjacent indexing disk slot the indexing roller segment of a first one of these two driver fingers is insertable into a first one of these two indexing disk slots due to rotation of the driver and the turret head is thereby rotatable into its next indexing position, wherein this indexing roller segment rests only against the leading longitudinal flank of

this first slot in the direction of movement of said segment, and that also in this next indexing position the locking roller segment of the first driver finger as well as the locking roller segment of another driver finger rest free of clearance against one of the two aforementioned curves and against the curve of the next indexing disk slot adjacent this curve.

5,768,758

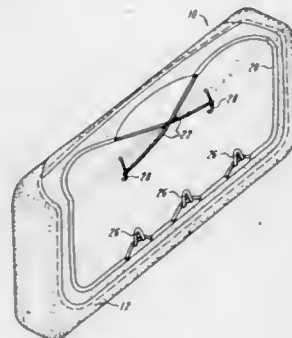
## METHOD AND APPARATUS FOR ATTACHMENT OF UPHOLSTERY TO SEATS

Chris Deignan, West Kingston; Thomas M. Miller, Barrington, both of R.I.; G. Michael Hanahan, Bloomfield Heights, Mich., and Abraham Silberberg, Providence, R.I., assignors to NFA Corp., Hope Webbing Division, Providence, R.I.  
Continuation of Ser. No. 300,448, Sep. 2, 1994, abandoned, which is a division of Ser. No. 60,605, May 12, 1993, abandoned. This application Sep. 26, 1996, Ser. No. 720,222

Int. Cl.<sup>6</sup> B68G 7/00; A47C 31/00

U.S. Cl. 29—91.1

7 Claims



6. A fastening arrangement for securing fabric to a seat or a component thereof, the fabric being configured to conform to a size and shape of the seat or the component and having an outer perimeter, the seat or seat component having a plurality of sides and an outer edge extending around the plurality of sides, said arrangement comprising:

- a web disposed about the perimeter of the fabric, said web having a longitudinal direction extending generally parallel to the perimeter of the fabric and having a length measured in the longitudinal direction, said web having first and second ends;
- a continuous cord disposed within said web and extending along the entire length of said web in said longitudinal direction, said cord having two ends, one end extending from said web at said first end and the other end of said cord extending from said web at said second end of said web;
- a plurality of openings disposed in said web adjacent said cord between said first and said second ends of said web; and
- at least one device disposed on the seat or the seat component along at least two of the sides of the seat or seat component adjacent said outer edge for attachment of said cord to the seat or seat component at said openings in said web, each of said devices being associated with at least one opening in said web and all of said devices having at least a portion thereof extending away from the adjacent outer edge of the seat or seat component.

5,768,759

## METHOD AND APPARATUS FOR REFLECTIVE IN-FLIGHT COMPONENT REGISTRATION

Edison T. Hudson, Chapel Hill, N.C., assignor to Zevatech, Inc., Morrisville, N.C.

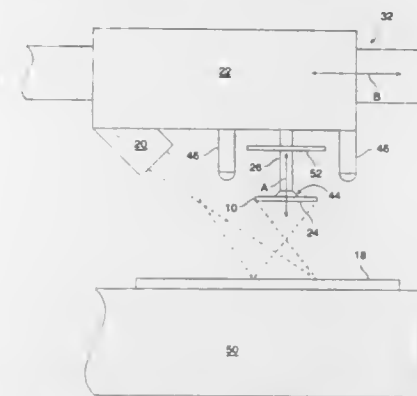
Filed Nov. 19, 1996, Ser. No. 753,037

Int. Cl.<sup>6</sup> B23Q 17/00

U.S. Cl. 29—407.04

21 Claims

1. A method of positioning a component in a selected position on a workpiece, said method comprising the steps of:



removing the component from a component storage means; transporting the component from the component storage means into the region of the workpiece by component transporting means, said component transporting means having a positioning axis, and the component having a predetermined nominal position relative to the positioning axis; moving the component transporting means to position said positioning axis in a predetermined position relative to the workpiece; detecting the actual position of the component relative to the positioning axis of said component transporting means and measuring the deviation of said actual position of the component from the predetermined nominal position thereof relative to the positioning axis while the component is spaced from the workpiece, said detecting step carried out by a camera directed at a reflective surface in turn directed at the component so as to image the component with said camera by means of reflecting an image of said component into said camera with said reflective surface; generating a control signal in response to a deviation of the actual position of the component from the predetermined nominal position thereof relative to the positioning axis; changing the position of the positioning axis of the component transporting means with respect to the workpiece in response to the control signal to thereby change the actual position of the component so that it coincides with the preset position thereof on the workpiece, and thereafter positioning the component on the workpiece.

5,768,760

## SYSTEM AND METHOD FOR AUTOMATICALLY PROCESSING COIN COLLECTION BOXES

Howard M. Citron, South Salem; David K. Asano, Shenorock; Henry R. Baletto, Northport; Sullivan S. Chen, Huntington, all of N.Y.; Alexis W. De Frondeville, Somerville, Mass.; Jeffrey H. Hahn, Greenwich, Conn.; Thomas J. Probst, Jr., White Plains, N.Y.; John E. Massucci, Bronx, N.Y.; Dinu Costin, Rosolyn Estates, N.Y., and Ralph E. Peragine, Massapequa, N.Y., assignors to Nynex Science & Technology, Inc., White Plains, N.Y.

Filed Oct. 31, 1995, Ser. No. 551,217

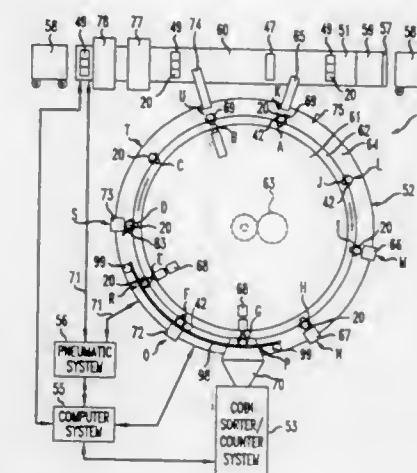
Int. Cl.<sup>6</sup> B23P 21/00; B65B 69/00

U.S. Cl. 29—430

73 Claims

71. A method of pipeline processing a plurality of boxes to remove the contents of said boxes, wherein removal of said contents requires the performance of a set of different processing operations in seriatim on each of said boxes, said method comprising:

- supporting a plurality of said boxes at spaced locations on a first member;
- supporting a plurality of box-processing units at corresponding processing stations spaced on a second member, said box-processing units each having a corresponding processing means for performing a different one of said processing operations on one of said boxes when located at said corresponding processing station;



5,768,761

## CHAIR SEAT FRAME SYSTEM

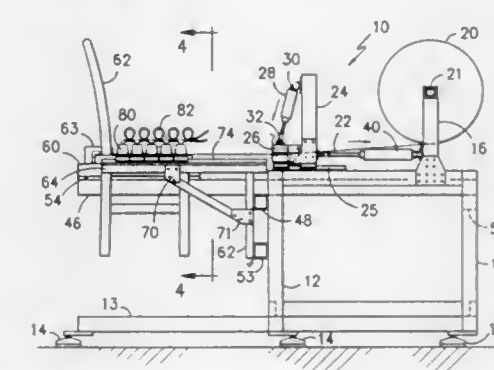
Bernhard Zeiler, and Howard Christy Willauer, Jr., both of Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Feb. 13, 1997, Ser. No. 799,314

Int. Cl.<sup>6</sup> B23P 11/02; B68G 7/00

U.S. Cl. 29—448

4 Claims



1. A method to cover the opening of a chair during the manufacture thereof comprising the steps of: supplying a roll of fabric stretchable in at least one direction, placing a chair with an opening therein in a fixture adjacent the roll of fabric, pulling fabric from the roll of fabric over the opening in the chair, securing the leading edge of the fabric to said chair, automatically clamping the fabric in the longitudinal and transverse directions to said chair and stretching the fabric in its stretchable direction, securing the stretched fabric to the chair, releasing and separating the stretched fabric from the roll of fabric and removing the chair from the fixture.



5,768,762

## METHOD AND APPARATUS FOR MANUFACTURING AN OPTICAL CABLE FROM A METAL TUBE

Gerhard Zlemek; Harry Staschewski, both of Langenhagen, and Klaus Porcher, Lehrte, all of Germany, assignors to Alcatel Kabel AG &amp; Co., Germany

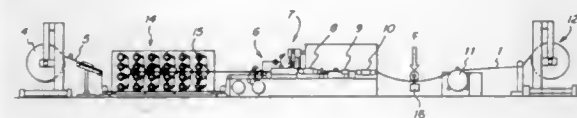
Filed Sep. 18, 1995, Ser. No. 529,489

Claims priority, application Germany, Sep. 24, 1994, 44 34 133.4

Int. Cl.<sup>6</sup> B23K 26/00

U.S. Cl. 29—452

7 Claims



1. A method for producing an optical fiber cable having a metal tube in which at least one optical fiber is located, comprising the steps of:

- (a) drawing a metal band from a storage reel;
- (b) continuously shaping the metal band into a tube with a lengthwise slot;
- (c) continuously guiding at least one optical fiber into the lengthwise slotted tube;
- (d) welding the lengthwise slotted tube at a welding station, thereby forming a welded tube having a welded seam;
- (e) gripping the welded tube with a first clamping tool, and causing the first clamping tool to guide and convey the lengthwise slotted tube to the welding station, and also guide and convey the welded tube from the welding station to a diameter reduction device;
- (f) passing the welded tube through the diameter reduction device, thereby reducing the diameter of the welded tube, and thereby producing a reduced diameter welded tube;
- (g) gripping the reduced diameter welded tube with a second clamping tool, and causing the second clamping tool to guide and convey the reduced diameter welded tube from the diameter reduction device to a take-up reel;
- (h) winding the reduced diameter welded tube at least once around the take-up reel
- (i) producing an elastic strain in the range of about 0.1 to 0.6% in the reduced diameter welded tube between the second clamping tool and the take-up reel; and
- (j) releasing the elastic strain in the reduced diameter welded tube on the take-up reel, thereby providing an overlength of the at least one optical fiber relative to the reduced diameter welded tube.

5,768,763

## METHOD AND APPARATUS FOR GROOVING ON ROTOR

Nobuyuki Yoshihara, and Masatoshi Tashima, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1995, Ser. No. 555,411

Claims priority, application Japan, Nov. 17, 1994, 6-310025

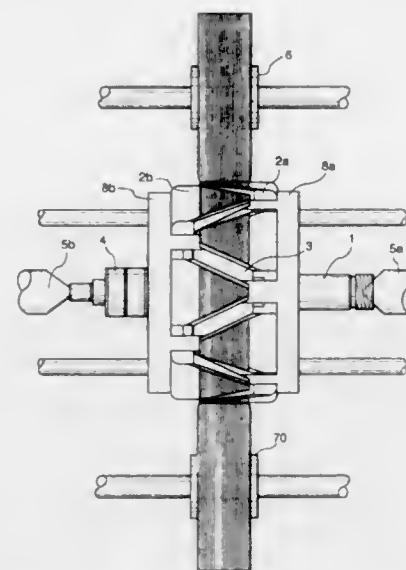
Int. Cl.<sup>6</sup> H02K 15/02

U.S. Cl. 29—598

7 Claims

4. A method of forming grooves on outer surfaces of field cores of a rotor, comprising the steps of:

- providing a groove rolling die having a groove pattern;
- providing pole-tip holders for supporting undersides of pawl-shaped magnetic poles provided on the rotor;



disposing a holder die, having a groove pattern conforming with the groove pattern of the groove rolling die, in opposition to the groove rolling die with respect to the rotor;

forming grooves in the outer surfaces of the field cores of the rotor using the groove rolling die and the holder die.

5,768,764

## STEEL BEAD WIRE EXTRACTING MACHINE FOR TIRES

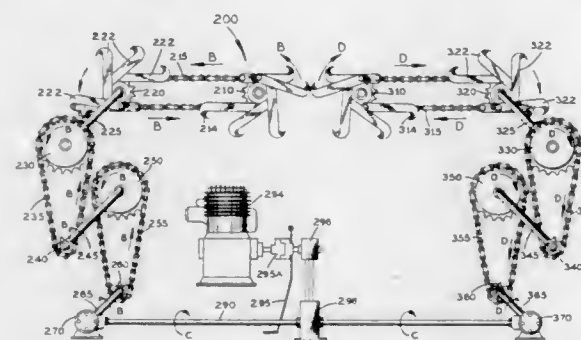
Bernard E. Batt, 11545 TerraBella Blvd., Plantation, Fla. 33325

Filed Apr. 22, 1996, Ser. No. 636,181

Int. Cl.<sup>6</sup> B23P 19/00

U.S. Cl. 29—700

16 Claims



1. An apparatus for removing bead wires from tires comprising:

- a main frame having means for mounting a first tire;
- a first chain positioned in the frame to one side of the tire having a first hook and a second hook attached thereon; and
- a second chain positioned in the frame to a second side of the tire opposite to the one side, the second chain having a first hook and a second hook attached thereon, wherein rotating the first chain and the second chain simultaneously causes the first hook on the first chain and the first hook on the second chain to remove bead wires from the first tire, and wherein rotating the first chain and the second chain simultaneously causes the second hook on the first chain and the second hook on the second chain to remove bead wires from a second tire.

5,768,765

## COMPONENT MOUNTING APPARATUS

Teruhiko Fujioka, and Tomosuke Okawa, both of Hamamatsu, Japan, assignors to Samsung Aerospace Industries, Ltd., Kyongsangnam-do, Rep. of Korea

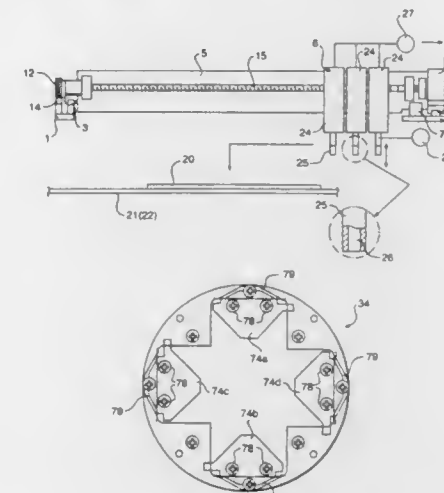
Filed Feb. 15, 1996, Ser. No. 602,086

Claims priority, application Japan, Feb. 21, 1995, 7-032741; Feb. 22, 1995, 7-033396

Int. Cl.<sup>6</sup> H05K 3/30; I3/04

U.S. Cl. 29—740

4 Claims



1. A component mounting apparatus for mounting a component onto a board, comprising:

- a cross-bar movably connected to the apparatus to move in a Y-axis direction;
- a mounting head slidably coupled to the cross-bar to move in an X-axis direction;
- a pressing member driving housing installed at one end of the mounting head;
- a hollow rod installed in the mounting head to axially slide through the pressing member driving housing and having at one end a suction bit for picking up and holding a component via vacuum pressure;
- a first pair of pressing members, installed in the pressing member driving housing and opposing each other to move toward and away from the hollow rod;
- a first motor;
- a first power transferring mechanism for transferring power from the first motor to the first pair of pressing members;
- a second pair of pressing members disposed at a predetermined angle with respect to the first pair of pressing members to move toward and away from the hollow rod for clamping and releasing the component in cooperation with the first pair of pressing members;
- a second motor; and
- a second power transferring mechanism for transferring power from the second motor to the second pair of pressing members.

5,768,766

## PRESS-CONNECTING TOOL

Yuji Hatagishi, and Takayoshi Hirakawa, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Continuation of Ser. No. 642,513, May 3, 1996, abandoned.

This application Jun. 23, 1997, Ser. No. 880,497

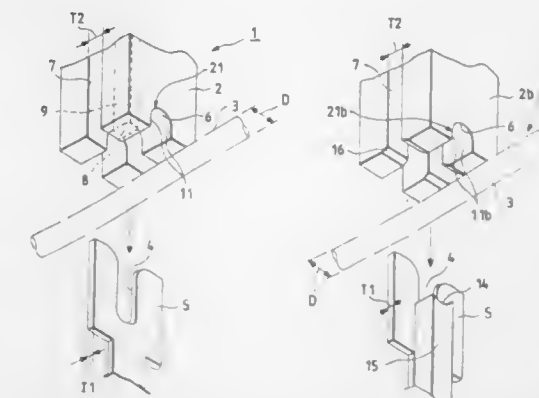
Claims priority, application Japan, May 12, 1995, 7-114748

Int. Cl.<sup>6</sup> H01R 43/01; 43/04; 4/24

U.S. Cl. 29—753

12 Claims

1. A press-connecting tool for electrically connecting a press-connecting blade having a U-shaped slot with a wire, the press-connecting tool comprising:



a press-connecting die having two die portions each including a substantially planar surface;

an arcuate pressing portion formed on a surface of the press-connecting die facing in a press-connecting direction, a longitudinal length of the arcuate pressing portion corresponding to a longitudinal length of the wire; and

a pair of opposed crush prevention walls, for preventing the wire from being crushed in the press-connecting direction, extending from each end of the arcuate pressing portion,

wherein a relief groove, for receiving the press-connecting blade, is formed adjacent to the arcuate pressing portion and defined directly between the planar surfaces of the pair of opposed crush prevention walls, the die portions symmetrically disposed about the relief groove,

wherein the wire is pressed into the U-shaped slot of the press-connecting blade by the arcuate pressing portions when the press-connecting die and the press-connecting blade are moved toward each other in the press-connecting direction, and

wherein a wire pressing groove is defined by the crush prevention walls and a portion of the arcuate pressing portions adjacent to the crush prevention walls, the wire pressing groove contacting at least a half of an outer peripheral surface of the sheath.

5,768,767

## AUTOMATIC HANDLE APPLICATOR

V. Howard Burchell, Howell, and Gary B. Baker, Manchester, both of Mich., assignors to Schmalbach-Lubeca AG, Ratingen, Germany

Filed Sep. 23, 1996, Ser. No. 717,917

Int. Cl.<sup>6</sup> B23P 21/00; 19/02

U.S. Cl. 29—774

29 Claims

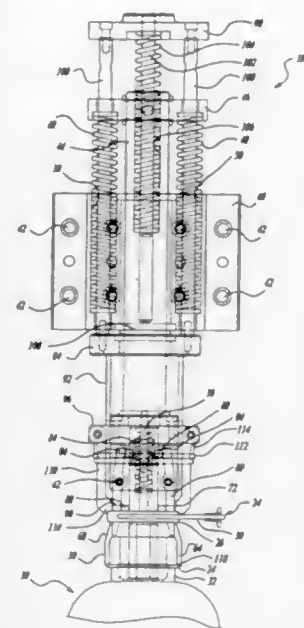
1. A handle applicator for applying a handle having an attachment ring onto a neck of a container by expanding the ring as the ring is being applied, said applicator comprising:

- a plurality of circumferentially positioned arms each having a distal end, said arms being moveable between a radially outward first position and a radially inward second position, in said second position said arms generally defining a reduced diameter relative to said first position to enable a ring to be positioned about said arms and over said distal end, said arms including ramp surfaces cooperating to define a frusto-conical shape when said arms are in said first position;

- a plurality of fingers generally located radially outward from said arms, said fingers being biased toward said arms, said fingers being radially and axially moveable between first and second finger positions, said fingers being located away from said distal ends of said arms when in said first finger position, said fingers being located adjacent to said distal ends of said arms when in said second finger position;

- a main body supporting said arms and said fingers; and
- whereby with said arms in said first position said fingers engage and push a ring on said arms up said ramp surfaces thereby expanding the ring and further pushing the ring over and off



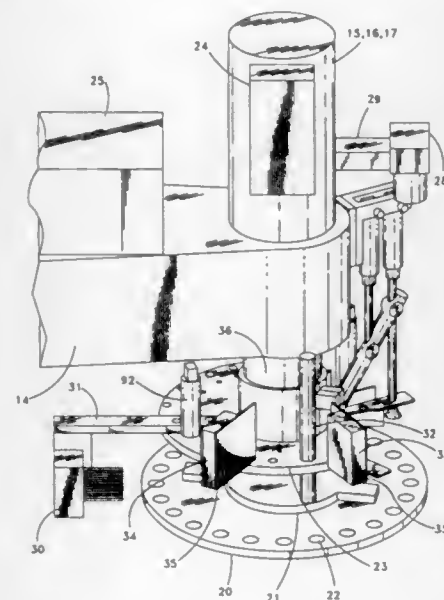


of said distal ends of said arms such that the ring contracts into retaining engagement onto the neck of the container.

**5,768,768**  
**APPARATUS FOR PROCESSING SMALL PARTS UTILIZING A ROBOT AND AN ARRAY OF TOOLS MOUNTED ON THE OUTER ROBOT ARM**  
Norman D. Best, 63 Glenflow Ct., Glendale, Calif. 91206  
Continuation of Ser. No. 237,301, May 3, 1994, Pat. No. 5,515,599. This application Feb. 23, 1996, Ser. No. 606,397  
Int. Cl.<sup>6</sup> B23P 19/00

U.S. Cl. 29—792

3 Claims



1. An apparatus for performing processing operations on at least one work-piece retained in a gripper holder and to be used in conjunction with a robot having a head capable of controlled X, Y, and Z movements, the gripper holder attached to the head, the apparatus comprising:

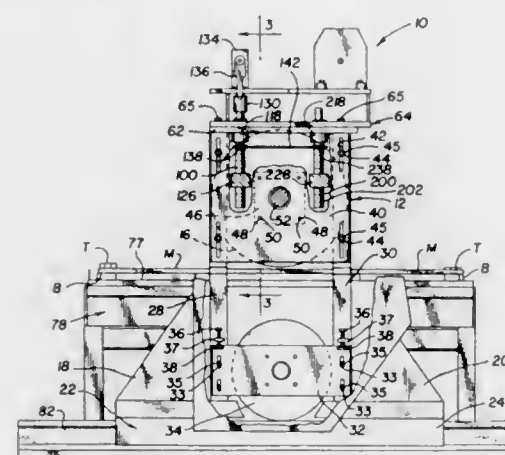
- a. a tooling plate fixedly mounted to said head of said robot for retaining at least one processing tool to perform an operation on said at least one work-piece, where said at least one work-piece is positioned by said gripper holder of said head of said robot relative to the at least one processing tool; and  
b. means for mounting said at least one processing tool to said tooling plate.

**5,768,769**  
**PARALLEL ADJUSTABLE GANTRY TRUSS PLATE PRESS**

Wayne A. Shamblin, 9013 Wessex Ct., Ft. Worth, Tex. 76134  
Filed Nov. 2, 1995, Ser. No. 552,194  
Int. Cl.<sup>6</sup> B23P 19/00

U.S. Cl. 29—798

7 Claims



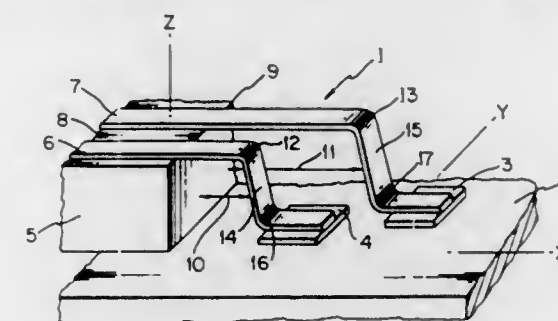
6. A gantry press adjustment apparatus for adjusting a vertical spacing and parallel orientation of a gantry press with respect to a work surface, the gantry press having a rigid frame with a first side frame portion and a second side frame portion, each of the first and the second side frame portions having first and second generally parallel vertical members, a bottom brace and a top brace, the first and the second side frame portions spaced sufficiently apart to accept a roller press with a first shaft end and a second shaft end, the apparatus comprising:

- a first planar member being adapted to receive and support the first shaft end of the roller press, said first planar member slidably mounted on the first side frame portion about the first and the second generally parallel vertical members;  
first and second vertical adjustment members connected to the first side frame portion and to said first planar member;  
a second planar member being adapted to receive and support the second shaft end of the roller press, said second planar member slidably mounted on the second side frame portion about the first and the second generally parallel vertical members;  
third and fourth vertical adjustment members connected to the second side frame portion and to said second planar member; and  
a drive interconnected with each of said first, second, third, and fourth vertical adjustment members to adjust each at a substantially equivalent rate and vertical spatial orientation such that a simultaneous four-point adjustment of said first planar member and said second planar member maintains the roller press of the gantry press in a parallel orientation with respect to the work surface.

**5,768,770**  
**ELECTRONIC PACKAGING SHAPED BEAM LEAD FABRICATION**  
Raymond Robert Horton, 106 Ridge Rd., Dover Plains, N.Y. 12522; Alphonso Philip Lanzetta, 194 Reservoir Rd., Marlboro, N.Y. 12542; Ismail Cevdet Noyan, 1235 Main St., Peekskill, N.Y. 10566, and Michael Jon Palmer, RD2, Box 372, Walden, N.Y. 12586  
Division of Ser. No. 994,096, Dec. 18, 1992, which is a continuation of Ser. No. 638,487, Jan. 4, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 477,074  
Int. Cl.<sup>6</sup> H01R 43/00

U.S. Cl. 29—827

10 Claims



1. The process of shaping conductors that are positioned with critical spacing on a first side of a dielectric carrier extending cantilevered from an edge of said carrier, that are to be bonded to contact locations on a substrate surface that are at different distances from an edge of said substrate, comprising in combination the steps of:

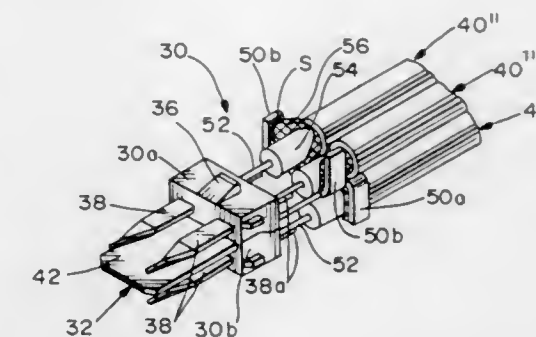
- supporting the second side of said carrier opposite to said first side with said conductors,  
preventing each said conductor from delaminating from said carrier at said edge of said carrier during bending of said conductor,  
bending the cantilevered end portion of each said cantilevered conductor in a first bend from said first side of said carrier toward said second side of said carrier for a distance slightly greater than the distance between said first and said second sides of said carrier, and in a second bend of the end of said conductor to a direction near parallel to the plane of said substrate, and,  
providing multiple separation distances from said edge of said carrier to the location of said first bend of said cantilevered conductors.

**5,768,771**  
**SYSTEM FOR TERMINATING THE SHIELD OF A HIGH SPEED CABLE**  
Michael O'Sullivan, Willowbrook; Daniel L. Dawiedczyk, Lisle, and Joseph W. Nelligan, Jr., LaGrange Park, all of Ill., assignors to Molex Incorporated, Lisle, Ill.  
Filed Mar. 1, 1996, Ser. No. 609,578  
Int. Cl.<sup>6</sup> H01B 13/20

U.S. Cl. 29—828

12 Claims

1. A method of terminating a high speed cable, comprising the steps of:  
providing a plurality of high speed cables, each cable having an inner conductor, an inner dielectric surrounding said inner conductor, a metallic ground shield at least partially surrounding said inner conductor, with a portion of said metallic ground shield exposed, and an outer dielectric sheath at least partially covering said metallic ground shield;  
providing a conductive terminating member with a plurality of positioning arms formable from an open position to a closed position;  
soldering the exposed portion of the metallic shield of each cable to a respective one of the positioning arms while the arm is in its open position; and

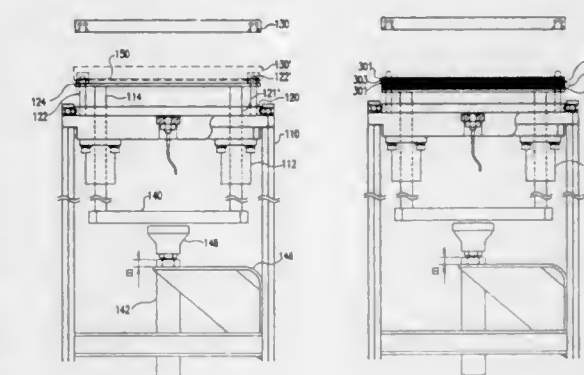


forming each positioning arm to its closed position to properly position the coaxial cables relative to each other.

**5,768,772**  
**PINSTACKING PROCESS AND FIXTURE**  
Alvin W. Buechele, Dutchess County, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed May 17, 1996, Ser. No. 650,078  
Int. Cl.<sup>6</sup> H05K 3/36; B23Q 3/00

U.S. Cl. 29—830

19 Claims

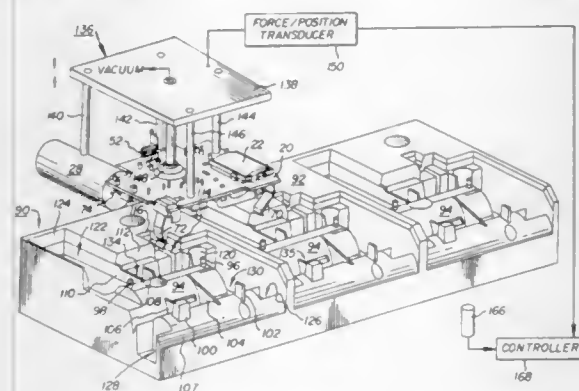


1. A method of stacking flexible lamina on alignment pins, said method including the steps of  
positioning a stacking plate near a free end of said alignment pins,  
frictionally supporting said stacking plate,  
self-aligning a flexible lamina on a shoulder portion of said alignment pins,  
aligning a pressing member with said shoulder portion of said stacking pins, and  
pressing said flexible lamina over said alignment pins against a frictional support of said stacking plate.  
12. An apparatus for aligning and stacking lamina including a stacking fixture including alignment pins and a stacking plate moveable along said alignment pins,  
means for positioning said stacking plate proximate a free end of said alignment pins,  
means for frictionally supporting said stacking plate, and  
means for pressing a lamina self-aligned with said alignment pins over said alignment pins to reposition said stacking plate along said alignment pins against support of said stacking plate by said means for frictionally supporting said stacking plate.

5,768,773  
**FIXTURE AND METHOD FOR REPOSITIONING COMPONENTS ON A CIRCUIT BOARD**  
James Edmund Fredell, Brockport, and Brian Norman Zimmer, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
Filed Dec. 14, 1995, Ser. No. 572,361  
Int. Cl.<sup>6</sup> H05K 3/34

U.S. Cl. 29—832

11 Claims

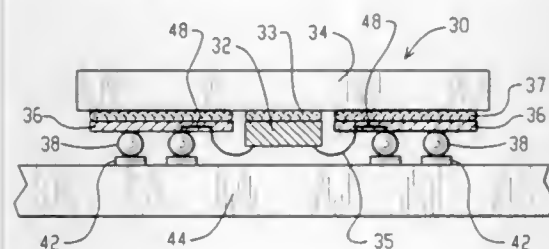


1. A fixture for repositioning at least one mispositioned component mounted via at least one deformable connector on and extended outward from a circuit board, said fixture comprising:  
a base;  
means supported by said base for simulating a mounting geometry for the circuit board in an apparatus into which the circuit board is to be installed; and  
camming means supported by said base for engaging the component to deform the connector and thereby reposition the component to a desired position for installation in the apparatus,  
whereby when the circuit board is placed on said means for simulating, the component engages said camming means to deform the connector and reposition the component to the desired position.

5,768,774  
**THERMALLY ENHANCED BALL GRID ARRAY PACKAGE**  
James Warren Wilson, Vestal; Stephen Robert Engle, Binghamton, and Scott Preston Moore, Apalachicola, all of N.Y., assignors to International Business Machines, Armonk, N.Y.  
Division of Ser. No. 474,989, Jun. 7, 1995, Pat. No. 5,572,405.  
This application Nov. 4, 1996, Ser. No. 740,888  
Int. Cl.<sup>6</sup> H05K 3/34

U.S. Cl. 29—840

6 Claims



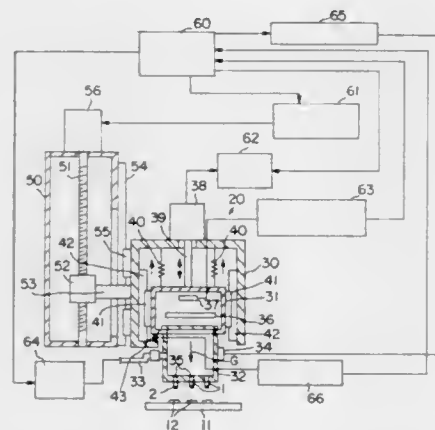
1. A method of producing a thermally enhanced ball grid array package for a solid state electronic component comprising:  
producing discrete ceramic connector members having first and second surfaces, with conductive pathways to multiple locations on said second surfaces;  
providing solder balls on said second surfaces so that said balls are electrically connected to said conductive pathways;  
bonding the first surfaces of a plurality of said connector members to a metal heat sink having a coefficient of thermal

expansion that is different from a coefficient of expansion of said ceramic component carriers;  
bonding said electronic component to said metal heat sink between said connector members to produce a composite bonded structure; and  
electrically connecting said electronic component to said conductive pathways, whereby said electronic component is electrically connected to said solder balls through said pathways.

5,768,775  
**MOUNTING APPARATUS OF CONDUCTIVE BALLS AND MOUNTING METHOD THEREOF**  
Shinichi Nakazato, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan  
Filed Aug. 23, 1996, Ser. No. 701,839  
Claims priority, application Japan, Aug. 24, 1995, 7-215877  
Int. Cl.<sup>6</sup> H01R 9/06; B23K 3/00

U.S. Cl. 29—843

10 Claims



1. A mounting method for mounting conductive balls on a workpiece having electrodes by using a mounting apparatus comprising a head body, moving means for moving said head body up and down, a suction tool for sucking conductive balls at a lower side of said suction tool, said suction tool slidably coupled to said head body, pulling means providing a pulling force for pulling said suction tool in an upward direction, said pulling means provided within said head body, pressing means providing a pressing force for pressing said suction tool in a downward direction, said pressing means provided within said head body, and control means for controlling said pressing force, said mounting method comprising the steps of:

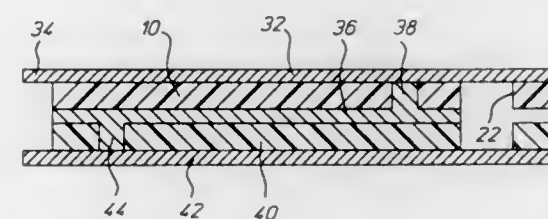
- sucking conductive balls into said suction tool;
- lowering said suction tool toward said workpiece;
- placing the conductive balls on the electrodes of said workpiece;
- pressing said suction tool toward said workpiece using the pressing force of said pressing means; and
- controlling the pressing force of said pressing means.

5. A mounting apparatus for mounting conductive balls on a workpiece having electrodes, said apparatus comprising:  
a head body;  
moving means for moving up and down said head body;  
a suction tool for sucking conductive balls at a lower side of said suction tool, said suction tool slidably coupled to said head body;  
pulling means providing a pulling force for pulling said suction tool in an upward direction, provided with said head body;  
pressing means providing a pressing force for pressing said suction tool in a downward direction, said pressing means provided within said head body; and  
control means for controlling said pressing force.

5,768,776  
**METHOD FOR FORMING A CONTROLLED IMPEDANCE FLEX CIRCUIT**  
Rajendra D. Pendse, Fremont, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.  
Continuation of Ser. No. 431,158, Apr. 28, 1995, abandoned, which is a division of Ser. No. 169,823, Dec. 17, 1993, Pat. No. 5,448,020. This application Jun. 16, 1997, Ser. No. 876,819  
Int. Cl.<sup>6</sup> H05K 3/10

U.S. Cl. 29—852

13 Claims

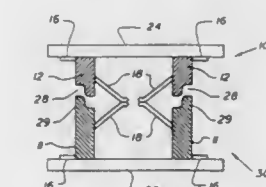
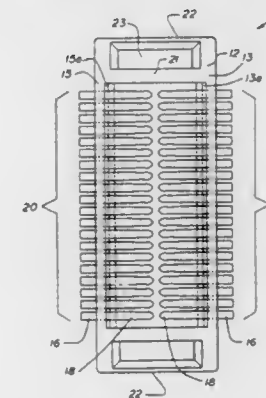


1. A method of fabricating a flexible circuit comprising:  
forming through holes in a flexible substrate having opposed first and second surfaces; and  
establishing a controlled impedance circuit on said flexible substrate, including simultaneously applying an electrically conductive adhesive on said second surface and into said through holes to form a structurally and electrically unitary layer filling said through holes and on said second surface, establishing said controlled impedance circuit further including forming a pattern of conductive traces on said first surface such that selected traces in said pattern contact said conductive adhesive in said through holes, thereby electrically interconnecting said selected traces and said conductive adhesive on said second surface and establishing a generally constant-voltage plane on said second surface.

5,768,777  
**METHOD OF MAKING LOW PROFILE CONNECTOR**  
Timothy Lemke, Carlisle, Pa., assignor to Berg Technology Inc., Reno, Nev.  
Division of Ser. No. 225,242, Apr. 8, 1994, Pat. No. 5,567,166.  
This application Jun. 25, 1996, Ser. No. 668,301  
Int. Cl.<sup>6</sup> H01R 43/04

U.S. Cl. 29—882

13 Claims



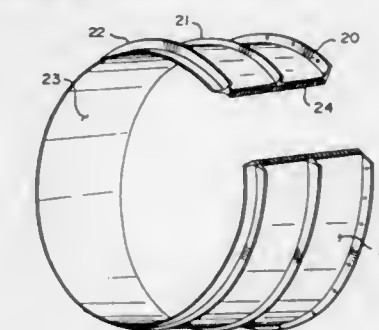
1. A process for making a low profile connector substrate comprising the steps of:

stamping a first strip of conductive material to form a first set of electrical contacts having a predetermined shape, each electrical contact having a first end and a second end, said first ends of said first set of electrical contacts being connected together by a detachable strip; and  
molding said plurality of electrical contacts into a housing having a first lateral face and a first back face to form a low profile connector substrate,  
said first set of electrical contacts extending from said lateral face of said housing and each electrical contact bending at an angle so that at least a portion of each electrical contact extends beyond a mating reference of said housing.

5,768,778  
**ONE-PIECE ENGINE INLET ACOUSTIC BARREL**  
Robert Elon Anderson, Huntington Station, and Charles A. Parente, Oyster Bay, both of N.Y., assignors to Northrop Grumman Corporation, Los Angeles, Calif.  
Division of Ser. No. 443,984, May 18, 1995, Pat. No. 5,581,054, which is a continuation of Ser. No. 985,909, Dec. 4, 1992, abandoned. This application Aug. 14, 1996, Ser. No. 696,798  
Int. Cl.<sup>6</sup> F02K 1/00

U.S. Cl. 29—888.01

8 Claims



1. A method of making an engine inlet acoustic barrel having a one-piece monocoque structure, said barrel being substantially cylindrical in shape and having as forward end, an aft end, and an air passage surface in an interior of the cylindrically-shaped barrel, comprising the steps of:

- forming a substantially cylindrical continuous one-piece porous inner facesheet having no splices extending from said forward end to said aft end;
  - forming a substantially cylindrical one-piece core structure having no splices;
  - forming a continuous one-piece non-porous back facesheet having no splices extending from said forward end to said aft end; and
  - forming a continuous one-piece non-porous inner facesheet;
- (d) bonding said continuous one-piece porous inner facesheet within said one-piece core structure and securing said core structure within said continuous one-piece non-porous back facesheet to form said engine inlet acoustic barrel having a one-piece monocoque structure.

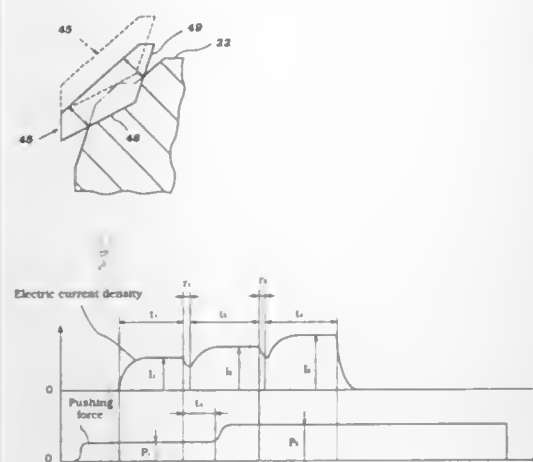
5,768,779  
**METHOD OF MANUFACTURING CYLINDER HEAD FOR ENGINE**  
Shuhei Adachi, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan  
Filed Sep. 13, 1996, Ser. No. 713,808  
Int. Cl.<sup>6</sup> B23P 15/00

U.S. Cl. 29—888.06

28 Claims

1. A method for forming a bonded valve seat for a cylinder head, said cylinder head comprising a casting having a flow passage extending therethrough and terminating at a valve port in a com-





bustion chamber surface thereof and an insert ring secured by metallurgical bonding into said valve port, said method comprising the steps of forming a recess at said valve port, said insert ring having an outer peripheral surface, positioning said insert ring into said recess and pressing and applying heat to said insert ring and said cylinder head for forming a metallurgical bond therebetween without any significant alloying of the cylinder head and insert ring materials, said heat being applied in at least three separate stages with subsequent brief cooling between the stages to control the amount of fusion and avoid alloying.

26. A method for forming a cylinder head, said cylinder head comprising a casting having an intake flow passage extending therethrough and terminating at an intake valve port in a combustion chamber surface thereof, an exhaust flow passage extending therethrough and terminating at an exhaust valve port in a combustion chamber surface thereof, an intake insert ring secured by metallurgical bonding into said intake valve port, and an exhaust insert ring secured by metallurgical bonding into said exhaust valve port, said method comprising the steps of forming recesses at said valve ports, said insert rings having an outer peripheral surface, positioning said insert rings into the respective of said recesses and pressing and applying heat to said insert rings and said cylinder head for forming a metallurgical bond therebetween without any significant alloying of the cylinder head and insert ring materials, the amount of heat applied in the bonding process for said exhaust insert ring being different from that of said intake insert ring.

5,768,780

## SEALING OF CYLINDER HEADS

Dale Graham Hobson, 8 Spiral Walk, Woodmead Springs, Sandton, Transvaal Province, and Johan Christoffel Adendorff, 42 Gail Street, Helderkruijn, Transvaal Province, both of South Africa

Filed Jul. 26, 1995, Ser. No. 506,910

Int. Cl.<sup>6</sup> B23P 15/00

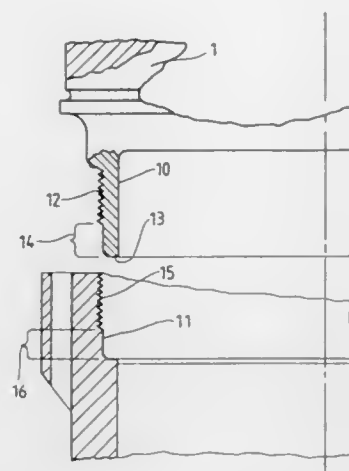
U.S. Cl. 29—888.061

10 Claims

1. A method of refurbishing a seal between a pre-existing cylinder head and a cylinder liner wherein a cylinder head is to be fitted to the cylinder liner, the cylinder head being shaped to fit against an end of the cylinder liner, and arranged to be sealed in this position by compression of the cylinder head against the cylinder liner, said method comprising:

creating an outer annular ring on a cylinder end of the cylinder head, and a matching annular rebate in the cylinder liner, dimensioned to have the ring fit within the rebate with opposing fitting surfaces by a process including machining,

providing co-operating screw threading on a portion of opposing fitting surfaces, and an interference fit on another portion of the opposing fitting surfaces, and



threading the cylinder liner and the cylinder head together to seal the cylinder head to the cylinder liner.

5,768,781

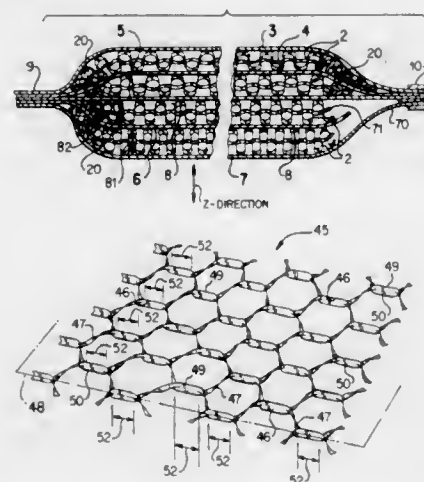
METHOD OF MAKING A METAL HEAT INSULATOR  
Stanley C. Shuler, Winston-Salem; John J. Hiers, Elkin, and Timothy L. Byrd, Booneville, all of N.C., assignors to Lydall, Inc., Manchester, Conn.

Continuation of Ser. No. 573,879, Dec. 18, 1995, abandoned, which is a continuation of Ser. No. 418,430, Apr. 7, 1995, abandoned, which is a division of Ser. No. 179,122, Jan. 10, 1994, Pat. No. 5,424,139. This application Jun. 4, 1996, Ser. No. 658,204

Int. Cl.<sup>6</sup> B21D 19/12; 47/00; 53/00

U.S. Cl. 29—890.03

28 Claims



1. A process for producing a generally elongated metal heat insulator, comprising:

(A) assembling alternating layers of a thin metal sheet and a metal separator such that the layers are disposed generally one above the other, said metal separator being a non-woven, substantially open, metal mesh which is not permanently attached to or part of the thin metal sheet, has a substantial Z-direction dimension and has substantially parallel upper and lower contact surfaces spaced apart in a Z-direction; and wherein said mesh is in the form of a twisted expanded metal mesh having spaced apart substantially vertically disposed portions and cut twisted portions connecting the vertically disposed portions and the vertically disposed portions extending further from a central plane of the mesh than the twisted portions such that the twisted portions do not substantially contact an adjacent thin metal sheet and the upper contact surface and a lower contact surface formed by the vertically disposed portions.

disposed portions have contact surface areas of less than 5% of a planar area of the mesh parallel to X and Y-dimensions of the mesh; and  
(B) at least partially closing peripheral edges of the assembled layers.

5,768,782

## FLAT TUBE FOR HEAT EXCHANGER AND METHOD FOR MANUFACTURING IT

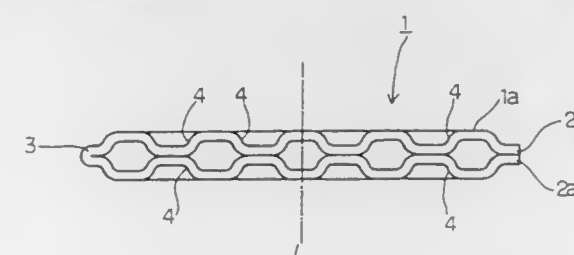
Soichi Kato, Konan-machi, Japan, assignor to Zexel Corporation, Tokyo, Japan

Division of Ser. No. 330,782, Oct. 28, 1994, abandoned. This application Jun. 10, 1996, Ser. No. 661,145

Claims priority, application Japan, Oct. 29, 1993, 5-272234 Int. Cl.<sup>6</sup> B23P 15/00

U.S. Cl. 29—890.053

2 Claims



1. A method of manufacturing a flat tube, comprising the steps of:

preparing a roll of a plate of a predetermined width; drawing said plate of said roll through a pair of vertically arranged forming rolls to form a projected portion projected in a direction opposite to a bending direction of said plate and extending along a center line of said plate; and continuously bending said plate along said projected portion in a plurality of continuous stages of bending rolls so that opposite edges of said plate are finally butted to each other to form a tubular body, thereby maximizing a production efficiency; and cutting said tubular body into a predetermined length, thus providing a flat tube.

5,768,783

## METHOD FOR FABRICATING A FLAT OR CENTRIPETAL WIRE

Werner Lange, Nattheim, Germany, assignor to Voith Sulzer Stoffaufbereitung GmbH, Ravensburg, Germany

Continuation of Ser. No. 537,546, Oct. 2, 1995, abandoned.

This application Jan. 24, 1997, Ser. No. 789,196

Claims priority, application Germany, Oct. 5, 1994, 44 35 538.6

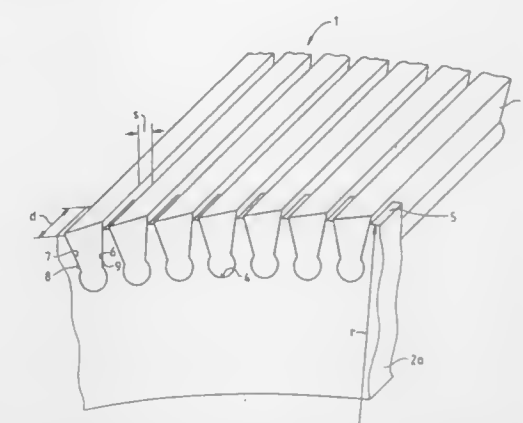
Int. Cl.<sup>6</sup> B21D 39/00

U.S. Cl. 29—897.15

3 Claims

1. A method of making a flat wire of the type comprising a plurality of bars in substantially axially parallel arrangement relative to one another and including wire slots contained inbetween, said method comprising the steps of:

providing a plurality of bars; providing at least two bar support members, wherein each bar support member includes laterally open recesses provided along a longitudinal edge of the bar support member, each said bar support member being in an initial state in which it is not subject to any tensions and wherein the longitudinal edge has an initial radius of curvature such that the laterally open recesses are open sufficiently to receive the bars; inserting the bars into the laterally open recesses of the bar support members while the bar support members are in the initial state in order to provide a wire shell; and



5,768,784

## COATING SYSTEM AND METHOD FOR FILLING OF A HYDRODYNAMIC BEARING AND A SECONDARY SEAL STRUCTURE MADE THEREBY

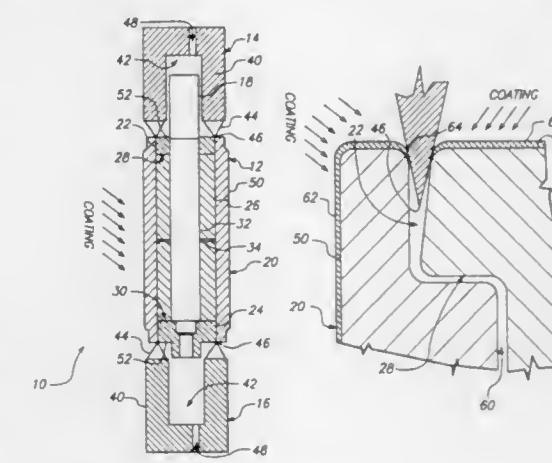
Carl D. Williams, Colorado Springs, Colo.; Shuo-Hao Chen, Fremont, Calif., and Jackie Cordova, Colorado Springs, Colo., assignors to Quantum Corporation, Milpitas, Calif.

Division of Ser. No. 437,995, May 9, 1995, abandoned. This application Jul. 1, 1996, Ser. No. 673,534

Int. Cl.<sup>6</sup> F16C 33/00

U.S. Cl. 29—898.12

16 Claims



1. A system for filling lubricant into a hydrodynamic bearing having at least one surface tension seal forming gap disposed between a shaft and a circumferentially surrounding sleeve, said system comprising:

means for selectively occluding predetermined portions of said surface tension seal forming gap; means for applying a surface energy reducing coating to said exterior surfaces of said hydrodynamic bearing, before filling said hydrodynamic bearing with said lubricant, while said predetermined portions of said surface tension seal forming gap are occluded; means for filling said hydrodynamic bearing with the lubricant to form a surface tension seal within said surface tension seal forming gap; and means for removing excess areas of said lubricant from said exterior surfaces of said hydrodynamic bearing coated with said surface energy reducing coating.

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5,768,785

## VERSATILE IMPACT-TYPE HAND TOOL

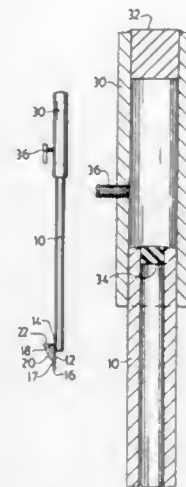
Ray H. Pessin, Hilton, N.Y., assignor to Marlin Products &amp; Manufacturing, Inc., Rochester, N.Y.

Filed Dec. 6, 1996, Ser. No. 761,565

Int. Cl.<sup>6</sup> B25D 3/00

U.S. Cl. 30—164.6

9 Claims



1. An impact-operated hand tool comprising:  
an elongated handle having a length of a preselected first dimension and having a lower end and an upper end;  
an elongated impact member having a length of a preselected second dimension that is shorter than said preselected first dimension and having its own respective lower and upper ends, said upper end of said impact member being integrated with a mass component and said lower end of said impact member being formed to be slidably received in mating relationship over the upper end of said handle;  
said impact member, when received over said handle, being slidably movable between (a) a first location in which said mass component is in contact with said upper end of said handle and (b) a second location in which said mass component is not in contact with said upper end of said handle so that said impact member may be moved from said second location to said first location to cause said mass component to strike said upper end of said handle; and  
a spade-like blade fixed to the lower end of said handle, said blade having:  
respective front and rear faces with respective top and bottom edges, and  
an inclined-ramp component (a) having a low end and a high end and (b) being fixed relative to said front face of said spade-like blade so that said low end of said inclined-ramp component is in proximity to said bottom edge of said front face and said high end of said inclined-ramp component is in proximity to said top edge of said front face.

5,768,786

## HAND-HELD MOTOR OR ENGINE POWERED RIGID BLADE BRUSH CUTTING DEVICE HAVING FAIL-SAFE DESIGN

Steven F. Kane, 460 Peters Blvd., Brightwaters, N.Y. 11718, and William Marletta, 143 Cedar Point Dr., West Islip, N.Y. 11795

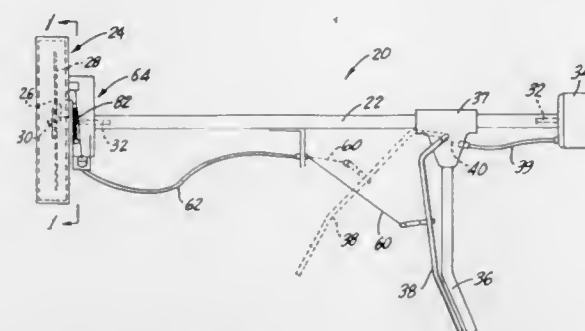
Filed Mar. 10, 1997, Ser. No. 813,991

Int. Cl.<sup>6</sup> B26B 7/00

U.S. Cl. 30—276

19 Claims

1. A hand-held, powered brush cutting device, comprising:  
an elongated member;  
a rigid rotatable cutting member rotatably mounted at a distal end of said elongated member to rotate about an axis generally in line with said elongated member;  
driving means for rotatably driving said cutting member;



- a selectively operable brake for quickly stopping the rotation of said rotatable cutting member, said brake including a rotatable member and a friction member, said friction member having an engaged position wherein said friction member is frictionally engaged to said rotatable member to stop its rotation and a released position wherein said friction member is disengaged from the rotatable member to allow it to freely rotate; resilient means coupled to said friction member to resiliently urge said friction member into its engaged position;  
lever means coupled to said elongated member and having a first position and a second position, said lever means being operatively coupled to said friction member so that manual movement of said lever means from said first position to said second position causes said friction member to move to its released position against the urging of said resilient means, and whereby movement of said lever means from said second position to said first position causes said resilient means to urge said friction member to its engaged position;  
means for selectively substantially fully enclosing said rotatable cutting member comprising a generally semicircular fixed guard extending approximately half way around said cutting member;  
a generally semicircular articulating guard being pivotable about an axis generally coaxial with the axis of rotation of said rotatable cutting member from a closed position, whereby the portion of said rotatable cutting member not enclosed by said fixed guard is covered, to an open position whereby the portion of said rotatable cutting member not enclosed by said fixed guard is not covered; and  
second resilient means coupled to said articulating guard to resiliently urge said articulating guard into its closed position.

5,768,787

## KNIVES WITH SLOTS

William Alfred Ireland, 257 Pirton Lane, Churchdown, Gloucestershire, England

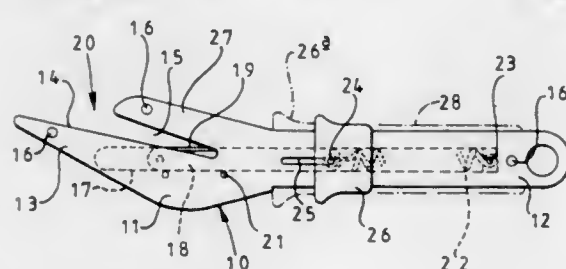
Filed Nov. 5, 1996, Ser. No. 743,218

Claims priority, application United Kingdom, Nov. 7, 1995, 9522738

Int. Cl.<sup>6</sup> B26B 29/06

U.S. Cl. 30—294

17 Claims



1. A knife comprising a main body formed with a slot having a narrow open mouth and a blade mounted on the main body with a portion of the cutting edge of the blade extending across the slot at a location spaced inwardly from the mouth of the slot, said blade being mounted on the main body for movement relative thereto across the slot, and a sleeve surrounding an elongate portion of the

main body and coupled to the blade so that movement of the sleeve relative to the main body causes movement of the blade across the slot.

5,768,788

## HACKSAW WITH IMPROVED BLADE TENSION MECHANISM

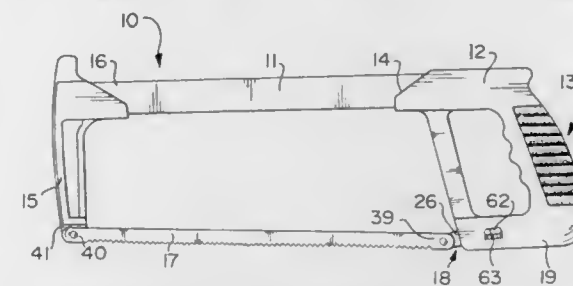
Robert L. Arnold, Jacobus, Pa., assignor to Hand Tool Design Corporation, Wilmington, Del.

Filed Aug. 12, 1996, Ser. No. 695,698

Int. Cl.<sup>6</sup> B27B 21/02

U.S. Cl. 30—513

32 Claims



1. A hacksaw having a blade, comprising:  
a handle having a lower portion and an upper portion and further having a detent means within the lower portion thereof, a socket extending through the lower portion of the handle,  
a blade tensioning means removably attached to the lower portion of the handle and connected to the blade at one end thereof,  
a frame arm being secured at one end thereof to the upper portion of the handle, and having a blade supporting member extending therefrom at another end thereof opposite to the handle and supporting another end of the blade, and  
a tension indicator window at the lower portion of the handle having at least one tension indicia adjacent thereto;  
wherein the blade tensioning means includes:  
a blade holder connected by its forward end to the blade, an adjusting screw threadably engaging a rearward end of the blade holder, and a crank handle having open and folded positions, and having means for disengaging the crank handle from the adjusting screw;  
wherein, for adjusting the blade tension, the crank handle, in its open position, is rotated in one direction causing the threading of the forward end of the adjusting screw into the blade holder, thereby driving the blade holder into the socket, and thereby increasing the blade tension, while the rotation of the crank handle in the opposite to said one direction, causes reduction of the blade tension;  
wherein said rearward end of the blade holder is observed through the tension indicator window for being aligned with said at least one tension indicia predetermined for a required type of blade; and  
wherein, when the blade tension adjustment has been accomplished, the crank handle, in its closed position, is held within the lower portion of the handle by the detent means and the crank handle is mechanically disconnected from the adjusting screw.

5,768,789

## CABLE SUPPORT DEVICE

William J. Tortora, Willington, and Thomas A. Gordon, S. Glastonbury, both of Conn., assignors to Gerber Scientific Products, Inc., Manchester, Conn.

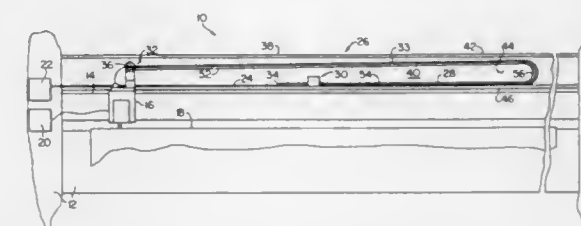
Filed Jun. 20, 1996, Ser. No. 666,248

Int. Cl.<sup>6</sup> B43L 13/00

U.S. Cl. 33—18.1

5 Claims

1. A plotter having a ribbon cable support device, said plotter comprising:



- a frame  
an elongated tool head support, carried by said frame and having a predetermined length;  
a tool head slidably mounted to said support for movement along said length of said support;  
a drive means, associated with said tool head for driving said tool head back and forth along the length of said support in response to commands issued from said controller;  
a vertically looped ribbon cable having upper and lower lengths connected to one another by a 180° bend and having one end attached to said tool holder, and a second end in communication with said controller, said ribbon cable having sufficient slack between said tool holder and said controller to allow said one end of said ribbon cable to move with said tool head as it traverses said length of said support; and  
a support device for said ribbon cable, said support device including a trough mounted to said frame and providing an interior channel containing said cable and defined by a rear wall and opposed upper and lower walls, an elongated cable support strip having one end attached by a first clamping means to said lower wall of said trough, a second end attached by a second clamping means to said tool holder so as to cause said support strip to assume a vertically looped shape having an upper support strip length positioned above a lower support strip length with said upper support strip length and said lower support strip length connected to one another by a 180° bend in said support strip and so that as said tool head traverses the length of said tool head support, said one end of said cable support strip moves with said tool head, and causes one of said upper or lower support strip lengths to increase while the other decreases; and  
said ribbon cable being positioned so that said upper length of said cable overlies and is vertically supported by said upper support strip length.

5,768,790

## ANGLE INDICATOR FOR PIPE BENDERS

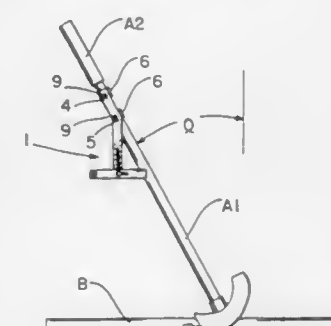
Robert C. Norman, Rt. 1, Box 50, Macclenny, Fla. 32063

Filed Oct. 28, 1996, Ser. No. 740,157

Int. Cl.<sup>6</sup> B43L 7/00

U.S. Cl. 33—451

6 Claims



1. An angle indicator for connection to a pipe bender having an elongated handle or like device, comprising:  
(a) A generally vertical member, said vertical member having an upper end and a lower end;  
(b) means for connecting said generally vertical member to a pipe bender handle;



- (c) a generally horizontal member having one end distant from said vertical member and another end proximate said vertical member, said horizontal member being rigidly joined by the end proximate said vertical member at a 90 degree angle to said vertical member;
- (d) a linear member having a first end by which it is pivotally connected to the end of said horizontal member distant from said vertical member in such manner as to remain parallel to the plane defined by said vertical member and said horizontal member when it is rotated on said pivot, and having a second end which remains adjacent to said vertical member when said linear member is rotated on said pivot;
- (e) means by which said linear member can be nonpermanently affixed at a selected angle in relation to said horizontal member;
- (f) degree markings provided on said vertical member such that the angle between the linear member and the horizontal member is indicated by said markings; and
- (g) a spirit level provided in said linear member, which spirit level indicates when the linear member is horizontal.

5,768,791

## RULER ASSEMBLY

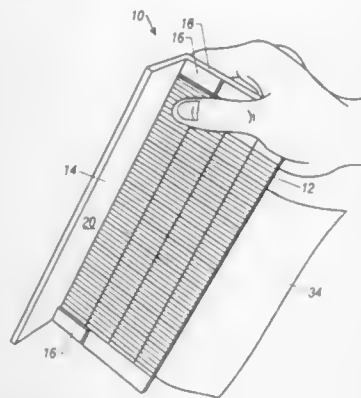
Jay Clark V, St. Pete, Fla., assignor to The Fastalign Ruler Company, Clearwater, Fla.

Filed May 9, 1996, Ser. No. 644,988

Int. Cl.<sup>6</sup> G01B 5/14; 3/10

U.S. Cl. 33—481

21 Claims



1. A ruler assembly comprising:  
a transparent overlay;  
a one-piece flange having a transverse and parallel legs; and  
fasteners attaching the overlay to the horizontal leg of the flange such that the length of the overlay is adjacent the transverse leg of the flange, wherein the overlay includes grid markings along its length.

5,768,792

## METHOD AND APPARATUS FOR MEASURING AND TUBE FITTING

Simon Raab, Longwood, Fla., assignor to Faro Technologies Inc., Lake Mary, Fla.

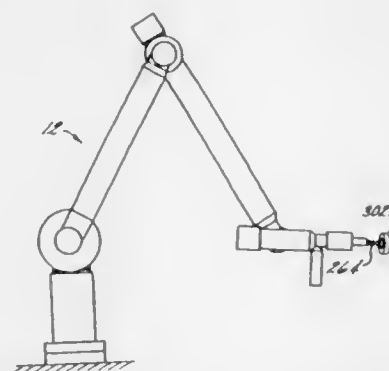
Filed Feb. 9, 1996, Ser. No. 600,275

Int. Cl.<sup>6</sup> G01B 5/012; A61B 5/103

U.S. Cl. 33—503

9 Claims

1. A method of producing bent tubing comprising:  
a) providing a coordinate measuring machine capable of measuring position and orientation in space by XY and Z coordinates of a probe;  
b) providing an interference extension at a distal end of the probe, said extension being mounted on a universal pivot;  
c) measuring and recording the path necessary to complete the part and recording the measurements;



- d) transferring the measurements to a manufacturing operation wherein said manufacturing operation produces bent tubing in accordance with the measurements recorded wherein said extension is of a geometry substantially replicating a cross-sectional geometry of the tube to be generated.

5,768,793

## ADJUSTABLE TEMPLATE FOR LAYING TILES AND METHOD

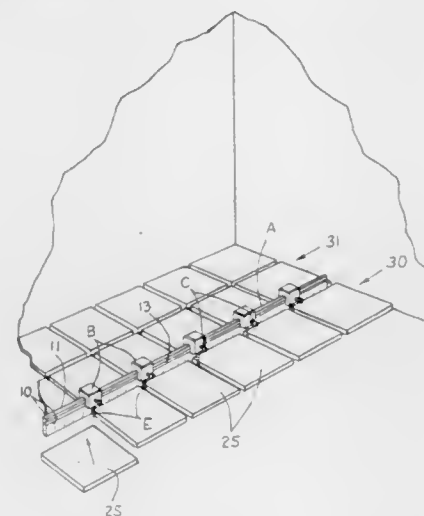
Timothy S. Fields, 1740 Gibson Ave., Surfside Beach, S.C. 29575

Filed Sep. 9, 1996, Ser. No. 709,636

Int. Cl.<sup>6</sup> G01B 1/00

U.S. Cl. 33—526

11 Claims



1. An adjustable template for laying tiles comprising:  
an elongated continuous guide for extending across a plurality of tiles;  
a plurality of blocks for mounting in longitudinally spaced relation on said elongated continuous guide for gauging and positioning the tiles in relation for setting;  
adjustable fasteners on said blocks for securing the blocks in desired longitudinally spaced relation to each other on said elongated continuous guide as governed by a size dimension of the tiles being laid;  
transversely spaced vertical receptacles on said blocks on opposite sides of said elongated continuous guide; and  
legs insertable in said receptacles for supporting said elongated continuous guide during a tile laying operation;  
whereby tiles of various sizes may be gauged by a single adjustable template.

5,768,794

## ELECTRONIC DATA RECORDING TAPER GAUGE

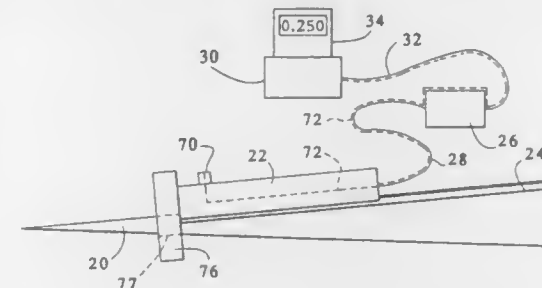
Michael W. Kelly, Joliet, Ill., assignor to Power House Tool, Inc., Joliet, Ill.

Filed Jul. 12, 1996, Ser. No. 678,817

Int. Cl.<sup>6</sup> G01B 7/13

U.S. Cl. 33—531

20 Claims



1. An electronic taper gauge system comprising:  
a taper gauge having a diminishing profile in at least one lateral dimension along its length;  
a movable stop member carried on said taper gauge and movable along said length;  
a magnetic strip storing information thereon and positioned along at least a portion of said length;  
a reading device carried on said stop member to read said magnetic strip and to generate a first signal indicating a linear position of said movable stop member;  
an electronic conversion device for converting said first signal into a second signal indicating a lateral dimension of said taper gauge at a point dependent on a then current position of said stop member on said taper gauge; and  
a transmission arrangement for transmitting said first signal from said reading device to said conversion device.

5,768,795

## STUD TEMPLATE

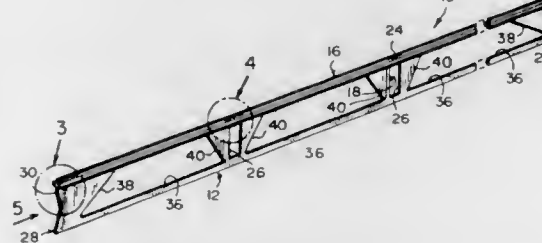
Leonard K. Jimenez, P.O. Box 902, Sumner, Wash. 98390

Filed Feb. 20, 1996, Ser. No. 604,140

Int. Cl.<sup>6</sup> G01D 21/00

U.S. Cl. 33—613

16 Claims



1. A stud template which comprises:  
a) a generally rectangular elongate flat blade sized to cover the width of a plurality of side by side sole plates before installation;  
b) an elongate T-shaped member integrally formed along one long side of said flat blade, whereby said T-shaped member can engage a longitudinal edge of one of the outermost sole plates; and  
c) means for repetitively marking a series of stud location stations along the length of the sole plates simultaneously, so that when the sole plates are installed in a wall frame of a building, studs can be erected upon the stud location stations on the sole plates quickly and without error, said marking means including said flat blade having a plurality of pairs of spaced apart parallel scoring edges extending across the widths of the sole plates at equal intervals therealong away from a first short end of said flat blade, wherein each said pair

of parallel scoring edges being equal to the width of each stud at each of the stud location stations, and said marking means further including:

- i) a first generally V-shaped index scoring edge at a first short end of said flat blade; and  
ii) a second generally V-shaped index scoring edge adjacent a second short end of said flat blade centrally located between said last pair of parallel scoring edges, so that said first generally V-shaped index scoring edge can be moved to the mark made at said second generally V-shaped index scoring edge to extend said equal intervals of said pairs of parallel scoring edges along the lengths of the side by side sole plates to be marked with additional stud locations.

5,768,796

## GAGE FOR MEASURING LENGTH OF FLEXIBLE EXTRUSIONS

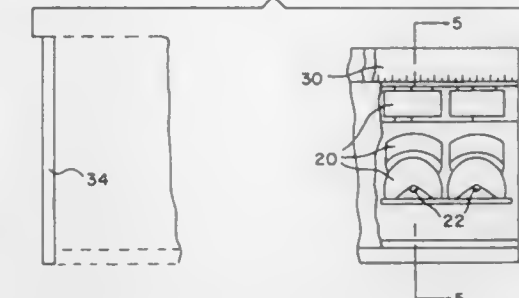
Richard Malik, Rossford, Ohio, assignor to Cooper Tire & Rubber Company, Findlay, Ohio

Filed Oct. 28, 1996, Ser. No. 738,800

Int. Cl.<sup>6</sup> G01B 5/02

U.S. Cl. 33—712

3 Claims



1. A fixture for measuring the length of long flexible extruded parts of different cross-sections, said parts being formed of foam rubber and the like material and being incapable of self-support in a straight line, comprising  
an elongated cradle including an upwardly open trough,  
a plurality of rollers having rims of like diameter arranged with said rims aligned serially in said trough to present a series of support surfaces arranged in a line,  
support shafts for said rollers extending through the axis of rotation of the corresponding rollers,  
said shafts extending parallel to each other and transversely of said trough and being spaced apart a distance slightly greater than the diameter of said rollers whereby the circumferential rim surfaces of said rollers facing upward in said cradle provide a part support of discontinued segments of said rollers extending at least the full length of the parts placed thereon, and localized tension and compression in the part will dissipate due to the part being supported independently at relatively closely spaced increments along the length of the part, a scale attached to and extending along said trough,  
an end stop at one end of said trough for indexing a part placed thereon, and  
a floating stop movable along said rollers into engagement with a free end of a part and cooperating with said scale to indicate the length of a part.

5,768,797

## POWERED REEL-TYPE TAPE MEASURING DEVICE

Hector Trevino, 2972 Royal La., Dallas, Tex. 75229-3604

Filed Feb. 27, 1996, Ser. No. 608,847

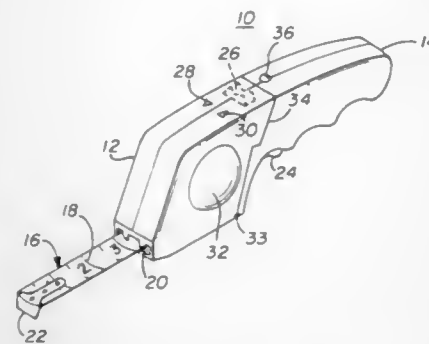
Int. Cl.<sup>6</sup> G01B 3/10

U.S. Cl. 33—761

3 Claims

1. A powered reel-type tape measuring device including:

a housing;



a reel rotatably mounted in the housing;  
flexible metal tape having measuring indicia thereon, said tape being mounted in a spool on said reel with an end portion extending from said spool;  
an exit slot in said housing through which the end portion of said tape passes;  
electric power-driven means coupled to said reel for driving said tape out of and into said housing through said exit slot;  
switch means operatively coupled to said electric power-driven means for energizing said power-driven means to selectively rotate said reel and drive said tape in a forward direction out of said housing and in a reverse direction into said housing;  
a microprocessor in said housing coupling said switch means to said reversible electric motor causing said motor to drive said tape out from or in towards said housing in accordance with said switch means operation;  
at least one roller in the housing for engaging the metal tape; said at least one roller being formed of pliable material frictionally engaging the metal tape; drive gears coupling the at least one roller to the reel such that the frictional roller applies a force to the metal tape to pull the tape from the reel as the reel is rotated by the motor;  
gear teeth on said drive gears coupling the said at least one roller to the reversible electric motor;  
detection means associated with said gear teeth counting the number of teeth passing said detector means as said tape is moved outwardly from said housing a predetermined distance;  
a storage means for storing said count of the number of teeth passing said detector means;  
a divide circuit coupled to said storage means for dividing said stored count by two; and  
a contact on said switch means for connecting said divided count to said microprocessor when said contact is actuated to cause said motor to rewind said tape to one-half of the distance it was extended to select a center point.

5,768,798

## DISPLACEMENT DETECTING APPARATUS

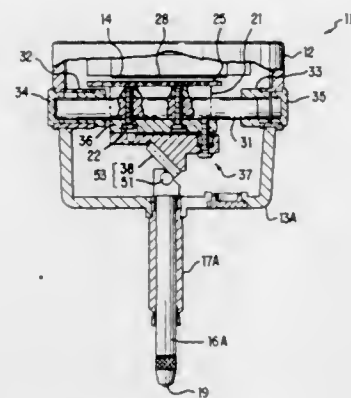
Seigo Takahashi; Masamichi Suzuki; Hiroshi Kawai, all of Kawasaki, and Yukio Kageura, Utsunomiya, all of Japan, assignors to Mitutoyo Corporation, Tokyo, Japan  
Filed Feb. 6, 1996, Ser. No. 597,199  
Claims priority, application Japan, Feb. 10, 1995, 7-022553; Apr. 17, 1995, 7-090541

Int. Cl.<sup>6</sup> G01B 3/22

U.S. Cl. 33—784

16 Claims

1. A displacement detecting apparatus having a digital display unit on a case, the apparatus comprising:  
a spindle secured to the case, said spindle moving perpendicular to the display surface of said digital display unit;  
a movable member secured to said case to move perpendicular to an axial direction of said spindle;  
a converting mechanism disposed between said spindle and said movable member to convert axial displacement of said spindle into displacement of said movable member;  
a detecting device that detects the displacement of said movable member and digitally displays the detected value on said



digital display unit, wherein said converting mechanism comprises first and second contact members, the first contact member being fixed to one of said spindle and said movable member at an angle of about 45 degrees relative to said movable member, said second contact member being fixed to the other one of said spindle and said movable member, said second contact member being in contact with said first contact member; and  
an angle adjusting device to adjust the angle of said first contact member relative to said movable member.

5,768,799

## PROCESS AND APPARATUS FOR COATING METAL SHEETS

Didier Delaunay, Breuillet, and Hugues Amaury Jean Vialla, Paris, both of France, assignors to Stein Heurtey, Ris-Orangis, France

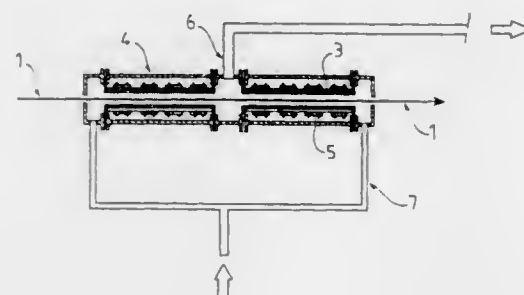
Filed May 6, 1996, Ser. No. 646,222

Claims priority, application France, May 23, 1995, 95 06141

Int. Cl.<sup>6</sup> F26B 3/34

U.S. Cl. 34—247

11 Claims



1. A method for curing a protective or decorative coating on a continuously moving metal sheet comprising the steps:  
displacing a length of the sheet along a chamber path in an oven, the chamber being enclosed by gas tight walled sections that are thermally insulated;  
energizing a source of induction heating that is located within the chamber;  
subjecting the length of sheet to induction heating for achieving a temperature sufficiently high to evaporate solvents in the coating and cause its curing;  
continuously extracting the evaporated solvents from the chamber;  
introducing hot air into the chamber at a temperature greater than the dew point of the solvent;  
wherein the walls of the chamber remain at a temperature above the dew point;  
thereby preventing condensation of the solvents on surfaces of chamber walls.

5,768,800

## POWDER FEED MECHANISM

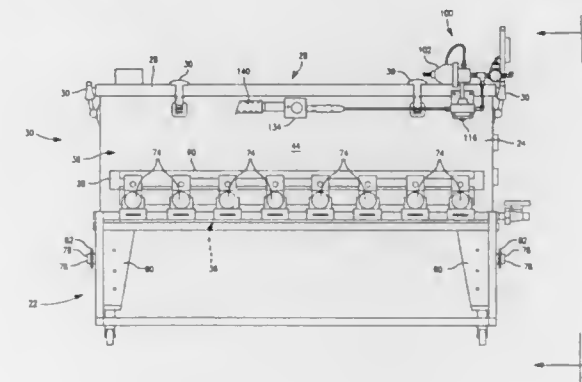
Christopher R. Merritt, Noblesville; Anthony J. Smotherman, Coatesville, and Michael J. Thies, Indianapolis, all of Ind., assignors to Matsuo Sangyo Co. Ltd., Osaka, Japan

Filed Jun. 8, 1995, Ser. No. 482,478

Int. Cl.<sup>6</sup> F26B 17/00

U.S. Cl. 34—576

10 Claims



1. Apparatus for fluidizing a pulverulent material in a stream of fluidizing gas, the apparatus comprising a membrane through which a fluidizing gas can flow but a pulverulent material to be fluidized cannot, a first means defining on a first side of the membrane a first fluidizing gas gallery, second means defining on a second side of the membrane a second fluidized pulverulent material gallery, third means providing a passageway out of the second gallery for the removal of fluidized pulverulent material from the second gallery, the third means comprising a housing having a first housing portion extending into the second gallery, the first housing portion having a first side region facing the semipermeable membrane and a second side region facing away from the semipermeable membrane, the second side region provided with an inlet opening for fluidized pulverulent material, a first conveyor in the housing, the first conveyor having multiple conveying sections, at least a first of the multiple conveying sections located adjacent the inlet opening, the first conveying section being generally coextensive with the inlet opening, the housing further having a second housing portion for collecting pulverulent material conveyed from the second gallery by actuation of the first conveyor, and a second conveyor communicating with the second housing portion for conveying the pulverulent material conveyed thereto to a pulverulent material utilization device.

5,768,801

## WELT SHOE COMFORT SYSTEM

Marvin O. Huff, Parsippany, N.J., assignor to Meldisco H.C., Inc., Mahwah, N.J.

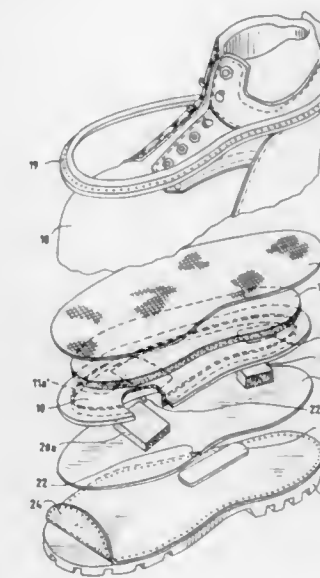
Filed Feb. 8, 1996, Ser. No. 598,477

Int. Cl.<sup>6</sup> A43B 13/18; A43D 9/00

U.S. Cl. 36—17 R

9 Claims

1. A shoe construction for a shoe manufactured in accordance with the Goodyear welt system, comprising:  
a rigid innersole board having two spaced-apart openings formed therethrough and a peripheral rib integral therewith and depending therefrom,  
a cushioning structure including a first portion overlying said innersole board and two second portions respectively extending through said openings and depending below said innersole board, and



a filler member disposed within said rib and secured to said innersole board covering said second portions of said cushioning structure.

5,768,802

## ONE-PIECE SPORTS SOLE-HEEL UNIT WITH INCREASED STABILITY

Marco Bramani, Milan, Italy, assignor to Vibram S.p.A., Albizzate, Italy

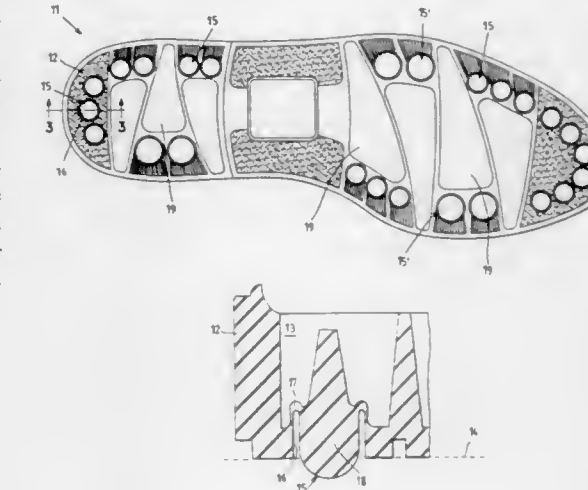
Filed Oct. 27, 1995, Ser. No. 549,122

Claims priority, application Italy, Jul. 12, 1995, MI95A1492

Int. Cl.<sup>6</sup> A43B 13/18; 21/26; 23/28; 13/04

U.S. Cl. 36—28

1 Claim



1. A one-piece sports sole-heel unit of increased stability comprising  
a unitary body of natural or synthetic rubber formed in one piece and including in a surface resting on the ground of a sole region and a heel region, limited in arrangement to strips located in proximity of perimetral regions of the sole region and the heel region, a plurality of downwardly projecting elements each integrally surrounded and connected by yieldable, thin elastic portions within said unitary body, with each downwardly projecting element at least partly retracting into a bottom seat formed in said unitary body when resting and applying load to the sole-heel unit, each projecting element integrally including with the unitary body a solid rounded stud at one end for engagement with the ground and a projection at an opposite end.





a receptacle for receiving the retaining member, the receptacle having  
a top end and a bottom end,  
a wall portion defining a cavity extending from the bottom end towards the top end,  
a ledge portion attached to the bottom end and extending into the cavity, the ledge portion being positioned so as to hold the plurality of extensions within the cavity, and  
a plurality of cantilevered fingers shaped and mounted within the cavity so as to engage the extensions of the retaining member and to resist dislodgment of the retaining member once the retaining member is installed;  
wherein the retaining member may be removably attached to the receptacle.

5,768,810

**METHOD FOR CARRYING OUT AUTOMATIC SURFACE FINISHING WORK WITH ELECTRO-HYDRAULIC EXCAVATOR VEHICLE**

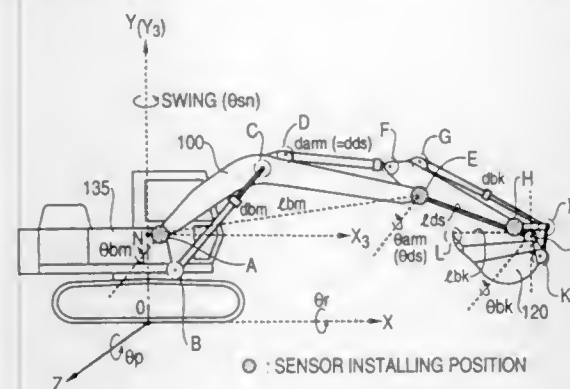
Seong-Ho Ahn, Seoul, Rep. of Korea, assignor to Samsung Heavy Industries Co., Ltd., Seoul, Rep. of Korea  
Continuation of Ser. No. 364,935, Dec. 28, 1994, abandoned.  
This application Nov. 22, 1996, Ser. No. 754,919

Claims priority, application Rep. of Korea, Apr. 29, 1994, 94-9369

Int. Cl.<sup>6</sup> E02F 5/02

U.S. Cl. 37—348

6 Claims



I. A method for surface finishing work with an electronically controlled hydraulic excavator comprising the steps:  
inputting a command to operate the electronically controlled hydraulic excavator to excavate the around with a bucket at an angle  $\theta$  relative to a horizontal reference;  
determining if a swinging operation of an upper rotary portion carrying the bucket of the electronically controlled hydraulic excavator about an axis orthogonal to the ground is being performed;  
in response to the determined swinging operation of the upper rotary portion calculating a deviation of an end L of the bucket from the angle  $\theta$ ; and  
compensating for the calculated deviation of the bucket end L from the angle  $\theta$  automatically by moving the bucket end L from the calculated deviation back to the angle  $\theta$  for performing the finishing work.

5,768,811

**SYSTEM AND PROCESS FOR CONTROLLING AN EXCAVATION IMPLEMENT**

Mark Cooper, Pella, Iowa, assignor to Vermeer Manufacturing Company, Pella, Iowa

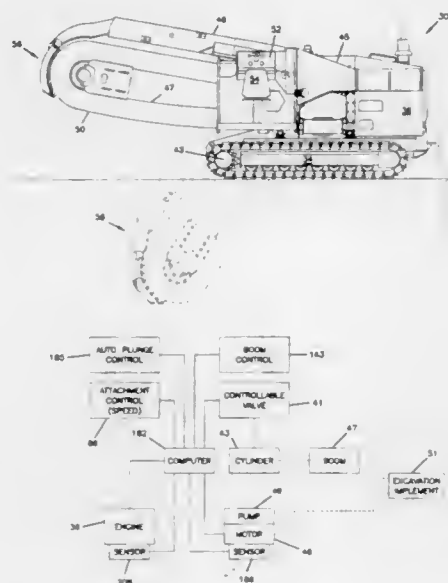
Filed Feb. 19, 1997, Ser. No. 801,369

Int. Cl.<sup>6</sup> E02F 9/24

U.S. Cl. 37—348

17 Claims

I. A system for controlling an excavation attachment coupled to an excavation machine having an engine, the system comprising:



a boom pivotally mounted to the excavation machine and supporting an endless digging chain;  
a cylinder, coupled to the excavation machine and the boom, that moves the boom between a ground-level position and a below-ground position;  
a controllable valve, coupled to the cylinder, that regulates displacement of the cylinder to modify a rate of boom movement; and  
a controller that controls the controllable valve to modify the rate of boom movement so as to maintain the engine at a target output level as the boom is moved between the ground-level and below-ground positions.

5,768,812

**DISPLAY MOUNT APPARATUS**

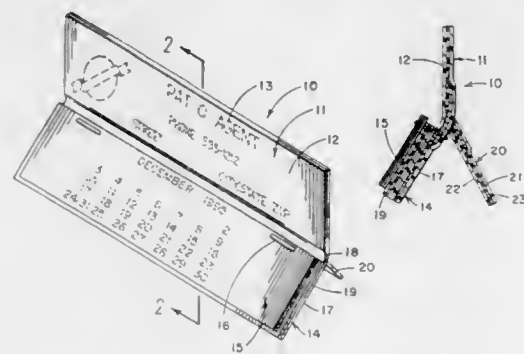
Carroll N. Cross, 3202 Holiday Ave., Apopka, Fla. 32703

Filed Oct. 11, 1995, Ser. No. 540,846

Int. Cl.<sup>6</sup> G09D 3/04

U.S. Cl. 40—120

6 Claims





an extractor member positioned in the longitudinal groove and having a first end and a second end with an outwardly extending lip portion positioned at the first end, said extractor member being normally positioned for extracting and pivotal in the groove about a first pivot point located between the first and second end; and

a spring member associated with the second end of the extractor member and connected to the bolt end which engages the extractor member to hold it in the groove while allowing the extractor to pivot against the force of the spring member; wherein the extractor member pivots radially against the force of the spring member about the first pivot point in order for the extractor member and bolt end to enter the cavity of the cartridge case so that the lip portion engages the cavity behind the flange of the cartridge case to aid in the withdrawal of the cartridge case from the chamber.

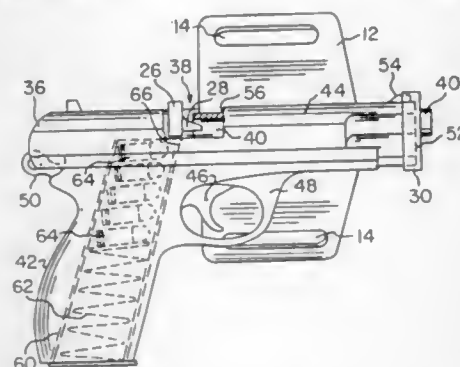
5,768,816

## SECURITY AND DEPLOYMENT ASSEMBLY

John N. Rassias, 7700 Cedarwood Cir., Boca Raton, Fla. 33434  
Continuation-in-part of Ser. No. 463,997, Jun. 5, 1995, Pat. No. 5,611,164. This application Nov. 5, 1996, Ser. No. 743,797  
Int. Cl.<sup>6</sup> F41A 17/00

U.S. Cl. 42—70.11

24 Claims



1. A locking assembly for a firearm having a firing chamber, a barrel and a spring-loaded, reciprocating slide element, said barrel having a barrel face and a muzzle end, said slide element having a muzzle end, said locking assembly comprising:

an action locking arm carrying a lug, said lug receivable in the firing chamber and barrel face of said firearm;

a slide element blocking device spaced from and structurally connected with said action locking arm, said slide element blocking device having an opening for passage of the muzzle end of said barrel therethrough;

the muzzle end of said barrel extendable through said opening when the muzzle end of said slide element is placed in contact with said slide element blocking device;

whereby when said lug is received in said barrel face and the muzzle end of said slide element is in contact with said slide element blocking device, said firearm is retained in said locking assembly.

5,768,817

## GUN HANDLE GRIP

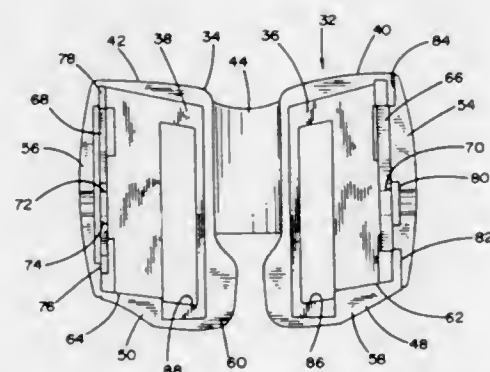
Terence J. Simons, 9020 Fir Dr., Thornton, Colo. 80229  
Filed Jan. 28, 1997, Ser. No. 789,854  
Int. Cl.<sup>6</sup> F41C 23/00; F41A 9/62

U.S. Cl. 42—71.02

20 Claims

16. A gun handle grip, comprising:

a first grip member having a first shell and a first L-shaped reinforcing member bonded to an inner surface of the first shell, and a second grip member having a second shell and a second L-shaped reinforcing member bonded to an inner surface of the second shell;



the first reinforcing member includes a first reinforcing flange and the first shell includes a first rear flange partially covering the first reinforcing flange, and the second reinforcing member includes a second reinforcing flange and the second shell includes a second rear flange partially covering the second reinforcing flange; and

wherein the first reinforcing flange and the second reinforcing flange are selectively engaged to facilitate the attachment of the first grip member and the second grip member to opposite sides of a handle of a firearm, while the first rear flange and the second rear flange are shaped to meet at a rear surface of the handle of the firearm and cover the rear surface of the handle of the firearm.

5,768,818

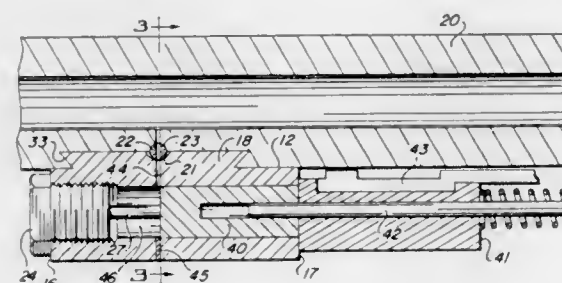
## ATTACHMENT FOR AFFIXATION TO THE BARREL OF A GAS OPERATED WEAPON

Joseph M. Rustick, 3043 E. Cypress, Phoenix, Ariz. 85008  
Filed Feb. 10, 1997, Ser. No. 797,040

Int. Cl.<sup>6</sup> F41A 21/00

U.S. Cl. 42—75.02

15 Claims



1. An attachment containing a gas chamber for affixation to the barrel of a gas operated weapon, said attachment having an open end for receiving the piston of a drive mechanism for ejecting spent shells from the weapon, said barrel containing a transverse slot for receiving the attachment, said attachment comprising:

a) a housing having first and second opposing surfaces and first and second opposing ends;

b) a chamber formed in said housing and having a port in the second end of said housing for receiving a piston therein;

c) a raised section formed on the first surface of the housing, said raised section having a top surface and inwardly tapered sides, said raised section being received by the transverse slot in the barrel;

d) a recess formed in the top surface of said raised section;

e) a sealing bead positioned in said recess for contacting the barrel and providing a sealing fit between said barrel and said raised section; and

f) a gas passage formed in said sealing bead and extending therethrough, said passage extending to the chamber in said housing and to the interior of the barrel, the increase in gas pressure generated in the barrel by firing a bullet being transmitted through the gas passage to the gas chamber and the piston therein.

5,768,819

## GUN GUARD

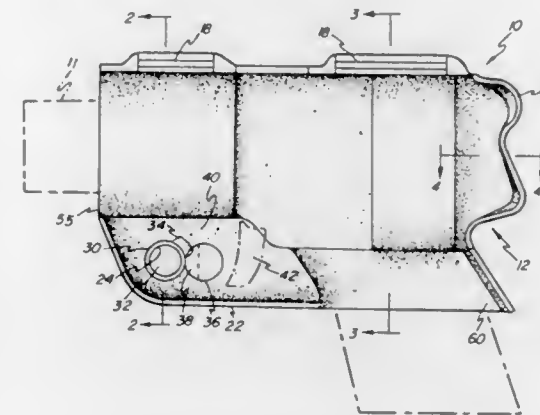
Kim W. Neal, Dayton, Ohio, assignor to GBG Corporation, Dayton, Ohio

Filed Mar. 14, 1997, Ser. No. 818,177

Int. Cl.<sup>6</sup> F41A 35/04

U.S. Cl. 42—96

5 Claims



1. A safety gun shield for enclosing certain operable portions of a handgun having a barrel, a trigger and trigger guard, a breech and a hand grip while protecting said operable portions and preventing unauthorized access thereto, comprising a pair of mutually engageable left-hand and right-hand body parts formed of high impact plastic material, which parts are substantially identical in configuration to each other and each of which forms a partial recess, a hinge permanently connecting each of said parts together along a common margin thereof permitting said parts to be moved from an open position in which a handgun may be placed therein and a closed position in which said parts mate together and form an interior space proportioned to receive such handgun therein, said parts, in the closed position, defining a forward facing opening proportioned to permit such gun barrel to extend therethrough and a downwardly facing opening proportioned to permit a portion of such handgun to extend therethrough and, in said closed position, enclosing such gun breech, trigger and trigger guard, leaving exposed only a portion of the gun barrel and a portion of the handgun extending respectively through said forward facing opening and said downwardly facing opening, said parts in said closed position having mutually interfitting and overlapping marginal edge portions for resisting ingress of a tool therebetween, said hinge along said common margin being substantially embedded within the plastic material of each of said parts, and a key operated lock extending between said parts at the portion thereof enclosing such trigger guard for retaining said parts in said closed position.

5,768,820

## SUBDUCTION BRINE SHRIMP HARVESTER

Patrick J. Bentzley, 184 E. N. Sandrun Rd., Salt Lake City, Utah 84103

Filed Sep. 22, 1994, Ser. No. 310,423

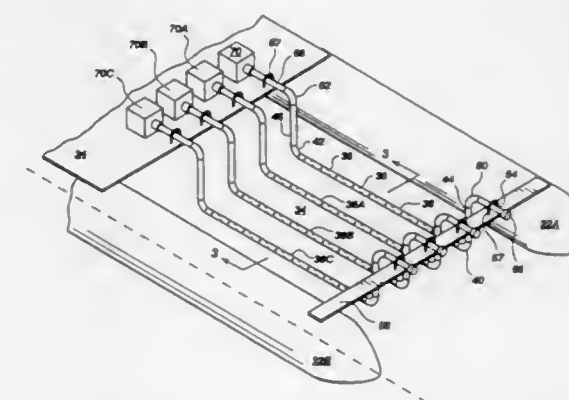
Int. Cl.<sup>6</sup> A01K 81/04

U.S. Cl. 43—6.5

15 Claims

1. An apparatus for collecting brine shrimp eggs floating in a body of water comprising:

an elongate pipe having an outer diameter of from about two to about four inches, said elongate pipe having a structure defining an interior space and an exterior surface, said structure defining apertures extending therethrough, communicating the interior space of the elongate pipe with the elongate pipe's exterior surface, said apertures extending along the elongate pipe's length, spacedly positioned from one to two inches



apart along said length, said apertures being of a size sufficiently large to pass brine shrimp eggs therethrough, said apertures having diameters of about one fourth to about three fourths inch, said elongate pipe further being positionable so that said apertures may be submersed in water at and beneath a level wherein brine shrimp eggs float in the water;

a pump, in fluid communication with the interior space of said elongate pipe, for creating a vacuum in said interior space for drawing water containing brine shrimp eggs through said apertures and into said interior space and thereafter withdrawing said water containing brine shrimp from within the interior space of said elongate pipe and directing it to a storage container,

wherein said pump is in fluid communication and connection with one end of said elongate pipe, and wherein the diameter of the apertures proximal the fluid communication and connection with the pump are dimensionally smaller than the diameters of said apertures distal the fluid communication and connection with the pump.

5,768,821

## PROTECTED PLATFORM FOR HUNTERS

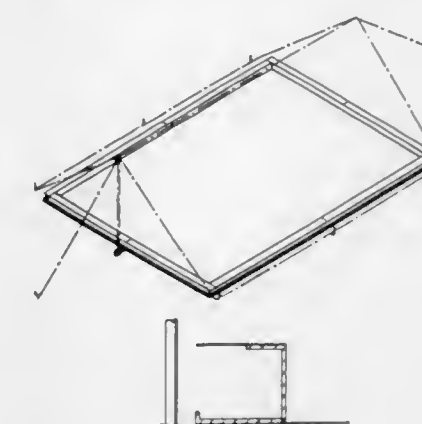
James D. Currey, 5054 W. University Blvd., Dallas, Tex. 75209

Filed Sep. 12, 1996, Ser. No. 712,807

Int. Cl.<sup>6</sup> A01M 1/14; B62D 63/04; A01K 3/00

U.S. Cl. 43—114

3 Claims



1. A protected platform comprising:

(a) a tarp having a periphery;

(b) a boundary extending upwards from the periphery of the tarp; and

(c) a tape attached to the boundary having an exposed adhesive surface extending beyond the periphery of the tarp.

5,768,822

## COMBINATION INSECT/WEED DESTROYER

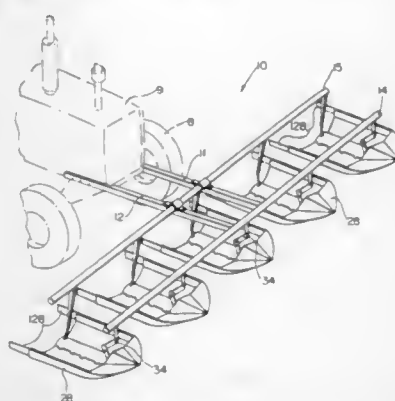
Robert C. Harrell, 616 N. St. John Ave., Dyersburg, Tenn. 38024

Filed Nov. 27, 1995, Ser. No. 562,884

Int. Cl.<sup>6</sup> A01M 5/00; 21/04

U.S. Cl. 43—144

6 Claims



I. Tractor mountable apparatus for collecting and destroying insects from multiple rows of growing plants and for destroying unwanted vegetation between the rows of growing plants, said apparatus comprising:

- a supporting frame including transversely spaced longitudinal support members for mounting to the front end of a tractor to project forward therefrom, and longitudinally spaced transverse support members carried by said longitudinal support members;
- a plurality of open top elongated metal pans;
- suspension means connected to said transverse support members and to said metal pans for suspending said metal pans at spaced intervals so that said metal pans move adjacent the ground between the rows of plants as the tractor mountable apparatus moves along the rows of plants;
- each of said metal pans having a plurality of transversely spaced longitudinal gas burner conduits for directing combustible gases along said pans for burning insects that fall into said pans as said pans move between the rows of plants;
- fluid couplings connecting said gas burner conduits to gas supply lines at one end of each of said metal pans; and
- a protective cover extending across said one end of each of said metal pans for preventing debris from entering each of said metal pans at said one end.

5,768,823

## CONTROLLED APPLICATION OF WEED CONTROL CHEMICALS FROM MOVING SPRAYER

Terrence J. Nelson, Saskatoon, Canada, assignor to Canadian Space Agency, Quebec, Canada

Continuation-in-part of Ser. No. 191,578, Feb. 4, 1994, Pat. No. 5,507,115. This application Apr. 15, 1996, Ser. No. 632,318

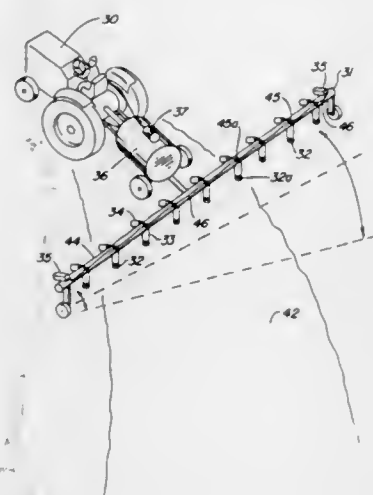
Int. Cl.<sup>6</sup> A01M 7/00

U.S. Cl. 47—1.7

3 Claims

1. A mobile chemical dispensing apparatus for applying herbicide to weeds through spray nozzles while the apparatus is traveling in a direction of travel over the ground comprising:

- (1) a boom positioned transversely to the direction of travel of the apparatus over the ground;
- (2) weed identification means carried by said boom for determining the probable presence of weeds within a field-of-view of said weed identification means;
- (3) a plurality of spray nozzles carried by said boom, each of said spray nozzles having a respective field-of-spray for applying herbicide to weeds present within the field-of-view of said weed identification means;
- (4) nozzle control means coupled between said weed identification means and each of said spray nozzles to cause the release of herbicide in proximity to said weeds; and



5,768,824

## LAWN AND GARDEN EDGING SYSTEM

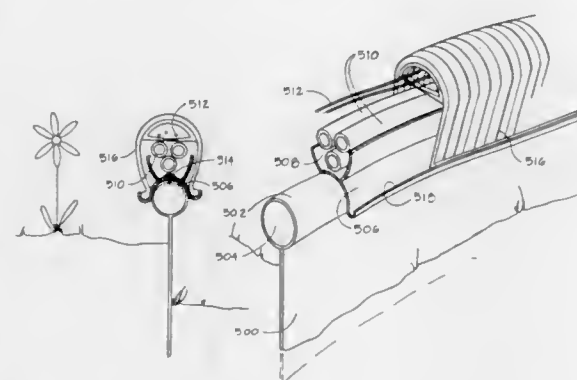
Warren W. Matz, 882 U.S. Hwy. 1, Juno Beach, Fla. 33408

Continuation-in-part of Ser. No. 435,891, May 5, 1995, Pat. No. 5,535,545. This application Jul. 15, 1996, Ser. No. 680,442

Int. Cl.<sup>6</sup> A01G 1/08

U.S. Cl. 47—33

11 Claims



1. A conduit for use with a flexible plastic edging divider, said edging divider defined by a tubular shaped top which extends longitudinally along the length of the divider with a vertical barrier of nominal thickness depending therefrom for insertion into the ground, said conduit comprising:

- a flexible structure defined by a substantially U-shaped upper portion formed integral to an inverted substantially U-shaped lower portion, said upper portion providing a passageway for placement of water tubes and electrical wires, said lower portion forming an inverted receptacle securable to said tubular shaped top of said edging divider; a cover for said passageway; and a means for coupling said cover to said flexible structure.

5,768,825

## PLANT PRESERVATION BAG AND METHOD

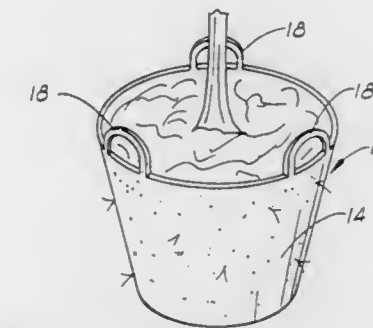
Ralph E. Reiger, 7505 N. Broadway, Oklahoma City, Okla. 73116

Continuation of Ser. No. 691,422, Aug. 2, 1996, abandoned, which is a continuation of Ser. No. 384,969, Feb. 7, 1995, abandoned. This application Aug. 6, 1997, Ser. No. 907,281

Int. Cl.<sup>6</sup> A01G 9/02

U.S. Cl. 47—78

14 Claims



1. A method of preserving a landscape plant while restricting the growth thereof after initially field growing the plant without restriction in the ground and removing it therefrom along with a root and soil mass having a shape generally corresponding to an inverted truncated cone in anticipation of transplantation comprising the steps of:

- field growing the plant without restriction to a desired transplantation size;
- placing said root and soil mass of said landscape plant in an inverted truncated cone shaped plant preservation and growth control bag having an open top, a continuous side and a bottom, said side being tapered inwardly from said open top to said bottom and being formed of a porous, needle punched fabric of fibers which are tangled and knotted as a result of being needle punched whereby said roots are caught by said fabric but penetration of said fabric by said roots is severely restricted thereby restricting further growth of said plant, said fabric substantially preventing said roots from circulating in said bag; and
- providing water to said plant within said bag, said bag maintaining its truncated cone shape after said root and soil mass has been placed therein.

5,768,826

## AIR WINDOW APPARATUS

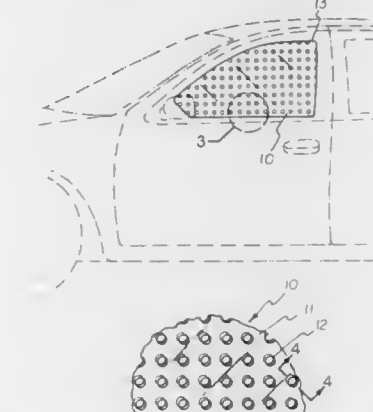
Lisa Wilcher, and Wayne Wilcher, both of Rt. 1 Box 123A, Kite, Ga. 31049

Filed Dec. 31, 1996, Ser. No. 775,724

Int. Cl.<sup>6</sup> E05B 65/04

U.S. Cl. 49—61

3 Claims



1. An air window apparatus mountable in a window opening of a vehicle comprising:

a transparent essentially rigid member having an outer perimeter shape adapted to fit in the window opening of a vehicle, said rigid member having an interior surface for orienting toward the interior of a vehicle and an exterior surface for orienting toward the exterior of a vehicle, said rigid member having top and bottom edges and a front edge for orienting in the window opening toward the front of the vehicle and a rear edge for orienting in the window opening toward the rear of the vehicle, said rigid member having a plurality of ventilation holes there-through, each said ventilation hole having an interior opening on the interior surface of the rigid member and an exterior opening on the exterior surface of the rigid member, wherein the interior opening of each said ventilation hole is located relatively closer to the top edge of said rigid member and the exterior opening is located relatively closer to the bottom edge of said rigid member to thereby discourage precipitation entry inward through the ventilation holes, and wherein the interior opening of each said ventilation hole is located relatively closer to the front edge of said rigid member and the exterior opening is located relatively closer to the rear edge of said rigid member to thereby discourage precipitation and wind entry inward through the ventilation holes of said rigid member as the vehicle moves in a forward direction.

5,768,827

## VEHICLE WINDOW GUARD FOR PETS

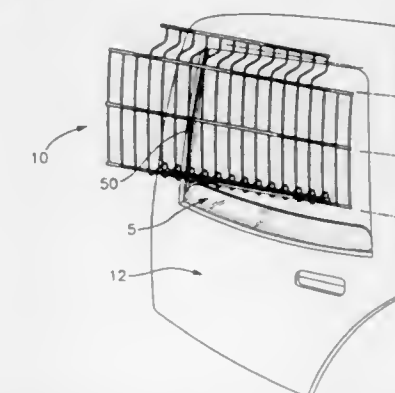
Cletus Eugene Hackett, Rte. 3, Box 266, Lone Oak, Tex. 75453

Filed Apr. 30, 1997, Ser. No. 846,297

Int. Cl.<sup>6</sup> E06B 3/68

U.S. Cl. 49—57

16 Claims



1. A vehicle window guard for an automotive vehicle having door windows defined by a door and a door window frame containing a window which is guided into a receiving groove comprising:

- (1) An outer frame;
- (2) a plurality of middle horizontal bars fixedly engaged to said outer frame;
- (3) a plurality of first vertical bars fixedly engaged to said outer frame and said middle horizontal bars;
- (4) a plurality of second vertical bars fixedly engaged to said outer frame and said middle horizontal bars;
- (5) a to retainer bar fixedly engaged to said second vertical bars; and
- (6) a bottom retainer bar fixedly engaged to said second vertical bars;

wherein said second vertical bars have a top portion and a bottom portion and wherein said second vertical bars are fixedly engaged to said outer frame and wherein the top portion of said second vertical bars bend away from the outer frame at an angle of approximately ninety degrees for a distance of one to five inches and then bend upward at an angle of approximately ninety degrees for a distance of one to five inches to the point where said second vertical bar is fixedly engaged to said top retainer bar and wherein the bottom portion of said second vertical bars bend away from the outer frame at an angle of approximately ninety degrees for a distance of one to five inches and then bend downward at an angle of approximately ninety degrees for a distance of one to five inches to the point where said second vertical bar is fixedly engaged to said bottom retainer bar.



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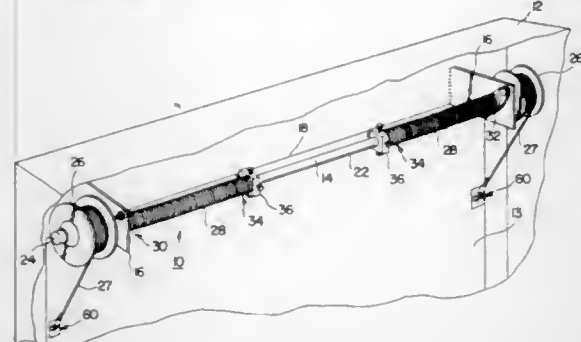
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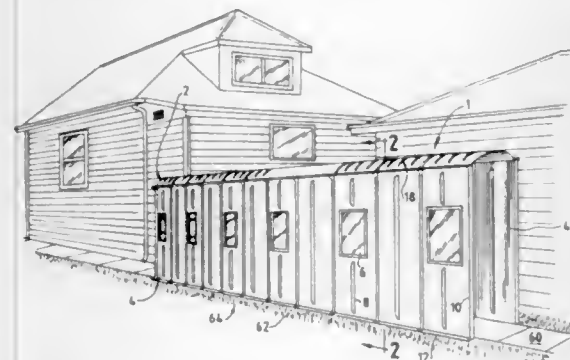
of approximately ninety degrees for a distance of one to five inches to the point where said second vertical bars are fixedly engaged to said bottom retainer bar.

5,768,828  
COUNTERBALANCING MECHANISM  
Randy Dale Wilson, 59725 County Rd. 9 South, Elkhart, Ind. 46517  
Filed May 30, 1996, Ser. No. 655,619  
Int. Cl.<sup>6</sup> E05F 1/10  
U.S. Cl. 49—386 4 Claims



1. An apparatus closing an opening in a wall, comprising:  
a door member hinged to the wall adjacent the bottom of the opening so as to permit upward pivotal movement of the door member to close the opening,  
a plurality of cables attached to the door member and connected to the wall adjacent the top of the opening,  
counterbalancing means, connected to the wall adjacent the top of the opening, for applying force to the cables to at least in part counterbalance the weight of the door member and thereby facilitate movement of the door member about the hinge, and  
the counterbalancing means including at least two spring elements, each of which independently applies a portion of the force to each of the cables, wherein each spring element is tensioned so as to be able to independently restrain the door against opening once the door is in a closed position.

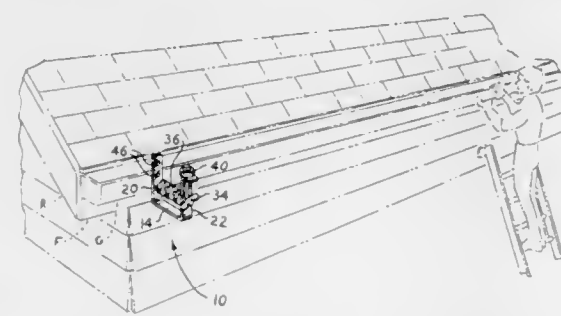
5,768,829  
METHOD AND APPARATUS FOR A TEMPORARY CORRIDOR  
Michael G. Thompson, and Lee A. Bowman, both of 5847 Cleveland, Morton Grove, Ill. 60053  
Filed May 24, 1996, Ser. No. 653,148  
Int. Cl.<sup>6</sup> E04B 1/32  
U.S. Cl. 52—86 11 Claims



10. A temporary corridor of easily transportable elements erected on a selected site for sheltering individuals against adverse weather conditions comprising:

a. at least one generally horizontal member, each of said at least one generally horizontal member being substantially rectangular in plan, having a first end edge and an oppositely disposed second end edge, and having a first side flange and an oppositely disposed second side flange,  
said first end edge and said second end edge, each being free of a transverse flange with perforations,  
said first side flange and said second side flange each having a predetermined number of holes therethrough;  
b. a plurality of vertical members equal in number to twice the number of said at least one generally horizontal member, each of said vertical members having a generally flat rectangular shape with a peripheral flange comprising a top section, a bottom section, a right side section and a left side section,  
said top section having a plurality of boreholes corresponding in number and pattern of distribution with the holes of either the first side flange or the second side flange of the horizontal member; and  
c. means for connecting the first side flange of each of said at least one generally horizontal member to the top section of one of said vertical members and for connecting the second side flange of each of said horizontal members to which one of said vertical members is connected to the top section of another one of said vertical members, to form at least one corridor unit with the horizontal member on top and at least one of said vertical members extending downwardly from the first side flange and at least one of said vertical members extending downwardly from the second side flange of the horizontal member, said vertical members supporting the horizontal member with the bottom section of each of the respective vertical members disposed toward the site,  
said means for connecting comprising a plurality of removable locking pins corresponding in number and pattern of distribution with the holes of the first side flange and the second side flange of the horizontal member,  
each of said removable locking pins being suitably sized to enter and interlock the holes of the at least one generally horizontal member to the boreholes of the top section of the respective vertical members; and further comprising means for joining the right side section of one of the vertical members of one of the corridor units to an adjacent left side section of the vertical member of another corridor unit placed side by side with the right side section of one of the vertical members of one of the corridor units adjacent to the left side section of the vertical member of another corridor unit,  
whereby a series of said corridor units may be joined together to form an extended passageway.

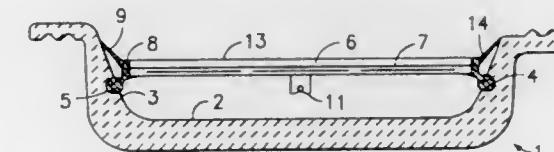
5,768,830  
SUPPORT FOR CONSTRUCTION MATERIAL  
Kevin J. Kelly, P.O. Box 1573, Rancho Cordova, Calif. 95741  
Filed Oct. 18, 1996, Ser. No. 732,689  
Int. Cl.<sup>6</sup> E02D 35/00; E04B 1/00; E04G 21/14  
U.S. Cl. 52—127.1 15 Claims



1. A support for construction material, comprising:  
a generally U-shaped frame having a flat, planar base with a first end and a second end opposite said first end;

said first end of said base having a flat, planar first frame arm extending upwardly therefrom, and said second end of said base having a flat, planar second frame arm extending upwardly therefrom, with said first frame arm and said second frame arm being parallel to one another and defining a construction material support channel therebetween;  
said second frame arm includes an uppermost end having a guide tab extending outwardly therefrom said guide tab including low friction construction material guide means disposed thereon;  
each said frame arm including an adjustment slot therein, with each said slot being parallel to one another;  
a construction material support member adjustably secured between and through each said adjustment slot, said support member extending between each said frame arm and spanning said construction material support channel and providing for the adjustable support of construction material thereupon;  
said support member further including low friction construction material support means disposed thereon, providing for the ease of lateral movement of construction materials between first frame arm and said second frame arm and precluding frictional damage to construction material supported by said support member;  
said low friction guide means comprises at least one guide roller having an axis generally perpendicular to said support member, said guide roller including an outer circumference extending inwardly past said second frame arm and slightly above said construction material support channel disposed between said first frame arm and said second frame arm, and;  
said first frame arm including temporary structure attachment means disposed therein.

5,768,831  
ROOFTILE SUPPORT FOR PHOTOCCELL PANEL  
Bernd Melchior, Wermelskirchen, Germany, assignor to Blue Planet AG, Schaan, Liechtenstein  
PCT No. PCT/EP94/02943, § 371 Date Apr. 24, 1996, § 102(e) Date Apr. 24, 1996, PCT Pub. No. WO95/08194, PCT Pub. Date Mar. 23, 1995  
PCT Filed Sep. 3, 1994, Ser. No. 615,215  
Claims priority, application Germany, Sep. 16, 1993, 43 31 424.4; Sep. 16, 1993, 43 31 425.2; Apr. 1, 1994, 44 11 458.3  
Int. Cl.<sup>6</sup> E04D 13/18; H01L 31/048  
U.S. Cl. 52—173.3 29 Claims



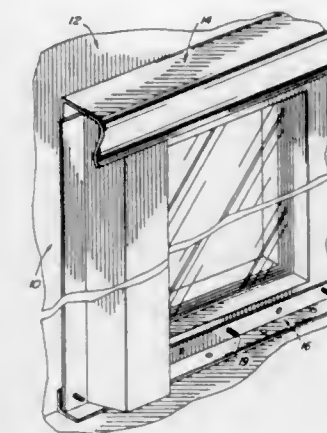
1. Roof tile/roof slate/wall plate made of a plate of clay, ceramic, concrete, fiber cement or synthetic, formed with a plurality of recesses, in combination with a solar panel (6) with photovoltaic solar cells to be attached to its upper side, wherein said solar panel (6) is attached form-fittingly to the upper side of the roof tile/roof slate/wall plate with at least two sides opposite to one another at the inner edges of a recess of an indent of a roof tile/roof slate/wall plate, flexible extensions (5, 19) are positioned on the side of the solar panel, and the extensions (5, 19), due to their own flexibility, engage in a snap-in manner, in recesses (4) of the roof tile/roof slate/wall plate indentation (2).

5,768,832

Patent Not Issued For This Number

179-280 O.G. - 98 - 4 : QL 3

5,768,833  
STORM SHUTTER RETAINER ASSEMBLY  
Selig Golen, 5137 NW 93rd Doral Way, Doral Estates, Miami, Fla. 33178  
Continuation-in-part of Ser. No. 260,332, Jun. 15, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 488,153  
Int. Cl.<sup>6</sup> E06B 3/26  
U.S. Cl. 52—202 6 Claims



1. A storm shutter retainer system designed to attach a storm shutter to a building structure, said system comprising:  
an upper retainer assembly comprising:  
a) a header structure having an elongated configuration and a hollow interior extending along the length thereof to define a retainer channel within said header structure,  
b) said header structure including a rear flange and a front flange spaced outwardly from said rear flange,  
c) a top flange integrally attached to and interconnecting said rear and front flanges,  
d) each of said top, rear, and front flanges extending along the length of said header structure in collectively surrounding relation to said retainer channel,  
e) said retainer channel adapted for receiving an upper peripheral edge of the storm shutter in a retaining position therein,  
f) connecting means mounted at least partially within said retaining channel for securing said header structure to the building structure,  
g) said connecting means including a connector element extending through said rear flange and including a head portion disposed within said channel, said connecting means adapted to orient said connector element in an upwardly angled position to resist any upwardly directed cantilever forces exerted on said header structure through the storm shutter, and  
a lower retainer assembly comprising:  
a) a generally L-shaped base member, said base member including a planar flange and a rear flange,  
b) said rear flange being structured and disposed for secure, planar connection to the building structure,  
c) said planar flange being structured and disposed to supportably receive a lower peripheral edge of the storm shutter thereon, the storm shutter being received therein from an open front face of said base member so as to permit facilitated slided engagement of the upper peripheral edge of the storm shutter into said upper retainer assembly,  
d) a generally L-shaped lock panel, said lock panel including a lower lock flange and an upwardly extending front flange, and  
e) said lower lock flange being structured for secure co-planar engagement with said planar flange of said base member, co-planar securing of said lock flange to said planar flange resulting in affirmative retention of the lower peripheral edge of the storm shutter within said lower retainer assembly.

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OFFICIAL GAZETTE

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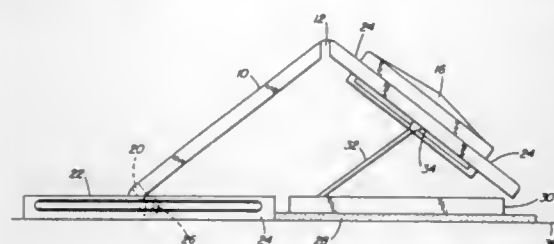
RAIN SHIELD

Robert C. Pinder, R.R. 21, Cambridge, Ont., Canada, N3C 2V3  
Continuation of Ser. No. 521,883, Aug. 31, 1995, abandoned.  
This application Aug. 27, 1996, Ser. No. 703,689

Int. Cl.<sup>6</sup> E06B 3/26

U.S. Cl. 52—202

8 Claims



1. A roof vent rain deflector for co-operating with a standard vehicle hinged roof vent cap, said roof vent cap being hinged at a forward edge, thereof and having side edges and a rear edge, said deflector adapted to overlie and be coupled to said cap to prevent rain from entering the vent when the cap is raised, said deflector comprising:

a first panel having a forward edge, a rear edge, and side edges, adapted to be attached to and entirely overlie said cap and extend beyond each side edge of said cap for a distance of approximately one half the width of said cap;  
a second panel of substantially the same size as said first panel having a forward edge hinged to said first panel at the rear edge of said first panel and having a rear edge,  
track means adapted to be fastened to the roof of a vehicle equipped with said roof vent, and positioned to provide a sliding connection to the rear edge of said second panel, and means connecting said second panel in sliding relation to said track means, whereby when said cap is opened, said first panel is moved with said cap, and the forward edge of said second panel which is hinged to said first panel moves upwardly, and the rear edge of said second panel moves along said track means, said first and second panels are capable of forming a pair of triangular openings on either side of said vent cap, permitting flow of air from said vent while preventing rain from entering therein.

5,768,835

Patent Not Issued For This Number

5,768,836

HEAT AND SOUND TRANSMISSION ATTENUATED  
FRAMING STRUCTURE, PARTICULARLY DOOR OR  
WINDOW FRAMING

Otto Bachmann, Hochdorf, Switzerland, assignor to Sunshine  
Engineering AG, Hochdorf, Switzerland

Filed Nov. 18, 1996, Ser. No. 751,635

Claims priority, application Switzerland, Nov. 21, 1995, 03  
289/95

Int. Cl.<sup>6</sup> E06B 3/32

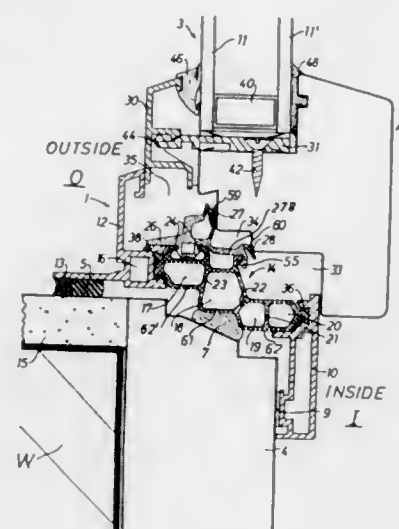
U.S. Cl. 52—204.51

18 Claims

1. A heat and sound transmission attenuated framing structure, optionally a door or window framing structure, for installation in a building having

a stationary frame (1, 1') and a movable window or door frame (2, 2a, 2b);

two metal rails (10, 12; 52, 54), one (10, 52) of said rails being an inside rail located at an inner side (I) of the building and the other (12, 54) being an outside rail, located at an outer side (O) of the building; and



a heat and sound insulating structure located between said inside and outside rails,

wherein the heat and sound insulating structure comprises

a thin-walled chambered strip (14) of hard plastic material having first and second thin-walled elongated strip portions and thin-walled cross ribs (21, 22, 23) between said strip portions, thereby defining at least three, and optionally four chambers (17—20), in which at least two of said chambers are of different size, said chambers being serially located in the direction of thermal gradient between the outside (O) and the inside (I) of the building,

said chambers (17—20) in said strip (14) being located, with respect to a dimension transverse to the longitudinal extent of the outer or inner one of said rails, in staggered or Z-shaped configuration;

wherein the metal rails (10, 12; 52, 54) and the end portions of said strip (14) are formed with interlocking, dovetail and respectively staggered connection arrangements, provided, respectively, on said rails and the end portions of said chambered strip (14) to form a connection means securely connecting opposite lateral portions of the chambered rail (14) with said inside and outside rails (10, 12; 52, 54) respectively, wherein at least one of said strip portions of the chambered strip is formed with an essentially flat, parallel surface (61, 62) facing a portion (4) of the building;

wherein support means (7) are provided between at least one (61) of said essentially flat surfaces (61, 62) and said portion (4) of the building;

wherein at least one of said strip portions of said chambered strip (14), opposite an outermost chamber (17), is formed with two oppositely directed ribs (24) defining a re-entrant dovetailed opening;

a rubber-elastic strip (26) is provided, fitted in said re-entrant dovetailed opening and in engagement with a portion of the movable window or door frame (2, 2a, 2b); and

wherein said sealing strip (26) is formed with at least one sealing extension or sealing lip (27, 28) engaging against the movable window or door frame (2, 2a, 2b).

5,768,837

PROFILE STRUCTURE FOR GLAZING

Jarmo Sjöholm, Hovitie 20, FIN-01380 Vantaa, Finland

PCT No. PCT/FI95/00078, § 371 Date Aug. 19, 1996, § 102(e)

Date Aug. 19, 1996, PCT Pub. No. WO95/22676, PCT Pub.

Date Aug. 24, 1995

PCT Filed Feb. 16, 1995, Ser. No. 696,937

Claims priority, application Finland, Feb. 21, 1994, U940110

Int. Cl.<sup>6</sup> E06B 1/04

U.S. Cl. 52—204.62

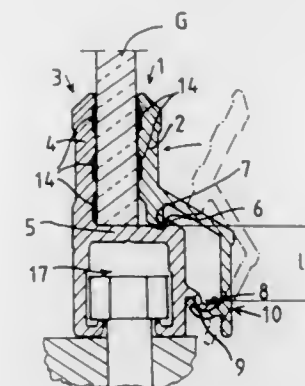
7 Claims

1. A sectional structure, comprising:

JUNE 23, 1998

GENERAL AND MECHANICAL

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a glazier's strip section having a first side brace flange for bracing one side of a glass pane;  
a casing section having a second side brace flange for bracing the other side of the glass pane;  
a bottom rest which is positioned at substantially a right angle with respect to the second side brace flange, the glass pane being disposed in a space defined by the first and second side brace flanges and the bottom rest;

the glazier's strip section and the casing section, formed mutually interlockable, having fixing means for detachably attaching the glazier's strip section to the casing section, said fixing means comprising a first locking claw, formed on the casing section, and a second locking claw, formed on the glazier's strip section for interlocking with the first locking claw;

a first brace member, formed on the casing section;  
a second brace member, formed on the glazier's strip section, bracing against the first brace member which forms a pivot between the glazier's strip section and the casing section, wherein the glazier's strip section is pivotable between a locked position and an unlocked position, with the first and second brace members urged against each other, the glazier's strip section being turnable around the pivot constituted by the first and second brace members in cooperation, for pressing the first side brace flange against a surface of the glass pane into the locked position, wherein the first and second locking claws become interlocked.

5,768,838

POLYURETHANE PITCH POCKET

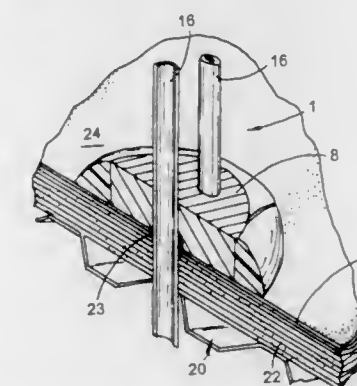
Philip C. Georgeau, Kalamazoo, Mich., assignor to Consul  
Tech, Inc., Kalamazoo, Mich.

Filed Feb. 21, 1997, Ser. No. 804,497

Int. Cl.<sup>6</sup> E04D 13/14

U.S. Cl. 52—219

12 Claims



1. A pitch pocket for sealing a mechanical penetration of a roof, comprising:

a multi-piece curb, having at least four quarter-circular corner elements, and at least four intermediate elements, wherein each of said curb elements is made from a substantially solid

polyurethane material and has a base surface and similarly shaped lateral cross-sectional configuration with diagonal cut free ends which when arranged abuttingly end-to-end define a continuous pocket with a generally quadrilateral plan shape; an adhesive applied to the base surface and the free ends of each of said curb element for securing the curb elements to each other, and to the roof; and

a pourable sealant cast within said pocket and forming a solid seal about the penetration in the roof.

5,768,839

CENTRAL FLANGE MOUNTED DAMPER

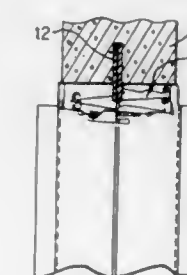
Francis J. McCabe, #6 Bunker Hill Rd., Ottsville, Pa. 18942

Filed Mar. 29, 1996, Ser. No. 625,796

Int. Cl.<sup>6</sup> F24F 13/10; F04G 21/02

U.S. Cl. 52—220.8

3 Claims



3. A method of mounting a fire damper in a masonry wall including mortar, said damper having a metal frame formed in a substantially rectangular channel shape terminating in end edges which lie in substantially parallel planes, comprising: providing said damper with a planar flange extending outwardly from and about said metal frame positioned in a plane substantially parallel to said planes of said end edges and located substantially centrally between the planes of said end edges; said flange having a plurality of holes therethrough; providing a hole in said wall; positioning the damper in said hole in said wall with the outwardly extending flange positioned within said hole and within said wall; and then building said wall up against the outer metal frame and outwardly extending flange, including forcing mortar through said holes in said flange.

5,768,840

INTEGRATED UTILITY DISTRIBUTION AND PANEL  
SYSTEM

Thomas G. Feldpausch, Hastings, and Carl V. Forslund, Grand  
Rapids, both of Mich., assignors to Steelcase Inc., Grand  
Rapids, Mich.

Continuation-in-part of Ser. No. 63,463, May 18, 1993. This  
application Aug. 22, 1994, Ser. No. 294,074

Int. Cl.<sup>6</sup> E04B 2/78

U.S. Cl. 52—239

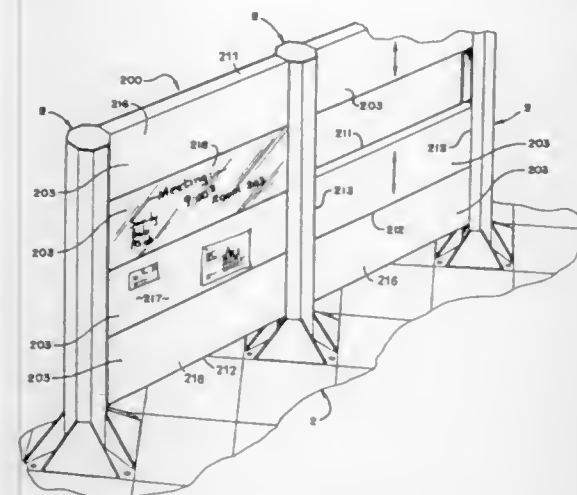
27 Claims

1. An integrated utility distribution and panel system for open  
office plans and the like, comprising:

a prefabricated floor construction adapted to be abuttingly supported on a building floor, and including a hollow interior portion thereof defining at least one raceway to route utilities therethrough, and a floor surface shaped to support at least one workstation thereon;

at least two utility posts for distributing utilities from said floor construction to the workstation, and each including a foot shaped to be mounted on said floor construction to rigidly support said utility posts in a generally upstanding orientation; said utility posts each include a fixed panel support channel extending longitudinally along a substantial portion of the same, and a utility channel which communicates with the raceway in said floor construction for dispensing utilities to the workstation; and





at least one non-structural panel extending between and supported by said utility posts; said panel having a lightweight non-structural construction, with connectors positioned adjacent opposite ends thereof which are slidably received directly in and mate with the panel support channels in said utility posts to removably support said panel on said utility posts, and permit said panel to be shifted vertically therealong between various elevations; said panel connectors being laterally movable to permit said panel to be manually mounted in and removed from the fixed panel support channels of said utility posts without tools.

5,768,841

## WALLBOARD STRUCTURE

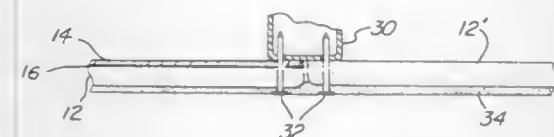
Allan J. Swartz, Orange, and Gregory Kulpa, Tustin, both of Calif., assignors to Swartz & Kulpa, Structural Design and Engineering, Tustin, Calif.

Continuation of Ser. No. 371,859, Jan. 12, 1995, abandoned, which is a continuation of Ser. No. 47,706, Apr. 14, 1993, abandoned. This application Jul. 26, 1996, Ser. No. 687,834

Int. Cl.<sup>6</sup> F04B 1/74

U.S. Cl. 52—281

11 Claims



1. A building shear wall structure for accommodating in-plane or shear loads imposed on the wall structure comprising:  
a plurality of framing studs forming a part of the building;  
a plurality of composite wallboard panels, each composite panel comprising only one wall board panel and one thin sheet of high strength material attached to and covering one entire side of the wallboard panel, the panel and attached thin sheet of high strength material forming together the entire composite wallboard panel; and  
securing means for attaching the wallboard panels to the framing studs such that the thin sheet of high strength material sits directly against the framing studs with the securing means penetrating the composite panel underlying the sheet of high strength material and the studs, the thin sheet of high strength material having a strength at least as great as a steel sheet having a thickness within the range of 0.015 to 0.060 inches, the sheet of high strength material being capable of resisting anticipated in-plane or shear loads imposed on the shear wall structure due to environmental conditions such as wind and earthquakes.

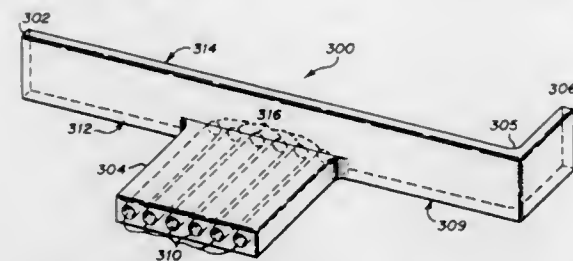
5,768,842  
WEED DRAIN FOR TILE WALLS  
Robert M. Austin, 15425 Sierra Morena Ct., Morgan Hill, Calif. 95037

Filed Jun. 28, 1996, Ser. No. 671,658

Int. Cl.<sup>6</sup> E04B 1/70

U.S. Cl. 52—302.3

9 Claims



1. A weep drain (300, 400) for integral engagement to a tile wall (100, 600, 800) for allowing water, moisture, or other liquids to drain from behind the tile wall (100, 600, 800) to the exterior of the tile wall, the weep drain (300, 400) comprising:  
a dam (302, 402) for integral coupling to said tile wall, the dam having a first exterior planar surface for positioning in a plane parallel with a plane of said tile wall, a base (309) for integral engagement to said tile wall with a first interior surface opposite said first exterior surface, the dam having a curved portion (306, 406) at one end and a plurality of holes (316) penetrating said base (309) from said first exterior surface to said first interior surface for collecting and diverting water, moisture, or other liquids from about said first interior surface to said plurality of holes (316); and  
an extrusion (304) coupled to the dam (302, 402) at said first exterior planar surface with a plurality of centrally located hollow cylindrical tubes (310) respectively coupled to said plurality of holes (316) in the dam (302, 304) and projecting from said first exterior planar surface for allowing said water, moisture, or other liquids to drain from said first interior side through said cylindrical tubes.

5,768,843

## APPARATUS AND METHOD FOR MOUNTING SUSPENSION CEILING PANELS

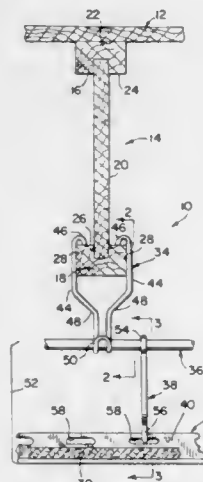
Jerome J. Dziedzic, 5350 S. Cambridge La., Greenfield, Wis. 53221

Filed Oct. 21, 1996, Ser. No. 734,094

Int. Cl.<sup>6</sup> E04B 9/18

U.S. Cl. 52—506.06

13 Claims



1. A ceiling construction comprising:  
a joist connected to a floor, said floor being located above said ceiling and forming part of said ceiling construction;  
a plurality of mounting clips suspended from said joist;

a plurality of ceiling panels;  
a panel holding framework suspended beneath said joist;  
a plurality of elongated leveling rods retained in said mounting clips in a substantially horizontal orientation extending generally transverse to a longitudinal axis of said joist; and  
a plurality of hangers dependent from and removably mounted on said leveling rods, said leveling rods supporting said panel holding framework and said ceiling panels therein,  
wherein said joist includes a top member secured to said floor, a bottom member having a substantially flat upper support surface and a pair of substantially flat side support surfaces, wherein said upper support surface and said side support surfaces support said mounting clip, said joist further including a web interconnecting said top member and said bottom member,  
wherein each of said mounting clips is constructed of drawn wire and includes a pair of resilient arms which engage said upper support surface of said bottom member,  
wherein said arms include parallel upper runs which engage against said side support surfaces of said bottom member, and  
wherein said parallel upper runs converge towards each other and form parallel lower runs which eventually merge together forming an upturned retainer loop in which one of said leveling rods is slidably supported.

5,768,844

## BUILDING SIDING PANELS AND ASSEMBLIES

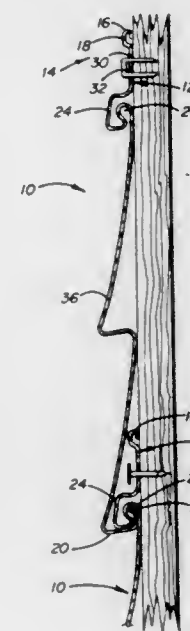
Thomas E. Grace, Sr., Catawaba, N.C., and Douglas L. Price, Cuyahoga, Ohio, assignors to Noradex, Macedonia, Ohio

Filed Dec. 16, 1996, Ser. No. 767,538

Int. Cl.<sup>6</sup> E04D 2/20; 2/30

U.S. Cl. 52—529

10 Claims



1. An elongated siding panel to be attached to a building substrate, comprising:  
an elongated body having an inner face and an outer face, an upper end, and a lower end, said body having a vertically oriented hem attaching portion near said upper end, said hem attaching portion having a plurality of horizontally spaced-apart slot pairs, each said slot pair having an upper slot and a lower slot that are vertically aligned and spaced apart in relation to each other, said upper and lower slots extending through the body to allow a fastener to be driven there-through;

a C-shaped portion at the upper end of the body extending above said hem attaching portion, said C-shaped portion having a vertically oriented flat edge that is generally parallel to the hem attaching portion.

5,768,845

## MODULE PANEL AND ASSEMBLY

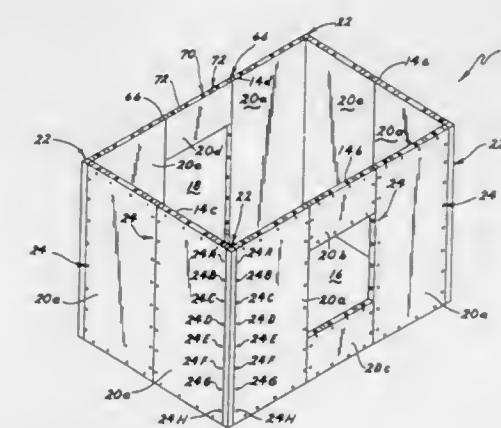
Bryan J. Beaulieu, and Igor Slutsky, both of Burnsville, Minn., assignors to Skyline Displays, Inc., Burnsville, Minn.

Filed Oct. 4, 1996, Ser. No. 725,725

Int. Cl.<sup>6</sup> E04B 2/74

U.S. Cl. 52—585.1

22 Claims



1. In combination:  
a module panel including a frame and a central core, the frame being formed of a generally rigid member having a substantially closed outer shell defining an interior region, a connector hole communicating with the interior region, and an anchor opening communicating with the interior region;  
a connector member having an end configured for insertion through the connector hole of the frame and an exposed end;  
a connector anchor member for supporting the end of the connector member within the hollow interior of the frame, the connector anchor member defining a connector cavity sized to receive the end of the connector member therethrough into the interior region of the frame such that the connector anchor member is moved within the interior region of the frame to align the connector cavity with the connector hole;  
a first fastener element selectively securing the connector anchor member in position with the connector cavity of the connector member, the exposed end of the connector member for selectively connecting the module panel to a like module panel.

5,768,846

Patent Not Issued For This Number

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5,768,847  
CONCRETE REINFORCING DEVICES, CONCRETE  
REINFORCED STRUCTURES, AND METHOD OF AND  
APPARATUS FOR PRODUCING SUCH DEVICES AND  
STRUCTURES

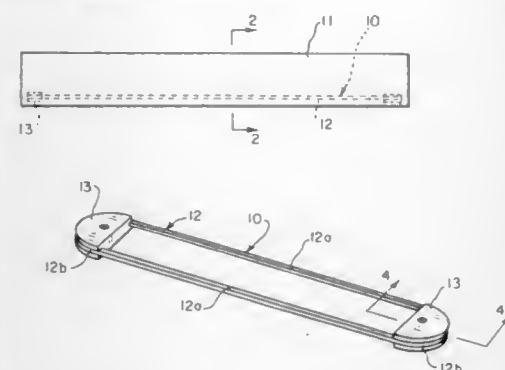
Frederick J. Policelli, 4891 Wallace La., Salt Lake City, Utah  
84117

Filed May 15, 1995, Ser. No. 441,386

Int. Cl.<sup>6</sup> E04C 3/34

U.S. Cl. 52—649.1

7 Claims



1. A reinforced concrete structure, comprising an advanced fibrous composite, concrete reinforcing device embedded in concrete and being of high strength, high modulus, fibrous material having a multitude of structural filaments bound together as laminae by a settable bonding material, said device comprising at least one elongate bar made up of at least one band of endless belt formation from said fibrous material, said at least one bar having band length portions extending longitudinally as load-bearing tendons along and defining a substantially correspondingly elongate, internal space substantially filled with concrete and having band end portions extending about opposite ends of the concrete-filled space in unbroken continuity with said band length portions.

5,768,848

Patent Not Issued For This Number

5,768,849  
COMPOSITE STRUCTURAL POST

Drago Blazevic, R.R. #1, Site 8, Box 28, Waverly, Nova Scotia,  
Canada, B0N 2S0

Filed Jun. 5, 1995, Ser. No. 463,018

Int. Cl.<sup>6</sup> E04C 3/36

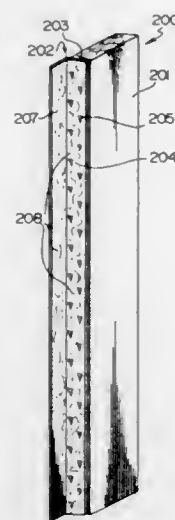
U.S. Cl. 52—737.3

12 Claims

1. A composite wooden/metal structural post for the erection of two interior walls which are disposed at right angles to one another said post comprising the combination of:

(A) a rectangular wooden stud having four faces and four corners; and

(B) at least one elongate metal angle bar having an "L"-shaped cross-section, and having a first arm and a second arm which are disposed at right angles to one another, each said arm having an exterior face and an interior face, the interior faces of each of said first arm of said elongate metal angle bar and said second arm of said elongate metal angle bar having a sufficiently rough surface for gripping a tip of a self-tapping screw to cause said self-tapping screw to enter said respective arm of said elongate metal angle bar upon application of torque to said self-tapping screw, said first arm of said elongate metal angle bar being secured to a first face of said rectangular wooden stud at one corner of said rectangular wooden stud by means of said exterior face of said first arm of said elongate metal angle bar being in secured contact with said first face of said rectangular wooden stud, and with said



exterior face of said second arm of said elongate metal angle bar extending outwardly from said rectangular wooden stud at said one corner adjacent to a second face of said rectangular wooden stud which is perpendicular to said first face of said rectangular wooden stud at said one corner; said first arm of said elongate metal angle bar thus having means for securing a first interior wallboard or interior sheathing directly to said interior face of said first arm of said elongate metal angle bar as well as to said first face of said rectangular wooden stud by means of self-tapping screws, and thus having means for securing a second interior wallboard or interior sheathing directly to said interior face of said second arm of said elongate metal angle bar by means of self-tapping screws; said second interior wallboard or interior sheathing being securable at right angles to said first interior wallboard or interior sheathing.

5,768,850

METHOD FOR ERECTING FLOOR BOARDS AND  
BOARD ASSEMBLY USING THE METHOD

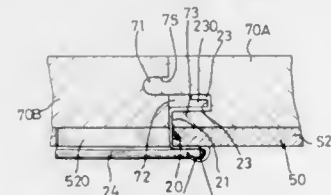
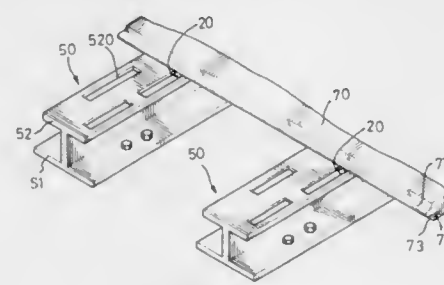
Alen Chen, No. 361-2, Sec. 3, Shenyang Rd., Peitun Dist.,  
Taichung, Taiwan

Filed Feb. 4, 1997, Ser. No. 794,807

Int. Cl.<sup>6</sup> E04B 5/00; E04F 15/00

U.S. Cl. 52—747.1

4 Claims



1. A method for assembling floor boards and comprising the steps of:

(a) providing a supporting joist fixedly mounted on a floor, said supporting joist including a bottom portion fixedly mounted

on said floor and a top portion forming a supporting beam defining a plurality of elongate slots therein;

(b) providing a plurality of floor boards on said supporting joist, each of said floor boards including a first end portion with a tongue protruding outwardly, a bottom plate located under said tongue, and a groove defined between said tongue and said bottom plate, and including a second end portion defining a recess therein,

(c) providing a plurality of fastener members each mounted on said supporting joist for securing each of said floor boards on said supporting joist, each of said fastener members including a plate abutting on an underside of said supporting beam, a question mark-shaped pressing member formed on said plate and received in a corresponding one of said elongate slots, and an opening defined between said plate and said pressing member with each said bottom plate of each said floor board securely received in a respective said opening; and and

(d) assembling each of said plurality of floor boards consecutively by forcing said tongue of each of said floor boards into said recess of an adjacent floor board.

5,768,851

STRUCTURE UNIT

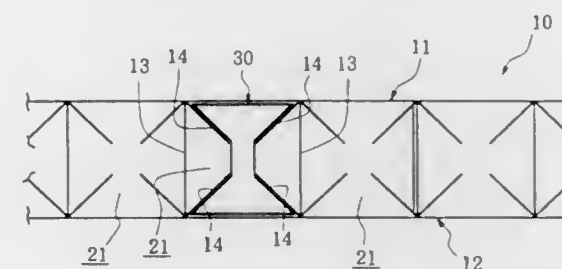
Tadayoshi Nagaoka, 573-2, Oaza Ureshi, Tondabayashi-shi,  
Osaka-fu, Japan

Filed Mar. 26, 1997, Ser. No. 827,327

Int. Cl.<sup>6</sup> E04B 2/28; E04C 2/34

U.S. Cl. 52—790.1

4 Claims



1. A structure unit comprising:

a pair of outer panels disposed in parallel to each other with a predetermined distance therebetween;

a plurality of partition panels provided between the pair of outer panels in a direction crossing the outer panels with a predetermined distance between the respective partition panels and with at least one end portion of the partition panels being connected to an inner surface of one of the outer panels, a unit space of a rectangular cross section being defined by adjacent ones of the partition panels and the inner surfaces of the outer panels; and

two pairs of inner diagonal panels provided substantially along diagonals of the rectangular cross section of the unit space, each of said pairs of inner diagonal panels consisting of panels located on the same diagonal and each of said panels having one end portion connected to the inner surface of one of the outer panels and an opposite end portion separated from an opposite end portion of the other panel of the same pair by a predetermined distance in a central portion of the unit space.

5,768,852

VERTICAL FORM, FILL AND SEAL MACHINE,  
COMPONENTS AND METHOD FOR MAKING  
RECLOSABLE BAGS

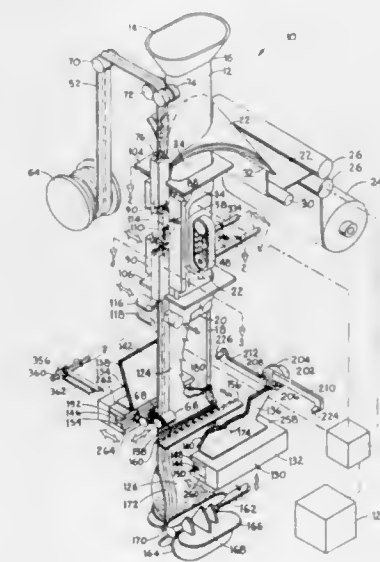
Emanuele Terminella; Frank Terminella, and Joseph Terminella, all of Fayetteville, Ark., assignors to Pacmac, Inc., Fayetteville, Ark.

Continuation-in-part of Ser. No. 355,933, Dec. 14, 1994, Pat. No. 5,505,037, which is a continuation of Ser. No. 153,273, Nov. 16, 1993, abandoned, which is a continuation of Ser. No. 905,903, Jun. 29, 1992, abandoned. This application Apr. 4, 1996, Ser. No. 628,966

Int. Cl.<sup>6</sup> B65B 9/20

U.S. Cl. 53—133.4

41 Claims



11. In a vertical, form fill and seal apparatus, the improvement comprising:

a common drive arrangement for selectively driving a film drive roll, film pull belts, and zipper drive rollers,

and including an electric servo-motor having a drive output connected to a T-transmission having a first transmission output providing drive to the zipper drive rollers by being operatively connected to a hexagonal shaft extending transverse to and spaced from a fill tube, and wherein a first drive belt pulley having a hexagonal central opening is mounted for sliding movement along at least a portion of the hexagonal shaft, a first drive belt passes over said first pulley and a second pulley operatively connected to one of said zipper drive rollers; said zipper drive rollers having a set of gear teeth at one end thereof, the gear teeth of each zipper drive roller intermeshing with one another to cause the drive rollers to rotate in opposite directions; said zipper drive rollers are mounted for reciprocation between first and second positions in a plane transverse to the vertical fill tube; said first transmission output also providing drive to film pull belts by being operatively connected to a horizontally compact, vertical belt transmission operatively connected to respective drive shafts which drive each of the pull belts at equal speed, but in opposite directions; each of said drive shafts including an expanding universal joint at at least one end thereof; and, a second transmission output driving said film drive roll via a first drive sprocket mounted on a second transmission output shaft, a second drive sprocket mounted on a shaft extending from one end of the film drive roll, and a toothed belt passing over both of the first and second drive sprockets, wherein the rotational axis of the second transmission output shaft is parallel to the rotational axis of the drive roll shaft.



5,768,853

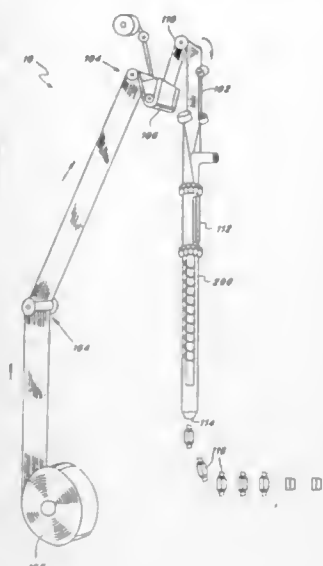
## DEACTIVATION OF MICROORGANISMS

Andrew H. Bushnell, San Diego, Calif.; Håkan Möller, Lund, Sweden; R. Wayne Clark, Del Mar, Calif.; Miriam Gersten, San Diego, Calif.; Don Meader, San Diego, Calif.; Lars-Åke Näslund, Furulund, Sweden; Håkan Mellbin, Hörby, Sweden; Pär Olanders, Genarp, Sweden, and Olof Stark, Ystad, Sweden, assignors to Purepulse Technologies, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 599,558, Feb. 15, 1996, abandoned. This application Mar. 12, 1996, Ser. No. 614,854  
Int. Cl.<sup>6</sup> B65B 55/00

U.S. Cl. 53—167

27 Claims



1. An apparatus for deactivating microorganisms comprising:  
a flashlamp;

packaging material moving means for moving packaging material relative to the flashlamp in order to sequentially expose portions of the packaging material to high-intensity, short-duration pulses of polychromatic light in a broad spectrum emitted from the flashlamp;

a water jacket surrounding the flashlamp; and  
an external coating applied to first and second ends of the water jacket.

5,768,854

## EQUIPMENT FOR PACKAGING PRODUCTS INTERNALLY OF BOXES

Luciano Nannini, Casalecchio di Reno, and Giulio Strazzari, Bologna, both of Italy, assignors to Azionaria Costruzioni Machine Automatiche A.C.M.A. S.P.A., Bologna, Italy  
Filed Sep. 25, 1996, Ser. No. 719,564

Claims priority, application Italy, Sep. 26, 1995, BO95A0450  
Int. Cl.<sup>6</sup> B65B 57/06; 5/00

U.S. Cl. 53—252

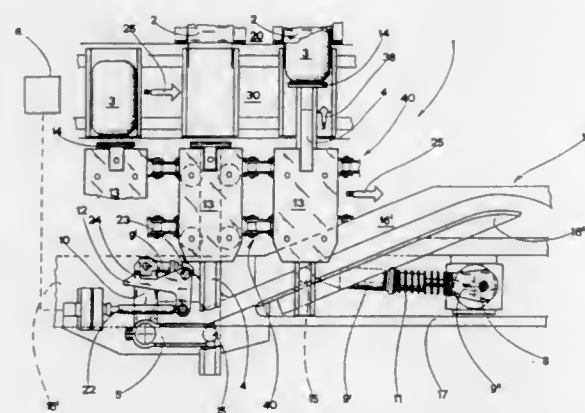
11 Claims

1. Equipment for packaging products internally of boxes, comprising:

a first feed line for conveying boxes;  
a second feed line synchronized with the first feed line, for conveying products;

a plurality of push-rod elements arranged to be advanced in succession and synchronously with said feed lines;

a diverter element positioned to engage the advancing push-rod elements and capable of movement between a first position, for selecting an active path which said push-rod elements are made to follow and along which each push-rod element is made to direct a respective product into a corresponding box, and a second position from which said push-rod elements are caused to follow an inactive path;



a sensor for detecting an error situation affecting the respective box or the respective product about to be packaged by a respective said push-rod element;

transmission means for causing said diverter element to alternate periodically between said first and said second position, synchronously with passage of said push-rod elements; and  
inhibiting means arranged to be piloted by said sensor to restrain said diverter element in said second position for a predetermined duration.

5,768,855

## CASING FOR HOUSING DISC CARTRIDGE AND METHOD FOR PACKAGING THE CASING

Takatsugu Funawatari; Masaei Fukaya; Hiroyuki Honma, and Kenji Takahashi, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

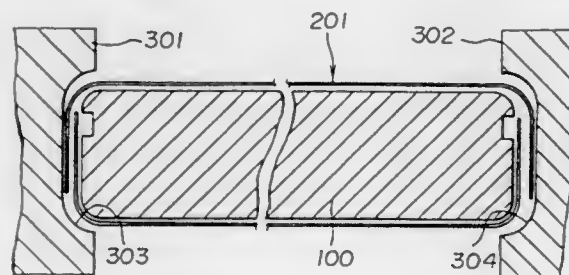
Continuation of Ser. No. 390,101, Feb. 17, 1995, Pat. No. 5,671,590, which is a division of Ser. No. 277,783, Jul. 20, 1994, Pat. No. 5,450,952, which is a continuation of Ser. No. 36,626, Mar. 24, 1993, abandoned. This application Feb. 19, 1997, Ser. No. 804,027

Claims priority, application Japan, Mar. 31, 1992, 4-103958; Mar. 31, 1992, 4-103959; Mar. 31, 1992, 4-103960; Mar. 31, 1992, 4-103965

Int. Cl.<sup>6</sup> B65B 53/02

U.S. Cl. 53—442

2 Claims



1. A packaging method for a disc cartridge casing having a top, a bottom, lateral sides and having an opening and a cut-out formed out of the top and bottom at the opening of the casing, comprising the steps of:

covering at least said opening and said cut-out with a sheet-shaped member;  
applying a film in a tubular form so that overlapping end portions are formed on the lateral sides of the casing;  
inserting said disc cartridge casing between ironing members; and  
heat-shrinking the film around the casing and fusing the ends of said film with said ironing members.

5,768,856

LOADING A PLURALITY OF PACKAGES INTO A BOX  
Heinz F. Odenthal, Zulpich, Germany, assignor to Ostma Maschinenbau GmbH, Zulpich, Germany

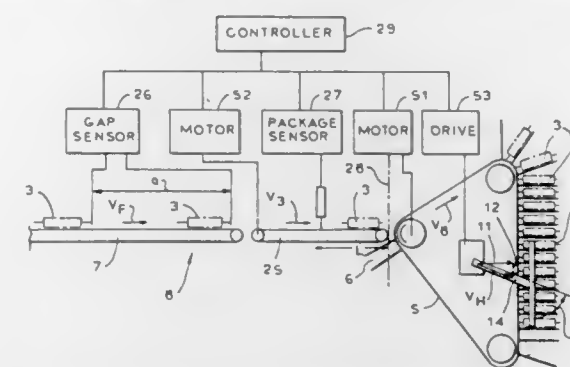
Filed Dec. 6, 1996, Ser. No. 761,158

Claims priority, application Germany, Dec. 7, 1995, 295 19 365 U; European Pat. Off., Nov. 18, 1996, 96118452

Int. Cl.<sup>6</sup> B65B 35/30

U.S. Cl. 53—443

12 Claims



1. A method of loading packages arriving continuously one after the other at a constant input speed at an input station into boxes, the method comprising the steps of:

continuously displacing an endless pocket belt through the input station;

detecting the spacing between succeeding packages as they arrive at the input station;

displacing the pocket belt and an intermediate conveyor between the input station and the pocket belt at respective variable speeds and loading the packages at the input station onto the intermediate conveyor and from it into respective pockets of the pocket belt;

coarse setting the variable speeds in accordance with the input speed and the spacing;

detecting the spacing between the packages on the intermediate conveyor and the pocket belt;

fine setting the variable speeds relative to each other by increasing the intermediate-conveyor speed and decreasing the pocket-belt speed on detection of a package on the intermediate belt at too great a spacing from the pocket belt and by

decreasing the intermediate-conveyor speed and increasing the pocket-belt speed on detection of a package on the intermediate belt at too close a spacing from the pocket belt;

at a transfer station offset along the pocket belt from the input station displacing groups of the packages in the pockets transversely of the belt out of the respective pockets with a gripper;

displacing the gripper in a direction forming an acute angle with a direction of displacement of the belt through the transfer station at a gripper speed having a speed vector parallel to a direction of displacement of the pocket belt through the transfer station equal to the pocket-belt speed; and

loading the groups of packages displaced out of the respective pockets of the belts into respective boxes.

5,768,857

## MULTIPLE PERFORATING, AUTOMATIC FOOD PREPARATION LINE HAVING IN-LINE FOLDOVER FOR FOOD SET-UPS

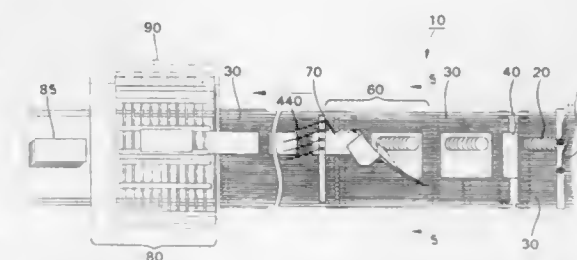
Lawrence A. Ward, 26 Woodstock Cir., Collegeville, Pa. 19426; Dante Pietriferri, Coatesville, and Allen Ely, Downingtown, both of Pa., assignors to Lawrence A. Ward, Collegeville, Pa.  
Filed May 2, 1996, Ser. No. 642,001

Int. Cl.<sup>6</sup> B65B 35/50

U.S. Cl. 53—447

12 Claims

1. A method of producing sliced food preparations comprising the steps of:



unrolling partially a roll of substrate which will be cut into predetermined lengths of substrate on which the preparations will be placed;

perforating in at least a first orientation the predetermined lengths of substrate;

moving the now perforated, predetermined lengths of substrate in a first direction along a conveyor, parallel to the first orientation of the perforations, and placing at least one pattern of sliced food on the predetermined lengths of substrate, wherein the food does not overlap the perforations, thereby creating an open area on the predetermined lengths of substrate which is not covered by the food;

lifting a leading edge portion of the open area of the substrate from a surface of the conveyor using a foldover mechanism;

directing the leading edge portion of the open area of the substrate with the foldover mechanism to a position which is over 90° from an initial position of the substrate; and

folding the open area of the substrate over the food in a transverse direction to the first direction to form a fold along the perforations, as the predetermined lengths of substrate are transported in the first direction.

5,768,858

## METHOD AND APPARATUS FOR PACKAGING A ROLL OF MATERIAL

Jakob Hannen, Willich, Germany, assignor to Voith Sulzer Finishing GmbH, Krefeld, Germany

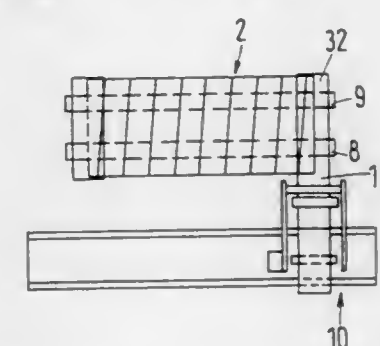
Filed Sep. 16, 1996, Ser. No. 714,769

Claims priority, application Germany, Sep. 26, 1995, 195 35 746.9

Int. Cl.<sup>6</sup> B65R 11/04

U.S. Cl. 53—465

15 Claims



1. A method for packaging a roll of web material with a paper packaging material, comprising the steps of:

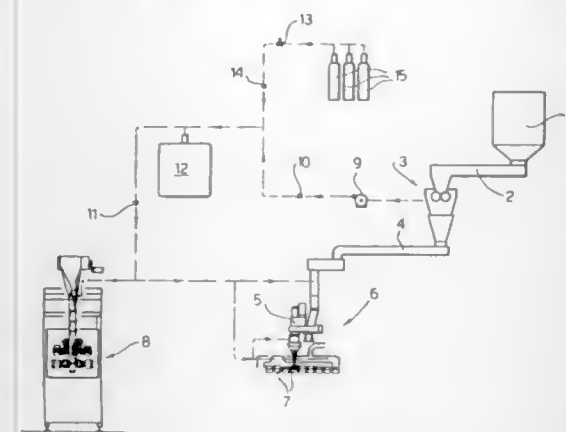
placing a first strip of the paper packaging material against the roll so that a longitudinal axis of the first strip of paper packaging material is disposed at an acute angle with respect to a circumferential direction of the roll of web material, said circumferential direction being a direction that is tangent to a circumferential surface of the roll and is parallel to an axial end of the roll;

helically wrapping the first strip of paper packaging material around the roll of web material so that at least one section of the circumferential surface of the roll of web material at an end of the roll remains uncovered;

placing a second strip of paper packaging material against the roll so that a longitudinal axis of the second strip is disposed parallel to the circumferential direction of the roll;

wrapping the second strip about the roll so that a portion of said second strip forms an axial projection adjacent to an axial end of the roll and a portion of said second strip covers the uncovered circumferential surface of the roll; wherein a position of the paper packaging material is adjustable so adjacent wrapping layers of the packaging material overlap one another, the second strip of packaging material is applied after the first strip of packaging material, the packaging material is packing paper.

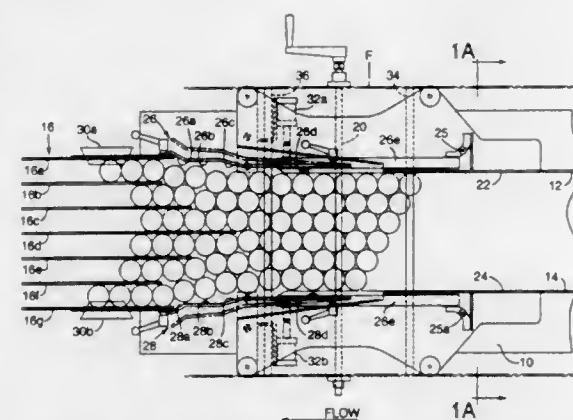
5,768,859  
**INSTALLATION FOR PACKAGING COFFEE**  
Luigi Goglio, Via Frua 11, 20146-Milano, Italy  
Division of Ser. No. 283,260, Aug. 1, 1994, Pat. No. 5,532,011.  
This application Apr. 17, 1996, Ser. No. 633,461  
Claims priority, application Italy, Aug. 11, 1993, MI93A1817  
Int. Cl.<sup>6</sup> B65B 55/00  
U.S. Cl. 53—510 6 Claims



1. An installation for packaging coffee, which comprises:  
a mechanism forming a gas filled container by forming a strip of sheet material comprising one or more layers around a mandrel so that the container is closed at the bottom and open at the top; a grinding station grinding coffee and in the process forming a coffee grinder gas;  
said mechanism filling the container with a coffee grinder gas;  
a closing device temporarily closing the top of the gas-filled container with an openable closure;  
a mechanism opening the temporary closure and immediately introducing coffee in one of a ground form and a bean form into the gas-filled container; and  
a sealing device sealing the top of the container by welding and subsequent creasing wherein said opening mechanism, said introducing mechanism and said sealing device are operable in an atmosphere comprising coffee grinder gas with or without an additional inert gas such that the coffee is packaged surrounded by its own aroma and wherein said container is provided with headroom at a top portion of the container.

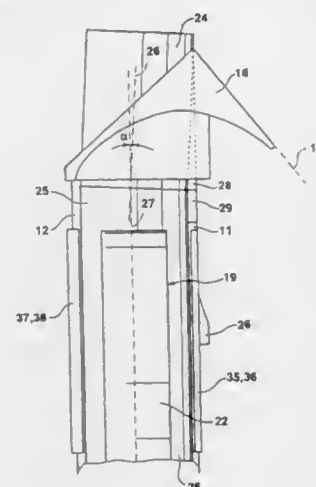
5,768,860  
**ROUND PRODUCT DIVIDER FOR PACKAGING LINE**  
J. Michael Weaver, Madison, Conn., assignor to Standard-Knapp, Inc., Portland, Conn.  
Filed Nov. 7, 1996, Ser. No. 745,926  
Int. Cl.<sup>6</sup> B65B 35/30  
U.S. Cl. 53—543 18 Claims

1. In a packaging line having a supply of cylindrically shaped articles provided on a continuously moving conveyor between fixed upstream side walls that are spaced apart to accommodate a tightly packed stream of nested articles that are to be divided into discrete columns for acceptance by a packer, the improvement comprising:



discrete lane defining means including outer lane guides and inner lane guides, defining a plurality of lanes for the articles to move in columns;  
movable article guiding panels defining a divergent funnel for the articles entering discrete lanes from the nested supply of articles, said panels having normal positions such that downstream ends thereof are normally aligned with said outer lane guides and having upstream ends that are normally aligned generally with the fixed upstream side walls thereby defining a divergent funnel for the articles to provide space for the nested articles to expand laterally for entry into said lanes, at least one article void detector providing a void signal in response to a gap in a column of articles in one of said lanes, means for moving said article guiding panels outwardly into "clear" positions and maintaining said "clear" positions for a predetermined dwell period before said panels are returned to said normal positions in response to said void signal, and said movable article guiding panels having downstream end portions that are longitudinally adjustable to accommodate articles of different diameter, and both odd and even numbered article columns in said lane defining means.

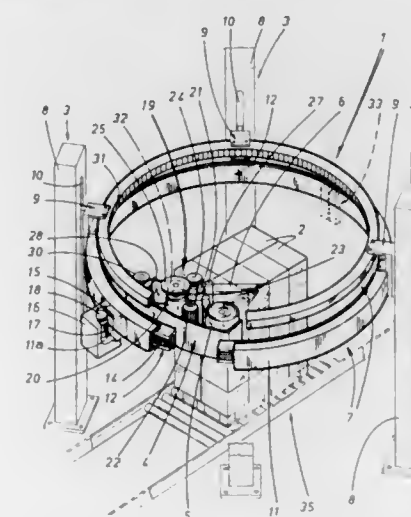
5,768,861  
**BAG FORMING, FILLING, AND SEALING MACHINE**  
Peter Slenders, Maarheeze, Netherlands, assignor to Robert Bosch GmbH, Stuttgart, Germany  
PCT No. PCT/DE96/01233, § 371 Date Jun. 24, 1997, § 102(e)  
Date Jun. 24, 1997, PCT Pub. No. WO97/15498, PCT Pub. Date May 1, 1997  
PCT Filed Jul. 9, 1996, Ser. No. 860,476  
Claims priority, application Germany, Oct. 26, 1995, 195 39 888.2  
Int. Cl.<sup>6</sup> B65B 9/20; 9/22  
U.S. Cl. 53—551 19 Claims



1. A bag forming, filling, and sealing machine (10) for producing bag packages (1) with two sealed lateral seams (13, 14) and two

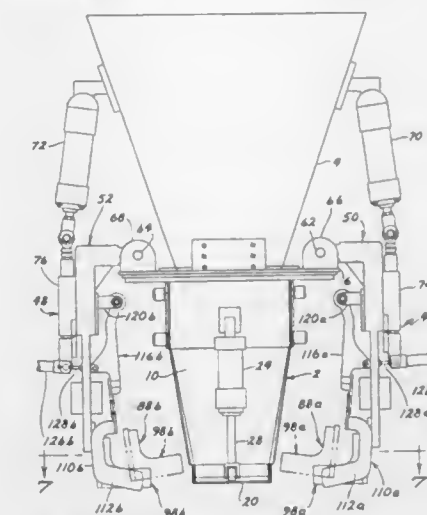
sealed longitudinal seams (11, 12) formed out of a heat-sealable sheet of packaging material (15), comprising a tube forming device (17) for forming a tube (20), a tube feeding device (21) for feeding the tube (20), a lateral seam sealer (41) and two longitudinal seam sealers (33, 34), the tube forming device (17) for forming the tube (20) is comprised of a forming tube (19) and a forming shoulder (18) connected to said forming tube (19) that the forming tube (19) has first and second sections (24, 25), each with a symmetry axis (26, 27), wherein the symmetry axis (26) of the first section (24), which is connected to the forming shoulder (18), is inclined in relation to the symmetry axis (27) of the second section (25) by an angle ( $\alpha$ ), wherein the angle ( $\alpha$ ) points in a direction of the incoming sheet of packaging material (15), that a wedge-shaped element (28) is connected to the first section (24) of the forming tube (19) for the purpose of forming the one longitudinal seam (11) out of a one-piece region of the sheet of packaging material, that the element (28) is disposed inside a slot (30) embodied in the forming shoulder (18), and that the height (H) of the element (28) tapers toward the second section (25) of the forming tube (19).

5,768,862  
**APPARATUS FOR THE WRAPPING OF PALLETIZED PRODUCT GROUPS WITH PLASTIC FILM**  
Ceré Mauro, Loiano (Bologna), Italy, assignor to Robopac Sistemi S.r.l., Rimini, Italy  
Filed May 6, 1996, Ser. No. 643,510  
Int. Cl.<sup>6</sup> B65B 53/00  
U.S. Cl. 53—556 13 Claims



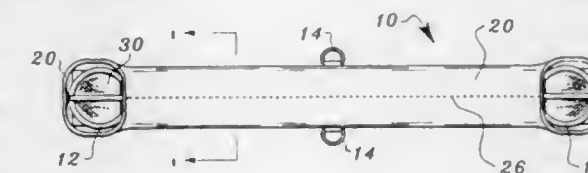
1. An apparatus for the wrapping of palletized product groups with a film or band of plastic including a support framework supporting a vertically mobile support structure for a mobile carriage which runs along said vertically mobile support structure, said carriage supporting a reel of plastic film, a pre-stretching unit, and an electric motor for driving said pre-stretching unit, said vertically mobile support structure comprising a vertically moving structure supported by said support framework and a rotating ring rotating around its own axis driven by a motor anchored and connected to said vertically moving structure; said carriage being fixed to the rotating ring and supporting an electric generator electrically connected to the electric motor of said pre-stretching unit for which it is the power supply source, said vertically moving structure including an annular toothed track and said electric generator including a shaft in continuous connection with said annular toothed track such that said shaft of said electric generator rotates in response to the rotation of said rotating ring.

5,768,863  
**GUSSET CONTROL MECHANISM FOR BAG CLOSING MACHINES**  
Harold R. McGregor, Owatonna; James R. McGregor, Lakeville; Scott Mitchell Anderson, Austin, and Kurt Bernard Snaza, Owatonna, all of Minn., assignors to Slidell, Inc., Owatonna, Minn.  
Filed Mar. 21, 1997, Ser. No. 822,228  
Int. Cl.<sup>6</sup> B65B 43/26; 43/28; 61/00  
U.S. Cl. 53—570 13 Claims



1. In a bag filling machine having a discharge spout actuatable between closed and open positions for the discharge of particulate material into a bag, and clamping means for holding the mouth of a bag on the spout, the improvement comprising:  
a pair of gusset pleat separator members positioned on each side of the spout and constructed and arranged to be located in the fold space between the two gusset pleats along each side of a gusseted bag vertically positioned with its mouth on the spout;  
a pair of gusset gripping members positioned on each side of the spout in opposed, cooperative gripping disposition, to each of the gusset pleat separator members and movable from first, open positions to second, closed positions in cooperation with said gusset pleat separator members to grip each of the four gusset pleats of a gusseted bag therebetween;  
power means for moving said gripping members between said first and second positions;  
a pair of separable arms on each side of the spout, with each of the arms carrying a gusset pleat separator and a gusset gripping member combination, and each pair of arms being movable towards and away from each other between first, gusset closing positions and second, gusset opening positions wherein the gussets on each side of a bag are stretched open to increase the area of a bag mouth during filling.

5,768,864  
**SADDLE GIRTH WITH PROTECTIVE COVER**  
Robert Chang, Merryearn, Ltd. 301-2 Fa Yuen Commercial Bldg. 75-77 Fa Yuen St., Mongkok, Kowloon, Hong Kong, China  
Filed May 10, 1996, Ser. No. 644,312  
Int. Cl.<sup>6</sup> B68C 1/14  
U.S. Cl. 54—23 4 Claims



3. A girth for equestrian saddles having improved lubrication between said girth and a horse's skin, comprising:



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OFFICIAL GAZETTE

JUNE 23, 1998

a belt having a first end and a second end, at least one buckle attached to said first end and at least one buckle attached to said second end, said belt having rings attached at a midsection of said belt, a protective cover for said belt including a sleeve, said sleeve being attached to said belt, said sleeve being made of a synthetic tear-resistant material, and said sleeve including a raised textured surface on substantially the entire exterior surface thereof, said textured surface for working the horse's sweat into a lubricating lather.

5,768,865

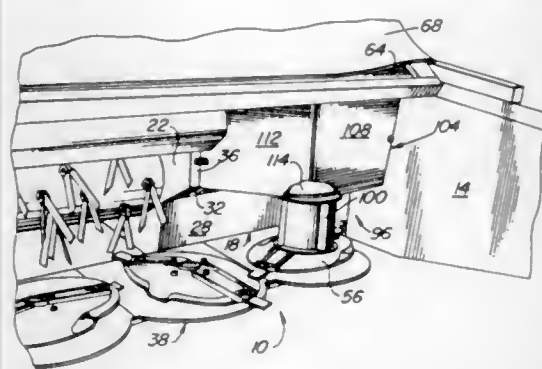
**HEADER EQUIPPED WITH ROTARY CUTTERBAR AND CROP CONVERGING STRUCTURE**

Allan Wesley Rosenbalm, Blakesburg; Michael Joseph Verhulst, Ottumwa, both of Iowa, and Duane Huppert, Ellensburg, Wash., assignors to Deere & Company, Moline, Ill. Continuation-in-part of Ser. No. 690,133, Jul. 31, 1996, abandoned. This application Mar. 14, 1997, Ser. No. 818,518

Int. Cl.<sup>6</sup> A01D 34/82

U.S. Cl. 56—6

13 Claims

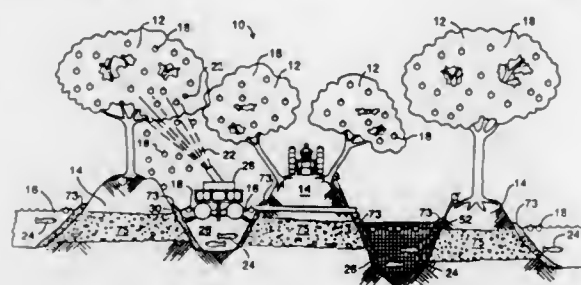


1. In a crop harvesting header including a rotary cutterbar extending between a pair of transversely spaced, right- and left-hand outer sidewalls of the header and including a plurality of cutter discs, which, as viewed by a person standing behind and looking down on the cutterbar, includes right-hand outer and adjacent cutter discs being driven counterclockwise, and left-hand outer and adjacent cutter discs being driven clockwise so as to deliver crop towards a central zone of the header, a crop passage defined by right- and left-hand transversely spaced inner sidewalls extending rearwardly at opposite sides of said central zone, a right-hand upright bulkhead extending between said right-hand outer and inner sidewalls, a left-hand upright bulkhead extending between said left-hand outer and inner sidewalls, a crop conditioner positioned across said crop passage for engaging and conditioning crop entering said crop passage, and right- and left-hand cut crop convergence structures including right and left-hand rotary elements respectively mounted for rotation with said right- and left-hand outer cutter discs for assisting movement of crop cut at opposite sides of said central zone to said central zone, the improvement comprising: said right- and left-hand crop convergence structures respectively including right- and left-hand stationary crop guide structures respectively mounted in the vicinity of said right- and left-hand rotary elements and including right- and left-hand upright crop engaging surfaces oriented for directing cut crop from forward locations respectively of said right- and left-hand rotary elements across said right- and left-hand adjacent cutter discs.

5,768,866  
**AQUA FARM FILTERING**  
Walter W. Minnich, 403 Executive Dr., Marion, Ohio 43302  
Filed Sep. 23, 1996, Ser. No. 717,568  
Int. Cl.<sup>6</sup> A01D 46/00

U.S. Cl. 56—8

18 Claims

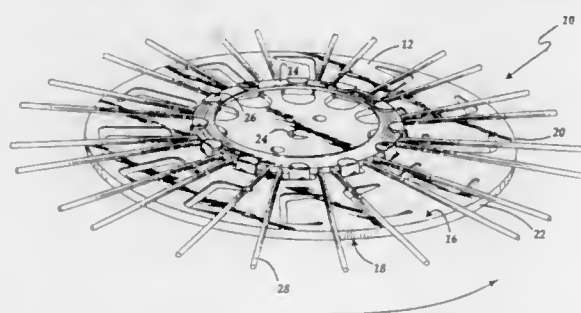


1. A system for aqua farming comprising: at least one land mass defining a plurality of channels within an adjacent body of water; means for growing plants on each land mass; means for separating plant parts from the plants from time to time; means for moving the separated parts into the water; and means for gathering them from the water; means for providing movement of the water in the channels; in a substantial region of the land mass, means for permitting movement of water through the land mass from the channel on one side to the channel on the other side thereof; and in the movement permitting means, filtering means for blocking the movement through the land mass of most of the pieces of solid matter that may be present in the water, whose smallest cross section is larger than a predetermined size.

5,768,867  
**ROTARY BLADE FOR CUTTING GRASS AND THE LIKE**  
Harry R. Carlsen, 4604 Rosewood La., Plymouth, Minn. 55442  
Filed Aug. 19, 1996, Ser. No. 699,534  
Int. Cl.<sup>6</sup> A01D 34/73

U.S. Cl. 56—12.1

16 Claims



1. A device adapted for attachment to a vegetation cutting mechanism for cutting grass and the like, said device comprising: (a) a disc for removable attachment to a mounting member of a rotary shaft of a vegetation cutting mechanism, said disc having an upper and lower planar surface, an outer perimeter, and a bore extending between said upper and lower surface, said bore being adapted for receiving a portion of the rotary shaft of the vegetation cutting mechanism, wherein the upper surface of said disc engages against the mounting member of said rotary shaft; (b) an annular ring including a central hub and a plurality of cutting filaments extending radially outward from said central hub, said ring being positioned on the lower planar surface of said disc such that said plurality of cutting filaments extend outward beyond the outer perimeter of said disc; and (c) retaining means for removably securing the ring against the lower planar surface of said disc.

JUNE 23, 1998

GENERAL AND MECHANICAL

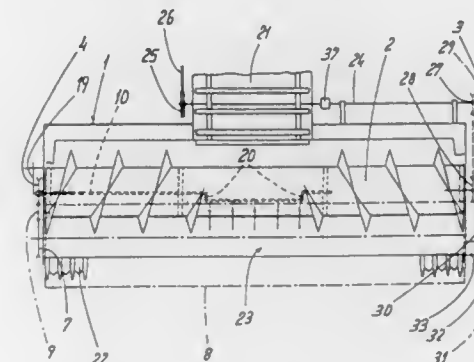
3551

5,768,868  
**ATTACHMENT FOR GRAIN HARVESTER**  
Franz Stein, Harsewinkel, Germany, assignor to CLAAS KGaA, Harsewinkel, Germany  
Filed Aug. 7, 1996, Ser. No. 694,480  
Claims priority, application Germany, Aug. 8, 1995, 195 29 067.4

Int. Cl.<sup>6</sup> A01D 57/02

U.S. Cl. 56—14.5

7 Claims



longitudinal axis such that an angle of the fingers of each bat to a vertical plane containing the respective bat axis is maintained approximately equal to a predetermined angle as the bat is rotated from a first angular position of the bat adjacent the cutting knife to a second angular position of the bat rearward of the first position;

beam support means mounting the main elongate beam on the support arms for sliding adjustment movement forwardly and rearwardly on the support arms so as to adjust the horizontal position of the beam relative to the cutting knife; and means responsive to the forward sliding movement of the main elongate beam along the support arms for simultaneously and automatically increasing said predetermined angle.

5,768,871

Patent Not Issued For This Number

5,768,872

## BALER WITH ADJUSTABLE FEED DEVICE

Wilhelm Voo Allwörden, Oberstötzingen, Germany, assignor to

Same Deutz-Fahr S.p.A., Treviglio, Italy

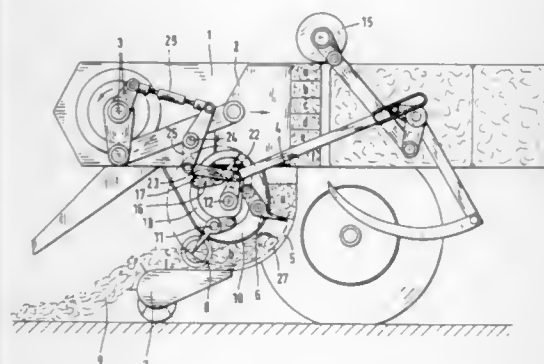
Filed Aug. 26, 1996, Ser. No. 703,005

Claims priority, application Germany, Aug. 25, 1995, 195 31 240.6

Int. Cl.<sup>6</sup> A01F 15/04

U.S. Cl. 56—341

8 Claims



1. A baler operable to bale agricultural crop material, comprising:

- a baling chamber (1),
- a baling plunger reciprocable in said baling chamber,
- means operable to reciprocate said baling plunger (2) including a crank mechanism (3) and
- a feed device for conveying feed material to be baled to said baling chamber (1) including a rotary conveyor arranged below said baling chamber (1) and connected in driven relation to said crank mechanism (3), said rotary conveyor conveying said feed material synchronously with the movement of said baling plunger (2), said rotary conveyor including a feed channel (5),
- a cam-track (18) and
- a cam-track-guided conveying means having a plurality of conveyor rakes (6) guided by said cam-track,
- said cam-track being connected in driven relation to said crank mechanism (3) by a motion transmitting apparatus including an adjustable length motion transmitting element,
- said conveyor rakes (6) having tips which, during operation of said baler, define a conveying curve (27, 28),
- the position of said conveying curve (27, 28) being changed by adjustment of said motion transmitting element.

5,768,873  
METHOD AND DEVICE FOR TESTING A PNEUMATIC  
SPlicing VALVE

Joachim Stiller, Wegberg, Germany, assignor to W. Schlafhorst AG &amp; Co., Moenchengladbach, Germany

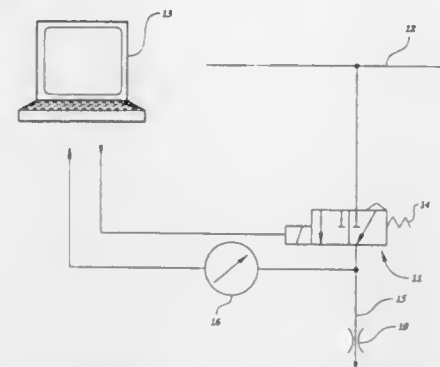
Filed Sep. 16, 1996, Ser. No. 710,377

Claims priority, application Germany, Sep. 14, 1995, 195 34 114.7

Int. Cl.<sup>6</sup> D01H 17/00

U.S. Cl. 57—22

14 Claims



1. In a yarn splicing device including a pneumatic splicing chamber, a compressed air line connecting the splicing chamber to a source of compressed air, an electromagnetic splicing valve disposed within the compressed air line for controlling delivery of the compressed air to the splicing chamber, and a control unit connected to the valve for initiating an opening signal to the valve for opening of the valve, a method for testing the electromagnetic splicing valve comprising the steps of:

- after the opening of the valve, determining a value representing a characteristic of the increasing air pressure prevailing in the compressed air line between the valve and the splicing chamber resulting from the compressed air being delivered to the splicing chamber through the valve,
- comparing the determined value and a reference value, and
- generating an error signal if the difference between the determined value and the reference value is greater than a predetermined variance value.

5,768,874

## MULTI-STRAND STEEL CORD

Luc Bourgois, Desselgem; Paul Soenen, Kuurne, and Frans Van Giel, Otegem, all of Belgium, assignors to N.V. Bekaert S.A., Zwevegem, Belgium

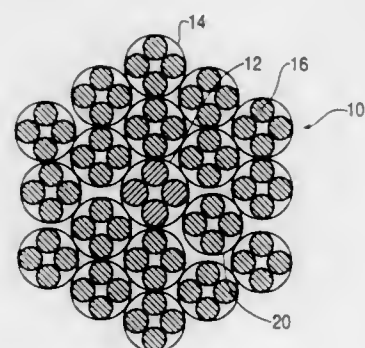
Filed Oct. 8, 1996, Ser. No. 727,035

Claims priority, application European Pat. Off., Oct. 27, 1995, 95202911

Int. Cl.<sup>6</sup> D07B 1/06

U.S. Cl. 57—218

16 Claims



1. A steel cord comprising at least eight strands twisted together, all strands of said steel cord having a same twisting direction

called cord twisting direction and a substantially same twisting pitch called cord twisting pitch, each of said strands consisting of two to five individual filaments twisted together.

5,768,875

FILTER FABRIC WITH CORE SHEATHING THREAD, AND  
A BAG PRODUCED THEREFROM

Eberhard Bergen, Emmenbrücke, Switzerland, assignor to Rhone-Poulenc Viscosuisse S.A., Emmenbrücke, Switzerland

Continuation of Ser. No. 335,836, Nov. 2, 1994, abandoned.

This application Nov. 15, 1996, Ser. No. 746,763

Claims priority, application Switzerland, Mar. 17, 1993, 802/93

Int. Cl.<sup>6</sup> D02G 3/02; 3/36

U.S. Cl. 57—225

12 Claims



1. An uncoated fabric for an inflatable airbag of a vehicle, comprising a core sheathing thread and a reversible fabric elongation of more than 30%–50% in warp and weft directions, said core sheathing thread having a core thread of heat-stable thermoplastic filament yarn.

5,768,876

## BOBBIN TRANSPORT SYSTEM

Robert Messing, St. Helier, Channel Islands, assignor to Technological Research Company Limited, St. Helier, Channel Islands

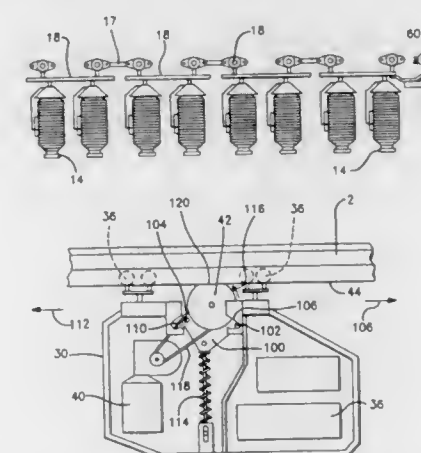
Continuation of Ser. No. 288,353, Aug. 10, 1994, abandoned.

This application Feb. 28, 1997, Ser. No. 808,156

Int. Cl.<sup>6</sup> D01H 9/10; B61B 3/00; B61C 3/00; B61G 11/00

U.S. Cl. 57—281

3 Claims



1. A drive unit for driving one or more bobbin carriers along a track of a bobbin transport system, the drive unit comprising: track engaging means for engaging with the track;

motor means for moving the drive unit along the track via said track engaging means;

detector means on the drive unit for detecting position indicators spaced along the track and for producing detector signals;

computer means on the drive unit for receiving said detector signals from the detector means and for computing the location of the drive unit on the basis of said detector signals, wherein the motor means comprise an electric motor for driving the drive unit along the track, and rechargeable battery for powering the electric motor, and the computer means includes means responsive to a low battery charge for stopping the drive unit in a region of the track equipped with means for recharging the rechargeable battery.

5,768,877

HEATING DEVICE WITH EXCHANGEABLE YARN  
GUIDE INSERT

Siegfried Morhenne, Breckerfeld, Germany, assignor to Bar-mag AG, Remscheid, Germany

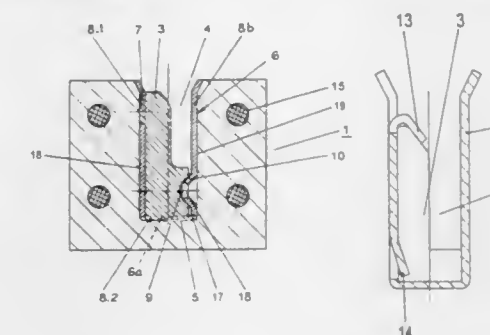
Filed Apr. 3, 1997, Ser. No. 832,545

Claims priority, application Germany, Apr. 3, 1996, 196 13 378.5

Int. Cl.<sup>6</sup> D01H 13/28; 57/00

U.S. Cl. 57—290

16 Claims



1. An apparatus for heating an advancing yarn comprising an elongate heater body having a channel therein which extends in an axial direction along the length thereof, with the channel being of generally rectangular cross section and defining a bottom wall of a predetermined width and opposite side walls of a predetermined height,

means for heating the heater body, and

yarn guide means disposed in the channel for guiding the advancing yarn axially along the channel, said yarn guide means comprising a generally U-shaped rail disposed in said channel so as to lie flat directly against substantially the entire width of the bottom wall and substantially the entire height of the side walls of said groove, and a plurality of axially spaced apart yarn guides secured to said rail so as to be disposed within said channel, with the yarn guides being positioned and configured for guiding the advancing yarn axially along the channel in a laterally zigzagged path of travel.

5,768,878

OPEN-END SPINNING PROCESS AND APPARATUS FOR  
PERFORMING SAME

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 73337 Bad Überkingen, Germany, assignor to Fritz Stahlecker, Bad Überkingen, and Hans Stahlecker, Süssen, both of Germany

Filed Dec. 24, 1996, Ser. No. 774,302

Claims priority, application Germany, Jan. 13, 1996, 196 01 038.1

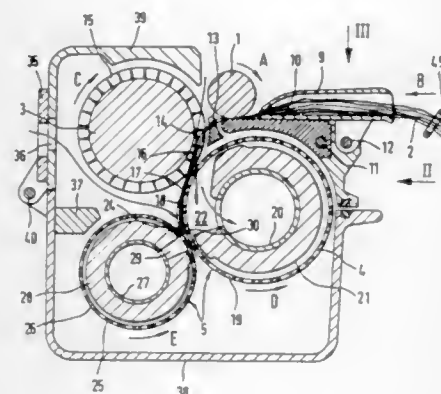
Int. Cl.<sup>6</sup> D01H 4/00

U.S. Cl. 57—401

10 Claims

1. A method of making yarn using an open end spinning process comprising:





opening at least one fiber sliver to single fibers using moving opening structure with formation of a fiber beard from which individual fibers are released and transported in a transport direction, taking up said fibers on a collecting surface of a moving collecting structure disposed immediately adjacent said opening structure at a position where said fibers leave the fiber beard and while travelling at a relatively low speed with respect to the speed of the opening structure,

moving the collecting surface at a higher speed than the speed of the arriving fibers with formation of a fiber veil expanded transversely to a fiber transport direction of said collecting surface whereby said fibers extend essentially parallel to each other,

withdrawing said fiber veil from the collecting surface at a speed at least corresponding to the speed of the fibers leaving the fiber beard and arriving at the collecting surface, and applying a twist to said fiber veil being withdrawn.

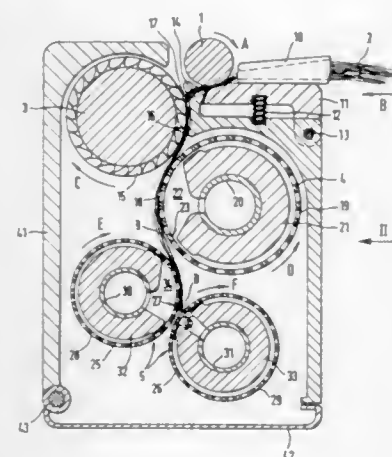
5,768,879  
OPEN-END SPINNING PROCESS AND APPARATUS FOR PERFORMING SAME

Fritz Stahlecker, Josef-Neidhart-Strasse 18, 73337 Bad Überkingen, Germany, assignor to Fritz Stahlecker, Bad Überkingen, and Hans Stahlecker, Süssen, both of Germany  
Filed Dec. 31, 1996, Ser. No. 775,395

/ Claims priority, application Germany, Jan. 20, 1996, 196 01 958.3

Int. Cl.<sup>6</sup> D01H 4/00  
U.S. Cl. 57—401

6 Claims



1. A method of making yarn using an open end spinning process comprising:

opening at least one fiber sliver to single fibers in an opening area with formation of a fiber beard from which individual fibers are released and transported in a transport direction,

taking up said fibers by a collecting surface immediately after leaving the fiber beard and while travelling at a relatively low speed,

moving the collecting surface at a higher speed than the speed of the arriving fibers with formation of a fiber veil expanded transversely to a fiber transport direction of said collecting surface whereby said fibers extend essentially parallel to each other, and

withdrawing said fiber veil from the collecting surface at a speed at least corresponding to the speed of the fibers leaving the fiber beard and arriving at the collecting surface,

wherein the fiber veil is removed from the collecting surface and after leaving the collecting surface is bundled to form a fiber bundle which is then pulled off with a spinning rotation being conferred on it to impart a spinning twist to form a yarn while the fiber bundle is being pulled off.

5,768,880  
OPENING ROLLER FOR AN OPEN-END SPINNING DEVICE

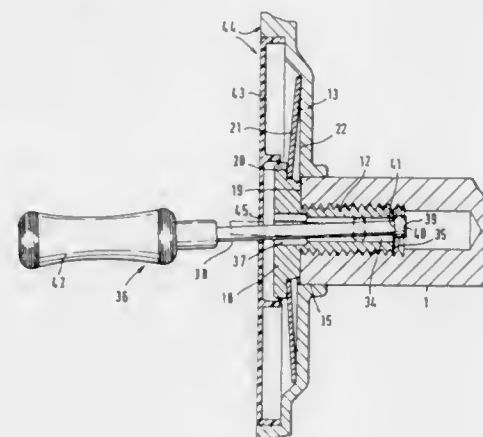
Friedbert Schmid, Bad Überkingen, Germany, assignor to Fritz Stahlecker, Bad Überkingen, and Hans Stahlecker, Süssen, both of Germany

Filed Mar. 11, 1997, Ser. No. 815,458

Claims priority, application Germany, Mar. 20, 1996, 196 109 61.2

Int. Cl.<sup>6</sup> D01H 4/00  
U.S. Cl. 57—408

13 Claims



1. An opening roller for an open-end spinning device comprising:

a shaft supported in a bearing housing,  
a base body arranged on the shaft,  
an exchangeable ring with combing structure placed on the base body, which ring with combing structure is fixed with its end faces between a flange of the base body and a flange of a releasably applied tension disc, and

a screw screwed axially into the shaft which braces the tension disc by means of a spring element against the ring with combing structure, which screw is provided with working surfaces for a tool for withdrawing the opening roller ring from a holding device of the bearing housing,

wherein the screw is provided with an axial bore hole for inserting a tool and wherein the tension disc has an even smooth outer front surface.

5,768,881  
YARN WITHDRAWAL NOZZLE FOR AN OPEN-END SPINNING MACHINE

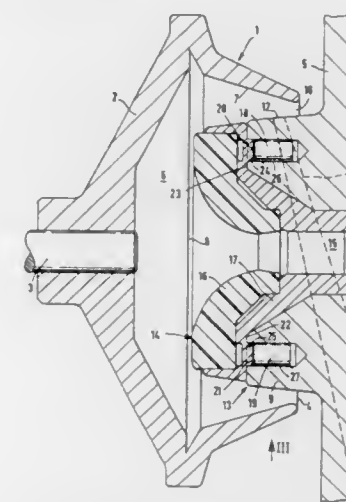
Dieter Lauschke, Geislingen/Steige, Germany, assignor to Fritz Stahlecker, Bad Überkingen, and Hans Stahlecker, Süssen, both of Germany

Filed Aug. 15, 1996, Ser. No. 698,082

Claims priority, application Germany, Sep. 5, 1995, 195 32 735.7

Int. Cl.<sup>6</sup> D01H 4/00  
U.S. Cl. 57—414

20 Claims



1. A yarn withdrawal nozzle for an open-end rotor spinning machine, said nozzle comprising at least one ferromagnetic member with at least one projection, said at least one projection fitting into a recess of a holding device, in which recess a permanent magnet is located spaced from an open end of said recess.

5,768,882  
TIE BAR FOR A POWER CONDUCTING CHAIN

Willibald Weber, Netphen, and Helmut Bräutigam, Siegen, both of Germany, assignors to Kabelschlepp GmbH, Germany

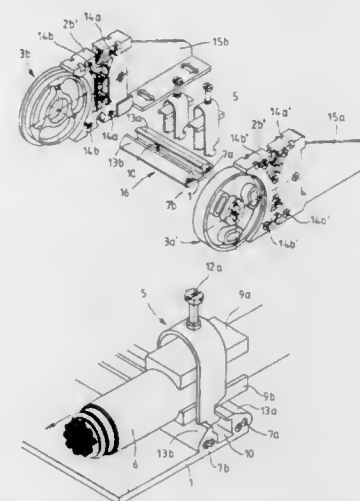
PCT No. PCT/EP95/01363, § 371 Date Dec. 9, 1996, § 102(e) Date Dec. 9, 1996, PCT Pub. No. WO95/28582, PCT Pub. Date Oct. 26, 1995

PCT Filed Apr. 12, 1995, Ser. No. 727,638

Claims priority, application Germany, Apr. 18, 1994, 44 13 303.0

Int. Cl.<sup>6</sup> F16G 13/16  
U.S. Cl. 59—78.1

20 Claims



1. Tie bar having ends, to be connected at the ends to side parts of a chain link of a power conducting chain, wherein the bar

comprises a fastening groove which is open toward the center of the chain link, which groove is delimited by two parallel beads having ends, the beads being connected to one another via a base plate, wherein said fastening groove is a fastener of strain relief elements, wherein the fastening groove has an asymmetrical cross sectional form.

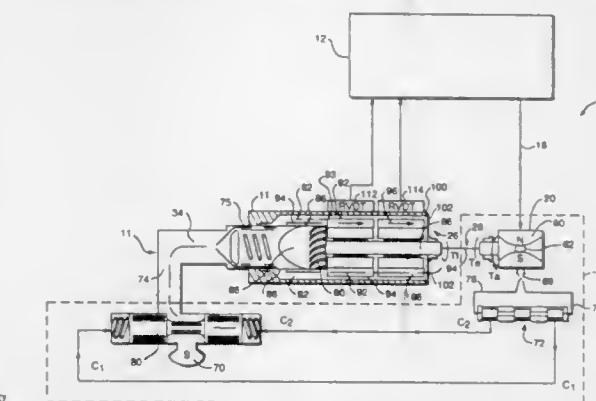
5,768,883  
FLOWRATE CONTROL SYSTEM AND METHOD

Christopher R. Mayer, Wilmington, Mass., assignor to Ametek Aerospace Products Inc., Wilmington, Mass.

Filed Jan. 25, 1996, Ser. No. 599,507

Int. Cl.<sup>6</sup> F02C 9/26  
U.S. Cl. 60—39.03

21 Claims



19. A method for controlling fluid flow, and comprising:  
a. generating a command torque related to a commanded mass-flowrate of a fluid from source;  
b. applying said command torque to a torque-controlled valve to release a flow of fluid from said source at an actual mass-flowrate;  
c. generating a feedback torque related to said actual mass-flowrate, said feedback torque being opposite in direction to said command torque; and  
d. summing said feedback torque to said command torque to reduce said command torque by said feedback torque whereby to adjust actual mass-flowrate of fluid released by said valve as a function of said feedback torque.

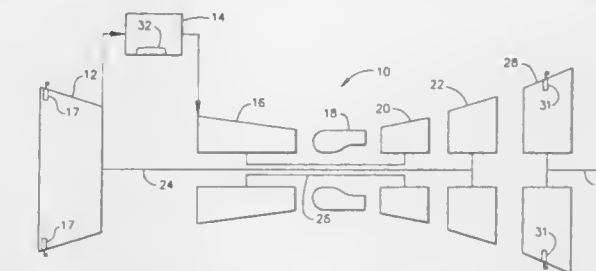
5,768,884  
GAS TURBINE ENGINE HAVING FLAT RATED HORSEPOWER

William R. Hines, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Nov. 22, 1995, Ser. No. 561,657

Int. Cl.<sup>6</sup> F02C 7/143;9/20  
U.S. Cl. 60—39.161

8 Claims



1. A gas turbine engine comprising:  
a low pressure compressor including at least one variable inlet guide vane operable to adjust air flow therethrough;  
a high pressure compressor;

an intercooler, including a fan, for cooling air output by said low pressure compressor and supplying the cooled air to said high pressure compressor;

a combustor located substantially adjacent on output of said high pressure compressor;

a high pressure turbine located substantially adjacent an output of said combustor, said high pressure turbine coupled to said high pressure compressor by a high pressure rotor shaft;

a low pressure turbine located substantially adjacent an output of said high pressure turbine, said low pressure turbine coupled to said low pressure compressor by a low pressure rotor shaft; and

a free wheel turbine located substantially adjacent an output of said low pressure turbine, said free wheel turbine including at least one variable area turbine nozzle operable to adjust flow through said high pressure turbine;

a speed of said intercooler fan, an orientation of said variable inlet guide vane, an orientation of said variable area turbine nozzle, and a speed of said low pressure compressor selected so that conditions at the inlet of said high pressure compressor are substantially the same for an ambient air temperature within a range of 59° F. and 100° F.

5,768,885

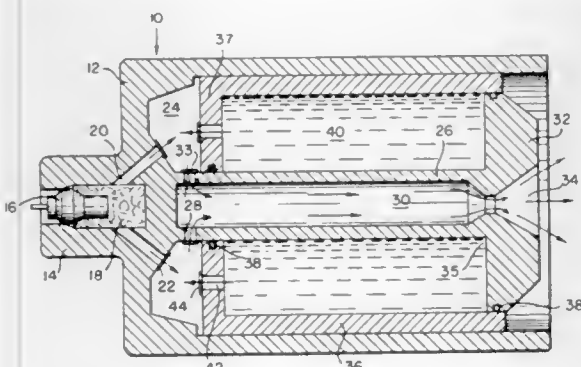
**REGENERATIVE PISTON LIQUID PROPELLANT  
ROCKET MOTOR**

Darrin L. Johnson, Fountain Hills, Ariz., and Donald R. Lauritzen, Hyrum, Utah, assignors to Autoliv ASP, Inc., Ogden, Utah

Filed Dec. 3, 1996, Ser. No. 760,011  
Int. Cl.<sup>6</sup> F02K 9/44

U.S. Cl. 60—204

7 Claims



1. A regenerative liquid propellant rocket motor comprising:

a body including an integrally formed central tube;

a primary combustion chamber disposed in the body;

a secondary combustion chamber formed by the central tube of the body;

a reservoir of liquid propellant disposed in the body;

regenerative piston means slidably disposed in the body for delivering the liquid propellant to the primary and secondary combustion chambers, the piston means including a plurality of injection means for injecting the liquid propellant;

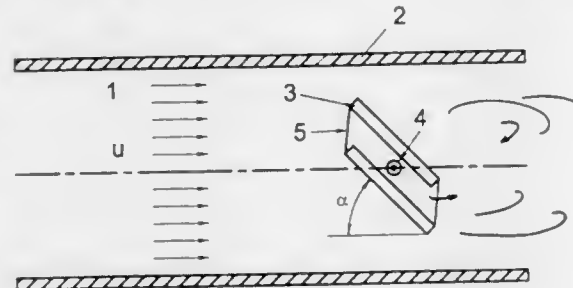
ignitor means disposed in the body for initiating combustion of the liquid propellant; and

nozzle means formed at a free end of the central tube for producing thrust, wherein upon ignition of the ignitor means combustion occurs in the primary combustion chamber driving the piston means into the liquid propellant reservoir and the liquid propellant is injected into the primary combustion chamber to produce combustion products which are channeled into the secondary combustion chamber and expanded through the nozzle means.

5,768,886  
**TWIN-PLATE FLAMEHOLDER CONSTRUCTION**  
Muh-Rong Wang, and Wei-Hsiang Lai, both of Tainan, Taiwan, assignors to National Science Council, Taipei, Taiwan  
Filed Sep. 29, 1995, Ser. No. 537,097  
Int. Cl.<sup>6</sup> F02K 3/10

U.S. Cl. 60—261

18 Claims



1. A flame holding system, comprising:

a casing having a flow chamber defined therein for an internal flow stream;

a fuel spray bar disposed in said casing;

a fuel injector disposed in said casing;

an igniter disposed in said casing;

a first control valve;

a first flow meter in communication with said first control valve and said fuel spray bar;

a second control valve;

a second flow meter in communication with said second control valve and said fuel injector; and

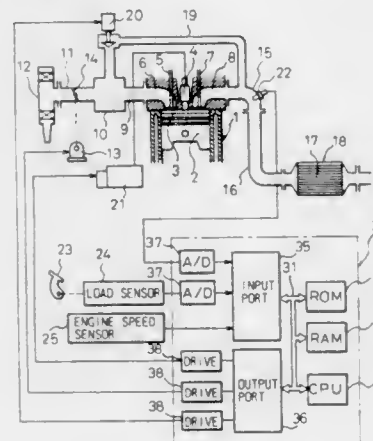
a flame holder including a first plate member, a second plate member and link means for linking said first plate member to said second plate member such that a slit is defined between said first and said second plate members, wherein, said fuel injector is positioned relative to said slit such that fuel injected therefrom is received in said slit of said flame holder during flame holding operation.

5,768,887

**DIRECT INJECTION TYPE COMPRESSION IGNITION  
ENGINE AND METHOD OF USE**

Norihiko Nakamura, Mishima, and Hiromichi Yanagihara, Gotenba, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 24, 1996, Ser. No. 636,927  
Claims priority, application Japan, Apr. 27, 1995, 7-103999;  
Feb. 27, 1996, 8-039944  
Int. Cl.<sup>6</sup> F01N 3/20; 3/36; F02M 25/07; F02D 41/40  
U.S. Cl. 60—274



2. A method of setting a stoichiometric air-fuel ratio in a combustion chamber of a compression ignition engine, comprising:

injecting fuel containing oxygen into the combustion chamber; and

determining an amount of the fuel injected;

setting a mean value, based in part on oxygen contained in the fuel, of an air-fuel ratio in the combustion chamber such that the mean value becomes equal to a target air-fuel ratio that is selected from the stoichiometric air-fuel ratio and a lean air-fuel ratio.

5,768,888

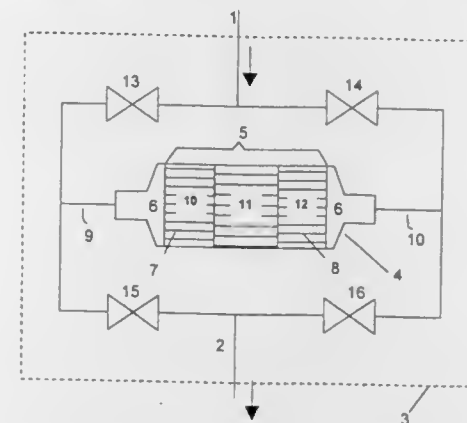
**EMISSION CONTROL SYSTEM**

Yurii Sh. Matros, Chesterfield; Grigori A. Bunimovich, Creve Coeur, and Vadim O. Strots, Clayton, all of Mo., assignors to Matros Technologies, Inc., Chesterfield, Mo.

Filed Nov. 8, 1996, Ser. No. 745,686  
Int. Cl.<sup>6</sup> F01N 3/20; 3/28

U.S. Cl. 60—274

59 Claims



1. A process for controlling the emission of noxious materials in exhaust gases from an internal combustion engine upon starting the engine wherein the exhaust gases are initially cool and then become hot, said exhaust gases containing noxious materials selected from the group consisting of volatile organic compounds, NOx, CO, carbonaceous particulate matter and mixtures thereof, said process comprising:

(a) passing cool exhaust gases through a gas permeable solid material containing an adsorbent and a heterogeneous catalyst, said adsorbent capable of adsorbing the noxious materials below a certain temperature and said catalyst capable of converting the noxious materials into innocuous materials when heated above a certain temperature, said catalyst initially below the temperature at which it is effective in converting the noxious materials, said noxious materials adsorbed by the adsorbent; and

(b) continuing to pass the exhaust gases through the gas permeable solid material as the exhaust gases become heated while reversing the flow of the gases through the gas permeable solid material in a continuing series of cycles to ignite at least some portion of the catalyst to the temperature at which the catalyst is effective in converting the noxious materials before all of the adsorbent has been heated to the point that the noxious materials desorb, said noxious materials converted by the catalyst,

whereby emissions are initially controlled by the adsorbent while the catalyst is being heated and thereafter are controlled by the catalyst.

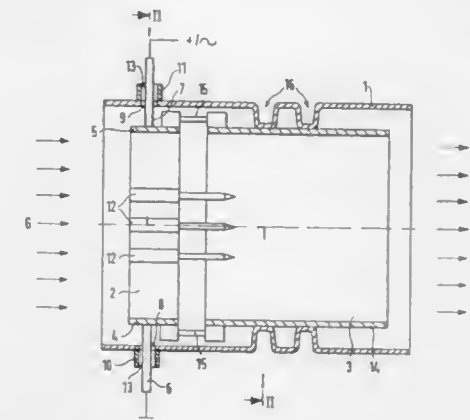
5,768,889  
**DEVICE FOR CATALYTICALLY CONVERTING  
EXHAUST GASES IN AN EXHAUST SYSTEM**

Wolfgang Maus; Rolf Brück, both of Bergisch Gladbach, and Carsten Kruse, Lohmar, all of Germany, assignors to Emitec Gesellschaft fuer Emissions-technologie mbH, Lohmar, Germany

Filed Mar. 28, 1997, Ser. No. 825,497  
Int. Cl.<sup>6</sup> F01N 3/28

U.S. Cl. 60—300

22 Claims



1. A device for catalytically converting exhaust gases in an exhaust system, comprising:

an outer jacket tube;

at least one first electrically heatable honeycomb body having a jacket surface and one second honeycomb body, said honeycomb bodies disposed adjacent one another in common in said outer jacket tube for successively conducting an exhaust gas can flow;

at least said first honeycomb body disposed in and spaced apart from said outer jacket tube and having at least one flow distributing structure;

support elements mechanically joining said adjacent honeycomb bodies together and protruding into said honeycomb bodies; and

additional electrically insulating retaining elements each having one end region joined to said jacket surface of said heatable first honeycomb body and another end joined to said adjacent second honeycomb body.

5,768,890

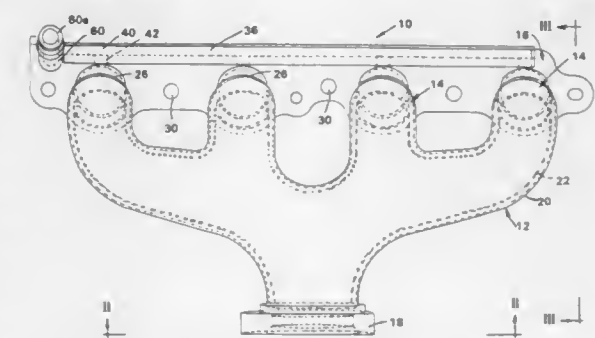
**EXHAUST AIR RAIL MANIFOLD**

Mark W. Bekkering, Byron Center, and Gary L. Wells, Kalamazoo, both of Mich., assignors to Benteler Automotive Corporation

Continuation-in-part of Ser. No. 366,465, Dec. 30, 1994, Pat. No. 5,572,867, which is a continuation-in-part of Ser. No. 151,556, Nov. 12, 1993, Pat. No. 5,349,817. This application May 21, 1996, Ser. No. 653,082  
Int. Cl.<sup>6</sup> F01N 3/34; F02F 1/42

U.S. Cl. 60—305

2 Claims



1. An engine exhaust manifold flange comprising:



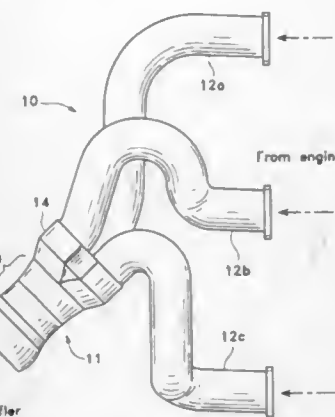
an elongated connecting flange having a plurality of gas flow openings therethrough, and having a plurality of sleeves at said openings, connected to said flange and extending from said openings for gas flow therethrough;  
said elongated connecting flange having an elongated corner extending adjacent all of said sleeves; each of said sleeves having an opening therethrough;  
an elongated configured cover plate extending along said elongated corner and said sleeves, having a pair of opposite elongated edges connected to said elongated connecting flange and having a central portion projecting from said elongated corner to form an elongated passageway;  
an air inlet connector in flow-communication with said elongated passageway; and connecting channels between said passageway and said exhaust gas inlet openings, through said sleeves, whereby combustion air can be injected through said connector, said passageway and said connecting channels to said sleeves for chemical conversion of residual combustible components remaining in engine exhaust gases.

5,768,891

**EXHAUST SYSTEM WITH SCAVENGING VENTURI**  
Dane Wagner, P O Box 211291, Anchorage, Ak. 99521  
Filed Sep. 16, 1996, Ser. No. 713,120  
Int. Cl.<sup>6</sup> F01N 7/10

U.S. Cl. 60—313

8 Claims



I. A collector for engines having a number of primary tubes, each primary tube having an inlet end and an outlet end, comprising:

- a) a generally cylindrical member, having an inlet end, an outlet end, and a cross-sectional area, wherein the inlet end of said generally cylindrical member has a plurality of semi-circular wall members formed thereon that correspond to the number of primary tubes and further such that said plurality of semi-circular wall members align with and cause said number of primary tubes to be arranged in a linear alignment within said plurality of semi-circular wall members, and further such that said plurality of semi-circular wall members have an inner perimeter, and a cross-sectional area substantially larger than the cross sectional area of the generally cylindrical member;
- b) a means for attaching said collector to an exhaust system, fixedly attached to said outlet end of said generally cylindrical member; wherein said means for attaching said collector to an exhaust system has a cross-sectional area substantially larger than cross sectional area of the generally cylindrical member, thereby forming a venturi between said inlet end and said outlet end of said generally cylindrical member; and
- c) a means for attaching said number of primary tubes to said collector, including a tube sheet, having an outer perimeter that conforms to the inner perimeter of said plurality of semi-circular openings, said tube sheet also having a plurality of holes formed therein that conform to the number of primary tubes and further such that said plurality of holes maintain said number of primary tubes in a linear alignment when said number of primary tubes are attached to said tube sheet.

5,768,892  
**RIDER TRANSAXLE HAVING IMPROVED HYDROSTATIC TRANSMISSION**

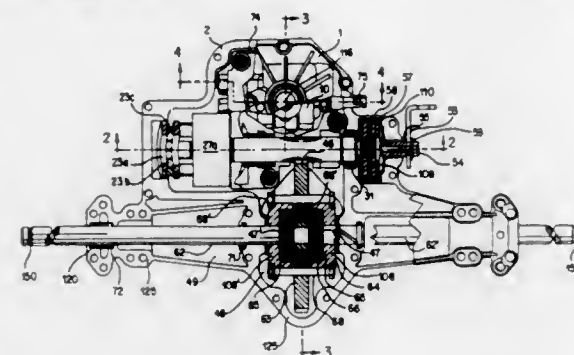
Ray M. Hauser, Decatur, Ill., and Alan W. Johnson, Ames, Iowa, assignors to Hydro-Gear Limited Partnership, Sullivan, Ill.

Continuation of Ser. No. 613,371, Mar. 11, 1996, Pat. No. 5,616,092, which is a continuation of Ser. No. 260,807, Jun. 16, 1994, Pat. No. 5,501,640, which is a continuation of Ser. No. 25,272, Mar. 2, 1993, Pat. No. 5,330,394, which is a continuation-in-part of Ser. No. 727,463, Jul. 9, 1991, Pat. No. 5,201,692. This application May 10, 1996, Ser. No. 644,474

Int. Cl.<sup>6</sup> F16D 39/00

U.S. Cl. 60—487

2 Claims



I. A transaxle, comprising:

- a housing;
  - a hydrostatic transmission disposed within said housing comprising:
  - a center section having a pump running surface and a motor running surface;
  - a hydraulic displacement pump having a rotating pump cylinder block disposed upon said pump running surface, said rotating pump cylinder block having a plurality of chambers each having disposed therein a reciprocating pump piston assembly;
  - a hydraulic displacement motor having a rotating motor cylinder block disposed upon said motor running surface, said rotating motor cylinder block having a plurality of chambers each having disposed therein a reciprocating motor piston assembly; and
  - porting formed within said center section for hydraulically connecting said hydraulic displacement pump to said hydraulic displacement motor;
- wherein said hydraulic displacement motor has an overall volumetric capacity and said hydraulic displacement pump has an overall volumetric capacity and wherein said overall volumetric capacity of said hydraulic displacement motor is larger than said overall volumetric capacity of said hydraulic displacement pump for providing a form of speed reduction.

5,768,893

**TURBINE WITH INTERNAL HEATING PASSAGES**

Kenzo Hoshino, and Simoes Raposo Bruges de Oliveira Manel Jose, both of 16-21 Daikan-cho, Hiratsuka-shi, Kanagawa-ken, Japan, 254

Division of Ser. No. 377,738, Jan. 25, 1995, Pat. No. 5,557,922.

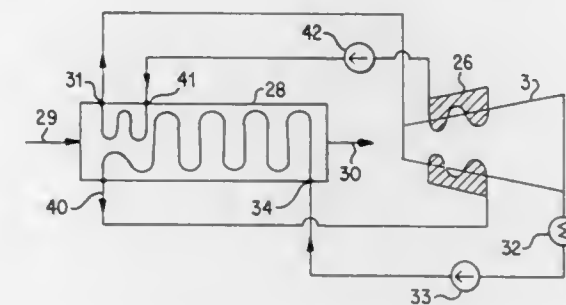
This application May 17, 1996, Ser. No. 649,188

Claims priority, application Japan, Jan. 25, 1994, 6-038998  
Int. Cl.<sup>6</sup> F01D 25/08

U.S. Cl. 60—682

2 Claims

- I. A turbine having an entrance, a heat exchanger where a heating gas heats and reheats a working gas, said heat exchanger having a heating element and a reheating element therein, and static blades and dynamic blades, and interspaces defined between adjacent ones of the static blades, said static blades having passages formed inside the blades, an inlet to said passages, and an



translating being substantially insensitive to the orientation of said tube and to the degree of filling of said tube by said process fluid.

5,768,895

**PRESSURE RELIEF SYSTEM AND METHOD FOR A REFRIGERATOR SYSTEM**

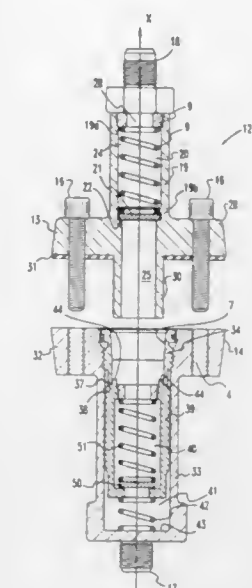
Luther D. Albertson, 1014 Plum Ridge Rd., Sellersburg, Ind. 47172; Walter R. Key, 1280 Diablo Rd., Greenwood, Ind. 46143, and Mark B. Key, 6434 Harting Overlook, Indianapolis, Ind. 46227

Continuation-in-part of Ser. No. 654,619, May 29, 1996, Pat. No. 5,729,991. This application May 28, 1997, Ser. No. 864,979

Int. Cl.<sup>6</sup> F25B 45/00

U.S. Cl. 62—77

18 Claims



5,768,894  
**APPARATUS, PROCESS AND SYSTEM FOR TUBE AND WHIP ROD HEAT EXCHANGER**

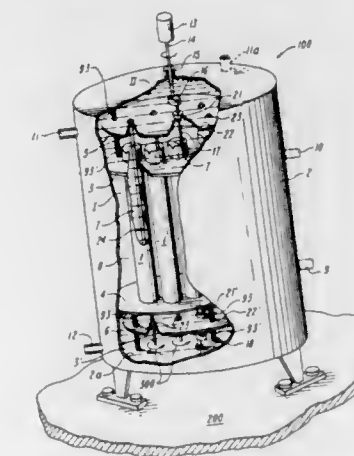
Yao Tzu Li, Lincoln, Mass.; Albert Yundt, Jr., Nashua, N.H.; I-Chien Ho, Concord, and Hong Ding Huang, Framingham, both of Mass., assignors to Y.T. Li Engineering, Inc., Acton, Mass.

Continuation-in-part of Ser. No. 81,039, Jun. 22, 1993, Pat. No. 5,385,645, and Ser. No. 81,499, Jun. 22, 1993, Pat. No. 5,363,660, each which is a continuation-in-part of Ser. No. 718,083, Jun. 17, 1991, Pat. No. 5,221,439. This application Dec. 19, 1995, Ser. No. 571,906

Int. Cl.<sup>6</sup> F25C 5/12; F28F 13/12

U.S. Cl. 62—71

13 Claims



I. A heat exchanger having at least one heat transfer tube that exchanges heat radially through the tube wall between hot and cold fluids, one of which is a process fluid that flows through the tube at least along the inner surface of the tube, and a whip-rod disposed in said tube, comprising,

- drive means for positively moving said whip rod around the inside wall of said tube that includes a motive power source, mechanical means coupling said power source to said rod and for translating the output of said motive power source into an orbiting movement of said rod over said inner surface, whereby said moving whip-rod interacts with said process fluid physically and controls the deposit of solids from said first process fluid on said inner tube surface, said coupling and

5,768,896

**AIR CYCLE REFRIGERATION AND AIR TEMPERATURE QUENCHING SYSTEM AND METHOD**  
Erin G. Kline, Vernon; Mark L. Harris, Enfield; George E. Wilmot, Jr., East Granby, and Douglas Christians, Vernon, all of Conn., assignors to United Technologies Corporation, Windsor, Conn.

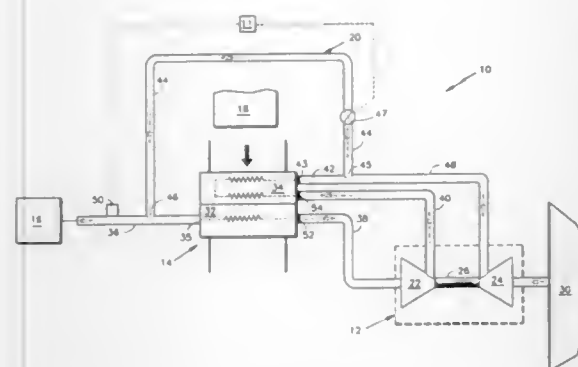
Filed Dec. 20, 1996, Ser. No. 771,188

Int. Cl.<sup>6</sup> F25B 9/00

U.S. Cl. 62—87

25 Claims

- I. An air cycle air conditioning system, comprising:
- a first air source for supplying cooling air;
  - a second air source for supplying system air to a system component of said system, wherein said system air has a higher temperature than said cooling air;
  - first means for transferring heat from said system air to said cooling air and producing conditioned air having a temperature lower than said system air; and
  - means for directing at least a portion of said conditioned air to said system air prior to said system air contacting said system



component for decreasing the temperature of said system air prior to reaching said system component.

5,768,897

#### AIR DRYING APPARATUS AND METHOD WITH HIGH RATIO GAS FLOW TO ABSORBER WEIGHT

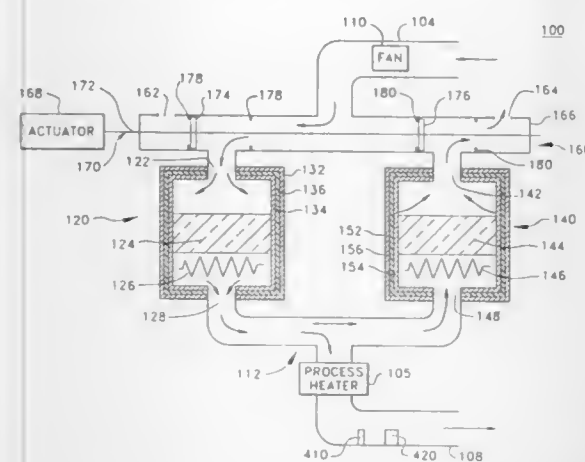
Donald D. Rainville, Manassas; Robert R. Crawford, and Rodrick W. Lyman, both of Stafford, all of Va., assignors to Universal Dynamics Corporation, Woodbridge, Va.

Continuation of Ser. No. 192,074, Feb. 4, 1994, abandoned, which is a continuation of Ser. No. 899,555, Jun. 16, 1992, abandoned. This application Feb. 27, 1995, Ser. No. 397,034

Int. Cl.<sup>6</sup> F25D 17/06

U.S. Cl. 62—94

6 Claims



1. A method for dehumidifying air and providing dehumidified air to an outlet, comprising the step of:

continuously causing air selectively from either a first air path or a second air path to flow to the outlet so as to maintain a continuous flow of dehumidified air into the outlet;

wherein said first air path is characterized by having a first opening, a second opening, and a first desiccant mass intermediate said first opening and said second opening;

wherein said second air path is characterized by having a first opening, a second opening, and a second desiccant mass intermediate said first opening and said second opening;

and wherein a ratio of the weight of both said first desiccant mass and said second desiccant mass to the flow rate to said outlet is not greater than about one pound per ten cubic feet per minute;

wherein said step of causing air to flow comprises, the steps of (a) selectively causing air from said first air path to flow to said outlet for a selected time, then (b) causing air from said second air path to provide air to said process outlet for said selected time and repeating said step (a) and (b), said selected time being between about five minutes and about 30 minutes.

#### 5,768,898 REFRIGERATOR HAVING FLUORESCENT LAMP FOR ILLUMINATING FRESH FOOD COMPARTMENT

Jin Oh Seok; Jong Ki Kim; Jong Hyun Lee, all of Suwon; Kwang Ho Kim, and Jin Ho Choi, both of Seoul, all of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

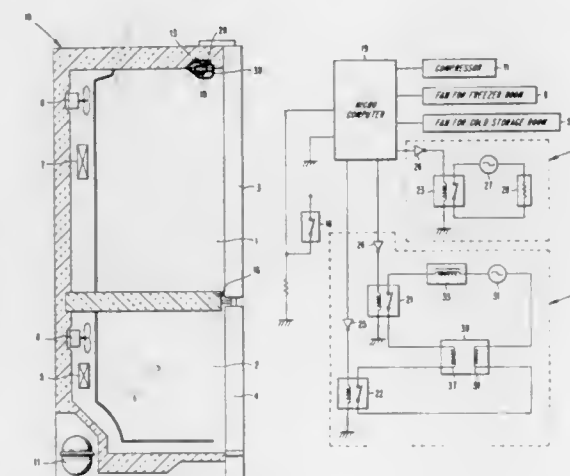
Filed Sep. 11, 1996, Ser. No. 710,027

Claims priority, application Rep. of Korea, Sep. 18, 1995, U.M.95-25094; May 23, 1996, 96-17745; May 23, 1996, 96-17833

Int. Cl.<sup>6</sup> F25B 49/00

U.S. Cl. 62—132

7 Claims



1. A refrigerator comprising:
  - a body forming a fresh food compartment;
  - a door mounted on the body for opening the compartment;
  - a fluorescent lamp disposed in the compartment and arranged to be turned on and off in response to an opening and closing, respectively, of the door;
  - a heater positioned adjacent to the fluorescent lamp for heating the lamp; and
  - a fan for circulating cool air to the compartment, the heater and fan disposed in a circuit which energizes the heater in response to the fan being activated.

#### 5,768,899 ICE MAKER WITH MECHANISM FOR DETERMINING A POSITION OF AN ICE MAKING TRAY

Gun Il Lee, Seoul, and Jae Eok Shim, Gunpo, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 21, 1996, Ser. No. 755,540

Claims priority, application Rep. of Korea, Dec. 22, 1995, 95-54792

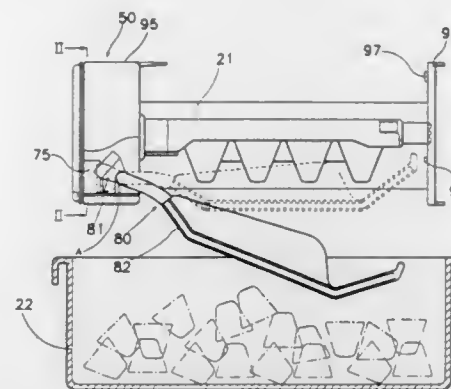
Int. Cl.<sup>6</sup> F25C 5/18

U.S. Cl. 62—137

5 Claims

1. An automatic ice maker adapted for use in a refrigerator, comprising:

- an ice tray rotatably mounted in the refrigerator;
- a motor operably connected to the tray for rotating the tray between an ice-making upright position and an ice-discharging inverted position;
- a container disposed below the tray for receiving ice discharged therefrom;
- a first electric on/off switch;
- a first cam connected for rotation with the tray for actuating a first switch between on/off states;
- a second electric on/off switch;
- a second cam connected for rotation with the tray for actuating the second switch between on/off states;



a controller connected to the first and second switches for determining that the tray is in an upright position in response to a first on/off relationship between the first and second switches, and in an inverted position in response to a second on/off relationship between the first and second switches, and a detector for detecting a condition when the container is full of ice and for moving the second switch to a state preventing further ice making operations when the container is full of ice, independently of the first and second cams, wherein the detector comprises a first portion adapted to contact ice in the container, and a second portion adapted to contact the second switch, the second cam arranged to act against the second portion of the detector to actuate the second switch.

#### 5,768,900 ICE MAKER HAVING STOPS FOR CONTROLLING THE POSITION OF A ROTARY ICE-MAKING TRAY

Gun Il Lee, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

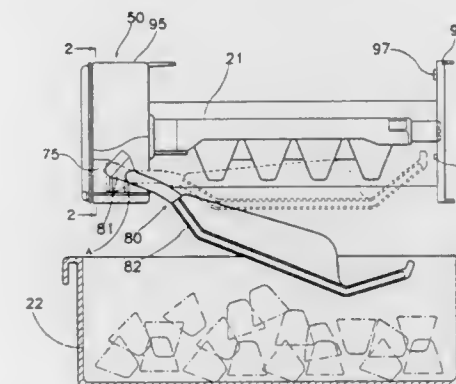
Filed Nov. 27, 1996, Ser. No. 757,548

Claims priority, application Rep. of Korea, Dec. 22, 1995, 95-54788; Dec. 22, 1995, 95-54790

Int. Cl.<sup>6</sup> F25C 5/06

U.S. Cl. 62—137

5 Claims



1. An automatic ice maker adapted for use in a refrigerator, comprising:

- an ice container rotatable about an axis;
- a motor;
- a drive transmission mechanism interconnecting the motor and the container for rotating the container between an ice-making upright position and an ice-discharging inverted position;
- a reservoir disposed below the container for receiving ice discharged therefrom;
- a cam structure operably connected to the drive transmission mechanism to be rotated thereby during rotation of the container;
- a switch arrangement operable by the cam structure to indicate a position of the container;

a controller operably connected to the motor and switch arrangement to shut off the motor when the container is in a desired one of its upright and inverted positions;

first and second stationary stop surfaces located for stopping the rotation of the container independently of the controller to prevent the container from rotating a substantial distance past the inverted and upright positions respectively; and

third and fourth movable stop surfaces engageable with the first and second stop surfaces, respectively, the third and fourth movable stop surfaces connected to the drive transmission mechanism for movement therewith to terminate a transmission of a driving force to the container in response to engagement of either of the third and fourth stop surfaces with the first and second stationary stop surfaces, respectively.

5,768,901

#### REFRIGERATING SYSTEM EMPLOYING A COMPRESSOR FOR SINGLE OR MULTI-STAGE OPERATION WITH CAPACITY CONTROL

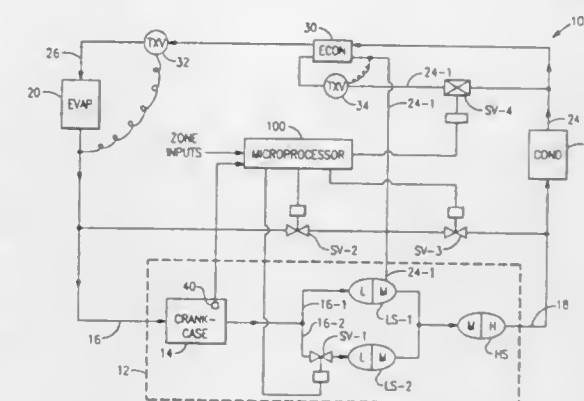
Michael J. Dormer, Fabius, and Bruce A. Fraser, Manlius, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 2, 1996, Ser. No. 758,837

Int. Cl.<sup>6</sup> F25B 7/00; F04B 3/00

U.S. Cl. 62—175

5 Claims



1. A refrigeration system having a closed circuit serially including a multi-stage compressor, a condenser, an economizer, an expansion device and an evaporator, a branch line connected to said closed circuit intermediate said condenser and said economizer and having a flow path including a first valve, an expansion device, and said economizer and connected to said compressor at an interstage location, said system including a microprocessor for controlling said system responsive to zone and system inputs, said compressor comprising:

- a first stage including at least two banks;
- a second stage;
- said banks of said first stage have discharge chambers and said second stage has a suction chamber;
- said second stage has a discharge chamber and said discharge chambers of said first stage and said suction chamber of said second stage are fluidly connected via a flow path which extends through said discharge chamber of said second stage;
- means for unloading one of said banks of said first stage;
- means for unloading one of said first and second stages;
- said microprocessor controlling said first valve, said means for unloading one of said banks and said means for unloading one of said first and second stages whereby said system can be operated single stage, two stage with or without economized flow and with or without unloading of said one of said banks of said first stage.



**5,768,902**  
**REFRIGERATION CYCLE AND METHOD OF CONTROLLING THE SAME**

Masayuki Nonaka, Ibaraki-ken; Hiroaki Matsushima, Ryugasaki; Kazuhiko Endoh, Ibaraki-ken; Kensaku Oguni, Shimizu; Kazumoto Urata, Shizuoka; Kyuhei Ishibane, and Takeshi Endoh, both of Shimizu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 330,677, Oct. 28, 1994, Pat. No. 5,651,263.

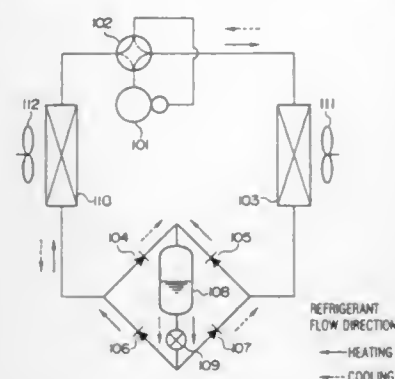
This application Dec. 13, 1996, Ser. No. 766,315

Claims priority, application Japan, Oct. 28, 1993, 5-270378; May 30, 1994, 6-116828

Int. Cl.<sup>6</sup> F25B 39/04; 43/00

U.S. Cl. 62—183

10 Claims



1. An air conditioner incorporating a refrigeration cycle operable both in heating and cooling mode, said refrigeration cycle including a compressor, a refrigerant flow passage changeover device, an indoor heat exchanger, an outdoor heat exchanger, a liquid receiver and a pressure reducer, said liquid receiver and said pressure reducer connected in series being provided between said indoor heat exchange and said outdoor heat exchanger, and a non-azeotropic mixture refrigerant charged in said refrigeration cycle and comprising at least two kinds of refrigerant of different boiling temperatures mixed together, said air conditioner comprising a refrigerant flow passage change-over means which selectively provide communication between the refrigerant passage between said indoor heat exchanger and said liquid receiver, the refrigerant passage between said outdoor heat exchanger and said liquid receiver, the refrigerant passage between said indoor heat exchanger and said pressure reducer, wherein said refrigerant flow passage changeover means includes a check valve provided at a junction where the refrigerant passage connected to said outdoor heat exchanger is connected to said liquid receiver, a check valve provided at a junction where the refrigerant passage connected to said indoor heat exchanger is connected to said liquid receiver, a check valve provided at a junction where the refrigerant passage connected to said outdoor heat exchanger is connected to said pressure reducer, and a check valve provided at a junction where a refrigerant passage connected to said indoor heat exchanger is connected to said pressure reducer.

**5,768,903**  
**REFRIGERATING APPARATUS, AIR CONDITIONER USING THE SAME AND METHOD FOR DRIVING THE AIR CONDITIONER**

Kunie Sekigami, Oota; Kouji Nagae, and Kazutoyo Kagami, both of Oozumimachi, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Mar. 7, 1996, Ser. No. 612,173

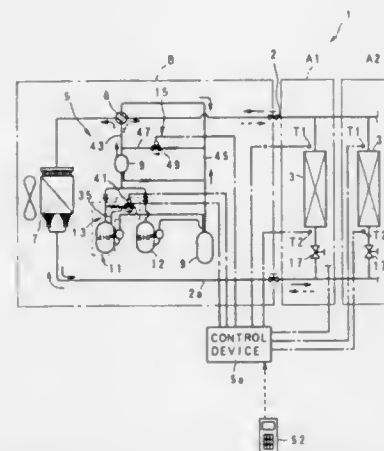
Claims priority, application Japan, Mar. 9, 1995, 7-078324; May 31, 1995, 7-157016

Int. Cl.<sup>6</sup> F25B 1/10

U.S. Cl. 62—196.2

7 Claims

1. A refrigerating machine including:



a heat exchanger for performing heat exchange between a refrigerant and air;  
a compressor having at least one cylinder for compression or sucking;  
a power control mechanism which is disposed in said compressor and serves to return a part of the refrigerant in the cylinder under a compressing process to the cylinder under sucking process to reduce an output power of said compressor;  
a refrigerant return mechanism for returning a part of the refrigerant discharged from said compressor to a refrigerant suction side of said compressor; and  
a controller for selectively controlling said power control mechanism and said refrigerant return mechanism to make the output power of said compressor variable.

**5,768,904**  
**PROCESSES FOR INTEGRATING A CONTINUOUS SORPTION COOLING PROCESS WITH AN EXTERNAL PROCESS**

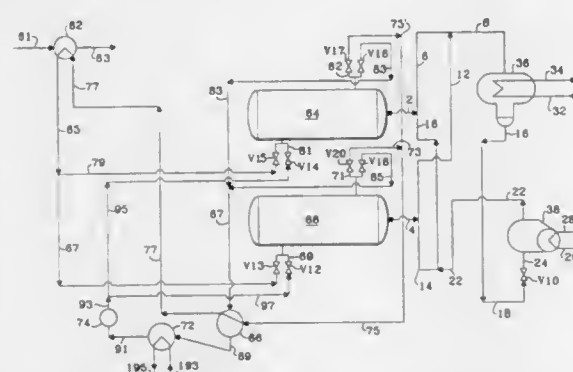
Constante P. Tagamolila, Arlington Heights, and Stephen R. Dunne, Algonquin, both of Ill., assignors to UOP LLC, Des Plaines, Ill.

Filed May 2, 1997, Ser. No. 850,402

Int. Cl.<sup>6</sup> F25B 27/00

U.S. Cl. 62—238.3

26 Claims



1. A process for continuous cooling of a condensable process stream with a sorption cooling system for producing a separate chilled stream, said process comprising:  
a) passing the condensable process stream to a hot source exchanger and therein cooling the condensable process stream by indirect heat exchange with a cooled hot exit stream to provide a cooled condensable process stream and a hot working fluid stream;  
b) passing the hot working fluid stream and a cold working fluid stream to the sorption cooling system and withdrawing a hot exit stream and a warm exit stream; and  
c) heat exchanging by indirect heat exchange the hot exit stream with at least a portion of the warm exit stream in an interme-

diate heat exchanger to provide the cooled hot exit stream and a heated warm exit stream and cooling the heated warm exit stream to provide the cold working fluid stream.

**5,768,905**  
**REFRIGERATOR HAVING A WATER DISPENSER AND A WATER STERILIZER**

Gil-Soo Oh, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

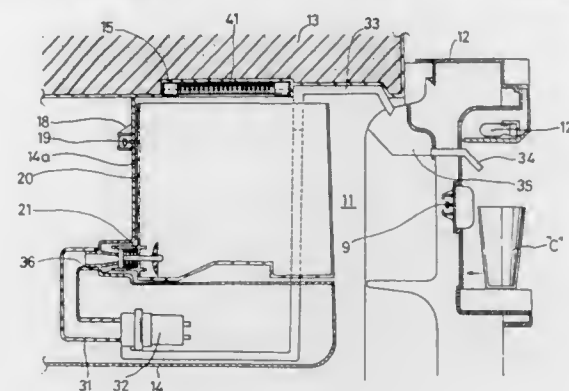
Filed Nov. 18, 1996, Ser. No. 749,890

Claims priority, application Rep. of Korea, Dec. 19, 1995, 1995-52132; Oct. 21, 1996, 1996-47120

Int. Cl.<sup>6</sup> F25D 23/00; B67D 5/62

U.S. Cl. 62—264

10 Claims



1. A refrigerator comprising:

a body containing a refrigerating compartment and a freezing compartment, the body including a door;  
a partition wall disposed inside of the body and separating the refrigerating compartment from the freezing compartment;  
a container disposed in the refrigerating compartment for storing water;  
a passage leading from the container to an outlet in the door for dispensing water through the door; and  
a sterilizer device arranged in the partition wall to be spaced from stored water in the container for emitting ultraviolet light into the container to sterilize the water stored therein.

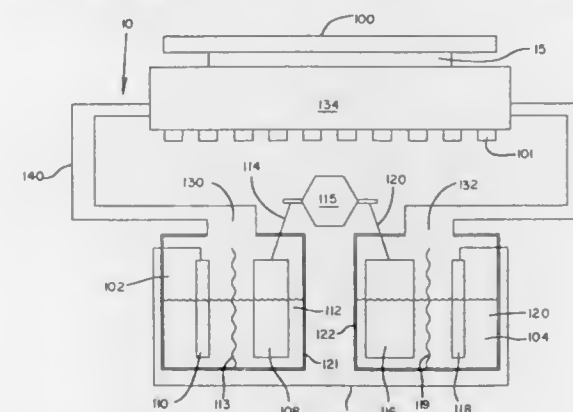
**5,768,906**  
**ELECTROCHEMICAL HEAT EXCHANGER**  
Boris Tsentser, Norcross, Ga., assignor to Borst, Inc., Norcross, Ga.

Filed Jan. 16, 1996, Ser. No. 586,369

Int. Cl.<sup>6</sup> F25B 17/08; F28D 15/00

U.S. Cl. 62—480

39 Claims



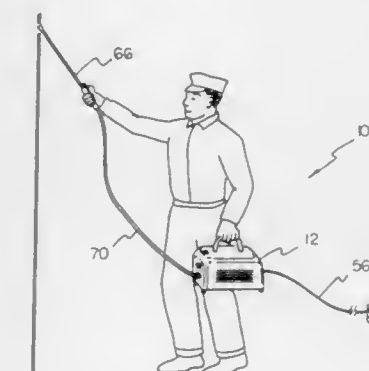
1. An electrochemical heat exchanger comprising:  
a housing;

at least one electrochemical cell within said housing; said electrochemical cell having a first electrode and a hydrogen electrode, said first electrode and hydrogen electrode being at least partially immersed in a liquid electrolyte;  
said electrodes being connected through the housing to positive and negative terminals of a power supply whereby the application of power to said electrodes causes the production or consumption of a heat exchange gas; and  
a gas space inside said housing for containing said heat exchange gas, said gas space being in communication with a heat exchange chamber, said heat exchange chamber being in thermal communication with an element to be temperature regulated.

**5,768,907**  
**SANITARY PEST CONTROL SYSTEM**  
Frank R. Lee, P.O. Box 14023, Las Vegas, Nev. 89114  
Filed May 5, 1997, Ser. No. 851,328  
Int. Cl.<sup>6</sup> F25D 3/00; A01M 1/20

U.S. Cl. 62—293

8 Claims



1. A sanitary pest control system for flushing out and killing insects and household pests by freezing them comprising, in combination:

a housing having a generally rectangular configuration, the housing having a top wall, a bottom wall, a forward wall, an openable vented rearward wall, two long vented side walls and a hollow interior, the top wall having a generally U-shaped handle affixed thereto, the forward wall having an outlet aperture therethrough, a circular flange coupling member disposed within the outlet aperture, the bottom wall having four legs disposed in four corners thereof, the two side walls having lateral grooves formed on an interior surface thereof for slidably receiving a supplemental base therebetween;

an air conditioning system disposed within the hollow interior of the housing, the air conditioning system positioned on the supplemental base, the air conditioning system including an evaporator disposed adjacent to the forward wall of the housing, a motor positioned rearwardly of the evaporator, the motor having an axial rod extending rearwardly therefrom, a forward fan rotatably coupled with the axial rod adjacent to the motor, an interior housing positioned rearwardly of the motor, the interior housing receiving the axial rod there-through, the interior housing having a compressor and a condenser disposed therein, a flow tube extends between the interior housing and the evaporator to allow flow of refrigerant from the compressor and the condenser to the evaporator, a rearward fan rotatably coupled with a distal end of the axial rod disposed between the interior housing and the rearward wall of the housing, the air conditioning system having a power cord extending outwardly of the housing for coupling with an electrical outlet;

a power switch disposed within the top wall of the housing, the power switch being electrically coupled with the air conditioning system for selective activation or deactivation thereof;

1. A natural gas liquefaction process, characterized in that the process comprises the steps of passing natural gas through a series of heat exchangers in countercurrent relationship with a single phase refrigerant gas circulated through a cooling cycle, substantially isentropically expanding portions of refrigerant to different cooling temperatures at which said refrigerant portions are supplied to respective heat exchangers for cooling the natural gas through corresponding temperature ranges, whereby the warming curve for the refrigerant comprising all said portions has sections of different gradients, discharging cooled natural gas from a final heat exchanger at an exit temperature in the range  $-160^{\circ}\text{C}$ . to  $-140^{\circ}\text{C}$ ., and supplying to the final heat exchanger of said series a refrigerant portion at a cooling temperature and in an amount selected in the range of 20 to 50% of the circulated refrigerant so that the part of the refrigerant warming curve relating to the final heat exchanger is closely matched to and has substantially the same slope as the part of the natural gas cooling curve extending over the temperature range from said exit temperature to  $-100^{\circ}\text{C}$ .



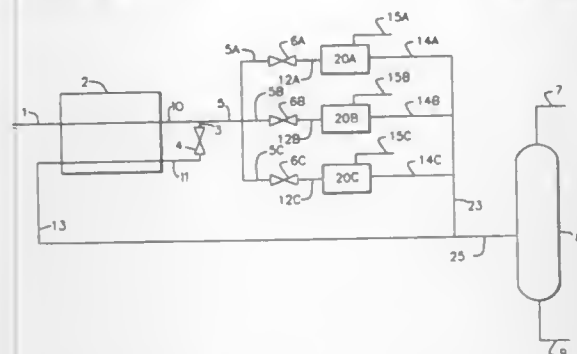
**5,768,913**  
**PROCESS BASED MIXED REFRIGERANTS FOR**  
**ETHYLENE PLANTS**

Richard H. McCue, Jr.; Mark Whitney, both of Houston; John L. Pickering, Jr., Klingwood, and David Chen, Sugar Land, all of Tex., assignors to Stone & Webster Engineering Corp., Boston, Mass.

Filed Apr. 16, 1997, Ser. No. 843,448  
Int. Cl.<sup>6</sup> F25J 3/02

U.S. Cl. 62—625

16 Claims



1. A process for the production of refrigerant for a process to separate gases from a product stream comprising the steps of: withdrawing a stream of process fluid from the separation process; cooling said withdrawn stream of process fluid to a temperature below the operating temperature of a downstream process fluid refrigerant user; cooling said downstream process fluid refrigerant user with said cooled withdrawn stream whereby said cooled withdrawn stream is at least partially vaporized; and returning said at least partially vaporized stream to said separation process.

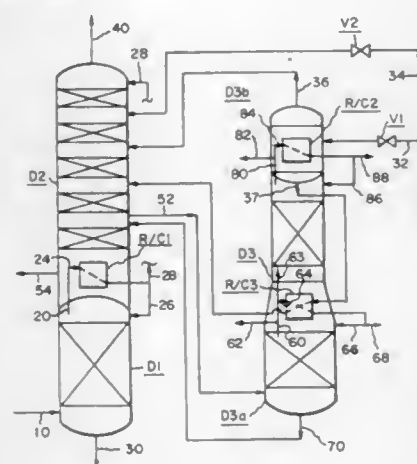
**5,768,914**  
**PROCESS TO PRODUCE OXYGEN AND ARGON USING**  
**DIVIDED ARGON COLUMN**

Jianguo Xu, Fogelsville, and Jeffrey A. Hopkins, Whitehall, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 28, 1997, Ser. No. 901,538  
Int. Cl.<sup>6</sup> F25J 3/04

U.S. Cl. 62—648

5 Claims



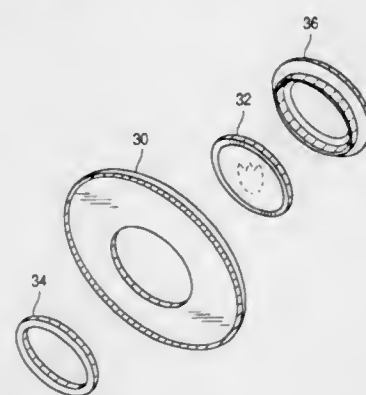
1. A process for the cryogenic distillation of an air feed to produce an oxygen product and an argon product using a distillation column system comprising a high pressure column, a low pressure column and an argon column having a lower section and an upper section, said process comprising:

- (a) feeding at least a first portion of the air feed to the high pressure column;
- (b) collecting a nitrogen-enriched overhead at the top of the high pressure column, condensing at least a first portion thereof in a first reboiler/condenser to produce a nitrogen-enriched liquid and feeding at least a first part of the nitrogen-enriched liquid as reflux to an upper location in the high pressure column;
- (c) removing a crude liquid oxygen stream from the bottom of the high pressure column, reducing the pressure of at least a first portion thereof, partially vaporizing said first portion in a second reboiler/condenser into a vaporized part and a remaining liquid part, and feeding the vaporized part to the low pressure column;
- (d) removing a nitrogen rich overhead from the top of the low pressure column as a secondary product stream;
- (e) collecting an oxygen rich liquid at the bottom of the low pressure column, vaporizing at least a first portion thereof in the first reboiler/condenser to produce an oxygen rich vapor and removing a portion of the oxygen rich liquid and/or oxygen rich vapor as said oxygen product;
- (f) removing a vapor stream enriched in argon from the low pressure column and feeding it to the bottom of the argon column's lower section;
- (g) collecting an argon-enriched overhead from the top of the argon column's lower section, feeding a first portion thereof to the bottom of the argon column's upper section, condensing a second portion thereof in a third reboiler/condenser to produce an argon-enriched liquid, feeding at least a first part of the argon-enriched liquid as reflux to an upper location in the argon column's lower section and removing a third portion of the argon-enriched overhead and/or a second part of the argon-enriched liquid as an impure argon stream;
- (h) collecting an argon rich overhead from the top of the argon column's upper section, condensing at least a first portion thereof in the second reboiler/condenser to produce an argon rich liquid, feeding at least a first part of the argon rich liquid as said argon product; and
- (i) removing a liquid stream from the bottom of the argon column's lower section and feeding it to the low pressure column.

**5,768,915**  
**COIN DISPLAY DEVICE**  
David Crumrine, Reno; Daniel J. Mitchell, and Matthew A. Taber, both of Sparks, all of Nev., assignors to Crumrine Manufacturing Jewelers, Inc., Reno, Nev.  
Filed May 2, 1996, Ser. No. 649,899  
Int. Cl.<sup>6</sup> A44C 17/02

U.S. Cl. 63—29.1

11 Claims

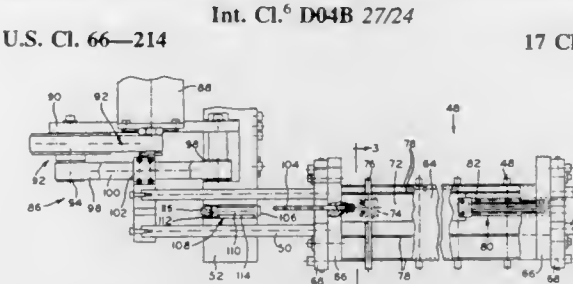


1. An artifact retaining device for retaining one or more artifacts such as coins, jewels, stones, or other type mementos in a display structure, said display structure having a front and a rear surface and an opening therethrough, said artifact retaining device comprising:

a bezel; and  
a retaining member having a first surface for engaging said display structure, said retaining member engageable with said bezel to retain said bezel with respect to said opening.

**5,768,916**  
**WARP KNITTING MACHINE**  
Silvan Borer, Uitikon, Switzerland, assignor to Textilma AG, Switzerland  
Filed Oct. 3, 1996, Ser. No. 725,568  
Claims priority, application Switzerland, Oct. 11, 1995, 2876/95

Int. Cl.<sup>6</sup> D04B 27/24  
U.S. Cl. 66—214  
17 Claims

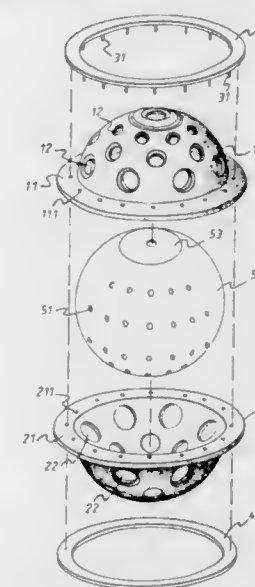


1. Warp knitting machine, with at least one knitting needle bar and at least one guide bar lapping in lengthwise direction with thread guides for the feeding of threads to the knitting needle bars, characterized in that the guide bar has at least one auxiliary guide bar lapping back and forth in the lengthwise direction of the guide bar with at least one auxiliary thread guide which is driven relatively to the guide bar, and the guide bar is constructed as a tubular profile and has inside guides for the auxiliary guide bar.

**5,768,917**  
**LAUNDRY BALL**  
Leu Shioh Jiuan Freida, No. 487, Noan Noan Street, Noan Noan District, Keelung City, Taiwan  
Filed Sep. 17, 1996, Ser. No. 714,257  
Int. Cl.<sup>6</sup> D06F 39/02

U.S. Cl. 68—17 R

3 Claims



1. A laundry ball for containing and dispensing a particulate cleaning agent into the water of a clothes washing machine, the ball comprising:

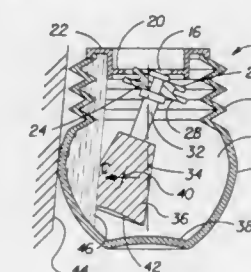
- a) a hollow spherical housing defined by two semi-spherical half sections, each half section including a plurality of openings

formed therein, a circumferential flange extending outwardly from a circular edge thereof and a plurality of position holes spaced around the flange, the position holes of the two flanges corresponding in number and location;  
b) a porous spherical shell disposable within the housing for containing a particulate cleaning material, the shell including a plurality of orifices formed therein; and  
c) a pair of annular plates engageable on opposite sides of the flanges, one annular plate including a plurality of dowel pins for extending through the position holes of the flanges and welding to the other annular plate for securing the semi-spherical half sections together.

**5,768,918**  
**RINSE WATER ADDITIVE DISPENSER**  
Gary E. McKibben, Middletown, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio  
Filed Apr. 7, 1997, Ser. No. 834,580  
Int. Cl.<sup>6</sup> D06F 39/02

U.S. Cl. 68—17 R

12 Claims

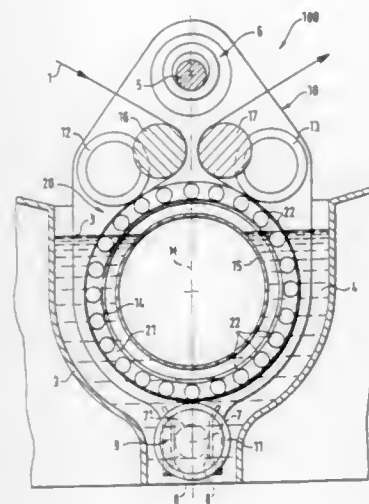


1. An improved rinse water additive dispenser for an automatic washer having a spinning drum, said dispenser comprising a substantially rigid body having a resilient portion and an internal volume, said dispenser further including an opening therein and a valve for sealing said opening closed so that said rinse water additive is maintained within said dispenser until said valve is acted upon by centrifugal force applied to said dispenser during a spin cycle of said automatic washer to unseat said valve, said resilient portion providing for volumetric expansion and contraction of said dispenser when said dispenser is placed in variable temperature water, said volumetric expansion and contraction substantially relieving an air pressure differential between ambient and said internal volume so that said centrifugal force unseats said valve without interference from said pressure differential.

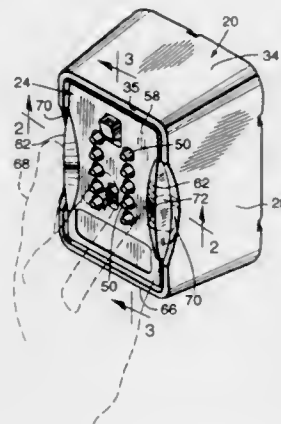
**5,768,919**  
**TREATMENT DEVICE FOR TEXTILE WEBS**  
Wolfgang Kurschatke, Krefeld, Germany, assignor to Eduard Küsters Maschinenfabrik GmbH & Co. KG, Krefeld, Germany  
PCT No. PCT/DE95/00380, § 371 Date Dec. 31, 1996, § 102(e) Date Dec. 31, 1996, PCT Pub. No. WO95/29280, PCT Pub. Date Nov. 2, 1995  
PCT Filed Mar. 21, 1995, Ser. No. 732,484  
Claims priority, application Germany, Apr. 21, 1994, 44 13 871.7

Int. Cl.<sup>6</sup> D06B 3/20  
U.S. Cl. 68—170  
19 Claims

1. An apparatus for treating a continuously moving textile web, comprising:  
a plurality of columnar supports;  
a container connected to the columnar supports to receive a treatment liquid;  
a drum with a cylindrical outer periphery that is rotatable in the container in a treatment liquid, said drum having a drum axis;  
a plurality of vertical bearing plates arranged at the ends of the drum perpendicular to the drum axis, and on which the drum



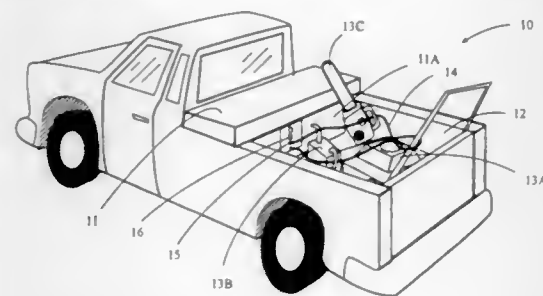
5,768,921  
**KEY BOX DEVICE**  
Matthew S. Hill, Salem, Oreg., assignor to Supra Products, Inc., Salem, Oreg.  
Filed Apr. 18, 1997, Ser. No. 844,537  
Int. Cl.<sup>6</sup> E05B 65/52  
U.S. Cl. 70—63 9 Claims



is mounted rotatably about its axis and which in turn are braced on the columnar supports;  
a plurality of oscillation generators, each one being operatively engaged with one of the bearing plates, by means of which the bearing plates and thus the drum can be caused to oscillate perpendicular to the drum axis;  
a driven eccentric located at a position that is above the intended level of treatment liquid; and  
a torque support located outside of the eccentric, wherein each of the bearing plates is arranged inside the container and is mounted on the machine chassis on the driven eccentric, and is braced against oscillations about the eccentric by the torque support.

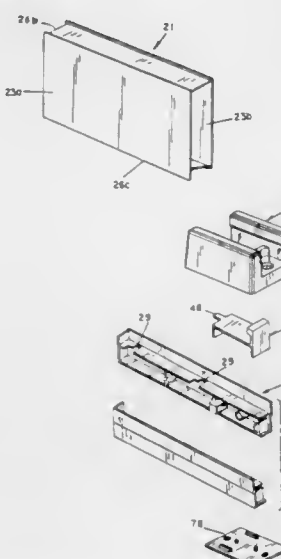
1. A key box device, comprising:  
a base defining a compartment and having an opening to the compartment on one side thereof, the base including sidewalls that have outer edges that terminate in a plane;  
a lid attachable to the base for covering the opening and closing the compartment, the lid having an outer surface that includes a margin that is disposed in the plane when the lid is attached to the base, except for opposing manual gripping flanged parts along peripheral side surfaces of the lid that protrude from the plane away from the base.

5,768,920  
**CARGO LOCKING DEVICE**  
Bruce D. DeBevoise, 133 E. De la Guerra St., #275, Santa Barbara, Calif. 93101  
Continuation-in-part of Ser. No. 527,699, Sep. 13, 1995, abandoned, which is a continuation of Ser. No. 277,425, Jul. 18, 1994, abandoned. This application Mar. 13, 1997, Ser. No. 815,633  
Int. Cl.<sup>6</sup> E05B 73/00  
U.S. Cl. 70—18 4 Claims



1. A storage box comprising:  
(a) a lid adapted to be opened or closed having a first locking means;  
(b) a bottom;  
(c) three sides;  
(d) a flat front surface having a cutout; and  
(e) a retractable-cable locking device mounted within said cutout and affixed to said flat front surface of said storage box, said retractable-cable locking device further comprising a cable having a free end and a cable lock which operates independently from said first locking means, wherein said cable lock is adapted to lock said free end of said cable in mating engagement with said retractable-cable locking device.

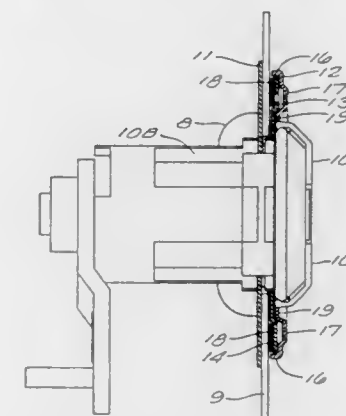
5,768,922  
**SECURITY CASE WITH FIELD ACTIVATED LOCKING MECHANISM**  
Michael R. Lax, Oyster Bay Cove, N.Y., assignor to Autronic Plastics, Inc., Westbury, N.Y.  
Continuation-in-part of Ser. No. 398,280, Mar. 3, 1995, Pat. No. 5,598,728. This application May 24, 1996, Ser. No. 656,039  
Int. Cl.<sup>6</sup> E05B 47/00  
U.S. Cl. 70—276 59 Claims



1. A security device comprising:  
a case having a bottom access opening to receive merchandise, a top, two opposing ends and two opposing sidewall surfaces;

at least one tab protruding from the case; and  
a locking mechanism for maintaining the received merchandise in the case when the locking mechanism is closed, the locking mechanism being fully separable from the case when the locking mechanism is open and including  
a base housing including at least one slot to engage the tab to and secure the case to the locking mechanism,  
two substantially parallel flanges extending from the base housing and spaced apart from each other to overlie at least one of the sidewall surfaces of the case,  
an actuator on the base housing that partially extends adjacent to the access opening for maintaining the received merchandise in the case when the actuator is in a first position, the actuator slidably extending into the base housing, and  
a locking device in the base housing retaining the actuator in the first position when the locking mechanism is closed.

5,768,923  
**PROTECTIVE PLATE FOR AN AUTOMOBILE LOCKING MECHANISM**  
Mark Langdon Hill, P.O. Box 228, Tucson, Ariz. 85702  
Filed May 16, 1996, Ser. No. 648,708  
Int. Cl.<sup>6</sup> E05B 9/08  
U.S. Cl. 70—370 10 Claims



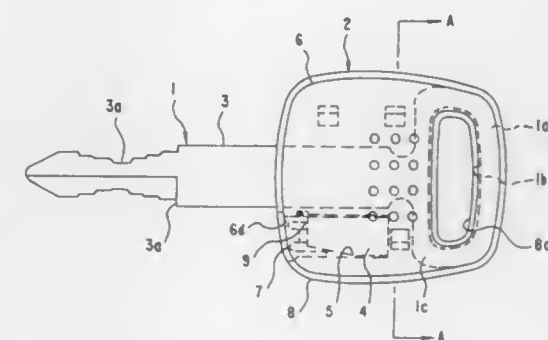
1. An automobile door lock comprising:  
a) a locking cylinder extending through a skin of an automobile door;  
b) a guard plate interposed between an outer portion of said locking cylinder and skin of an automobile door and having,  
1) a first member being substantially circular in shape and having,  
A) a flange encircling an entirety of an outer periphery thereof,  
B) a substantially circular opening, and,  
C) a shoulder portion positioned around a periphery of said circular opening, and,  
2) a second member, bonded to said first member within said flange and being substantially circular in shape, said second member having an opening accessible through said substantially circular opening of said first member, the opening of said second member adapted to connect with the locking cylinder in a unique orientation; and,  
c) a snap bracket connected to said locking cylinder on an interior portion of said automobile door, said snap bracket being substantially circular and having a diameter larger than said first member.

5,768,924  
**KEY CLIP**  
Chang June Song, 6740 Comstock Road, Richmond, British Columbia, Canada  
Continuation of Ser. No. 446,194, May 19, 1995, abandoned. This application Jan. 3, 1997, Ser. No. 778,562  
Int. Cl.<sup>6</sup> E05B 19/04  
U.S. Cl. 70—408 11 Claims



1. A key clip in combination with a key, the combination comprising:  
a key having an elongated groove formed along at least a first edge of said key;  
a key clip, formed from a single piece of material and shaped for slidable insertion into said groove formed along at least said first edge of said key, said key clip having a tongue for coupling said key to an object.

5,768,925  
**ELECTRONIC-COMPONENT-INTEGRATED KEY**  
Takuro Ozawa, and Yoshio Watanuki, both of Kanagawa, Japan, assignors to Alpha Corporation, and Nissan Motor Co., Ltd., both of Kanagawa, Japan  
Continuation of Ser. No. 531,085, Sep. 20, 1995, abandoned. This application Feb. 14, 1997, Ser. No. 801,924  
Claims priority, application Japan, Sep. 29, 1994, 6-235494  
Int. Cl.<sup>6</sup> E05B 19/04  
U.S. Cl. 70—408 5 Claims



1. An electronic-component-integrated key comprising:  
a key plate having a) a blade portion formed at a front end with serrations which serve to give a key code and b) a head portion extending sideways from a rear end of said blade portion;  
a head being made of resin and fixed to an end portion of the key plate, said head including  
an inside case portion being made of hard resin and having a recessed portion located parallel with and adjacent to a side of the blade portion, said recessed portion having a front end extending toward the serrations of the key plate and a rear end located adjacent to the head portion, and  
an outer sheath portion being fixed to an outside of the inside case portion and being made of soft resin; and



an electronic component arranged within the recessed portion of the inside case portion, which is activated by a signal by an antenna outside said key and which is rearwardly shielded by said head portion of the key plate;  
wherein abutment portions are formed on the inside case portion and are partially exposed to the outer sheath portion.

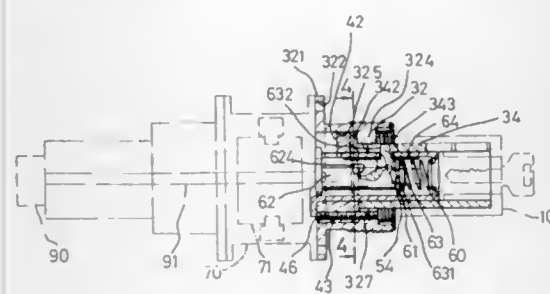
5,768,926

**LOCK HAVING AN EXTERIOR DOOR HANDLE  
CAPABLE OF A FREE TURNING MOVEMENT**  
Mu-lin Shen, No. 32, Lane 76, Sec. 5, Fu-an Rd., Tainan,  
Taiwan

Filed Nov. 4, 1996, Ser. No. 743,908  
Int. Cl.<sup>6</sup> E05B 55/06

U.S. Cl. 70—472

4 Claims



1. A lock sub-assembly for a cylinder lock having a chassis, a retractor received within the chassis, an interior hub fixed to an interior side of the chassis, an interior long handle and an exterior long handle, the sub-assembly comprising:  
an exterior hub configured to be fixed to an exterior side of the chassis, the exterior hub having a protruding step;  
a handle spindle rotatable received within the exterior hub and having a stopper, the handle spindle being configured to rotate together with the exterior long handle;  
a restricting block fixedly secured within the exterior hub, the restricting block having a protrusion which together with the protruding step of the exterior hub defines a space for a limited turning movement of the handle spindle with respect to the exterior hub;  
an actuating spindle extending through both the restricting block and the handle spindle, the actuating spindle having a roll-back portion adapted to operate the retractor; and  
means for releasably coupling the actuating spindle to the handle spindle;  
wherein the exterior hub has a hole through the protruding step thereof and a pair of through-holes in an inner wall thereof; the restricting block has a bottom threaded hole aligned with the hole of the exterior hub and a pair of side threaded holes aligned with the pair of through-holes of the exterior hub; and  
a first fastener extending through the hole of the exterior hub and the bottom threaded hole of the restricting block and a second fastener extending through the pair of through-holes of the exterior hub and the pair of side threaded holes of the restricting block, thereby fixedly securing the restricting block within the exterior hub.

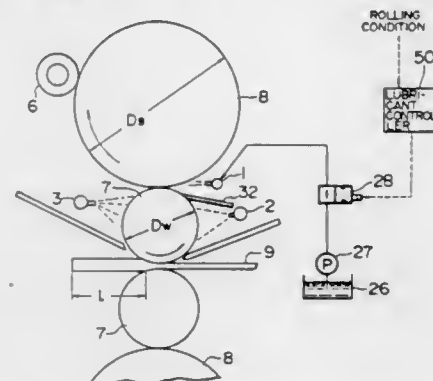
**ROLLING MILL, HOT ROLLING SYSTEM, ROLLING  
METHOD AND ROLLING MILL REVAMPING METHOD**  
Toshiyuki Kajiura, Tokyo; Tokuji Sugiyama, Ibaraki-ken;  
Yoshio Takakura, Hitachi; Takao Sakanaka, Hitachi; Yasut-  
sugu Yoshimura, Hitachi; Ken-ichi Yasuda, Katsuta, and  
Shinichi Kaga, Hitachi, all of Japan, assignors to Hitachi  
Ltd., Tokyo, Japan  
Continuation of Ser. No. 224,017, Apr. 6, 1994, abandoned,  
which is a continuation-in-part of Ser. No. 859,945, Mar. 30,  
1992, abandoned. This application Jul. 24, 1996, Ser. No.  
685,605

Claims priority, application Japan, Mar. 29, 1991, 3-066007;  
Feb. 6, 1992, 4-020956

Int. Cl.<sup>6</sup> B21B 37/58

U.S. Cl. 72—10.1

49 Claims



1. A rolling mill in which a pair of work rolls and a pair of back-up rolls for respectively supporting the work rolls are provided on a rolling stand and said work rolls are arranged such that their axes can be inclined in a horizontal plane such that a rolling of a material to be rolled is carried out with the axes of said work rolls crossing each other, wherein:  
said back-up rolls are arranged such that the axes of said back-up rolls are disposed in a horizontal plane and fixed in a direction substantially perpendicular to a direction of rolling of said material;  
said work rolls are supported such that respective angles of inclination of respective work rolls are controllable so that the axes of said work rolls cross the axes of said back-up rolls and also cross a line perpendicular to the direction of rolling of said material;  
said work rolls and said back-up rolls are arranged such that a first thrust force acts from each back-up roll to an associated work roll in a direction opposite to a direction in which a second thrust force acts from said material to the work roll so that an actual thrust force acting on the work roll is equal to a difference between said first and second thrust forces; and  
a lubricant supply device is provided for supplying an axial thrust reducing lubricant to a zone between each work roll having its axis crossing the axis of an associated back-up roll and the back-up roll with which said work roll is in direct contact, to thereby maintain axial thrust reducing lubrication in said zone, whereby the actual thrust force is reduced by the lubrication in said zone between the work roll and the back-up roll.

5,768,928

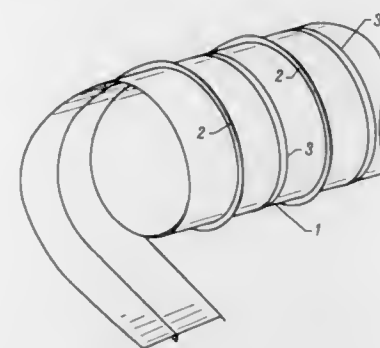
**METHOD OF MAKING AN HYDRAULICALLY  
EFFICIENT RIBBED PIPE**

Ken Carson, 111 E. 100th Ave., Anchorage, Ak. 99515  
Division of Ser. No. 543,757, Oct. 16, 1995. This application  
Jun. 5, 1997, Ser. No. 870,097  
Int. Cl.<sup>6</sup> B21C 37/12

U.S. Cl. 72—49

10 Claims

1. The method of forming a smooth flow metal pipe having a pipe wall including a substantially cylindrical wall, having an inner



surface, said pipe wall also including a plurality of outer, integral reinforcing ribs spirally around the outer wall, whereby said plurality of reinforcing ribs are closed, said smooth flow metal pipe also having a means for joining the pipe wall into a continuous length of pipe, comprising the steps of:

- running a flat sheet of metal through a ten stand forming roll machine, each stand having a left, right and center position, including:
  - a "V" former roll at stand 1,
  - a narrow "V" forming roll in the center position, plus one "V" forming roll in the left position and one "V" forming roll in the right position at stand 2,
  - a wide rib former in the center position plus one "V" forming roll in the left position and one "V" forming roll in the right position at stand 3,
  - a rib forming roll in the center position plus one narrow "V" forming roll in the left position and one narrow "V" forming roll in the right position at stand 5,
  - a rib forming roll in the center position, a rib forming roll in the right position and a narrow "V" forming roll at stand 6,
  - a rib forming roll at the center, right and left positions of stand 7 for closing said plurality of ribs formed on said smooth flow metal pipe,
  - a rib forming roll at the center, right and left positions of stand 8,
  - a rib forming roll at the center, right and left positions, plus a seam forming roll at stand 9, and
  - a rib forming roll at the center, right and left positions, plus a seam forming roll at stand 10; and
- closing said closeable seam, thereby forming said smooth flow metal pipe.

5,768,929

Patent Not Issued For This Number

5,768,930

**WIRE STRAIGHTENING DEVICE**

Albert Eckehard, Berlin, Germany, assignor to Witel  
Apparate-Maschinen Albert GmbH & Co KG, Berlin, Ger-  
many

Filed Feb. 7, 1997, Ser. No. 797,570

Claims priority, application Germany, Feb. 23, 1996, 196 06  
875.4

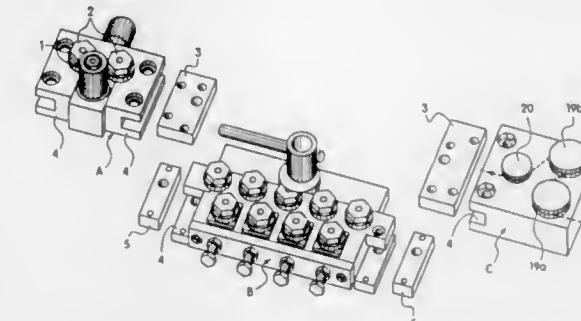
Int. Cl.<sup>6</sup> B21D 1/02

U.S. Cl. 72—164

11 Claims

1. A straightening device for the treatment of material such as wire, multiple wire or tubular material running in a predetermined direction, comprising:

- a first unit and a second unit, each unit comprising a plurality of straightening rollers having vertical axes arranged in two planes substantially parallel to the running direction of the material, said material running between said planes, said



straightening rollers adapted to be adjusted either singly or together, toward and away from the material, wherein said straightening rollers are off-set from each other, and wherein said first unit has at least one straightening roller that is adjustable in height along its vertical axis and said second unit has non-height adjustable straightening rollers; and  
a third unit comprising a dead straightener connected to one of the first and second units at the infeed end relative to the running direction of the material, said dead straightener comprising first and second straightening rollers of larger diameter at the material infeed end, and a third straightening roller of smaller diameter at the outfeed end.

5,768,931

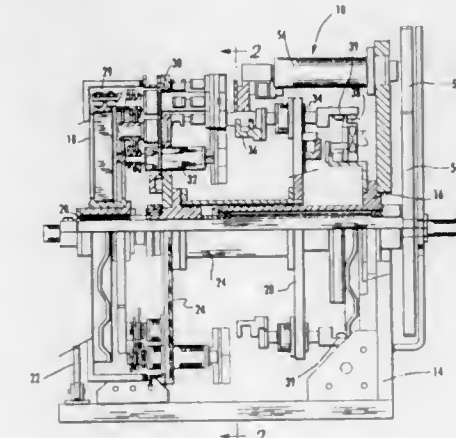
**ARTICLE PROCESSING MACHINE**

Laszlo A. Gombas, 23768 Shooting Star Dr., Golden, Colo.  
80401

Filed Dec. 13, 1996, Ser. No. 764,848  
Int. Cl.<sup>6</sup> B21D 51/26

U.S. Cl. 72—184

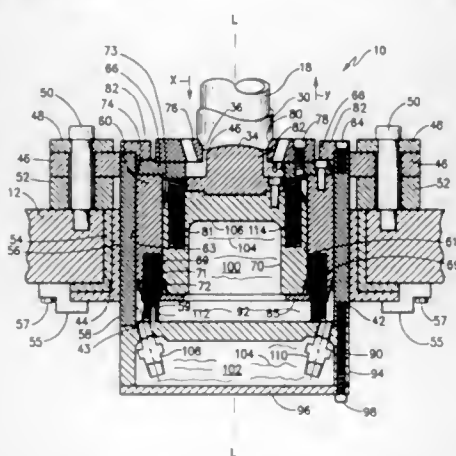
26 Claims



1. An article processing machine, comprising:  
a machine base;  
a central turret carried by said machine base for rotation with respect thereto about a central turret axis;  
a workpiece carrying means defining a workstation and transporting a workpiece through a processing cycle including receiving the workpiece into the workstation, conveying the workpiece in the workstation along a workpiece pathway about said central turret axis, and discharging the workpiece from the workstation;  
a planetary turret orbiting the central turret axis, rotatable about a planetary turret axis, and carrying a plurality of tool heads along a tool head pathway positioned to successively bring each tool head to the workstation;  
an index drive means for cycling a planetary turret about the planetary turret axis through alternating periods of indexed motion and dwell, wherein during successive periods of dwell, successive ones of said tool heads are positioned at the workstation; and

means for operatively engaging a tool head positioned at the workstation with a workpiece carried at the workstation.

**5,768,932**  
**DOUBLE ACTION HYDRAULIC CONTAINER DOME**  
Roger A. Hahn, 16576 W. 51st Pl., Golden, Colo. 80403  
Filed Aug. 9, 1996, Ser. No. 694,598  
Int. Cl.<sup>6</sup> B21D 51/26  
U.S. Cl. 72—348 26 Claims

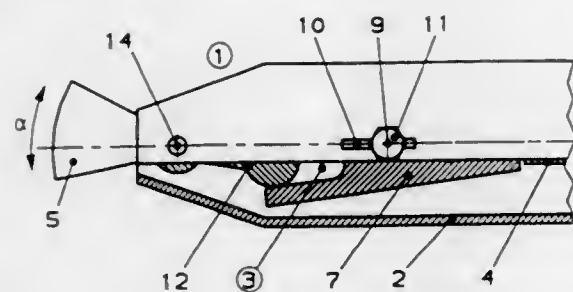


1. A forming apparatus mountable on a support frame and operative to form a dome structure in a bottom panel of a container wherein said container has a bottom peripheral edge surrounding said bottom panel, comprising:

- (a) a first piston reciprocally movable in opposite first and second directions relative to said support frame;
- (b) a pressure ring disposed on said first piston and operative to engage the bottom peripheral edge of said container and configured to reform said bottom peripheral edge to produce a desired shoulder profile as the container is forcibly advanced in the first direction;
- (c) a second piston reciprocally movable in the first and second directions relative to said first piston, said first and second pistons being hydraulically coupled with one another by a hydraulic fluid such that movement of one of said first and second pistons respectively in the first and second directions causes counter movement of another of said first and second pistons in an opposite direction; and
- (d) a doming die disposed on said second piston and operative to engage the bottom panel of said container and configured to deform said bottom panel into a desired dome structure as said container is forcibly advanced in the first direction relative to the second piston.

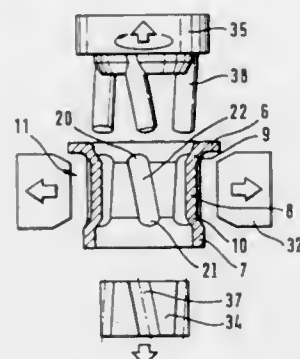
**5,768,933**  
**MOTION CONVERTER FOR CONVERTING ROTATION INTO TO-AND-FRO DISPLACEMENT**  
Peter Tanner, and Daniel Herzog, both of Bubendorf, Switzerland, assignors to Synthes, Paoli, Pa.  
PCT No. PCT/CH95/00044, § 371 Date Feb. 12, 1996, § 102(c) Date Feb. 12, 1996, PCT Pub. No. WO96/27093, PCT Pub. Date Sep. 6, 1996  
PCT Filed Feb. 28, 1995, Ser. No. 718,487  
Int. Cl.<sup>6</sup> F16H 21/52; B27B 19/00  
U.S. Cl. 74—48 13 Claims

1. A motion converting apparatus for converting rotational motion to angular reciprocal motion which comprises:
- a tubular housing defining a longitudinal slot therein;
  - a tool holder pivotally mounted in the housing at a pivot point and including a tool which extends away from the pivot point and out of the housing, and a holder head which extends away from the pivot point and into the housing; and



a transmission element pivotally mounted in the housing by means for pivotally mounting said element and having a first end which receives the holder head of the tool holder, and a second end which is adapted to receive an eccentrically rotating drive head such that the transmission element pivots back and forth due to eccentric rotation of the drive head and transfers such motion to the holder head of the tool holder which in turn imparts reciprocal angular motion to the tool, wherein the transmission element can be positioned at different locations between the drive head and holder head by moving the pivot mounting means along the slot to adjust the amount of reciprocal angular motion of the tool.

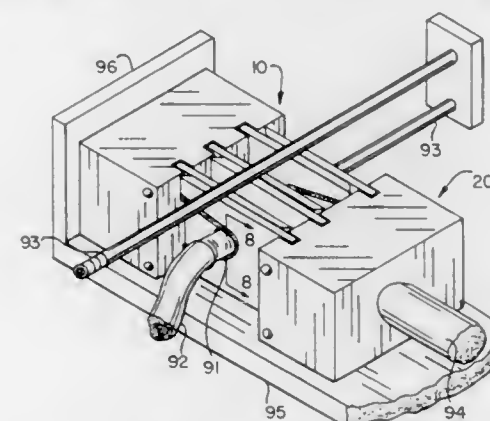
**5,768,934**  
**OUTER JOINT PART PRODUCED AS A FORMED PLATE METAL PART**  
Peter Urban, Köln, and Bert Zimmermann, Bonn, both of Germany, assignors to GKN Automotive AG, Lohmar, Germany  
Division of Ser. No. 398,152, Mar. 3, 1995, Pat. No. 5,660,593.  
This application Feb. 24, 1997, Ser. No. 805,230  
Claims priority, application Germany, Mar. 12, 1994, 44 08 371.8  
Int. Cl.<sup>6</sup> B21K 21/08  
U.S. Cl. 72—370.05 7 Claims



1. A method of producing an outer joint part for a constant velocity universal ball joint produced from a tubular member as a formed plate metal part and provided with substantially longitudinally extending ball tracks intended to receive torque transmitting balls, comprising:

- forming a flange by expanding one end of a straight circular-cylindrical tubular portion;
- pre-forming the ball tracks by radially reducing an axial central portion by means of radially inwardly moving outer tools above a supporting inner tool; and
- calibrating the ball tracks by radially expanding the axial central portion by means of radially outwardly moving inner tools against a supporting outer tool.

**5,768,935**  
**BLADE CRIMPING DEVICE**  
Carl H. Owens, 5215 Phillips Hwy. #1, Jacksonville, Fla. 32207  
Filed Mar. 13, 1997, Ser. No. 816,858  
Int. Cl.<sup>6</sup> B21D 39/04  
U.S. Cl. 72—416 10 Claims

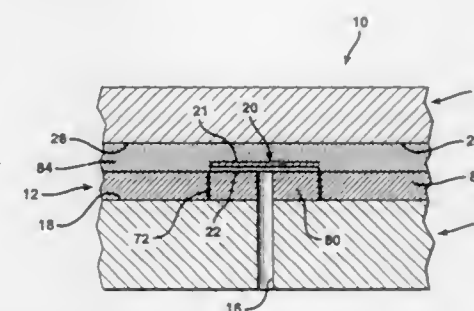


1. A crimper device for attaching a hose composed of a compressible material onto tubing stem having a deformable sleeve ferrule, the device comprising:

- (A) a first crimper assembly comprising a first base member and a first set of crimper blades mounted therein, said first set of crimper blades comprising a plural number of crimper blades, each crimper blade having a crimping slot of diminishing width to receive a combined ferrule, hose and stem assembly for crimping;
- (B) a second crimper assembly comprising a second base member and a second set of crimper blades mounted therein, said second set of crimper blades comprising a plural number of crimper blades, each crimper blade having a crimping slot of diminishing width to receive a combined ferrule, hose and stem assembly for crimping;
- (C) support means for said first and said second crimper assemblies whereby said assemblies are disposed with said crimper blades of said first crimper assembly facing said crimper blades of said second crimper assembly; and
- (D) drive means to advance said first and said second crimper assemblies together against said combined ferrule, hose, stem assembly to deformably compress said ferrule against said hose and stem to form a circular crimp, where each of said crimper blades has an abutting side which contacts an abutting side of another of said crimper blades and a non-abutting side opposite from said abutting side which does not contact either an abutting or non-abutting side of another of said crimper blades whereby a space is defined between said non-abutting sides of adjacent crimper blades, and further where said first and said second crimper assemblies are disposed whereby one of each of said abutting sides of said crimper blades of said first crimper assembly contiguously abuts one of each of said abutting sides of said crimper blades of said second crimper assembly to define a pairing of crimper blades, each of said crimper blade pairings separated a distance from each other crimper blade pairing.

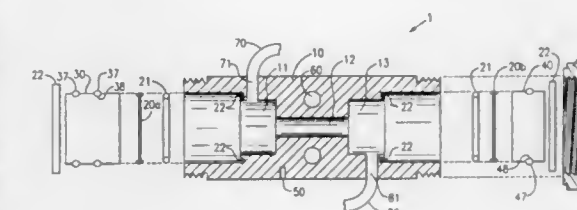
**5,768,936**  
**ADHESION AND COHESION PAINT TESTING SYSTEM**  
George Mann, 1816 Oak St., Pasadena, Calif. 91030  
Continuation-in-part of Ser. No. 746,496, Nov. 12, 1996, Pat. No. 5,673,586, which is a continuation-in-part of Ser. No. 184,429, Jan. 21, 1994, Pat. No. 5,575,868, which is a continuation of Ser. No. 910,626, Jul. 8, 1992, Pat. No. 5,265,850.  
This application Jun. 9, 1997, Ser. No. 871,507  
Int. Cl.<sup>6</sup> G01N 19/08  
U.S. Cl. 73—150 A 20 Claims

15. A method for testing the strength of a test substance bonded to a substrate comprising the steps of:



applying the test substance to the substrate so as to bond the test substance to the substrate;  
forming an aperture through the substrate and the test substance; positioning a thin film patch atop an area of the test substance directly above the aperture, wherein the thin film patch extends beyond the perimeter of the aperture;  
forming a groove in the test substance to surround the thin film patch;  
bonding a plate to the test substance, thereby encapsulating the film between the test substance and the plate such that the adhesive strength of the bond between the plate and the test substance is greater than the adhesive strength of the bond between the test substance and the substrate; and  
determining the critical pressure required to create a failure of the test substance in a continuous area of the test substance surrounding the film patch.

**5,768,937**  
**ACOUSTIC SENSOR FOR IN-LINE CONTINUOUS MONITORING OF GASES**  
Abdul Wajid, Syracuse; Clarence Hurd, Baldwinsville, and Melvin C. Hetzel, Syracuse, all of N.Y., assignors to Leybold Inficon, Inc., E. Syracuse, N.Y.  
Filed Nov. 13, 1996, Ser. No. 748,599  
Int. Cl.<sup>6</sup> G01F 17/00; G01N 29/22  
U.S. Cl. 73—24.06 22 Claims



1. An acoustic cell for analyzing the gas concentration of a gas flowing gas mixture, said cell comprising:  
a cell housing;  
said cell housing including an interior having a plurality of adjacently coupled acoustic cavities which defines a resonator chamber;  
gas flowing means, fluidly connected to said cell housing, for flowing a gas mixture through said resonator chamber;  
acoustic driving means at a first end of said cell housing for sending an acoustic signal through said gas mixture flowing through said cell housing receiving means at a second end of said cell housing for receiving said acoustic signal;  
processing means for processing said received acoustic signal; means for detecting the resonant frequency of said flowing gas mixture; and for determining the composition of said gas mixture, and  
means for acoustically isolating at least one of said driving means and said receiving means from said cell.





**5,768,944**  
**VEHICULAR AUTOMATIC TRANSMISSION SHIFT DEVICE**

Takeshi Inuzuka; Masashi Hattori, both of Alchi-ken; Tsutae Takeda, Fukui-ken; Akihiro Seki, Fukui-ken; Junichi Kurosaki, Fukui-ken; Masahiro Yamaguchi, Fukui-ken, and Tamotsu Miyoshi, Fukui-ken, all of Japan, assignors to Aisin AW Co., Ltd., Anjo, Japan

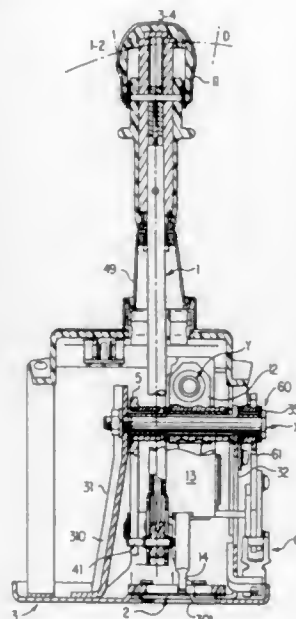
Filed Jun. 18, 1996, Ser. No. 665,705

Claims priority, application Japan, Jun. 21, 1995, 7-176879; Jul. 3, 1995, 7-187691

Int. Cl.<sup>6</sup> F16H 59/08

U.S. Cl. 74—473 R

15 Claims



1. A vehicular automatic transmission shift device, comprising: a shift lever having an operating knob provided on a top portion of said shift lever; a gate plate that defines a shift pattern for an automatic shift mode and for a manual shift mode; a first rotational center shaft and a second rotational center shaft for allowing said shift lever to be rotated in a front-to-rear direction and rotated in a right-to-left direction, respectively, in accordance with the shift pattern of said gate plate; a cross joint supported so as to be freely rotatable around said first and second rotational center shafts; a retainer that is rotatable together with said cross joint around said first rotational center shaft and rotatable around said second rotational center shaft independently of said cross joint, wherein said shift lever is connected to said retainer, and said gate plate is disposed apart from said operating knob of said shift lever, with said first and second rotational center shafts positioned between said gate plate and said operating knob.

**5,768,945**  
**EXTENSION HANDLE FOR A BICYCLE SHIFTING DEVICE**

Kenji Ose, Sakai, Japan, assignor to Shimano, Inc., Osaka, Japan

Filed Feb. 14, 1996, Ser. No. 601,097

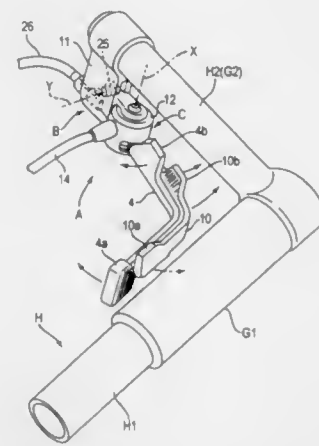
Int. Cl.<sup>6</sup> G05G 11/00

U.S. Cl. 74—489

25 Claims

1. A bicycle shift control device for attachment to a handlebar including a first grip (G1) extending laterally with respect to the bicycle and a second grip (G2) extending forwardly with respect to the bicycle, the device comprising:

a first shift lever (4) extending from the shift control device so that the first shift lever (4) is disposed in close proximity to



the first grip (G1) and to the second grip (G2) when the shifting device is mounted to the bicycle, the first shift lever (4) including:

a first finger tab (4a) positioned so that the first finger tab (4a) is disposed in close proximity to the first grip (G1) when the shift control device is mounted to the bicycle; and a second finger tab (4b) positioned so that the second finger tab (4b) is disposed in close proximity to the second grip (G2) when the shift control device is mounted to the bicycle.

**5,768,946****PEDAL WITH INTEGRATED POSITION SENSOR**

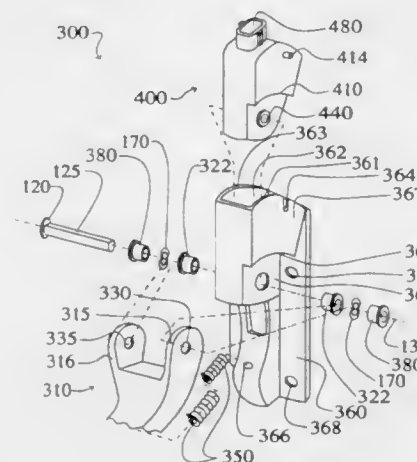
Eric E. Fromer, and Danny L. Koester, both of Elkhart, Ind., assignors to CTS Corporation, Elkhart, Ind.

Continuation-in-part of Ser. No. 321,195, Oct. 11, 1994, abandoned. This application Sep. 11, 1996, Ser. No. 712,039

Int. Cl.<sup>6</sup> G05G 11/14

U.S. Cl. 74—514

8 Claims



5. A pedal assembly containing a position sensor, comprising:

a) a pedal having a pad and a yoke at opposite ends, the yoke including a pair of parallel and oppositely facing tabs; b) a pocket with at least one pair of parallel and oppositely facing sides positioned and dimensioned for the tabs to be adjacent to outside surfaces of the respective sides; and c) the position sensor, positioned adjacent and between inside surfaces of the sides, and being coupled to the yoke, for sensing a rotational position of the pedal relative to the position sensor.

**5,768,947****IMPLEMENT HAND SUPPORT AND CONTROL**

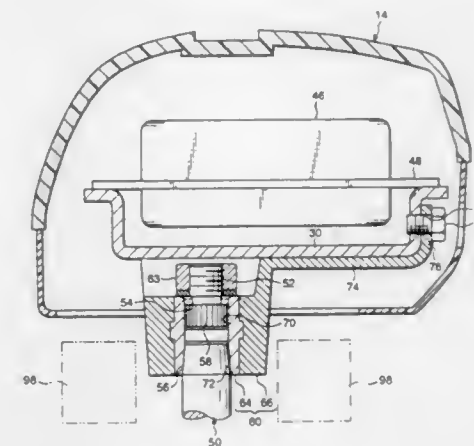
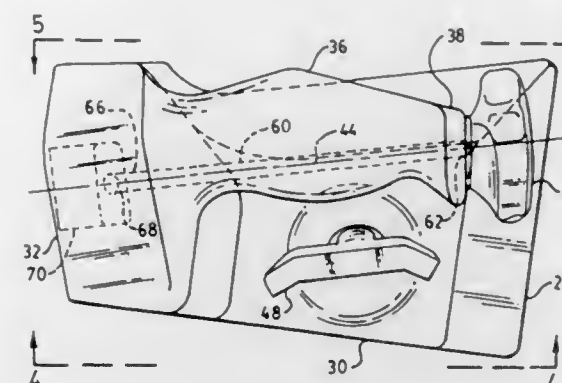
David M. Fee, Groveland, and Stephen A. Haytcher, Peoria, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jun. 24, 1996, Ser. No. 670,736

Int. Cl.<sup>6</sup> G05G 1/24

U.S. Cl. 74—523

7 Claims



and wherein said guide rails taper toward one another from one end to another end.

1. An implement control system for use with an article of construction equipment, the implement control system comprising: an implement adapted for mounting to the article of construction equipment, said implement including first and second ranges of motion;

a hand support adapted for mounting to the article of construction equipment in the vicinity of an operator;

said hand support including a base, an end portion upstanding at a first angle from said base and a hand grip extending outwardly from said end portion;

said hand grip defining a distal end thereof and an opening between said hand grip and said base adapted for permitting the operator's fingers to extend therebetween in order to grip said hand grip;

a first control lever movably mounted to said distal end of said hand grip, said first control lever being operably connected to said implement for controlling said first range of motion and adapted for movement thereof by the operator's thumb;

a second control lever movably mounted to said base, said second control lever being operably connected to said implement for controlling said second range of motion and adapted for movement thereof by the operator's fingers.

**5,768,949**  
**INTEGRAL CAST FLYWHEEL AND METHOD OF PRODUCING THE SAME**

Hiroya Fujimoto, Zushi, and Takaya Fujita, Yamato, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

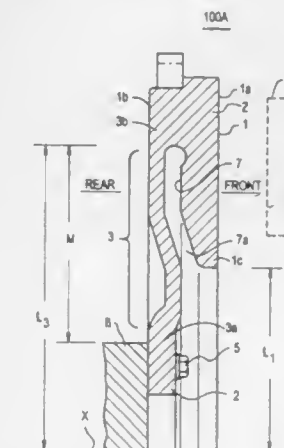
Filed May 29, 1996, Ser. No. 654,963

Claims priority, application Japan, May 31, 1995, 7-133897; Jan. 19, 1996, 8-007366

Int. Cl.<sup>6</sup> F16F 15/10; G05G 1/00

U.S. Cl. 74—572

18 Claims



1. An integral cast flywheel comprising:

a circular center flange portion;

an annular mass portion concentric with said center flange portion, said annular mass portion being radially outwardly spaced from said center flange portion;

an annular plate portion extending radially outwardly from said center flange portion and having an outer periphery which is integral with said annular mass portion to constitute a function zone; and

an annular cavity extending from said junction zone radially outwardly to an outer periphery of said annular mass portion to provide an increased surface area of the flywheel, and having an annular opening directed radially inward, said annular cavity being concentric with said center flange portion.

**5,768,948****STEERING WHEEL**

Akio Hosoi, Komaki; Atsushi Nagata, Inazawa, and Tooru Koyama, Nishikasugai-gun, all of Japan, assignors to Toyota Gosei Co., Ltd., Aichi, Japan

Filed Oct. 10, 1996, Ser. No. 728,902

Claims priority, application Japan, Oct. 11, 1995, 7-263216

Int. Cl.<sup>6</sup> B62D 1/04

U.S. Cl. 74—552

5 Claims

1. A steering wheel comprising:

a steering wheel main body having a connecting portion fixed thereto; and

a boss member having a fixed portion configured to be secured to a steering shaft, and an engaging portion that removably interfits with said connecting portion,

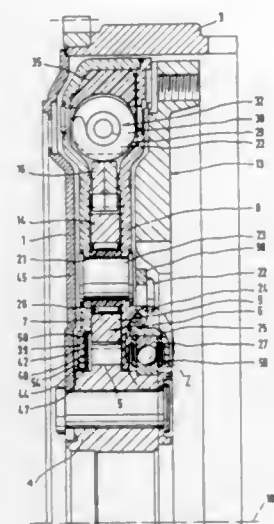
wherein said connecting portion includes a pair of guide rails attached to and depending from said connecting portion, said engaging portion being slidably retained in said guide rails,



5,768,950  
FLYWHEEL DEVICE HAVING A SEALING FOR A GREASE CHAMBER  
Bernhard Schierling, Kürnberg; Hilmar Göbel, Grafenrheinfeld, and Rudolf Bäuerlein, Schweinfurt, all of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Germany  
Filed Jul. 1, 1996, Ser. No. 674,192  
Claims priority, application Germany, Jul. 1, 1995, 195 24 100.2

U.S. Cl. 74—573 F Int. Cl.<sup>6</sup> F16F 15/10

11 Claims



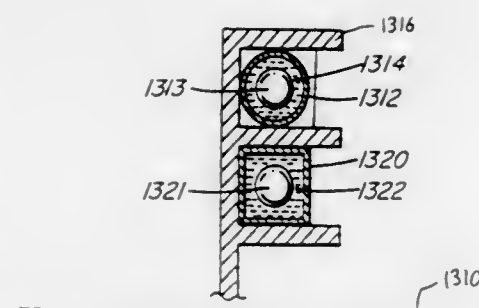
1. A flywheel device, comprising: a first flywheel mass rotationally driveable about an axis of rotation; a second, deflectable flywheel mass having a first structural part that forms a seal seat, and a second structural part that forms an opposing seal seat; torsion damping means for drivingly connecting the second flywheel mass with the first flywheel mass; a grease chamber formed by at least one of the flywheel masses, the torsion damping means being at least partially arranged in the grease chamber; and a preassembly including the first structural part, a first packing supported on one of the seal seats of the second flywheel mass so as to seal the grease chamber, a second packing supported on another of the seal seats of the second flywheel mass and, a bearing configured to permit the second flywheel mass to deflect relative to the first flywheel mass, the bearing and the first and second packings being arranged in the first structural part of the second flywheel mass so that the packings are initially axially stressed against a respective side of the bearing, the first structural part of the second flywheel mass being formed with recesses, the packings including holding means that project into the recesses so as to axially secure the packings relative to the first structural part and the bearing, the preassembly being axially connected to the second structural part so that the second packing rests against the seal seat of the second structural part with a predetermined axial force.

5,768,951  
DYNAMIC BALANCING METHOD AND APPARATUS  
R. Craig Hannah; Paul Wierzb; John P.M. Doyle, and Randy W. Perusse, all of Calgary, Canada, assignors to ETI Technologies Inc., St. Peter Port, Channel Islands  
Continuation of Ser. No. 419,641, Apr. 10, 1995, abandoned, which is a continuation-in-part of Ser. No. 246,864, May 20, 1994, abandoned, which is a continuation-in-part of Ser. No. 66,307, May 21, 1993, Pat. No. 5,460,017, which is a continuation-in-part of Ser. No. 887,340, May 21, 1992, abandoned, which is a continuation of Ser. No. 175,320, Dec. 29, 1993, abandoned. This application Feb. 28, 1997, Ser. No. 808,333

U.S. Cl. 74—573 F Int. Cl.<sup>6</sup> F16F 15/22

4 Claims

1. Arrangement for removing imbalance, comprising an enclosing structure in which are disposed a plurality of races, said

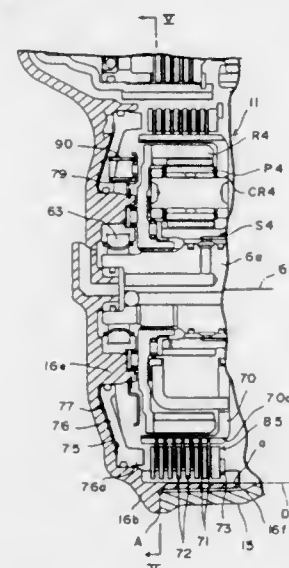


enclosing structure having a rotational axis, said plurality of races including a first annular race coaxially disposed with respect to said rotational axis, a second annular race separate from said first annular race, said second annular race being coaxially disposed with respect to said rotational axis, a plurality of first weights disposed in said first annular race for movement in the first race during rotation of the enclosing structure, a plurality of second weights disposed in said second annular race for movement in the second race during rotation of the enclosing structure, a first fluid disposed in the first race, a second fluid disposed in the second race, said first fluid disposed in the first race having a viscosity that is different from the viscosity of said second fluid in the second race.

5,768,952  
AUTOMATIC TRANSMISSION  
Kazumasa Tsukamoto, Toyota; Masahiro Hayabuchi; Masaaki Nishida, both of Anjo, and Kaoru Ono, Nishio, all of Japan, assignors to Aisin AW Co., Ltd., Japan  
Filed Jul. 31, 1996, Ser. No. 688,782  
Claims priority, application Japan, Jul. 31, 1995, 7-195424  
Int. Cl.<sup>6</sup> F16H 3/44

U.S. Cl. 74—606 R

12 Claims



1. An automatic transmission comprising: an input member for receiving torque from an engine; output members for outputting torque to vehicle drive wheels; gear shifting units interposed between said input member and said output members for changing speed of rotation of the input engine torque and for transmitting rotation from said input member to said output members via one of a plurality of torque transmission paths; friction engagement means including at least one brake for changing the transmission path, said one brake being in the form of a multi-plate brake having a plurality of inner friction plates and outer friction plates alternately arranged;

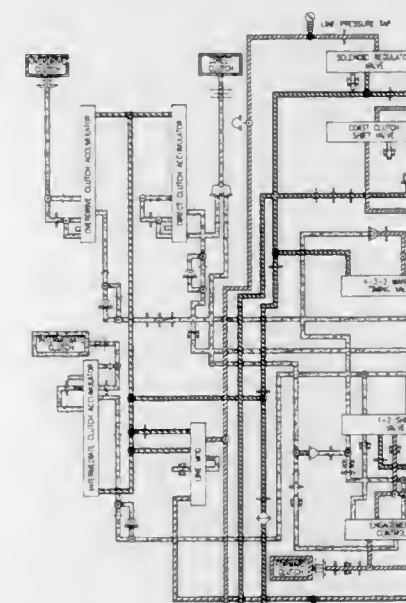
a valve body and a hydraulic control circuit for controlling said friction engagement means;  
a hydraulic servo including a piston for pressing the multiplate brake into engagement operating state and a cylinder slidably accommodating the piston responsive to oil pressure received through said hydraulic control circuit;  
a case including at least first and second case members and housing said gear shifting units and said friction engagement means, said first and second case members being joined together in a joint defining a joint plane, said valve body being mounted on said first case member and said cylinder being integrally formed in said second case member, said second case member including an integral extension extending from said second case member, through said joint plane and into the interior of said first case member, the outer friction plates of said one brake being engaged and held against rotation by said extension.

5,768,953  
METHODS AND SYSTEMS FOR IMPROVING THE OPERATION OF TRANSMISSIONS FOR MOTOR VEHICLES

Gilbert W. Younger, 2621 Merced Ave., El Monte, Calif. 91733  
Filed Aug. 28, 1996, Ser. No. 697,625  
Int. Cl.<sup>6</sup> F16H 3/62

U.S. Cl. 74—606 R

20 Claims

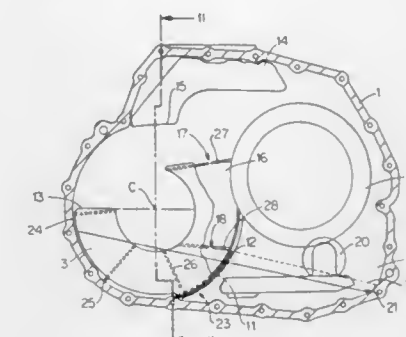


18. A method for modifying the hydraulic circuitry of an automotive transmission including a manual valve coupled in fluid flow relationship to a "1-2" shift valve, a "2-3" shift valve, and a "3-4" shift valve; said manual valve being coupled to a gear selector; said method comprising the steps of:  
providing said "2-3" shift valve with a land for preventing the application of line pressure to a predetermined end of "3-4" shift valve for permitting said "3-4" shift valve to remain in a downshifted position until a 4th gear position is selected.

5,768,954  
GEAR CASE HAVING THREE LUBRICANT CHAMBERS  
Werner Grabherr, Ravensburg, and Helmut Sellmair, Noonenhorn, both of Germany, assignors to ZF Friedrichshafen AG, Friedrichshafen, Germany  
PCT No. PCT/EP95/01418, § 371 Date Oct. 21, 1996, § 102(e) Date Oct. 21, 1996, PCT Pub. No. WO95/29349, PCT Pub. Date Nov. 2, 1995  
PCT Filed Apr. 15, 1995, Ser. No. 727,514  
Claims priority, application Germany, Apr. 22, 1994, 44 14 164.5

U.S. Cl. 74—606 R Int. Cl.<sup>6</sup> F16H 57/04; F01M 9/06

4 Claims



1. A gear case (1) having first, second and third casing chambers (2-4), said first casing chamber (2) being separated from said second casing chamber (3) by a first wall (11), a height of said first wall (11) defining an upper lubricant level (22) so that any increase in a volume of lubricant, due to a temperature increase, causes said lubricant to flow from said first casing chamber (2) into said second casing chamber (3), and a basket wheel (6) being located within said second casing chamber (3) for scooping and conveying lubricant located therein, said third casing chamber (4) being separated from said second casing chamber (3) by a second wall (13), and said third casing chamber (4) being connected with said first casing chamber (2) by an aperture (19);

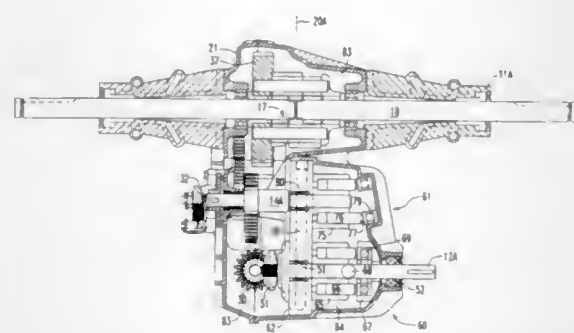
wherein said third casing chamber is formed from a plurality of individual chambers which are separated from one another by ribs (24-28), and each of said plurality of individual chambers are connected with one other by a passage, and a lower lubricant level (21) of said gear casing is defined by a volume of lubricant in said first and said third casing chambers (2 and 4).

5,768,955  
HEAVY DUTY TRANSAXLE  
Raymond Hauser, Decatur, Ill., assignor to Agri-Fab, Inc., Sullivan, Ill.  
Continuation of Ser. No. 669,211, Jun. 24, 1996, abandoned, which is a continuation of Ser. No. 386,987, Jan. 20, 1995, Pat. No. 5,528,958, which is a continuation of Ser. No. 954,602, Sep. 30, 1992, Pat. No. 5,392,670, which is a continuation of Ser. No. 541,321, Jun. 21, 1990, Pat. No. 5,027,068.  
This application Mar. 24, 1997, Ser. No. 822,877  
Int. Cl.<sup>6</sup> F16H 47/00

U.S. Cl. 74—606 R

14 Claims

1. A hydrostatic transaxle for transferring power from an engine to an output axle, comprising:  
a housing;  
a hydraulic center section containing pressure passages and having first and second planar mounting surfaces, said center section being mounted entirely within said housing;  
a hydraulic pump mounted on said first planar mounting surface of said center section;



5,768,957

## RATCHET TOOL

Rodney William Baker, 23 Penrod Dr., Bell Block, Taranaki, New Zealand

PCT No. PCT/NZ94/00086, § 371 Date Apr. 24, 1996, § 102(e) Date Apr. 24, 1996, PCT Pub. No. WO95/05923, PCT Pub. Date Mar. 2, 1995

PCT Filed Aug. 25, 1994, Ser. No. 596,340

Claims priority, application New Zealand, Aug. 25, 1993, 248500

Int. Cl. B25B 13/46

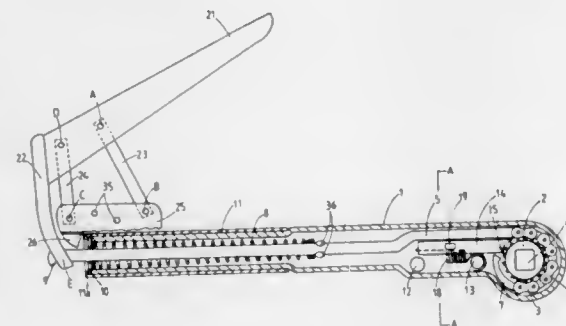
U.S. Cl. 81—57.39

16 Claims

an input power shaft drivingly linked to said engine and drivingly linked to said hydraulic pump; and

a hydraulic motor mounted on said second planar surface of said center section, said hydraulic motor being hydraulically connected to said hydraulic pump via said pressure passages and drivingly linked to said output axle;

wherein said housing has a parting plane disposed perpendicular to the longitudinal axis of said output axle and wherein at least one of said first or second planar mounting surfaces of said hydraulic center section is mounted parallel to said parting plane.



1. A lever assembly for converting lateral motion of a handle of a lever means into reciprocating motion of a distal end of the lever means comprising:

a mounting means to secure the lever assembly at a position where reciprocating motion is required, the lever means comprising the handle adapted to permit manual gripping and adapted to be movable under manual pressure towards the mounting means and a reciprocating portion of the distal end of the lever means at a distal position, first and second linkage means spaced apart from each other and pivotably mounted between the handle of the lever means and the mounting means in substantially the same plane so that four pivot points form the corners of a four sided figure, the first linkage means being pivotably connected closer to the distal end of the lever means than the second linkage means, the length of the sides and the relationship between the lever means and the mounting means providing reciprocal motion at the distal end of the lever means wherein the longest side of the four sided figure is between the pivot points of the second linkage means, the second longest side is between the pivot points of the first and second linkage means connected to the mounting means, the third longest side is between the pivot points of the first linkage means and the shortest side is between the pivot points of the first and second linkage means connected to the handle of the lever means, the distal end of the lever means being adapted to be connected to a rod extending from a tool engaged with the mounting means, the lever assembly including a return bias means fitted to the rod to apply a return bias to the rod and wherein the mounting means is an elongate housing, and the rod is disposed in the housing, the arrangement being such that lateral motion of the handle end of the lever means will impart a reciprocal motion of the rod in the housing.

5,768,958

## OPEN ENDED RATCHET WRENCH

Bruce H. Gamble, Rte. 1, Box 173, Le Feria, Tex. 78559

Filed Jan. 16, 1997, Ser. No. 784,768

Int. Cl. B25B 13/00

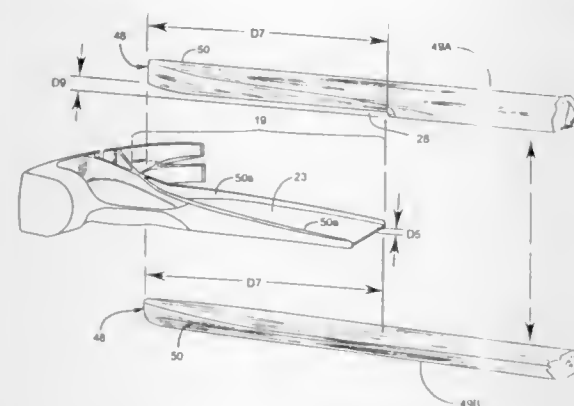
U.S. Cl. 81—58.2

9 Claims

1. A new and improved open ended ratchet wrench comprising, in combination:

a handle formed in an elongated planar, generally rectangular shaped configuration with a rounded outboard end;

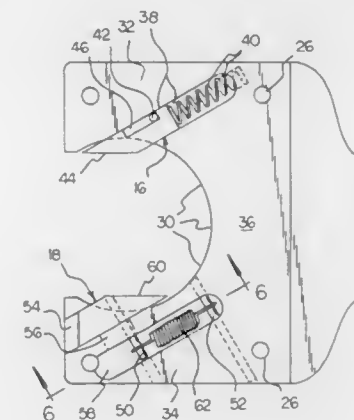
5,768,956  
STRIKING TOOL  
Todd Douglas Coonrad, 220 Alta Ave., Santa Cruz, Calif. 95060  
Filed Mar. 28, 1996, Ser. No. 624,178  
Int. Cl. B25D 1/00  
U.S. Cl. 81—20 14 Claims



1. In a striking tool having a plane of substantial symmetry and a striking head oriented substantially at right angles to a long axis of a handle, the head having a height in the direction of the long axis of the handle, a head-to-handle interface for attaching the handle to the head, the interface comprising:

a central web in the plane of substantial symmetry, the central web contiguous with the head, beginning below the head and extending from the head in the direction of the long axis of the handle for a distance at least equal to the height of the head in the direction of the long axis of the handle; and

sidewalls substantially orthogonal to the central plate extending on each side of the central plate around the periphery of the central plate except in the direction of the long axis of the handle.



5,768,959

## APPARATUS FOR FEEDING A WEB

John L. Lorenzo, Southbury, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

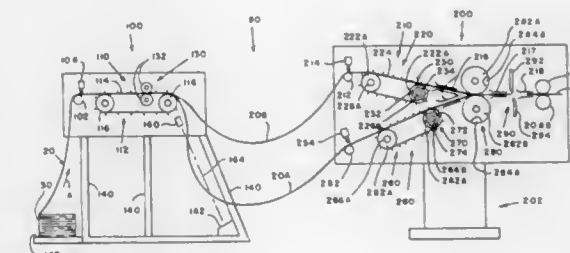
Continuation of Ser. No. 509,279, Jul. 31, 1995, abandoned.

This application Jun. 11, 1997, Ser. No. 872,990

Int. Cl. B23Q 15/00; B26D 5/00; b65H 20/00

U.S. Cl. 83—74

9 Claims



a head formed in a planar generally rectangular shaped configuration with an upper plate and a lower plate, the upper plate having a greater length and thickness than the lower plate and being formed integral with the handle, the upper and lower plates each including four aligned hex screw holes extending therethrough, the upper and lower plates being coupled together by four hex screws, the upper and lower plates each having an outboard end including a large generally semicircular shaped recess extending therein, the recess and outboard end defining a first arm and a second arm formed contiguously with a central region therebetween;

the first arm of the upper plate including a generally rectangular shaped bore defining a first key track, the first key track being positioned at an angle of about one hundred twenty degrees with respect to the outboard end, the first key track having an inboard region and an outboard region, the inboard region including a resilient compression spring coupled therein, a first roll pin being coupled within the outboard region of the first key track, a first key being formed in a generally rectangular configuration with a flat proximal end and an angled distal end, the first key having a long side wall including a rectangular notch, the first key being slidably positioned within the first key track with the angled distal end extending outside the track, the proximal end of the first key being affixed to the compression spring, the notch of the first key being positioned around the first roll pin, the angled distal end being positioned at a ninety degree angle with respect to the outboard end of the first arm;

the second arm of the upper plate including front and rear cylindrical holes extending therethrough, front and rear roll pins being positioned through the holes, an aperture defining a second key track extending through the second arm at an angle of about one hundred twenty degrees with respect to the outboard end of the second arm, a rectangular intermediate recess being formed within the second arm and being positioned adjacent to the second track, a cylindrical shaped interior bore formed in a generally oval configuration being positioned within the second arm adjacent to the intermediate recess, a second key formed in a generally rectangular configuration with an angular interior end and an exterior end, the second key being slidably positioned within the second key track, the front pin being perpendicularly coupled within the second key, a tension spring having front and rear hook members being coupled around the front and rear roll pins, the angular interior end being positioned at a ninety degree angle with respect to the outboard end of the second arm; and

in an operative orientation a user positioning the semicircular recess around a bolt such that the distal end of the first key and the interior end of the second key engage the bolt, a user tightening a bolt by rotating the handle of the apparatus in a clockwise direction, a user loosening a bolt by inverting the wrench and rotating the handle in a counterclockwise direction.

1. Apparatus for feeding a web having two portions in a path of travel, comprising:

a first module including means for feeding the two web portions in side-by-side relationship;

a second module located downstream in the path of travel from said first module, said second module including means for feeding the two web portions in upper-lower relationship where the two web portions each form a loop between said first module and said second module so as to reorient from side-by-side to upper-lower relationship;

sensor means for detecting the presence of one of the two web portion loops; and

control means including means operatively connected to said second module for determining the feed speed of said second module feed means, said control means operatively connected to said sensor means and said second module feed means for setting the feed speed of said first module feed means corresponding to the feed speed of said second module feed means, said determining means including encoder means for providing a plurality of encoder pulses indicative of the feed speed of said second module feed means;

said control means further for measuring an interval of time between successive encoder pulses;

wherein, for a first time interval within a first predetermined range of intervals, said control means sets the feed speed of said first module to a first corresponding value if the one loop is present and to a second corresponding value if the one loop is not present; and

for a second time interval within a second predetermined range of intervals different from said first predetermined range of intervals, said control means sets the feed speed of said first module to said first corresponding value if the one loop is present and to a third corresponding value different from said second corresponding value if the one loop is not present.

5,768,960

## LOCKING SWIVEL HEAD RATCHET WRENCH

Tarue David Archuleta, 2937 Lawn Ct., Merced, Calif. 95348

Continuation of Ser. No. 570,398, Dec. 11, 1995, abandoned.

This application Jan. 2, 1997, Ser. No. 775,517

Int. Cl. B25B 23/16

U.S. Cl. 81—177.8

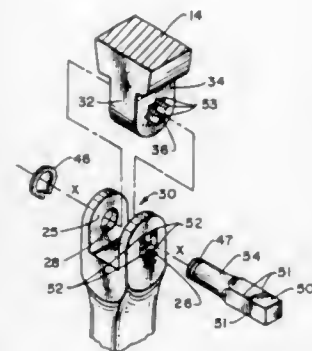
16 Claims

1. A tilt head wrench comprising:

a handle having an attachment end with spaced-apart first and second flanges through which extend respective first and second openings, said first opening having a polygonal shape with inner corners and said second opening having a circular shape;

a tilt head connected to said attachment end by a hinge means, said tilt head having a connector part with a connector opening having a polygonal shape with respective inner corners;





said hinge means comprising a connector shaft which is axially slidable within said connector opening and said first and second openings, said shaft comprising a first end portion having a polygonal cross-sectional shape with outer corners and a second end portion having a circular cross-section, said first end portion having a longitudinal extent that is greater than the width of said first flange and less than the combined widths of said connector part and said first flange; said first end portion preventing rotation of said tilt head when positioned within said first opening and said connector opening, said second end portion permitting free rotation between said tilt head and attachment end when positioned within said second opening and said connector opening.

5,768,961

**SELF-ADJUSTING SOCKET FOR A WRENCH HANDLE**

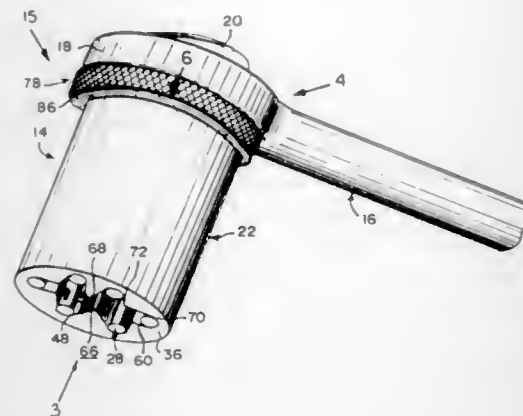
Eric L. Frawley, 2958 SW. 21st St., Gresham, Ore. 97080

Filed Dec. 16, 1996, Ser. No. 767,183

Int. Cl.<sup>6</sup> B25B 13/18

U.S. Cl. 81—128

23 Claims



1. A self-adjusting socket for a wrench handle having a drive end with a ratchet reverse lever and a square peg, said socket comprising:

- a cylindrical wall;
- means rotatively carried in a top end of said cylindrical wall, for coupling the square peg of the wrench handle thereto;
- a plurality of movable pins;
- means rotatively carried below said coupling means in said cylindrical wall, for engaging with said movable pins;
- means for connecting said coupling means to said movable pin engaging means; and
- means fixed within a bottom end of said cylindrical wall below said movable pin engaging means, for guiding said movable pins radially inwardly towards the center, to contact a hex nut/hex bolt head when the hex nut/hex bolt head is inserted into said movable pin guiding means and the wrench handle is turned to apply torque thereto.

**5,768,962  
MULTIPLE-SPINDLE TURNING MACHINE**  
Helmut Link, Aichwald, and Guenther-Helrich Trautmann, Kirchhelm, both of Germany, assignors to Index-Werke GmbH & Co. KG Hahn & Tessky, Germany

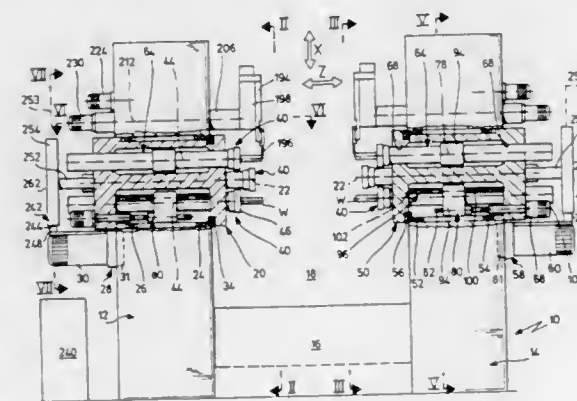
Filed Oct. 7, 1996, Ser. No. 726,416

Claims priority, application Germany, Feb. 10, 1995, 195 04 370.7

Int. Cl.<sup>6</sup> B23B 9/04

U.S. Cl. 82—129

24 Claims



1. A multiple-spindle turning machine, comprising: a machine frame;

first and second drums arranged on opposite sides of a machining area, and mounted on said machine frame to be respectively rotatable around respective essentially parallel rotational axes;

said first and second drums being rotatable around said respective rotational axes independently of one another relative to the machine frame;

machining means arranged on said first and second drums in respective individual positions with associated central axes thereof aligned essentially parallel to the respective rotational axis; and

tools for machining work pieces held in at least one portion of said machining means.

5,768,963

**METHOD AND APPARATUS FOR PUNCHING A STACK**  
Michel G. Bruehwiler, Babson Park, Mass., assignor to Blumer Maschinenbau AG, Otelfingen, Switzerland

PCT No. PCT/CH95/00241, § 371 Date Aug. 7, 1996, § 102(e)

Date Aug. 7, 1996, PCT Pub. No. WO96/12593, PCT Pub. Date May 2, 1996

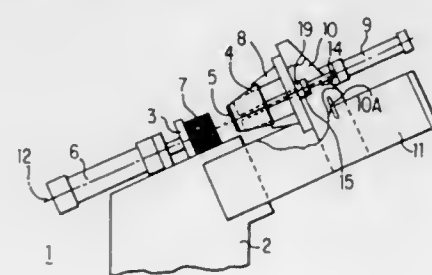
PCT Filed Oct. 17, 1995, Ser. No. 666,387

Claims priority, application Switzerland, Oct. 20, 1994, 03 154/94

Int. Cl.<sup>6</sup> B26D 7/18; B26F 1/40

U.S. Cl. 83—27

18 Claims



1. A method for punching a stack of flat articles, comprising: arranging a punching ram and a hollow-cylindrical punching knife at a first distance with respect to one another;

placing the stack of flat articles for punching onto the punching ram while the punching ram is in a receiving position; moving the punching ram into an end position towards the punching knife so that the stack of flat articles is moved into the punching knife to perform the punching operation; holding the punching knife in a fixed punching position during the punching operation; exerting a counter-pressure on the stack of flat articles prior to and during the punching operation; retracting the punching ram from the end position to the receiving position after the stack of flat articles is punched; moving the punching ram and the punching knife apart from one another after completing the punching operation, thereby creating an enlarged area between the punching ram and the punching knife, wherein the steps of (i) retracting the punching ram and (ii) moving the punching ram and the punching knife apart from one another after the punching operation, are performed simultaneously; moving a receiving apparatus into the enlarged area; pushing a stack of punched articles from the punching knife towards the enlarged area and onto the receiving apparatus; moving the receiving apparatus and the stack from the enlarged area; loading the punching ram with a new stack of flat articles for punching after the punching ram has reached its receiving position; moving the punching knife into the punching position so that the punching ram and punching knife are at the first distance with respect to one another; and commencing a new cycle starting with moving the punching ram towards the punching knife.

5,768,964

**METHOD AND DEVICE FOR SETTING UP A WEB OF PAPER HAVING LATERAL DRAGGING HOLES IN A PAPER PROCESSING AND/OR PRINTING APPARATUS**  
Luciano Meschi, Aurelia, Italy, assignor to Industria Grafica Meschi S.r.l., Livorno, Italy

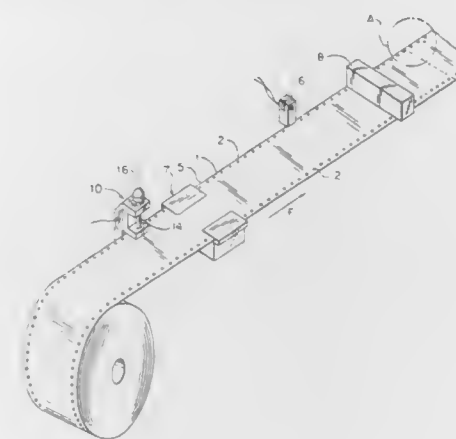
Filed Jul. 12, 1996, Ser. No. 679,208

Claims priority, application Italy, Jul. 12, 1995, FI95A0163

Int. Cl.<sup>6</sup> B26F 1/02

U.S. Cl. 83—33

6 Claims



1. A method for setting up a web of paper for further processing, comprising the steps of:

- providing a web of paper having a pair of lateral edges and a row of lateral dragging holes aligned along at least one of said lateral edges, each couple of successive dragging holes being bisected by a midway line orthogonal to said lateral edges of said web;
- providing an apparatus having a hole making means, a control unit and a hole sensing means;
- using the hole making means to make a reference hole in said web on a midway line.

conveying said web thru said apparatus, sensing said reference hole with said sensor, said sensor sending a communication to said control means the moment the sensor senses said reference hole, starting the linear measurement of said web upon receipt of said communication by said control means such that an exact position of the midway lines will be known for further processing.

5,768,965

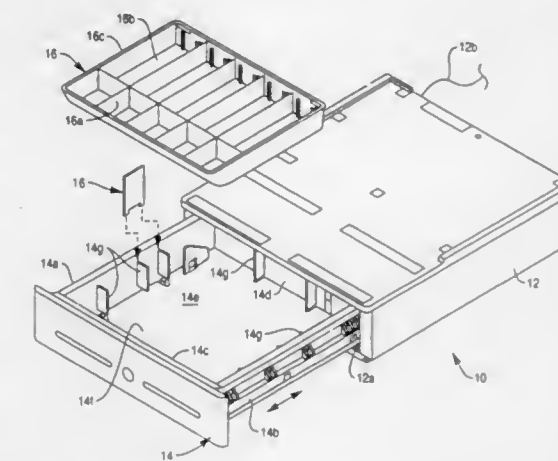
**CASH DRAWER ASSEMBLY WITH CUTTER**  
Cesar A. Gonzalez, Lawrenceville, and Dale R. Lyons, Suwanee, both of Ga., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 27, 1996, Ser. No. 703,832

Int. Cl.<sup>6</sup> B26D 1/02

U.S. Cl. 83—440

20 Claims



1. A cash drawer assembly comprising:

- a housing having an access slot;
- a drawer slidably mounted in said housing through said access slot, and including left, right, front, and back walls integrally joined together in a rectangle to define a drawer cavity therebetween opening upwardly from a closed bottom;
- a till removably sitting in said drawer, and including a plurality of compartments for storing cash; and
- a cutter in the form of a flat plate having spaced apart top and bottom edges, with said cutter being removably trapped laterally between said till and said drawer, with said bottom edge abutting said drawer bottom, and said top edge being positioned above said till for providing a cutting edge for opening a coin roll.

5,768,966

**WOODWORKING MACHINERY JIG AND FIXTURE SYSTEM**Mark A. Duginske, 1010 First Ave., North Wausau, Wis. 54401  
Continuation-in-part of Ser. No. 278,369, Jul. 21, 1994, Pat. No. 5,617,909, which is a continuation-in-part of Ser. No. 944,867, Sep. 14, 1992, Pat. No. 5,337,641. This application

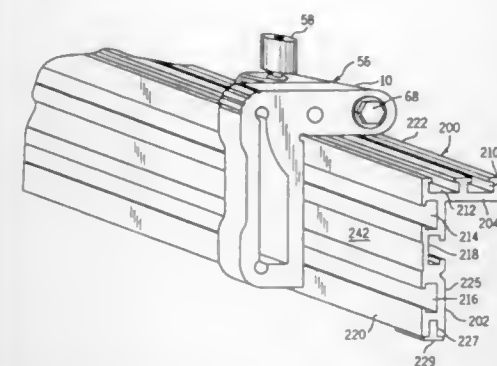
Nov. 21, 1996, Ser. No. 754,438

Int. Cl.<sup>6</sup> B27B 27/00; 31/00

U.S. Cl. 83—468.7

24 Claims

1. In a woodworking machinery jig and fixture system of the type having a section of track along which jigs and fixtures may be adjustably secured, the improvement wherein said track has a generally L-shaped cross-sectional shape, having a first leg with a front side and a rear side and a second leg connected to one end of said first leg at a right angle, said second leg extending rearwardly from said first leg and having a top side and a bottom side, said



track having with a longitudinal T-slot on said rear side of said first leg and a longitudinal T-slot on a top side of said second leg.

5,768,967

# SLIDE BAR MOUNTING MECHANISM IN SLIDE-TYPE CIRCULAR SAW AND METHOD OF MOUNTING SLIDE BARS

Katsuhiko Sasaki; Kouji Matsubara, both of Anjo, and Masahiro Sato, Aichi-ken, all of Japan, assignors to Makita Corporation, Aichi-ken, Japan

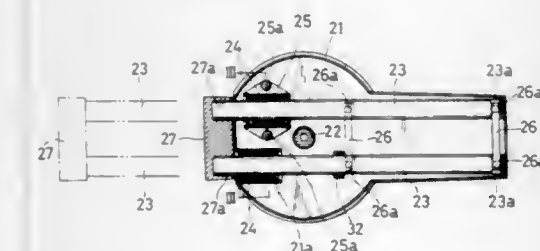
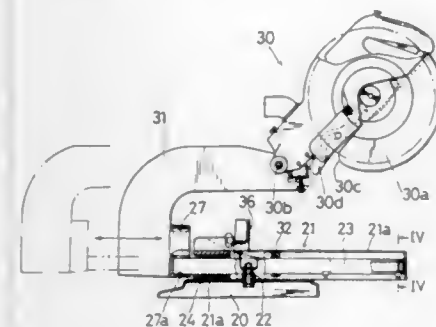
Filed Jun. 14, 1996, Ser. No. 663,983

Claims priority, application Japan, Jun. 15, 1995, 7-149050

Int. Cl.<sup>6</sup> B27B 5/18

U.S. Cl. 83—471.3

10 Claims



8. A circular saw comprising:

- a turntable rotatably mounted to a base;
- a saw unit having a saw blade mounted thereon, the saw unit being slidably mounted to the turntable by a plurality of slide bars extending in a substantially longitudinal direction;
- first mounting means, including a plurality of first mounting portions, for mounting the slide bars to the saw unit for movement of the saw unit together with the slide bars; and
- second mounting means, including a plurality of second mounting portions, for slidably mounting the slide bars on the turntable for movement of the slide bars and the saw unit relative to the turntable;
- at least one of said plurality of first and second mounting portions being laterally adjustably mounted to the saw unit and the turntable, respectively, to adjust portions of said slide bars with respect to each other and to bring the slide bars into parallel relative to each other.

## 5,768,968 PLASTIC FILM FOOD WRAP DISPENSER

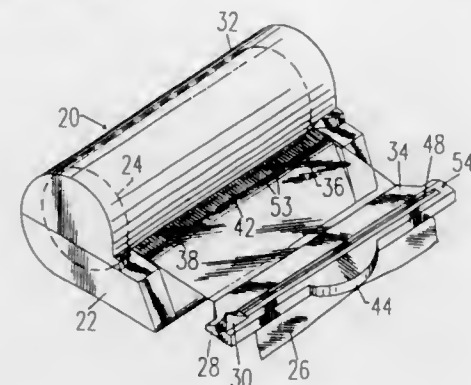
Young Ho Park, and Kathy A. Park, both of 1639 Holly Ave., Northbrook, Ill. 60062

Filed Apr. 5, 1996, Ser. No. 628,889

Int. Cl.<sup>6</sup> B26D 1/18

U.S. Cl. 83—614

13 Claims



1. A dispenser for plastic film wrap comprising:
  - a base for supporting a roll of the plastic film wrap;
  - a puller for engaging an end of the plastic film wrap and removing a selected length of the plastic film wrap; and
  - a cutter movable across the width of the plastic film wrap for cutting said selected length of the plastic film wrap from the roll;
- wherein said puller includes an elongated slot for receiving said cutter.

5,768,969

# PERFORATING KNIFE

Attilio Dalfiume, San Lazzaro Di Savena, Italy, assignor to Koenig & Bauer-Albert Aktiengesellschaft, Würzburg, Germany

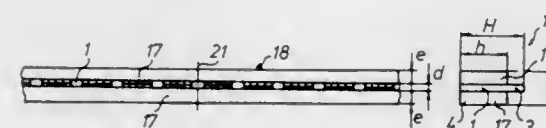
Filed Sep. 5, 1995, Ser. No. 523,437

Claims priority, application Germany, Sep. 6, 1994, 44 31 645.3

Int. Cl.<sup>6</sup> B42D 13/00; B26F 1/02; B41F 13/54

U.S. Cl. 83—660

2 Claims



1. A compound perforating knife receivable in a receptacle in a perforating knife cylinder, said compound perforating knife being useable to perforate a multi-layer signature prior to folding of the signature in a folding apparatus of a web-fed rotary printing press, said compound perforating knife having a constant base thickness, said constant base thickness compound perforating knife comprising at least one knife blade selected from first knife blades each having a first blade thickness, and second knife blades each having a second blade thickness, said first blade thickness being greater than said second blade thickness, and from spacer blades selected from first spacer blades each having said first blade thickness, and second spacer blades each having said second blade thickness, said constant base thickness compound perforating knife having a combined total of three of said selected knife blades and said selected spacer blades, to provide said constant base thickness of said compound perforating knife, said constant base thickness being twice said first blade thickness plus said second blade thickness, said constant base thickness compound perforating blade having at least one of said selected knife blades and less than three of said selected spacer blades, each of said knife blades having a first height and each of said spacer blades having a second height, said second height being less than said first height, said first height

being sufficiently greater than said second height to allow only said selected knife blades to contact a multi-layer signature during perforation of said signature, and wherein said selected knife blades and said selected spacer blades are mounted in said receptacle to prevent relative movement between said selected knife blades and said selected spacer blades in said compound perforating knife.

5,768,970

# ULTRASONIC CUTTING SYSTEM

Karl-Heinz Wolf, Halle; Hartmut Grosse, Nauendorf/Saalkreis; Lothar Gebhardt, Halle; Christian Roth, Halle; Thomas Schröter, Halle, and Hans Schröder, Halle, all of Germany, assignors to Dr. Wolf & Partner, Ingenieurbüro fuer Lebensmitteltechnik GmbH., Halle, Germany

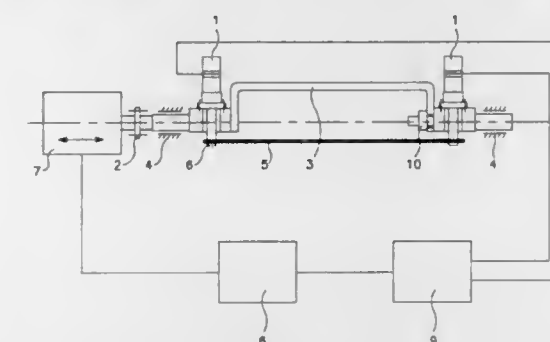
Filed Oct. 9, 1996, Ser. No. 728,494

Claims priority, application Germany, Oct. 11, 1995, 195 37 826.1

Int. Cl.<sup>6</sup> B26D 1/45

U.S. Cl. 83—701

17 Claims



1. A cutting system, comprising:
  - a substantially straight elongate cutting member;
  - elongate arcuate means having first and second ends for mounting opposite ends of the cutting member therebetween;
  - transducer means mounted adjacent to each of the first and second ends and operatively connected therewith for inducing in the cutting member vibrations of a predetermined wavelength by ultrasonic energy;
  - means for controlling the transducer means such that the predetermined wavelength of the vibrations is shorter than the wavelength of the ultrasonic energy;
  - drive means connected to one of the first and second ends for imparting reciprocating mechanical movements to the cutting member.

5,768,971

# SCROLL SAW

Michael L. O'Banion, Westminster; Louis M. Shadeck, Timonium, both of Md.; Thomas R. Sommerville, Port Perry, Canada, and Robert P. Welsh, Hunt Valley, Md., assignors to Black & Decker Inc., Newark, Del.

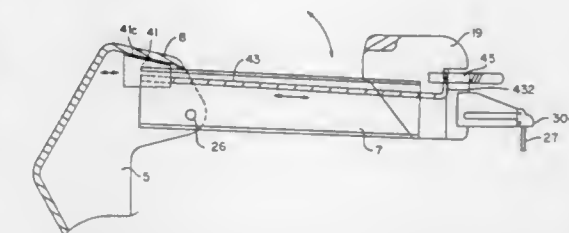
Filed Sep. 26, 1996, Ser. No. 721,298

Int. Cl.<sup>6</sup> B27B 3/02; B26D 1/02

U.S. Cl. 83—784

11 Claims

1. A saw comprising:
  - a housing having an inner surface;
  - a pivoting arm having rearward and forward ends, the rearward end of said pivoting arm disposed within an opening in said housing and said pivoting arm extending forwardly from said housing, said pivoting arm vertically pivotable relative to said housing about an axis intermediate of the rearward and forward ends;
  - a first blade clamp mounted on a drive linkage, said drive linkage being mounted generally at the forward end of said





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(d) position indicator means adjustably fixed to said mechanical compacting device of interest and in communication with said fluid operated logic means for indicating the position of said plurality of reversing linear actuators, including intermediate and extreme positions, and providing control signals to said fluid operated logic means.

5,768,973

# HYDRAULIC LINE AND VALVE ASSEMBLY FOR CONSTRUCTION VEHICLE AUXILIARY IMPLEMENTS

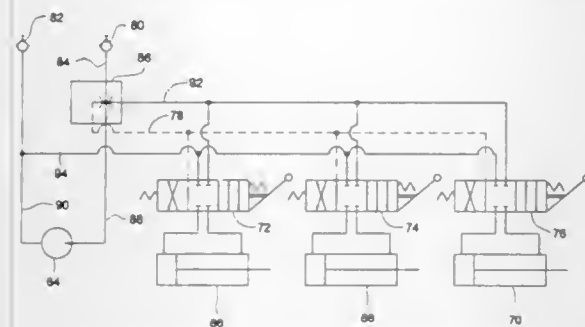
Gary Cochran, 3052 N. Forrest Lakes, Wichita, Kans. 67205

Filed Dec. 27, 1996, Ser. No. 773,607

Int. Cl.<sup>6</sup> F15B 11/00

U.S. Cl. 91—516

8 Claims



1. An hydraulic line and valve assembly for supplying hydraulic pressure and fluid flow to a hydraulically powered auxiliary implement, the auxiliary implement being adapted for attachment to a construction vehicle having an hydraulic power system, the auxiliary implement having an hydraulic motor driven work piece, and the auxiliary implement having a plurality of hydraulic positioning means for positioning the work piece, the hydraulic line and valve assembly comprising:

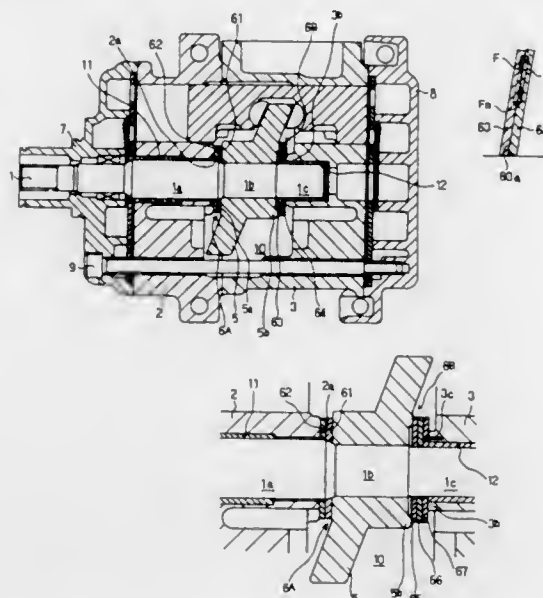
- (a) An on demand priority flow control valve having a pressure inlet port, a primary pressure outlet port, a secondary pressure outlet port, and a load sensing port, the pressure inlet port being adapted for attachment to an hydraulic pressure line extending from the hydraulic power system of the construction vehicle, and the secondary pressure outlet port being adapted for attachment to an hydraulic motor pressure line extending to the hydraulic motor;
- (b) A primary pressure line having a first end and having a plurality of second ends, said first end being fixedly attached to the primary pressure outlet port of the on demand priority flow control valve;
- (c) A plurality of position control valves, each such position control valve having a load signaling port, each such position control valve having a primary pressure line inlet port, and each such position control valve having a plurality of position control outlet ports, each such position control outlet port being adapted for attachment of a position control line for driving the hydraulic positioning means, the second ends of the primary pressure line being respectively fixedly attached to the primary pressure line inlet ports of the position control valves; and,

- (d) A hydraulic load signaling line having a first end and plurality of second ends, said first end being fixedly attached to the load sensing port of the on demand priority flow control valve, and said second ends being respectively fixedly attached to the load signaling ports of the position control valves, the hydraulic load signaling line, upon the introduction of hydraulic pressure into the pressure inlet port of the on demand priority flow control valve and upon the actuation of one of the position control valves, sending a pressure signal to the on demand priority flow control valve causing said valve to divert a portion of said hydraulic pressure to said valve's primary pressure outlet port, supplying hydraulic power to the hydraulic positioning means.

5,768,974  
SWASH PLATE TYPE COMPRESSOR  
Hayato Ikeda; Tomoji Tarutani; Masanobu Yokoi; Hiromi Michiyuki; Hirofumi Sato, and Yasunori Ueda, all of Aichi-ken, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Selsakusho, Aichi-ken, Japan  
Filed Mar. 21, 1996, Ser. No. 620,026  
Claims priority, application Japan, Mar. 22, 1995, 7-062946  
Int. Cl.<sup>6</sup> F01B 3/00

U.S. Cl. 92—71

15 Claims



1. An improved swash plate type compressor, comprising: a block assembly having a swash plate chamber defined therein; a drive shaft;
- a swash plate mounted for rotation within said swash plate chamber, said swash plate being connected to said drive shaft for rotation therewith;
- fluid compression means for compressing a refrigerant, said fluid compression means being driven by said swash plate; and
- self-adjusting thrust bearing means, interposed between said swash plate and said block assembly, for supporting said swash plate against axial displacement during operation, said self-adjusting thrust bearing means being of a composite type and including at least two elastically deformable slide bearing elements, said bearing means further being constructed and arranged to provide a greater amount of resistance to axial displacement of said swash plate during high speed operation of the compressor than during low speed operation of the compressor, whereby said thrust bearing means both minimizes frictional resistance during low speed operation of the compressor and minimizes the potential of unwanted vibration and noise during high speed operation of the compressor.

5,768,975

# BUBBLE-FORMING SLEEVE FOR AN ESPRESSO COFFEE MAKER

Tsan-Kuen Wu, Tainen Hsien, Taiwan, assignor to Tsann Kuen USA Inc., Pasadena, Calif.

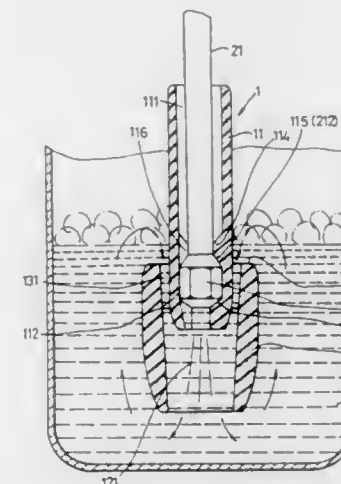
Filed Jul. 16, 1997, Ser. No. 895,134

Int. Cl.<sup>6</sup> A47J 31/40; 31/46; 43/12; B01F 13/02

U.S. Cl. 99—290

4 Claims

1. A bubble-forming sleeve adapted to be coupled with an espresso coffee maker and adapted to be immersed into a beverage within a container, the coffee maker being provided with a vapor tube which has a lower end that is provided with a nozzle, the nozzle having a top surface, and a lower end portion from which vapor flows downward, said sleeve comprising:



- a generally vertical sleeving portion which is located at an upper end portion of said sleeve and which is adapted to be sleeved fixedly on the nozzle in such a manner that a liquid-tight seal is established therebetween, said sleeve having a central bore formed therethrough; and
- a mixing portion attached around a lower end portion of said sleeving portion and adapted to be immersed entirely into the beverage within the container, said mixing portion having a downwardly opened mixing chamber which is located under and which is communicated fluidly with said central bore of said sleeving portion so as to be adapted to permit vapor flow from the nozzle of the vapor tube into said chamber of said sleeve, and a generally vertical air passage unit having a lower end which is communicated fluidly with said chamber, and an upper end which is communicated fluidly with an exterior of said sleeve;
- whereby, heated vapor can flow downward from said chamber of said mixing portion so as to heat the beverage in the container and so as to draw the beverage in the container into said chamber via said air passage unit, according to principle of a venturi tube, thereby forming bubbles of the beverage in the container.

5,768,976

# DEVICE FOR AUTOMATICALLY LOCKING THE PRESSURE LID IN ELECTRIC PRESSURE COOKERS

Joong Kwang Suk, Dae-Lim Apt. 207-905, 898-2 Pyungchon-Dong, Dongan-Ku, AnYang City KyungKi-Do, 431-070, Rep. of Korea

PCT No. PCT/KR96/00068, § 371 Date Aug. 7, 1997, § 102(e) Date Aug. 7, 1997, PCT Pub. No. WO97/20488, PCT Pub. Date Jun. 12, 1997

PCT Filed May 7, 1996, Ser. No. 875,861

Claims priority, application Rep. of Korea, Dec. 7, 1995, 1995-38967

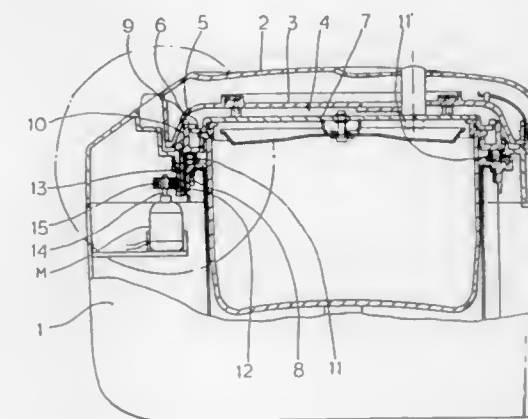
Int. Cl.<sup>6</sup> F47J 27/08; 27/09; B65D 45/00; 45/34

U.S. Cl. 99—337

1 Claim

1. A device for automatically locking or unlocking a pressure lid in an electric pressure cooker, comprising the pressure lid mounted to a bottom side of a cooker's top lid with a gap therebetween, said pressure lid having a plurality of outward protrusions radially extending outward from a peripheral edge of said pressure lid; a lock ring movably placed on a lower guide rail and positioned around the peripheral edge of said pressure lid, said ring having a plurality of inward protrusions radially extending inward from the top of a side wall of said ring, said inward protrusions selectively engaging with said outward protrusions of the pressure lid to lock said pressure lid to said ring; and a plurality of guide rollers mounted to the bottom of said lock ring and rolling on said guide rail when said lock ring is rotated, further comprising:

- a spur gear carrier extending downward from a part of an outside bottom portion of said lock ring, said carrier passing



5,768,977

# SMOKER ADAPTER FOR BARBECUE GRILLS

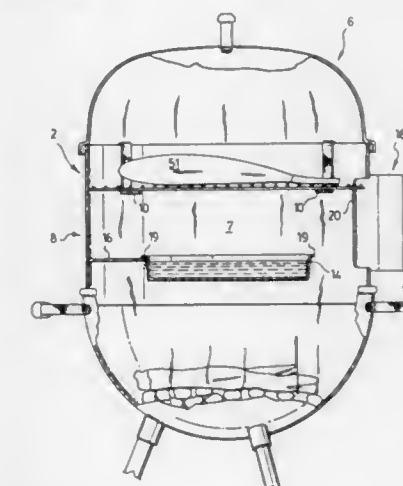
Bob G. Parris, St. Peters, and Cynthia Marie Dabbelt, St. Charles, both of Mo., assignors to Jackes-Evans Manufacturing Company, St. Louis, Mo.

Filed Jul. 28, 1997, Ser. No. 901,411

Int. Cl.<sup>6</sup> A47J 37/00; 37/04; 37/06; 37/07

U.S. Cl. 99—340

8 Claims



1. An adapter for converting a barbecue having a base and a cover to a smoker barbecue comprising
- a tubular extension member having a lower edge which seats with said base and a top edge configured to support said cover such that said tubular extension member substantially increases the height and cooking volume of said barbecue, said tubular extension member below said top edge including inwardly directed support means supporting a cooking grill at the periphery thereof,
- said tubular extension member below said cooking grill including a water supply pan,

said tubular extension member further including an access door in a wall thereof positioned adjacent said water supply pan to allow water to be added to said pan and to allow fuel to be added to the base of said barbecue during use of said barbecue.

5,768,978

# FOOD PROCESSOR COMPRISING A MIXING VESSEL AND A DRIVE MECHANISM FOR AN AGITATOR IN THE MIXING VESSEL

Stefan Dörner, and Volker Schmitz, both of Solingen, Germany, assignors to Vorwerk & Co. Interholding GmbH, Wuppertal, Germany

PCT No. PCT/EP95/01633, § 371 Date Jan. 27, 1997, § 102(e) Date Jan. 27, 1997, PCT Pub. No. WO95/29616, PCT Pub. Date Nov. 9, 1995

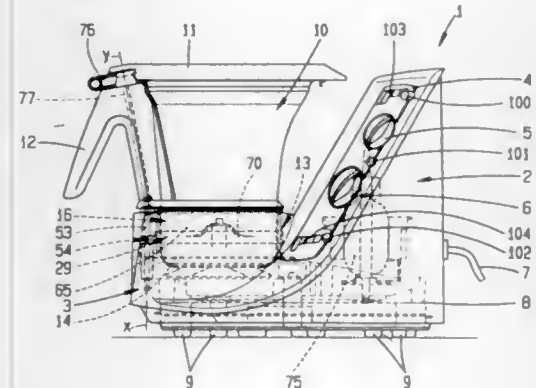
PCT Filed Apr. 28, 1995, Ser. No. 737,374

Claims priority, application Germany, Apr. 28, 1994, 44 14 821.6

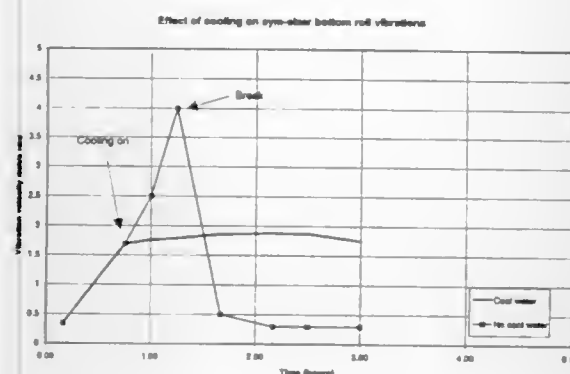
Int. Cl.<sup>6</sup> A21B 1/00; A47J 29/00; 43/04; 43/07

U.S. Cl. 99—348

24 Claims







measuring a magnitude of vibration of the roll set; and changing a temperature of the coating of the at least one coated roll during operation of the apparatus when the magnitude of vibration increases so as to change the natural frequency of the roll set.

5,768,986

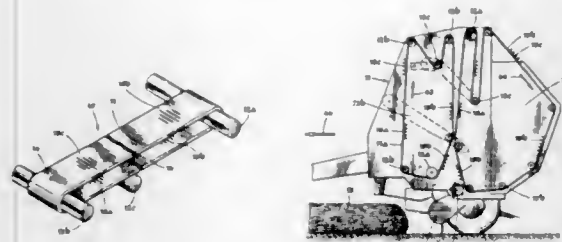
## CROP BALER BELT SYSTEM

Dale B. Arnold; Anson D. Sanford, and Chester I. Barber, all of Anthony, Kans., assignors to Morrison Co., Inc., Anthony, Kans.

Filed Oct. 30, 1995, Ser. No. 550,072  
Int. Cl.<sup>6</sup> B30B 5/04; A01F 15/07; 15/18

U.S. Cl. 100—88

26 Claims



1. A belt system for use with a plurality of rollers, comprising: an elongated elastomeric belt having an inner surface and an outer surface; a set of flexible cleaning bars disposed on said inner surface for cleaning debris off at least one of said rollers; and a portion of said elongated elastomeric belt devoid of said cleaning bars.

5,768,987

## DEVICE FOR CLEARING THE SURFACE OF A DRUM PRESS

Timo Tapio Saalasti, Espoo, Finland, assignor to Finbark Oy, Espoo, Finland

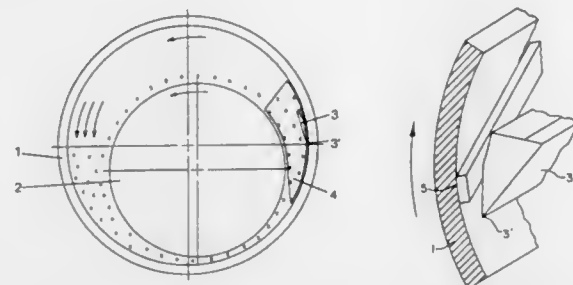
Filed Oct. 10, 1996, Ser. No. 720,967

Claims priority, application Finland, Oct. 13, 1995, 954891  
Int. Cl.<sup>6</sup> B30B 3/06

U.S. Cl. 100—157

10 Claims

1. A drum press which comprises: a rotating drum having an inside surface, a rotating press roll mounted within the rotating drum, removing means fixedly mounted within the rotating drum to form a gap between the removing means and the inside surface of the rotating drum for removing material from the drum surface, and



clearing means mounted to the inside surface of the rotating drum for clearing the gap between the removing means and the inside surface of the drum.

5,768,988

## COMPACTING DEVICE FOR INORGANIC SOLID URBAN WASTE

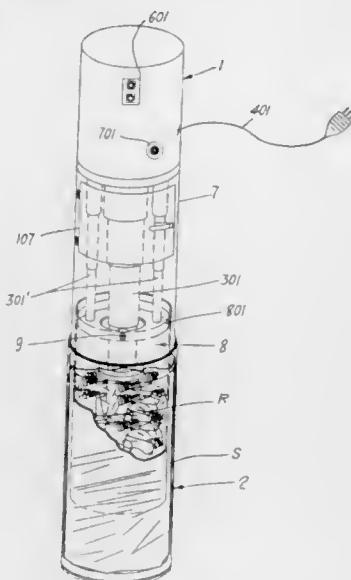
Gianfranco Meloni, Selargius, Italy, assignor to Tecnova S.r.l., Italy

Filed Mar. 20, 1996, Ser. No. 618,556

Claims priority, application Italy, Mar. 24, 1995, AL9500001  
Int. Cl.<sup>6</sup> B30B 9/30

U.S. Cl. 100—229 A

4 Claims



1. A compacting device for inorganic urban solid waste for reducing sizes and volumes of hollow and bulky bodies, the compacting device having a modular-type construction and comprising:

a collection and compaction container for receiving a package; a compacting unit removably assembled to the collection and compaction container, the compacting unit including waste compressor means positioned against a stationary striker wall of the compaction container, the compressor means comprising at least one double-acting linear actuator having a rod carrying a compression plate, said compression plate cooperating with an opposite stationary striker surface formed on an opposite side of the collection and compaction container, the compacting unit further comprising a tubular jacket member coaxially movable inside a package in the collection and compaction container in a filling direction thereof, the jacket member being superimposed to an inner side of a peripheral wall of the package when the jacket member is inserted in the package, thereby forming a waste compaction chamber which is not in direct contact with the walls of the package, the compression plate being movable inside the jacket member and capable of remaining inside the package during with-

drawal of the tubular jacket member for keeping compacted material in place in the package.

5,768,989

Patent Not Issued For This Number

5,768,990

## GAPLESS TUBULAR PRINTING BLANKET

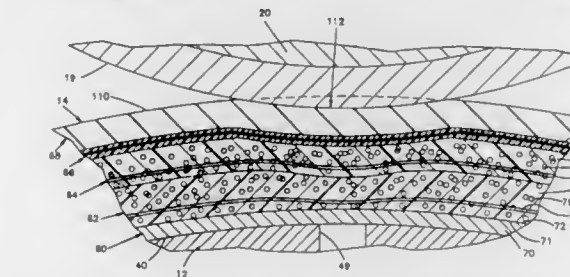
James B. Vrotacoe, Dover; Glenn Alan Guaraldi, Kingston, both of N.H.; James R. Carlson, Racine, and Gregory T. Squires, Union Gove, both of Wis., assignors to Heidelberg Harris, Inc., Dover, N.H.

Continuation of Ser. No. 129,551, Sep. 29, 1993, Pat. No. 5,553,541, which is a continuation of Ser. No. 699,668, May 14, 1991, abandoned, which is a continuation-in-part of Ser. No. 417,587, Oct. 5, 1989, abandoned. This application Jul. 19, 1996, Ser. No. 684,648

Int. Cl.<sup>6</sup> B41N 10/04

U.S. Cl. 101—217

24 Claims



1. A printing blanket comprising a cylindrical tubular body for mounting around a blanket cylinder, said cylindrical tubular body being gapless for rotational symmetry thereby minimizing vibration at high speeds said cylindrical tubular body comprising:

a cylindrical sleeve;  
a gapless inner layer of compressible material disposed around the cylindrical sleeve, the cylindrical sleeve being operative for disposition around an outer surface of the blanket cylinder;  
a gapless layer of inextensible material disposed around the inner layer of compressible material; and  
a gapless outer printing layer disposed around said layer of inextensible material, said outer printing layer being operative to print ink on paper.

5,768,991

## LABEL PRINTER FOR PRINTING MOISTENED ADHESIVE BAR CODE LABELS

Gerhard Cless, Northbrook; Kenneth Folke Ullenius, Cary; Michael Roger Garross, Beach Park; Gene Allen Hofer, Lake Zurich; Gary N. Schneider, Libertyville, and Barry Matthew Bidinger, Palatine, all of Ill., assignors to Zebra Technologies Corporation, Vernon Hills, Ill.

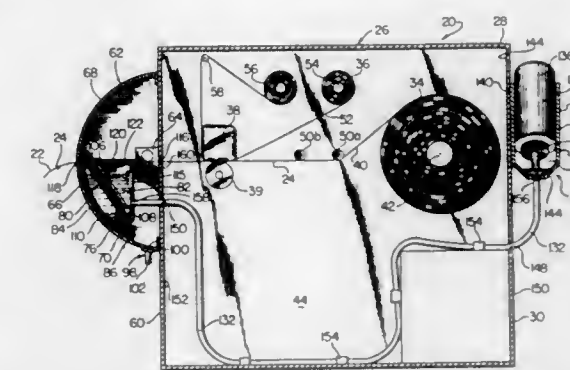
Filed Apr. 10, 1996, Ser. No. 631,322

Int. Cl.<sup>6</sup> B41F 13/56

U.S. Cl. 101—227

19 Claims

1. A printer apparatus for producing a pre-moistened label, said printer apparatus having a media associated therewith, said media having an upper surface and a lower surface, said lower surface having a liquid activated adhesive thereon, said printer apparatus comprising: an outer casing; printhead means mounted in said casing for printing indicia on said upper surface of said media; liquid application means associated with said casing for applying liquid to said adhesive coated lower surface of said media to pre-moisten said media after said printhead means has printed the



5,768,992

## HAND STAMP AND METHOD OF ASSEMBLING SAME

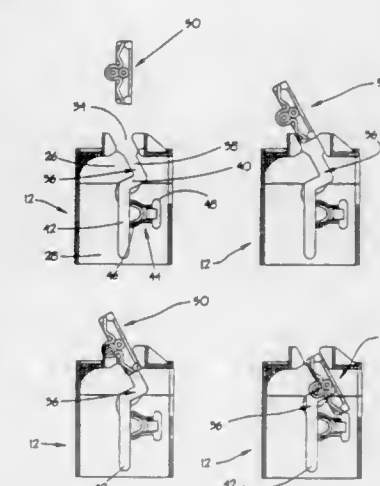
Sean P. Daw, Brooklyn, and John R. Laverack, Beacon, both of N.Y., assignors to M&R Marking Systems, Inc., Piscataway, N.J.

Filed May 24, 1996, Ser. No. 653,408

Int. Cl.<sup>6</sup> B41K 1/42

U.S. Cl. 101—334

22 Claims



1. A hand stamp comprising: a platen adapted for movement between a stamping position and a non-stamping position; a unitary frame including a top portion, a bottom portion and at least a pair of opposing side portions, said frame having a passageway arranged at said top portion and extending downwardly through said opposing side portions toward said bottom portion, said passageway being open at said top portion for receiving said platen during assembly operations, said passageway remaining open at said top portion of said frame when said hand stamp is fully assembled; and case connected to said platen and being mounted over a portion of said frame for effecting movement of said platen along said passageway between said stamping position and said non-stamping position.

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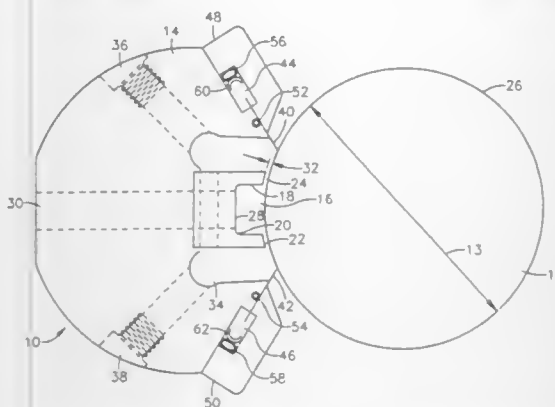
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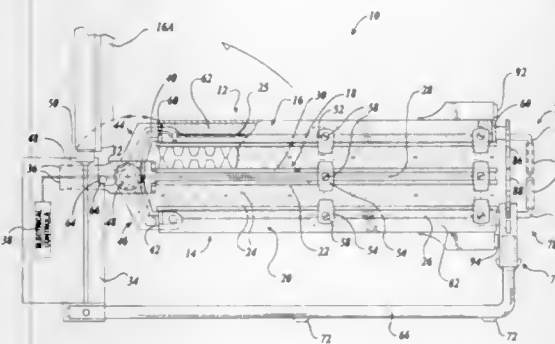
UMI

5,768,993  
**INKING SYSTEM FOR OFFSET PRINTERS**  
Warner Hugh Stuart, Thatcher, Id., assignor to Bryce International, L.L.C., Memphis, Tenn.  
Filed May 9, 1997, Ser. No. 853,407  
Int. Cl.<sup>6</sup> B41F 31/04; 31/06; 31/08  
U.S. Cl. 101—366 20 Claims



1. An apparatus for delivering a flow of fluid onto the surface of an elongate cylinder having a cylindrical exterior surface, the apparatus comprising an elongate housing having an opening positionable adjacent the exterior surface of the cylinder and a fluid collection chamber, an elongate nozzle in said housing contained within said fluid collection chamber and in fluid flow communication therewith and projectable through said opening of said housing for placement in close proximity to the exterior surface of the cylinder, said nozzle having a length about equal the length of the cylinder and a width less than the diameter of the cylinder, a first conduit connecting said fluid collection chamber in fluid flow communication with a vacuum device for establishing a reduced pressure in said chamber through the first conduit, a second conduit connecting said fluid collection chamber in fluid flow communication with a fluid reservoir for conducting a flow of fluid into the reservoir from said collection chamber, a fluid transfer device connecting the fluid reservoir in fluid flow communication with said nozzle for supplying fluid from said reservoir to said nozzle under pressure and elongate wiper seals disposed adjacent said opening of said housing oriented substantially parallel to the length of said housing positionable in close adjacency with the exterior surface of the cylinder.

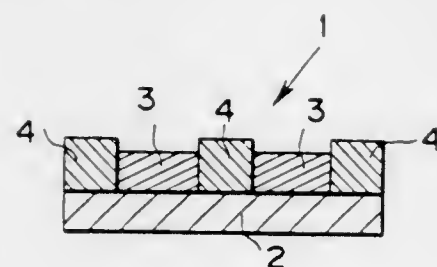
5,768,994  
**DUAL LEVEL HORIZONTAL WAFFLE IRON APPARATUS AND METHOD**  
Thomas B. Bobo, 6343 Katella Ave., Las Vegas, Nev. 89118-1246  
Filed Oct. 11, 1996, Ser. No. 729,613  
Int. Cl.<sup>6</sup> A47J 37/00  
U.S. Cl. 99—374 21 Claims



1. A dual level waffle iron apparatus comprising, in combination:

a first horizontal level waffle iron assembly having a cover member and a base member, said cover member and said base member of said first horizontal level waffle iron assembly each having a grid array spaced apart from each other;  
a second horizontal level waffle iron assembly having a cover member and a base member, said cover member and said base member of said second horizontal level waffle iron assembly each having a grid array spaced apart from each other;  
said base member of said second horizontal level waffle iron assembly being separated from said base member of said first horizontal level waffle iron assembly and space therefrom; and  
rotation means coupled to both said first horizontal level waffle iron assembly and said second horizontal level waffle iron assembly for rotating both said first horizontal level waffle iron assembly and second horizontal level waffle iron assembly about a common horizontal axis to reverse their horizontal positions in said dual level waffle iron apparatus.

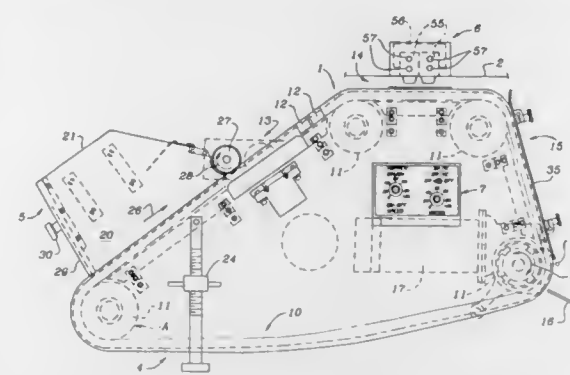
5,768,995  
**METHOD FOR PRODUCING A WATERLESS LITHOGRAPHIC PRINTING PLATE**  
Akinori Miyaguchi, and Shuzaburo Kobayashi, both of Tokyo, Japan, assignors to Corporation Association "Printechno", Tokyo, Japan  
Filed Jan. 30, 1997, Ser. No. 791,805  
Int. Cl.<sup>6</sup> G03G 13/28  
U.S. Cl. 101—463.1 2 Claims



1. A method for producing a waterless planographic printing plate, which comprises outputting desired images to be printed onto a substrate with toner, heating said substrate, forming a silicone rubber layer on said substrate having said desired images formed with toner, and shaving parts of said silicone rubber layer formed on said desired images, wherein after heating said substrate having the desired images formed with toner, water-soluble polymer is applied to the substrate and dried.

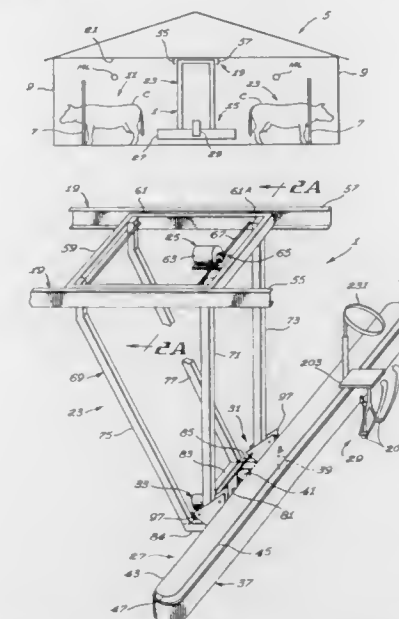
5,768,996  
**METHOD FOR MAXIMIZING LOADING EFFICIENCY OF PELLET SHAPED ARTICLES**  
E. Michael Ackley, 1273 N. Church St., Moorestown, N.J. 08057  
Continuation of Ser. No. 472,968, Jun. 7, 1995, Pat. No. 5,655,453, which is a continuation-in-part of Ser. No. 37,719, Mar. 25, 1993, Pat. No. 5,433,146, which is a continuation-in-part of Ser. No. 690,067, Apr. 23, 1991, abandoned, which is a continuation of Ser. No. 404,216, Sep. 7, 1989, abandoned, which is a continuation-in-part of Ser. No. 229,763, Aug. 5, 1988, Pat. No. 4,905,589, which is a continuation-in-part of Ser. No. 11,790, Feb. 6, 1987, abandoned. This application Mar. 17, 1997, Ser. No. 819,725  
Int. Cl.<sup>6</sup> B41F 17/08  
U.S. Cl. 101—483 6 Claims

1. A method for maximizing printing and pellet loading efficiency of a machine having a printing station for marking indicia



on pellet shaped articles to be loaded in a hopper mounted on a ramped section of a conveyor passing beneath the hopper, said conveyor including a plurality of carrier bars having pockets structured to receive the pellet shaped articles from the hopper in the ramped section, the ramped section being angled at an angle of incline optimized for the pellet shaped articles, said method comprising the steps of:  
evaluating dimensional and conveying characteristics of a plurality of pellet shaped articles;  
determining the optimum angle of incline of the ramped section; and  
setting the angle of incline of the ramped section based on the characteristics of the pellet shaped articles without requiring independent adjustment in the printing station, such that printing and pellet loading efficiency are maximized.

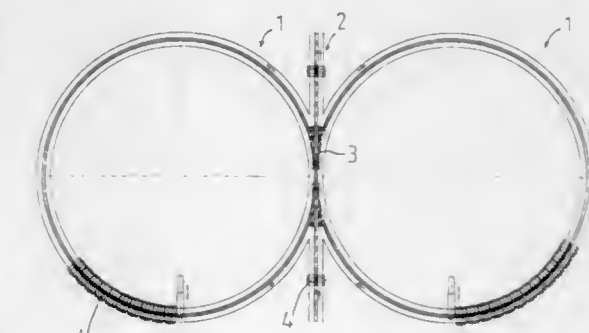
5,768,997  
**PERSON MOVER**  
Fritz Meier, R.R. #1, Bainesville, Ontario, Canada, K0C 1E0  
Filed Mar. 27, 1996, Ser. No. 625,037  
Int. Cl.<sup>6</sup> B61B 3/00  
U.S. Cl. 104—89 9 Claims



1. A person mover for installation in a building, the person mover having:  
longitudinal extending overhead rails;  
a first carriage mounted for movement along the rails, the first carriage having vertical guide ways extending downwardly nearly to the floor of the building, and first moving means for moving the first carriage along the overhead rails;  
a second carriage mounted for movement along the vertical guide ways, the second carriage having a horizontal support,

and second moving means for moving the second carriage up and down along the vertical guide ways;  
a third, elongated, carriage mounted for horizontal movement along the support of the second carriage in a direction transverse to the rails, the third carriage elongated in the direction of the movement, and third moving means for moving the third carriage along the support;  
and a chair on the third, elongated, carriage.

5,768,998  
**SUSPENSION CONVEYOR SYSTEM**  
Robby Enderlein, Landsberg a. Lech; Johann Robu, Olching, both of Germany, and Hansjörg Geiger, Schwaz, Austria, assignors to MTS Modulare Transport Systeme GmbH, Vomp, Austria  
PCT No. PCT/EP95/01323, § 371 Date Sep. 30, 1996, § 102(e) Date Sep. 30, 1996, PCT Pub. No. WO95/27669, PCT Pub. Date Oct. 19, 1995  
PCT Filed Apr. 11, 1995, Ser. No. 718,540  
Claims priority, application Germany, Apr. 12, 1994, 9406060 U; May 24, 1994, 9408513 U  
Int. Cl.<sup>6</sup> B61B 3/00  
U.S. Cl. 104—103 16 Claims



1. Suspension conveyor system comprising a rail network composed of a plurality of rails, the suspension conveyor system further comprising a roller apparatus adapted to travel along the rail network, wherein  
the rails comprise at least two sectional running girders (8) each provided with an upper running surface (9) and a lower running surface (19);  
the sectional running girders (8) extend side by side and are interconnected through strips spaced from each other such as to form a guide slit (7) having a defined width between the two sectional running girders (8);  
the roller apparatus (4) has a carriage comprising two bearing rollers (5) supported by the upper running surfaces (9) of the sectional running girders (8), the bearing rollers (5) having a common travelling axis;  
the lower end of the roller apparatus (4) is equipped with a load carrying means, arranged below the guide slit (7);  
the roller apparatus has only one travelling axis;  
at least two stabilizing rollers (18), below the bearing rollers, are arranged at a distance from each other in the travelling direction of the roller apparatus, behind and in front of the travelling axis of the bearing rollers (5), respectively, the stabilizing rollers (18) being arranged to engage from below the lower running surfaces (19) of the sectional running girders (8), the axis of the stabilizing rollers (18) extending parallel to the axis of the bearing rollers (5);  
the roller apparatus (4) comprises two lateral guide rollers (6) spaced from each other in the travelling direction of the roller apparatus (4), the axis of the lateral guide rollers (6) extending perpendicular to the axis of the bearing rollers (5), and the lateral guide rollers (6) are arranged between the bearing



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rollers (5) and the stabilizing rollers (18) such that the lateral guide rollers (6) are guided in the guide slit (7); the rails comprise at least one sectional support girder (11); the sectional running girders (8) have a rectangular cross-section; the sectional running girders (8) extending side by side and the sectional support girders (11) are interconnected through strips spaced from each other; the roller apparatus is conveyed automatically by means of a driver member (23) engaging the roller apparatus; switches are provided to direct the roller apparatus (4) to straight forward travel, a diversion to the left or a diversion to the right, depending on the switch position, and the lateral guide rollers (6) are disposed between the bearing rollers (5) and the stabilizing rollers (18) such as to cooperate with the switches.

5,768,999

## MODEL RAILROAD TRUCK

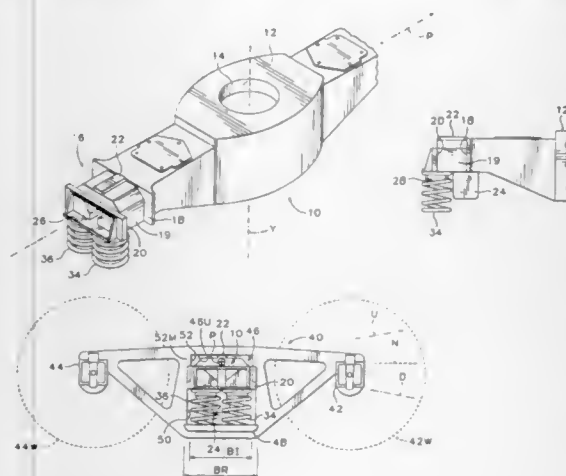
Lawrence D. Edwards, Eagle Point, Oreg., assignor to Kadec Quality Products Co., White City, Oreg.

Filed Feb. 3, 1997, Ser. No. 794,525

Int. Cl.<sup>6</sup> B61F 5/00

U.S. Cl. 105—157.2

15 Claims



9. A model railroad truck structure for use with model railroad rolling stock, comprising:

- a truck bolster having a side-frame keeper on each end thereof, wherein each side-frame keeper is bounded by an inner flange and an outer flange, and includes vertically disposed fore and aft-keeper abutment surfaces extending between said inner and outer flanges, and a pair of spring retainers extending downward from the bottom side of said side-frame keeper for holding a spring thereon, wherein said bolster includes an upper spacer located on the upper surface of said side-frame keeper and a lower spacer located adjacent each end of said bolster on the lower surface thereof;
- an elongate truck side frame carried on each end of said truck bolster, each side frame having a bolster receiver therein, wherein said bolster receiver includes a spring pan at a lower margin thereof, wherein said spring pan has a raised lip extending along an outer side thereof; and
- a truck spring located on each of said spring retainers and extending between said truck bolster and said spring pan, for maintaining said side-frame keeper within said bolster receiver.

5,769,000  
UMBRELLA TABLE HAVING A BUILT-IN LIGHT  
SOURCE

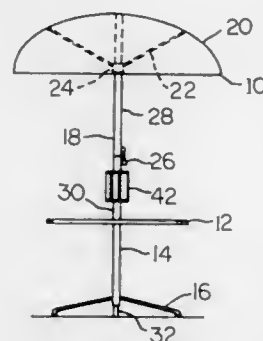
Sean M. Dunfey, Falmouth, Me., assignor to Downeast Woodworks, Inc., Falmouth, Me.

Filed Jan. 21, 1997, Ser. No. 786,678

Int. Cl.<sup>6</sup> A47B 85/00

U.S. Cl. 108—23

19 Claims



1. An umbrella table comprising a table top and a tubular guide extending downwardly from said top; and an upstanding post structure removably supported in said tubular guide; said post structure comprising a lower tube having an upper end, a lower disk radiating from the upper end of said lower tube, an upper tube having a lower end, an upper disk radiating from the lower end of said upper tube, and a plurality of vertical rods extending between said upper and lower disks; and a light source located within a central space circumscribed by said vertical rods.

5,769,001

## LOAD-CARRYING PALLET

Hans Viessmann, Schlosstrasse 3, D-95030 Hof, Germany  
PCT No. PCT/DE95/00571, § 371 Date Dec. 27, 1995, § 102(e)  
Date Dec. 27, 1995, PCT Pub. No. WO95/30587, PCT Pub.  
Date Nov. 16, 1995

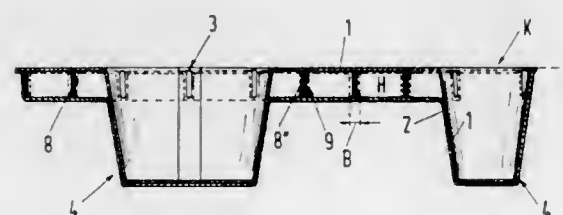
PCT Filed Apr. 28, 1995, Ser. No. 586,657

Claims priority, application Germany, May 4, 1994, 44 15 698.7; Mar. 7, 1995, 195 08 009.2

Int. Cl.<sup>6</sup> B65D 19/00

U.S. Cl. 108—51.3

9 Claims



1. A suction molded pallet comprising a bearing face and cup-shaped support legs comprised of at least two layers of recyclable cellulose fiber waste, the bearing face and the cup-shaped support legs being comprised of two outer layers and a reinforcing intermediate layer of recyclable cellulose fiber waste, the outer layers having a smooth face and a rough face, the rough faces facing the reinforcing intermediate layer, the reinforcing intermediate layer defining a multiplicity of openings where one of the outer layers is sucked into contact with the other outer layer, and the rough faces of the outer layers contacting each other through the openings in the reinforcing intermediate layer whereby the contacting rough faces are locked to each other to connect the outer layers to each other.

5,769,002

Patent Not Issued For This Number

5,769,003

## KEG PALLET

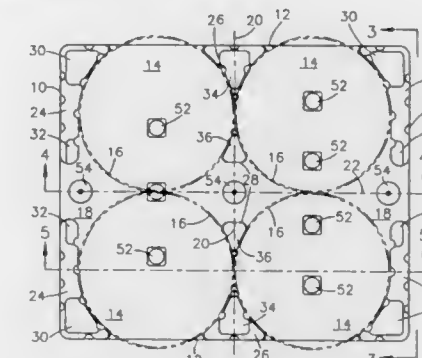
Henry H. Rose; Leonard Bryan Yarnell, and Daniel E. Major, all of Knoxville, Tenn., assignors to Formall, Inc., Knoxville, Tenn.

Filed Sep. 5, 1996, Ser. No. 707,608

Int. Cl.<sup>6</sup> B65D 19/06

U.S. Cl. 108—55.3

22 Claims



1. A twin sheet pallet formed from a pair of thermoplastic material sheets comprising:  
top and bottom platforms having a general separation space between planes respective to said platforms;  
a center plane aligned substantially normal to the top platform plane;  
a plurality of platform foot columns projecting from said bottom platform along said center plane and along first and second lateral planes on opposite sides of said center plane and substantially parallel therewith;  
a plurality of parallel ribs formed from said bottom platform to extend longitudinally between said center plane and said lateral planes, said ribs having alternating top ridges and bottom ridges connected longitudinally by sidewalls formed inwardly from said bottom platform toward said top platform, the longitudinal extension of said ridges aligned substantially perpendicular to said center plane, said top ridges being thermally fused with said top platform, a separation space between said top ridges and bottom ridges increasing progressively from said center plane toward said lateral planes; and  
a plurality of pockets formed inwardly from said top platform toward said bottom platform, said pockets having respective pocket bottoms and side walls, and pocket bottoms being thermally fused with said bottom platform and pocket side walls being thermally fused with adjacent rib sidewalls.

5,769,004

## STAND INTEGRATED TRIPOD RISER

Charles S. Kendall, P.O. Box 10893, Alexandria, Va. 22310

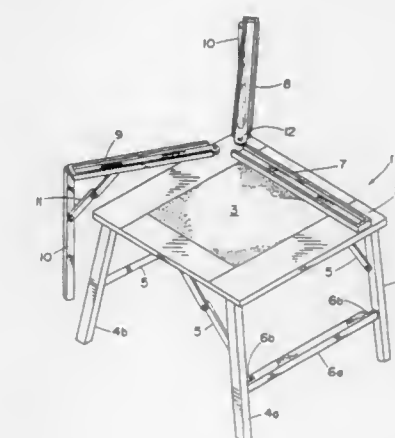
Filed Apr. 22, 1997, Ser. No. 837,824

Int. Cl.<sup>6</sup> A47B 57/00

U.S. Cl. 108—59

12 Claims

1. A portable tripod riser, transportable in a closed configuration and setup in an open configuration, comprising:  
a stand having a top surface and a plurality of folding legs;  
a first tripod receiving channel rigidly attached to a top side of said stand;  
a second tripod receiving channel attached to said top side of said stand in close proximity to said first tripod receiving channel, rotatable within the horizontal plane of said first tripod receiving channel;



a third tripod receiving channel attached to said top side of said stand in close proximity to said first tripod receiving channel, rotatable axially within a horizontal plane of said first tripod receiving channel, and wherein said second and third tripod receiving channels are displaced with respect to said first tripod receiving channel during setup to equidistantly receive the legs of a tripod.

5,769,005

## ADJUSTABLE LENGTH TABLE LEG FOR A MESSAGE TABLE

Robin Haynes, 1730 Industrial Dr., Auburn, Calif. 95603

Filed Sep. 28, 1995, Ser. No. 534,379

Int. Cl.<sup>6</sup> A47B 3/02

U.S. Cl. 108—116

19 Claims



1. An adjustable length leg on a table, the leg comprising:  
a first channel;  
a second channel having means to intermesh within said first channel, and means to move in changing longitudinal interrelationship with said first channel;  
wherein said first channel has inwardly converging walls and said second channel has outwardly diverging walls adapted to intermesh with inside surfaces of said inwardly converging walls of said first channel;

wherein a bushing means is attached to outside surfaces of said outwardly diverging walls of said second channel;  
a rack of projecting teeth disposed longitudinally on an inside surface of first channel;  
a pawl means attached to said second channel having biasing means toward engagement with said rack; and  
a pawl release means adapted to disengage said pawl means from an engaged tooth of said rack when activating said biasing means thereby allowing said pawl means to reengage said rack when said release means is not activated;  
said pawl means including means to force said second channel against said first channel when engaged.

5,769,006  
SAFETY BOX

Dina Allaer, Hever, Belgium, assignor to Alcadi, Hever, Belgium

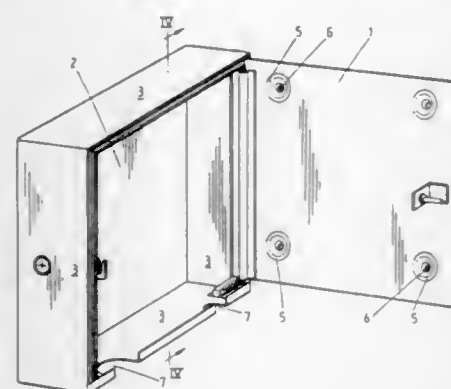
PCT No. PCT/BE94/00066, § 371 Date Aug. 17, 1995, § 102(e) Date Aug. 17, 1995, PCT Pub. No. WO95/10132, PCT Pub. Date Apr. 13, 1995

PCT Filed Oct. 6, 1994, Ser. No. 448,480

Claims priority, application Belgium, Oct. 6, 1993, 09301050 Int. Cl.<sup>6</sup> E06B 3/34

U.S. Cl. 109—73

20 Claims



1. A safety box comprising:

a substantially planar bottom plate having a plurality of side edges;

a box-shaped cover connected to said bottom plate and movable between an open position and a closed position, said box-shaped cover including a top plate and a plurality of side walls extending from said top plate, one of said side walls including an inwardly turned lip directed toward one of said side edges of said bottom plate, said plurality of side walls forming an opening in said box-shaped cover which is approximately equal to dimensions of said bottom plate such that the bottom plate is adapted to pass closely through said opening and fit entirely within said box-shaped cover when in said closed position, a portion of each of said side walls projecting below said side edges of said bottom plate when in said closed position; and

a hinge operatively connecting one of said side walls to said bottom plate, wherein one of said side walls includes a pair of spaced-apart openings therein.

5,769,007  
BULK MATERIAL HEATING CHAMBER EQUIPPED WITH HEATING TUBES  
Herbert Tratz, Ottensoos; Helmut Werdinag, Nurnberg; Joachim Boretzky, Adelsdorf, and Anton Ebert, Ellwangen-Schreizeim, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

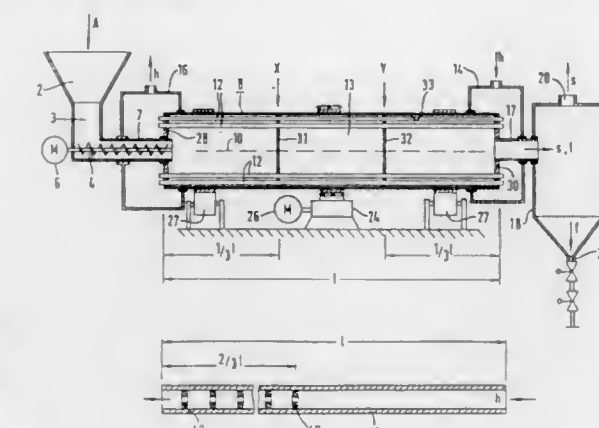
Filed Aug. 22, 1995, Ser. No. 518,009

Claims priority, application Germany, Aug. 23, 1994, 44 29 908.7

U.S. Cl. 110—246

Int. Cl.<sup>6</sup> A47J 36/00

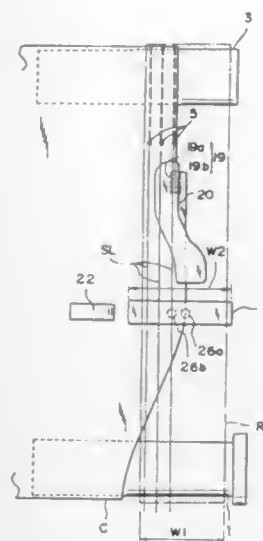
17 Claims





U.S. Cl. 112—470.29 4 Claims

1. A sewing apparatus of tubular cloth comprising:



a tubular cloth setting unit for setting the tubular cloth at a position matching with a cloth feed direction of a sewing machine in a peripheral direction of the tubular cloth and passing through a needle drop point of the sewing machine in a state that the set tubular cloth is movable in the cloth feed direction,

a tubular cloth forced feed device for feeding said set tubular cloth by force in the cloth feed direction regardless of driving of the sewing machine,

a cutting device for cutting the tubular cloth disposed in front of the needle drop point along a direction matching with the cloth feed direction, and

a tubular cloth end correcting device for guiding the end portion of said set tubular cloth set in a direction crossing a cutting line of said cutting device,

wherein said tubular cloth end correcting device comprises: tubular cloth end position correcting means for correcting deviation of position of the end portion of tubular cloth in front of the needle drop point, and

a tubular cloth end detector disposed near the tubular cloth end position correcting means, for detecting the end portion of the tubular cloth at a first position on the cutting line parallel to the cloth feed direction passing through the cutting device and at a second position apart from said cutting line in the direction crossing the cloth feed direction, and the tubular cloth end detector detects at the first position from start of sewing to a first number of stitches, and for a second number of stitches before end of sewing.

5,769,018

**LOOPER THREAD CONTROL METHOD AND DEVICE FOR A DOUBLE CHAINSTITCH SEWING MACHINE**

Minoru Nakano, Osaka, Japan, assignor to Pegasus Sewing Machine Mfg. Co., Ltd., Osaka, Japan

Filed Apr. 10, 1996, Ser. No. 628,547

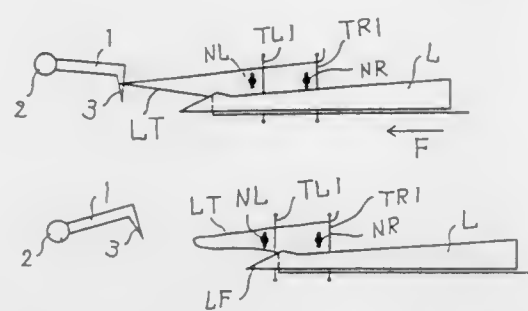
Claims priority, application Japan, Apr. 12, 1995, 7-112501  
Int. Cl.<sup>6</sup> D05B 61/00

U.S. Cl. 112—475.17

6 Claims

1. A method of forming a double chainstitch with a sewing machine, said sewing machine comprising a pair of needles having threads passing through eyelets provided therein and mounted for vertical movement, a looper having a looper thread passing through an eyelet provided therein and mounted for lateral elliptical movement and a looper thread support member having an end thereof adapted to move toward and grasp the looper thread and move away and release the looper thread, said method comprising the steps of:

lowering the pair of needles from their highest position;  
moving the end of the looper thread support member into an area defined by the needle threads and the looper thread;



grasping the looper thread with the end of the looper thread support member at a position that is to the left of the pair of needles and above and at the left center of the looper;  
moving the looper to the right and in front of the descending pair of needles and deforming the area defined by the needle threads and the looper thread to form a loop;  
lowering the pair of needles into the loop;  
moving the end of the looper thread support member away from the loop to disengage the looper thread therefrom;  
raising the pair of needles from their lowermost position; and  
moving the looper to the left and behind the rising pair of needles to begin formation of a new stitch.

5,769,019

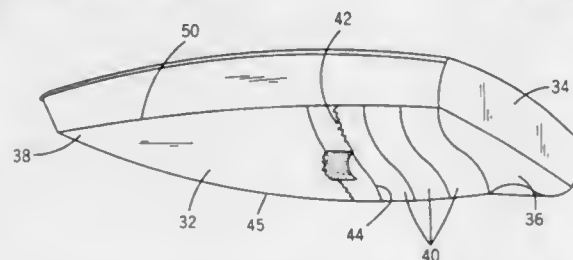
**PROTECTIVE COVERING FOR OUTDOOR STRUCTURES**

Luiz F. Dias da Silva, 13264 Heiden Cir., Lake Bluff, Ill. 60044  
Filed Jun. 27, 1996, Ser. No. 671,628

Int. Cl.<sup>6</sup> B63B 1/34

U.S. Cl. 114—67 R

20 Claims



1. A method of protecting a hull of a marine craft from adhesion of marine growths, the method comprising the steps of applying flexible protective covering sheets to the hull in a pattern that provides substantially complete coverage of at least a portion of an external surface that is submerged during normal use of the marine craft, wherein the sheets have a non-porous outer surface consisting essentially of a polymer that resists adhesion of marine growths and inorganic deposits, and an inner surface comprising a water-resistant adhesive effective to secure the sheets to the outer hull surface and prevent the sheets from coming off during normal use of the marine craft.

5,769,020

**SYSTEM AND METHOD FOR STABILIZING MULTIPLE PLATFORMS ONBOARD A VESSEL**

Steven E. Shields, San Diego, Calif., assignor to Raytheon Company, Los Angeles, Calif.

Filed Jun. 16, 1997, Ser. No. 876,990

Int. Cl.<sup>6</sup> B63B 9/08

U.S. Cl. 114—121

10 Claims

1. A system for stabilizing at least one adjustable platform on a vessel, comprising:

a plurality of primary sensors on said vessel that sense changes in said vessel's position and orientation and produce a common reference corresponding to said vessel's position and orientation,

5,769,022

**CANOPY FOR FLOAT TUBE**

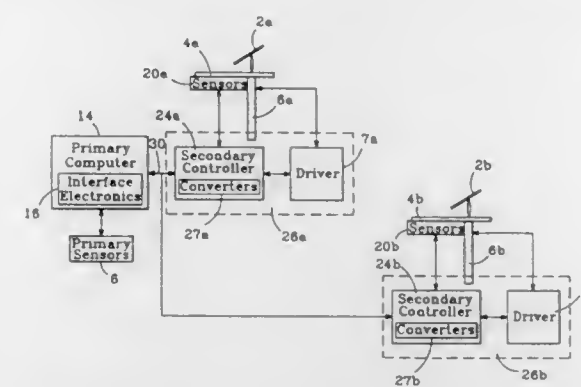
Timothy Luxford, 3511 Carlisle Street, Coquitlam, British Columbia, Canada, V3J 4M1

Filed Dec. 12, 1996, Ser. No. 764,297

Int. Cl.<sup>6</sup> B63B 17/00

U.S. Cl. 114—361

13 Claims



a plurality of secondary sensor at said at least one platform's respective location that sense motion of said at least one platform and produces respective secondary position data corresponding to the motion of said at least one platform,

at least one computer on said vessel that processes said respective secondary position data relative to said common reference to calculate adjustments required to stabilize said at least one platform, and

a respective plurality of stabilizing devices to adjust the position of said at least one adjustable platform using the calculated adjustments from said computer.

5,769,021

**AMPHIBIOUS CRAFT**

Robert D. Schad, 110 Bloor St. W., Suite 2104, Toronto, Ontario, Canada

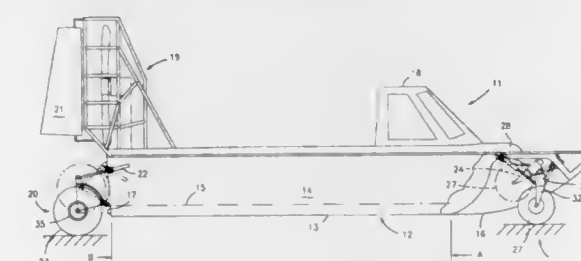
Continuation of Ser. No. 534,381, Sep. 28, 1995, abandoned.

This application Mar. 13, 1997, Ser. No. 815,962

Int. Cl.<sup>6</sup> B63H 7/00

U.S. Cl. 114—270

17 Claims



1. A multi-terrain vehicle for travel on water, land and ice comprising:

a hull having a bow, a stern, and a centerline extending from said bow to said stern;

a bow wheel mounted to the bow of said hull;

a wheel well in said bow for receiving said bow wheel when said vehicle travels in water and on ice;

said wheel well having a bottom opening through which said bow wheel is retracted;

said bow wheel being located above the waterline of said hull when retracted within said wheel well;

at least one retractable rear wheel mounted to and positioned rearwardly of the stern of said vehicle;

primary surface engaging means for supporting said vehicle when said vehicle is travelling in said water and on said ice, said primary engaging means comprising a hull portion having a smooth, continuous, uninterrupted surface extending from a point aft of said wheel well to a point substantially adjacent the stern of said vehicle;

said uninterrupted surface being located beneath said waterline; and

said wheel well being positioned forward of said primary surface engaging means.

5,769,023

**CONSTRUCTION INCLUDING AN IMPLEMENT FOR AUTOMATICALLY MILKING ANIMALS**

Olaf van der Lely, Steinhausen, Switzerland, and Karel van den Berg, Bleskensgraaf, Netherlands, assignors to Maasland N.V., Maasland, Netherlands

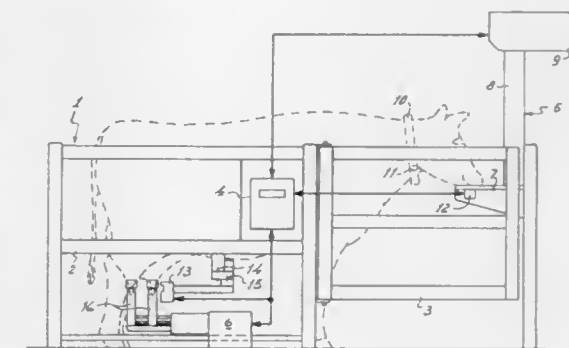
Filed Jun. 26, 1996, Ser. No. 602,720

Claims priority, application Netherlands, Jun. 23, 1994, 9401035

Int. Cl.<sup>6</sup> A01J 5/00

U.S. Cl. 119—14.02

29 Claims



1. An apparatus for milking an animal, comprising:  
a milking compartment,  
an automatic feeding system,  
an animal identification system connected to a computer,  
said computer programmed for controlling said automatic feeding system thereby providing a computer-controlled feeding system,



wherein during said milking of said animal, a quantity of fodder, adjusted to said animal, is automatically supplied to said animal by said computer-controlled feeding system, and wherein said computer-controlled feeding system controls said quantity of fodder automatically supplied to said animal so that said quantity of fodder is automatically distributed to said animal substantially over an expected milking period for said animal in a flow of said fodder which is substantially uninterrupted.

5,769,024

## METHOD OF MILKING ANIMALS

Benny Örnérfor, Järfälla, and Ann-Louise Hörberg, Trångsund, both of Sweden, assignors to Alfa Laval Agri AB, Tumba, Sweden

PCT No. PCT/SE95/00545, § 371 Date Nov. 13, 1996, § 102(e)

Date Nov. 13, 1996, PCT Pub. No. WO95/31095, PCT Pub.

Date Nov. 23, 1995

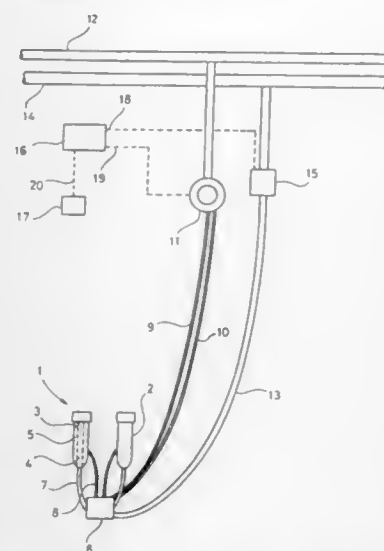
PCT Filed May 16, 1995, Ser. No. 737,722

Claims priority, application Sweden, May 17, 1994, 9401684

Int. Cl.<sup>6</sup> A01J 5/00

U.S. Cl. 119—14.02

20 Claims



1. A method for milking an animal, comprising stimulating initially the animal during a stimulation phase for initiating the animal to let down milk in the udder, while achieving a relatively small milk flow from the animal's teats, treating the animal during a subsequent main milking phase to eject a relatively large milk flow from the animal's teats, monitoring at least one milking variable during the stimulation phase, ending the stimulation phase and starting the main milking phase when said milking variable reaches a predetermined value, said milking variable being the milk quantity extracted from the animal.

5,769,025

## MILKING APPARATUS

Ary van der Lely, Maasland; Olaf van der Lely, Steinhausen; Karel van den Berg, Bleskensgraaf, and René Fransen, Vlaardingen, all of Netherlands, assignors to Maasland, N.V., Maasland, Netherlands

Filed Jul. 26, 1995, Ser. No. 507,614

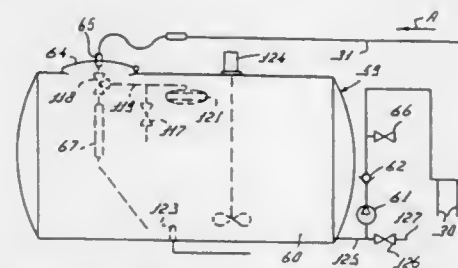
Claims priority, application Netherlands, Jan. 26, 1993, 9300143

Int. Cl.<sup>6</sup> A01J 5/00

U.S. Cl. 119—14.42

62 Claims

1. A milking apparatus including a milk circulation line and comprising a milk storage and cooling tank and a pump, said pump circulating the milk sequentially through said circulation line and



said tank, said pump, said circulation line and said tank comprising a circuit for circulating milk, the apparatus further comprising a supply line and a milking machine, said milking machine connected to said supply line to supply milk via said supply line to said circulation line, a milk filter in said supply line that filters milk passing from said milking machine via said supply line to said circulation line.

5,769,026

## CAT LITTER ENCLOSURE

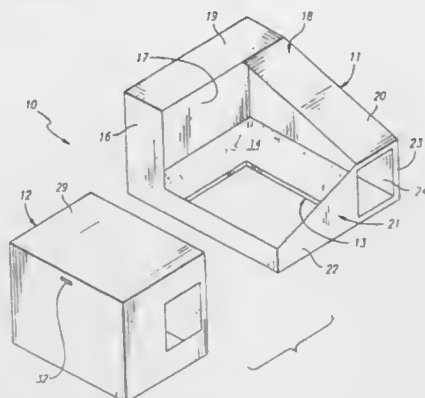
Lawrence Kohn, 161 N. Arnaz Dr., Beverly Hills, Calif. 90211

Filed Dec. 23, 1996, Ser. No. 772,398

Int. Cl.<sup>6</sup> A01K 1/035

U.S. Cl. 119—165

12 Claims



1. A cat litter enclosure comprised of:

a first outer housing having a bottom wall surrounded by interconnected side walls forming a first enclosure;

a second inner housing removably mounted internally of said first outer housing having an open bottom formed by a plurality of interconnected side walls closed off by a top wall forming a second enclosure;

an opening through one of the side walls of said outer housing leading into the interior thereof; and

an opening through one of the side walls of said inner housing leading into the interior thereof, said opening through one of the side walls of said inner housing being spaced from the opening through one of the side walls of said outer housing when said inner housing is mounted internally of said outer housing.

5,769,027

## AQUACULTURE CONTAINER AND CONSTRUCTION

Anjanette M. Adams, and Anthony L. Mertz, both of 1745 Vine St., McKinleyville, Calif. 95519

Filed Feb. 26, 1997, Ser. No. 806,688

Int. Cl.<sup>6</sup> A01K 61/00

U.S. Cl. 119—238

15 Claims

1. An aquaculture container, comprising:

a solid, homogeneous, monolithic, and rigid monocoque aquaculture container shell having at least an internal surface area and a single internal volume extending completely there-through;

5,769,029

## ANIMAL BATHING AND DRYING SYSTEM

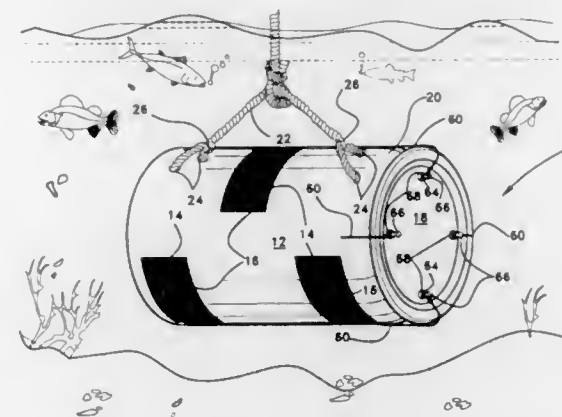
William J. Marshall, P.O. Box 6425, Akron, Ohio 44312

Filed Nov. 4, 1996, Ser. No. 743,024

Int. Cl.<sup>6</sup> A01K 13/00

U.S. Cl. 119—651

30 Claims



said container shell including at least one opening therethrough for circulating water through said internal volume, with said at least one opening including screen means disposed there-across;

internal structure attachment means affixed to said internal surface area of said container shell; and

said container shell further including at least one removably installed panel for accessing said internal volume thereof.

5,769,028

## PET CARRIER

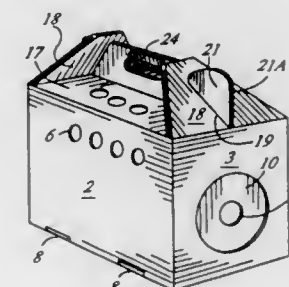
Jonas E. Deckys, 9220 NE. 141st, Bothell, Wash. 98038

Filed Jun. 6, 1996, Ser. No. 660,033

Int. Cl.<sup>6</sup> A01K 1/035

U.S. Cl. 119—496

20 Claims



1. A cat carrier comprising:

a main unit including four sides and a bottom defining a carrying space having a top opening, one of said sides having a side opening therethrough large enough to permit a cat to enter said space through said side opening; and

an insert unit including four sides, a closed top, and an open bottom; said insert unit being dimensioned to slide down through said top opening into a use position in said space and to closely fit inside said main unit in said use position, and said insert unit at least substantially blocking said side opening when said insert unit is in said use position to block egress of the cat from said space; and said insert unit having a raised position in which it is partially received in said space with a lower portion of each said side of said insert unit closely adjacent to an inner surface of a corresponding side of said main unit and with at least said lower portion corresponding to said one of said sides of said main unit above said side opening, to cooperate with said main unit to block entry and egress of the animal into and from said space except through said side opening.

5,769,030

## ANIMAL TRAINING AND CONDITIONING APPARATUS

Marcus La'Roi Acoff, 4114 Fletcher Dr., Garland, Tex. 75044

Filed Mar. 10, 1997, Ser. No. 814,263

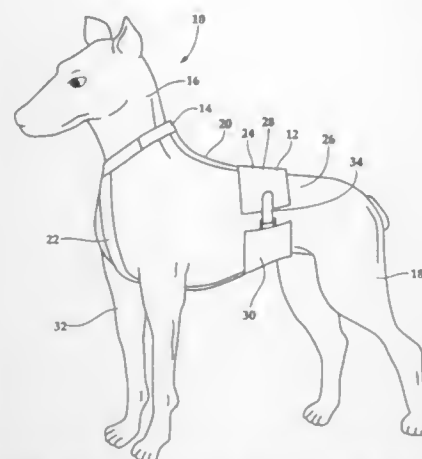
Int. Cl.<sup>6</sup> A01K 15/00

U.S. Cl. 119—712

19 Claims

17. An animal training and conditioning apparatus comprising: a collar for securing the training and conditioning apparatus around the animal's neck and for preventing the animal training and conditioning apparatus from sliding toward the animal's hind legs, said collar having first and second adjustment members each disposed on opposite sides of said collar such that the circumference of said collar is adjustable without rotating said collar relative to the animal's neck;

a back strap having a first end and a second end, said first end of said back strap securably attached to said collar at a point behind the animal's neck, said back strap having an adjustment member located between said first end and said second end of said back strap to adjust the distance between said first end and said second end of said back strap;



a chest strap having a first end and a second end, said first end of said chest strap securably attached to said collar at a point in front of the animal's neck, said chest strap having an adjustment member located between said first end and said second end of said chest strap to adjust the distance between said first end and said second end of said chest strap; and

a weighted vest having an upper portion and a lower portion, said upper portion of said weighted vest securably attached to said second end of said back strap such that said back strap extends from said collar to said upper portion of said weighted vest down the middle of the animal's back, said lower portion of said weighted vest securably attached to said second end of said chest strap such that said chest strap extends from said collar to said lower portion of said weighted vest down the middle of the animal's chest and between the animal's front legs, said upper portion of said weighted vest extends generally perpendicularly from said second end of said back strap for disposition upon the upper side of the animal's torso, said lower portion of said weighted vest extends generally perpendicularly from said second end of said chest strap for disposition under the lower side of the animal's torso, said upper portion of said weighted vest being adjustable relative to said lower portion of said weighted vest to provide for a snug and comfortable fit around the animal's torso, thereby enhancing the training and conditioning of the animal's hind legs and cardiovascular system.

5,769,031

Patent Not Issued For This Number

5,769,032

**METHOD AND APPARATUS FOR CONFINING ANIMALS AND/OR HUMANS USING SPREAD SPECTRUM SIGNALS**

Robert G. Yarnall, Sr., and Robert G. Yarnall, Jr., both of P.O. Box 758, Kimberton, Pa. 19442

Filed Feb. 3, 1997, Ser. No. 794,014

Int. Cl.<sup>6</sup> A01K 3/00; 27/00

U.S. Cl. 119—721

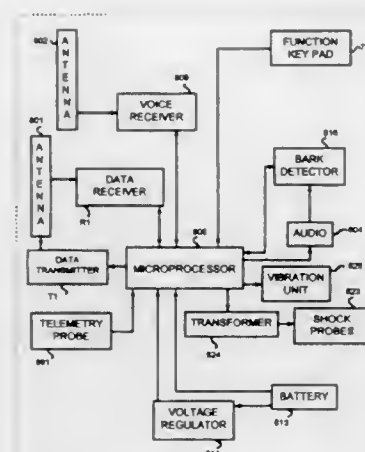
31 Claims

1. A confinement arrangement for one of an animal and human comprising:

home base transmitting means for transmitting a spread spectrum modulated signal from a first signal-emitting wire; and receiver means for receiving the spread spectrum modulated signal, the receiving means having:

(a) despread demodulation means for despread demodulating the received spread spectrum modulated signal to produce a despread demodulated signal;

(b) comparator means for determining whether the received spread spectrum modulated signal was transmitted from the home base transmitting means, and



(c) deterrent means, responsive to a signal strength of the received spread spectrum modulated signal, for producing a deterrent signal if the comparator means determined that the received spread spectrum modulated signal was transmitted from the home base transmitting means.

5,769,033

**HOT WATER STORAGE**

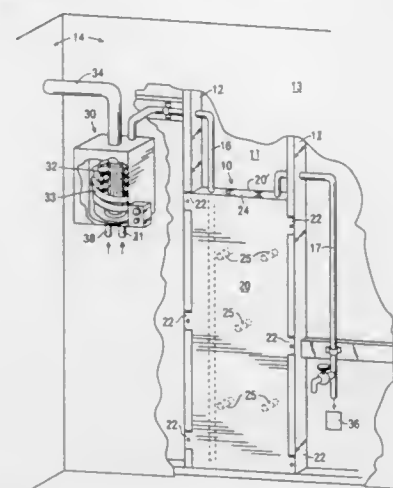
Stephen E. Petty, Dublin, Ohio, and Ronald G. Jones, Indianapolis, Ind., assignors to Columbia Gas of Ohio, Inc., Columbus, Ohio

Filed Jan. 22, 1996, Ser. No. 589,824

Int. Cl.<sup>6</sup> F22B 5/00; H05B 1/02

U.S. Cl. 122—13.1

21 Claims



1. Apparatus for heating and storing water, comprising container means for holding a quantity of water; at least a portion of the container means being held in place within a space between elongate structural members in a wall, ceiling, floor, or like surface of a structure; inlet conduit means for conveying water into the container means; outlet conduit means for conveying water out of the container means; heating means, spaced apart from the container means, for receiving water at a lower temperature, heating the water to a higher temperature, and communicating the heated water to the inlet conduit means of the container; and supply conduit means for furnishing water at the lower temperature from a source of supply thereof to the heating means; so constructed and arranged that the water is furnished to the container means at substantially the higher temperature, and

made available to another entity, via the outlet conduit means, at a temperature above the lower temperature.

5,769,034

**DEVICE, SYSTEM AND METHOD FOR ON-LINE EXPLOSIVE DESLAGGING**

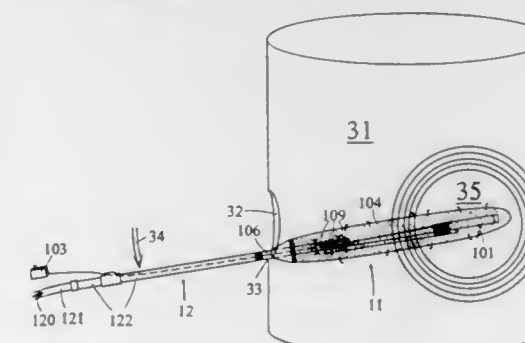
Frank Zilka, 318 Fitch Rd.; Tim Zilka, 200 Lake Ave., both of Saratoga, N.Y. 12866; Kurt Prouty, 47 Bay Path La., Norwell, Mass. 02061, and Don Howard, 147 Juniper Dr., Ballston Spa, N.Y. 02020

Filed Jan. 17, 1997, Ser. No. 786,096

Int. Cl.<sup>6</sup> F22B 37/18; 37/48; F28G 1/00

U.S. Cl. 122—379

22 Claims



22. An explosives-based system for deslagging a hot, online heat-exchange device, comprising:

an explosive device, a cooling envelope, a coolant delivery pipe, an explosive connector means, and a hydraulic tube, each of which is a separate module of said system prior to assembly of these modules into said system, wherein subsequent to said assembly, the resulting configuration is such that:

a cap is affixed to the explosive; a signal connection is established between an initiator and said cap; the pipe and the explosive are affixed in predetermined position relative to one another, via said explosive connector means; the envelope is affixed to a first of two ends of the pipe such that it envelops the explosive; and the hydraulic tube is affixed to a second of said two ends of the pipe.

5,769,035

**BOILER FURNACE PUFF SOOTBLOWER**

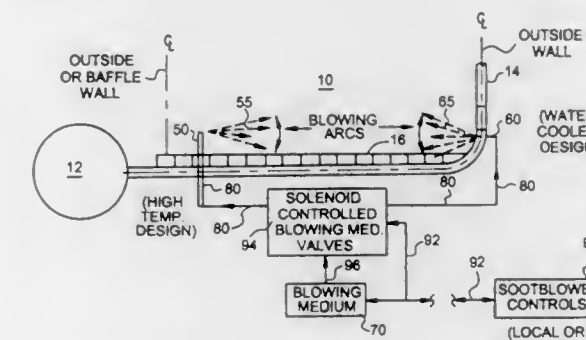
Ronald G. Fiedler, Fairlawn, Ohio, assignor to McDermott Technology, Inc., New Orleans, La.

Filed Oct. 24, 1996, Ser. No. 736,637

Int. Cl.<sup>6</sup> F22B 37/48; 37/54

U.S. Cl. 122—384

6 Claims



1. A sootblower system for entraining and removing ash from the combustion zone of a flat floor, solid fuel fired boiler, comprising:

a combustion zone defined by a furnace floor and a plurality of furnace walls, each furnace wall connected to the furnace floor and to two adjacent furnace walls, wherein at least one furnace wall is a water-cooled wall comprising a plurality of adjacent water tubes;

a plurality of first stationary sootblower pipes projecting substantially vertically through the furnace floor into the combustion zone, each of said first stationary sootblower pipes having a blower end and a source end, the blower end being provided with an opening oriented substantially parallel to the furnace floor and in communication with the combustion zone;

a plurality of second stationary sootblower pipes, each of said second stationary sootblower pipes having a blower end and a source end, each blower end extending between adjacent water tubes in the water-cooled wall into the combustion zone at a location proximate the furnace floor and in communication with the combustion zone; and

blower medium means for providing a blowing medium to each of the plurality of first stationary sootblower pipes and the plurality of second stationary sootblower pipes connected to each source end of the first sootblower pipes and to each source end of the second sootblower pipes.

5,769,036

**OIL FILTER ARRANGEMENT FOR FOUR-CYCLE ENGINE**

Masanori Takahashi; Atsushi Isogawa, and Hitoshi Watanabe, all of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

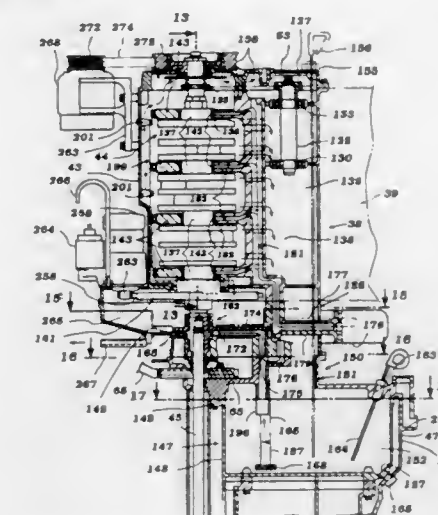
Filed Aug. 2, 1996, Ser. No. 692,817

Claims priority, application Japan, Aug. 3, 1995, 7-198878; Aug. 31, 1995, 7-223868

Int. Cl.<sup>6</sup> F01P 11/08

U.S. Cl. 123—41.33

25 Claims



1. An outboard motor comprised of a power head consisting of a four-cycle internal combustion engine, a protective cowling encircling said engine, said engine being comprised of a cylinder block having at least one cylinder bore formed therein, a crankcase chamber formed at one end of said cylinder block and containing a crankshaft journaled for rotation about a vertically extending axis, a drive shaft housing and lower unit depending from said power head and journaling a drive shaft for rotation about a vertically extending axis, means for coupling said crankshaft to said drive shaft for driving said drive shaft, a propulsion device driven by said drive shaft for propelling an associated watercraft, an oil tank for said engine contained at least in part in said drive shaft housing and lower unit, an oil pump driven by said engine, a circulating system for circulating oil from said oil tank to said oil pump, from said oil pump components of said engine for their lubrication and back to said oil tank, and an oil filter positioned below said cylinder block and in communication with said circulation system



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OFFICIAL GAZETTE

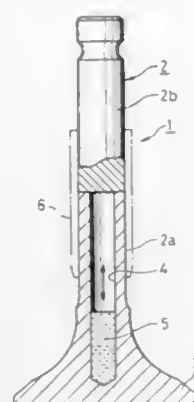
JUNE 23, 1998

for filtering oil pumped by said oil pump, said oil pump being disposed below said cylinder block and closer to said oil tank than to said crankcase chamber.

**5,769,037**  
**HOLLOW VALVE IN AN INTERNAL COMBUSTION ENGINE**  
Kizuku Ohtsubo, Kawasaki, and Takeji Kenmoku, Fujisawa, both of Japan, assignors to Fuji Oozx, Inc., Kanagawa-ken, Japan

Filed Jan. 27, 1997, Ser. No. 789,008  
Int. Cl.<sup>6</sup> F01L 3/14  
U.S. Cl. 123—41.34

7 Claims

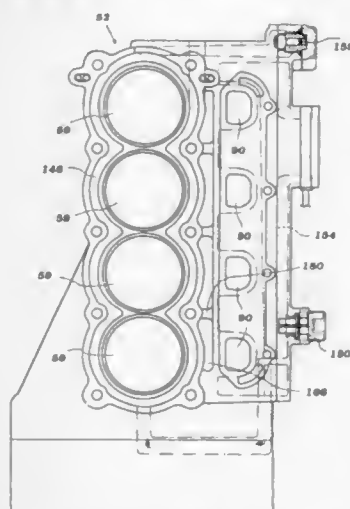


1. A hollow valve in an internal combustion engine, the valve comprising:  
a valve head;  
a valve stem; and  
a cavity which is formed in the valve head and the valve stem, a low melting point alloy being enclosed in the cavity;  
wherein the low melting point alloy contains Sn and Bi.

**5,769,038**  
**LIQUID COOLING SYSTEM FOR ENGINE**  
Masanori Takahashi, and Hiroshi Oishi, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 11, 1997, Ser. No. 814,216  
Claims priority, application Japan, Mar. 11, 1996, 8-082007;  
Mar. 21, 1996, 8-089923  
Int. Cl.<sup>6</sup> F02F 1/40; 1/38  
U.S. Cl. 123—41.82 R

20 Claims



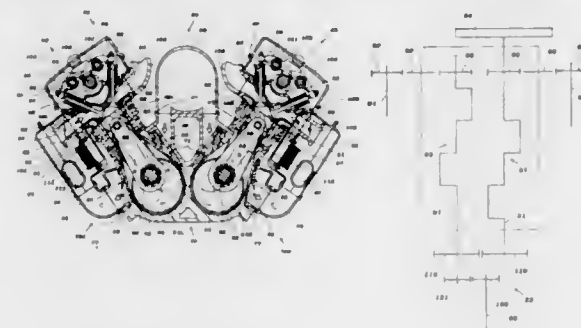
1. An internal combustion engine having a liquid cooling system, said engine comprising a cylinder block having at least one

cylinder head connected thereto and defining a combustion chamber, a common exhaust passage extending through said cylinder block, and an exhaust passage leading through said head from each combustion chamber to said common exhaust passage, and wherein said liquid cooling system comprises at least one first cooling passage extending through said head adjacent said exhaust passages leading from said combustion chambers, at least one second cooling passage extending through said cylinder block adjacent said common exhaust passage, one or more combustion chamber cooling passages extending through said cylinder head and block adjacent said combustion chambers, a cooling liquid source, means for pumping liquid from said source for delivery through said at least one first and second cooling passages before delivering said cooling liquid to said combustion chamber cooling passages and further including a pressure relief valve positioned along said cooling path after said first and second cooling passages and before said combustion chamber cooling passages.

**5,769,039**  
**V SHAPED MULTI-CYLINDER ENGINE OF CRANKCASE COMPRESSION TYPE**  
Jun Taue, and Masahisa Kuranishi, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jun. 4, 1997, Ser. No. 868,711  
Claims priority, application Japan, Jun. 4, 1996, 8-141872  
Int. Cl.<sup>6</sup> F02B 75/02  
U.S. Cl. 123—52.4

18 Claims



1. A four cycle, V type, internal combustion engine comprised of a pair of cylinder blocks disposed at a V angle to each other and forming a valley therebetween, each of said cylinder block having at least one cylinder bore, a crankcase at one end of said cylinder bores and forming a plurality of crankcase chambers each associated with a respective cylinder bore, a pair of cylinder heads closing the other end of said cylinder blocks, a plurality of pistons each reciprocating in a respective one of said cylinder bores and forming with said cylinder bores and said cylinder heads a plurality of combustion chambers, crankshaft means rotatably journaled in said crankcase, a plurality of connecting rods each coupled to a respective one of said pistons and said crankshaft means for transmitting motion therebetween, means for providing a seal so that said pistons, said cylinder bores, said connecting rods, said crankshaft means and said crankcase chambers act as a plurality of positive displacement pumps, intake means for admitting an air charge to said crankcase chambers in said valley, delivery means for discharging a compressed air charge from said crankcase chambers at the other side of said valley, a pair of compressor chambers located at said other sides of said valley for receiving the compressed charge therefrom the respective crankcase chamber, each of said cylinder heads having at least one intake port on said other side of said valley for serving the respective of said combustion chambers, means for supplying a compressed charge from said compressor chamber to said intake ports entirely located on said other side of said valley, at least one exhaust passage formed in each of said cylinder heads contiguous to said valley for discharging exhaust products from said combustion chambers, and an exhaust manifold positioned at least in part in said valley for collecting the exhaust gasses from said exhaust passages.

JUNE 23, 1998

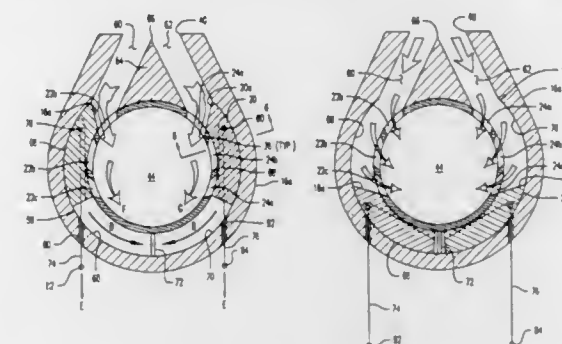
GENERAL AND MECHANICAL

3607

**5,769,040**  
**TWO CYCLE INTERNAL COMBUSTION ENGINE**  
Oval F. Christner, 3596 Prudence Dr., Sarasota, Fla. 34235, and David L. Christner, 4626 Country Manor Dr., Sarasota, Fla. 34233

Filed Apr. 18, 1997, Ser. No. 844,072  
Int. Cl.<sup>6</sup> F02B 25/08  
U.S. Cl. 123—65 V

15 Claims



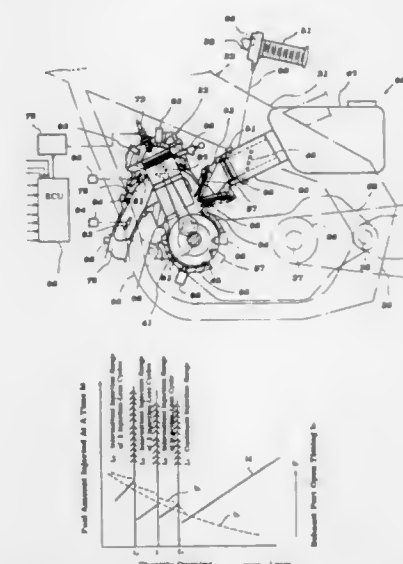
1. An inlet system for a two cycle internal combustion engine comprising:  
a cylinder and a piston which slidably translates within said cylinder and defining a combustion chamber between a closed end of said cylinder and a head of said piston;  
a wall of said cylinder including at least two inlet ports there-through extending substantially circumferentially part way around said cylinder and in fluid communication with an inlet passage;  
an elongated arcuately shaped transfer deflector valve mounted for sliding arcuate movement within said inlet passage which, when closed, is in substantial alignment with at least one said inlet port, an inner arcuate surface of said transfer deflector valve substantially sealingly engaged against a portion of an outer surface of said cylinder wall adjacent at least one said inlet port;  
said transfer deflector valve sized and slidably movable between a closed position wherein at least a substantial portion of at least one of said inlet port is covered by said transfer deflector valve and an open position wherein substantially all of at least one said inlet port is open and uncovered by said transfer deflector valve;  
means for controlled positioning said transfer deflector valve at any point between said closed and said open position whereby said inlet ports are sequentially opened in proportion to movement of said transfer deflector valve.

**5,769,041**  
**TWO CYCLE FUEL INJECTION ENGINE**  
Takahiro Suzuki, and Takeo Yoshida, both of Iwata, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Apr. 25, 1997, Ser. No. 846,059  
Claims priority, application Japan, Apr. 26, 1996, 8-108252  
Int. Cl.<sup>6</sup> F02B 27/04; F02D 17/02  
U.S. Cl. 123—73 C

38 Claims

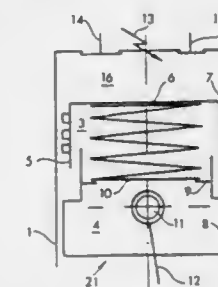
1. A method of operating a two-cycle internal combustion engine comprised of  
a cylinder block, cylinder head assembly having a cylinder bore, a piston reciprocating in said cylinder bore and forming a variable volume combustion chamber with said cylinder block, cylinder head assembly, a scavenge port opening into said combustion chamber through said cylinder bore and opened and closed by the movement of said piston, an exhaust port opening into said combustion chamber through said cylinder bore and opened and closed by the reciprocation of said piston, and a fuel injector for injecting fuel directly into said combustion chamber, said method comprising the steps of measuring the load on said engine, skipping a number of



fuel injections to said combustion chamber for a predetermined number of cycles when the load falls below a predetermined value, advancing the beginning of fuel injection when fuel injection is skipped, and taking action to preclude the escape of unburned fuel from said exhaust port when fuel injection is skipped.

**5,769,042**  
**METHOD OF OPERATING AN INTERNAL COMBUSTION ENGINE DURING A COMBUSTION PROCESS**  
Ovidiu Petru Popadiuc, 542 Charles St., Windsor On., Canada, N8X 3G3  
Continuation-in-part of Ser. No. 427,848, Apr. 26, 1995, abandoned. This application Nov. 16, 1995, Ser. No. 558,400  
Int. Cl.<sup>6</sup> F02B 75/04  
U.S. Cl. 123—78 B

8 Claims



1. A method of operating an internal combustion engine during a combustion process, the engine having at least one cylinder and an associated piston for forming a working chamber in which intake, compression, combustion, expansion and exhaust operational events occur as the result of piston movement, the piston comprising (1) an upper portion having a working face defining a movable wall of the working chamber, (2) a lower portion having means for connection with a motor mechanism and (3) an elastic means for resiliently connecting the upper portion with the lower portion, the lower portion being operatively connected to the motor mechanism for moving the piston during the operational events and thereby generally increasing the working chamber in volume during the combustion, the method comprising:  
(A) initiating the combustion of a combustible charge inside of the working chamber in the vicinity of piston top dead center position for generating a relatively abrupt initial increase in the gas pressure;  
(B) additionally increasing the working chamber in volume by deforming the corresponding elastic means because of the

initial increase of the gas pressure and thereby producing a relative movement of the upper portion with reference to the lower portion; and  
(C) controlling the increase of the working chamber in volume by a predetermine deformation of the corresponding elastic means to brake the initial increase of the gas pressure within the combustion chamber and at least partially to replace it by a substantially isobaric combustion.

5,769,043

**METHOD AND APPARATUS FOR DETECTING ENGINE VALVE MOTION**

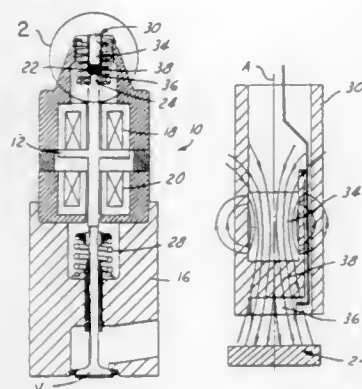
James A. Nitkiewicz, Newport News, Va., assignor to Siemens Automotive Corporation, Auburn Hills, Mich.

Filed May 8, 1997, Ser. No. 854,023

Int. Cl.<sup>6</sup> F01L 9/04

U.S. Cl. 123—90.11

9 Claims



5. Apparatus for detecting engine valve motion in an internal combustion engine having an electromechanical valve actuator with a ferrous component that moves in a linear path with reciprocating motion of an engine valve between open and closed positions, the apparatus comprising:

a stationary magnetic field source mounted in said actuator and having an axis aligned with said linear path and positioned such that at a closest position of travel of the ferrous component to said stationary magnetic field source alters the magnetic field flux; and

a sensor mounted in said linear path between said stationary magnetic field source and said ferrous component and sufficiently spaced from the magnetic field source to respond to an amplified change in magnetic field flux at said closest travel position;

wherein said sensor senses the change in the magnetic field flux of said stationary magnetic field source caused by the presence and absence of said ferrous component in said closest travel position as an indicator of engine valve motion.

5,769,044

**VALUE PERFORMANCE CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINE**

Yoshihito Moriya, Nagoya, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 23, 1997, Ser. No. 862,885

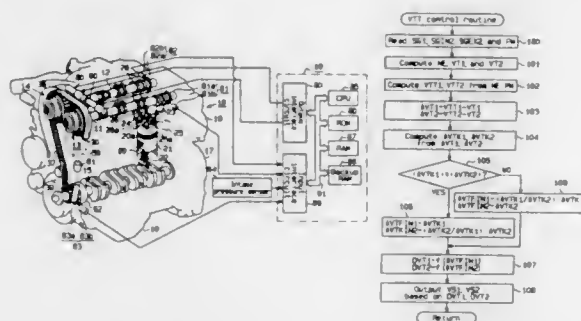
Claims priority, application Japan, May 24, 1996, 8-130095

Int. Cl.<sup>6</sup> F02D 13/02; F01L 1/34

U.S. Cl. 123—90.17

12 Claims

1. An apparatus for controlling a valve performance for an internal combustion engine, said engine having a combustion chamber communicating with an air intake passage and an air exhaust passage, said intake passage having an air intake valve that is selectively open and closed to control airflow passing in the intake passage to the combustion chamber, said exhaust passage having an air exhaust valve that is selectively open and closed to



control exhaust gas flow passing in the exhaust passage from the combustion chamber, each of said valves being actuated by a camshaft based on valve performance affecting opening and closing timing and a lift amount of the valve, said apparatus comprising:

first changing means for changing the valve performance of the intake valve, said first changing means being actuated by fluid pressure;

second changing means for changing the valve performance of the exhaust valve, said second changing means being actuated by the fluid pressure;

a fluid source connected with the first changing means and the second changing means to supply fluid to said first changing means and said second changing means;

means for adjusting amount of the fluid supplied from the fluid source to said first changing means and said second changing means;

means for detecting the running condition of the engine; and

means for controlling said adjusting means to change each valve performance so as to coincide the engine torque with desired engine torque, said control means includes means for selecting one of the valves based on the detected running condition of the engine, said selected valve being capable of coinciding said engine torque with desired torque faster than the other one of valves to allow larger amount of the fluid supplied to one of the changing means that is associated with the selected valve than the other one of the changing means.

5,769,045

**MODULAR AIR INDUCTION SYSTEM WITH ISOLATED THROTTLE BODY**

James R. Edwards, Royal Oak, and Thomas M. Knowles, Sterling Heights, both of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

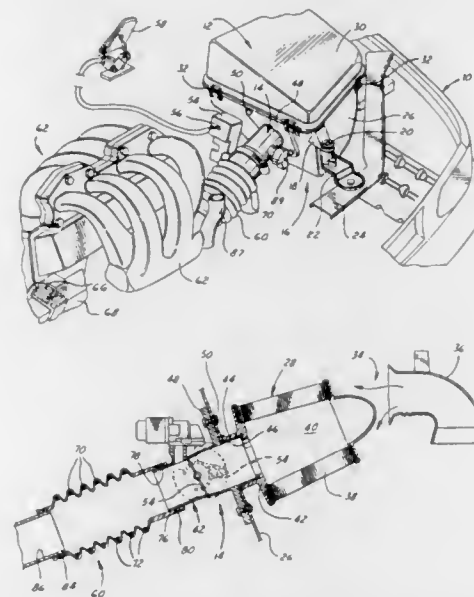
Filed May 1, 1997, Ser. No. 847,090

Int. Cl.<sup>6</sup> F02M 35/10

U.S. Cl. 123—184.61

7 Claims

1. A modular air induction system for an internal combustion engine of an automotive vehicle operatively supported by resilient engine mounts to a first fixed support within the vehicle to accommodate engine oscillation and vibrations, and separate from a second fixed support therein, comprising an air intake manifold for direct connection to said engine, an air cleaner for direct mounting to the second support for filtering air for mixing with fuel for said engine and subsequent combustion within said engine, a throttle body operatively mounted to said air cleaner to receive filtered air from said air cleaner, an elongated zip tube operatively and directly connecting said throttle body to said air intake manifold to provide an unobstructed air flow passage for conducting air from said throttle body to said air intake manifold, said zip tube being defined by a confining curved wall of thin resilient material for



vibrationally isolating said throttle body from said air intake manifold and from said engine.

5,769,046

**CARBON-CARBON CYLINDER BLOCK**

Philip O. Ransone, Gloucester, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

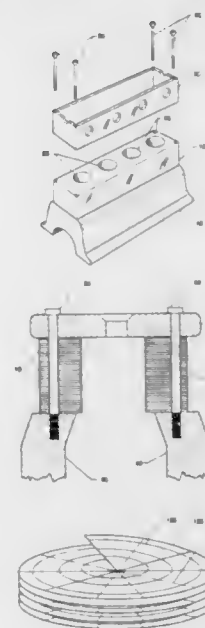
Continuation of Ser. No. 416,599, Apr. 4, 1995, abandoned.

This application Apr. 25, 1997, Ser. No. 845,652

Int. Cl.<sup>6</sup> F02F 75/06

U.S. Cl. 123—193.2

20 Claims



1. A cylinder block for an internal combustion engine that comprises:

a carbon-carbon cylinder block composed of a fibrous material embedded in a carbonaceous matrix; said fibrous material having fibers, each of said fibers having nonisotropic heat-transfer capability and a nonisotropic coefficient of thermal expansion, such that:

a) greater heat-transfer capability is realized parallel to each of said fibers than perpendicular to each of said fibers, and

b) the coefficient of thermal expansion parallel to each of said fibers is less than the coefficient of thermal expansion perpendicular to each of said fibers;

said carbon-carbon cylinder block having at least one cylinder bore with a cylinder axis aligned along each cylinder bore; and

a large majority of said fibers of said fibrous material being oriented in planes substantially perpendicular to the cylinder axis of each cylinder bore so that heat is conducted more efficiently away from each cylinder bore and thermal distortion effects on each cylinder bore are minimized.

20. A cylinder block for an internal combustion engine having a single cylinder bore with a cylinder axis aligned along the cylinder bore, said cylinder block comprising:

a thin-walled carbon-carbon cylinder block composed of a fibrous material embedded in a carbonaceous matrix, said fibrous material having fibers that are woven into a laminated polar weave with laminations substantially perpendicular to the cylinder axis; and

a clamping means for providing a force to said thin-walled carbon-carbon cylinder block, the force being substantially parallel to the cylinder axis, said clamping means being designed to prevent delamination of said thin-walled carbon-carbon cylinder block.

5,769,047

**ENGINE WITH OIL SEPARATOR**

Michael Zoche, Keferstrasse 13, 80802 Munchen, Germany

PCT No. PCT/DE91/01001, § 371 Date Oct. 5, 1994, § 102(e)

Date Oct. 5, 1994, PCT Pub. No. WO93/13302, PCT Pub.

Date Jul. 8, 1993

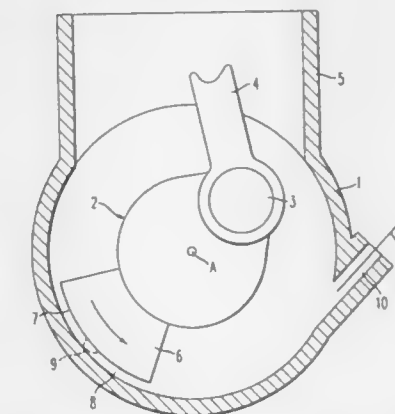
Continuation of Ser. No. 256,009, Oct. 5, 1994, abandoned.

This PCT application Dec. 23, 1991, Ser. No. 701,556

Int. Cl.<sup>6</sup> F01M 11/06

U.S. Cl. 123—196 R

5 Claims



said plurality of components being lubricated with engine oil via lubrication points and being connected with means for removing oil from said crankcase;

wherein some of said plurality of components are rotating components that rotate about said shaft axis, an inner wall of said crankcase (1) closely surrounds said rotating components in a manner such that only a small gap results between the inner wall of the crankcase and at least one of said rotating components, said small gap being sufficiently small to produce, during use, an oil flow along said inner wall, and wherein a plurality of oil outlets are provided in the inner wall of said crankcase which all extend substantially tangentially out of



1. An internal combustion engine and control system therefor, said engine being formed with at least one combustion chamber, an air-fuel charging system for supplying an air-fuel charge to said combustion chamber for combustion therein, a spark plug having gap extending into said combustion chamber, an ignition control system including timing means for firing said spark plug at a timing dependent upon at least one engine condition for initiating combustion in said combustion chamber, an exhaust port for discharging combustion products from said combustion chamber, an exhaust system communicating said exhaust port with the atmosphere for discharge of exhaust gases to the atmosphere, an air-fuel ratio sensor for sensing the air-fuel ratio supplied to said combustion chamber, an air flow sensor for providing a signal indicative of the air flow to said combustion chamber, a feedback control system for adjusting the air-fuel ratio in response to the output of said air-fuel ratio sensor for maintaining the desired air-fuel ratio in said engine, said ignition control system including means for varying the timing of firing of said spark plug in response to changes in the air-fuel ratio and adjusting the varying of the timing in response to the amount of air flow as sensed by said air flow sensor for minimizing variations in engine speed.

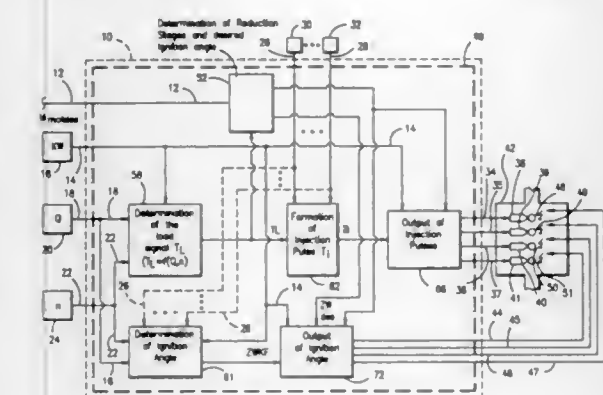
5,769,054

**METHOD AND ARRANGEMENT FOR CONTROLLING THE TORQUE OF INTERNAL COMBUSTION ENGINE WHILE DEACTIVATING INDIVIDUAL CYLINDERS**  
Eberhard Schnabel, Hemmingen, and Hong Zhang, Regensburg, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany  
Continuation-in-part of Ser. No. 318,263, Oct. 5, 1994, abandoned. This application Feb. 26, 1996, Ser. No. 607,131  
Claims priority, application Germany, Oct. 13, 1993, 43 34 864.5

Int. Cl.<sup>6</sup> F02P 5/00

U.S. Cl. 123—417

10 Claims



1. Method for controlling the torque of an internal combustion engine while deactivating a single cylinder, the method including adjusting the ignition angle and adjusting the metering of fuel to the cylinder, the engine having cylinders which assume a first state in which fuel is supplied thereto and a second state in which no fuel is supplied thereto, the method comprising the steps of:

reading a pregiven desired value of torque ( $M_{motdes}$ ) for the torque of said engine;  
determining a number ( $X$ ) of cylinders which assume said second state and determining an adjustment of said ignition angle ( $ZW_{des}$ ) dependent upon said pregiven desired value of torque ( $M_{motdes}$ );  
outputting injection pulses in dependence upon the determined number ( $X$ ) of said cylinders which assume said second state;  
determining whether at least one cylinder changes its state relative to a previous operating cycle;  
outputting an ignition angle on the basis of the determined ignition angle ( $ZW_{des}$ ) for any one of said cylinders when no cylinder changes its state; and  
outputting an ignition angle on the basis of the determined ignition angle ( $ZW_{des}$ ) only for the at least one cylinder which changes its state when at least one cylinder changes its state compared to a previous operating cycle.

5,769,055

**ENGINE OVERHEAT CONTROL SYSTEM**  
Hitoshi Motose, and Masaki Okazaki, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 11, 1996, Ser. No. 613,500

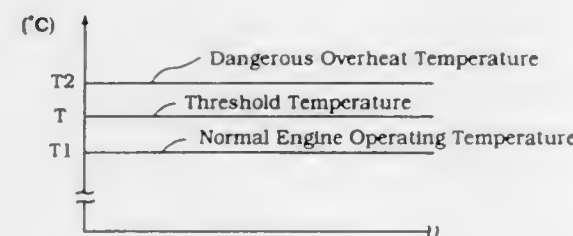
Claims priority, application Japan, Mar. 9, 1995, 7-049585

Int. Cl.<sup>6</sup> F02D 41/22

U.S. Cl. 123—478

8 Claims

1. An engine operational control system comprised of an internal combustion engine having a cooling system, an engine temperature detector associated with said engine cooling system for measuring the temperature of said engine, overheating predicting means receiving the output of the signal from said engine temperature detector and determining from the measured engine temperature and independently of other engine parameters when a dangerous overheating condition may be imminent, even though the temperature detected is substantially less than a dangerous temperature, and



overheat preventing means for providing preventive action in response to a signal from said overheating predicting means for attempting to reduce the temperature of said engine.

5,769,056

**FUEL INJECTION PUMP**

Wolfgang Geiger, Remshalden, and Thomas Kulder, Steinheim, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE96/00674, § 371 Date May 12, 1997, § 102(e) Date May 12, 1997, PCT Pub. No. WO97/10430, PCT Pub. Date Mar. 20, 1997

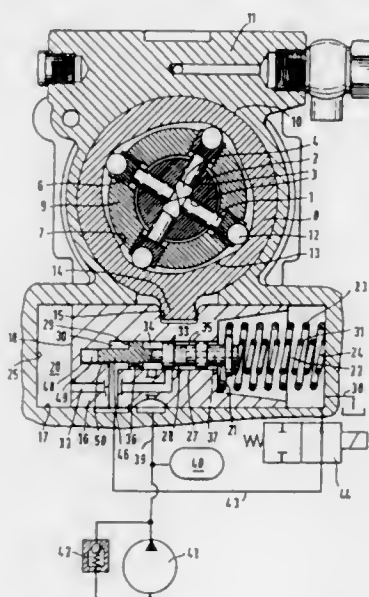
PCT Filed Apr. 17, 1996, Ser. No. 836,319

Claims priority, application Germany, Sep. 13, 1995, 195 33 807.3

Int. Cl.<sup>6</sup> F02M 37/04

U.S. Cl. 123—502

1 Claim



1. A fuel injection pump having an injection adjustment piston (16) that is used to adjust an onset of injection and defines a work chamber (20) in a cylinder (17), said chamber is acted upon by a controllable pressure fluid, which forces the injection adjustment piston counter to a restoring spring (23), a control slide valve (28) is disposed so that the control slide valve can slide in a closed-ended cylinder bore (27) of the injection adjustment piston (16), in an axial direction of the injection adjustment piston (16), said control slide valve is adjusted counter to a force of a control spring (31) by a control pressure that prevails in a control chamber (30) enclosed inside the cylinder bore by the control slide valve and acts upon an end face (29) of the control slide valve, said control slide valve in the cylinder bore 27 includes control edges, said control edges control a pressure fluid inlet (39) into the cylinder bore (27), a pressure fluid outlet (37) from the cylinder bore, and a connecting line (32) from the cylinder bore (27) to the work chamber (20), wherein the pressure fluid inlet communicates via a throttle (36) with the control chamber (30) defined by the end face (29), and the end face (29) is embodied as an annular end face, which encompasses a pin (46) that protrudes from the control slide valve.

5,769,057

**FUEL TANK SYSTEM**

Takashi Hashimoto, Junichi Hanai, Tomoyuki Sato, Masami Honma, and Kei Orita, all of Kanagawa-ken, Japan, assignors to Nissan Motor Co., Ltd., Kanagawa-ken, Japan

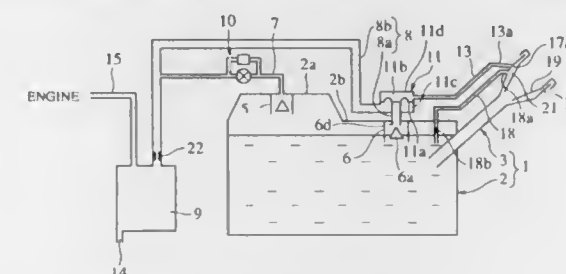
Filed Oct. 9, 1996, Ser. No. 729,236

Claims priority, application Japan, Oct. 9, 1995, 7-261832; Oct. 11, 1995, 7-262717; Aug. 27, 1996, 8-224944

Int. Cl.<sup>6</sup> F02M 37/04

U.S. Cl. 123—516

19 Claims



1. A fuel tank system comprising:

a tank body for containing fuel therein;  
a canister for disposing of a gaseous fuel component;  
a filler tube connected with said tank body and forming a channel for supplying fuel to said tank body;  
a vent check valve having a first chamber and a second chamber separated by a diaphragm;  
a signal tube connecting said first chamber of the vent check valve with the upper part of said filler tube;  
a vent tube connecting said tank body with said canister via the second chamber of said vent check valve for introducing the gaseous fuel component in said tank body into said canister via said second chamber when filling fuel; and  
a signal tube orifice disposed in an upper part of said signal tube proximate the filler tube, said signal tube orifice having an inside diameter and length selected to be effective for equalizing pressures in said first chamber and filler tube through said signal tube, and preventing fuel permeation into the signal tube from said filler tube.

5,769,058

**COMPRESSOR AND ENGINE SYSTEM**

Russell L. Scogin, Tomball, Tex., assignor to Production Operators, Inc., Houston, Tex.

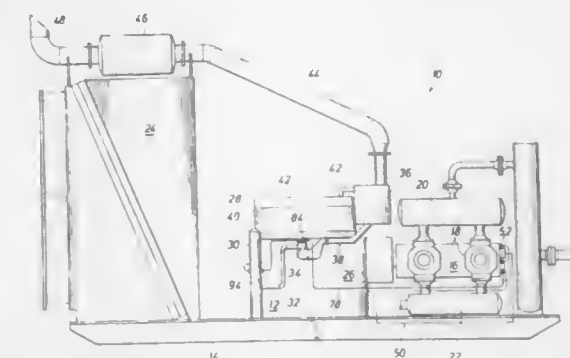
Filed Mar. 7, 1997, Ser. No. 813,576

Int. Cl.<sup>6</sup> F01M 9/00

U.S. Cl. 123—527

20 Claims

1. A compressor and engine system, comprising:  
a compressor for compressing natural gas;  
an internal combustion engine operatively connected to the compressor, the internal combustion engine including:  
an engine block having a plurality of cylinder bores;  
a piston operatively engaged in each cylinder bore;  
a cylinder head connected to the block, wherein a combustion chamber is defined in each cylinder bore by the piston and the cylinder head, the cylinder head having an intake port and an exhaust port for each combustion chamber;  
an intake valve operatively engaged in each intake port;  
an exhaust valve operatively engaged in each exhaust port;  
an intake manifold having a passageway for delivering an air and fuel mixture to each combustion chamber through the intake port;



a nozzle connected to the manifold, the nozzle having a nozzle inlet and a nozzle outlet, wherein the nozzle outlet discharges into the manifold;  
a first line conveying a source of oil to the nozzle inlet, the oil having an additive that deposits an ash residue when the oil is burned; and  
a second line conveying an atomizing fluid to the nozzle inlet, wherein the atomizing fluid atomizes the oil so that an oil mist is discharged into the manifold, the oil mist being burned in the combustion chamber for extending run time between repairs, the ash residue being found deposited on an inner surface of the cylinder head when the engine is taken out of service and inspected.

5,769,059

**ELONGATED FUEL-AIR BYPASS FOR INTERNAL COMBUSTION ENGINE**

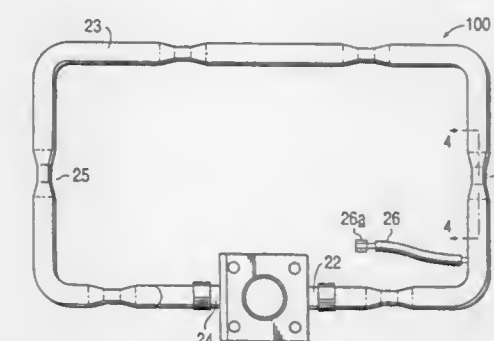
William K. Wallace, and Florence W. Wallace, both of 131042 Kahukai St., Leilani Estates, Pahoa, HI. 96778

Continuation of Ser. No. 541,097, Oct. 11, 1995, Pat. No. 5,606,956. This application Feb. 28, 1997, Ser. No. 808,533

Int. Cl.<sup>6</sup> F02M 31/02

U.S. Cl. 123—545

18 Claims



1. An apparatus for use with an internal combustion engine including a fuel-air mixing device with an inlet port and an outlet port, an intake manifold with an inlet port operably communicated with the outlet port of the fuel-air mixing device and at least one outlet port, and at least one cylinder communicated with the at least one outlet port of the intake manifold, said apparatus comprising:

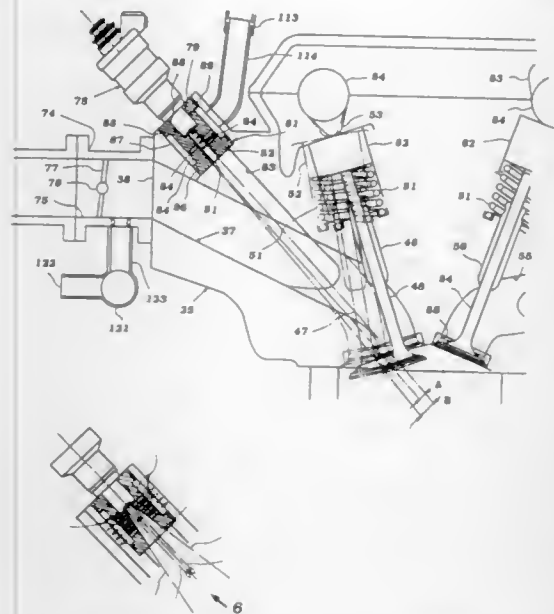
an elongated bypass conduit operably coupled between the outlet port of the fuel-air mixing device and the inlet port of the intake manifold for passing a fuel-air mixture from the fuel-air mixing device to the intake manifold;  
turbulence creating means for creating turbulence in the fuel-air mixture flowing through said elongated bypass conduit; wherein said elongated bypass conduit is formed of a thermally conductive material; and  
wherein said elongated bypass conduit has a length, an exterior surface area and a thermal conductivity sufficiently great so as to constitute a means for causing liquid fuel introduced



through the fuel-air mixing device to change from a liquid state to a gaseous state prior to entry into the at least one cylinder without requiring said elongated bypass conduit to be connected to a heat exchanger.

5,769,060  
**AIR-ASSISTED FUEL INJECTION SYSTEM**  
Hiromitsu Matsumoto, Iwata, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan  
Division of Ser. No. 442,196, May 16, 1995, Pat. No. 5,623,904. This application Nov. 20, 1996, Ser. No. 752,806  
Int. Cl.<sup>6</sup> F02M 23/12  
U.S. Cl. 123—585

21 Claims

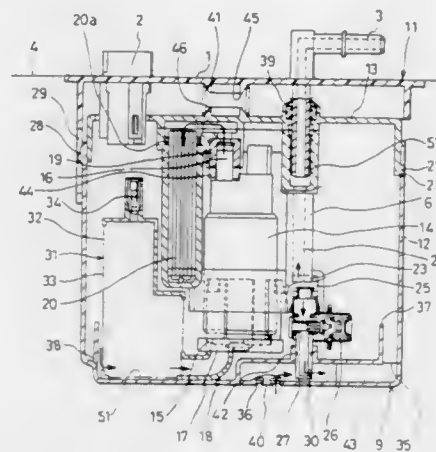


1. An apparatus for injecting fuel into an internal combustion engine comprising a fuel injector having a spray nozzle for discharging a spray of fuel, an insert piece fixed relative to said fuel injector and defining a fan shaped channel through which at least a portion of the fuel from said injector passes, said channel tapering in one planar cross section from a narrow inlet end for receiving fuel and terminating in a wider outlet end from which fuel is discharge, the width of said channel in a perpendicular cross section plane being substantially constant along the length of said channel for creating a fan shaped spray pattern, and means for delivering air into said channel at a point to atomize the fuel delivery from said fuel injector and redirect the spray of fuel.

5,769,061  
**FUEL SUPPLY SYSTEM HAVING A SUCTION FILTER IN A SUB-TANK**  
Kiyoshi Nagata, Anjo; Masashi Miyamoto, Nishio, and Kouji Izutani, Nagoya, all of Japan, assignors to Denso Corporation, Kariya, Japan  
Filed Mar. 28, 1997, Ser. No. 829,541  
Claims priority, application Japan, Apr. 1, 1996, 8-078799; Apr. 1, 1996, 8-078800  
Int. Cl.<sup>6</sup> F02M 37/04  
U.S. Cl. 123—509

12 Claims

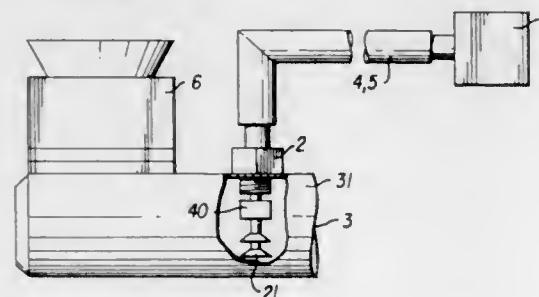
1. A fuel supply system comprising:  
a fuel tank for storing fuel;  
a sub-tank provided in the fuel tank and having a fuel intake port for taking the fuel from a lower part of the fuel tank to an inside thereof;  
a suction filter provided in the sub-tank;  
a fuel pump provided in the sub-tank to pump the fuel in the sub-tank from a suction opening side thereof through the suction filter;



a flange for fixing the sub-tank to the fuel tank; and  
a fuel level holding member formed to rise on the suction opening side of the fuel pump for accumulating the fuel in a space defined by a rising part thereof.

5,769,062  
**FUEL SYSTEM**  
Gregory Innocencio Xavier Romeo Antao, Wild Geese House, 30A Wings Road, Surrey GU9 0HW, Great Britain  
PCT No. PCT/GB94/02665, § 371 Date Jun. 6, 1996, § 102(e)  
Date Jun. 6, 1996, PCT Pub. No. WO95/16124, PCT Pub. Date Jun. 15, 1995  
PCT Filed Dec. 6, 1994, Ser. No. 656,247  
Claims priority, application United Kingdom, Dec. 7, 1993, 9325030; Feb. 24, 1994, 9403574  
Int. Cl.<sup>6</sup> F02M 29/02  
U.S. Cl. 123—590

17 Claims

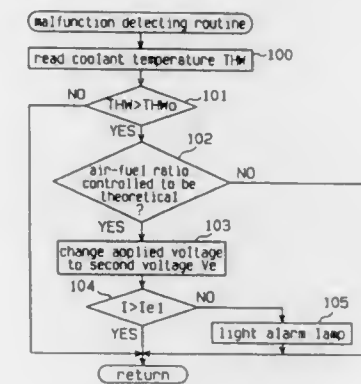


1. A device for mixing combustion gases in an internal combustion engine having an intake manifold with a flow axis comprising a vortex generator disposed in the intake manifold, said vortex generator comprising a circular disk having a disk axis and a generally aerofoil shape in a chordwise cross-section parallel to the disk axis, said disk being disposed in the intake manifold such that the disk axis is substantially perpendicular to the flow axis and to the flow of combustion gases over the disk.

5,769,063  
**MALFUNCTION DETECTING APPARATUS FOR AIR-FUEL RATIO SENSOR**  
Kazuya Mizusawa, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan  
Filed Jun. 2, 1997, Ser. No. 867,447  
Claims priority, application Japan, Jun. 5, 1996, 8-142780  
Int. Cl.<sup>6</sup> F02D 41/14; 41/22  
U.S. Cl. 123—688

12 Claims

1. An apparatus for detecting malfunction of an air-fuel ratio sensor employed in an exhaust passage of an internal combustion engine, wherein a current output value of said sensor varies in

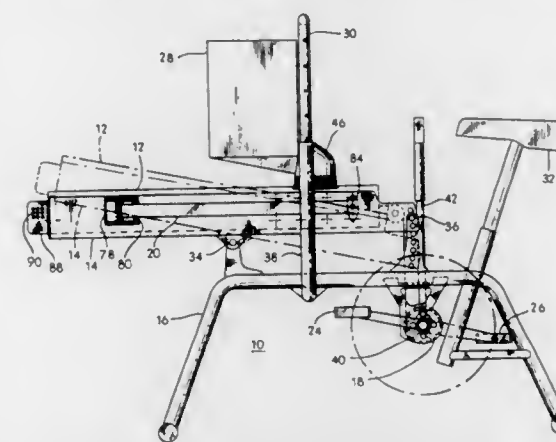


accordance with a voltage applied to the sensor and with the concentration of oxygen in exhaust gas within the exhaust passage, and wherein said sensor has a certain applied voltage range in which said output current value is substantially zero when the air-fuel ratio of said mixture substantially matches a theoretical optimum air-fuel ratio, wherein the engine includes:

- a combustion chamber;
- an intake passage for introducing air-fuel mixture to the combustion chamber; and
- a fuel controller for controlling the amount of fuel in said mixture in accordance with the magnitude of said output current value when a first predetermined voltage is applied to said sensor such that the air-fuel ratio of said mixture is made to substantially coincide with a target air-fuel ratio, said apparatus comprising:
  - a voltage changer for changing said applied voltage to a second voltage located outside of said certain applied voltage range; and
  - a malfunction detector for detecting malfunctions in said sensor after said applied voltage is changed to said second voltage.

5,769,064  
**ELASTIC BAND POWERED BALL PROJECTING MACHINE**  
Jian Gang Lu, and Xian Li Ni, both of 6436 Shoreline Dr., Troy, Mich. 48098  
Filed May 8, 1995, Ser. No. 438,047  
Int. Cl.<sup>6</sup> F41B 7/00  
U.S. Cl. 124—21

12 Claims

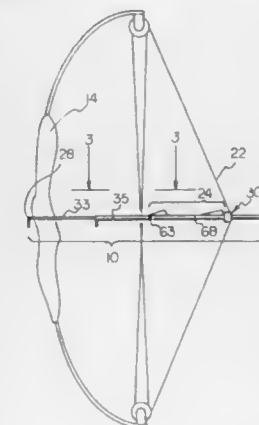


1. An elastic band powered ball projecting machine, comprising:  
a frame;  
an elongated barrel mounted to said frame;  
a carrier piston means adapted to receive a projectile movable through said barrel between a forward launch position and a rearward cocked position in which said carrier piston means includes a carrier mounted to a piston;

elastic means connected between said carrier piston and said frame to bias said carrier piston toward said forward launch position;  
means to selectively draw said carrier piston toward said rearward cocked position, comprising:  
a cable connected at one end to said carrier piston, and at the other end to a rotatable roller;  
rotating means mounted to said frame including two pedals for operation by the feet of a user for rotating said roller for taking up said cable and drawing said carrier piston toward said rearward position;  
clutch means selectively engageable and disengageable by said user for selectively engaging and disengaging said rotating means and said roller;  
whereby a user may operate said rotating means by pedaling with the feet while said clutch means is engaged, thereby pulling said carrier piston toward said rearward cocked position, and then disengage said clutch means to allow said roller to rotate freely, allowing said carrier piston to move under said bias toward said forward release position, and launch a projectile received in said carrier piston.

5,769,065  
**BOW-ATTACHED, ARROW LAUNCHING APPARATUS**  
David L. Hurd, Rte. 3, Box 789A, Tazewell, Va. 24651  
Filed Jun. 11, 1997, Ser. No. 873,228  
Int. Cl.<sup>6</sup> F41B 5/00  
U.S. Cl. 124—24.1

10 Claims



1. A bow-attached, arrow launching apparatus for launching an arrow that has a head portion having a head width and that has a tail portion having a tail width, comprising:  
a bow attachment assembly adapted to be attached perpendicularly to a bow, and  
an arrow guide assembly which includes a front end, a midportion, and a rear end, wherein said front end is connected to said bow attachment assembly such that said arrow guide assembly is oriented perpendicularly with respect to said bow attachment assembly, wherein said rear end is adapted to contact a bow string, wherein said arrow guide assembly is adapted to receive an arrow for launching from said arrow guide assembly,  
wherein said arrow guide assembly includes,  
a pair of longitudinally extensible and retractable front-end guide track assemblies located at said front end of said arrow guide assembly, wherein each of said pair of longitudinally extensible and retractable front-end guide track assemblies includes a front telescopic segment and a rear

telescopic segment, adapted to be arranged in either a longitudinally retracted orientation or a longitudinally extended orientation.

- a plurality of spacer supports connected to said front-end guide track assemblies and supported by said front-end guide track assemblies a predetermined distance from one another, wherein a first spacer support is connected to said bow attachment assembly;
- a pair of transversely rotatable joint assemblies, wherein each joint assembly includes a front joint link fitted into a respective rear telescopic segment, and wherein each joint assembly includes a rear joint link and a hinge portion connected between said front joint link and said rear joint link;
- a first elastic resilient member connected between said front telescopic segment and said front joint link for urging said front telescopic segment and said rear telescopic segment to a retracted orientation with respect to each other;
- a pair of transversely rotatable rear-end guide track assemblies, wherein each rear-end guide track assembly is connected to a respective joint assembly; and
- a bow string guide assembly connected between said rear-end guide track assemblies at said rear end of said arrow guide assembly.

5,769,066

## GAS POWERED BALL GUN

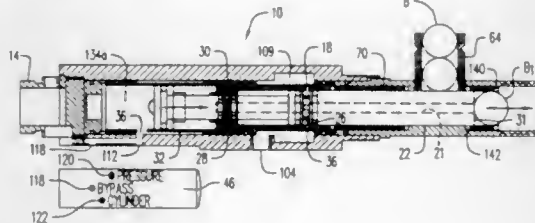
Larrie Schneider, Nokomis, Fla., assignor to Ronald Fowler, Bradenton, Fla.

Filed Apr. 1, 1997, Ser. No. 831,107

Int. Cl.<sup>6</sup> F41B 11/00; 11/32

U.S. Cl. 124—75

3 Claims



1. A pressurized gas powered ball gun for firing ball projectiles comprising:

- an elongated housing connectable to a pressurized gas source and having a cylindrical bore there through extending substantially between a closed and an open end of said housing;
- an air control sleeve held from substantial relative longitudinal movement within said bore, said bore having an enlarged portion which, in cooperation with an outer surface of said air control sleeve, defines a sealed air reservoir around said air control sleeve;
- an elongated air control spool having a longitudinal air passage formed there-through from a closed to an open end thereof, said air control spool slidably positioned for relative longitudinal movement within said air control sleeve between a biased at-rest position wherein said air control spool closed end is positioned immediately adjacent said housing closed end, and a firing position;
- an air passage formed through said air control sleeve in fluid communication with said air reservoir whereby said air reservoir is filled with pressurized gas when the pressurized gas source is connected to said housing;
- a chamber connected to and extending coaxially from said housing open end for receiving and sealingly positioning one ball projectile at a time within said chamber;
- a cylindrical barrel connected to and extending coaxially from said open end;
- means connected to said chamber for repeatedly automatically feeding one ball projectile at a time into said chamber;
- gas control means connected to said housing for selectively directing pressurized gas from the pressurized gas source to

between said air control spool closed end and said housing closed end to move said air control spool from the at-rest position to the firing position each time a trigger means operably activates said gas control means whereby the ball projectile in said chamber is moved by said air control spool second end into a sealed firing position of the ball projectile; said air control spool including sealing and radial air passage means positioned at a mid portion thereof for releasing pressurized gas from said air reservoir and from the pressurized gas source into said air passage means into said longitudinal air passage in said air control spool to propel the ball projectile as said air control spool reaches the firing position.

5,769,067

## AIR HEATER AND HUMIDIFIER USING DIRECT CONTACT HEATING PRINCIPLES AND METHOD OF OPERATION

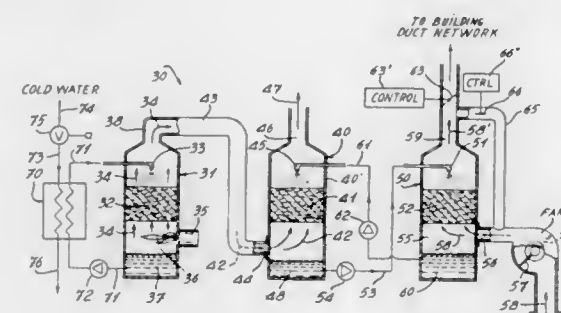
Luc Mandeville, 1995 Maisonneuve Street, Terrebonne, Quebec, Canada, J6X 2T7; Michel Dallaire, 1797 Cambray Street, St-Bruno-de-Montarville, Quebec, Canada, J3V 3J4, and Kébir Ratnani, 205 De Bayeux Street, Boucherville, Quebec, Canada, J4B 7T9

Filed Sep. 23, 1996, Ser. No. 724,041

Int. Cl.<sup>6</sup> F24F 3/14

U.S. Cl. 126—113

20 Claims



1. An air heating and humidifying system using direct contact heating apparatus, said system comprising a direct contact water heater having heat exchange means therein, a water spray means above said heat exchange means to supply water thereto and to cause water to percolate through said heat exchange means and heat by contact therewith, a hot gas heat supply below said heat exchange means for heating said heat exchange means and water percolating downwards to a reservoir below said heat supply to produce a supply of hot water, a flue to exhaust cooled flue gases from said water heater, pump means to direct hot water from said reservoir above a further heat exchange means in a direct contact air treating chamber to heat and humidify fresh air passing through said further heat exchange means to provide a supply of hot moist fresh air at an outlet port of said air treating chamber.

5,769,068

## APPARATUS FOR SUPPORTING A SOLAR COLLECTOR UNIT

Kei Takahashi, 1-14-16 Achi, Kurashiki, Okayama 710, Japan

Filed Feb. 21, 1997, Ser. No. 803,017

Claims priority, application Japan, Feb. 27, 1996, 8-067163

Int. Cl.<sup>6</sup> F24J 2/00

U.S. Cl. 126—569

14 Claims

1. An apparatus for supporting a solar collector unit comprising: a pair of spaced carriers; support means for supporting a solar collector unit thereon, said support means including a first set of elongated elements extending between said pair of carriers, and a second set of elongated elements extending in a direction transverse to said first set of elongated elements and connected thereto; and

5,769,070

## DEVICE FOR THE TREATMENT OF ASTHMATIC PATIENTS, SUITABLE FOR MEASURING THE PEAK EXPIRATORY FLOW RATE AND FOR DELIVERING DRUGS USED IN THE TREATMENT OF ASTHMA

Franco Frati, Cortona, and Claudio Albani, Folano Della Chiana, both of Italy, assignors to Istoria Farmaceutici S.p.A., Padua, Italy

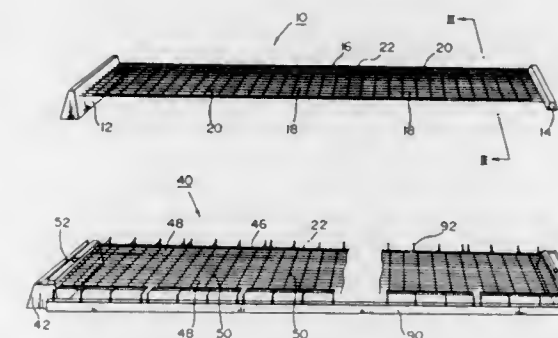
Filed Oct. 11, 1996, Ser. No. 730,290

Claims priority, application Italy, Oct. 12, 1995, MI95A2078

Int. Cl.<sup>6</sup> A61M 11/00; A62B 7/00; 9/04

U.S. Cl. 128—200.23

13 Claims



tension means mounted to at least one of said pair of carriers for adjusting tension of said first set of elongated elements, said tension means including holder means for holding said first set of elongated elements between said pair of carriers, and fastener means operatively associated with said holder means to adjust the tension of said first set of elongated elements so that said first set of elongated elements are aligned in a transverse direction.

5,769,069

## LOW FLOW-RATE PUMP

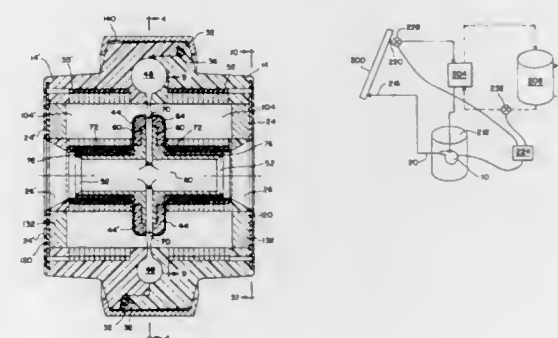
Anthony Caffell, Toronto, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of Natural Resources, Ottawa, Canada

Filed Jun. 7, 1995, Ser. No. 471,826

Int. Cl.<sup>6</sup> A61B 19/00; F04D 13/06; F04B 17/00

U.S. Cl. 126—634

11 Claims



1. A centrifugal pump comprising:

- a stator including a pair of half-stator assemblies each having a like number of poles constructed from a plurality of coils arranged about a central aperture, bars of magnetic permeable material being inserted between portions of said coils;
- a rotor-impeller assembly including a hollow member forming a rotational axis and a permanent magnet rotor-impeller fixed to said hollow member, said rotor-impeller having a periphery, said rotor-impeller having a radius of between 5 mm to 30 mm and having at least two radial passages communicating between the interior of said hollow member and the periphery of said rotor-impeller;
- a housing including two opposed fluid inlets and one fluid outlet and a cavity to receive said stator;
- bearing means to rotatably receive said rotor-impeller assembly such that each of said two fluid inlets is in fluid communication with a respective end of said hollow member and said fluid outlet is adjacent the periphery of said rotor-impeller.

5,769,071

## HUMIDIFIER SYSTEMS

Christopher Stratton Turnbull, Hythe, England, assignor to Smiths Industries PLC, London, England

Continuation of Ser. No. 588,419, Jan. 18, 1996, abandoned.

This application Jan. 23, 1997, Ser. No. 787,820

Claims priority, application United Kingdom, Feb. 16, 1995, 9503012

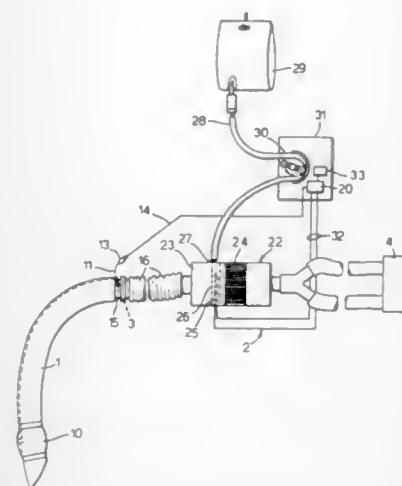
Int. Cl.<sup>6</sup> A61M 15/00

U.S. Cl. 128—203.12

6 Claims

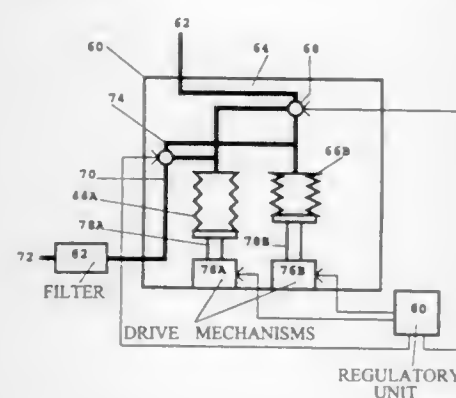
1. A medical humidifier system for automatically controlling the humidity of a gas supplied to a patient, said system comprising: a humidifier, said humidifier including a heat and moisture exchange device, a supply of water to the exchange device, and a heater for heating the water supplied to the exchange device; tubing connected at one end with said humidifier; a patient breathing device; a gas connector connected at one end to said patient breathing device and at an opposite end to said tubing such that humidified gas flows to and from said moisture exchange device and to and from a patient via said tubing, said connector and said breathing device; a humidity sensor connected in said connector and exposed to gas flow through the connector for directly sensing the humidity of gas actually being supplied to a patient; and means responsive to an output from said sensor for automatically producing an increase in the humidification of the gas by said humidifier when there is a decrease in the sensed humidity of the gas and a decrease in the





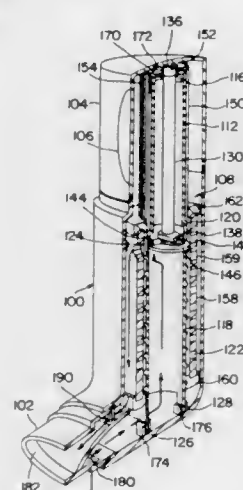
humidification of the gas by said humidifier when there is an increase in the sensed humidity of the gas.

**5,769,072**  
**ANESTHETIC SYSTEM WITH MULTIPLE VALVE-CONTROLLED BELLOWS**  
Sven-Gunnar Olsson, Arlov; Göran Rydgren, Bunkeflostrand, and Kalman Csiki, Landskrona, all of Sweden, assignors to Siemens Elema AB, Solna, Sweden  
Filed Mar. 18, 1997, Ser. No. 819,834  
Claims priority, application Sweden, Mar. 20, 1995, 9601665  
Int. Cl.<sup>6</sup> A62B 7/04; A61M 16/00; F16K 31/02  
U.S. Cl. 128—205.13 10 Claims



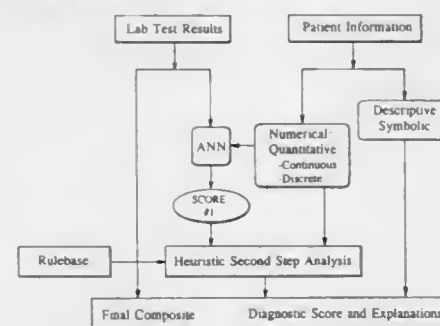
1. An anesthetic system comprising:  
an inspiratory line adapted for carrying breathing gas containing an anesthetic to a lung system, an expiratory line adapted for carrying expired breathing gas from a lung system;  
a ventilator unit having an inlet for receiving at least a portion of said breathing gas and for delivering said at least a portion of said breathing gas to said inspiratory line, and an outlet for removing expired breathing gas carried in said expiratory line;  
a gas reservoir comprising at least two volume variable gas receptacles connected to said outlet via a first valve system and connected to said inlet via a second valve system for controlling a direction of flow of said breathing gas;  
regulatory means acting on said volume variable gas receptacles for alternately emptying one of said volume-variable gas receptacles at a time for supplying expired breathing gas to said inlet and for simultaneously collecting expired breathing gas from said outlet in another of said volume variable gas receptacles; and  
filter means for removing at least one gaseous pollutant from said expired breathing gas before said expired breathing gas is returned to said inlet.

**5,769,073**  
**POWDER INHALATOR**  
Stephen William Eason, Redgrave; Clive Patrick Catterall, Wantage; Roger William Clarke, Histon, and Donna Joy Wilson, Cambridge, all of Great Britain, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Germany  
PCT No. PCT/GB94/02716, § 371 Date Aug. 29, 1996, § 102(e) Date Aug. 29, 1996, PCT Pub. No. WO95/16483, PCT Pub. Date Jun. 22, 1995  
PCT Filed Dec. 9, 1994, Ser. No. 663,245  
Claims priority, application United Kingdom, Dec. 18, 1993, 9325835; May 17, 1994, 9409841  
Int. Cl.<sup>6</sup> A61M 11/00; 15/00; 16/00  
U.S. Cl. 128—203.15 16 Claims



1. A device for dispensing single doses of a particulate material, the device comprising a housing carrying a mouthpiece which communicates with an air inlet through an airway within the housing, a cylindrical container contained within the housing, the container having a plurality of compartments therein, each compartment containing a respective dose of particulate material, operating means for moving the container relative to the airway so as to bring successive compartments into registry with the airway and enable the doses of medicament to be discharged therefrom, wherein the compartments are angularly and axially spaced relative to each other so as to define a helical path which is substantially coaxial with the axis of the container.

**5,769,074**  
**COMPUTER ASSISTED METHODS FOR DIAGNOSING DISEASES**  
Stephen D. Barnhill, Savannah, Ga., and Zhen Zhang, Mt. Pleasant, S.C., assignors to Horus Therapeutics, Inc., Rochester, N.Y.  
Continuation-in-part of Ser. No. 323,446, Oct. 13, 1994, abandoned. This application May 3, 1996, Ser. No. 642,848  
Int. Cl.<sup>6</sup> A61B 5/00 18 Claims



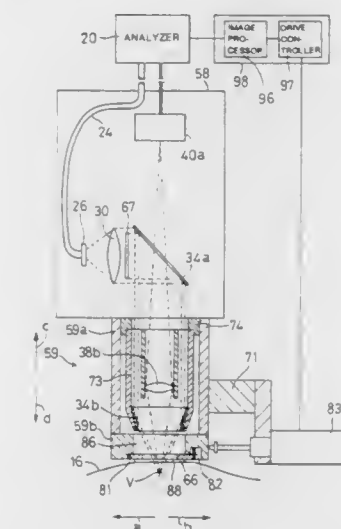
1. A method for training a computer-based neural network to be used in diagnosing or prognosing disease in a patient comprising:

preprocessing patient biomarkers, comprising:  
selecting patient biomarkers associated with a disease process; statistically and/or computationally testing discriminating power for indicating presence or absence of the disease of the selected patient biomarkers individually in linear and/or non-linear combination;  
applying statistical, mathematical, or computational tools, and/or expert knowledge for the derivation of secondary input to the neural network that are linear or non-linear combinations of the original or transformed biomarkers;  
selecting only those patient biomarkers or derived secondary inputs that show discriminating power; and  
training the computer-based neural network using the preprocessed patient biomarkers or derived secondary inputs.

**5,769,075**

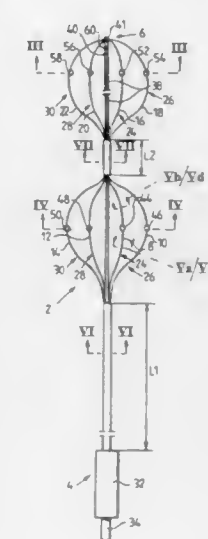
Patent Not Issued For This Number

**5,769,076**  
**NON-INVASIVE BLOOD ANALYZER AND METHOD USING THE SAME**  
Yasunori Maekawa; Kaoru Asano; Yasuhiro Kochi, and Ken Ishihara, all of Hyogo, Japan, assignors to TOA Medical Electronics Co., Ltd., Hyogo, Japan  
Filed May 2, 1996, Ser. No. 641,828  
Claims priority, application Japan, May 2, 1995, 7-108723  
Int. Cl.<sup>6</sup> A61B 5/00 19 Claims



1. A non-invasive blood analyzer comprising:  
light application device for illuminating a detection region including a blood vessel having blood flowing therethrough, the detection region being under skin of a part of a living body;  
image capturing device for capturing an image of the illuminated detection region;  
analysis device for processing the captured image and analyzing at least a component of the blood in the blood vessel in the detection region;  
a transparent plate contacting the skin, the light application device illuminating the detection region through the transparent plate and the image capturing device capturing the image of the detection region through the transparent plate;  
support device for supporting the transparent plate; and  
drive control device for driving the support device to move the transparent plate in order to adjust the detection region.

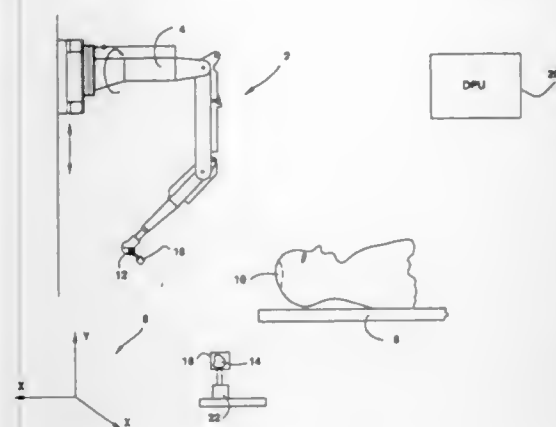
**5,769,077**  
**MULTI-CONTACT IMPLANTABLE ELECTRODE CABLE WITH A RESORBABLE STIFFENING ELEMENT**  
Ulf Lindegren, Enskede, Sweden, assignor to Pacesetter AB, Solna, Sweden  
Filed Dec. 23, 1996, Ser. No. 771,660  
Claims priority, application Sweden, Dec. 28, 1995, 9504675  
Int. Cl.<sup>6</sup> A61N 1/05 10 Claims



1. An implantable electrode cable device having a proximal end and a distal end and comprising at least one thin, insulated electrical conductor with a proximal end and a distal end, said conductor carrying at least one electrode contact electrically connected to the conductor, adapted for permanent electrical contact with tissue of a cavity in a human body, elongate pre-shaped stiffening means connected to and running along the conductor, made of an bendable material which is resorbable in vivo, for imparting an arch to at least a section of the conductor in an area in which said electrode contact is disposed until said material is resorbed and a longitudinal channel for receiving a stylet for temporary, substantially linear stretching of the cable device and said arch of said conductor.

**5,769,078**  
**DEVICE AND PROCESS FOR PREPARING FOR AND SUPPORTING SURGICAL OPERATIONS**  
Ulrich Kliegis, Holteneau Str. 273, D-24106 Kiel, Germany  
PCT No. PCT/DE94/00156, § 371 Date Aug. 16, 1995, § 102(e) Date Aug. 16, 1995, PCT Pub. No. WO94/18899, PCT Pub. Date Sep. 1, 1994  
PCT Filed Feb. 15, 1994, Ser. No. 501,045  
Claims priority, application Germany, Feb. 16, 1993, 43 04 570.7  
Int. Cl.<sup>6</sup> A61B 17/00 18 Claims

1. A system for preparing for and supporting surgical operations, comprising:  
a numerically controlled positioning appliance arranged in a measurable geometric relationship with respect to an operation site, said positioning appliance being movable in relation to the operation site;  
a machining tool for machining tissue or bone and a holder for holding a graft, wherein one of said machining tool and said holder is adapted to be selectively releasably connected to said positioning appliance;  
a securing device for releasably engaging said holder, said securing device being stationary with respect to a stationary reference system; and



a data processing unit for controlling a position of said positioning appliance within said stationary reference system, said data processing unit having a memory;

wherein said memory of said data processing unit stores a data record of a three-dimensional structural image of the operation site, said data record containing the individual anatomical morphology of the grafting site, which is determined before surgery by evaluation of the results of noninvasive examinations, said data record being used to determine the dimensions of the graft and the dimensions of a diseased part of a bone to be cut out of the operation site,

wherein said positioning appliance carries said machining tool to machine the graft according to the dimensions stored in said data record and, after removal of said machining tool, carries said holder to implant the graft at the operation site.

5,769,079

#### METHOD AND APPARATUS FOR DETERMINING QUANTITATIVE MEASURES OF FLOW PARAMETERS

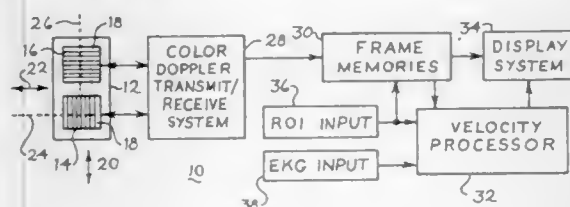
John A. Hossack, Palo Alto, Calif., assignor to Acuson Corporation, Mountain View, Calif.

Filed Oct. 22, 1996, Ser. No. 736,048

Int. Cl. A61B 8/00

U.S. Cl. 128—661.08

9 Claims



1. A method for making Doppler ultrasound measurements comprising the following steps:

- providing an ultrasound probe comprising first and second transducer arrays, each array comprising a respective plurality of transducer elements and a central image plane, said central image planes oriented to intersect at an angle greater than 45°; said arrays spaced from one another;
- using the first transducer array to measure a plurality of first apparent Doppler parameters at a respective plurality of regions within a cross-section of a structure; and
- using the second transducer array to measure a second apparent Doppler parameter substantially at one of the regions.

#### 5,769,080 GAS FILLED LIPOSOMES AND STABILIZED GAS BUBBLES AND THEIR USE AS ULTRASONIC CONTRAST AGENTS

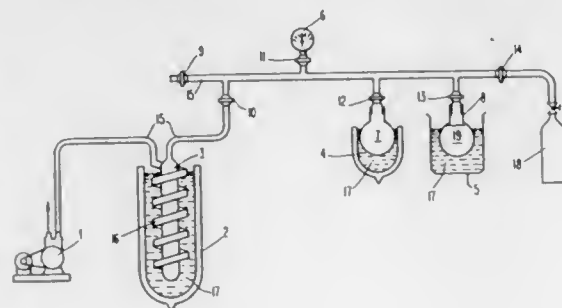
Evan C. Unger, and Guanli Wu, both of Tucson, Ariz., assignors to DuPont Merck Pharmaceutical Company, Wilmington, Del.

Division of Ser. No. 88,268, Jul. 7, 1993, Pat. No. 5,348,016, which is a division of Ser. No. 17,683, Feb. 12, 1993, Pat. No. 5,305,757, which is a division of Ser. No. 717,084, Jun. 18, 1991, Pat. No. 5,228,446, which is a continuation-in-part of Ser. No. 569,828, Aug. 20, 1990, Pat. No. 5,088,499, which is a continuation-in-part of Ser. No. 455,707, Dec. 22, 1989, abandoned. This application Feb. 22, 1994, Ser. No. 199,462

Int. Cl. A61B 8/00; A61K 49/00

U.S. Cl. 128—662.02

56 Claims



41. A contrast agent adapted to be injected into the body of a patient and comprising stabilized gas bubbles which comprises gas encapsulated by one or more lipid materials, said stabilized gas bubbles being substantially devoid of liquid in the interior thereof.

5,769,081

#### METHOD FOR DETECTING CANCEROUS TISSUE USING OPTICAL SPECTROSCOPY AND FOURIER ANALYSIS

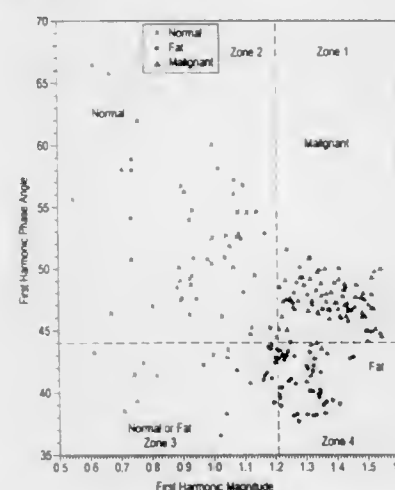
Robert R. Alfano; Alvin Katz, both of Bronx, and Yuanlong Yang, New York, all of N.Y., assignors to The Research Foundation of City College of New York, New York, N.Y.

Filed Mar. 18, 1996, Ser. No. 618,459

Int. Cl. A61B 6/00

U.S. Cl. 128—665

30 Claims



1. A method for determining if a tissue sample is cancerous or not, said method comprising the steps of:

- illuminating the tissue sample with light of a wavelength suitable to cause cancer-indicative native fluorophors in the tissue sample to fluoresce;
- obtaining a fluorescence spectrum for the tissue sample;

- performing Fourier analysis on the fluorescence spectrum so as to determine respective magnitude and phase calculations for at least one non-zero order Fourier harmonic; and
- comparing the respective magnitude and phase calculations for at least one of said at least one non-zero order Fourier harmonics to both a magnitude threshold and a phase threshold, both of which have been determined from known cancerous and non-cancerous tissue samples, said magnitude threshold separating cancerous magnitude values on one side thereof from non-cancerous magnitude values on an opposite side thereof, said phase threshold distinguishing cancerous phase values on one side thereof from non-cancerous phase values on an opposite side thereof whereby cancer is indicated only by the occurrence of a magnitude calculation for the tissue sample consistent with a cancerous magnitude, together with a phase calculation for the tissue sample consistent with a cancerous phase.

5,769,082

#### METHOD OF ASSESSING CARDIOVASCULAR FUNCTION

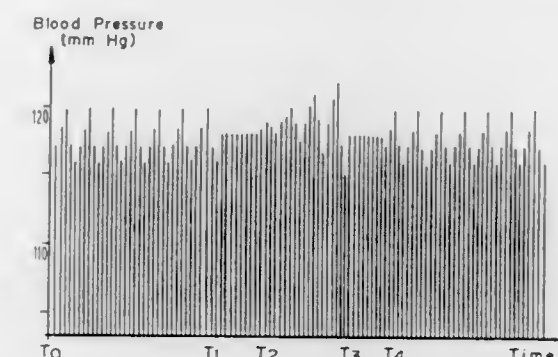
Azriel Perel, Moshav Bar Giyora, D.N. Ha'ela, Israel, 99880

Filed Jul. 18, 1995, Ser. No. 503,907

Int. Cl. A61B 5/02

U.S. Cl. 128—671

13 Claims



1. A method for cardiovascular assessment in patients ventilated with at least one of a predetermined tidal volume and pressure, which comprises:

- varying said at least one of the tidal volumes and pressure levels in at least one breath cycle,
- measuring a hemodynamic parameter in response to each variation according to step (a); and
- assessing a cardiovascular status of a patient based on a degree of change of the hemodynamic parameter in response to the variation in said at least one of the tidal volumes and pressure levels.

5,769,083

#### PRESSURE TRANSDUCER POSITIONING SYSTEM

A. Walter MacEachern, Woburn, Mass., assignor to Gatron Corporation, Woburn, Mass.

Continuation-in-part of Ser. No. 198,838, Dec. 18, 1994. This application Mar. 6, 1996, Ser. No. 612,338

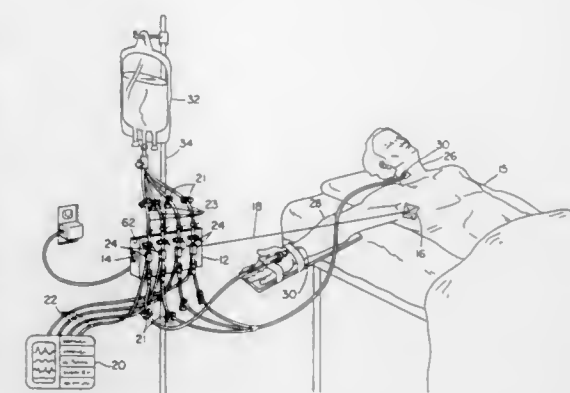
Int. Cl. A61B 5/02

U.S. Cl. 128—673

20 Claims

1. An optical positioning system for a bodily fluid pressure transducer comprising:

- a mounting plate having a first side on which a pressure transducer is mounted and a second side, the pressure transducer measuring fluid pressure in a patient;



a support assembly attached to the second side of the mounting plate, the support assembly having an adjustable holder such that the mounting plate and support assembly can be vertically translated by a user; and

a light source mounted between the second side of the mounting plate and the holder, the light source emitting light such that the user can vertically alter the relative position between the pressure transducer and the patient.

5,769,084

#### METHOD AND APPARATUS FOR DIAGNOSING SLEEP BREATHING DISORDERS

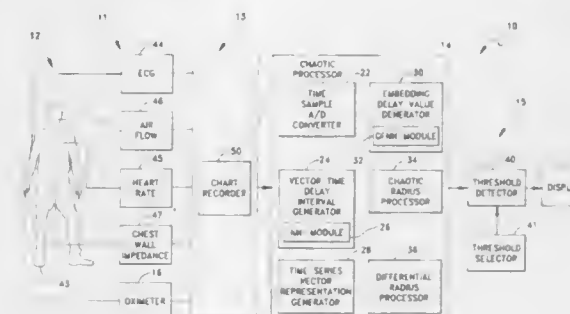
Richard A. Katz, East Lyme, Conn.; Michael S. Lawee, Marblehead, and A. Kief Newman, Woburn, both of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 10, 1996, Ser. No. 687,098

Int. Cl. A61B 5/0472

U.S. Cl. 128—700

24 Claims



1. A method for generating markers identifying the timing of the onset of an event characteristic of a sleep breathing disorder including the steps of:

- monitoring at least one cardio-respiratory function over time;
- generating a time series vector representation of each monitored cardio-respiratory function;
- generating a signal for each monitored function based upon chaotic processing of the corresponding time series vector representation; and
- identifying as a marker each excursion of each signal beyond a corresponding threshold value thereby to indicate the timing of the onset of an event.



# UMI

- a) a cylindrical housing including an outer surface, an inner surface, a first open end and a second closed end, said second closed end being inserted deeper within the vaginal cavity than said first open end and said inner surface being able to absorb any fluid dispensed within said cylindrical cavity;
- b) a plurality of pressure sensors positioned around said outer surface for sensing contractions in walls of the vaginal cavity;
- c) means for sensing pressure caused by insertion of an object into said cylindrical cavity positioned within said cylindrical cavity; and
- d) at least one needle extending into said inner side of said cylindrical cavity for contacting the object inserted into said cylindrical cavity and retaining a tissue sample of said object.

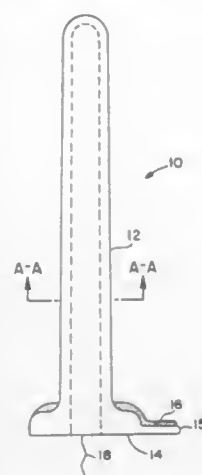
5,769,091

**URETHRAL PLUG HAVING ADHESIVE FOR ENHANCED SEALING CAPABILITIES AND METHOD OF USING SAID PLUG**

John G. Simon, Boston; Paul D. McLaughlin, Scituate, both of Mass.; Leo C. Felce, Pascoag, R.I.; Sharad Joshi, Watertown, Mass.; Azhar Syed, Brookline, Mass.; Richelle Tartacower, Acton, N.H., and Jonathan O'Keefe, Hingham, Mass., assignors to UroMed Corporation, Needham, Mass. Continuation-in-part of Ser. No. 124,264, Sep. 20, 1993, Pat. No. 5,509,427. This application Feb. 9, 1996, Ser. No. 599,636 Int. Cl.<sup>6</sup> A61F 5/48

U.S. Cl. 128—885

31 Claims



1. A remove-to-void urethral plug having enhanced sealing capabilities comprising:

- a non-expandable, hollow body adapted to internally occlude the urethra, the body having a substantially constant cross section, and
- a meatal plate attached to the body, the meatal plate having a layer of adhesive on at least a portion thereof for anchoring the meatal plate at the urethral meatus.

5,769,092

**COMPUTER-AIDED SYSTEM FOR REVISION TOTAL HIP REPLACEMENT SURGERY**

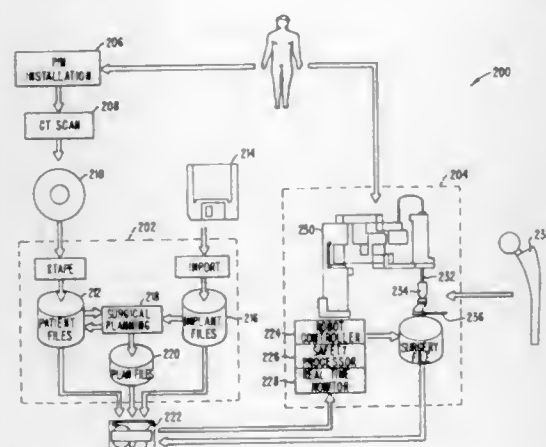
Willie Williamson, Jr., Roseville, Calif., assignor to Integrated Surgical Systems, Inc., Sacramento, Calif.

Filed Feb. 22, 1996, Ser. No. 606,989

Int. Cl.<sup>6</sup> A61B 19/00

U.S. Cl. 128—898

12 Claims



1. A method for producing a cut file useful for controlling a robotic system for replacing a bone prosthesis, said method comprising the steps of:

receiving image data comprising an image of a bone; identifying bounding contours of a non-bone material surrounding a first bone prosthesis to be removed in the image data; generating system contours from the bounding contours, the system contours specifying a cavity to be cut in the bone to accommodate a second bone prosthesis; generating a cut file from the system contours for use by the robotic system; and storing the cut file in a tangible medium.

5,769,093

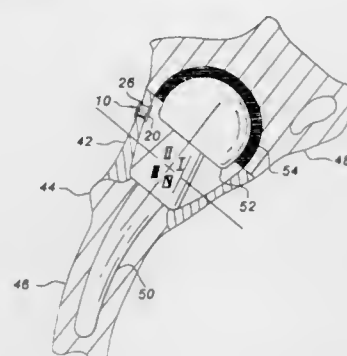
**METHOD OF RELIEVING SYNOVIAL FLUID PRESSURE**  
F. Barry Bays, Clearwater, Fla., assignor to Xomed Surgical Products, Inc., Jacksonville, Fla.

Continuation of Ser. No. 594,076, Jan. 30, 1996, abandoned, which is a division of Ser. No. 353,483, Dec. 9, 1994, abandoned. This application May 15, 1997, Ser. No. 857,185

Int. Cl.<sup>6</sup> A61B 19/00; A61M 5/00

U.S. Cl. 128—898

5 Claims



1. A method of relieving synovial fluid pressure in a capsule surrounding a joint comprising the steps of creating an opening in the capsule; implanting a valve in the opening to create a passage from an interior of the capsule to an exterior of the capsule; securing the valve to the capsule to prevent extrusion of the valve; and regulating the synovial fluid pressure within the capsule using the valve to drain synovial fluid and particulate debris from the capsule into surrounding tissue when a predetermined synovial fluid pressure is exceeded.

5,769,094

**FOLDING KNIFE WITH BLADE CARRIER**

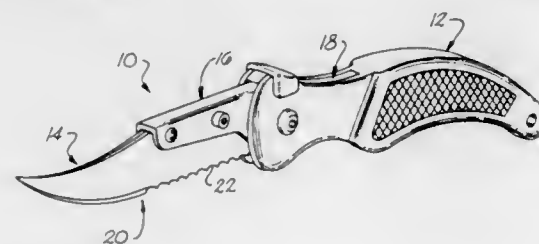
R. B. Jenkins, Jr., P.O. Box 2089, Gastonia, N.C. 28053-2089, and Walter W. Collins, P.O. Box 100, North, S.C. 29112

Filed Dec. 27, 1996, Ser. No. 777,358

Int. Cl.<sup>6</sup> B26B 1/02

U.S. Cl. 30—161

11 Claims



1. A knife, comprising:  
a handle member having a first end and a second end opposite said first end, said handle member defining a blade compartment;  
a blade insert having a cutting edge;

5,769,096

**DEVICE FOR TRIMMING SHREDDED TOBACCO LAYER FORMED IN CIGARETTE MANUFACTURING MACHINE**

Yutaka Okumoto, Tokyo, Japan, assignor to Japan Tobacco Inc., Tokyo, Japan

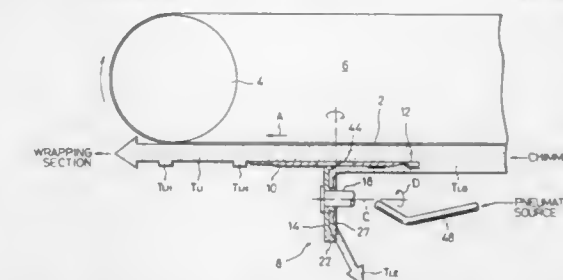
Filed May 29, 1997, Ser. No. 865,190

Claims priority, application Japan, May 29, 1996, 8-135068

Int. Cl.<sup>6</sup> A24C 5/39

U.S. Cl. 131—84.4

6 Claims



1. A device for trimming a shredded tobacco layer formed in a cigarette manufacturing machine, comprising:

- a trimming disk rotatably arranged in a vicinity of a suction band which forms and transports the shredded tobacco layer, said trimming disk continuously cutting into the shredded tobacco layer during the rotation of said trimming disk, thereby dividing the shredded tobacco layer into a required layer portion and a surplus portion; and
- removing means for removing the surplus portion of the shredded tobacco layer in cooperation with said trimming disk, said removing means including
- scraping means for scraping the surplus portion off said trimming disk, said scraping means including a peeling blade arranged to move keeping contact with said trimming disk, and
- deflecting means for deflecting the scraped-off surplus portion of shredded tobacco in a direction deviating from said trimming disk, said deflecting means including air ejecting means for ejecting a compressed air flow to the scraped-off surplus portion of shredded tobacco.

5,769,095

**METHOD OF AND APPARATUS FOR FILLING TUBULAR WRAPPERS WITH SMOKABLE MATERIAL**  
Christian Schramm, Evry, France, assignor to Chillinov s.a.r.l., Chilly-Mazarin, France

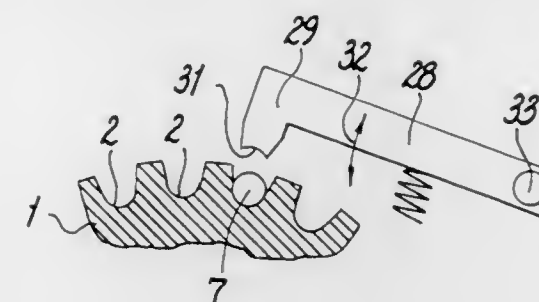
Filed Jun. 7, 1996, Ser. No. 664,248

Claims priority, application Germany, Jun. 10, 1995, 195 21 180.4

Int. Cl.<sup>6</sup> A24C 5/42

U.S. Cl. 131—70

21 Claims



1. A method of filling tubular wrappers with smokable material, comprising the steps of conveying a series of successive elongated empty tubular wrappers transversely of their lengths along a predetermined path to a filling station; introducing elongated batches of smokable material into successive wrappers at said station, including advancing a batch by an inserting tool lengthwise into the wrapper at said station and thereupon withdrawing the tool from the thus filled wrapper; propping the wrapper at said station in the course of the respective batch introducing and tool withdrawing steps; and thereafter advancing successive filled wrappers beyond said station.

5,769,098

**LIGHTER WITH LOOPED GUARD**

James M. McDonough, Guilford, Conn.; Gerald J. Doiron, Athol, Mass.; Paul H. Adams, Monroe, Conn.; Floyd B. Fairbanks, Naugatuck, Conn.; Arthur R. Hamilton, Jr., Derby, Conn., and Guy LaForest, Cascais, Portugal, assignors to BIC Corporation, Milford, Conn.

Continuation-in-part of Ser. No. 97,685, Jul. 28, 1993, Pat. No. 5,483,978. This application Jun. 7, 1995, Ser. No. 486,855

Int. Cl.<sup>6</sup> A24F 13/00

U.S. Cl. 131—329

22 Claims

- 1. A lighter comprising:  
a lighter body containing a fuel reservoir with a valve for releasing fuel therefrom;  
spark producing element rotatable by a user to produce sparks directed toward said valve, said element mounted on the body with at least a portion thereof exposed for manipulation and rotation by the user;  
a valve actuator depressible to actuate said valve and release said fuel; and  
a guard member having first and second ends mounted on the lighter and forming a loop around said spark producing element with said first and second ends being both secured to at least one of the lighter body and valve actuator, wherein said



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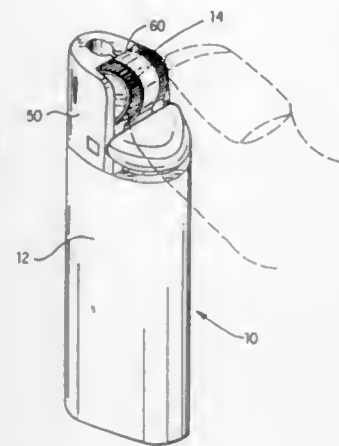
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guard member is normally disposed radially outward from at least a portion of said exposed portion of said spark producing element so as to inhibit manipulation of the spark producing element and is depressible to a position permitting manipulation of said spark producing element.

5,769,099

## AUTOMATED NAIL POLISH REMOVER

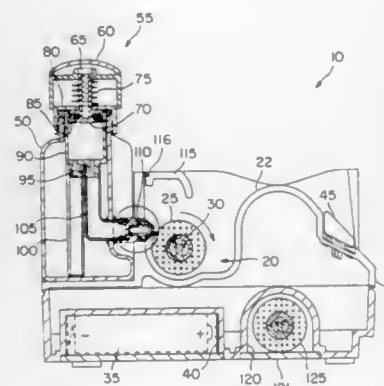
Aaron L. Davis, and Mary B. Davis, both of Minnetonka, Minn., assignors to Sofspin, San Francisco, Calif.

Filed Jun. 21, 1996, Ser. No. 668,408

Int. Cl.<sup>6</sup> A45D 29/05

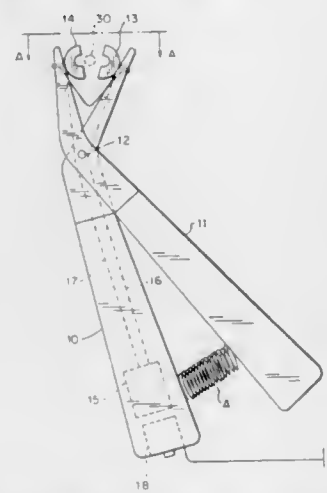
U.S. Cl. 132—73.6

25 Claims



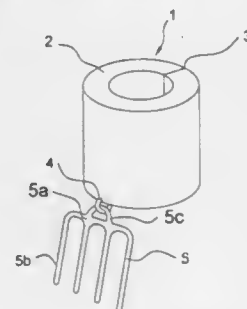
1. A device for removing fingernail polish simultaneously from a plurality of fingernails of a first hand comprising:
- a base having a first area adapted for simultaneously receiving a plurality of fingers of the first hand;
  - a rotatable sponge coupled to the base such that the plurality of fingernails of the first hand are positionable in contact with the rotatable sponge when the plurality of fingers are positioned in the first area;
  - a motor positioned in the base and coupled to the rotatable sponge for rotating the rotatable sponge when the motor is actuated; and
  - a switch positioned on the base, the switch being so disposed and arranged on the base such that the switch can be actuated by a palm of the first hand when the plurality of fingers of the first hand are positioned in the first area of the base, wherein the switch is electrically coupled to the motor such that actuation of the switch by the palm of the first hand causes the motor to be actuated to thereby rotate the sponge and remove the fingernail polish from the plurality of fingernails.

5,769,100  
SYNTHETIC HAIR-LIKE FUSER APPARATUS  
Eugene D. Alexander, 7422 Eastern Ave. NW., Washington, D.C. 20012  
Continuation of Ser. No. 422,841, Mar. 31, 1995, abandoned.  
This application May 5, 1997, Ser. No. 851,280  
Int. Cl.<sup>6</sup> A45D 20/08  
U.S. Cl. 132—271 26 Claims



1. A synthetic hair fuser apparatus for fusing and terminating the an end of a braided synthetic hair-like material, comprising:
- a first elongated member;
  - a second elongated member;
  - a first fuser element, attached to a first end of said first elongated member, emanating heat; and
  - a second fuser element attached to a first end of said second elongated member directly opposite said first fuser element, emanating heat;
- wherein said first and second fuser elements cooperate with each other to fuse and terminate the end of the braided synthetic hair-like material; and
- wherein said second elongated member being pivotally attached to said first elongated member at a pivot point such that pivotal movement of said first and second elongated members relative to each other moves said first and second fuser elements from an open position to a closed position adapted to contact with opposite sides of the end of the braided synthetic hair-like material which can be positioned between said first and second fuser elements to fuse and terminate the end using heat emanating from said first and second fuser elements.

5,769,101  
HAIR BUNDLING CORE AND METHOD OF USING THE CORE  
Hidenobu Iwata, Sagami-hara, Japan, assignor to Yonesho Company, Ltd., Tokyo, Japan  
Filed Apr. 2, 1997, Ser. No. 825,914  
Claims priority, application Japan, Apr. 2, 1996, 8-079734  
Int. Cl.<sup>6</sup> A45D 8/04; 8/34; 8/36  
U.S. Cl. 132—273 16 Claims



1. A hair bundling core structure comprising:

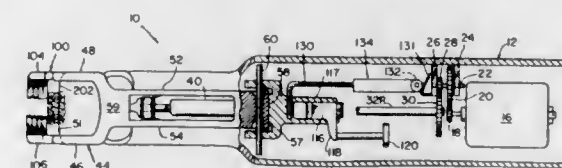
an elastic cylinder made of a foamed synthetic resin having a thickness and strength which are sufficient for facilitating a piercing of a hair fixing U-shaped pin and an extraction of the U-shaped pin from the elastic cylinder and capable of fixing hair to the elastic cylinder by the piercing by the U-shaped pin, the synthetic resin capable of being cut;

the elastic cylinder having a rift from a top end surface to a lower end surface;

a hair fastening pin connected to a lower end portion of the elastic cylinder by an attachment member;

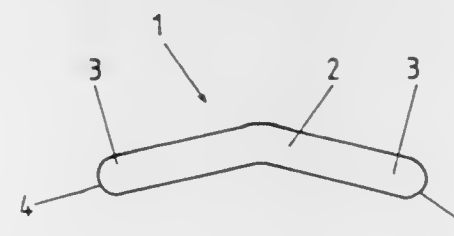
wherein a through hole for letting a hair bundle of a user is defined by an inside of the elastic cylinder, the hair fastening pin comprising a plurality of parallel shafts for thrusting into the hair bundle.

5,769,102  
AUTOMATED DENTAL CLEANER  
William H. Zebuhr, Nashua, N.H., assignor to DynaProducts, Inc., Nashua, N.H.  
Continuation-in-part of Ser. No. 418,837, Apr. 7, 1995, Pat. No. 5,647,385. This application Mar. 21, 1996, Ser. No. 620,038  
Int. Cl.<sup>6</sup> A61C 15/00  
U.S. Cl. 132—322 15 Claims



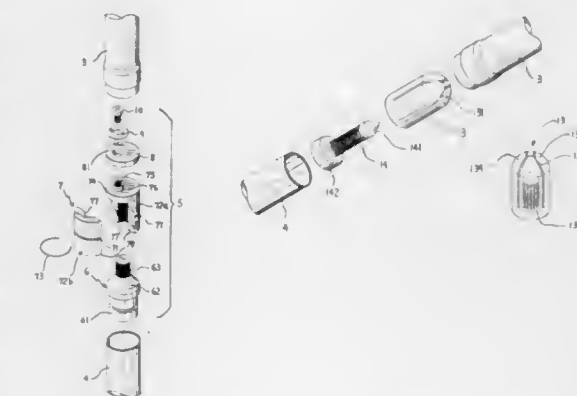
1. A dental cleaner comprising:
- a fork having a pair of spaced tines for supporting a floss span extending therebetween; and
  - first and second brushes attached to the tines, respectively, the brushes having bristles extending inward between the tines for simultaneously engaging lingual and buccal tooth surfaces.

5,769,103  
FLAT INTERDENTAL SPACE CLEANER  
Visnja Turjak, Aleja pomoraca 23, Zagreb, Croatia, 10020  
Filed Sep. 23, 1996, Ser. No. 710,895  
Claims priority, application Croatia, Sep. 22, 1995, 950495 A  
Int. Cl.<sup>6</sup> A61C 15/02  
U.S. Cl. 132—329 9 Claims



1. Flat interdental space cleaner comprising
- an essentially flat resilient strip in an angled configuration so as to be substantially boomerang shaped, and
  - free end portions of flat resilient strip including different uniform thicknesses and a width comparable to a visible length of teeth for enabling passing between two teeth into the interdental space.

5,769,104  
STAGELESSLY ADJUSTABLE TELESCOPIC WALKING STICK WITH A POSITION RETAINING DEVICE  
Shinichi Uemura, Nagoya, Japan, assignor to Crystal Industrial Co., Ltd., Nagoya, Japan  
Filed May 30, 1997, Ser. No. 866,018  
Int. Cl.<sup>6</sup> A61H 3/02  
U.S. Cl. 135—69 3 Claims



1. A stagelessly adjustable telescopic walking stick having a position retaining device, comprising:
- an upper pipe;
  - a lower pipe;
  - a taper means having a joint block disposed at one end and a conic tapered face in connection to an outer threaded post disposed at the other end being secured to one end of said lower pipe;
  - a retainer having a round securing plate at one end and a semi-cylindrical extension having an inner threaded half passage projecting downwardly therefrom and an outer groove defined on the periphery of the semi-cylindrical extension;
  - a conically tapered face defined at the free end of said semi-cylindrical extension;
  - another semi-cylindrical portion in conformance to said semi-cylindrical extension having an outer groove defined in correspondence to said outer groove of said semi-cylindrical extension and an inner threaded half passage and a conically tapered face at one end;
  - a C-shaped clamp ring being disposed in the outer groove of said semi-cylindrical extension and said semi-cylindrical portion to lock them together so as to form an expandable plastic tube having an inner threaded passage and a conically tapered end;
  - an eccentric engagement protrusion having a screw hole being disposed at the top of said round securing plate;
  - a circular disk having an eccentric hole being secured to said round securing plate by way of a washer and a screw engaged with said screw hole of said eccentric engagement protrusion;
  - said retainer engaged with said eccentric circular disk at one end and connected to said outer threaded post of said taper means at the other end being housed in said upper pipe;
  - said circular disk and said round securing plate being in linear alignment with each other when said taper means being not engaged with said ring clamped plastic tube, and becoming out of alignment with each other when said lower pipe being rotated along with said taper means, resulting in said round securing plate and said circular disk in tight abutment against the inner wall of said upper pipe to hold said retainer in place whereby said outer threaded post of said taper means can proceed in said plastic tube of said retainer continually until said tapered face of said taper means becomes in abutment against said tapered face of said plastic tube to make said ring clamped plastic tube to outwardly expand, causing said plastic tube made up of said semi-cylindrical extension and portion to be in frictional contact to the inner wall of said upper pipe so as to lock said lower pipe to said upper pipe after a proper length of said walking stick is stagelessly adjusted.

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5,769,105

## STATIONARY BOAT COVER

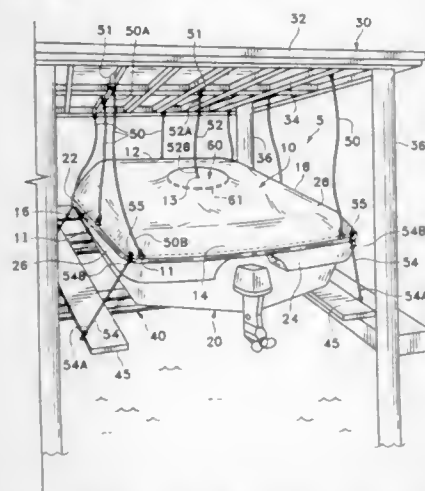
Geoffrey Margol, and Rodney S. Margol, both of 11062 Riverport Dr., West, Jacksonville, Fla. 32223

Filed Oct. 6, 1997, Ser. No. 944,373

Int. Cl.<sup>6</sup> E04H 15/04

U.S. Cl. 135—90

3 Claims



1. A cover suspended from an overhead supporting structure disposed over a boat lift, surrounded by a catwalk, for covering a boat, comprising:

- a sheet having a front, a back and sides;
- a plurality of periphery cords having first and second ends, said first end connected to said overhead supporting structure and said second end connected to said sheet;
- a central supporting member located below said sheet;
- a central cord having a first and second end, said first end connected to said overhead supporting structure and said second end, passing through said sheet, connected to said central supporting member located under said sheet; and
- a plurality of connectors having first and second ends, said first end connected to said catwalk and said second end connected to said sheet to secure said sheet over the boat.

5,769,106

## CONVERTIBLE PANEL AND SHELTER SYSTEM

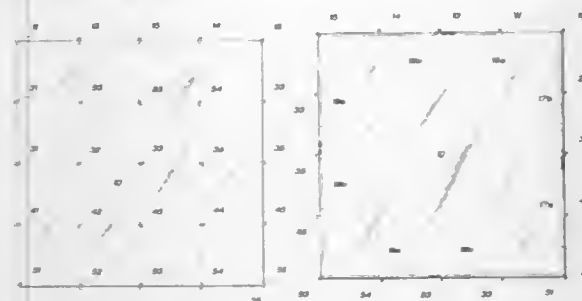
Jonathan M. Achuff, 2550 S. Garfield St., Denver, Colo. 80210

Filed May 15, 1996, Ser. No. 648,325

Int. Cl.<sup>6</sup> E04H 15/30

U.S. Cl. 135—95

9 Claims



4. A quarter panel unit comprising

- a quarter panel comprised of a substantially square panel of thin sheet material, said quarter panel having an upper surface, a lower surface, four corners, a center point equidistant from all said corners, and four edges;
- a plurality of engaging means disposed along said edges and fastened said lower surface of to said quarter panel, each said edge having said engaging means, said engaging means providing a means for continuously connecting each said edge selectively with each of at least two said edges of said quarter panel of any said quarter panel unit, and said engaging means

and all elements thereof being disposed in a two-fold radially symmetrical pattern about said center point; and

a plurality of attachment means fastened to said quarter panel and disposed at intervals on said upper surface, along each said edge, and at each said corner in a regular and evenly-spaced grid having four-fold radial symmetry about said center point, said attachment means providing a means for attaching various devices to said quarter panel.

whereby said quarter panel unit provides a means for forming a multitude of configurations including a backpack and a head-net from said quarter panel unit and a multitude of diverse forms of shelters and a rain cape from a plurality of said quarter panel units fastened together by means of said engaging means.

5,769,107

## VALVE SYSTEM, PARTICULARLY FOR USE WITH TERMITICIDE SYSTEMS

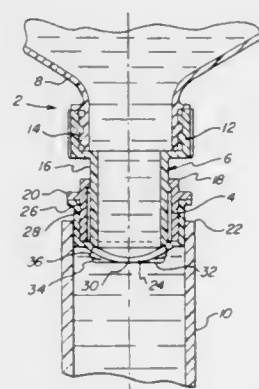
Keith F. Woodruff, Mountainside, N.J., assignor to American Cyanamid Company, Madison, N.J.

Filed Mar. 28, 1996, Ser. No. 624,977

Int. Cl.<sup>6</sup> F16L 37/28

U.S. Cl. 137—1

21 Claims



17. A method of opening and closing a valve device, said method including the steps of:

- mounting a first valve component for movement relative to a second valve component,
- mounting a cover over a discharge outlet defined in said second valve component, said cover extending over and being mounted to at least a portion of the outer surface of said second valve component,
- moving said first valve component relative to said cover on said discharge outlet defined in said second valve component, said cover being formed in part from a resilient material and defining a plurality of resilient adjacent cover segments in contiguous relationship,
- applying a force on said cover by said first valve component for separating at least two of said adjacent cover segments,
- defining an opening in the end of said first valve component closest to said discharge outlet of said second valve component, said opening in said first valve component being defined substantially planar with the forward end thereof, and
- removing said applied force to permit said plurality of cover segments to return to said contiguous relationship and for moving said first valve component in a direction relative to said second valve component away from said cover by the resilient return force of said cover.

5,769,108

## FLUID MEASURING, DILUTION AND DELIVERY SYSTEM WITH AIR LEAKAGE MONITORING AND CORRECTION

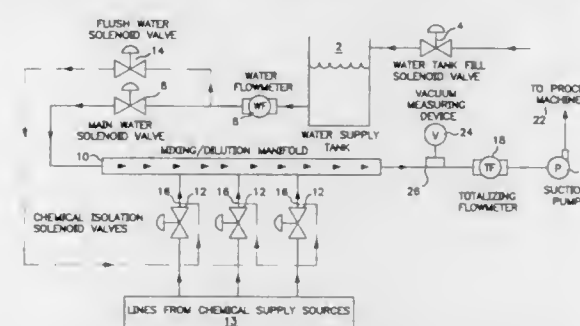
Donald L. Proudman, c/o Proudman Systems, 30 Waverly St., Taunton, Mass. 02780

Filed May 9, 1995, Ser. No. 437,325

Int. Cl.<sup>6</sup> G05D 11/13

U.S. Cl. 137—7

4 Claims



3. A process for liquid dilution and delivery comprising the steps of:

- (a) diluting at least two fluid inputs and outputting the co-mingled flow,
- (b) pumping liquid said co-mingled flow,
- (c) measuring the volume flow of at least one of the fluid inputs being diluted with a first flow meter,
- (d) measuring the total volume being pumped with a second flow meter,
- (e) controlling the pumping,
- (f) detecting air entering at least one of the fluid inputs
- (g) measuring pressure drop and the time that said pressure drop exists, for calculating a volume flow error, and
- (h) responsive to said volume flow error, shutting down said system, and
- (i) indicating said shutdown.

5,769,109

## STORAGE VAULT WITH OVERFLOW CONTAINMENT COLLAR

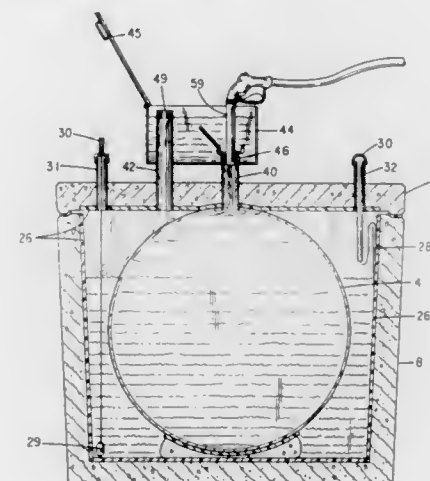
Kelly Stanton, Schenectady, N.Y., and Laura Misiewicz-DelZotto, Ocala, Fla., assignors to Guardian Containment Corp., Schenectady, N.Y.

Filed Jun. 7, 1996, Ser. No. 660,276

Int. Cl.<sup>6</sup> B65D 47/00

U.S. Cl. 137—264

14 Claims



1. Liquid containment apparatus comprising:

- (a) a base having a plurality of sidewalls that project from a bottom wall to define an open cavity;

- (b) tank means mounted within said open cavity for containing a liquid within a primary storage space;
- (c) a liquid impermeable membrane mounted to encompass said tank means and terminating at a peripheral edge of said sidewalls, which membrane defines a secondary storage space in said open cavity that surrounds said tank means;
- (d) a cast cover which mounts to said sidewalls to cover the open cavity and wherein a fill pipe extends through said cover and communicates with the primary storage space; and
- (e) spill containment means including a housing mounted to surround said fill pipe for capturing spillage from said fill pipe and directing the spillage into said secondary storage space whereby tank leakage or spillage from filling or backup from the primary storage space is contained within the secondary storage space.

5,769,110

## FLUID CONTROL APPARATUS

Tadahiro Ohmi, Sendai; Keiji Hirao, Osaka; Michio Yamaji, Osaka; Shigeru Itol, Osaka; Tsutomu Shinohara, Osaka; Nobukazu Ikeda, Osaka; Hiroshi Morokoshi, Osaka, and Tetsuya Kojima, Osaka, all of Japan, assignors to Fujikin Incorporated, Osaka, Japan

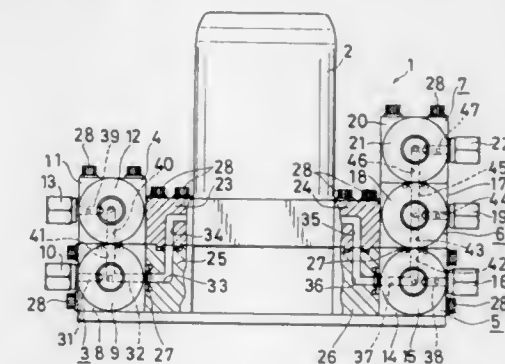
Filed Jun. 28, 1996, Ser. No. 672,668

Claims priority, application Japan, Jun. 30, 1995, 7-164902

Int. Cl.<sup>6</sup> F16K 11/22

U.S. Cl. 137—269

2 Claims



1. A fluid control apparatus, comprising: a regulator for regulating a flow rate or pressure; a valve device disposed on at least one of an inlet side and an outlet side of the regulator, wherein the valve device includes a plurality of valves for selectively causing one of a plurality of fluid channels to communicate with a fluid channel of the regulator upon a change-over, wherein the valves of the valve device are positioned one upon another,
- wherein the regulator includes an upper connector having a downwardly open channel in communication with the regulator; and
- a connection member including a lower connector having an upwardly open channel in communication with the connection member, the upper connector being disposed on, and removably joined to, the lower connector so as to cause the downwardly open channel to communicate with the upwardly open channel.

5,769,111

## LEAK DETECTOR

Joseph U. Han, Rancho Cucamonga, Calif., assignor to Fluidmaster, Inc., Anaheim, Calif.

Filed Jan. 7, 1997, Ser. No. 779,678

Int. Cl.<sup>6</sup> F16K 31/22;33/00

U.S. Cl. 137—312

14 Claims

1. Leak detector apparatus for use with an inlet valve assembly which includes a vertical post, an inlet valve, and a float which is



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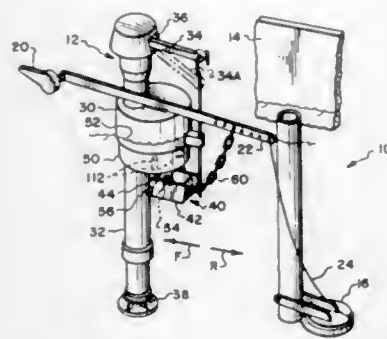
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slidable vertically along said post and which is coupled to said inlet valve to open it when said float moves down and to close it when said float moves up, to prevent the float from moving down and opening the inlet valve to refill the tank as when water leaks through an outlet valve, said float having a lower portion that normally lies under water, comprising:

a buoyant body;  
a mount that is attachable to said float and that is connected to said body so said body can prevent said float from moving down to open said inlet valve when said body cannot move down, said mount being pivotally connected to said body about a body axis so said body lies under water when said float lower portion lies under water;

said body having a body forward end portion that lies closest to said post with said forward end portion having a post-engaging part that engages said post to prevent downward movement of the body when said body pivots in a direction wherein said forward end portion moves upward and forward, and said body having a rear end portion which can be pulled up;

said body having a center of buoyancy, when immersed in water with said post-engaging part lying adjacent to said post, which lies below and forward of said body axis to urge body pivoting to move said post-engaging part forwardly and upwardly against said post to prevent downward movement of the body and cause the body to prevent downward movement of the float when water leaks through the outlet valve.

5,769,112  
SUPPORT SYSTEM FOR FIRE HYDRANT  
INSTALLATION

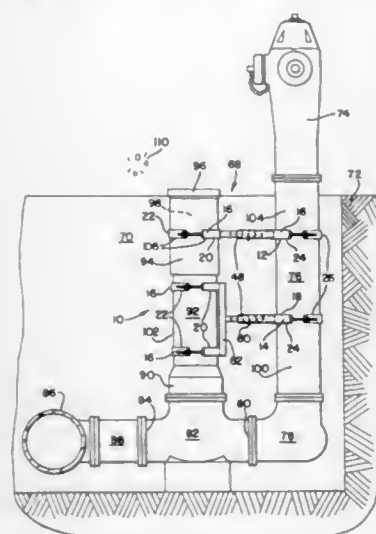
Bruno Rendina, 103 Oswego Plains Dr., Oswego, Ill. 60543

Filed May 3, 1996, Ser. No. 642,677

Int. Cl.<sup>6</sup> F16K 51/00; B63B 35/03

U.S. Cl. 137—316

8 Claims



1. A support system for use in construction or repair of a fire hydrant installation located in an open hole, said system comprising:

bracket means for supporting a valve casing of said installation, said bracket means having a casing clamp formed with an adjustable inner and an outer portion to fit about a casing of said installation to produce incrementally spaced apart lines of contact with said casing, a riser clamp having an adjustable inner and an outer portion to fit about a riser of said installation to produce incrementally spaced apart lines of contact with said riser, and a spacer having a pair of interacting members longitudinally adjustable to accommodate a selective distance between said casing and said riser with an outer end of one said spacer member joined to said casing clamp inner portion and an outer end of said other spacer member joined to said riser clamp inner portion,

wherein for use said bracket is attached to said casing and said riser, said spacer members secured in a fixed location, and dislodging forces on said casing resulting from back filling of said installation open hole are resisted by stabilizing forces transmitted from said riser to said casing through said riser-riser clamp lines of contact and said casing-casing clamp lines of contact to maintain said casing seated on and aligned with a valve of said installation.

5,769,113  
DUAL PILOT MANIFOLD ASSEMBLY FOR A SAFETY  
RELIEF VALVE

Jack B. Alberts, Houston, and Michael D. McNeely, Katy, both of Tex., assignors to Keystone International Holdings Corporation, Houston, Tex.

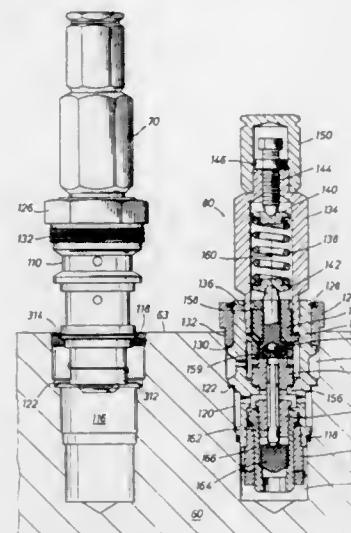
Division of Ser. No. 523,051, Sep. 1, 1995, Pat. No. 5,590,684.

This application Nov. 6, 1996, Ser. No. 743,724

Int. Cl.<sup>6</sup> F16K 31/383

U.S. Cl. 137—454.6

21 Claims



1. A cartridge valve assembly for mounting within a block cavity extending through a face in a block, the block cavity having a central valve axis, the block having a first passageway therein communicating with a first portion of the block cavity, and a second passageway therein communicating with a second portion of the block cavity axially spaced from the first portion of the block cavity, the cartridge valve assembly comprising:

a valve body partially positioned within the cavity and extending outward of the cavity in the block, the valve body having a valve seat therein;

a valve stem axially movable within at least a portion of the cavity in the valve body;

a valve element carried by the valve stem and movable with respect to the valve body for sealing engagement with the valve seat to fluidly isolate the first passageway and the second passageway, and for unsealing with the seat to establish fluid communication between the first passageway and the second passageway;

5,769,115  
CONTROL VALVE

Hiroshi Ohsaki, and Shinji Hojo, both of Sashima-gun, Japan, assignors to Kyosan Denki Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 281,239, Jul. 27, 1994, abandoned.

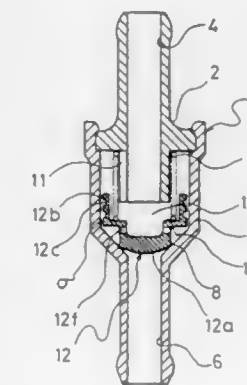
This application Dec. 22, 1995, Ser. No. 576,857

Claims priority, application Japan, Aug. 4, 1993, 5-050232

Int. Cl.<sup>6</sup> F16K 17/08

U.S. Cl. 137—469

9 Claims



5,769,114  
CONTROL VALVE FOR USE IN A DUAL HANDLED HOT/  
COLD WATER MIXING FAUCET

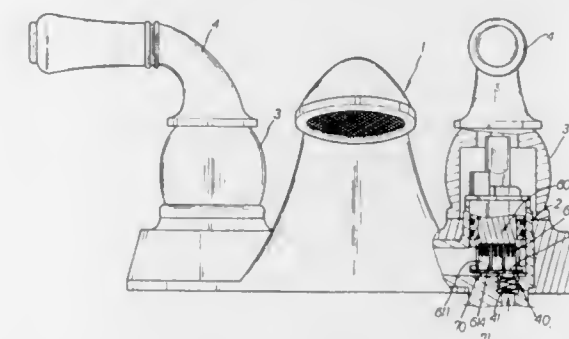
Hsi-Chia Ko, Changhua Hsien, Taiwan, assignor to Chung Cheng Faucet Co., Ltd., Changhua Hsien, Taiwan

Filed Dec. 10, 1996, Ser. No. 762,859

Int. Cl.<sup>6</sup> F16K 51/16

U.S. Cl. 137—454.6

1 Claim



1. A water mixing faucet control valve comprising a valve mount, a spindle assembly mounted in the valve mount and a water restraining plate attached to the spindle assembly, said valve mount comprising a hollow tube having a countersunk through hole and said spindle assembly comprises a spindle body with a spindle rod having a sealing ring attached to a root of said spindle rod, a chamber formed in the spindle body having two discharge openings through a wall bounding said chamber, a shoulder formed on an edge of said chamber, said spindle rod extending through the countersunk through hole of said valve mount and partially sticks out of the valve mount, said control valve further comprising a plurality of cylindrical rods extending into said chamber from said spindle body, the plurality of rods arranged in an outer circular array comprising a first plurality of rods, an inner circular array comprising a second plurality of rods and an intermediate circular array located between the outer and inner circular arrays, a plurality of rods in the intermediate circular array having a length greater than lengths of rods in the outer and inner circular arrays;

a flanged wall located on said spindle assembly having a plurality of recesses on a periphery thereof;

said water restraining plate having two tear-drop shaped outlet openings and two symmetric T-shaped lugs disposed on the periphery thereof,

said water restraining plate being secured to said spindle assembly by engagement of said T-shaped lugs with said recesses on said flanged wall, said rods in the intermediate circular array contacting a side of said water restraining plate so as to support the same firmly in place.

1. A pressure-responsive control valve assembly, comprising:  
a casing defining therein an internal valve chamber defined by a surrounding inner wall, said casing having inlet and outlet ports formed adjacent opposite ends thereof and communicating with said valve chamber, said casing also defining thereon an annular valve seat at an end of said chamber at said inlet port;

a valve unit movably disposed within said valve chamber and including a valve head adapted for sealing engagement with said valve seat when said valve unit is in a closed state;

a spring acting against said valve unit for normally maintaining the valve head in sealing engagement with the valve seat to prevent flow of fluid from said inlet port to said outlet port; said valve unit including a valve part which is fixed to and projects downstream of said valve head and is movably disposed within said valve chamber, said valve part having an outer peripheral wall which is disposed adjacent but at least slightly spaced from the inner wall of the casing to define a small annular gap therebetween which is disposed downstream of said valve seat, said annular gap having a downstream end thereof disposed in communication with said outlet port, said annular gap having an upstream end thereof disposed in communication with said inlet port downstream of said valve seat so as to be in open communication with the inlet port only when the valve unit is in an open state, said annular gap defining a first flow path for permitting fluid flow from said inlet port to said outlet port in the open state of said valve unit;

a stopper stationarily mounted on said casing for abutment with the valve unit when the latter is moved away from the valve seat into an open state; and  
said valve unit having a fluid passageway formed therein and extending therethrough, said fluid passageway having an inlet end which communicates with said valve chamber downstream of said valve seat but generally upstream of said small annular gap, said fluid passageway having a downstream end which opens through said valve unit at a location generally downstream of said small annular gap for providing communication with said outlet port, said passageway defining a second flow path which extends generally in parallel relationship to said first flow path for permitting fluid flow therethrough from said inlet port to said outlet port only when said valve unit is in said open state;

whereby the valve unit is stably maintained in engagement with the stopper when the valve unit is in the open state.

5,769,116

COMPOSITE ACTION TYPE WATER-HAMMER-  
PREVENTIVE CHECK VALVE

Hiroshi Yokota, and Shingo Yokota, both of Hiroshima, Japan, assignors to Kabushiki Kaisha Yokota Seisakusho; Hiroshi Yokota, and Shingo Yokota, all of Hiroshima-Ken, Japan  
PCT No. PCT/JP95/00097, § 371 Date Sep. 13, 1996, § 102(e)  
Date Sep. 13, 1996, PCT Pub. No. WO95/20735, PCT Pub.  
Date Aug. 3, 1995

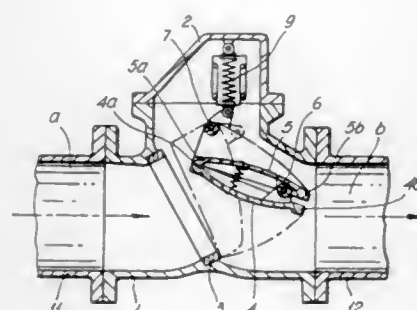
PCT Filed Jan. 27, 1995, Ser. No. 682,734

Claims priority, application Japan, Jan. 31, 1994, 6-009250;  
Nov. 21, 1994, 6-286509; Jan. 25, 1995, 7-009424

Int. Cl.<sup>6</sup> F16K 21/10

U.S. Cl. 137—514

10 Claims



1. A composite action type water-hammer-preventive check valve, comprising:

a valve casing having therein a flow passage with a flow line along which a fluid flows;

a valve seat disposed across said flow line in an inclined attitude relative to the flow line so that the valve seat has an upstream lateral side positioned upstream of a downstream lateral side with respect to said flow line;

an arm member in said valve casing at a position downstream from said valve seat and pivotably connected to said valve casing by an arm member support shaft positioned adjacent to said upstream lateral side of the valve seat, said arm member having an upstream end portion adjacent to said upstream lateral side of the valve seat and a downstream end portion;

a valve element shaped to provide small flow resistance and small inertial resistance and pivotably connected to said arm member by a valve element support shaft, said valve element being positioned to face said valve seat at a downstream side thereof and being movable between a fully open position away from the valve seat and a fully closed position in which the valve element is in close contact with said valve seat, said valve element having an upstream end portion for contacting said upstream lateral side of the valve seat, and a downstream end portion for contacting said downstream lateral side of the valve seat, said valve element being disposed to be gravitationally urged in a valve closing direction;

said valve element being urged to turn around said valve element support shaft so that said upstream end portion of the valve element is caused to contact said upstream end portions of the arm member; and

a valve closing member connected between said valve casing and one of said arm member and said valve element to urge said arm member and said valve element in said valve closing direction, said valve closing member being provided at such a position as to provide a minimum value of valve closing force in said valve fully open position of the valve and a maximum value of valve closing force in said valve closing position;

whereby when fluid flow along said flow line through said passage stops, due to cessation of inertia after power supply to a pump is stopped, the valve element will be seated on the valve seat with said downstream end portion of the valve element first contacting the valve seat and with said upstream end portion of the valve element thereafter contacting the valve seat.

5,769,117

GUARD AND SEAT ASSEMBLY, AND A GUARD  
STRUCTURE THEREFOR

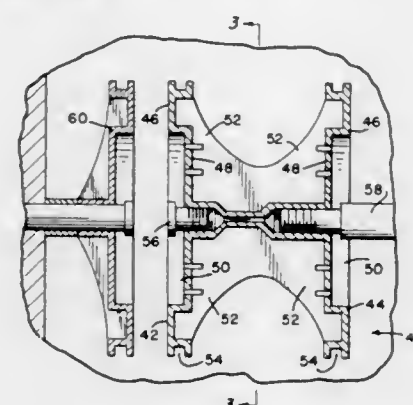
Wayne F. Wehber, Horseheads, N.Y., and Paul Wilkinson, Tulsa, Okla., assignors to Dresser-Rand Company, Corning, N.Y.

Filed May 20, 1996, Ser. No. 650,277

Int. Cl.<sup>6</sup> F16K 15/00

U.S. Cl. 137—516.11

6 Claims



1. A guard structure, for guard and seat assemblies for fluid control valves, comprising:

a pair of valve guards;  
each of said guards having front and rear surfaces; and  
means inseparably joining said rear surfaces together.

5,769,118

## POSITION INDICATING VALVE WHEEL

Lars Lénberg, Nössebro, Sweden, assignor to Tour & Andersson Hydronics AB, Ljung, Sweden

PCT No. PCT/SE94/00106, § 371 Date Jul. 18, 1995, § 102(e)  
Date Jul. 18, 1995, PCT Pub. No. WO94/19636, PCT Pub.  
Date Sep. 1, 1994

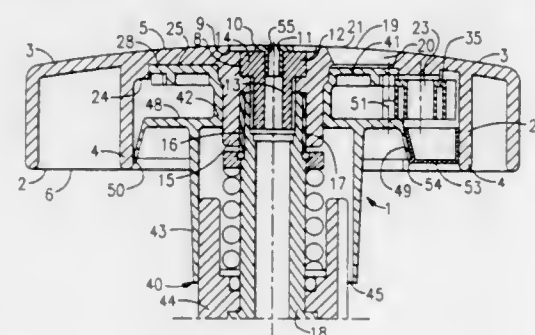
PCT Filed Feb. 10, 1994, Ser. No. 491,912

Claims priority, application Sweden, Feb. 25, 1993, 9300642

Int. Cl.<sup>6</sup> F16K 37/00; 31/60

U.S. Cl. 137—553

20 Claims



1. A position indicating valve wheel which rotates a spindle end of a valve and indicates a full turn position and a partial turn position of a valve body relative to a top portion of the valve, comprising:

a wheel house having a center lying along a central axis;  
a decimal ring in the wheel house mounted for rotation about the central axis and having a decimal indicating mechanism to indicate the partial turn position of the valve wheel;  
a driver rigidly secured to the decimal ring and being located radially outward from the central axis;  
an intermediate wheel rotatably secured to the wheel house and being positioned such that the driver temporarily engages with the intermediate wheel with each full turn of the wheel house.

and the driver urging the intermediate wheel to rotate during the temporary engagement; and  
a digit ring being rotatably secured to the wheel house and being in constant rotating communication with the intermediate wheel such that rotation of the intermediate wheel urges the digit ring to rotate, and said digit ring having a digit indicating mechanism to indicate the full turn position of the valve wheel.

5,769,119

COMBINED CONTROL AND CHECK VALVE FOR GAS  
TORCHES

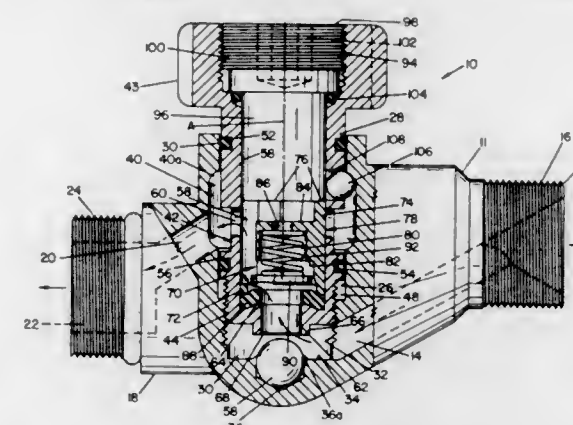
Randy C. Edenfield, Flowery Branch, Ga., assignor to The Lincoln Electric Company, Cleveland, Ohio

Filed Sep. 27, 1996, Ser. No. 722,893

Int. Cl.<sup>6</sup> E03B 65/20

U.S. Cl. 137—614.2

32 Claims



32. A valve for controlling the flow of gas to a gas torch comprising, a valve body having an inlet for connection to a source of gas under pressure and an outlet for connection to a torch, a flow control valve in said valve body between said inlet and outlet and including a gas passageway having upstream and downstream ends with respect to the direction of flow of gas from said inlet to said outlet, said flow control valve having open and closed positions respectively connecting and disconnecting said upstream end of said passageway in flow communication with said inlet, and a check valve in said gas passageway downstream from said upstream end thereof and having open and closed positions respectively opening and closing said gas passageway to the flow of gas therethrough, and spring means biasing said check valve in the direction opposite said direction to said closed position thereof.

5,769,120

INFRARED SENSOR WITH REMOTE CONTROL  
OPTION

Martin J. Laverty, Jr., Charlottesville; Robert N. Capper, Jr., Roanoke; Steve Davis, Roanoke; Gary Hamrick, Roanoke; Timothy Eichblatt, Roanoke; Chuck Tavares, Roanoke, and Ryp R. Walters, Christiansburg, all of Va., assignors to Coyne & Delany Co., Charlottesville, Va.

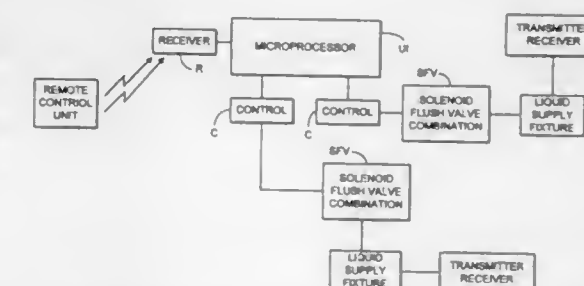
Division of Ser. No. 156,370, Nov. 23, 1993, Pat. No. 5,508,510. This application Mar. 15, 1995, Ser. No. 404,527

Int. Cl.<sup>6</sup> E03C 1/05

U.S. Cl. 137—624.11

20 Claims

1. A control system for a liquid supply fixture, comprising:  
a microprocessor connected to receive inputs continuously from a plurality of sources continuously supplying inputs to said microprocessor and to provide outputs to a plurality of receivers for control of the supply of liquid by said fixture, and said microprocessor being programmed to receive inputs having a preselected digital code, transmitted from the plurality of sources with said preselected digital code; and



a collection of inputs receivable by said microprocessor from the plurality of sources activated in response to infrared rays received after transmission from an infrared transmission device associated with said microprocessor for activation of means for activation of a control to supply the liquid to said fixture solely in response to infrared rays received after transmission from said infrared transmission device; wherein said microprocessor is configured to control a solenoid valve.

5,769,121

ROTARY SLIDE VALVE FOR POWER-ASSISTED  
STEERING IN MOTOR VEHICLES

Werner Breitweg, Bargau, Germany, assignor to ZF Friedrichshafen AG., Friedrichshafen, Germany

PCT No. PCT/EP95/03657, § 371 Date Mar. 21, 1997, § 102(e)  
Date Mar. 21, 1997, PCT Pub. No. WO96/09200, PCT Pub.  
Date Mar. 28, 1996

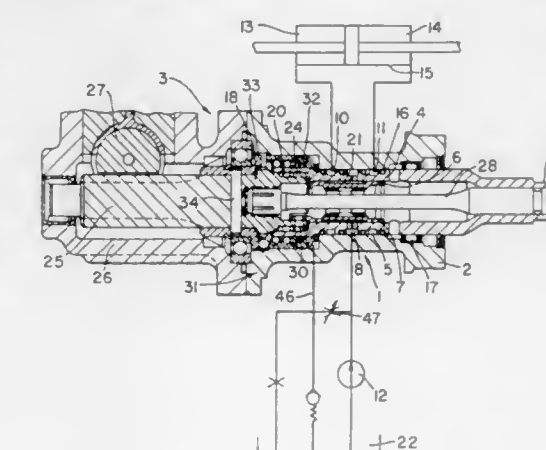
PCT Filed Sep. 18, 1995, Ser. No. 809,837

Claims priority, application Germany, Sep. 21, 1994, 44 33 599.7

Int. Cl.<sup>6</sup> F15B 9/10

U.S. Cl. 137—625.23

9 Claims



1. A rotary slide valve for the power steering of motor vehicles, comprising a first valve element, which is fixedly connected to a valve inlet member to prevent relative rotation between the first valve element and the valve inlet member, and a second valve element, which is fixedly connected to a valve outlet member to prevent relative rotation between the second valve element and the valve outlet member.

the first valve element is a rotary distributor (4) having an axial bore (5) and is connected to the valve outlet member (4) via a torsion bar (6) and a backlash coupling (7), the second valve element (3) is situated radially inside the axial bore (5) of the rotary distributor (4) and is guided as a control bushing (8), the two valve elements (1, 3) are arranged to be coaxially movable inside each other and are located in a valve housing (9) and the two elements (1, 3) can be rotated in relation to each other to a maximum of the rotational travel path of a backlash coupling (7), and



wherein the rotary distributor has longitudinal control sorts on its interior and the control bushing has longitudinal control ports on its exterior, which exterior ports are limited in their axial length and cooperate in the control of a pressure medium to and from two work chambers of a servo motor,

a centering device is disposed between the rotary distributor and the valve outlet member,

the improvement comprising:

the centering device contains two parts, which can be rotated in respect to each other, and at least one ball located between the two parts,

the first part is fixedly connected to a reaction piston having a circumferential interior surface, and is fixedly connected to the rotary distributor to prevent relative rotation between the first part and the rotary distributor and permit axial displacement of the first part,

the second part is fixedly connected to the valve outlet member in a predetermined position to prevent relative rotation between the second part and the valve outlet member and the second part is not axially displaceable,

each of the first and second parts includes a recess which together form a recess of the two parts;

the ball is maintained in a recess of the two parts, and

a spring having two ends acts on the reaction piston, which spring is supported at the one end on the reaction piston and at the other end on a stop disposed on the rotary distributor.

5,769,122

## FLUID PRESSURE REDUCTION DEVICE

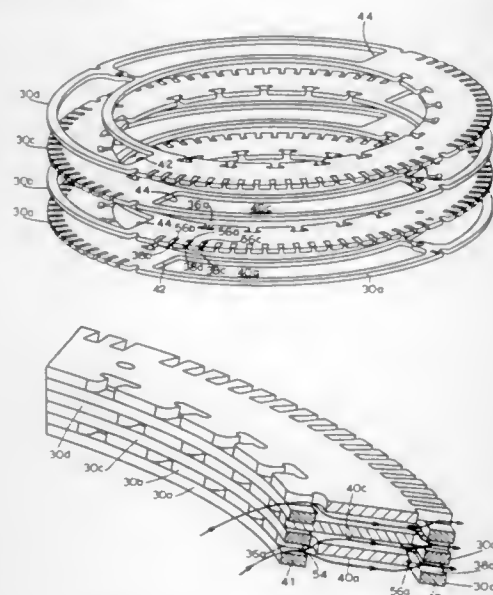
Hans D. Baumann, Rye, N.H.; Paul J. Schafbuch, Marshalltown, Iowa; Douglas P. Gethmann, Gladbrook, Iowa; Michael M. Anderson, Marshalltown, Iowa, and David J. Koester, Gladbrook, Iowa, assignors to Fisher Controls International, Inc., Clayton, Mo.

Filed Feb. 4, 1997, Ser. No. 794,470

Int. Cl.<sup>6</sup> F16K 3/24

U.S. Cl. 137—625.33

23 Claims



1. A fluid pressure reduction device comprising:  
a plurality of stacked disks having a perimeter and hollow centers aligned along a longitudinal axis;  
each disk having (a) fluid inlet stage slots partially extending from the disk center towards the disk perimeter, and (b) fluid outlet stage slots partially extending from the disk perimeter towards the disk center, and (c) at least one plenum slot extending through the disk;  
said disks selectively positioned in said stack to enable fluid flow from said fluid inlet stage slots in one disk to said plenum slots in adjacent disks and to said fluid outlet stage

slots in at least said one disk, wherein the fluid flow path is split into two initial axial directions, then into said plenum slots with multiple radial flow directions, and then distributed through multiple outlet stage slots in at least said one disk.

5,769,123

## CYLINDER ACTUATED DESCALE VALVE

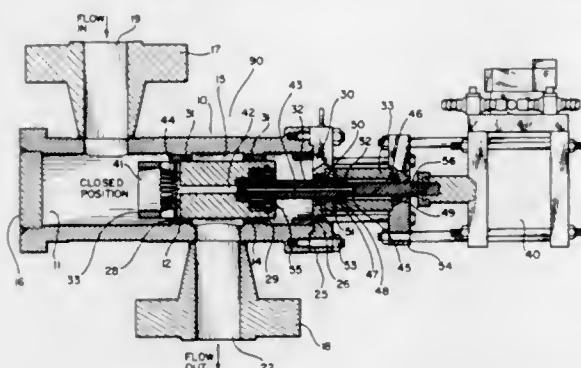
Mickey C. Heestand, Salem, and James M. Glasser, Leetonia, both of Ohio, assignors to Hunt Valve Company Inc., Salem, Ohio

Filed Feb. 26, 1997, Ser. No. 807,893

Int. Cl.<sup>6</sup> F16K 1/52

U.S. Cl. 137—625.38

3 Claims



1. A valve for controlling the flow of liquid under pressure, comprising:

A valve housing, having a longitudinal opening which is closed at both ends,

a disc closing the valve housing at one end,

inlet and outlet ports communicating with said housing opening at longitudinally spaced places therealong,

a valve plunger slidably received within said housing opening and reciprocable axially thereof, said plunger being in the form of a tubular cylinder with a flow opening at one end and cooperating with the flow of liquid through the inlet port and a plurality of flow slots and ports disposed in the defining wall of said plunger and cooperating with the said outlet port, whereby in one position said plunger communication between said inlet and outlet ports is blocked, and in the other plunger position communication between said inlet and outlet ports is effected, a plunger passage port longitudinally through said plunger to allow the flow of liquid through said flow opening, said flow slots and ports, and through said plunger so that the fluid communicates with both ends of said plunger and biases said plunger in any position,

a two-ended operator rod with one end extending into said opposite end of said plunger for effecting shifting action of said plunger to selected positions and permitting substantially unrestricted flow of liquid through and out said opposite end of said plunger and out to surround the exterior of said plunger at said opposite end and thereby provide a balancing effect to minimize liquid resistance to plunger shifting action and the other end of said operator rod extending perpendicular to and through a housing plate sealing the opposite end of the valve housing and through a piston cylinder tube disposed axially from said housing closure plate, and said operator rod having a passage port longitudinally through said operator rod and communicating with the passage port of the plunger and the piston cylinder tube and said operator rod having a plurality of radial ports communicating with said operator rod passage port to allow said fluid to flow from said opposite end of said plunger through said radial ports and through said operator rod passage port and cooperating therewith,

said housing closure plate disposed at said opposite end of said housing to seal said opposite end of said housing and adapted to slidably accept said operator rod through said housing closure plate,

a seal ring and o-ring disposed at said opposite end of said valve housing to seal said housing closure plate and said housing,

a pair of circular lands on the inter-wall surface of said valve housing being spaced apart and disposed on opposite sides of said outlet port and cooperating with the exterior surface of said plunger,

an annularly enlarged chamber formed in said valve housing between said pair of lands,

a pair of seals disposed between said pair of lands and the exterior surface of said plunger to seal and prevent fluid flow from said inlet port to said outlet port except through the cylinder plunger,

said piston cylinder tube disposed axially from said housing closure plate having a longitudinal opening of substantially uniform interior diameter along its entire length and closed at one end by said housing closure plate and closed at the opposite end by a cylinder closure plate and said cylinder piston tube adapted to slidably accept said operator rod and an actuator rod reciprocable axially thereof and within said piston cylinder tube,

said actuator rod of smaller diameter than said operator rod and at one end extending axially from said opposite end of said operator rod within said piston cylinder tube and extending perpendicular to and through said cylinder closure plate, and providing for said operator rod passage port extending slightly longitudinally into said actuator rod and cooperating with said operator rod passage port, and a plurality of actuator rod radial ports disposed in said actuator rod and cooperating with said operator rod passage port and to allow the flow of fluid continuously through said plunger, said operator rod and said actuator rod and into said piston cylinder tube,

a balancing chamber formed within said piston cylinder tube between the exterior surface of said actuator rod and the interior surface of said piston cylinder tube and cooperating with actuator rod radial ports and to allow the flow of fluid into said piston cylinder tube and to communicate with and completely balance the pressure against both ends of the said plunger and to keep said plunger in a balanced condition in any position,

a piston disposed at the juncture of said operator rod and said actuator rod adapted to slide within said piston cylinder tube and to effect positioning of said plunger,

a retaining nut disposed on said actuator rod to bias and secure said piston against said operator rod,

a vent chamber disposed between the exterior surface of said operator rod and the interior surface of said piston cylinder tube and a plurality of radial vent ports cooperating with said vent chamber to exhaust air to the atmosphere in the slidable stroke of the said piston,

said cylinder closure plate disposed at the opposite end of said cylinder piston tube to seal said cylinder piston tube and bored to slidably accept said actuator rod perpendicularly and through said cylinder closure plate,

actuator rod seals disposed within said piston cylinder tube at said cylinder closure plate end to seal said cylinder closure plate to said piston cylinder tube,

an operator means disposed at the opposite end of said actuator rod to urge said plunger to selected position.

5,769,124

FRESH WATER SUPPLY SYSTEM FOR AN AIRCRAFT  
Joachim Ehrhardt, Beckdorf, Germany, assignor to Daimler-Benz Aerospace Airbus GmbH, Hamburg, Germany

Filed Mar. 12, 1997, Ser. No. 815,570

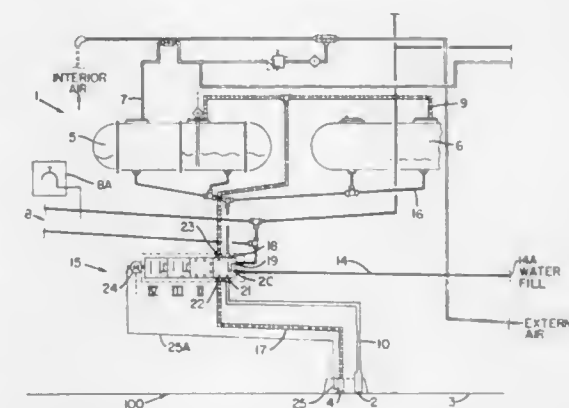
Claims priority, application Germany, Mar. 14, 1996, 196 09 939.0

Int. Cl.<sup>6</sup> E03B 7/07

U.S. Cl. 137—625.47

20 Claims

1. A water supply system for an aircraft including at least one water-using device, said water supply system comprising a ventilatable water tank,



a water supply line adapted to be connected to said water-using device for supplying water thereto,  
a fresh water filling line,  
a drain line, and

a multi-function valve interposed between said water tank, said supply line, said filling line, and said drain line, wherein said valve comprises a valve housing and a shut-off element movably arranged in said housing,

wherein said housing includes a filling port connected to said filling line, a tank port connected to said water tank, a supply port connected to said supply line, and a drain port connected to said drain line, and

wherein said shut-off element has a water flow passage therein including and terminating in a first branch, a second branch, and a third branch.

5,769,125

## INVERSION-RESISTANT, READILY OPENABLE TIDE GATE VALVE

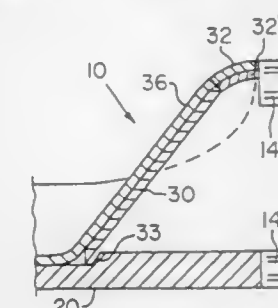
Michael Duer, Spiros G. Raftis, both of Pittsburgh, and A. Thomas Abromaitis, Sewickley, all of Pa., assignors to Red Valve Company, Inc., Carnegie, Pa.

Filed Mar. 27, 1996, Ser. No. 622,824

Int. Cl.<sup>6</sup> F16K 15/14

U.S. Cl. 137—844

19 Claims



1. An inversion-resistant tide gate valve comprising:  
(a) a generally tubular sleeve bounding a longitudinally-extending flow-through passage for fluids, said sleeve having an upstream fluid inlet end region adapted to be affixed to an effluent conduit and a downstream fluid outlet region;  
(b) said downstream fluid outlet region of said sleeve being integrally formed with a longitudinally-extending semi-cylindrical trough, said trough having a bottom wall and a pair of side walls integral with said bottom wall, said trough formed with said downstream fluid outlet region of said sleeve so as to provide a flow-through passage for said fluids;  
(c) a disc comprising a first material affixed along a first portion of its periphery to a flexible hinge member, said flexible hinge member affixed to and interposed between said disc and said downstream fluid outlet region of said sleeve, said flexible hinge member comprising a second material which is more

said on-machine-seamable papermakers' fabric having a first end and a second end joinable to said first end during installation of said fabric on a paper machine to place said fabric into the form of an endless loop; said first end having a plurality of first seaming loops formed by MD yarns of said first system of MD yarns and said second end having a plurality of second seaming loops formed by MD yarns of said second system of MD yarns, said first seaming loops at



said first end being interdigitated with said second seaming loops at said second end, when said first and second ends are brought together on the paper machine, thereby defining a passage through which a pintle is directed to join said first and second ends together.

5,769,132

**PROJECTILE OR GRIPPER SHUTTLE LOOM WITH ANTI-BALLOONING CONE FOR WEFT FEEDER**

Lars Helge Gottfrid Tholander, and Joachim Fritzson, both of Ulricehamn, Sweden, assignors to Iro AB, Ulricehamn, Sweden

PCT No. PCT/EP94/03059, § 371 Date May 13, 1996, § 102(e) Date May 13, 1996, PCT Pub. No. WO95/08013, PCT Pub. Date Mar. 23, 1995

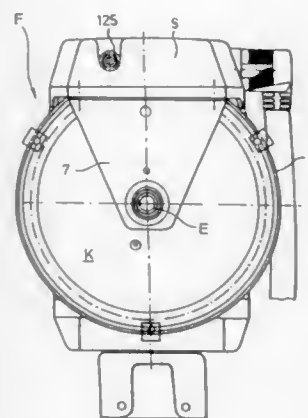
PCT Filed Sep. 13, 1994, Ser. No. 615,304

Claims priority, application Sweden, Sep. 15, 1993, 9303084; Oct. 4, 1993, 9303266

Int. Cl.<sup>6</sup> D03D 47/34; B65H 51/22

U.S. Cl. 139—450

19 Claims



1. A projectile or gripper shuttle loom comprising a weft-thread delivery unit having a stationary drum for withdrawal of a weft yarn stored in windings on said drum over an end thereof, a withdrawal eye arranged in a yarn path through which said yarn is withdrawn downstream of said drum, and a yarn brake which is provided downstream of said withdrawal eye for braking said yarn being withdrawn, said yarn path being enclosed by at least one hollow body which extends from a circumferential surface of said drum toward said withdrawal eye at least in an axially limited segment, said circumferential surface extending in approximately parallel fashion up to a withdrawal edge of said drum, a cylindrical annular body surrounding said circumferential surface near said withdrawal edge at a radial distance therefrom, at least one of said hollow body and said annular body being fixed on a mounting on an extension arm of said delivery unit in an axially adjustable manner, said at least one hollow body being disposed coaxial to a drum axis of said drum and having on an inner side thereof a plurality of inwardly protruding balloon disturbing and braking elements which end at a distance from said drum, said elements forming circumferentially acting projections and deposit surfaces for said weft yarn, said elements contacting said yarn when said yarn is braked for limiting ballooning of said yarn.

**5,769,133  
POWER ACTUATED HANDHELD TENSIONING AND CUTOFF TOOL**

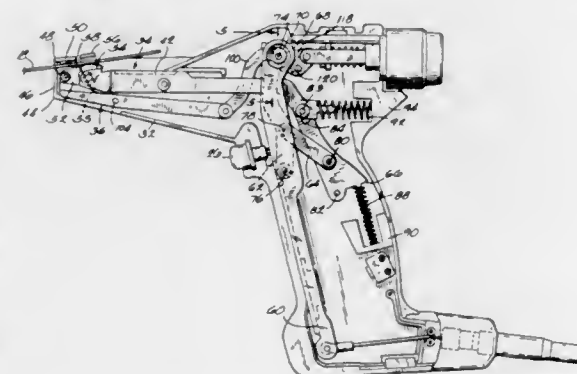
Edward Paul Dyer, Germantown, and William Karl Lueschen, Cedarburg, both of Wis., assignors to Tyton-Hellermann Corp., Milwaukee, Wis.

Filed Apr. 8, 1997, Ser. No. 841,935

Int. Cl.<sup>6</sup> B21F 9/00

U.S. Cl. 140—123.6

52 Claims



1. A power assisted tensioning and cutoff tool system comprising:

- a remote power unit;
- a handheld unit operable to tension a cable tie and to cutoff the excess portion of the cable tie when a predetermined tension has been achieved in the cable tie;
- a power transfer member interconnecting the remote power unit with the handheld unit for transferring actuating power from the remote power unit to the handheld unit; and
- a user actuatable trigger for actuating the remote power unit to transfer actuating power to the handheld unit.

5,769,134

**VARIABLE SPEED PUMP-MOTOR ASSEMBLY FOR FUEL DISPENSING SYSTEM**

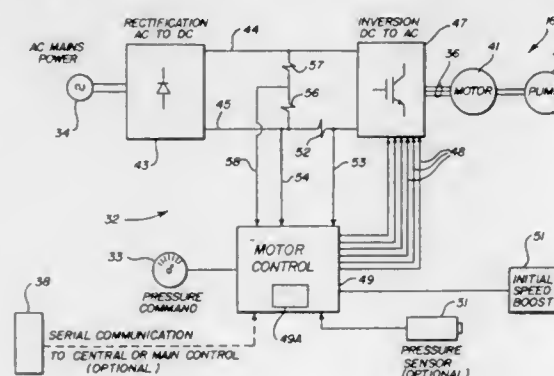
Donald P. Kenney, McFarland, Wis., and David M. Triezenberg, Fort Wayne, Ind., assignors to Fe Petro Inc., McFarland, Wis.

Continuation of Ser. No. 500,709, Jul. 11, 1995, Pat. No. 5,673,732. This application Aug. 19, 1997, Ser. No. 916,966

Int. Cl.<sup>6</sup> B67D 5/00

U.S. Cl. 141—59

21 Claims



1. A fuel dispensing system for a service station for motor vehicles, said fuel dispensing system comprising:

- an underground fuel storage tank that stores a quantity of liquid fuel for motor vehicles;
- a plurality of fuel dispensers that deliver said fuel to motor vehicle tanks, each of said fuel dispensers comprising:
- a fuel dispensing hose;
- a nozzle fluidly coupled to said fuel dispensing hose; and

a switch for allowing said fuel dispenser to be placed in a fuel-dispensing state in which said fuel dispenser dispenses fuel and a non-fuel dispensing state in which said fuel dispenser is not dispensing fuel, each of said switches of said fuel dispensers being independently operable;

an underground fuel flow conduit network that conveys fuel from said underground fuel storage tank to said fuel dispensers;

a submersible fuel pump assembly that pumps fuel from said underground fuel storage tank through said underground fuel flow conduit network to said fuel dispensers, said submersible fuel pump assembly being located within said underground fuel storage tank and at least a portion of said submersible fuel pump assembly being submerged in said liquid fuel disposed in said underground fuel storage tank, said submersible fuel pump assembly comprising:

- a fuel pump;
- an electric motor operable at an adjustable speed and operatively coupled to drive said fuel pump; and
- a casing in which said fuel pump and said electric motor are disposed;

a vapor recovery system associated with said fuel dispensers adapted to recover fuel vapors from motor vehicle tanks, said vapor recovery system comprising a vapor recovery conduit for each of said fuel dispensers;

a sensor that generates a signal representing a parameter of electrical power drawn by said electric motor;

means for selecting a fluid pressure;

an AC-to-DC converter adapted to be connected to a source of AC power, said AC-to-DC converter generating a DC voltage from said AC power;

a DC-to-AC inverter operatively coupled between said AC-to-DC converter and said electric motor that converts said DC voltage generated by said AC-to-DC converter into an AC voltage having a frequency that may be adjusted; and

a controller operatively coupled to said DC-to-AC inverter via a plurality of control lines and being operatively coupled to said fluid-pressure selecting means and said sensor, said controller controlling the rate at which fuel is delivered from said underground fuel storage tank to said fuel dispensers, said controller causing the fuel pressure at a point within said underground fuel flow conduit network to be maintained substantially constant so that fuel is delivered from said underground fuel storage tank through said underground fuel flow conduit network to each of said fuel dispensers that is in said fuel-dispensing state at a fuel flow rate of at least approximately eight gallons per minute and not exceeding approximately ten gallons per minute, said controller controlling said adjustable speed of said electric motor in response to said signal generated by said sensor and in response to said fluid pressure selected by said fluid-pressure selecting means to maintain substantially constant said fuel pressure at said point within said underground fuel flow conduit network.

5,769,135

**STEAM OUTLET TUBE ASSEMBLY FOR MAKING BEVERAGES**

Gotthard Mahlich, Kronberg, Germany, assignor to Eugster/Frisma AG, Romanshorn, Switzerland

Filed Feb. 13, 1996, Ser. No. 600,446

Claims priority, application Germany, Feb. 17, 1995, 295 02 594.8

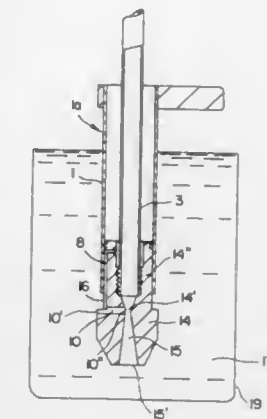
Int. Cl.<sup>6</sup> A47J 31/24

U.S. Cl. 141—70

11 Claims

11. A steam outlet tube assembly for preparing beverages, comprising:

- (a) a steam tube having a terminal length portion including an outlet end; said steam tube being adapted to guide steam therein and eject the steam through said outlet end of said steam tube; in operation said outlet end of said steam tube being submerged in a liquid;



- (b) a first conduit having an inlet end and an outlet end; said outlet end of said first conduit being located at said terminal length portion of said steam tube; in operation said inlet end of said first conduit being submerged in the liquid;
- (c) a second conduit having an inlet end and an outlet end; said outlet end of said second conduit being located at said terminal length portion of said steam tube; in operation said inlet end of said second conduit being in communication with air; and
- (d) means for selectively placing said second conduit into an unblocked position and into a blocked position; in said unblocked position the steam passing through said steam tube draws liquid through said first conduit and draws air through said second conduit to effect a discharge of a steam/liquid/air mixture through said outlet end of said steam tube; in said blocked position the steam passing through said steam tube draws liquid through said first conduit, to effect a discharge of solely a steam/liquid mixture through said outlet end of said steam tube.

5,769,136

**LIQUID METERING-FILLING APPARATUS**

Toshio Kanematsu, Yoshihiro Saijo, and Michio Ueda, all of Tokushima, Japan, assignors to Shikoku Kakoki Co., Ltd., Tokushima, Japan

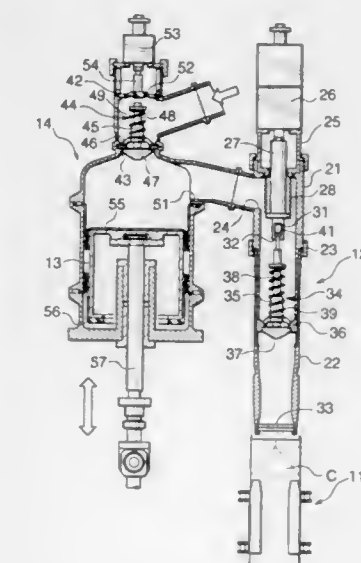
Filed Nov. 20, 1996, Ser. No. 754,590

Claims priority, application Japan, Nov. 22, 1995, 7-304020

Int. Cl.<sup>6</sup> B65B 1/04

U.S. Cl. 141—129

6 Claims



1. A liquid metering-filling apparatus comprising:

a container transport conveyor intermittently drivable so as to halt containers one by one at a filling station;  
 a filling nozzle disposed above a path of transport of containers at said filling station;  
 a metering cylinder housing a piston and having an outlet in communication with said filling nozzle;  
 an inlet check valve provided at an inlet of said metering cylinder;  
 an outlet check valve provided at any one of said outlet of said metering cylinder and inside said filling nozzle;  
 drive means for causing said piston to perform a cycle of stroking movement every time said conveyor is driven by one pitch;  
 a first sensor means for detecting any one of a presence and an absence of a container of said containers at said filling station;  
 a second sensor means for detecting any one of a presence and an absence of a container of said containers at said stop station immediately preceding said filling station upstream therefrom; and  
 valve opening-closing means for opening said inlet check valve upon said first sensor means detecting said absence of a container of said containers and said second sensor means detecting said presence of a container of said containers.

5,769,137

Patent Not Issued For This Number

#### 5,769,138 NOZZLE AND ADAPTER FOR LOADING MEDICAMENT INTO AN INJECTOR

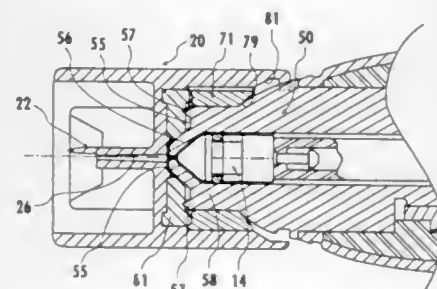
Peter L. Sadowski, Woodbury; Sheldon Nelson, New Hope, both of Minn.; David Schiff, Highland Park, N.J., and Walter Stoeckmann, Mahopac, N.Y., assignors to Medi-Ject Corporation, Minneapolis, Minn.

Filed Apr. 1, 1996, Ser. No. 625,881

Int. Cl.<sup>6</sup> B65B 1/04

U.S. Cl. 141—329

22 Claims



1. An injector nozzle comprising a body defining a chamber, with a portion of the body having an orifice communicating with the chamber for allowing fluid to enter into or exit from the chamber; said body portion including at least one depression comprising an entry portion and a seating portion which are positioned in spaced relation by an intermediate portion; said depression configured and dimensioned to cooperatively engage with a tab member of an associated component for coupling thereto; said depression further configured and dimensioned to positively lock the body portion to the associated component wherein the intermediate portion is narrower in width than the seating portion to provide positive feedback when said tab member engages the seating portion.

5,769,139

Patent Not Issued For This Number

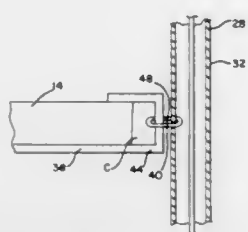
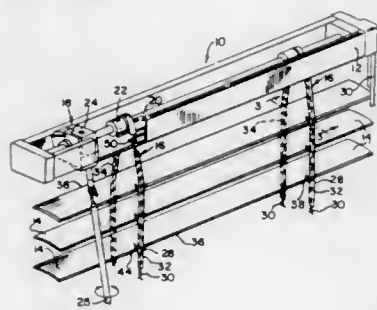
#### 5,769,140 HOLELESS WINDOW BLIND

Zeki Tuzmen, 11 Wakefield, Irvine, Calif. 92620  
 Filed Sep. 17, 1996, Ser. No. 715,127

Int. Cl.<sup>6</sup> E06B 9/30

U.S. Cl. 160—168.1 R

15 Claims



1. A window blind having a headrail housing a tilt assembly and a plurality of slats, the slats further having opposed external longitudinal edges, the blind comprising:

a sleeve extending from the tilt assembly to a bottommost slat along at least one external longitudinal edge of each slat, wherein the external longitudinal edge extends substantially the entire length of each slat;  
 a means for connecting the sleeve to each slat; and  
 a lift cord within the sleeve, and extending from the headrail to the bottommost slat wherein the cord is attached thereto.

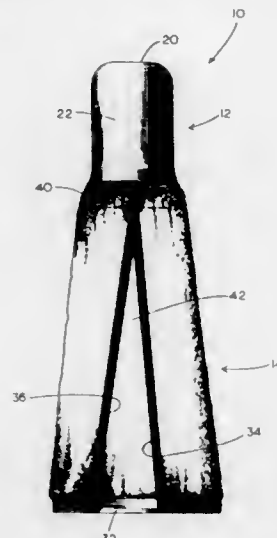
#### 5,769,141 COMBINATION GOLF CLUB HEAD COVER AND GOLF TOWEL

Gary F. Rinehard, 1024 Climburg Rose Turn, Cary, N.C. 27511  
 Filed May 2, 1997, Ser. No. 850,797

Int. Cl.<sup>6</sup> A63B 57/00

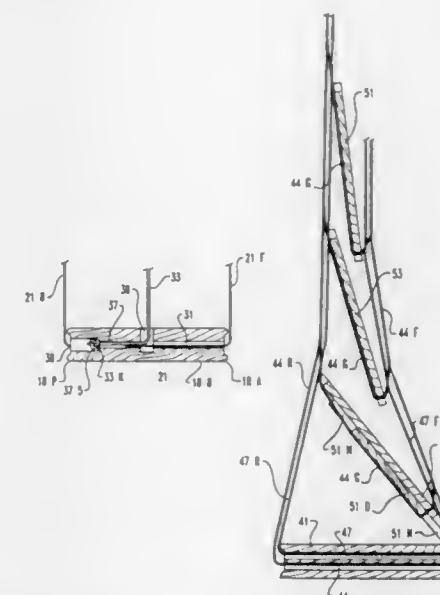
U.S. Cl. 150—160

17 Claims



1. A combination golf club head cover and golf towel comprising: a head cover section including a closed end and a surrounding

side having an outer terminal edge portion that forms a club head opening through which a club head passes as it is inserted into the head cover section; an integral towel section secured to the club head opening of the head cover section and extending therefrom; the towel section including a connecting end portion, a free end portion, and a pair of opposed side edge portions; wherein the connecting end portion of the towel section is connected to the terminal edge portion of the head cover section in such a fashion that the towel section forms a wrap around having an elongated slit, defined by the pair of side edge portions of the towel section, that extends from adjacent the club head opening of the head cover section to the free end portion of the towel section; and wherein the pair of side edges of the towel section are secured together and overlapped for a relatively short segment adjacent the area where the club head cover section and the towel section join.



#### 5,769,142 DEVICE FOR OPERATING VENETIAN BLINDS BY MAGNETIC MECHANISM

Giovanni Nicolosi, Codogno, Italy, assignor to Pellini S.R.L., Milan, Italy

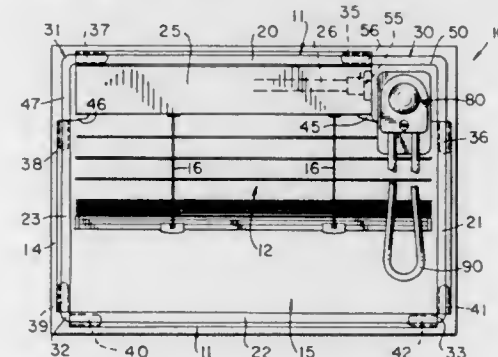
PCT No. PCT/IT94/00121, § 371 Date Jul. 23, 1996, § 102(e)  
 Date Jul. 23, 1996, PCT Pub. No. WO95/24539, PCT Pub. Date Sep. 14, 1995

PCT Filed Jul. 22, 1994, Ser. No. 682,530

Claims priority, application Italy, Mar. 11, 1994, M194A0460  
 Int. Cl.<sup>6</sup> E06B 3/32

U.S. Cl. 160—107

12 Claims



1. A pane device with venetian blinds, comprising two panes of glass forming a sealed chamber; a blind arranged within said sealed chamber; a horizontal shaft for supporting and operating said blind; an internal mechanism provided for rotating said shaft; and an external mechanism operating outside said sealed chamber, said mechanisms having magnetic connection means with lines of forces passing through one of said panes of glass, said internal mechanism has a body and a gearing-down unit including a rotor placed in said body and carrying satellite pinions meshing with a fixed crown gear coaxial with said rotor and with circumferential teeth of a coaxial shaft, so that a rotation impressed on said coaxial shaft is transmitted to said rotor at a divisor ratio corresponding to a ratio between said teeth of said shaft and said crown gear, said rotor being connected with said horizontal shaft for supporting and operating said blind.

#### 5,769,143 VENETIAN BLIND WITH SMOOTH BOTTOM RAIL

Joe N. Morgan, Otterbein; Jay R. Cleaver, Lafayette; Mark A. Parker, Lafayette, and William C. Schultz, Lafayette, all of Ind., assignors to Lafayette Venetian Blind, Inc., West Lafayette, Ind.

Filed Mar. 20, 1996, Ser. No. 618,985

Int. Cl.<sup>6</sup> E06B 9/30

U.S. Cl. 160—168.1 R

5 Claims

1. In a venetian blind assembly having a headrail, a bottom rail having a top and a bottom and a front and a rear, a plurality of

horizontal slats, a flexible ladder assembly holding the slats in vertically spaced relationship in a series, lift cords to raise and lower the blind, the blind having a front and a rear, the improvement comprising:

engagement of the ladder assembly with the bottom rail only at locations above the bottom; and wherein the bottom rail has a transverse hole extending through the rail from the rear to the front; the ladder assembly has a cord extending through the transverse hole and upward from the rear of the bottom rail to the headrail and upward from the front of the bottom rail to the headrail; the bottom rail has a second transverse hole extending through the rail from the rear to the front; one of said lift cords extends through the second transverse hole and up from the front of the bottom rail to the headrail and upward from the rear of the bottom rail to the headrail; and the second transverse hole is above the first-mentioned transverse hole.

#### 5,769,144 EYELET REINFORCEMENT FOR CURTAINS

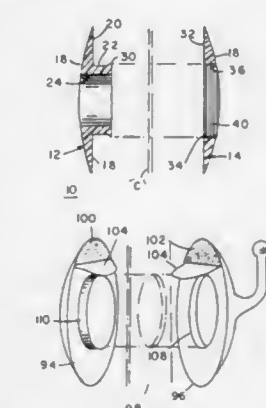
Damon A. Carter, 320 Newbury St., Unit 106, Danvers, Mass. 01923

Filed Sep. 4, 1996, Ser. No. 707,519

Int. Cl.<sup>6</sup> A47H 1/00

U.S. Cl. 160—330

10 Claims



1. An eyelet reinforcement for application to an eyelet of a thin flexible sheet, for the repairing and strengthening of that sheet and eyelet, comprising:



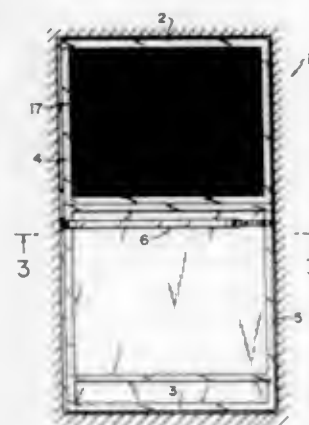
a first disc of plastic having a first generally hemispherically shaped side and a second planar side;  
a centrally disposed bore extending through said first disc, from said first side to said second side;  
a hollow standoff extending off of said second side of said first disc, in coaxial alignment with said bore in said first disc;  
a second disc of plastic having a first generally hemispherically shaped side and a second planar side;  
a centrally disposed bore extending through said second disc from said first side towards said second side, said bore in said second disc having a plurality of rings spaced therethrough, to provide a roughened surface for said ridge on the distal end of said standoff to securely engage;  
an annular surface surrounding each of said bores on said planar sides of said first and second discs; and  
a radially outwardly extending ridge disposed on the distal end of said standoff, to engage one of said rings within said bore within said second disc, so as to securely maintain said sheet between said discs when said discs are pressed together.

**5,769,145**  
**ADJUSTABLE MEANS FOR OPENING A DOOR LATCH**  
Frank Kwatonowski, 5 Lamington Rd., Whitehouse, N.J. 08888-0427

Filed Mar. 31, 1997, Ser. No. 828,570  
Int. Cl.<sup>6</sup> A47G 5/00

U.S. Cl. 160—371

12 Claims



1. An assembly for opening a door latch used in combination with a door, said door comprising a top rail, a bottom rail each substantially parallel to each other and secured to a pivot stile and a lock stile each substantially parallel to the other, a central portion of said door encased by said top rail, said bottom rail, said pivot stile and said lock stile, said door also having mechanical fastening means situated on said lock stile which cooperates;  
said assembly comprising a push-bar having a fulcrum end and a lock end attached respectively to said pivot stile and said lock stile of said door and spanning the distance between said pivot stile and said lock stile;  
said lock end of said push-bar comprising an end piece that envelopes said mechanical fastening means;  
said end piece being integrally connected to a connecting bar at a first end of said bar, said connecting bar having a second end secured to a lock end, said lock end being fastened to a first end of positioning means which maintains said assembly in a spaced relationship away from said door, said positioning means also having a second end which is fastened to said pivot stile.

**5,769,146**

Patent Not Issued For This Number

**5,769,147**  
**METHOD FOR PRODUCING METALLIC INGOT FOR PLASTIC WORKING**

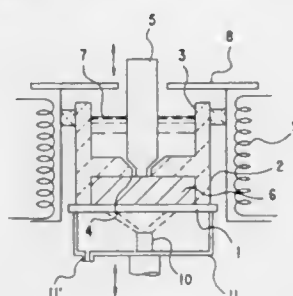
Shigeru Yanagimoto; Masashi Fukuda; Yoshiaki Sutou, and Takayuki Kato, all of Kitakata, Japan, assignors to Showa Denko Kabushikikaisha, Tokyo, Japan

Filed Dec. 6, 1995, Ser. No. 568,255

Claims priority, application Japan, Dec. 6, 1994, 6-330546  
Int. Cl.<sup>6</sup> B22D 27/04

U.S. Cl. 164—122.1

4 Claims



1. A method for producing a metallic ingot for plastic working, comprising the steps of:  
locating a main mold on a cooling plate and a melt reservoir above the main mold;  
filling the main mold with a metallic melt from the melt reservoir through a sprue of the main mold without leaving a clearance in the mold;  
closing the sprue by an openable plug thereby forming a portion of the mold by a front end of the openable plug;  
and  
cooling the cooling plate so as to forcedly cool the metallic melt to produce the metallic ingot.

**5,769,148**  
**OSCILLATING DEVICE FOR A CONTINUOUS CASTING MOLD**

Hans-Peter Kaiser, and Jürgen Hemmerle, both of Düsseldorf, Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Germany

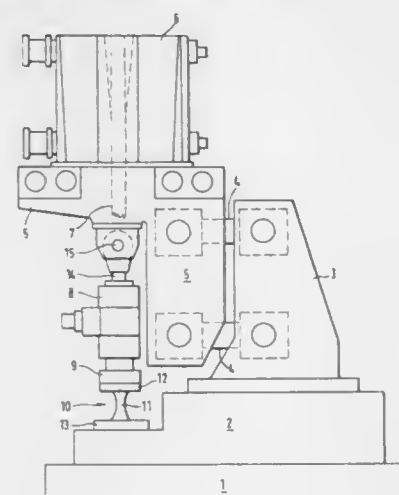
Filed Nov. 1, 1996, Ser. No. 743,430

Claims priority, application Germany, Nov. 4, 1995, 195 41 164.1

Int. Cl.<sup>6</sup> B22D 11/04

U.S. Cl. 164—416

3 Claims



1. A continuous casting mold guided in a casting direction on a support frame, the continuous casting mold comprising an oscillating device comprising servo hydraulic cylinders mounted on the support frame, the servo hydraulic cylinders comprising piston

rods connected to the continuous casting mold for moving the continuous casting mold in an oscillating manner, each servo hydraulic cylinder having a bottom, further comprising an elastic fastening element connected to the bottom of each servo hydraulic cylinder, the elastic fastening element being fastened on the support frame, wherein the elastic fastening element is configured such that bending of the elastic fastening element occurs without bending of the piston rods to permit pivoting of the hydraulic cylinders.

**5,769,149**  
**PLANT FOR PRODUCING HOT-ROLLED STEEL STRIP**  
Werner Mertens, Viersen, Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Germany

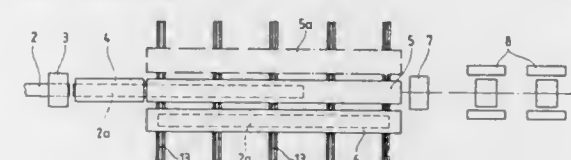
Filed Jun. 27, 1996, Ser. No. 673,803

Claims priority, application Germany, Jul. 1, 1995, 195 24 082.0

Int. Cl.<sup>6</sup> B22D 11/12; B21B 1/46

U.S. Cl. 164—418

3 Claims



1. A plant for producing hot-rolled steel strip in a production line comprising a continuous slab casting plant, transverse cutting shears, a continuous furnace and a hot finishing rolling train, wherein the continuous furnace comprises a first stationary section and a second section downstream of the first section, the second section comprising two moveable furnaces, the moveable furnaces being transversely moveable such that a first of the moveable furnaces is located in the production line and a second of the moveable furnaces is in a holding position located laterally of the production line.

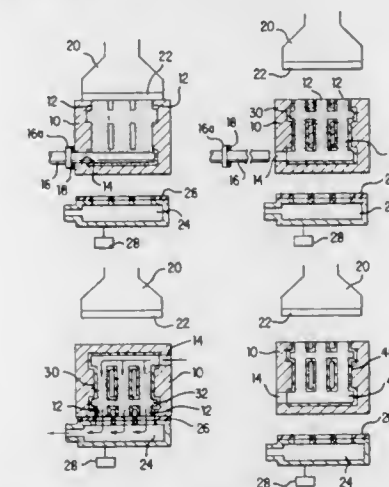
**5,769,150**  
**METHOD FOR FORMING HOLLOW CORE**  
Tokiharu Fukuda, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Oct. 10, 1996, Ser. No. 727,989

Claims priority, application Japan, Oct. 13, 1995, 7-265669  
Int. Cl.<sup>6</sup> B22C 9/10

U.S. Cl. 164—456

4 Claims



1. A method for forming a hollow core, comprising the steps of:  
preparing a mould for core formation having a core sand filling space within the mould;

providing a filling hole and air inlet hole each connecting with said core sand filling space through said mould;  
closing said air inlet hole;  
filling said core sand filling space with core sand through said filling hole;  
heating said mould filled with core sand;  
opening said inlet hole;  
sucking out the unhardened core sand filled in said space through said filling hole, whereby air is introduced into the space through said air inlet hole and sucked out through said filling hole;  
measuring a pressure at said filling hole when the unhardened core sand is sucked out; and  
comparing the measured pressure with a predetermined pressure, whereby hollowness of the hollow core is checked while the core is within said mould.

**5,769,151**  
**METHODS FOR CONTROLLING THE SUPERHEAT OF THE METAL EXITING THE CIG APPARATUS IN AN ELECTROSLAG REFINING PROCESS**

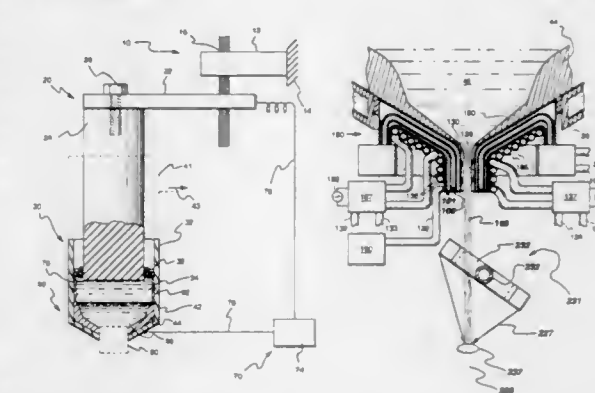
William Thomas Carter, Jr., Galway; Mark Gilbert Benz, Burnt Hills; Robert John Zabala, Schenectady; Bruce Alan Knudsen, Amsterdam, and Paul Leonard Dupree, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 21, 1995, Ser. No. 576,791

Int. Cl.<sup>6</sup> B22D 23/10; C23C 4/12

U.S. Cl. 164—457

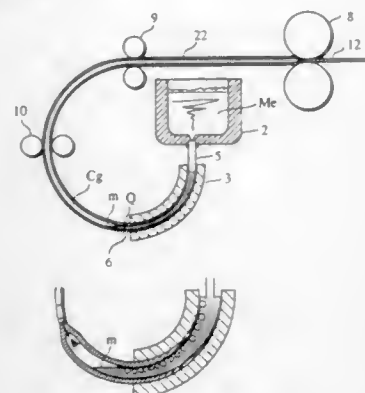
10 Claims



1. A method for controlling the temperature of the melt exiting a cold wall induction guide tube mechanism comprising the steps of:  
providing a cold wall induction guide tube mechanism including a neck having an exit orifice;  
operatively forming a skull of melt in the mechanism;  
providing a reservoir of melt above the mechanism;  
providing a stream of melt exiting the exit orifice of the mechanism;  
selectively controlling the temperature of the stream of melt exiting the exit orifice by selectively heating at least one portion of the cold wall induction guide tube mechanism proximate the exit orifice of the mechanism, wherein the temperature of melt flowing from the exit orifice of the mechanism is selectively increased or decreased thereby controlling the temperature of the melt provided to an atomization zone;  
the selectively controlling the temperature of the stream of melt exiting the exit orifice by selectively heating at least one portion of the cold wall induction guide tube mechanism proximate the exit orifice of the mechanism further comprising controllably power supplied to the at least one portion of the cold wall induction guide tube mechanism to selectively control the temperature of the stream of melt;  
forming a spray at the atomization zone;  
scanning the spray in a predetermined spray angle; and  
coordinating the scanning the spray in a predetermined spray angle with the controllably power, thereby providing the

spray with a temperature gradient so spray at an outer portion is at a higher temperature than spray at an inner portion.

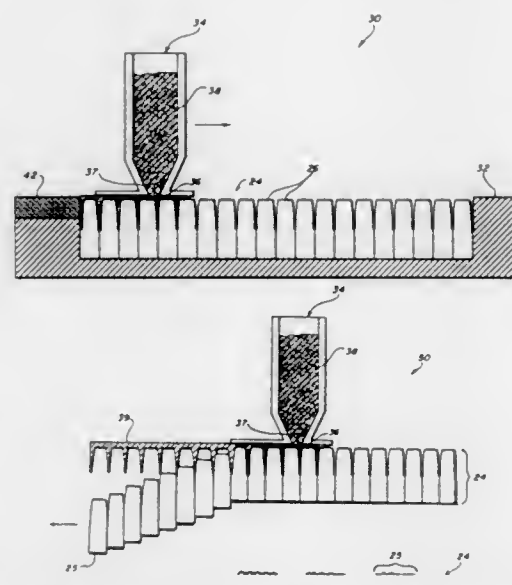
5,769,152  
CONTINUOUS CASTING PROCESS AND CONTINUOUS  
CASTING/ROLLING PROCESS FOR STEEL  
Katsuhiko Yamada, 2-6, Fujiwaradaikitamachi 3-chome, Kita-  
ku, Kobe-shi, Hyogo 651-13, Japan  
Filed Nov. 25, 1994, Ser. No. 348,927  
Claims priority, application Japan, Nov. 25, 1993, 5-321096  
Int. Cl.<sup>6</sup> B22D 11/12  
U.S. Cl. 164—476 6 Claims



1. A continuous casting process for steel, the process comprising the steps of:  
stalling a molten core inside a strand at a specific point Q in a pass of said strand to form a cored portion including no molten steel in said strand downstream of said specific point Q; and  
welding said cored portion by a pair of rolls under pressing said rolls drawing said cored strand through a curved continuous casting path such that the strand pass is curved immediately after said strand leaves a casting mold said curved portion of the strand pass being set to be 1/4 or more of the circumference of a circle, said specific point Q being set by filling an inert gas into said cored portion beforehand and solidified shell thickness ratios  $\alpha, \alpha'$  are set to be in the range of 0.05 to 0.5.

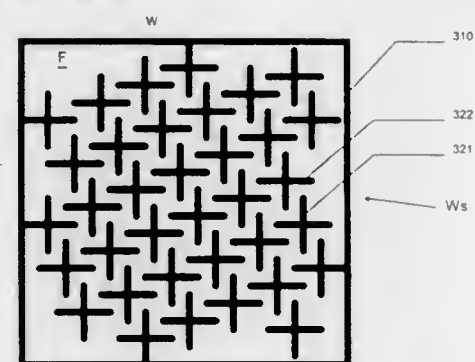
5,769,153  
METHOD AND APPARATUS FOR CASTING THIN-  
WALLED HONEYCOMB STRUCTURES  
Jack D. Ayers, Oakton, Va., assignor to The United States of  
America as represented by the Secretary of the Navy, Wash-  
ington, D.C.  
Filed Nov. 7, 1996, Ser. No. 745,169  
Int. Cl.<sup>6</sup> B22D 11/06; 29/04  
U.S. Cl. 164—479 14 Claims

1. A process for making a honeycomb structure of a selected material, comprising the steps:  
disposing molten material in a melt container disposed over a mold, wherein said melt container has an opening for releasing molten material into said mold, wherein said mold is shaped for molding said honeycomb structure, wherein said mold comprises a plurality of dies;  
moving said melt container relative to said mold, wherein said molten material flows out of said opening into said mold; and  
removing said mold from said material wherein, said step of removing said mold from said material comprises removing said dies in a predetermined sequence, at predetermined times, wherein each of said predetermined times is at least as long as a time necessary for at least a portion of said material in contact with said die to reach a temperature wherein said material can maintain its shape after removal of said die.



14. An apparatus for making a honeycomb structure of a selected material, comprising:  
a mold shaped for molding said honeycomb structure;  
a melt container, disposed over said mold, having an opening for releasing molten material into said mold; and  
a conveyor, for moving said melt container relative to said mold as said melt container releases said molten material into said mold;  
wherein said mold comprises a plurality of dies, and wherein said conveyor is adapted for removing said dies from said material in a predetermined sequence, at predetermined times after said melt container releases said molten material into said mold, wherein each of said predetermined times is at least as long as a time necessary for a portion of material in contact with said die said to reach a temperature wherein said material can maintain its shape after the removal of said die.

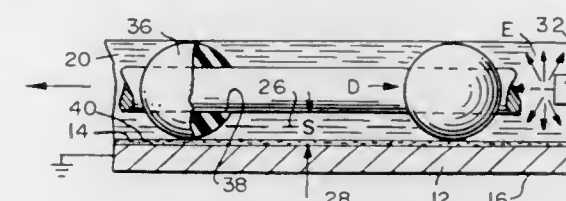
5,769,154  
HEAT PIPE WITH EMBEDDED WICK STRUCTURE  
Douglas Ray Adkins; David S. Shen; Melanie R. Tuck; David W. Palmer, all of Albuquerque, and V. Gerald Grafe, Corrales, all of N. Mex., assignors to Sandia Corporation, Albuquerque, N. Mex.  
Filed Jan. 29, 1996, Ser. No. 593,596  
Int. Cl.<sup>6</sup> F28D 15/00  
U.S. Cl. 165—104.26 12 Claims



1. A wick structure comprising a substrate having a surface with a width and a length not less than the width, and a plurality of projections disposed on the surface in an arrangement so that no straight fluid communication path can be drawn across the surface that does not intersect at least one projection, wherein the surface defines an x axis disposed along the surface, and a y axis disposed along the surface at an angle to the x axis, and wherein the projections comprise:

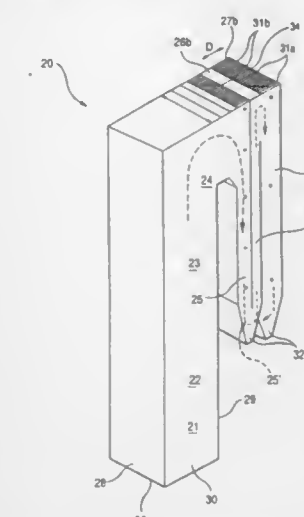
a) a plurality of first projections extending from the surface, where each of the first projections has a length along the x-axis and extends from a first point (x1, y1) to a second point (x1, y2);  
b) a plurality of second projections extending from the surface, where each of the second projections has a length along the y-axis and extends from a first point (x1, y1) to a second point (x2, y1); and  
wherein the arrangement comprises:  
c) each first projection separated from every other first projection by at least one of: a first x-distance along the direction of the x axis, and a first y distance along the direction of the y axis;  
d) each second projection separated from every other second projection by at least one of: a second x-distance along the direction of the x axis, and a second y-distance along the direction of the y axis; and  
e) where every line parallel to the y axis encounters at least one second projection and every line parallel to the x axis encounters at least one first projection.

5,769,155  
ELECTROHYDRODYNAMIC ENHANCEMENT OF HEAT  
TRANSFER  
Michael M. Ohadi, Columbia, and Serguei V. Dessiatoun, Colmar Manor, both of Md., assignors to University of Maryland, College Park, Md.  
Filed Jun. 28, 1996, Ser. No. 673,424  
Int. Cl.<sup>6</sup> F28F 13/12  
U.S. Cl. 165—109.1 20 Claims



1. An apparatus for electrohydrodynamic (EHD) augmentation of heat transfer with a working fluid comprising:  
a heat transfer surface, said surface being formed with fins extending from a side of said surface for contact with the working fluid, said fins defining a channel having confronting sidewalls;  
an elongated, electrically conductive electrode disposed in the channel in relatively closely spaced relation between the sidewalls for carrying a current and producing an electric field when energized for interacting with the heat transfer surface and working fluid to enhance heat exchange with the surface; and  
at least one insulator disposed about the electrode for engaging the channel in longitudinal spaced locations therealong, said insulator for supporting the electrode in closely spaced stand-off relation with the sidewalls sufficient for preventing excessive current flow between the electrode and the heat exchange surface through the working fluid, and the longitudinal spacing of the insulator facilitating convective and conductive heat transfer of the working fluid with the surface.

5,769,156  
ECONOMIZER SYSTEM WITH SIDE-BY-SIDE  
ECONOMIZERS  
Jan Storbacka, Varkaus, Finland, assignor to Ahlstrom Machinery Oy, Helsinki, Finland  
Filed May 31, 1996, Ser. No. 657,843  
Claims priority, application Finland, Jun. 2, 1995, 952707  
Int. Cl.<sup>6</sup> F28F 9/22; F22D 1/02  
U.S. Cl. 165—145 22 Claims

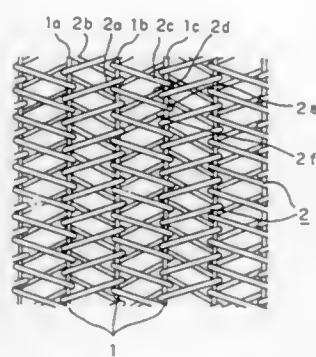


1. An economizer system for recovering heat energy from hot gas flowing therethrough, comprising:  
a source of hot gas including an outlet from which the hot gas flows in a first generally horizontal direction;  
first and second economizers for heating liquid flowing there-through by bringing the liquid into heat exchange relationship with the hot gas, said economizers being downstream, in the first generally horizontal direction of the gas, of said source of hot gas and mounted side-by-side, extending in a second generally horizontal direction substantially transverse to the first direction;  
an intra-economizer flow channel extending between said first and second economizers for directing hot gas exiting said first economizer after flowing in heat exchange relationship with the liquid flowing within said first economizer, from said first economizer into said second economizer to flow in a heat exchange relationship with the liquid flowing within said second economizer; and  
wherein said first economizer has a top and a bottom, and has a gas inlet adjacent said top and a gas outlet adjacent said bottom; wherein said second economizer has a top and a bottom, and has a gas inlet adjacent said second economizer top and a gas outlet adjacent said second economizer bottom; and wherein gas flows from said source outlet to said first economizer inlet, and said intra-economizer flow channel extends from said outlet of said first economizer into said inlet of said second economizer.

5,769,157  
HEAT EXCHANGER AND METHOD OF FABRICATING  
THE HEAT EXCHANGER  
Kaoru Ikejima; Takashi Gotoh; Tsuneo Yumikura, all of Hyogo; Michimasa Takeshita, Shizuoka, and Takayuki Yoshida, Kanagawa, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
Filed Apr. 4, 1995, Ser. No. 417,159  
Claims priority, application Japan, Jul. 22, 1994, 6-171307; Oct. 24, 1994, 6-258351  
Int. Cl.<sup>6</sup> F28F 1/32; 1/36  
U.S. Cl. 165—184 8 Claims

1. A heat exchanger comprising:





a plurality of heat-transfer tubes arranged in parallel to each other at predetermined intervals, the heat-transfer tubes are divided into groups of two adjacent heat-transfer tubes, each group having a common tube with each adjacent group; and a plurality of fine wire fins serving as heat-transfer fins, at least one of the fine wire fins being wound helically around two adjacent heat-transfer tubes of each group so that a fine wire fin wound around one group of tubes does not cross portions of another fine wire fin wound around another group and does not cross other portions of the same fine wire fin wound around the same group.

5,769,158

**INTERFACE PORTION STRUCTURE AND REINFORCING STRUCTURE OF FLEXIBLE THERMAL JOINT**

Akira Yao, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

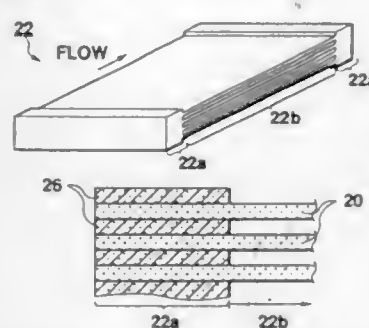
Filed Mar. 6, 1997, Ser. No. 812,729

Claims priority, application Japan, Mar. 28, 1996, 8-074611

Int. Cl.<sup>6</sup> F28F 7/00

U.S. Cl. 165—185

9 Claims



1. A thermal joint for performing a heat transfer between external substances, comprising:

- a plurality of main conductors for performing transfer and having flexibility in a direction crossing a direction of heat transfer, said main conductor having first and second interface portions to provide a path for heat conduction between said external substances and said main conductor;
- a plurality of auxiliary conductors for providing an additional and separate path for heat conduction between said external substances and said plurality of main conductors; and
- a laminated structure formed by alternately disposing said main conductors and said auxiliary conductors at said interface portions in a direction crossing said direction of heat transfer, wherein said plurality of main conductors are arranged in parallel to one another and extend from said first interface portion to said second interface portion which are at respective ends of said plurality of main conductors, and wherein said plurality of auxiliary conductors space apart respective ones of said plurality of main conductors, said spacing being maintained as a substantial uniform gap between said main conductors between said first and second interface portions.

5,769,159

**APPARATUS FOR OPENING/CLOSING A RADIATING SECTION BY USING A SHAPE MEMORY ALLOY**

Hee-Do Yun, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd, Seoul, Rep. of Korea

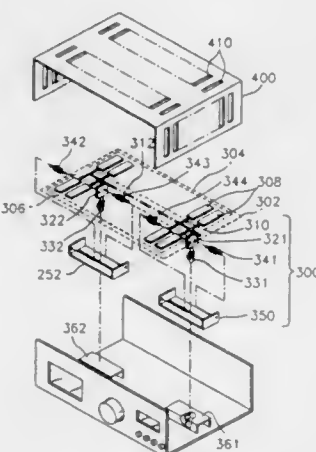
Filed Dec. 27, 1995, Ser. No. 579,019

Claims priority, application Rep. of Korea, Apr. 19, 1995, 94-9211; Apr. 19, 1995, 94-9212

Int. Cl.<sup>6</sup> F28F 27/00

U.S. Cl. 165—276

7 Claims



1. In an apparatus including a housing having a radiating section while enclosing a heat generating section, a radiating section opening/closing apparatus comprising:

- at least one heat transmitting section fixed onto said heat generating section and for transmitting heat generated from said heat generating section, including first and second walls and a connection plate, the first wall being formed to one end of the connection plate and the second wall being formed to the other end of the connection plate, and the connection plate being mounted on said heat generating section, wherein the connection plate has a guide groove in the lengthwise direction in the center thereof;
- at least one expansion section for receiving said heat from said heat transmitting section and expanding/contracting at a specific temperature;
- at least one radiating section opening/closing section displaced by the expansion/contraction of said expansion section for opening/closing said radiating section; and
- at least one elastic member contracting/expanding while said expansion section expands/contracts for restoring said radiating section opening/closing section to an original position thereof; and
- at least one moving section including a supporting rod, a fixing plate, a rectangular ring, and a guide wheel, and for moving said at least one radiating section opening/closing section to open/close said radiating section according to the contracting/expanding of said at least one elastic member and said at least one expansion section, one end of the supporting rod being fixed to said at least one radiating section opening/closing section, and the other end of the supporting rod being fixed to the upper end of the fixing plate, the lower end of the fixing plate being fixed to the upper end of the rectangular ring, and the center portion of the guide wheel being rotatably inserted into the lower end of the rectangular ring, wherein the guide wheel is rotatably fitted into the guide groove of the connection plate of said at least one heat transmitting section.

5,769,160

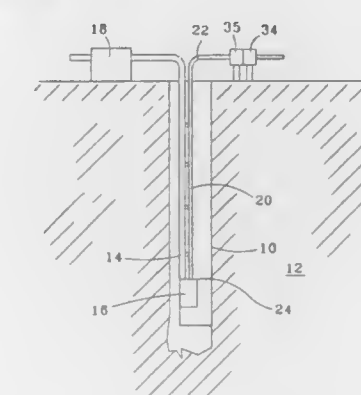
**MULTI-FUNCTIONAL DOWNHOLE CABLE SYSTEM**  
Steve Owens, The Woodlands, Tex., assignor to PES, Inc., The Woodlands, Tex.

Filed Jan. 13, 1997, Ser. No. 782,369

Int. Cl.<sup>6</sup> E21B 17/00

U.S. Cl. 166—65.1

20 Claims



1. An apparatus for communicating electricity downhole to a well tool in a wellbore, comprising:

- a hollow sheath having a first end proximate to the well surface and having a second end extending downwardly to the tool, wherein said sheath has an exterior surface proximate to the wellbore;
- an electrical conductor within said hollow sheath for communicating electricity to the tool; and
- a fluid within said hollow sheath.

5,769,162

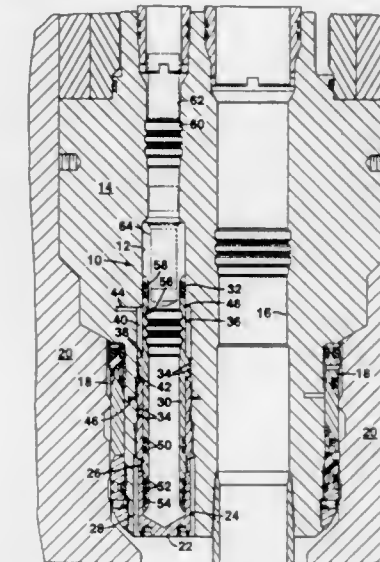
**DUAL BORE ANNULUS ACCESS VALVE**  
Christopher D. Bartlett, and Christopher E. Cunningham, both of Spring, Tex., assignors to FMC Corporation, Chicago, Ill.

Filed Mar. 25, 1996, Ser. No. 621,850

Int. Cl.<sup>6</sup> E21B 34/02

U.S. Cl. 166—87.1

2 Claims



1. An annulus access valve system for selectively opening and sealing an annulus bore in a wellhead apparatus comprising:

- an annular bore insert sealingly and fixedly attached within the annulus bore;
- at least one flow port formed in the bore insert for establishing a fluid path through the annulus bore;
- an annular valve sleeve sealingly and slideably attached within the bore insert; and
- hydraulic means for raising and lowering the valve sleeve over the flow port;
- whereby the sleeve may be actuated to open the flow port and thereby open the annulus bore and to close the flow port and thereby seal the annulus bore;
- a wireline tool profile formed in the valve sleeve; and
- a wireline tool;
- wherein the wireline tool engages the wireline tool profile to provide a means for manually opening and closing the valve sleeve.

5,769,161

**POLISHED ROD FOR OIL WELL PUMPING**

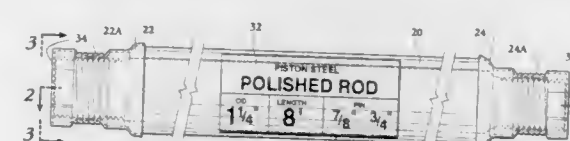
B. Michael Borden, P.O. Box 1422, Sapulpa, Okla. 74067

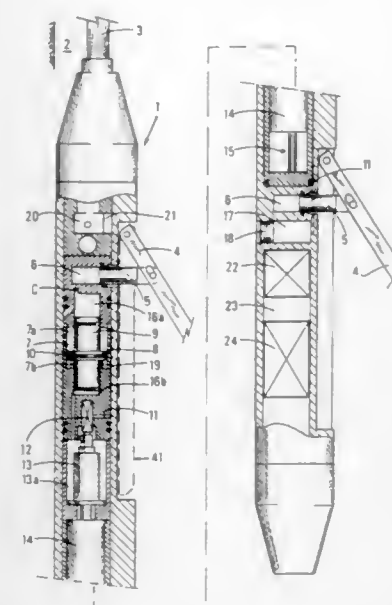
Filed Aug. 22, 1996, Ser. No. 701,383

Int. Cl.<sup>6</sup> E21B 17/10

U.S. Cl. 166—72

6 Claims





two opposed forces in the second chamber, a second of the two opposed forces being generated in the first chamber by the pressurized hydraulic fluid and wherein expansion of the pressurized gas moves the piston in a direction causing opening of the at least one anchor element and the second force causing the retracting of the anchor element back to the retracted position.

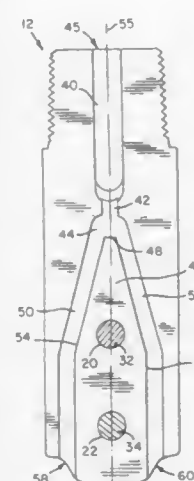
**5,769,164**  
**WELLBORE CLEANING TOOL**

Larry Dean Archer, 1001 W. Mesquite St., Jacksboro, Tex. 76458

Filed Jan. 14, 1997, Ser. No. 783,549  
Int. Cl.<sup>6</sup> E21B 21/00

U.S. Cl. 166—222

16 Claims



1. A wellbore cleaning tool, comprising:  
an elongated, cylindrical body having an upper end that is threaded for attachment to a fluid supply conduit and a lower end that is circumferentially tapered and terminates in a narrowed, planar surface;  
a fluid entry channel in the upper end of said cylindrical body; and  
a pair of fluid discharge channels in communication with said fluid entry channel, each of said discharge channels having a discharge port positioned in said lower end of said cylindrical body adjacent said narrowed, planar surface.

**5,769,165**  
**METHOD FOR INCREASING METHANE RECOVERY FROM A SUBTERRANEAN COAL FORMATION BY INJECTION OF TAIL GAS FROM A HYDROCARBON SYNTHESIS PROCESS**

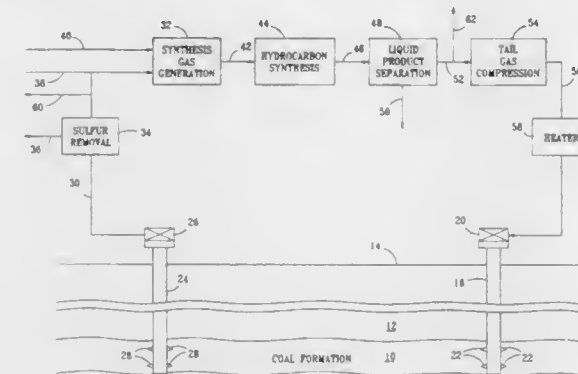
Stephen V. Bross, Sugar Land, and Vu P. Dinh, Katy, both of Tex., assignors to Vastar Resources Inc., Houston, Tex.

Filed Jan. 31, 1996, Ser. No. 594,700

Int. Cl.<sup>6</sup> E21B 43/17; 43/24; 43/34

U.S. Cl. 166—266

19 Claims



1. A method for increasing the production of methane from a subterranean coal formation penetrated by at least one injection well and at least one production well, the method comprising:  
producing methane from the coal formation through at least one production well;  
passing at least a portion of the methane to a synthesis gas generation zone wherein at least a major portion of the methane is reacted with an oxygen containing gas to produce a mixture of carbon monoxide and hydrogen;  
passing the mixture to a hydrocarbon synthesis zone wherein at least a major portion of the carbon monoxide and hydrogen are reacted to produce a heavier mixture of hydrocarbons containing more than one carbon atom per molecule and a tail gas comprising nitrogen and carbon dioxide;  
separating at least a major portion of the tail gas from at least a major portion of the hydrocarbons and recovering the hydrocarbons as a product stream;  
compressing at least a portion of the tail gas to a pressure suitable for injection into the coal formation; and  
injecting at least a portion of the tail gas into the coal formation through at least one injection well.

**5,769,166**  
**WELLBORE WINDOW MILLING METHOD**

John A. Duke, Baytown, Tex., assignor to Weatherford/Lamb, Inc.

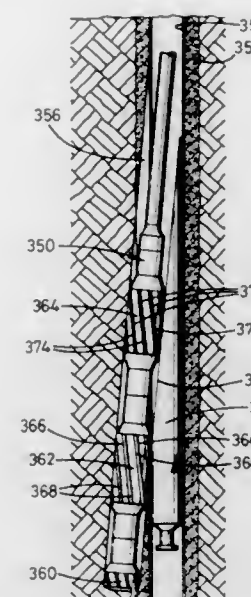
Division of Ser. No. 590,747, Jan. 24, 1996. This application Oct. 10, 1996, Ser. No. 728,478

Int. Cl.<sup>6</sup> E21B 29/06; 7/06

U.S. Cl. 166—298

16 Claims

2. A method for forming an opening in a tubular in a wellbore extending through a formation, the method comprising  
running a starter mill releasably secured to a whipstock into the wellbore into a tubular through which it is desired to form an opening,  
securing the whipstock at a desired location in the wellbore, releasing the starter mill from the whipstock,  
rotating the starter mill to form an initial opening in the tubular, removing the starter mill from the wellbore,  
introducing a milling system into the wellbore and into the tubular at the location of the initial opening, the milling system comprising a window mill, a neck member connected at its bottom to the window mill, a watermelon mill, the neck member connected at its top to the watermelon mill, the window mill having milling blades thereon with rough finish outer surfaces dressed with milling material, and



rotating the milling system to mill the tubular to form a completed opening therethrough, the watermelon mill and neck member sized, configured, and disposed so that the watermelon mill does not mill the whipstock.

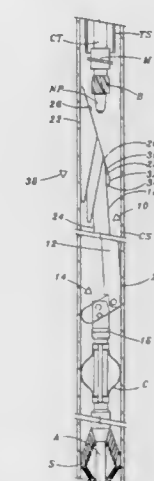
**5,769,167**  
**THRU TUBING WHIPSTOCK AND METHOD**  
Britt O. Braddick, Houston, Tex., assignor to TIW Corporation, Houston, Tex.

Filed Jul. 17, 1996, Ser. No. 682,422

Int. Cl.<sup>6</sup> E21B 23/00

U.S. Cl. 166—382

43 Claims



1. A thru tubing whipstock assembly for setting within a casing string on an anchor for securing the set whipstock assembly within the casing string after passing through a lower end of a tubing string positioned within the casing string, the whipstock assembly being settable within the casing string to divert a tool with respect to the casing string, the whipstock assembly comprising:  
an elongate whipstock body having a whipstock face for diverting the tool;  
a hinge assembly positioned between the whipstock body and the anchor for pivoting from a run-in position for passing the whipstock assembly through the tubing string to a set position for positioning the whipstock face for engagement with the tool; and  
a wedge assembly at an upper end of the whipstock body for moving from a run-in position for passing the whipstock assembly through the tubing string to a set position for posi-

tioning the whipstock face for engagement with the tool, the wedge assembly including at least one wedge member supported on and radially moveable with respect to the whipstock body from a radially inward run-in position to a radially outward set position for engagement of the at least one wedge member with the casing string and thereby radially space the upper end of the whipstock body from an interior surface of the casing string.

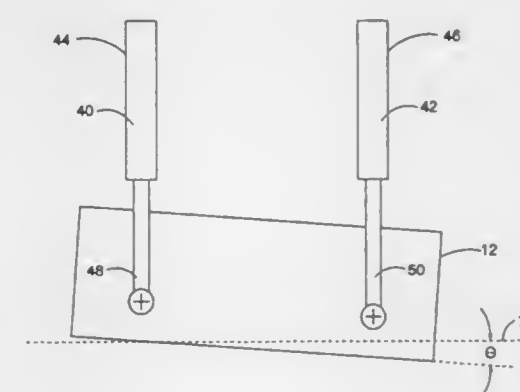
**5,769,168**  
**BLADE TILT ANGLE LIMITING FUNCTION FOR A BULLDOZER**  
Richard J. Skiba, Peoria, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Sep. 5, 1996, Ser. No. 708,525

Int. Cl.<sup>6</sup> E02F 3/76

U.S. Cl. 172—4.5

5 Claims



1. A tilt angle control system for an implement of an earth working machine having a frame, comprising:  
first and second fluid operated lift cylinders being connected to the implement;  
first and second fluid operated tilt cylinders being connected to the implement, the implement being movable relative to the frame in response to movement of at least one of the lift and tilt cylinders;  
hydraulic control valves being adapted to deliver pressurized hydraulic fluid to the lift and tilt cylinders;  
a control lever being pivotally movable to a plurality of positions, the control lever producing an implement tilt command signal in response to position of the control lever;  
a controller being adapted to receive the implement tilt command signal and responsively deliver an implement tilt control signal to the hydraulic valves to cause pressurized fluid flow to actuate at least one of the lift and tilt cylinders to tilt the implement;  
a first displacement sensor being adapted to produce a first position signal indicative of the extension of the first lift cylinder;  
a second displacement sensor being adapted to produce a second position signal indicative of the extension of the second lift cylinder; and  
wherein the controller receives the first and second position signals, determines a magnitude of a difference between the relative positions of the first and second lift cylinders, compares the magnitude difference to a maximum differential value, and stops the delivery of the implement tilt control signal in response to the magnitude difference being within a predetermined range of the maximum differential value, the maximum differential value representing the maximum angle that the implement can tilt without the implement damaging the machine.



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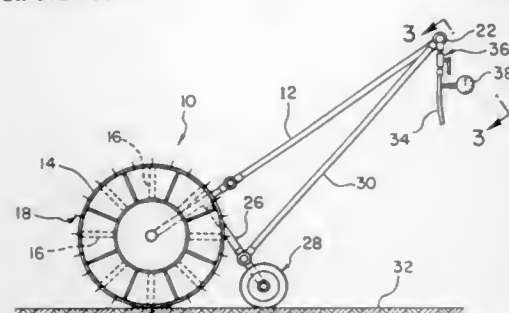
UMI

5,769,169

**SOIL IRRIGATION AND AERATION APPARATUS**  
Frank J. Miksitz, 603 Barrymore St., Phillipsburg, N.J. 08865  
Continuation-in-part of Ser. No. 617,209, Mar. 18, 1996,  
abandoned. This application Jan. 16, 1997, Ser. No. 784,917  
Int. Cl.<sup>6</sup> A01B 45/02

U.S. Cl. 172—21

25 Claims



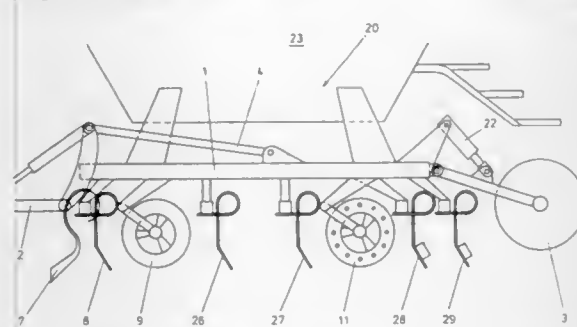
1. A soil irrigation and aeration device comprising:  
a rotatable ground engaging drum having an outer wall, an inner wall defining a central chamber and being spaced from said outer wall, and a plurality of compartments disposed between said inner and outer walls around a circumference of said drum, said compartments having a length substantially equal to a length of said drum;  
a plurality of probes extending radially outward from an outer surface of said drum, each of said probes having a cylindrical side wall defining a substantially tubular shape with a slot in said side wall extending longitudinally from a first inner end in communication with an interior of one of said compartments to a second open outer end, each of said probes having an open inner axial face and an open outer axial face;  
a water source connected to said central chamber in said drum; and  
a valve assembly and water connection coupled to each of said inner walls of said compartments for selectively supplying water under pressure from said central chamber and water source to said inner walls and compartments sequentially when said probes engage the ground, thereby injecting water to the probes engaging the ground.

5,769,170

**INTEGRATED SOIL CULTIVATING APPARATUS**  
Magne Skjaeveland, Klepp stasjon, Norway, assignor to Kvernland Klepp AS, Norway  
Filed Oct. 17, 1996, Ser. No. 732,859  
Claims priority, application United Kingdom, Oct. 26, 1995, 9521922; Jul. 17, 1996, 9615034  
Int. Cl.<sup>6</sup> A01C 5/00

U.S. Cl. 172—142

13 Claims



1. An integrated soil cultivation apparatus which is intended to be coupled to the rear of a propelling vehicle and to carry out a number of different soil-working operations during forward movement of the apparatus by the vehicle, said apparatus comprising:  
a frame;  
a coupling arrangement at the forward end of the frame to couple the apparatus to the rear of the propelling vehicle;

transversely extending rows of harrow tines mounted on the frame;  
a rotatable soil packer mounted on the frame and having axially spaced packer elements extending generally parallel to the rows of harrow tines, said packer being adjustable relative to the frame so that the engagement of the packer with the ground controls the working depth of the harrow tines; and  
a transversely extending row of seed coulters mounted on the frame rearwardly of the soil packer.

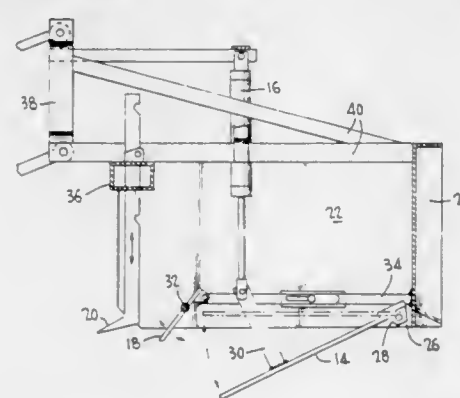
5,769,171

**DIRT SCRAPER HAVING A HINGED FLOOR**  
W. Richard Newman, IV, 126 Camden Ct., Madison, Miss. 39110

Filed Oct. 9, 1996, Ser. No. 728,062  
Int. Cl.<sup>6</sup> A01B 49/02

U.S. Cl. 172—200

4 Claims



1. A scraping implement comprising an exterior body frame having first and second side plates and a back plate wherein the back plate is fixed perpendicularly to the side plates to define a box having a bottom plane, a cutting blade having longitudinal ends wherein said ends are fixed to the exterior body frame, a floor hinged to the bottom plane and connected to the exterior body frame, an activating means to move the floor downward out of the bottom plane, and a floor support having a first end and a second end, the first end being fixed to the floor and the second end being fixed to the activating means.

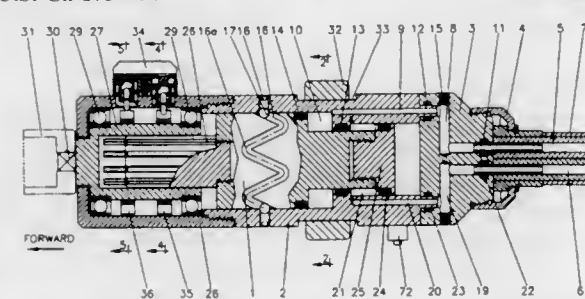
5,769,172

**POWER TOOL**

Arieh Sher, 35 Spinoza Street, Rehovot, 76452, Israel  
Continuation-in-part of Ser. No. 473,880, Jun. 7, 1995, Pat. No. 5,592,866, which is a continuation of Ser. No. 100,949, Aug. 3, 1993, Pat. No. 5,467,684, which is a continuation-in-part of Ser. No. 83,760, Jun. 30, 1993, Pat. No. 5,350,390, which is a continuation of Ser. No. 857,556, Mar. 25, 1992, abandoned. This application Jul. 22, 1996, Ser. No. 693,782  
Int. Cl.<sup>6</sup> B25D 16/00

U.S. Cl. 173—97

14 Claims



1. A power tool for driving fasteners and for drilling purposes, said power tool comprising:

- (a) a housing;  
(b) a piston slidable within said housing;  
(c) a rotary piston driving mechanism for converting longitudinal motion of said piston in said housing to a combined longitudinal and rotary movement of said piston;  
(d) a linear sliding element for converting said combined longitudinal and rotary movement of said piston into a rotation movement;  
(e) a working head fixedly attached to said linear sliding element; and  
(f) a counter moment element attached to said housing.

5,769,173

**VIBRATION EXCITER MACHINE**

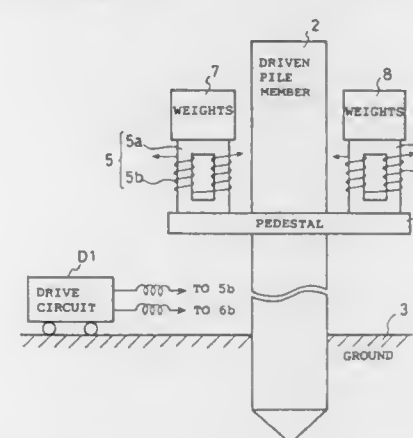
Noritaka Egami; Shinichi Hattori; Ryosuke Taniguchi; Takahiro Sakamoto, and Takashi Shimada, all of Nagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1995, Ser. No. 539,527

Claims priority, application Japan, Jun. 10, 1995, 7-168051  
Int. Cl.<sup>6</sup> E21D 20/00

U.S. Cl. 173—114

21 Claims



1. A vibration exciter machine for driving a driven pile member to a ground or pulling the driven pile member out of the ground, comprising:  
magnetostriction means for providing a vibration of up and down direction to said driven pile member; and  
a drive circuit for controlling expansion and contraction movement of said magnetostriction means by changing a current supplied to said magnetostriction means.

5,769,174

**PARALLEL DISPLACEMENT SINGLE AXIS VIBRATION ISOLATOR**

Jyeching R. Lee, Endicott, and Timothy R. Cooper, Owego, both of N.Y., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

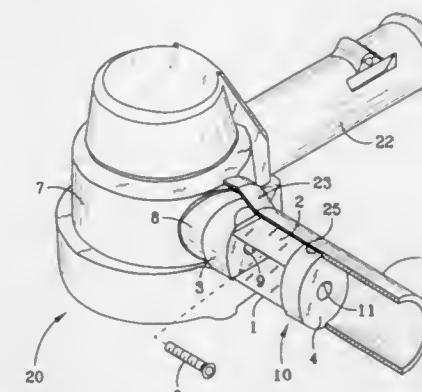
Filed Dec. 18, 1996, Ser. No. 769,718

Int. Cl.<sup>6</sup> B25D 17/24

U.S. Cl. 173—162.2

12 Claims

1. A parallel displacement single axis vibration absorber comprising:  
a first base member and a second base member;  
each of said first base member and said second base member being provided with a surface spaced apart from and parallel to each other and being spaced apart a given distance along a Z axis;  
a pair of parallel elongate flexible beam members spaced apart and interconnecting said first base member and said second base member and being parallel with an X axis; and  
said pair of elongate beams each being further provided with a thickness along a Y axis which is substantially smaller than a



width of said flexible beam members along said X axis whereby said first base member is substantially free to translate along said Y axis relative to said base member and substantially restrained in relative motion between said first base member and said second base member along both the X and Z axes, wherein said X, Y and Z axes are orthogonal relative to one another.

5,769,175

**CUTTER ASSEMBLIES FOR ROTARY DRILL BITS**  
Terry R. Matthias, Longlevens, United Kingdom, assignor to Camco Drilling Group Limited, Stonehouse, United Kingdom

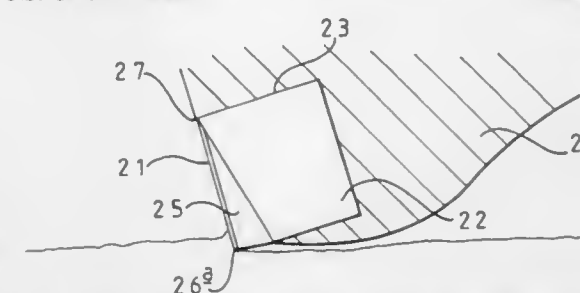
Filed Mar. 15, 1996, Ser. No. 618,433

Claims priority, application United Kingdom, Mar. 23, 1995, 9505922.6

Int. Cl.<sup>6</sup> E21B 10/46

U.S. Cl. 175—420.2

17 Claims



1. A cutter for a rotary drill bit comprising a cutting table of superhard material bonded to a less hard substrate, the cutting table having a front face and a peripheral edge at least a part of which defines a convexly curved cutting region, and the substrate including a portion of the surface thereof which is bevelled so as to increase in lateral extent beyond at least said curved cutting region of the peripheral edge of the cutting table as it extends rearwardly therefrom, the rearward extent of said bevelled surface portion of the substrate varying around the periphery of the cutting table.

5,769,176

**DIAMOND SINTERED COMPACT AND A PROCESS FOR THE PRODUCTION OF THE SAME**

Hitoshi Sumiya, and Shuichi Satoh, both of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 5, 1996, Ser. No. 675,932

Claims priority, application Japan, Jul. 7, 1995, 7-172094; Jul. 7, 1995, 7-172095; Aug. 10, 1995, 7-204264; Aug. 10, 1995, 7-204265; Aug. 10, 1995, 7-204266; Aug. 28, 1995, 7-218758

Int. Cl.<sup>6</sup> B22F 7/06

U.S. Cl. 175—434

48 Claims

1. A diamond sintered compact comprising (1) 0.1 to 30 volume % of at least one compound containing (a) one or more elements

selected from the group consisting of silicon and titanium, and (b) oxygen and (2) the balance of diamond.

5,769,177

**HYDRO ELECTRIC VEHICLE DRIVE SYSTEM**

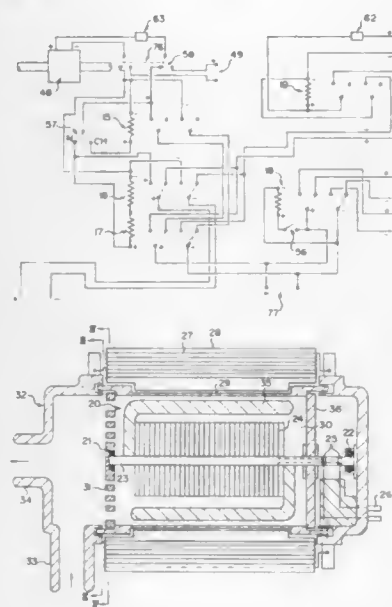
Dominic Wickman, Hill Farm, Wissett, Halesworth, Suffolk IP19 0JJ, Great Britain

Continuation of Ser. No. 314,921, Sep. 29, 1994, abandoned, which is a continuation of Ser. No. 924,011, Sep. 18, 1992, abandoned. This application Mar. 11, 1996, Ser. No. 613,529 Claims priority, application United Kingdom, Nov. 24, 1990, 9025609

Int. Cl.<sup>6</sup> B60K 1/04

U.S. Cl. 180—65.3

13 Claims



1. A hydraulic drive system for a vehicle comprising:  
a fluid circuit;  
a driven motorized pump operable to circulate fluid around said fluid circuit;  
a turbine-generator operably associated with said fluid circuit to generate hydro-electricity; and  
a drive motor for driving the vehicle directly connectable to the turbine-generator so as to be powered directly by the hydro-electricity produced by said turbine-generator,  
wherein said turbine-generator comprises a chamber housing a turbine having an impeller and a generator having a rotor and stator, the impeller of said turbine being integral with said rotor of said generator, said chamber housing having a substantially cylindrical internal surface defining a main chamber around said impeller and rotor and defining an offset portion axially offset from said impeller and rotor, said offset portion and said main chamber being separated by a perforated grill, an inflow port connects to said offset portion for introduction of a motive fluid to move said impeller and rotor, said inflow port being configured and dimensioned to introduce the motive fluid tangentially to said cylindrical internal surface, and said offset portion further having an outflow port in non-axial alignment with said inflow port, whereby when the motive fluid flows through said chamber, it flows in a vortex which moves said impeller and rotor thereby generating electricity.

5,769,178

**POWER STEERING SYSTEM FOR VEHICLE**

Jong Bum Kim, Kyungsang-do, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

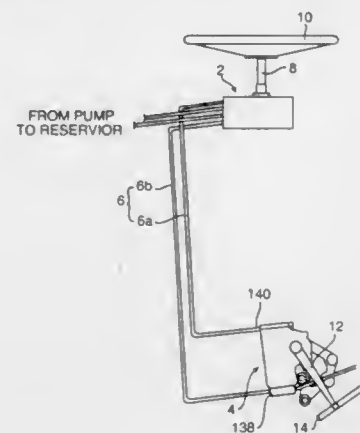
PCT No. PCT/KR94/00131, § 371 Date May 23, 1996, § 102(e) Date May 23, 1996, PCT Pub. No. WO96/10512, PCT Pub. Date Apr. 11, 1996

PCT Filed Sep. 30, 1994, Ser. No. 632,467

Int. Cl.<sup>6</sup> B62D 5/083

U.S. Cl. 180—403

15 Claims



1. A power steering system for a vehicle, comprising:  
a rotatable mounted steering wheel;  
a torsion bar fixed to said steering wheel so as to rotate therewith;  
a hydraulic control unit for controlling a hydraulic pressure from an oil pump in response to a rotation of said torsion bar, said hydraulic control unit being mounted around said torsion bar and comprising:  
a first rotating member for receiving a rotating force from said torsion bar which is inserted into and fixed to a central axle of said first rotating member, an outer circumference of said first rotating member having a plurality of grooves formed thereon;  
a second rotating member located around said torsion bar at an upper side of said first rotating member to receive the rotating force from said first rotating member, an outer circumference of said second rotating member having a channel formed therealong;  
a third rotating member located around said torsion bar at a lower side of said first rotating member to receive the rotating force from said first rotating member, an outer circumference of said third rotating member having a channel formed therealong;  
a fourth rotating member located at an outer circumference of said first rotating member between said second and third rotating members and having a plurality of upper and lower horizontal passages selectively communicating with said plurality of grooves of said first rotating member, and a plurality of vertical passages communicating with said channels of said second and third rotating members, respectively; and  
a cylinder for containing said first, second, third and fourth rotating members, said cylinder having two holes each communicating with a respective said channel of said second and third rotating members; and  
a power cylinder spaced from said torsion bar and receiving the hydraulic pressure from said hydraulic control unit, said power cylinder having a piston meshed with a sector gear which is connected with a pitman arm.

5,769,179

**POWER STEERING SYSTEM AND METHOD FOR A VEHICLE**

Myung-Sik Choi, Kyungnam-Do, Rep. of Korea, assignor to Hyundai Motor Company, Ltd., Seoul, Rep. of Korea

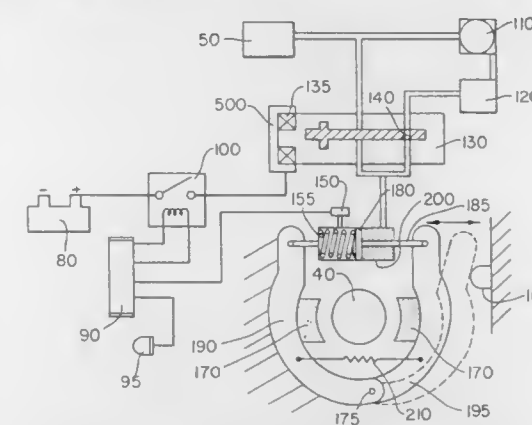
Filed Jun. 28, 1996, Ser. No. 672,567

Claims priority, application Rep. of Korea, Jun. 28, 1995, 95-17703

Int. Cl.<sup>6</sup> B62D 5/06

U.S. Cl. 180—414

20 Claims



1. A power steering system for a vehicle having a gear box and an intermediate shaft connected thereto, comprising:  
sensor means for detecting a speed of the vehicle and a pressure within a cylinder connected to the gear box; and  
limiting means for limiting steering force of the vehicle according to the detection by the sensor means,  
wherein the limiting means includes,  
valve means for controlling a flow of an oil from the gear box to the cylinder,  
arm means for movably surrounding the intermediate shaft, and  
cylinder means including the cylinder for moving the arm means.

5,769,180

**STEERING SYSTEM FOR WORKING VEHICLE AND THE METHOD THEREOF**

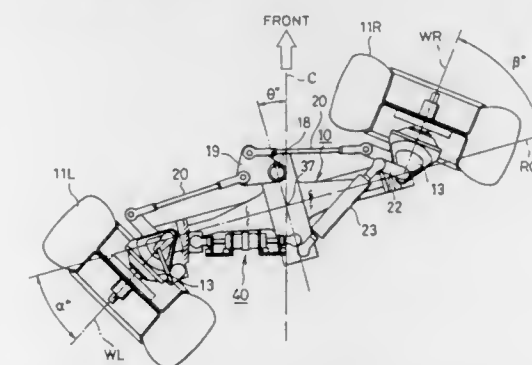
Shinroku Momose, Ota, and Yasuhiko Miyamoto, Omiya, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 28, 1995, Ser. No. 563,548

Int. Cl.<sup>6</sup> B62D 5/26

U.S. Cl. 180—424

10 Claims



10. A steering system for a vehicle having a chassis, comprising:  
an axle member having a first end and a second end and being pivotable relative to said chassis of said vehicle;  
first and second knuckle members pivotably connected to said first and second ends of said axle member, respectively;

first pivot means for pivoting said axle relative to said chassis; and  
second pivot means for pivoting said first and said second knuckle members relative to said axle member.

5,769,181

**LADDER BRACKET AND STAGING UTILIZING THE SAME**

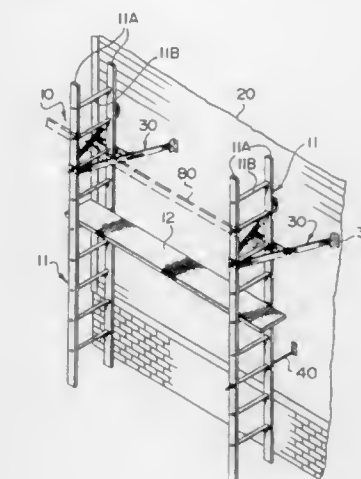
Charles F. Gussow, P.O. Box 337, and Chris T. Honegger, P.O. Box 316, both of Wakefield, P.Q., Canada, J0X 3G0, assignors to Charles F. Gussow, and Chris T. Honegger, both of Wakefield, Canada

Filed Nov. 5, 1996, Ser. No. 743,215

Int. Cl.<sup>6</sup> E06C 7/16

U.S. Cl. 182—118

11 Claims



1. A ladder support bracket for use with a ladder having tubular rungs, said bracket comprising stiff members providing a rigid open A-frame that has an apex, a pair of legs extending from said apex and diverging in a direction away from said apex with each leg terminating at a free outer end, a crossbar secured to respective ones of said diverging legs interconnecting said legs at a position between said apex and said free outer ends and means for detachably anchoring said ladder to said frame and capably retaining such ladder between said apex of said frame and said crossbar when said ladder is located at a position between said diverging pair of legs, said ladder anchoring means being securable respectively to said crossbar and the apex of the frame and projecting from each to extend into a tubular rung of said ladder.

5,769,182

**LUBRICANT SUPPLY SAFETY SYSTEM**

Daniel Parenteau, Laval, Canada, assignor to Kvaerner Hymac Inc., Laval, Canada

PCT No. PCT/IB94/00314, § 371 Date Jun. 12, 1996, § 102(e) Date Jun. 12, 1996, PCT Pub. No. WO95/10729, PCT Pub. Date Apr. 20, 1995

PCT Filed Oct. 13, 1994, Ser. No. 624,400

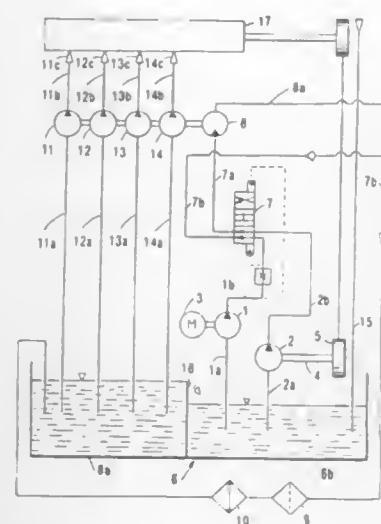
Claims priority, application Sweden, Oct. 13, 1993, 9303372 Int. Cl.<sup>6</sup> F16N 7/40; 29/02; 13/16

U.S. Cl. 184—6.4

8 Claims

8. A lubricant supply safety system for a machine, comprising a reservoir (6) for lubricating oil, a hydraulic motor (8) driving one or more feeder pumps (11, 12, 13, 14) supplying lubricating oil from said reservoir to various points in said machine, a first pump (1) for supply of lubricating oil from said reservoir to drive said hydraulic motor (8) under normal operating conditions, a second pump (2) for supply of lubricating oil from said reservoir (6) to drive said hydraulic motor (8) in the event of a failure of said first pump (1), said second pump (2) being continuously driven by said





machine and being automatically engaged by means of a valve device (7) to drive said hydraulic motor (8) immediately upon detection of a malfunction of said first pump (1), and wherein the lubricating oil reservoir is divided into a first (6a) and a second (6b) compartment by means of an overflow barrier (16), over which overflowing oil flows from the first (6a) to the second (6b) compartment, said first and second pumps (1, 2) drawing oil from said second compartment, said feeder pumps (11, 12, 13, 14) drawing oil from said first compartment (6a).

5,769,183

**DRIVE UNIT FOR A SELF-PROPELLED ELEVATOR CAR**  
Utz Richter, Ebikon; Christoph Liebetrau, Menziken, both of Switzerland; Albrecht Morlock, Horb, Germany; Helmut Heizmann, Stuttgart, Germany, and Ortwin Piper, Schwenningen, Germany, assignors to Inventio AG, Hergiswil, Switzerland

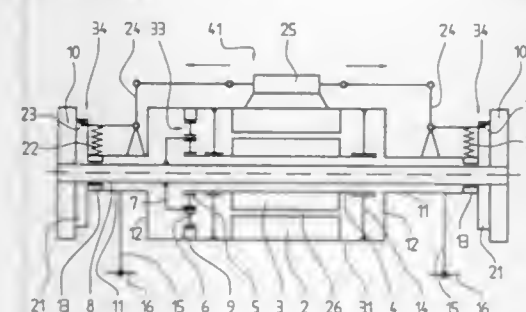
Filed May 31, 1996, Ser. No. 656,057

Claims priority, application Switzerland, Jun. 2, 1995, 01623/95

Int. Cl.<sup>6</sup> B66B 9/00

U.S. Cl. 187—249

19 Claims



11. A drive unit (1,41,51) for a self-propelled elevator car (30), which car travels along guide rails (27) and is attached to a car-supporting structure (16), comprising:

- a) an axle tube (11) adapted to be connected to an elevator car-supporting structure (16);
- b) a wheel shaft (8) rotatably mounted in and extending coaxially through said axle tube (11);
- c) a pair of drive wheels (10) each mounted on an associated end of said wheel shaft (8);
- d) a motor means (2,3,26,31) coaxial with said wheel shaft (8), mounted on said axle tube (11) and coupled to drive said wheel shaft (8) in rotation;
- e) a speed-reducing gear (33) coaxial with said wheel shaft (8) and coupled between said motor means (2,3,26,31) and said wheel shaft (8) for driving said wheel shaft (8) and said drive wheels (10) in rotation;

at least one rocker arm (15) having one end attached to said axle tube (11) and an opposite end adapted to be pivotally attached to the car-supporting structure (16); and

at least one contact pressure means (29) having one end connected to said axle tube (11) and an opposite end adapted to be pivotally connected to the car-supporting structure (16).

5,769,184

**COAXIAL DRIVE ELEVATOR**

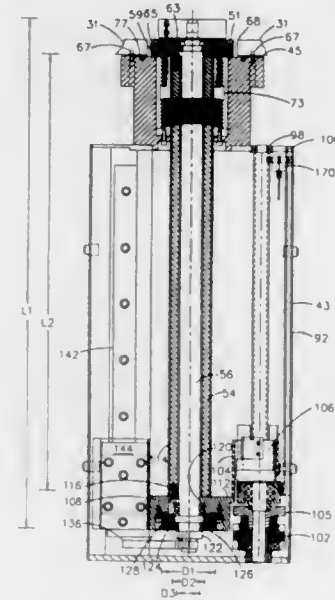
Christopher A. Hofmelster, Hampstead, N.H., assignor to Brooks Automation, Inc., Chelmsford, Mass.

Filed Sep. 27, 1996, Ser. No. 722,353

Int. Cl.<sup>6</sup> B66B 9/02

U.S. Cl. 187—267

19 Claims



15. A rotary linear drive comprising:

- a) a base;
- b) a linear positioning device extending in a given direction and having a first and second ends secured within said base;
- c) a first rotary drive, said rotary drive being secured to said base and drivingly coupled to said linear positioning device;
- d) a carriage connected to said linear positioning device for movement along said given direction in response to energization and reverse energization of said first rotary drive;
- e) said carriage having a support base surface which extends generally perpendicularly to said first given direction;
- f) a lift tube supported on said support base at the lower end thereof and having a hollow internal confine for receiving a rotary shaft therein;
- g) said rotary shaft having a length longer than the length of said lift tube so as to extend upwardly beyond one end of said lift tube and to depend downwardly therefrom and through an opening formed in said support base to define a depending connecting portion thereon;
- h) a second drive mounted to said carriage and having an output for causing rotation of said rotary shaft;
- i) a coupling means for drivingly coupling the output of said second drive to the rotary shaft for effecting rotation in either rotational direction; and
- j) control means for controlling the ON and OFF conditions of said first and second drives.

5,769,185

**CARBON BRAKE DISC STRUCTURES AND METHOD OF MAKING SAME**

Ralph R. Main, Canal Fulton; Jeremiah W. Mills, Akron; Julian Norley, Chagrin Falls; Edward M. Tatarzycki, Stow; William D. Thompson, Canton, and John G. Evrard, Canal Fulton, all of Ohio, assignors to Aircraft Braking Systems Corporation, Akron, Ohio

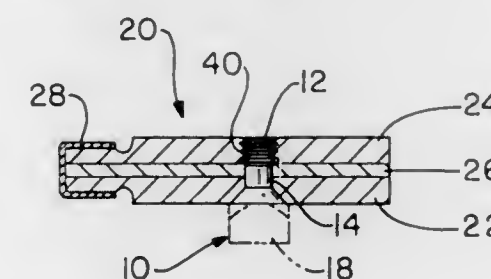
Continuation of Ser. No. 450,443, May 25, 1995, abandoned.

This application Feb. 18, 1997, Ser. No. 801,554

Int. Cl.<sup>6</sup> B60T 1/06

U.S. Cl. 188—18 A

9 Claims



1. A brake disc, comprising:

- a) a carrier plate;
- b) carbon wear plates maintained on opposite sides of said carrier plate, said carbon wear plates having a wear surface area; and
- c) threaded carbon members passing through and flush with said wear surface areas and into said carrier plate and securing said carbon wear plates thereto to form the brake disc.

5,769,186

**WHEEL CHOCK FOR TANDEM WHEELS**

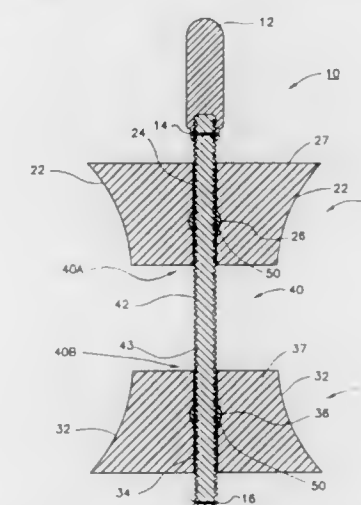
Fred H. Roberts, 3635 Fairlane St., High Point, N.C. 27265

Filed Mar. 13, 1997, Ser. No. 816,857

Int. Cl.<sup>6</sup> B60T 1/04

U.S. Cl. 188—32

17 Claims



1. A wheel chock for tandem wheels, comprising:

- a) upper and lower spaced apart wedge members sized and configured for wedging engagement with facing surfaces of the tandem wheels, a substantially vertical longitudinal bore formed through each of said upper and lower wedge members, each of said substantially vertical longitudinal bores having an inwardly directed thread disposed therein;
- b) a threaded rod threaded on an upper portion thereof in a first thread direction and threaded on a lower portion thereof in a second thread direction which is opposite to said first thread direction, said upper portion of said rod disposed within said

bore of said upper wedge member and said lower portion disposed within said bore of said lower wedge member;

c) said threaded rod joining said upper and lower wedge members and connected to each of said upper and lower wedge members such that rotation of said rod in a first prescribed direction causes translational movement of each of said upper and lower wedge members along said rod and toward one another, and such that rotation of said rod in a second prescribed direction causes translational movement of each of said upper and lower wedge members along said rod and away from one another;

d) wherein said inwardly directed thread of said upper wedge member is complementary to and engages said thread of said upper portion of said rod and said inwardly directed thread of said lower wedge member is complementary to and engages said thread of said lower portion of said rod; and

e) wherein at least one of said upper and lower wedge members includes a pivot nut mounted therein, said pivot nut having a nut bore formed therethrough, and wherein said inwardly directed thread of said at least one of said upper and lower wedge members is formed in said nut bore.

5,769,187

**PRESS DRIVE WITH OIL SHEAR CLUTCH/BRAKE DRIVES**

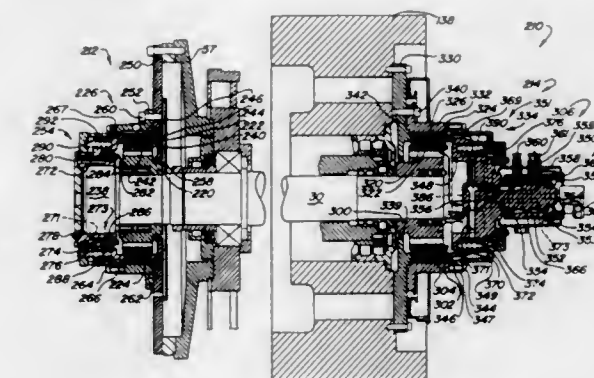
Gordon Maurice Sommer, Grosse Pointe Farms, Mich., assignor to Midwest Brake Bond Co., Warren, Mich.

Filed Jun. 27, 1996, Ser. No. 671,457

Int. Cl.<sup>6</sup> F16D 55/36

U.S. Cl. 188—71.5

25 Claims



1. A combination oil shear clutch unit and brake unit; support means for securing said brake unit to a relatively non-rotatable member;

shaft means for transmitting rotary motion; selectively operable brake means including a plurality of interleaved first friction disks for resisting rotation between said shaft means and said support means, said brake means being movable between an applied condition and a released condition;

a) a brake biasing member for providing a first load for urging said brake means into said applied condition, said brake means defining a brake chamber for accepting a pressurized fluid to overcome said first load and move said brake means into said released condition;

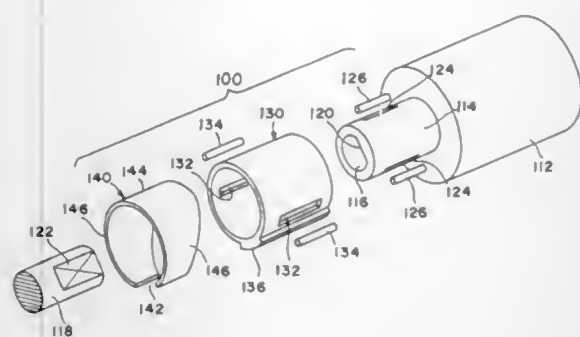
means for supporting said clutch unit in operative association with a flywheel;

selectively operable clutch means including a plurality of interleaved second friction disks for operatively connecting said flywheel with said shaft means, said clutch means being movable between a disengaged condition and an engaged condition; and

a) a clutch biasing member for providing a second load for urging said clutch means into said disengaged condition, said second load being generally equal to said first load, said clutch means defining a clutch chamber for accepting said pressurized fluid to overcome said second load and move said clutch means

into said engaged condition, said clutch chamber having dimensions generally equal to said brake chamber, said clutch chamber being separate from said brake chamber.

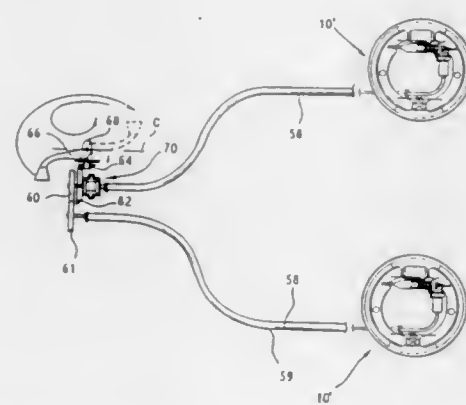
5,769,188  
**ROTARY DAMPER WITH SELF-STANDING MECHANISM**  
Harunori Okabe; Kenji Takahashi; Hirozumi Sasa, and Takeaki Kobori, all of Tokyo, Japan, assignors to TOK Bearing Co., Ltd., Tokyo, Japan  
Filed Dec. 27, 1995, Ser. No. 579,310  
Claims priority, application Japan, Dec. 27, 1994, 6-338023  
Int. Cl.<sup>6</sup> E05D 11/00; 11/10; F16F 9/10; 9/12  
U.S. Cl. 188—82.84 7 Claims



1. A rotary damper comprising:  
a damper housing;  
a damper shaft rotatably supported by said damper housing, said damper shaft having at least one first axial groove defined in an outer circumferential surface thereof;  
a collar fixed to said damper housing and disposed around said damper shaft for rotation relative thereto, said collar having at least one second axial groove defined in a circumferential wall thereof;  
at least one first needle disposed in said first groove and having a portion projecting radially outwardly from the outer circumferential surface of said damper shaft; and  
at least one second needle disposed in said second groove; and  
an annular spring resiliently fitted over said collar and held against said second needle for resiliently pushing said second needle partly out of said second groove for engagement with said first needle.

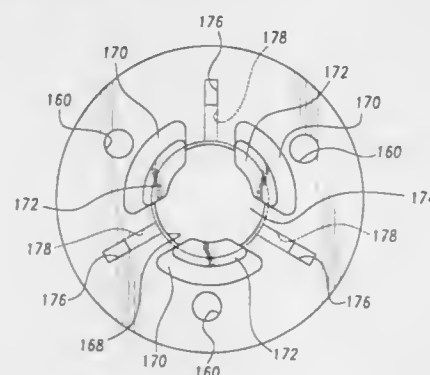
5,769,189  
**AUTOMOTIVE PARKING BRAKE AND PARKING BRAKE SYSTEM FOR MOTOR VEHICLES**  
Helmut Heibel, Moschheim; Hermann-Josef Geilen, Mendig, and Werner Dieringer, Vallendar, all of Germany, assignors to Lucas Industries public limited company, United Kingdom  
Filed Feb. 29, 1996, Ser. No. 608,628  
Claims priority, application Germany, Mar. 3, 1995, 195 07 566.8; Apr. 20, 1995, 195 14 684.0  
Int. Cl.<sup>6</sup> B60T 1/06; 13/74; 11/04; F16D 65/21  
U.S. Cl. 188—156 23 Claims

1. An electrically actuatable automotive parking brake with mechanical emergency actuation, characterized in that the parking brake is one of a disk brake (10) including brake pads (52, 54) and a drum brake (10') including brake shoes (110, 112) which can be applied and released by means of a gear arrangement (100) which is arranged at the brake and which comprises one power input and one power output, with the power input of the gear arrangement (100) being coupled with one end of a flexible shaft (58), the other end of which is arranged remote from the brake and is adapted to be coupled with a manual crank (66), in order to be able to



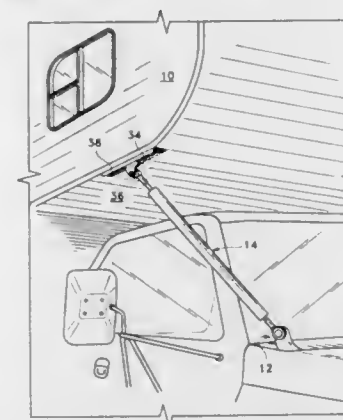
mechanically actuate the parking brake in the case of a failure of the electrical actuation.

5,769,190  
**CONTINUOUS CONTROLLED RESTRICTION VALVE FOR A SHOCK ABSORBER**  
Stefan Deferme, Heusden Zolder, Belgium, assignor to Tenneco Automotive Inc., Lake Forest, Ill.  
Filed Jan. 16, 1996, Ser. No. 587,227  
Int. Cl.<sup>6</sup> F16F 9/50  
U.S. Cl. 188—282.1 21 Claims



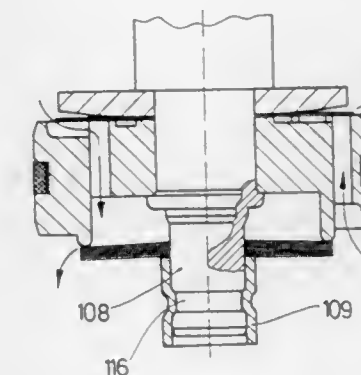
1. A shock absorber comprising:  
a pressure tube symmetrically disposed about an axis, said pressure tube forming a working;  
a piston assembly slidably disposed within said working chamber, said piston separating said working chamber into an upper and a lower portion;  
a fluid flow restricting member disposed within said piston assembly;  
a rebound fluid flow passage formed in said piston assembly, said passage including a fluid entrance, a fluid exit and a contoured wall extending between said fluid entrance and said fluid exit, said passage having a cross-sectional area which continuously increases from said fluid entrance to said fluid exit, said fluid flow restricting member being movable with respect to said contoured wall between said fluid entrance and said fluid exit to progressively increase said cross-sectional area of said passage.

5,769,191  
**UNIVERSAL STABILIZER STRUT FOR A TRUCK CAMPER**  
Earl Jackson Cole, Jr., Canyon Country, and Larry Whaley, Palmdale, both of Calif., assignors to Lance Camper Mfg. Corp., Lancaster, Calif.  
Filed Oct. 28, 1996, Ser. No. 744,775  
Int. Cl.<sup>6</sup> B60P 3/32  
U.S. Cl. 188—321.11 5 Claims



1. A shock absorbing strut adapted to be mounted between a cabover front portion of a truck camper and a structural member in a front bulkhead region of the truck on which the camper is mounted, said strut comprising:  
a hydraulic unit having a first end and a second end and extending along a longitudinal axis;  
an upper coupling secured to the first end of the hydraulic unit;  
a lower coupling secured to the second end of the hydraulic unit;  
a track secured to a downwardly facing surface of the cabover portion of the camper;  
an upper bracket extending downwardly and forwardly from the track and adapted to releasably receive one of the two couplings;  
means for securing the upper bracket to the track such that the upper coupling is adjustable fore-and-aft;  
a lower bracket extending upwardly and rearwardly from the structural member and adapted to releasably receive the lower coupling; and  
means for extending a body portion of said hydraulic unit in the direction of said longitudinal axis such that the spacing between said first and second ends may be varied to accommodate different designs of truck cabs with different heights and widths.  
wherein each of said couplings includes a spherical member free to rotate in three perpendicular axes, and  
wherein said bracket and said spherical member collectively comprise a bore, an axle passing through the bore, and a quick-release mechanism for securing the axle inside the bore, whereby the strut may be readily adapted for installation on different designs of truck cabs with different heights and widths, and  
whereby the strut may be quickly and easily removed from the truck and the truck camper.

5,769,192  
**SHOCK ABSORBER HAVING A PISTON PERMANENTLY ATTACHED TO ITS PISTON ROD**  
Hubert Beck, Eitorf-Keuenhof, Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Germany  
Continuation of Ser. No. 239,365, May 6, 1994, Pat. No. 5,547,050. This application Sep. 20, 1995, Ser. No. 531,042  
Claims priority, application Germany, May 10, 1993, 4315457.3; May 10, 1993, 4315458.1  
Int. Cl.<sup>6</sup> F16F 9/32  
U.S. Cl. 188—322.15 20 Claims  
1. A shock absorber for a motor vehicle, said shock absorber comprising:



a cylinder defining a chamber therein, said cylinder containing a damping fluid;  
a piston rod sealingly projecting into said cylinder and being axially displaceable within said cylinder;  
said piston rod having a longitudinal axis;  
a piston being attached to said piston rod, said piston being slidably disposed within said cylinder to sealingly divide said chamber into first and second chambers;  
said piston comprising a piston body;  
an arrangement to permit fluid communication between said first chamber and said second chamber;  
a first end and a second end;  
said cylinder being disposed between said first end and said second end;  
said first end comprising a first connecting apparatus to connect said shock absorber to a first body;  
said second end comprising a second connecting apparatus to connect said shock absorber to a second body;  
at least one valve disc for regulating fluid flow in said arrangement to permit fluid communication;  
a first fastening arrangement;  
said first fastening arrangement comprising an arrangement to fasten said piston rod and said piston body together;  
said first fastening arrangement comprising a first arrangement for being destroyed during the removal of said piston body from said piston rod, said piston rod and said piston body being substantially non-detachable from one another, said piston rod, and said piston body being detachable from one another only upon substantial destruction of said first arrangement for being destroyed;  
a second fastening arrangement;  
said second fastening arrangement comprising an arrangement to fasten said at least one valve disc and said piston rod together;  
said second fastening arrangement holding said at least one valve disc in contact with said piston body;  
said second fastening arrangement comprising a second arrangement for being destroyed during the removal of said at least one valve disc from said piston rod, said at least one valve disc and said piston rod being substantially non-detachable from one another, said at least one valve disc and said piston rod being detachable from one another only upon substantial destruction of said second arrangement for being destroyed;  
said second arrangement for being destroyed comprising a fastening member;  
said fastening member being disposed about said piston rod;  
said fastening member being disposed to pre-stress said at least one valve disc;  
said fastening member being configured to have been disposed by being pushed axially along said piston rod to pre-stress said at least one valve disc;  
said second arrangement for being destroyed comprising an arrangement to attach said fastening member to said piston rod and to maintain the pre-stress of said fastening member on said at least one valve disc;  
said fastening member being configured to have been attached to said piston rod subsequent to said fastening member being disposed on said piston rod by being pushed axially along said piston rod to pre-stress said at least one valve disc; and



said arrangement to attach said fastening member to said piston rod being disposed a distance from said at least one valve disc such that said at least one valve disc does not contact said arrangement to attach said fastening member to said piston rod.

5,769,193

**TELESCOPING VIBRATION DAMPER**

Hubert Beck, Eitorf-Keuenhof, Germany, assignor to Fichtel & Sachs AG, Eitorf, Germany

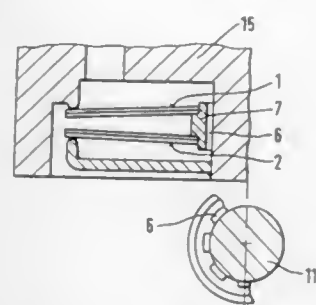
Filed Dec. 22, 1995, Ser. No. 577,627

Claims priority, application Germany, Dec. 22, 1994, 44 45 926.2

Int. Cl.<sup>6</sup> F16F 9/00

U.S. Cl. 188—322.22

11 Claims



1. A vibration damper, said vibration damper comprising:
  - a work cylinder, said work cylinder defining an interior chamber with a substantially central longitudinal axis;
  - a piston disposed within said interior chamber of said work cylinder and displaceable along said longitudinal axis;
  - said piston dividing said interior chamber of said work cylinder into a first piston chamber and a second piston chamber;
  - a piston rod connected to said piston and extending outside of said interior chamber of said work cylinder;
  - a fluid disposed in each of said first piston chamber and said second piston chamber;
  - said fluid in said first piston chamber having a first piston chamber fluid pressure, and said fluid in said second piston chamber having a second piston chamber fluid pressure; and
  - a flow control valve for controlling a flow of said fluid between said first and second piston chambers, said flow control valve comprising:
    - a first annular chamber formed within said piston and in fluid communication with said first piston chamber;
    - a first annular valve member disposed within said piston, one side of said first annular valve member bordering said first annular chamber;
    - a first valve seat disposed adjacent said first annular valve member;
    - first biasing means for biasing said first annular valve member into contact with said first valve seat against the force exerted by said first piston chamber fluid pressure on said one side of said first annular valve member;
    - a second annular chamber formed within said piston and in fluid communication with said first piston chamber;
    - a second annular valve member disposed within said piston, one side of said second annular valve member bordering said second annular chamber;
    - a second valve seat disposed adjacent said second annular valve member;
    - second biasing means for biasing said second annular valve member into contact with said second valve seat against the force exerted by said first piston chamber fluid pressure on said one side of said second annular valve member; and
    - the other sides of said first and second annular valve members being in fluid communication with said second piston chamber;
  - a fluid flow channel connecting said first and second annular chambers;

a support member connected to at least one of said piston and said piston rod;

said support member comprising a radial portion extending radially outward from said longitudinal axis;

said support member additionally comprising a longitudinal portion extending substantially parallel to said longitudinal axis;

said second valve seat being disposed on said longitudinal portion of said support member;

said support member and said second annular valve member substantially enclosing said second annular chamber;

said first valve seat comprising a first control edge for controlling a flow of said fluid between said first annular valve member and said first valve seat;

said second valve seat comprising a second control edge for controlling a flow of said fluid between said second annular valve member and said second valve seat;

the radial distance of said first control edge from said longitudinal axis being substantially equal to the radial distance of said longitudinal portion of said support member from said longitudinal axis;

the radial distance of said first control edge from said longitudinal axis being substantially greater than the radial distance of said second control edge from said longitudinal axis;

at least one of said piston and said piston rod comprising an extended portion extending along said longitudinal axis;

said fluid flow channel connecting said first and second annular chambers being disposed substantially adjacent to and at least partially encircling said extended portion of said at least one of said piston and said piston rod;

a spacer member at least partially encircling said longitudinal axis; and

said first and second annular valve members being positioned at an axial distance from one another along said longitudinal axis by said spacer member.

5,769,194

**LUGGAGE TRUCK**

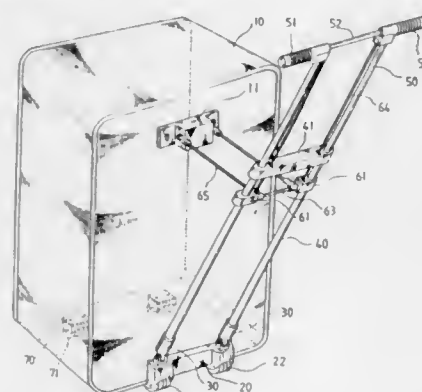
Fu-Chin Chang, Taipei, Taiwan, assignor to Tandun Incorporation Canniness Import-Export Associated Ltd., Taipei, Taiwan

Filed Oct. 15, 1996, Ser. No. 732,850

Int. Cl.<sup>6</sup> A45C 5/14; 13/28

U.S. Cl. 190—18 A

3 Claims



1. A luggage truck comprising:
  - a luggage body adapted for holding things, said luggage body having a locating frame fixedly secured to a rear side thereof near a top side thereof, at least one roller holder respectively and fixedly secured to a bottom side thereof and holding a respective roller;
  - a base frame fixedly secured to the bottom side of said luggage body and holding at least one roller for moving on the ground;
  - a plurality of parallel sleeves respectively pivotally mounted on said base frame and pivotal on said base frame relative to the rear side of said luggage body;

a plurality of sliding tubes joined by a handle grip outside said sleeves, and movable in and out of said sleeves; and

a plurality of sliding coupling devices respectively mounted around said sleeves and coupled to said handle grip and the locating frame of said luggage body for permitting said sleeves to be moved between a tilted position in which said handle grip can be pushed with the hand to move the luggage truck on the ground, and a vertical position in which said sleeves and said handle grip are located adjacent to the rear side of said luggage body;

wherein each of said sliding coupling devices comprises:

- a sliding block mounted around one sleeve and having a horizontal axle hole and a vertical through hole;
- a connector having a first coupling tube and a second coupling tube arranged at right angles, said first coupling tube being connected to the horizontal axle hole of one sliding block;
- a first link having a hooked bottom end inserted into the vertical through hole of said sliding block and hooked on the first coupling tube of said connector, and a top end coupled to said handle grip; and
- a second link having one end pivotally mounted on the locating frame of said luggage body, and an opposite end connected to the second coupling tube of said connector.

5,769,195

**LOCK-UP CLUTCH FOR A TORQUE CONVERTOR**

Hirohito Fukushima, Hirakata, Japan, assignor to Exedy Corporation, Osaka, Japan

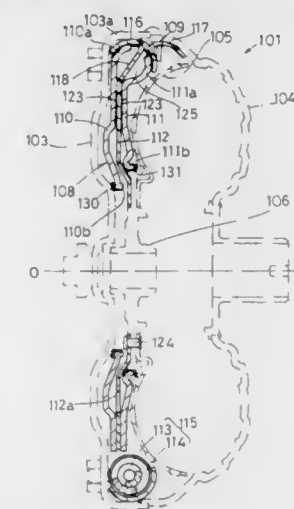
Filed Jun. 3, 1996, Ser. No. 656,820

Claims priority, application Japan, Jun. 9, 1995, 7-143194; Jun. 9, 1995, 7-143195; Aug. 29, 1995, 7-220122

Int. Cl.<sup>6</sup> F16D 3/12; F16H 45/02

U.S. Cl. 192—3.29

7 Claims



1. A lock-up clutch for a torque converter, comprising:
  - a torque converter having a front cover and a turbine;
  - a lock-up clutch mechanism for transmitting torque between said front cover and said turbine, said lock-up clutch mechanism having:
    - an output disc member having a radially inward portion connected to said turbine;
    - a pair of input disc members, at least a first said input disc members being engaged with said front cover for rotation therewith but configured for limited axial movement with respect to said front cover, said pair of input disc members being disposed on opposing axial sides of said output disc member, said pair of input disc members are configured to move axially toward one another for clamping engagement with an outer circumferential portion of said output disc member in response to changes of fluid pressure within a portion of said torque converter;

a plurality of coil elastic members having an arcuate shape in an unstressed state, said coil elastic members being disposed on an outer circumferential side of said output disc member and supported at opposing circumferential ends by said pair of input disc members; and

a support member connected to said front cover for supporting said opposing circumferential ends of said coil elastic members in the circumferential direction.

5,769,196

**TORQUE CONVERTER WITH A LOCK-UP MECHANISM**

Kiyohito Murata, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

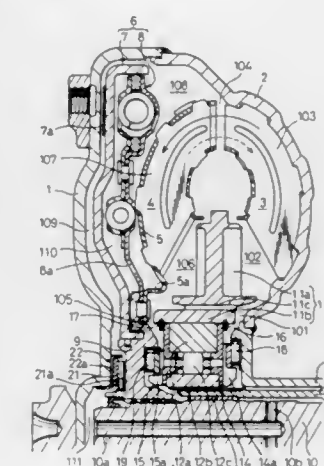
Filed Aug. 14, 1996, Ser. No. 698,259

Claims priority, application Japan, Aug. 23, 1995, 7-214488

Int. Cl.<sup>6</sup> F16H 41/24; 41/30; 45/02

U.S. Cl. 192—3.29

4 Claims



1. A torque converter with a lock-up mechanism used in an automobile, comprising:
  - a front cover connected with an input member, said input member being connected to an output shaft of an engine;
  - a pump connected with said front cover;
  - a turbine connected with an output member, said turbine circulating hydraulic operating fluid in said pump and said turbine in cooperation with said pump for thereby hydraulically coupling said input member and said output member;
  - a stator supported by a fixed member through a one-way clutch and disposed in an area between radially inner portions of said pump and said turbine, said stator rectifying said circulating hydraulic operating fluid;
  - a lock-up clutch connected with said output member and extended in an area between said turbine and said front cover, said lock-up clutch selectively engaged with said front cover for directly coupling said input member and said output member without the use of said circulating hydraulic operating fluid;
  - an oil passage, for introducing hydraulic operating fluid used for engaging said lock-up clutch with said front cover, that leads to a first oil chamber defined between said stator and said pump; and
  - a by-pass oil passage branched from said oil passage for communicating said oil passage and a second oil chamber defined between said stator and said turbine so that said hydraulic operating fluid used for engaging said lock-up clutch with said front cover may be introduced into said second oil chamber having lower oil pressure when said turbine pumps said circulating hydraulic operating fluid at the coasting running of said automobile.

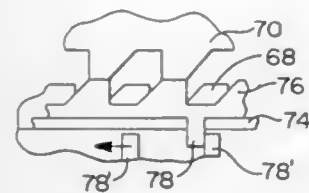
5,769,197

**CLUTCH ASSEMBLY FOR AN EXERCISE APPARATUS**  
Anthony Michael Kest, 29600 Franklin Rd., #22, Southfield, Mich. 48034, and Joseph Unkyung Han, Rancho Cucamonga, Calif., assignors to Anthony Michael Kest, Southfield, Mich.

Continuation of Ser. No. 595,738, Feb. 2, 1996, Pat. No. 5,634,874. This application Nov. 12, 1996, Ser. No. 745,744  
Int. Cl.<sup>6</sup> F16D 41/00

U.S. Cl. 192—46

16 Claims



1. A clutch assembly for selectively coupling a source and a load, the clutch assembly comprising:

- a drive member operably coupled to the source for movement therewith in a first direction and a second direction, said drive member having a plurality of teeth formed thereon;
- a drive clutch member disposed adjacent said drive member and operably coupled to said drive member for movement therewith, said drive clutch member having a plurality of teeth formed thereon;
- a driven member operably coupled to the load and having a plurality of teeth formed thereon such that said teeth of said driven member engage said teeth of said drive member when said drive member is moved in said first direction; and
- a stop member interdisposed between said drive member and said drive clutch member to position said teeth of said drive clutch member relative to said teeth of said drive member when said drive member is moved in said second direction to disengage said drive member from said driven member.

5,769,198

**PIN-TYPE SYNCHRONIZER**

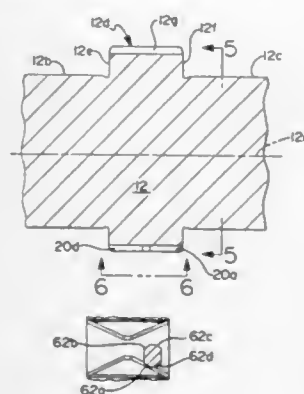
James D. Gluys, Portage, and Timothy S. Smith, Kalamazoo, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Sep. 16, 1996, Ser. No. 715,262

Int. Cl.<sup>6</sup> F16D 23/06

U.S. Cl. 192—53.31

6 Claims



1. A pin-type synchronizer selectively operative to frictionally synchronize and positive connect either of first and second drives mounted for relative rotation about an axis of a shaft; the synchronizer including:

first and second jaw members affixed respectively to the first and second drives and respectively engagable with axially movable third and fourth jaw members positioned between the drives, the third and fourth jaw members having internal splines slidably mating for non-relative rotation with external splines affixed to the shaft;

first and second cone friction rings respectively secured for rotation with the first and second drives and third and fourth cone friction rings concentric to the shaft and axially movable between the drives for frictional engagement respectively with the first and second friction rings to provide a synchronizing torque for synchronizing the drives with the shaft;

a radially extending flange having axially oppositely facing sides positioned between the third and fourth jaw members and between the third and fourth friction rings for axially moving the jaw members and rings into said engagement in response to an axial bidirectional shift force ( $F_s$ ) applied to the flange; blocker means operative when engaged for preventing engagement of the jaw members prior to the synchronizing, the blocker means including a plurality of circumferentially spaced apart pins rigidly extending axially between the third and fourth friction rings and into a first set of openings in the flange, each of the pins having a blocker shoulder engagable with a blocker shoulder defined about the associated opening;

first means securing the flange against axial movement relative to the third and fourth jaw members;

second means allowing limited circumferential movement of the flange relative to the third and fourth jaw members and the shaft, the second means including first and second ramps respectively affixed against axial and radial movement relative to the flange and shaft, said first and second ramps engagable in response to the synchronizing torque for producing an axial additive force ( $F_a$ ) on the flange in the direction of the shift force ( $F_s$ ) for increasing the total force engaging the friction rings; the improvement comprising:

the shaft including first and second cylindrical surfaces rotatably supporting the drives, an annular member having an outer circumference greater in diameter than diameters of the cylindrical surfaces and having an axial length separating the drives via axially oppositely facing shoulders limiting axial movement of the drives toward each other, the annular member affixed against axial and radial movement relative to the shaft and the external splines affixed to the shaft formed in the outer circumference thereof;

the first and second jaw members defined by external splines affixed thereto, the third and fourth jaw member internal splines mating continuously with the external splines of the annular member, and the third and fourth jaw member internal splines respectively engagable with external splines of the first and second jaw members;

the outer circumference of the annular member includes at least one recess of axial length equal to said axial length and totally removing several adjacent of the external splines of the annular member; and said second ramp defined in the recess.

5,769,199

**CLUTCH DISC WITH ACTUATION OF THE IDLE SPRINGS BY MEANS OF A CONTROL PLATE**

Norbert Lohaus, Schweinfurt, Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Germany

Filed Jul. 16, 1996, Ser. No. 680,938

Claims priority, application Germany, Jul. 17, 1995, 195 26 050.3

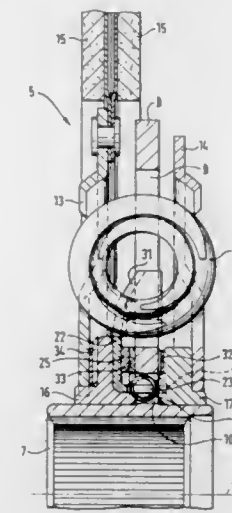
Int. Cl.<sup>6</sup> F16D 13/64; 3/14

U.S. Cl. 192—213.21

18 Claims

1. A clutch disc for a friction clutch, such as a motor vehicle friction clutch, said clutch disc comprising:

- a hub disc;
- said hub disc being oriented concentrically about a rotational axis;
- said hub disc having a thickness;



said hub disc thickness being defined generally parallel with the rotational axis;

an idle suspension system;

said idle suspension system comprising:

- at least one spring;
- said at least one spring having a width;
- at least one aperture disposed in said hub disc;
- said at least one aperture comprising means for locating said at least one spring; and
- said width of said at least one spring being similar to said thickness of said hub disc;

a first control plate;

said first control plate being oriented concentrically about the rotational axis;

said first control plate comprising a portion extending generally radially about the rotational axis;

the rotational axis defining an axial direction;

the axial direction being generally parallel with the rotational axis;

said first control plate comprising at least one control tab;

said at least one control tab substantially projecting in the axial direction from said radially extending portion of said first control plate;

said idle suspension system comprising said first control plate; and

said at least one control tab being disposed to operatively contact said at least one spring to activate said idle suspension system.

5,769,200

**COIN COLLECTION APPARATUS**

Wilfried Meyer, Buxtehude, and Hans-Ulrich Cohrs, Horneburg, both of Germany, assignors to National Rejectors, Inc., GmbH, Buxtehude, Germany

Filed Aug. 5, 1996, Ser. No. 693,880

Claims priority, application Germany, Aug. 9, 1995, 195 29 259.6

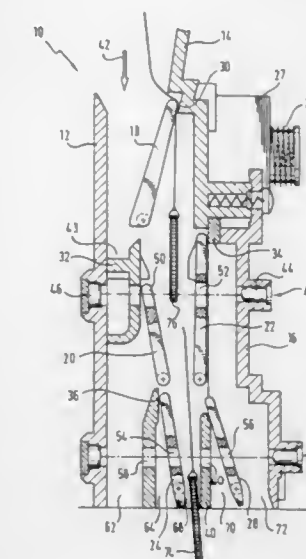
Int. Cl.<sup>6</sup> G07F 1/00

18 Claims

U.S. Cl. 194—203

8. Coin collection apparatus for use in a coin operated device to detect attempts at fraudulent transactions by use of a genuine coin suspended by a line for withdrawing the coin from the coin operated device after acceptance of the coin by the coin operated device and vending of the product or service, the coin operated device including a coin genuineness testing device, the coin collection apparatus comprising:

- a chute having walls for receiving the genuine coin and directing the coin generally downward;
- a flap disposed in the chute for blocking travel of the coin down the chute except past the flap;



an accept channel disposed generally downstream of the flap for receiving the genuine coin for passage to a coin collection receptacle of the coin operated device;

a reject channel disposed generally downstream of the flap for receiving a coin whose genuineness is rejected by the coin genuineness testing device;

the flap being pivotally mounted for swinging motion between an accept position in which the flap directs the coin whose genuineness is accepted by the coin genuineness testing device, and a reject position in which flap directs the coin whose genuineness has been rejected by the coin genuineness testing device, the flap and at least one of the chute walls being constructed and arranged to squeeze the line attached to the genuine coin between the flap and wall after passage of the genuine coin into the accept channel;

the flap and wall being formed to cooperate in the reject position of the flap to define an optical channel extending transversely of the chute, the line being forced into the optical channel by the flap moving to the reject position from the accept position;

a sensing device operable after passage of the genuine coin past the flap to detect the presence of the line being squeezed between the flap and the wall and generating a signal indicative of the presence of the line between the flap and wall, the sensing device comprising a photoelectric sensor disposed for viewing through the optical channel to detect the presence of a shadow cast by the line in the channel and generating a signal indicative of the presence of the line in the channel;

a controller for receiving the signal from the sensing device and generating a signal of a fraudulent transaction occurrence to be used for controlling the coin operated device.

5,769,201

**SAFETY APPARATUS FOR A NOVICE SKI LIFT**

Barton R. Dwight, Denver, and John S. Horn, Granby, both of Colo., assignors to Silver Creek Holding Co., Inc., Silver Creek, Colo.

Filed Dec. 19, 1995, Ser. No. 574,819

Int. Cl.<sup>6</sup> B65G 43/00

18 Claims

U.S. Cl. 198—323

1. Safety apparatus incorporated in a moving conveyor comprising a conveyor belt journaled around at least a two spaced apart rolls, each having an axis of rotation and having an entrance portion and an exit portion and used to transport people from one location to another location comprising:

- safety means located adjacent to said exit portion;
- pivot means for pivotally mounting at least a portion of said safety means;
- upper and lower stop means for limiting the pivotal movement of said at least a portion of said safety means;



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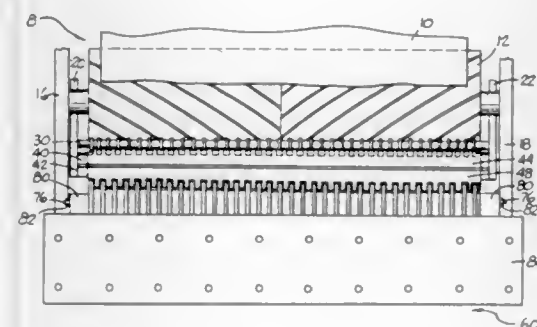
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3662

OFFICIAL GAZETTE

JUNE 23, 1998



force applying means for urging said at least a portion of said safety means against said upper stop means until a sufficient force is applied to said at least a portion of said safety means to overcome said force applying means and pivotally move said at least a portion of said safety means; control means for stopping said moving conveyor being actuated by said pivotal movement of said at least a portion of said safety means;

a frame having opposite side portions mounted at a fixed location; at least two spaced apart mounting plates; pivot means on each of said opposite side portions for pivotally mounting said mounting plates for movement around an axis of rotation; support means extending between and secured to said mounting plates for movement therewith; and said support means comprising at least one plate.

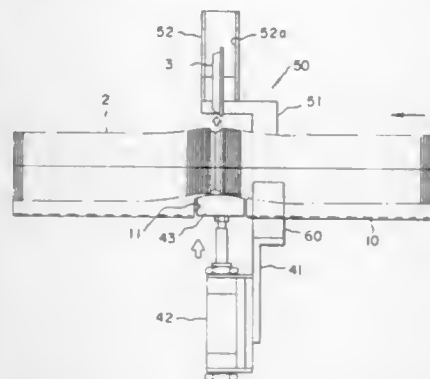
5,769,202

## INSIDE-OUT CAN LID REMOVAL DEVICE

Hideo Itoh, and Saburoh Itoh, both of Shizuoka-ken, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan Continuation of Ser. No. 309,989, Sep. 20, 1994, abandoned. This application Apr. 22, 1997, Ser. No. 844,780 Int. Cl.<sup>6</sup> B65G 47/256

U.S. Cl. 198—395

15 Claims



1. An inside-out can lid removal device comprising:

a transfer passage through which a row of can lids is transferred while being urged in a downstream direction, said row being constituted by a stacked and closely contacting plurality of can lids each formed in a generally disk-like shape, said row of can lids having an axis; a detection mechanism placed proximate to said transfer passage to detect the presence of an inside-out can lid; and an extrusion mechanism including an abutting block having an abutting surface for abutting against the inside-out can lid which has a width in the direction of the axis of the row of can lids greater than the thickness of a can lid whereby when said detection mechanism detects the inside-out can lid, said extrusion mechanism extrudes said inside-out can lid from said row with said abutting block.

5,769,203  
AUTOMATED FACILITY FOR THE UNSCRAMBLING OF  
LIGHT, HOLLOW, ELONGATED ARTICLES AND FOR  
THE LINED UP DELIVERY OF SAID ARTICLES

Jaime Marti Sala, Emancipación, 8, Barcelona, Spain, 08017

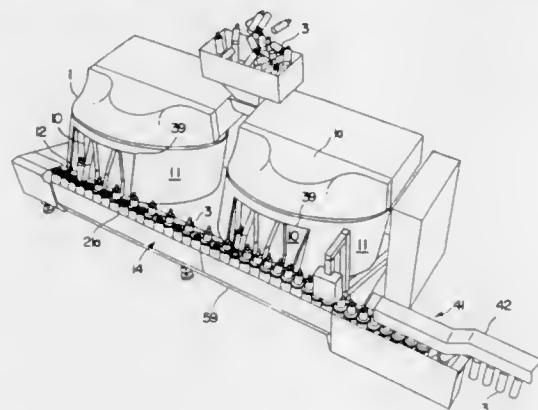
Filed Nov. 9, 1995, Ser. No. 555,751

Claims priority, application Spain, Nov. 9, 1994, 9402348; Feb. 6, 1995, 9500291; Jun. 5, 1995, 9501119

Int. Cl.<sup>6</sup> B65G 47/24

U.S. Cl. 198—397

18 Claims



1. An automated facility for the unscrambling of light, hollow, elongated articles and for the lined up delivery of said articles such as empty containers made of plastics material with a body and a neck and in particular with an unstable bottom which have to be fed at a high speed into a filling line, comprising:

at least an article unscrambling and lining up unit which delivers said articles one by one and in a preoriented arrangement to the inside of discharge chutes travelling along a closed circuit and thereby conveying said articles with their bottom slidingly resting on a supporting stationary floor, said discharge chutes being delimited by a casing;

a first opening provided in said supporting stationary floor of each of said unscrambling and lining up units;

a second opening in a lower lateral sector of said casing of each of said unscrambling and lining up units, said second opening being placed next to said first opening;

flexible driving means running along a closed circuit and comprising an upper out feeding strand and a lower return strand, provided with a plurality of article receiver members which are close together;

said upper out feeding strand extending along an area situated below said first opening in such a way that said article receiver members are at a given time close to a lower end of said discharge chutes and operationally coaligned with them for a transfer by gravity of said articles to the inside of said article receiver members;

said transfer by gravity taking place when said articles fall through said first opening;

said container receiver members having a holding aperture;

said container receiver members being linked by a lateral region of their base in a hinged connection with a plate attached to said flexible driving means so that said container receiving members are capable of adopting at least two positions: a first one with said holding aperture close to and facing said first opening and with a symmetry axis of said holding aperture coaligned with said discharge chutes, and a second position with said symmetry axis conveniently oriented in correspondence with a sequential positioning of said article receiver members next to an exit conveyor provided to feed said filling line.

JUNE 23, 1998

GENERAL AND MECHANICAL

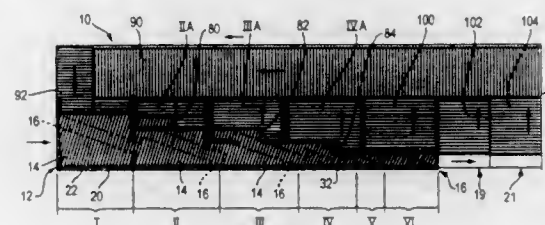
3663

5,769,204  
SINGULATOR CONVEYOR SYSTEM HAVING  
PACKAGE-RETURN CONVEYORS  
Goro Okada, and Edward Ydoate, both of Louisville, Ky.,  
assignors to Sandvik Sorting Systems, Inc., Louisville, Ky.  
Filed Dec. 21, 1995, Ser. No. 576,474

Int. Cl.<sup>6</sup> B65G 47/22

U.S. Cl. 198—443

9 Claims



1. A conveyor system for arranging randomly oriented articles into a single file traveling in a longitudinal direction, comprising: a frame forming a vertical side wall;

a singulator conveyor section including a plurality of driven rollers upon which the articles ride, the rollers driven about stationary axes of rotation and arranged in longitudinally successive groups, with the rollers of each group being driven at a faster speed than a preceding group, the axes being skewed to urge the articles in a direction having a longitudinal component directed toward a conveyor discharge end, and a lateral component directed toward the side wall, the rollers including inside ends disposed proximate the side wall, and outside ends disposed remote from the side wall, the rollers with stationary axes extending continuously from an inlet end of the singulator conveyor section to the conveyor discharge end thereof, some of the rollers being of shorter width than respective preceding rollers to form steps between such rollers;

a secondary return portion arranged at said steps for guiding excess packages in a generally lateral direction away from said side wall; and

a driven main return conveyor arranged to receive packages from said secondary return portion for returning the packages to the inlet end of said singulator conveyor section.

5,769,205

## CONTINUOUS CIGARETTE MANUFACTURING MACHINE

Bruno Belvederi, S. Pietro, and Giulio Barbieri, Emilia, both of Italy, assignors to G. D. Società Per Azioni, Bologna, Italy  
Filed Oct. 10, 1995, Ser. No. 541,909

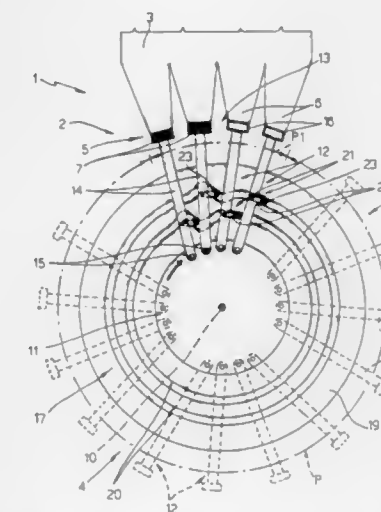
Claims priority, application Italy, Oct. 13, 1994, B094A0448; Mar. 24, 1995, B095A0127

Int. Cl.<sup>6</sup> B65G 47/84

U.S. Cl. 198—475.1

28 Claims

1. A continuous cigarette manufacturing machine comprising a conveyor; a number of conveying units supported on the conveyor, and in turn respectively comprising a conveying pocket for receiving an item comprising a number of cigarettes, and supporting means for connecting the pocket to the conveyor, said conveyor being movable continuously to move the pockets successively along a given path, said supporting means being movable in relation to the conveyor to move the respective pocket along said path and in relation to the conveyor; a loading station located along said path; and supply means for supplying said items, and having at least two outputs at the loading station; said conveying units being divided into groups, each comprising a number of pockets equal to the number of outputs of said supply means; said supporting means being provided with control means for imparting to the pockets of the conveying units in each said group given movements in relation to the conveyor, said control means comprising a plurality of cam means equal in number to the pockets in each group; each said cam means being associated with one pocket in each said group; each pocket in each said group being associated,



5,769,206

## CONTINUOUS UNLOADER

Isao Miyazawa, Urawa; Yoichi Seki, Aichi; Seizaburo Suda, Aichi, and Yoshinori Yamada, Aichi, all of Japan, assignors to Ishikawajima-Harima Heavy Industries Co. Ltd., Tokyo, Japan

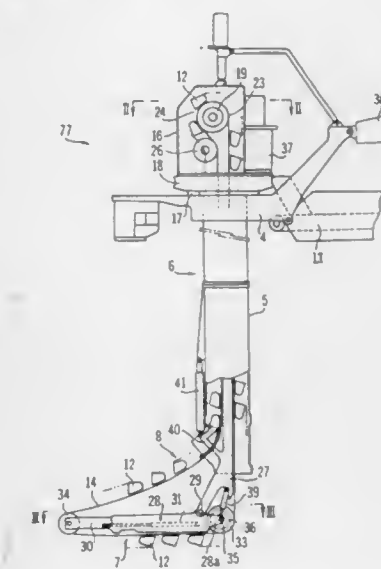
Filed Dec. 13, 1995, Ser. No. 572,216

Claims priority, application Japan, Jun. 16, 1995, 7-150460; Jul. 14, 1995, 7-179031; Jul. 14, 1995, 7-179032; Jul. 18, 1995, 7-181465; Jul. 18, 1995, 7-181466

Int. Cl.<sup>6</sup> B65G 17/36

U.S. Cl. 198—712

5 Claims



1. A continuous unloader of a type including a substantially vertically extending elevator portion having a bottom and a top, a digging portion having a first segment downwardly and diagonally extending from the bottom of the elevator portion and a second segment horizontally extending from a free end of the first segment, and a return portion extending from the top of the elevator portion to a free end of the second segment of the digging portion thereby forming an endless route comprising:

an endless bucket conveyer extending through the endless route;  
a plurality of drive components provided on the conveyer at predetermined positions, the drive components being synchronously driven for driving the conveyer; and  
an endless chain extending along the conveyer and being at least engaged over a first sprocket located at the top of the elevator portion and a second sprocket located at the bottom of the elevator portion, the first and second sprockets being synchronously driven by the drive components to drive the conveyer.

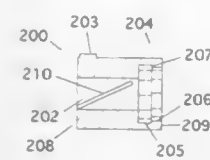
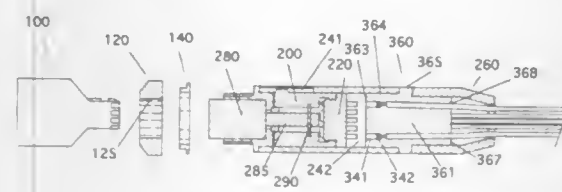
5,769,207

**KEY OPERATED VEHICLE ANTI-THEFT ELECTRICAL SWITCHING DEVICE**

Gary Christian, Moordown Bouenemouth, United Kingdom,  
assignor to Robin P. Whitfield, Calgary, Canada  
Filed Oct. 28, 1996, Ser. No. 739,046  
Int. Cl.<sup>6</sup> H01H 27/06

U.S. Cl. 200—43.08

6 Claims



1. A key-operated vehicle anti-theft electrical switching device, attachable to a vehicle having an electrical system, comprising:  
(A) an elongate device housing having an axial chamber and a keyway;

(B) a lock mechanism, carried by the device housing, the lock mechanism having a spindle that rotates as a key is turned in the lock mechanism, the spindle carrying a drive pin oriented perpendicularly to the spindle;

(C) a helix bushing, comprising:

(a) a cylindrical body having an axial channel, carried by the device housing and slidable within the device housing in an axial direction, the cylindrical body having an inside surface and an outside surface;

(b) raised key means, protruding from the outside surface of the cylindrical body, for travel in the keyway and for preventing rotation of the helix bushing;

(c) at least one helix groove in the inside surface of the cylindrical body, the groove sized to receive the drive pin; and

(d) a rear interlock structure, carried by the cylindrical body;

(D) a male contact block, comprising:

(a) a cylindrical body, carried by the device housing and slidable within the axial chamber of the device housing in an axial direction; and

(b) a front interlock structure, carried by the cylindrical body, and engageable with the rear interlock structure of the helix bushing;

(E) at least one U-shaped solid contact pin, carried by the male contact block;

(F) a female contact block, carried by the device housing; and

(G) at least two female contact sockets, carried by the female contact block, each contact socket sized to receive a prong of the U-shaped solid contact pin, each contact socket having connector means for attaching to the conductor of a wire from the vehicle's electrical system.

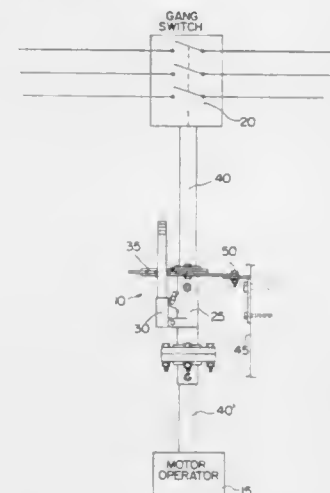
5,769,208  
**LOCKABLE ASSEMBLY FOR ENGAGING AND  
DISENGAGING A MOTOR OPERATOR WITH AN  
OVERHEAD DISTRIBUTION GANG SWITCH**  
Charles E. Griffith, 112121 Whisperwood La., Rockville, Md.  
20852

Filed Nov. 29, 1996, Ser. No. 758,450

Int. Cl.<sup>6</sup> H01H 31/00

U.S. Cl. 200—48 R

18 Claims



17. A lockable engagement/disengagement assembly for use between a motor operator which is connected to a first operating shaft and a gang switch which is connected to a second operating shaft, the first and second operating shafts being aligned so as to have a common axis and the gang switch having an open state or a closed state, said lockable engagement/disengagement assembly comprising:

a coupler assembly which includes a first member adapted to be connected to the first operating shaft and a second member adapted to be connected to the second operating shaft, the first member being disposed adjacent the second member and being rotatable with respect to the second member;

connecting means, including a handle which is pivotable between a first pivoted position wherein the handle is spaced apart from the common axis by a first distance and a second pivoted position wherein the handle is spaced apart from the common axis by a second distance, for connecting the first and second members when the handle is in the first pivoted position so that the second operating shaft rotates in unison with the first operating shaft and for disconnecting the first and second members when the handle is in its second pivoted position so that the second operating shaft can be manually rotated about the common axis, without rotating the first operating shaft, between an open position wherein the gang switch is in its open state and a closed position wherein the gang switch is in its closed state; and

locking means for locking the handle in either its open or closed position while the handle is in its second pivoted position.

5,769,209  
**HANDLE FOR ELECTRICAL TOGGLE SWITCH ON A  
TRUCK DASH**

William G. Massey, III, Portland, Oreg., assignor to Freightliner Corporation, Portland, Oreg.

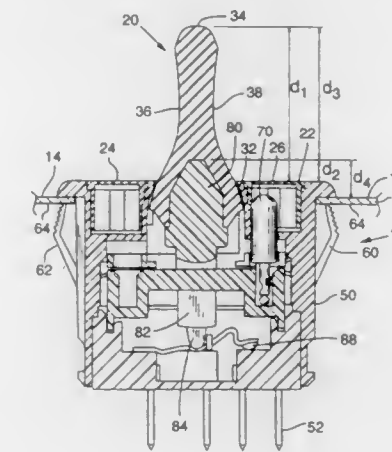
Filed Jul. 1, 1996, Ser. No. 675,341

Int. Cl.<sup>6</sup> H01H 3/00

U.S. Cl. 200—339

15 Claims

15. A toggle switch for mounting to a front surface of a truck dash, the toggle switch having a handle comprising an elongated body with a longitudinal axis and projecting outwardly from the front dash surface when the toggle switch is mounted in place, the handle having a base at the front dash surface into which a toggle



switch lever may be inserted, the portion of the handle projecting outwardly beyond the dash front surface and beyond the lever being comprised of a resilient flexible material which bends and absorbs shock upon impact by a driver or passenger in the truck; and

in which the toggle switch is enclosed in a housing having a platform with an outer surface, the handle projecting outwardly beyond the outer surface of the platform, and at least a portion of the resilient flexible material forming the handle being positioned within the housing and below the outer surface.

5,769,210

**SCISSORS-TYPE KEY SWITCH**

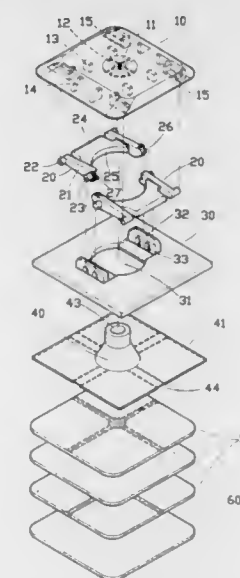
Ching-Cheng Tsai, Chi Lung, Taiwan, assignor to Chicony Electronics Co., Ltd., Taipei Hsien, Taiwan

Filed Feb. 11, 1997, Ser. No. 798,630

Int. Cl.<sup>6</sup> H01H 3/12

U.S. Cl. 200—344

5 Claims



1. A scissors-type key switch comprising:  
a key top having four connecting slots thereof;  
a pair of scissors-type supporting brackets, each of said supporting brackets including a pair of supporting arms disposed opposite to each other, each of said supporting arm further including a pair of pin shafts at upper and lower end portions respectively, said supporting arms being connected to each other by a base plate, the lower portion of said base plate being provided with a circular cutout, one of said supporting arms being provided with an external teeth portion at the

lower portion and the other supporting arm being provided with an internal teeth portion corresponding to the external teeth portion, wherein when said external and internal teeth portion are meshed together, said scissors-type supporting brackets can be moved in an interactive manner;

a base for receiving and supporting said supporting brackets, said base being provided with a through hole for passing through thereof the elastic actuator in the position corresponding to said key top, both sides of said through hole being provided with a connecting socket respectively, each of said connecting sockets being provided with a connecting hole for pivotally receiving said pin shaft of said supporting arm of said supporting bracket;

an elastic actuator being disposed within said through hole of said base;

a membrane switch being disposed under said elastic actuator; and

a bottom plate being disposed under said membrane switch; wherein said membrane switch, said elastic actuator and said base are disposed above said bottom plate and said scissors-type supporting brackets are well supported and received within said base by the pivotally engagement between said pin shafts and said connecting holes of said connecting sockets of said base, said key top is pivotally connected with said scissors-type supporting brackets by the connecting slots of said key top and said pin shafts of said scissors-type supporting bracket.

5,769,211

**MEDICAL HANDPIECE WITH AUTOCLAVABLE SWITCH**

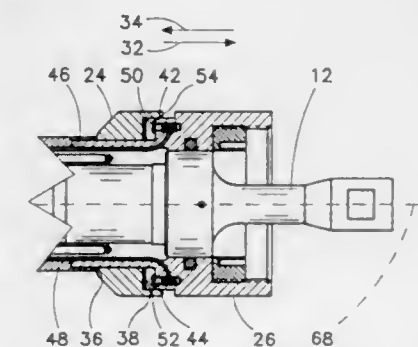
Ronald R. Manna, Valley Stream; Theodore A. D. Novak, Northport; Scott Isola, Deer Park, and David Ng, Brooklyn, all of N.Y., assignors to Misonix, Inc., Farmingdale, N.Y.

Filed Jan. 21, 1997, Ser. No. 785,989

Int. Cl.<sup>6</sup> H01H 9/06

U.S. Cl. 200—549

23 Claims



1. A handpiece assembly for a medical instrument, comprising:  
a handle having an axis extending from a proximal end of the instrument toward a distal end thereof;

an electrical circuit incorporated at least partially in said handle for controlling an application of an action to a patient via the medical instrument, said circuit having a first electrical contact and a second electrical contact each projecting from a surface of said handle, said first electrical contact and said second electrical contact being disposed in a plane oriented transversely to said axis, said surface being an annular surface extending in said plane transversely to said axis and facing toward said proximal end of said handle, said first electrical contact and said second electrical contact projecting from said annular surface toward said proximal end of said handle, said first electrical contact and said second electrical contact being angularly spaced from one another about said axis;

an actuator ring slidably disposed on said handle and surrounding same for motion in alternately opposite directions along said handle under the control of an operator; and

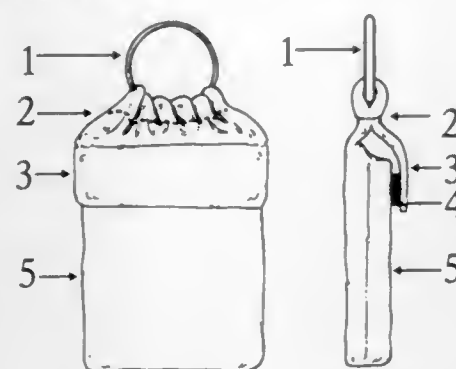


a bridging electrical contact disposed on said ring for conductively connecting said first electrical contact and said second electrical contact at a first predetermined longitudinal position of said ring along said handle, thereby closing said circuit at said first predetermined longitudinal position of said ring, and for opening said circuit at another longitudinal position of said ring along said handle.

5,769,212  
AUTOMOTIVE ALARM SYSTEM REMOTE CONTROL  
KEYPAD POUCH  
La Vella Collins, 3753 S. Plaza Trail, Virginia Beach, Va. 23452  
Filed Feb. 11, 1997, Ser. No. 797,210  
Int. Cl.<sup>6</sup> A45C 11/32

U.S. Cl. 206—38

1 Claim



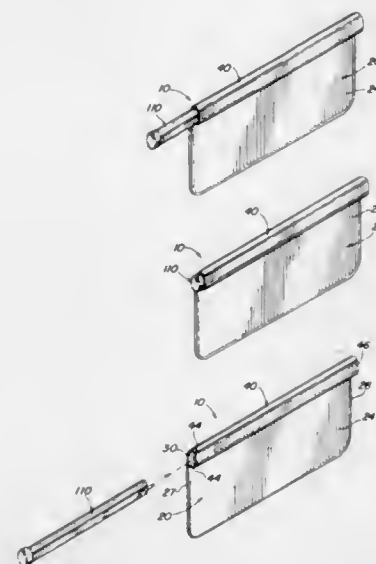
1. A device for supporting an object, said device comprising a pouch adapted to accommodate and support therein an automotive alarm system remote keypad, said pouch being constructed of a heavy weight durable material which is flexible enough to facilitate actuation of mechanisms of said keypad without removal of the keypad from the pouch, said material selected from one of the group consisting of flexible sheet plastic and fabric, said pouch being formed from a rectangular length of said material which is folded back on itself and stitched along right and left edges thereof to form a pocket having a closed end and an open end, an extension of said length of said material at said open end being folded and stitched to form a flap to close said open end and a sleeve disposed across the top of said flap, a key ring attached to said sleeve to accommodate automobile keys thereon.

5,769,213  
CARD WITH ARTICLE CARRIER  
Philip Chatterton, 2360 Tallahassee St., Fort Lauderdale, Fla. 33326-2330  
Continuation of Ser. No. 664,742, Jun. 17, 1996, which is a continuation-in-part of Ser. No. 414,388, Mar. 31, 1995, abandoned. This application Feb. 28, 1997, Ser. No. 810,600  
Int. Cl.<sup>6</sup> A45C 15/00

U.S. Cl. 206—38

14 Claims

1. A device to be carried in a wallet or purse having credit card sized pockets or slots, said device comprising:  
a base including a flat, rigid primary panel having a front surface, a rear surface, and surrounding peripheral edge zones, said base being sized and configured for removable receipt within the credit card sized pockets or slots of the wallet or purse so that when said base is received within said pockets or slots, one of said peripheral edge zones remains exposed exteriorly of the pocket or slot,  
an article having a generally elongate configuration, an external surface, a distal end portion and a proximal end portion,  
means for releasably grasping and capturing said article in a secured, stowed position on said base and including an article receptacle formed along said exposed one of said peripheral edge zones, said receptacle including a wall structure having a

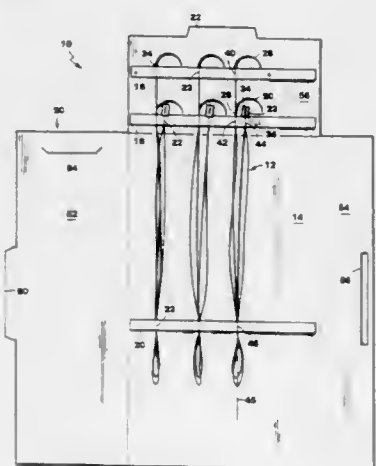


top longitudinal surface and a bottom longitudinal surface defining an elongate raised rail along said exposed one of said peripheral edge zones, said wall structure further defining a hollow elongate channel for receiving said article therein, said channel being structured and disposed for congruent, snug-fitted axial receipt of the article through either of said open ends so that the article is held in a captivated, fixed position relative to said receptacle when received therein, defining said stowed position, said receptacle being structured to expose said proximal end portion of the article when in said stowed position to enable grasping of the article for axial retrieval from the receptacle; and  
handle means for grasping said device to remove said base from within said pockets or slots.

5,769,214  
SUTURE PACK  
Catherine Zatarra, Fall River, Mass., assignor to Deknatel Technology Corporation, Wilmington, Del.  
Continuation of Ser. No. 406,560, Mar. 20, 1995, Pat. No. 5,582,288. This application Oct. 22, 1996, Ser. No. 731,907  
The portion of the term of this patent subsequent to Mar. 20, 2015, has been disclaimed.  
Int. Cl.<sup>6</sup> A61B 17/06

U.S. Cl. 206—63.3

3 Claims



1. A suture pack, comprising:  
a support, and  
a suture having two needles, one at each of its ends, and a pledget between the ends,

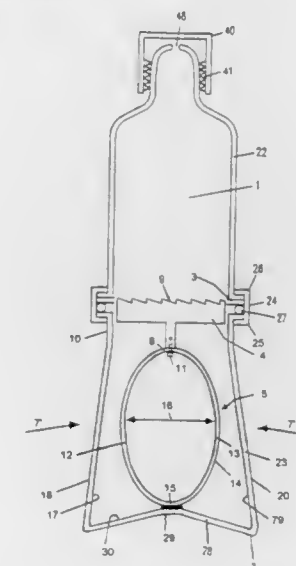
said support comprising an upper mounting strip including a first retainer holding a first of said needles, a central mounting strip including a second retainer holding a second of said needles and a third retainer holding the pledget separately from either of the needles, and a lower mounting strip extending along a portion of said support and including a fourth retainer in the form of a slit.

5,769,215  
TWO-COMPONENT PACKAGE  
Hyeong Sook (Morin) Kim, Kowloon, Hong Kong, assignor to Georg Wiegner, Kowloon, Hong Kong  
Continuation-in-part of Ser. No. 408,598, Mar. 22, 1995, Pat. No. 5,685,422. This application Jan. 16, 1997, Ser. No. 785,024  
Claims priority, application Germany, Mar. 22, 1994, 44 09 696.8

Int. Cl.<sup>6</sup> B65D 25/08

U.S. Cl. 206—222

10 Claims



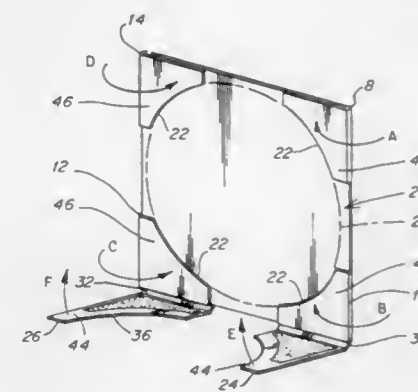
1. A container for separately packaging two different substances and for enabling mixing of said substances prior to dispensing thereof from said container, comprising:  
a first compartment containing a first substance and a second compartment containing a second substance;  
a frangible seal separating said first and second compartments;  
a discharge port for enabling discharge from at least one of said compartments of a mixture of said substances; and  
a puncturing device for breaking said frangible seal to establish a communication between said compartments; and  
said puncturing device comprising a length extendable press shank and at a top end thereof a die with a sharp knife edge adjacent said frangible seal, said device being contained within one of said compartments in a guided manner to break said frangible seal upon application of a force against said press shank by laterally squeezing said compartment containing said puncturing device to extend the length of said press shank in the direction of said frangible seal, while said press shank is being supported by an inside wall of said compartment containing said functioning device, allowing said sharp knife edge to break said frangible seal.

5,769,216  
HOLDER FOR COMPACT DISC AND THE LIKE  
William Collins, 30 Durham Rd., New Hyde Park, N.Y. 11040  
Filed Feb. 27, 1996, Ser. No. 607,647  
Int. Cl.<sup>6</sup> A65D 85/30

U.S. Cl. 206—308.1

28 Claims

1. A disc package for retaining a disc having an edge defining a radius of curvature, comprising:

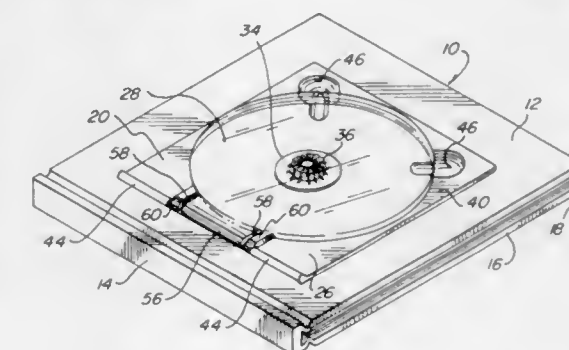


a retention panel defining a plane having first and second surfaces, the first surface of said retention panel being in substantial contact with a face of said disc when the disc is inserted within said disc package;  
a plurality of lateral engagement sections superposed with respect to the first surface of the retention panel, each of the plurality of lateral engagement sections having a curved edge which substantially corresponds to at least a portion of said disc edge for accommodating insertion of said disc, engagement of said disc edge and lateral retention of said disc, at least first and second lateral engagement sections of said plurality of lateral engagement sections being noncontiguous with one another such that at least a first portion of said edge of said disc is proximate to and unengaged with said first and second lateral engagement sections for ease of removal of said disc from said disc package; and  
a disc retainment tab being superposed with respect to at least one of said plurality of lateral engagement sections, the disc retainment tab being non-planar with respect to the retention panel plane, at least a portion of said disc retainment tab extending over at least a portion of the first surface of the retention panel to operatively engage at least a portion of a surface of said inserted disc and retain the disc therein.

5,769,217  
COMPACT DISC HOLDER  
William N. Derragha, Weston, and Peng Cheong Loo, Norwalk, both of Conn., assignors to Printlink Publishers, Inc., Monroe, Conn.  
Filed Mar. 11, 1997, Ser. No. 814,664  
Int. Cl.<sup>6</sup> B65D 85/57

U.S. Cl. 206—308.1

30 Claims



1. In a construction having a pivoted cover with an aperture therein, the improvement comprising:  
a compact disc holder mounted in the construction so that a compact disc therein is visible through the aperture, the compact disc holder comprising a compact disc holder tray having a recess dimensionally sized to accept a conventional compact disc, means engageable with the conventional compact disc to releasably hold the conventional compact disc within said compact disc holder tray, a compact disc holder cover

hingedly connected to said compact disc holder tray so that said compact disc holder cover is pivotable between a closed position and an open position, said compact disc holder cover being dimensionally sized to cover at least a portion of said recess, and means adapted for releasably securing said compact disc holder cover to said compact disc holder tray in the closed position of said compact disc holder cover.

5,769,218

# STORAGE AND SAFETY DEVICE FOR ARTICLE BEING STORED

Isao Yabe, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

PCT No. PCT/JP95/01782, § 371 Date May 24, 1996, § 102(e) Date May 24, 1996, PCT Pub. No. WO96/09969, PCT Pub. Date Apr. 4, 1996

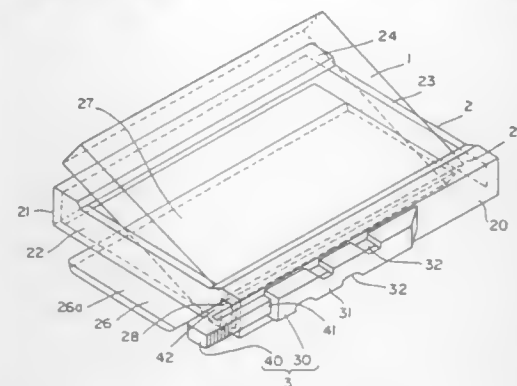
PCT Filed Sep. 7, 1995, Ser. No. 649,625

Claims priority, application Japan, Sep. 27, 1994, 6-231444; Nov. 22, 1994, 6-287632; Mar. 3, 1995, 7-043710

Int. Cl.<sup>6</sup> B65D 85/57

U.S. Cl. 206—308.2

27 Claims



1. A storage and safety device, comprising:

an enclosure frame for storing an article, said enclosure frame being a parallelepiped having two pairs of side frames, and upper and lower frames, and including an opening for insertion and removal of the article and an interior configuration sized to enable said article to move, one of the side frames having a gap bar insertion opening,

a lock mechanism for locking the article contained in the enclosure frame to prevent the article from being taken out, said lock mechanism being integrally formed with the enclosure frame to be inserted into and removed from a gap formed between the article stored in the enclosure frame and one of the side frames, said lock mechanism including a lock housing fixed to said side frame which is positioned next to said gap bar insertion opening, and a lock key having a lock key main body and a gap bar with a U-shaped cross-section formed at one end of the lock key main body, said gap bar being inserted into said gap bar insertion opening when said lock key main body slides in the lock housing so that said gap bar is located between the article and the side frame to thereby lock the article, and

a release jig for releasing the lock mechanism.

5,769,219

# BEVERAGE STORAGE APPARATUS FOR USE WITH A GOLF BAG

Jerry W. Shmel, 14165 W. Warren Cir., Lakewood, Colo. 80228

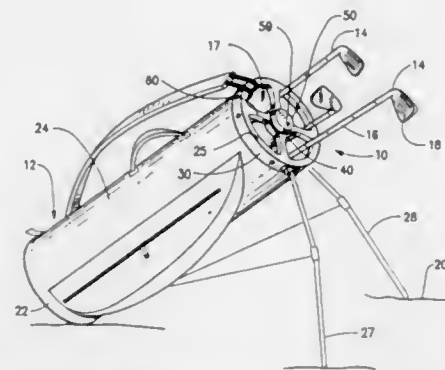
Filed Jun. 8, 1995, Ser. No. 482,917

Int. Cl.<sup>6</sup> A63B 55/00; 57/00

U.S. Cl. 206—315.3

20 Claims

1. A beverage storage apparatus adapted to receive a beverage container and adapted to mount to a golf bag that includes a base



and an elongated surrounding sidewall that extends longitudinally from said base to terminate in a rim thereby to define an interior of said golf bag with said rim defining a mouth therefor through which shafts of a plurality of golf clubs may be inserted so that said golf clubs are stored in the interior of said golf bag, said beverage storage apparatus comprising:

- a collar adapted to engage a margin of said bag proximate to said rim and having a channel sized and adapted to matably receive said rim;
- a receptacle operative to matably receive said beverage container and adapted to removably support said beverage container during transport of the golf bag; and
- a support structure interconnecting said collar and said receptacle such that said receptacle depends from and is maintained at a fixed location relative to said golf bag by said collar.

5,769,220

# SECTIONAL GOLF BAG

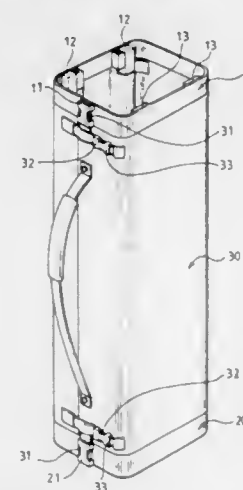
Bum-ki Hong, 105-903, Hyundai first APT, 653 Gaepo-dong, Kangnam-gu, Seoul, Rep. of Korea

Filed Apr. 21, 1997, Ser. No. 840,488

Int. Cl.<sup>6</sup> A63B 55/00

U.S. Cl. 206—315.3

3 Claims



1. A sectional golf bag comprising:

- a top frame forming an opening top of said golf bag and including:
  - a clip holder on the exterior side wall;
  - a rectangular sleeve holder on the interior side wall, said sleeve holder comprising a rectangular guide sleeve and a ratchet sleeve abutting on one exterior side wall of said guide sleeve; and
  - a T-shaped clip on the interior side wall at a position opposite to said sleeve holder;
- a bottom frame forming the bottom of said golf bag and including a clip holder, a rectangular sleeve holder and a T-shaped clip, said clip holder, sleeve holder and T-shaped

clip of the bottom frame respectively having the same constructions as those of the top frame and being formed at positions corresponding to those of the top frame;

a bag body having a predetermined thickness and being selectively assembled with said top and bottom frames into a single body, said bag body including:

- a belt-attached vertical, clip selectively engaging with each of the clip holders of the top and bottom frames;
- a belt-attached horizontal clip provided at a position suitable for surrounding a belt of said vertical clip; and
- a belt-attached holder selectively engaging with said horizontal clip, thus tightening the bag body when the bag body is assembled with the top and bottom frames;
- a ratchet bolt unit and a T-shaped bolt unit, both bolt units being interiorly provided on each of the top and bottom edges of said bag body and selectively engaging with both the sleeve holder and the T-shaped clip of each of the top and bottom frames respectively, thus assembling the bag body with the top and bottom frames into a single body; and
- a reinforcement unit interiorly and vertically extending from each of the bolt units provided on the top edge of the bag body to each of the bolt units provided on the bottom edge of the bag body thus reinforcing the bag body, said reinforcement unit including:
  - a longitudinal holder having an axial opening; and
  - a longitudinal pipe passing through said opening of the longitudinal holder, said pipe being fitted into each of the bolt units at each end thereof.

5,769,221

# LENS-GATE DIVIDER SYSTEM FOR CAMERA BAGS

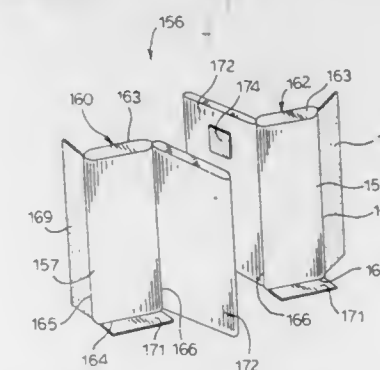
Ryan Cyr, Hidden Hills, Calif., assignor to Tamrac, Inc., Chatsworth, Calif.

Division of Ser. No. 385,311, Feb. 7, 1995, Pat. No. 5,573,114. This application Sep. 10, 1996, Ser. No. 711,970

Int. Cl.<sup>6</sup> B65D 85/38

U.S. Cl. 206—316.1

17 Claims



1. A camera bag for holding photographic equipment, comprising:

- a generally rectangular base wall and a pair of end walls connected at their ends to a pair of sidewalls, the walls extending upwardly from the base wall to form an enclosure with a top opening;
- a cover secured to said enclosure and adapted to be positioned to span and enclose said top opening of said enclosure for restraining and protecting said photographic equipment;
- at least one pair of spaced apart vertical panels attachable to and extending between said sidewalls of said enclosure and leaving a gap portion between the pair of vertical panels and spaced from one of said end walls of said enclosure, each of the at least one pair of panels having a bottom edge, two vertical side edges and a top edge;
- means for stabilizing said at least one pair of vertical panels within said enclosure; and
- a pair of swinging gates extending between said at least one pair of vertical panels and covering said gap portion in said enclosure, one of the pair of swinging gates hingeably

attached to a proximal one of said two vertical side edges of the at least one pair of panels, and the other one of the pair of swinging gates hingeably attached to a proximal one of said two vertical side edges of the other one of said at least one pair of panels, where the at least one pair of swinging gates can swing open or closed and transform said at least one pair of panels into a full length divider.

5,769,222

# ANGIOGRAPHY GUIDE WIRE CONTAINER

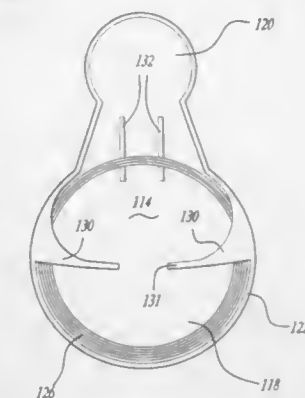
Kirk Banerian, 7105 Glenburnie, Clarkston, Mich. 48346

Continuation-in-part of Ser. No. 470,937, Jun. 6, 1995, Pat. No. 5,611,428. This application Mar. 17, 1997, Ser. No. 819,502

Int. Cl.<sup>6</sup> B65D 83/10; A61B 5/00

U.S. Cl. 206—364

21 Claims



1. A container for use in medical procedures comprising:

- a base having an upper surface and a lower surface, the base defining an insertion end and an exposing removal end, each end allowing passage of an entire coiled flexible medical device having two free ends;
- a continuous side wall extending upwardly from and encircling the insertion and removal ends of the base forming a basin for retaining the coiled, flexible medical device;
- at least one retaining flange attached to the side wall and spaced apart from the upper surface of the base, the retaining flange extending across at least a portion of the base and configured to retain the free ends of the coiled medical device; and
- at least one guide arm attached to the side wall, each guide arm spaced apart from the upper surface of the base and extending across at least a portion of the insertion end of the base; whereby each guide arm guides the coiled medical device onto the upper surface of the base as the medical device is inserted at the insertion end, the retaining flange retaining the free ends of the coiled medical device during and after insertion into the basin.

18. A method of containing an elongated, flexible medical device having two free ends in between medical procedures, said method comprising the steps of:

- removing said medical device from a patient,
- coiling said medical device,
- disposing said medical device in a container, said container comprising a base having an upper surface and, a lower surface, the base defining an insertion end and an exposing removal end, each end allowing passage of an entire coiled flexible medical device having two free ends; a continuous side wall extending upwardly from and encircling the insertion and removal ends of the base forming a basin for retaining the medical device, at least one retaining flange attached to the side wall and spaced apart from the upper surface of the base, the retaining flange extending across at least a portion of the base and configured to retain the free ends of the coiled medical device, and at least one guide arm attached to the side wall, each guide arm spaced apart from the upper surface of the base and extending across at least a portion of the insertion end of the base.



5,769,223

**DEVICE FOR RECAPPING NEEDLES AND SHARPS**  
M. Lou Marsh, Del Mar, Calif., assignor to Ohana Medical Concepts, LLC, Solana Beach, Calif.  
Continuation-in-part of Ser. No. 428,324, Apr. 25, 1995, abandoned, which is a continuation-in-part of Ser. No. 203,784, Mar. 1, 1994, abandoned. This application Sep. 24, 1996, Ser. No. 719,279

Int. Cl.<sup>6</sup> B65D 85/24; A61M 5/32  
U.S. Cl. 206—365

20 Claims



1. A device for removing and holding protective sheaths of sharp piercing objects during single-handed use of the object, comprising:

a hollow container having a cavity therein, said container having an opening into said cavity, said opening being sized to simultaneously receive a plurality of the sheaths therethrough; a solid support block, said support block being composed of a deformable semi-rigid elastomeric material for receiving and gripping the sheaths and being disposed within said cavity to present an exposed surface thereof at said opening, said exposed surface of said support material being penetrable by said sheaths to surround and embed tip portions of the sheaths therein to grip the sheaths in substantially fixed upright positions relative to said container while the objects are withdrawn from or inserted into the sheath; and

said support block material having low memory and having low plasticity coefficient sufficient to grip firmly and to retain the embedded sheaths in their upright positions for a sufficiently long period of time to permit the user to employ the objects before re-inserting the objects back into their respective sheaths, said material being able to withstand relatively high temperatures to enable the device to be sterilized, said material being generally translucent to enable the user to readily determine contamination thereof.

11. A device for removing and holding a protective sheath of a sharp piercing object during single-handed use of the object, which comprises:

a deformable elastomeric support material having a plasticity coefficient between about 55.9 and about 60.6 at about 20° C.; means for containing the deformable elastomeric support material, said containing means having an opening to expose said support material and said opening being sized to simultaneously receive a plurality of said sheaths therethrough; means attached to said containing means for selectively exposing a portion of said support material at said opening of said containing means to allow penetration of said support material by at least one said sheath to embed said sheath therein and to hold said sheath in a substantially fixed relationship with said containing means while said object is withdrawn from or inserted into said sheath; and

means attached to said containing means for stabilizing said containing means.

17. A method for protecting a user from accidental needle sticks during single-handed operation of a hypodermic needle having a removable protective sheath, which comprises the steps of:

containing a deformable elastomeric support material in a cavity of a hollow receptacle, said receptacle having an opening sized to simultaneously receive a plurality of said sheaths therethrough, said deformable elastomeric support material having a low plasticity coefficient between about 55.9 and about 60.6 at about 25° C.;

stabilizing the hollow receptacle;

penetrating said support material at said opening with at least one said protective sheath to embed said sheath in said support material and hold said sheath therein in a substantially fixed position relative to said receptacle;

withdrawing said hypodermic needle from said protective sheath while said sheath remains engaged with said support material; and

inserting said hypodermic needle into said protective sheath to recap said needle while said sheath remains engaged with said support material.

5,769,224

**SHEATH PACKAGE FOR PIPETTERS**

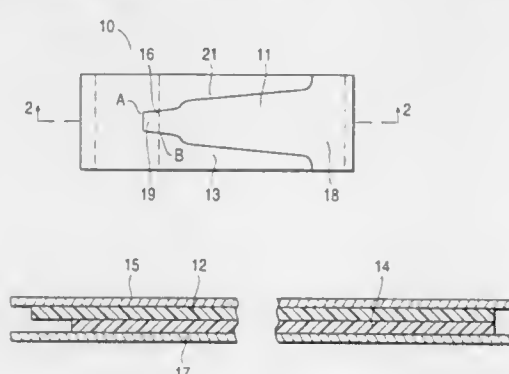
Richard Poncy, 120 Spinnaker Ln., Jupiter, Fla. 33477, and George W. Poncy, Sr., 5380 N. Ocean Blvd., Apt. 12-J, Singer Island, Fla. 33404

Filed Mar. 21, 1997, Ser. No. 821,822

Int. Cl.<sup>6</sup> B65D 85/00

U.S. Cl. 206—365

6 Claims



1. A packaging system for a pipettor sheath comprising:

a front cover strip;

a back cover strip;

a first strip of thermoplastic material;

a second strip of thermoplastic material, said first and second strip of thermoplastic material sandwiched between said front and back cover strips;

a tear seal formed in said first and said second strips of thermoplastic material, wherein said tear seal forms a pipettor sheath comprised of said first and second thermoplastic strips, said pipettor sheath having a tip end and a mouth end;

said first strip of thermoplastic material extending beyond said second strip of thermoplastic material;

a tear line formed in the portion of said first strip of thermoplastic material extending beyond said second strip and connecting to the tear seal at the tip end of said sheath;

a first peelable seal between said front cover strip and said first strip of thermoplastic material; and

a second peelable seal between said back cover strip and said second strip of thermoplastic material.

5,769,225

**PACKAGE FOR DENTAL FLOSS**

Laurence S. Braude, 797 Kimballwood La., Highland Park, Ill. 60603

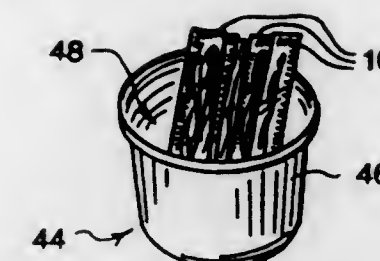
PCT No. PCT/US96/08733, § 371 Date Jan. 27, 1997, § 102(e) Date Jan. 27, 1997, PCT Pub. No. WO96/39947, PCT Pub. Date Dec. 19, 1996

Continuation of Ser. No. 484,141, Jun. 7, 1995, Pat. No. 5,549,201. This PCT application Jun. 4, 1996, Ser. No. 776,335

Int. Cl.<sup>6</sup> A61C 15/04

U.S. Cl. 206—388

9 Claims



1. In combination, a cup-shaped dispenser having a plurality of elongated single use individual packages of dental floss therein, the elongated single use individual dental floss packages being of a type for removal on a one-at-a-time basis from the cup-shaped dispenser,

the cup-shaped dispenser comprising:

an upstanding wall defining a dental floss package-receiving space and having an upper end defining an opening for accessing the elongated single use individual dental floss packages for removal thereof; and

the elongated single use individual dental floss packages each comprising:

a separate elongate enclosure having a piece of dental floss extending between spaced apart ends thereof;

the upstanding wall of the cup-shaped dispenser having a height dimension sufficiently less than a length dimension of the elongated single use individual dental floss packages so that the dental floss packages extend to a point above the opening as they rest in the container;

whereby one end of each of the elongated single use individual dental floss packages is easily accessed for independent removal of the dental floss packages from the cup-shaped dispenser on a one-at-a-time basis.

5,769,226

**PACKAGE FOR FILM PRODUCT**

Takuya Arai, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 3, 1996, Ser. No. 675,574

Claims priority, application Japan, Jul. 6, 1995, 7-171218

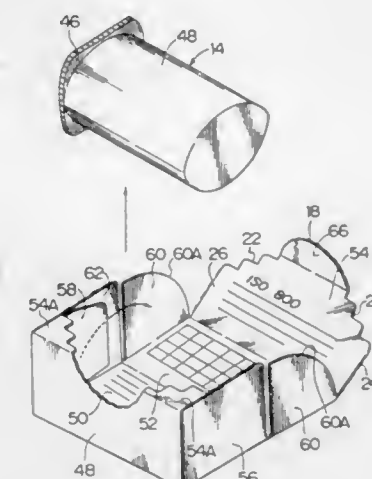
Int. Cl.<sup>6</sup> B65D 5/54

U.S. Cl. 206—455

17 Claims

1. A package for a film product, comprising a rectangular-parallelepiped paper box, wherein:

the paper box has a semicircular first break line formed on a first wall next to a lid of the paper box and formed in such a manner that ends of the first break line are positioned on a first ridge line between the first wall and the lid, a second break line formed on the lid and inclining so that one end of the second break line is connected to one end of the first break line and the other end of the second break line is positioned on a ridge line between the lid and the second wall next to the first wall, a third break line formed on the lid and inclining so that one end of the third break line is connected to the other end of the first break line and the other end of the third break line is positioned on a third ridge line between the lid and a third wall facing the second wall, a fourth break line formed along the second ridge line in such a manner that an end of



the fourth break line is connected to the other end of the second break line, and a fifth break line formed along the third ridge line in such a manner that an end of the fifth break line is connected to the other end of the third break line; and wherein

the first break line is breakable to open the lid to break the second and third break lines, and then the fourth and fifth break lines are breakable to open the lid.

2. A package for a film product, comprising:

a case for sealing and storing the film product;

a rectangular-parallelepiped paper box enclosing the case, said paper box comprising a top panel, a bottom panel, a front panel having two tabs, a back panel, and a plurality of exterior side panels, said tabs being secured to said side panels, said front panel being attached to said top panel;

at least one break line formed on at least one of the panels of the paper box, wherein:

tearing along the at least one break line creates an opening in the paper box which widens gradually, said tearing further separating a major portion of the top panel from the exterior side panels, the entire back panel being adapted to be separated from the exterior side panels and hingeably attached to the bottom panel upon separation of the top panel from the exterior side panels, the front panel remaining secured to both the exterior side panels via the two tabs and a portion of the top panel.

6. A package for a film product, comprising:

a case for sealing and storing the film product;

a rectangular-parallelepiped paper box enclosing the case, said paper box comprising a top panel, a bottom panel, a front panel, a back panel, a left side panel, and a right side panel; a first break line formed on the front panel of the paper box, the ends of the first break line being located along an edge connecting the front panel to the top panel;

a second break line formed on the top panel, terminating at a forward end at the end of the first break line nearest the left side panel, and terminating at an aft end at a point along an edge between the top panel and the left side panel;

a third break line formed on the top panel, terminating at a forward end at an end of the first break line nearest the right side panel, and terminating at an aft end at a point along an edge between the top panel and the right side panel;

a fourth break line running along the edge between the top panel and the left side panel from the aft end of the second break line to the back panel; and

a fifth break line running along the edge between the top panel and the right side panel from the aft end of the third break line to the back panel; wherein

tearing along the first break line and lifting a separated portion of the front panel adjacent to the top panel causes tearing along the second and third break lines and then along the fourth and fifth break lines, separating a major portion of the top panel from the left and right side panels as well as from a portion of the front panel still connected to the right and left side panels, and allowing the back panel to pivot away from

the left and right side panels by pivoting along an edge between the back panel and the bottom panel, the side panels remaining connected to the front panel.

14. A package for a film product, comprising:

a rectangular-parallelepiped paper box, said paper box comprising a top panel, a bottom panel, a front panel, a back panel, a left side panel, and a right side panel;

a first break line formed on the front panel of the paper box, the ends of the first break line being located along an edge connecting the front panel to the top panel;

a second break line formed on the top panel, terminating at a forward end at the end of the first break line nearest the left side panel, and terminating at an aft end at a point along an edge between the top panel and the left side panel;

a third break line formed on the top panel, terminating at a forward end at an end of the first break line nearest the right side panel, and terminating at an aft end at a point along an edge between the top panel and the right side panel;

a fourth break line running along the edge between the top panel and the left side panel from the aft end of the second break line to the back panel; and

a fifth break line running along the edge between the top panel and the right side panel from the aft end of the third break line to the back panel; wherein

tearing along the first break line and lifting a separated portion of the front panel adjacent to the top panel causes tearing along the second and third break lines and then along the fourth and fifth break lines, separating a major portion of the top panel from the left and right side panels as well as from a portion of the front panel still connected to the right and left side panels, and allowing the back panel to pivot away from the left and right side panels by pivoting along an edge between the back panel and the bottom panel, the side panels remaining connected to the front panel.

5,769,227

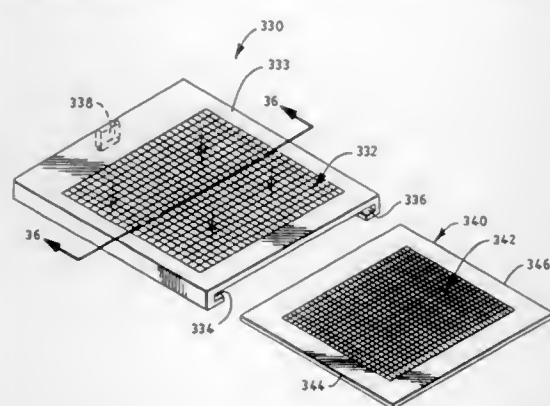
**BOX CONTAINER SYSTEMS AND DISPLAY FRAMES WITH TWO-DIMENSIONAL MULTIPLE VIEW OPTICS**  
Stephen D. Fantone, Lynnfield, Mass., assignor to Insight, Inc., Lynnfield, Mass.

Continuation-in-part of Ser. No. 222,632, Apr. 1, 1994, abandoned, Ser. No. 338,246, Nov. 14, 1994, Pat. No. 5,588,526, and Ser. No. 508,380, Jul. 31, 1995. This application Dec. 23, 1996, Ser. No. 772,968

Int. Cl.<sup>6</sup> B65D 85/00

U.S. Cl. 206—459.1

71 Claims



1. A system for displaying visual information, said system comprising:

information bearing media of predetermined geometry and thickness, said information bearing media having printed on a surface thereof as an array of two-dimensional image segments a plurality of interlaced images and having one edge that serves as a reference edge and has a given angular orientation to within a given tolerance with respect to said interlaced images;

at least one wall having at least one major dimension, said wall having at least one transparent lenticulated section optically associated therewith, said transparent lenticulated section having arranged thereon a plurality of lenslets arranged in a two-dimensional array and whose foci collectively substantially reside in a focal plane and have a given depth of focus; and

means for releasably holding said information bearing media with respect to said wall so that said information bearing media is located in a position of contacting alignment with respect to said transparent lenticulated section such that said interlaced images are located within said depth of focus of said lenslets and said reference edge is in said fixed angular orientation, within a predetermined fraction of the width of one of said lenslets over a predetermined length of said interlaced images, with respect to said lenslets so that an observer of said transparent lenticulated section is provided with distinctly different information when viewing said transparent lenticulated section from different angular perspectives, said two-dimensional array of lenslets arranged on said transparent lenticulated section being selectively progressively offset with respect to one another in two-dimensions to correct for visual parallax effects that would otherwise be apparent to an observer when viewing said transparent lenticulated section from a finite viewing distance.

5,769,228

**DISPLAY PACKAGE**

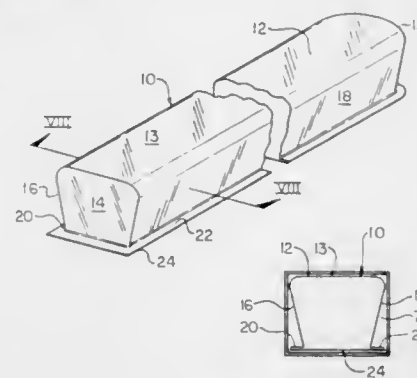
Gerald Wroblewski, Half Moon Bay, Calif., assignor to Gillette Canada Inc., Kirkland, Canada

Filed Dec. 20, 1996, Ser. No. 772,140

Int. Cl.<sup>6</sup> B65D 75/00

U.S. Cl. 206—461

15 Claims



1. A blister package for use in an upright merchandising rack comprising:

an elongate molded plastic envelope having a pair of opposed side walls, a pair of end walls and an upper wall to form a cavity therebetween, said envelope having an opening opposite said upper wall;

a substantially elongate planar member covering said opening opposite said upper wall, said planar member having a pair of opposite side edges each disposed adjacent a respective envelope side wall, and a pair of end edges;

flange means disposed on said pair of opposed side walls for attachment of said pair of opposed side walls to said elongate planar member, said flange means extending outwardly from said cavity and substantially parallel with said planar member; and

said pair of opposite side walls being spaced one from the other a distance equal to or greater than the distance between said opposite side edges of said planar member for at least a portion of the length of said elongate plastic envelope.

5,769,229

**CONTAINER ASSEMBLIES OF DIFFERENT SIZES WHICH STACK, NEST AND ASSEMBLE SEPARATELY AND IN COMBINATION**

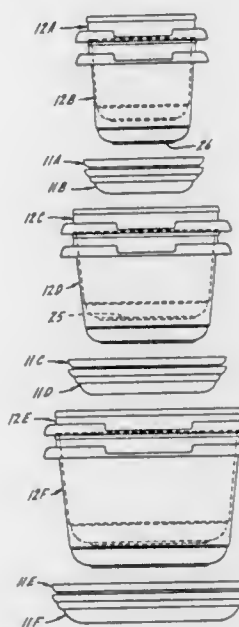
Bradley W. Address, Hudson, Wis.; Dale V. Rude, St. Paul, Minn., and Dick E. VanKeuren, River Falls, Wis., assignors to Plastics, Inc., St. Paul, Minn.

Continuation of Ser. No. 34,902, Mar. 22, 1993, Pat. No. 5,356,026. This application Jul. 12, 1994, Ser. No. 273,957

Int. Cl.<sup>6</sup> B61D 21/02

U.S. Cl. 206—505

6 Claims



1. A set of lid and container type container assemblies, said set including

a first container assembly, said first container assembly including

a first container of a given size having an upper rim portion, and an upwardly, outwardly inclined wall top portion

a lid adapted to be assembled to and disassembled from said first container,

said lid having generally downwardly depending inner flange means and generally downwardly depending outer flange means, said flange means forming a space therebetween adapted to receive the upper rim portion of the upper rim portion of said first container,

cam means which force the upper rim portion of the upwardly, outwardly inclined wall top portion of said first container wall inwardly as said first lid is assembled to said first container, whereby after the upper rim portion of the container wall passes the cam means and the container and lid are assembled, the upper rim portion of the container wall is held between the inner and outer flange means,

said first container assembly, when said lid is assembled thereto, being stackable on another assembled lid and container assembly of the same size,

said first container being nestable in the same size container, a second container assembly, said second container assembly including

a second container of a size smaller than said first container having an upper rim portion and an upwardly, outwardly inclined wall top portion,

a second lid adapted to be assembled to and disassembled from said second container,

said second lid having generally downwardly depending inner flange means and generally downwardly depending outer flange means, said flange means forming a space therebetween adapted to receive the upper rim portion of the upper rim portion of said second container,

cam means which force the upper rim portion of the upwardly, outwardly inclined wall top portion of said second container wall inwardly as said second lid is assembled to said second container, whereby after the upper rim portion of the container wall passes the cam means and the container and lid are assembled, the upper rim portion of the container wall is held between the inner and outer flange means,

said second container assembly, when said lid is assembled thereto, being stackable on another assembled lid and container assembly of the same size,

said second container being nestable in the said same size smaller container,

said second container assembly being received within said first container assembly.

ond container wall inwardly as said second lid is assembled to said second container, whereby, after the upper rim portion of the said second container wall passes the cam means and the second container and its rim are assembled, the upper rim portion of the container wall is held between the inner and outer flange means,

said second container assembly, when said second lid is assembled to said second container, being stackable on another lid and container assembly of said same smaller size,

said second container being nestable in the said same size smaller container,

said second container assembly being received within said first container assembly.

5,769,230

**STACKABLE AND NESTABLE CASE WITH HINGED COVER**

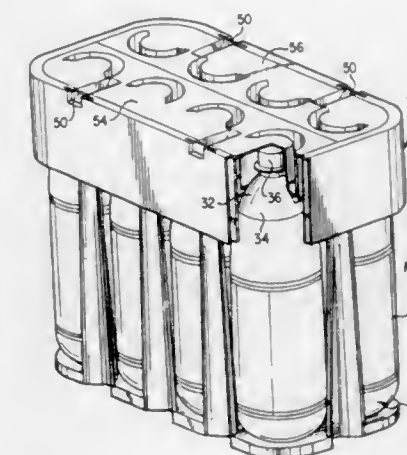
Gerald R. Koefelda, Hermosa Beach, Calif., assignor to Rehrg-Pacific Company, Inc., Los Angeles, Calif.

Filed Jul. 11, 1996, Ser. No. 678,708

Int. Cl.<sup>6</sup> B65D 21/036

U.S. Cl. 206—508

11 Claims



1. A stackable and nestable full-depth case for bottles, comprising:

a floor structure for supporting a plurality of bottles thereon and defining an outer peripheral surface;

a plurality of vertical columns extending upwards from said floor structure;

a rim having an upper edge and a lower edge, said rim connecting said plurality of columns;

a bifurcated cover hingedly connected to said upper edge of said rim and positionable in open and closed positions over the bottles, said bifurcated cover includes a generally planar ceiling structure and a plurality of separating projections depending from a lower surface of said ceiling structure, each said separating projection is adapted to engage one of the bottles when said cover is in the closed position over the bottles such that the bottles are retained in an upright position.

5,769,231

**AIR INFLATABLE AND DEFLATABLE END CAP PACKAGING COMPONENTS**

Charles A. Batsford, Stow, Mass., assignor to Air-Ride Packaging of America, Inc., Stow, Mass.

Continuation of Ser. No. 274,225, Jul. 13, 1994, abandoned.

This application Apr. 19, 1996, Ser. No. 639,937

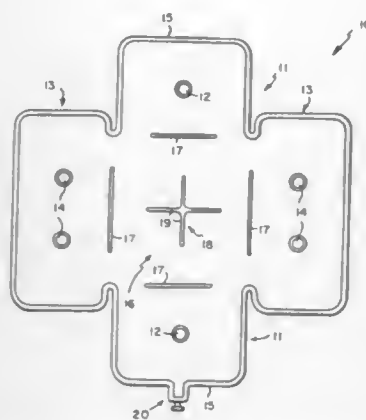
Int. Cl.<sup>6</sup> B65D 81/03

U.S. Cl. 206—522

3 Claims

1. A packaging component comprising





a first pair of generally rectangular elements oppositely disposed at two sides of said component, and formed as inflatable and deflatable plastic elements;

a second pair of generally rectangular elements oppositely disposed at the remaining two sides of said component and formed as inflatable and deflatable plastic elements;

said first and second pairs of elements being interconnected at their peripheries to form a generally rectangular interior element of said component, said interior element being formed as an inflatable and deflatable plastic element directly coupled to each of said first and second pairs of elements, each of said first and second pairs of elements and said interior element having non-inflatable regions therein; and

valve means for permitting air under pressure to be supplied to, or to be released from, said first and second pairs of elements and said interior element whereby said elements are inflated, or deflated, respectively;

said first and second pairs of elements being independently foldable when inflated, thereby providing a conformational cushioning effect;

wherein said first and second pairs of elements and said interior element are formed of layers of laminated polyurethane film material sealed about the peripheries of said first and second pairs elements and sealed at said non-inflatable regions; and wherein said laminated film material includes a pair of thermoplastic, polyurethane sheets having an intermediate sheet of nylon mesh material therebetween, all of said sheets being laminated together.

5,769,232  
INFLATABLE PROTECTIVE LINING SYSTEM FOR CONTAINERS

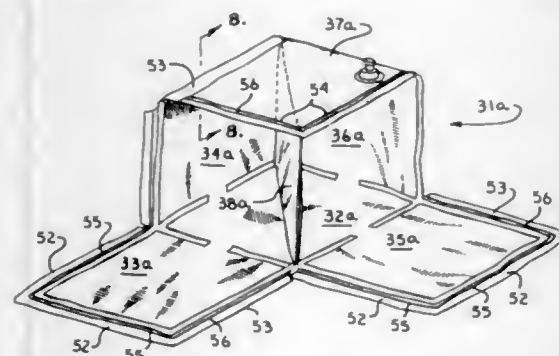
Ronnie L. Cash, and William Scott Sanders, both of 7214 SW, Drycreek, Andover, Kans. 67002

Filed Aug. 16, 1996, Ser. No. 699,097

Int. Cl.<sup>6</sup> B65D 81/14

U.S. Cl. 206—522

11 Claims



1. An inflatable protective lining system for at least partially enclosing and protecting at least one article, said system comprising:

- a double wall base chamber with a plurality of perimeter edges;
- a plurality of double wall side chambers, each of which has one perimeter edge attached to a respective one of said base chamber edges, said side chambers being foldable at their attached edges with respect to said base chamber to form an enclosure for said at least one article;
- a double wall top chamber with one edge attached to a corresponding edge of one of said side chambers, said top chamber being foldable with respect to said one side chamber to form a top of said enclosure;
- a valve extending through a wall of one of said base or side chambers to allow interconnected ones of the base, top and side chambers to be inflated; and
- said side chambers and said top chamber each include portions of an interlocking system such that said side chambers and said top chamber can be interlocked to form said enclosure, said interlocking system comprising a tongue and groove system in which elongate tongues are formed along certain unattached edges of said side and top chambers and mating grooves are formed along other, unattached, overlapping edges of said side and top chambers such that said side and top chambers can be interlocked to form a closed container.

7. An inflatable protective lining system for at least partially enclosing and protecting at least one article, said system comprising:

- a double wall base chamber with a plurality of perimeter edges;
- a plurality of double wall side chambers, each of which has one perimeter edge attached to a respective one of said base chamber edges, said side chambers being foldable at their attached edges with respect to said base chamber to form an enclosure for said at least one article;
- a double wall top chamber with one edge attached to one of said side chambers, said top chamber being foldable with respect to said one side chamber to form a top of said enclosure;
- a double wall separation chamber with one edge attached to said base chamber such that said separation chamber extends vertically to separate said enclosure into two separate sections; and
- a valve extending through a wall of at least one of said base, top, separation or side chambers to allow interconnected ones of the base, top, separation and side chambers to be inflated.

5,769,233  
ASSEMBLY OF AN OBJECT AND FOUR PACKAGING ELEMENTS, PACKAGING ELEMENT FOR USE IN THIS ASSEMBLY, AND PACKAGING METHOD

Jan Fredriks, Zwartsluis, Netherlands, assignor to Bestpak Holding B.V., Zwartsluis, Netherlands

Filed Mar. 1, 1996, Ser. No. 611,444

Claims priority, application Netherlands, Mar. 2, 1995, 9500416

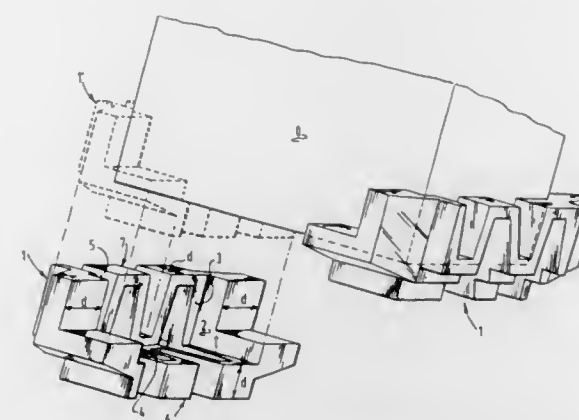
Int. Cl.<sup>6</sup> B65D 81/107

U.S. Cl. 206—523

9 Claims

1. An assembly of a substantially block-shaped object and four packaging elements, each element configured to be placed over one edge part formed by the intersection of two side surfaces defining a corner and two opposing, substantially transverse surfaces abutting the side surfaces of the object, wherein each packaging element is manufactured from one piece of at least slightly flexible foamed plastic and each packaging element comprises:

- a first engaging surface configured to engage the first transverse surface of the object, and
- a second engaging surface configured to engage the second transverse surface of the object with the second engaging surface extending substantially parallel to the first engaging surface, wherein each of the four packaging elements is provided with an expandable meander-shaped structure which extends between the first engaging surface and the second



engaging surface and which wraps around the corner to enclose the two side surfaces of the edge part.

2. A packaging element configured to be placed over one edge part formed by the intersection of two side surfaces defining a corner and two opposing, substantially transverse surfaces abutting the side surfaces of an object, each packaging element formed from one piece of flexible foamed plastic and comprising:

- a first engaging surface configured to engage the first transverse surface of the object, and
- a second engaging surface configured to engage the second transverse surface of the object, with the second engaging surface extending substantially parallel to the first engaging surface, wherein the packaging element includes an expandable structure extending between the first engaging surface and the second engaging surface, and wherein the expandable structure is substantially meander-shaped and which wraps around the corner to enclose the two side surfaces of the edge part.

5,769,234  
TRANSPARENT CARE-PRODUCT CONTAINER

Jean-Louis H. Gueret, Paris, France, assignor to L'Oreal, Paris, France

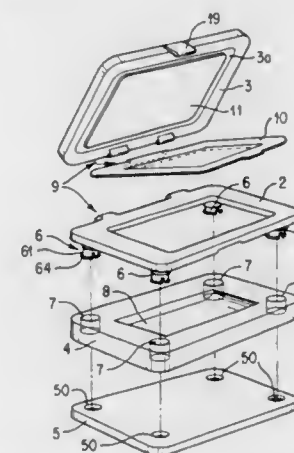
Filed Jun. 26, 1996, Ser. No. 670,573

Claims priority, application France, Jun. 26, 1995, 95 07665

Int. Cl.<sup>6</sup> A45D 40/22;33/16;33/22

U.S. Cl. 206—581

14 Claims



1. Arrangement for packaging a cosmetic product, including a container comprising a receptacle having an upper and lower face and at least one passage extending from said upper face to said lower face, a plate which is engageable with said upper face of said receptacle, and a mechanism fixing the plate on the receptacle wherein the receptacle is transparent and is free of undercuts wherein the fixing mechanism is connected to said plate and at least partially projects into and is secured within said passage.

5,769,235  
PACKAGING DEVICE AND METHOD FOR ASSEMBLING SAME

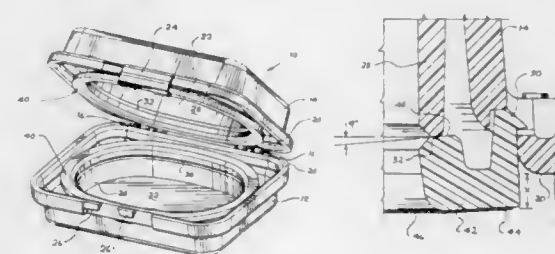
Priscilla M. Keach; Dean F. Staal, both of Chicago, Ill.; Stephen J. Lang, Lawrence, Kans., and Randy L. Sperry, Burlington, Iowa, assignors to Ade, Inc., Chicago, Ill.

Filed Jun. 19, 1996, Ser. No. 666,015

Int. Cl.<sup>6</sup> B65D 81/02;85/30

U.S. Cl. 206—583

17 Claims



1. A packaging device comprising: first and second container portions; at least one support element comprising at least one frame and a film secured to the frame, said support element secured in the first container portion with at least a central portion of the film spaced from the first container portion; and means, included in the first container portion and coupled to the support element, for increasing tension on the film when the support element is secured in place to the first container portion.

5,769,236  
COMPONENT COLLECTIVE AND COMPONENT COLLECTIVE FEEDING APPARATUS

Yoshio Maruyama, Kyoto; Shinji Kadoriku, Takarazuka; Toshiaki Yamauchi, Yawata; Shoriki Narita, Kadoma; Naomi Kuromoto, and Hiroshi Yamauchi, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

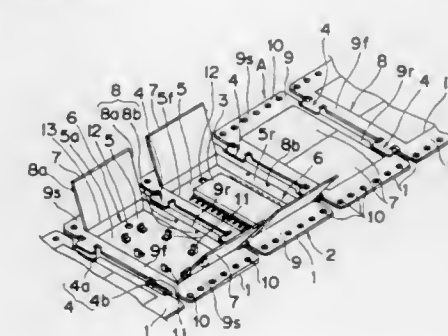
Filed Jul. 20, 1995, Ser. No. 504,654

Claims priority, application Japan, Jul. 20, 1994, 6-167799

Int. Cl.<sup>6</sup> B65D 85/86

U.S. Cl. 206—714

19 Claims

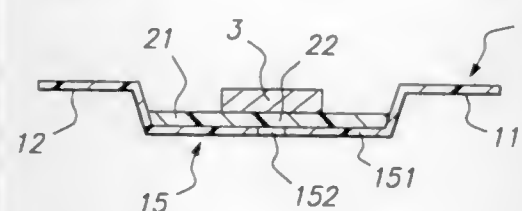


1. A component collective comprising component holders respectively holding components therein and connected to one another in a form of a tape carrier; each of the component holders being provided with a cavity to accommodate one of the components, a lid means for shutting an opening of the cavity, and a keeping means for keeping the lid means at a closed position.

5,769,237  
TAPE CARRIER FOR ELECTRONIC AND ELECTRICAL PARTS  
Victor E. Althouse, Los Altos, and Christopher E. Brodie, Mountain View, both of Calif., assignors to Vichem Corporation, Sunnyvale, Calif.  
Filed Jul. 15, 1996, Ser. No. 680,390  
Int. Cl.<sup>6</sup> B65D 85/30

U.S. Cl. 206—714

20 Claims



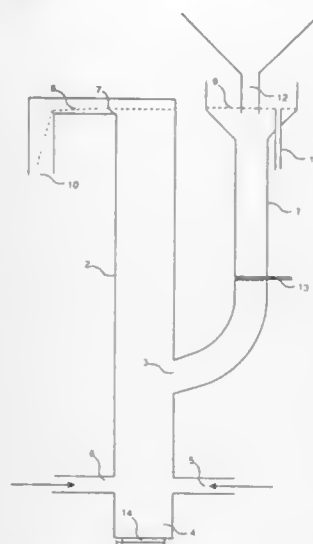
1. A tape carrier for electronic and electrical devices, the carrier comprising

- (1) a flexible support film which
- (a) is composed of a polymeric material, and
- (b) comprises (i) two longitudinally extending edge portions, and (ii) a longitudinally extending central portion which lies between the edge portions and which comprises a plurality of spaced-apart pockets, each of the pockets having a floor; and
- (2) within each of the pockets, a fastening member which comprises
- (a) a fixed portion which is attached to the floor of the pocket, and
- (b) a release portion which is composed of a flexible polymeric film and which is either attached to said floor less securely than said fixed portion, or is not attached to said floor, such that said release portion can be deformed away from the floor without detaching the fixed portion from the floor.

5,769,238  
APPARATUS FOR CLEANING AND DESTONING BEANS, PEAS, AND OTHER FOODS OF PARTICULATE FORM  
Vijai P. Gupta, 816 Newtown Rd., Berwyn, Pa. 19312  
Filed Dec. 21, 1995, Ser. No. 576,225  
Int. Cl.<sup>6</sup> B03B 7/00

U.S. Cl. 209—158

14 Claims



1. Food-cleaning apparatus for separating into three fractions feed particulate matter in which said three fractions are mixed, a first one of said fractions consisting of particles that float or sink

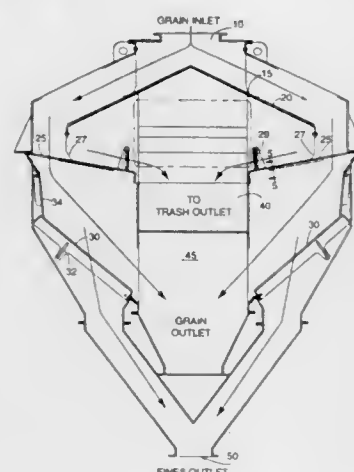
slowly in stagnant water, a second one of said fractions consisting of particles of food that sink more rapidly than the said first fraction in stagnant water but which if introduced into water flowing upwardly at an average velocity of a predetermined minimum value or higher will be carried upwardly by said upwardly-flowing water, and a third one of said fractions consisting of particles that will sink if introduced into water flowing upwardly at said predetermined minimum value, said apparatus comprising:

- (a) first and second substantially vertical columns, each having a lower and an upper end, the lower end of the first column being connected to the second column through an entry port located at a point between the ends of the second column,
- (b) means for causing water to flow upwardly through said second column at an average velocity exceeding said predetermined minimum value and for causing water in said first column to flow upwardly through said first column at a low average velocity less than the said predetermined minimum value or to remain stagnant,
- (c) means for introducing said feed particulate matter into said first column while water in said first column is either stagnant or flowing upwardly at an average velocity below said predetermined minimum value and water in second column is flowing upwardly at an average velocity exceeding said predetermined minimum velocity, thereby causing said first fraction to be carried to the upper surface of the water in said first column and causing said second and third fractions to sink through the water in said first column past the lower end thereof and through said entry port into the upwardly flowing water in said second column, and in which:
- (d) the particulate matter entering the upwardly-flowing water in said second column from said first column is separated within said second column into said second and third fractions, the third fraction sinking toward the lower end of said second column while the second fraction is carried by the upwardly-flowing water toward the upper end of said second column,
- (e) means is provided for removing said second fraction from the upper end of said second column via a first path, and
- (f) means is provided for removing said first fraction from the upper surface of the water present in said first column via a second path that is separate from said first path, whereby said first and second fractions remain separated.

5,769,239  
GRAIN SCALPING APPARATUS  
Kelsey C. Thom, Jr., Cedar Falls; Ted D. Waitman, Waverly, and Mark Heimann, Dike, all of Iowa, assignors to Consolidated Process Machinery, Inc., Merrimack, N.H.  
Filed Oct. 18, 1995, Ser. No. 544,527  
Int. Cl.<sup>6</sup> B07B 1/00

U.S. Cl. 209—240

15 Claims



1. A gravity flow scalper for removing trash from feed material, the scalper comprising:

a scalper housing having a feed material inlet, a product discharge outlet and a trash discharge;

an inclined stationary slide member located within the scalper housing below the feed inlet;

a first means for slowing the momentum of feed material falling on the slide member;

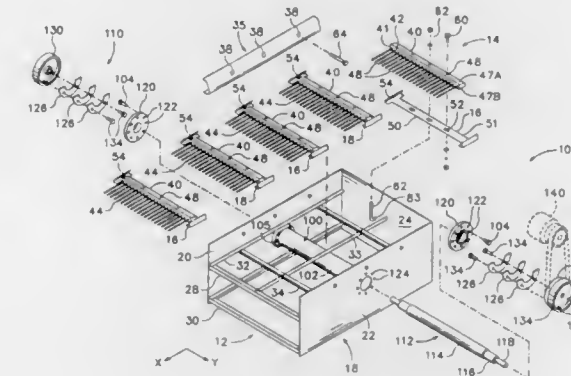
an inclined stationary feed material screening member located within the scalper housing below the slide member and above the product discharge outlet and extending towards the trash discharge; and

a second means for slowing momentum of feed material falling on the feed material screening member.

5,769,240  
SCREENING SYSTEMS AND METHODS FOR SCREENING PARTICULATE MATERIAL  
Paul H. Middour, Albuquerque, N. Mex.; Frederick W. Oldenburg, Mesa, Ariz.; Cletus E. Riedel, Cedar Crest, and Thomas E. Teeter, Los Lunas, both of N. Mex., assignors to Western Wire Works, Inc., Portland, Oreg.  
Filed Oct. 11, 1995, Ser. No. 540,744  
Int. Cl.<sup>6</sup> B07B 1/28

U.S. Cl. 209—314

31 Claims



1. A finger screening system for screening particulate material comprising:

- a screening assembly including a housing defining an interior screening chamber and a horizontally-extending support members located within the confines of the interior screen chamber and joined to the housing for supporting a plurality of screening modules attached to the horizontally-extending support members, the screening assembly having a longitudinally-extending axis and a laterally-extending axis;
- a plurality of screening modules mounted for direct attachment to and removal from the screening assembly without the need to detach or disassemble the horizontally-extending support members from the screening assembly, each screening module comprising a support block defining a plurality of first attachment apertures and a plurality of rods joined at a first end to the support block, the second end of the rods being free of attachment, to form a row of the rods arranged substantially parallel to each other and extending outwardly from the support block, the row of rods defining an array of sieve openings of a predetermined size for allowing particulate material up to a predetermined size to pass through the screening module, the second end of each rod in each row, when said screening modules are in a stationary position, being arranged in a fixed position at a point above the first end of the rods, thereby facilitating screening of the particulate material;
- a plurality of attachment assemblies for removably joining the plurality of screening modules to the screening assembly, each the attachment assembly comprising an elongate connector strip defining a plurality of second attachment apertures

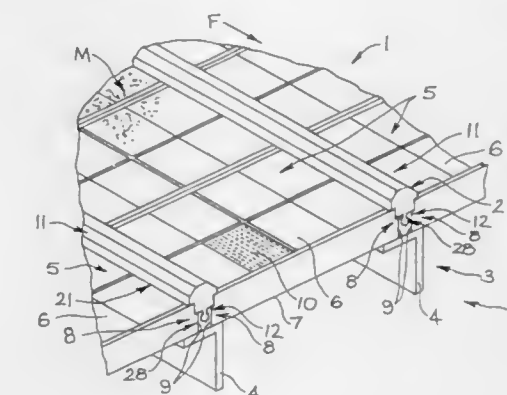
located within the elongate connector strip so that the second attachment apertures are in vertical alignment with the first attachment apertures in the support block thereby allowing a fastener to pass therethrough for connecting the support blocks to the elongate connector strips and in turn attaching the screening modules to the screening assembly; and

a plurality of fasteners located within the first and second attachment apertures and connecting the support blocks to the elongate connector strips and the screening modules to the screening assembly.

5,769,241  
SCREEN PANEL FIXING SYSTEM  
Raymond Maxwell Woodgate, Melton South, Australia, assignor to Lettela Pty Ltd, Victoria, Australia  
Filed Oct. 19, 1995, Ser. No. 545,557  
Claims priority, application Australia, Oct. 19, 1994, PM8885  
Int. Cl.<sup>6</sup> B07B 1/49

U.S. Cl. 209—399

16 Claims



1. A system for fixing screen panels to a screen deck frame of an ore screening apparatus, each screen panel having an upper screening surface and a pair of opposed side edge regions with an upwardly facing bearing face formed along each side edge region beneath the upper screening surface, the system comprising: an elongate fixing member arranged to extend over the screen deck frame along and between the side edge regions of a pair of adjacent screen panels, the fixing members, in use, non-interconnecting with the adjacent, screen panels; and an elongate retaining member arranged to extend along and connect with the fixing member, the retaining member including a locating portion which, in fixing system use, is positioned between the adjacent screen panels beneath the upper screening surfaces thereof, the locating portion having a pair of downwardly facing retaining faces extending therealong, each said retaining face being arranged for downward bearing engagement upon a respective one of the upwardly facing bearing faces, and a cover portion which, in fixing system use, is positioned above the adjacent screen panels, the cover portion having another pair of downwardly facing retaining faces extending therealong, each said other retaining face being arranged for downward bearing engagement upon a respective one of the upper screening surfaces of the adjacent screen panels, whereby the retaining member secures the screen panels in position against upward movement away from the screen deck frame.



5,769,242

**AIR-PULSED JIGGING MACHINE WITH EXHAUST AIR REMOVAL**

Walter Strangalis, Altenholz, Germany, assignor to Allmineral Aufbereitungstechnik GmbH &amp; Co. KG, Duisburg, Germany

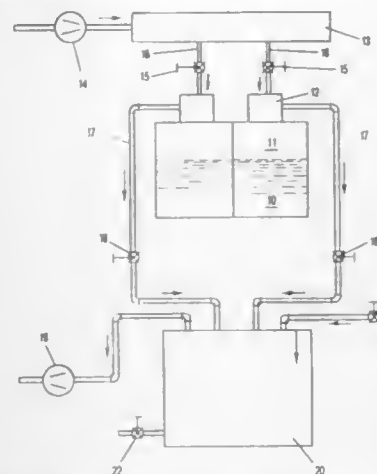
Filed Dec. 15, 1995, Ser. No. 572,962

Claims priority, application Germany, Dec. 15, 1994, 44 44 641.1

Int. Cl.<sup>6</sup> B03B 5/20

U.S. Cl. 209—455

7 Claims



1. A settling device for treating minerals, said settling device comprising:

- a settling tank comprising a settling container and an air chamber arranged above said settling container;
- said settling tank containing water;
- said air chamber having at least one inlet valve and at least one outlet valve separate from said inlet valve;
- an inlet line connected to said at least one inlet valve;
- an outlet line connected to said at least one outlet valve;
- a compressed air supply connected to said inlet line, said compressed air supply comprising a compressed air blower, wherein compressed air is pulsed via said at least one inlet valve into said air chamber for forcing the water contained in said settling tank from said air chamber into said settling container and wherein after each pulse of compressed air the water flows back into said air chamber and forces the air out of said air chamber via said at least one outlet valve;
- a suction blower connected to said outlet line for removing the air from said air chamber; and
- a water separator connected to said outlet line between said air chamber and said suction blower.

5,769,243

**THROUGH-FLOW CLEANER WITH IMPROVED INLET SECTION**

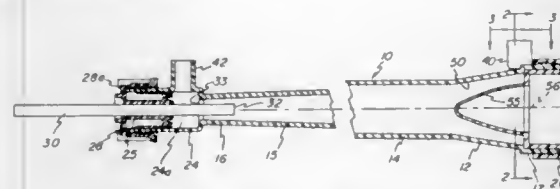
Christopher E. McCarthy, Middletown, Ohio, assignor to Thermo Black Clawson Inc., Middletown, Ohio

Filed Jul. 30, 1996, Ser. No. 688,398

Int. Cl.<sup>6</sup> B04C 3/04

U.S. Cl. 209—725

5 Claims



1. In a hydrocyclone separator for separating lightweight contaminants from a suspension of papermakers' stock and having a central axis therethrough leading from an inlet section through an

elongated separator section to an outlet section at which rejects and accepts are collected, the improvement in said inlet section comprising a frusto-conical flow controlling wall formed with a relatively wide base at one end and formed with an outlet at the other end and located on said axis with said outlet joined with said elongated separator section for delivering a suspension of stock into said separator section, a closure closing said flow controlling wall portion at said relatively wide end and forming a radially extending annular wall at said end, a flow stabilizer on said closure having a generally parabolic shape, said flow stabilizer extending from said annular wall along said axis into said frusto-conical wall portion and terminating generally coterminous with the junction of said wall portion with said elongated separator section, said flow stabilizer defining with said frusto-conical wall section, an annular flow space of relatively constant cross-sectional area from said base annular wall to said outlet, and means in said inlet flow section forming a tangential inlet opening into the annular space at said annular wall for directing fluid tangentially into said annular space, whereby fluid entering said inlet section is caused to rotate within said frusto-conical wall about said flow stabilizer and delivered to said elongated separator section without making a substantial change in axial velocity.

5,769,244

**COMPACT DISC STORAGE RACK**

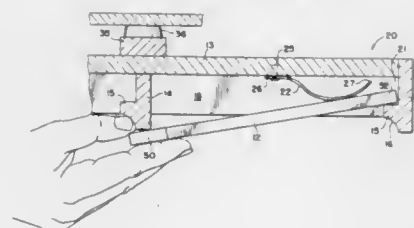
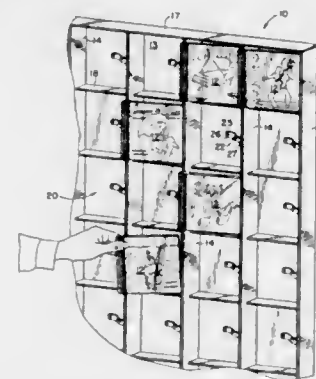
Duane C. Wyatt, 275 Weeping Willow Way, Tyrone, Ga. 30290

Filed Feb. 25, 1997, Ser. No. 805,284

Int. Cl.<sup>6</sup> A47F 7/00

U.S. Cl. 211—40

5 Claims



1. A rack for the storage and display of compact disc cases comprising a backboard having a front side and back side, a plurality of spaced-apart horizontal and vertical bars mounted to said front side to form a grid defining a plurality of cells, each of said cells sized to receive a compact disc case for display, retention means in each cell for holding an edge portion of a compact disc disposed therein, and spring means mounted to said front side within each one of said cells and oriented towards said retention means for securing a compact disc case against said retention means.

5,769,245

**TOOTHBRUSH HOLDER**

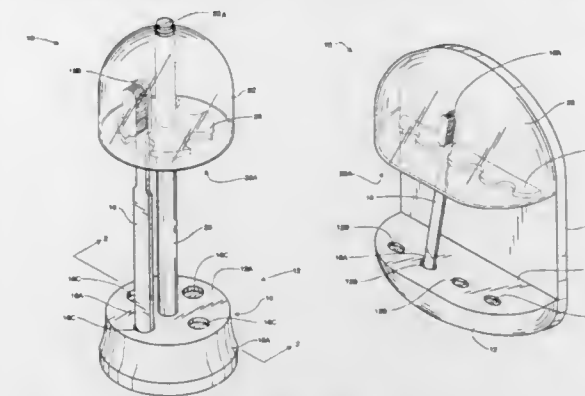
Stevan Ray Butler, 22809 121st St. SE., Monroe, Wash. 98272

Filed Apr. 21, 1997, Ser. No. 845,188

Int. Cl.<sup>6</sup> A47F 7/00

U.S. Cl. 211—65

7 Claims



1. A toothbrush holder comprising:

- a. a base adapted to support a distal handle end of a toothbrush thereon;
- b. a resting means for leaning at least one toothbrush thereagainst near a head of the toothbrush when the distal handle end is supported on the base;
- c. a dome adapted to cover a head of the toothbrush when the distal handle end of the toothbrush is supported on the base and the toothbrush is leaning against the resting means; and
- d. the dome having a completely uncovered open mouth for air to pass through and for the toothbrush to extend through when the dome is covering the head of the toothbrush.

5,769,246

**HOLDER FOR MIXER ATTACHMENTS**

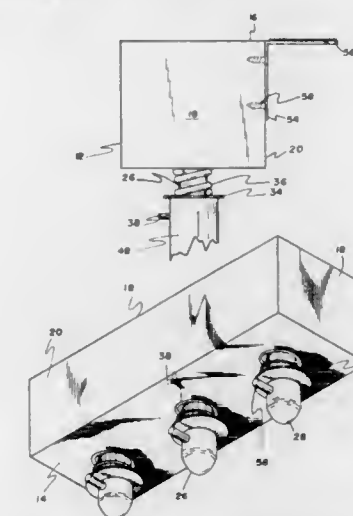
Darrell R. Estep, 4805 Camas, Boise, Id. 83705-5834

Filed Sep. 16, 1996, Ser. No. 716,806

Int. Cl.<sup>6</sup> A47F 7/00

U.S. Cl. 211—70.6

1 Claim



1. A new and improved holder for mixer attachments for supporting an attachment in a vertical orientation comprising in combination:

- a generally rectangular base member having a uniform structure, the base member having a front wall, a back wall and pair of short peripheral walls and a pair of long peripheral walls between the front and back wall;
- a plurality of guide dowels with each being tapered at one end and interconnected to the front wall of the base member at another end, the plurality of guide dowels being proportionately spaced between about 2.5 to 4.5 inches one from the other in a symmetrical alignment along the base member, each guide dowel having a washer and spring therearound, each guide dowel having a retaining pin threadably positioned within a side thereof, each retaining pin being capable of allowing each washer of each guide dowel to apply limited compression force against the spring;

at least one electric mixer attachment being positionable over one of the guide dowels, the mixer attachment having a neck portion with a key hole being capable of engaging the retaining pin of the dowel when the neck portion applies pressure against the washer, the neck of the mixer attachment being twisted for locking the mixer attachment onto one of the guide dowels; and

an L-shaped bracket having a first panel and a second panel, the first panel being fixedly attached to one of the long side walls of the base member, the second panel being projected outwardly from the base member when the first panel being attached to the base member, the second panel having a mounting surface and a plurality of holes therethrough, the mounting surface having a strip of adhesive material attached thereto, the second panel being capable of coupling with a receiving structure for securing the base member, with the mixing attachment coupled thereto, juxtapose the receiving structure, the adhesive material being capable of securing the second panel to the receiving structure, the L-shaped mounting bracket being secured to the receiving structure and the base member in alternative directions for allowing the plurality of guide dowels to be upwardly extended and downwardly extended.

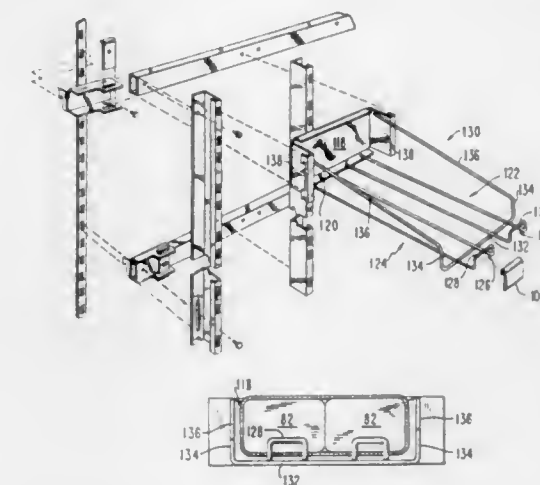
1. An apparatus for the storage of multi-pack products having an array of individual containers joined together, comprising: a connector plate having a lower, forward-facing lip and a pair of spaced side walls, said side walls having rearwardly facing, mounting means for affixing the connector plate to vertical mounting bars; a first support comprising first and second pairs of U-shaped support wires mounted to said lip and extending forwardly therefrom for supporting each of the individual containers thereon; and a second support affixed to the spaced side walls and extending forwardly therefrom to define side rail supports for the containers.

5,769,247

**PRODUCT DISPLAY SYSTEM**Milton J. Merl, 50 Wilcox Rd., Storington, Conn. 06830  
Division of Ser. No. 311,864, Sep. 26, 1994, Pat. No. 5,641,081, which is a continuation-in-part of Ser. No. 259,464, Jun. 14, 1994, Pat. No. 5,509,541. This application Mar. 6, 1997, Ser. No. 812,759Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 211—103

3 Claims



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5,769,248

## PRODUCT DISPLAY GRID SYSTEM

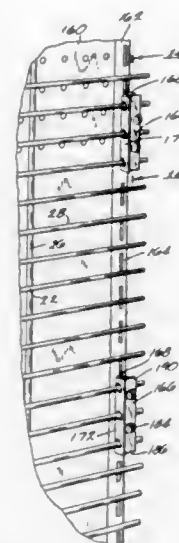
Allen E. Johnson, Hartford, Wis., assignor to DCI Marketing, Milwaukee, Wis.

Filed Jul. 22, 1996, Ser. No. 681,158

Int. Cl.<sup>6</sup> A47F 5/08

U.S. Cl. 211—106

5 Claims



1. A product display system for displaying products, said product display system comprising:

a pair of spaced vertical supports having therein a plurality of elongate slots;

a grid including a plurality of spaced first members oriented in generally horizontal relation to each other and a plurality of spaced second members oriented in a generally vertical relation to each other;

at least two brackets for removably securing said grid to said pair of vertical supports, said brackets including a hook member that interengages with one of said plurality of slots of each of said vertical supports to secure said grid between said vertical supports, each of said brackets including a body having a first leg, a second leg and a web therebetween, said hook member being on said first leg, said second leg having therein at least two apertures and two of said plurality of first members extending through said apertures; and

a plurality of product hangers having an attachment member that secures said product hanger to one of said first members, said product hangers adapted to support and display the products.

5,769,249

## STORAGE RACK BEAM HAVING ROLLED, INTERMEDIATE SECTION WITH UPTURNED, DECK-SUPPORTING EDGE AND WITH INCLINED, INDICIA-RECEIVING SURFACE

Linda P. Lascara, Goodlettsville, Tenn., assignor to Unarco Material Handling, Inc., Springfield, Tenn.

Filed Dec. 16, 1996, Ser. No. 767,197

Int. Cl.<sup>6</sup> A47B 57/00

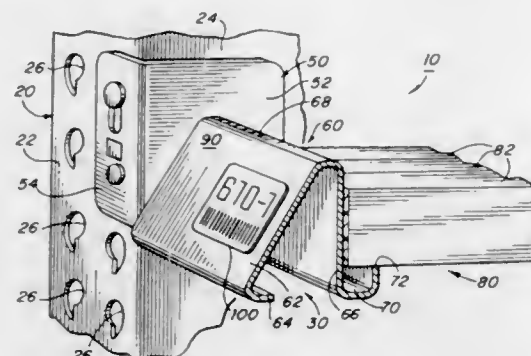
U.S. Cl. 211—191

8 Claims

1. A storage rack comprising

(a) two columns, each said column having an outer wall facing outwardly and a side wall facing the side wall of the other column, and

(b) a steel beam extending between and supported by the columns, the beam including two flange sections and an intermediate section, each flange section being fastened to an associated one of the columns, each flange section having a side plate adjacent to the side wall of the associated one of the columns and an outer flange adjacent to the outer wall of the associated one of the columns, the intermediate section extending horizontally between the flange sections, the inter-



mediate section having two opposite ends and being welded at each of the opposite ends to the side flange of an associated one of the flange sections, the intermediate section being rolled from a steel sheet and defining a downwardly opening channel profile, the intermediate section having an outer wall, an inner wall being generally vertical and being joined unitarily to the outer wall so as to define an upper edge of the downwardly opening channel profile, and a lower flange extending inwardly from a lower portion of the inner wall, the lower flange having an upturned edge spaced below the upper edge of the intermediate section,

wherein the upturned edge provides means for supporting a deck on the upturned edge, between the side plates and behind the inner wall, wherein the inner wall provides means for confining such a supported deck against outward movement, and wherein the side plates provide means for confining such a supported deck against side-to-side movement.

5,769,250

## METHOD AND APPARATUS FOR CONTROLLING THE LOADING ELEMENT AND LOAD OF A CRANE

Olavi Jussila, Hyvinkää, and Timo Sorsa, Jokela, both of Finland, assignors to KCI Konecranes International Corporation, Hyvinkää, Finland

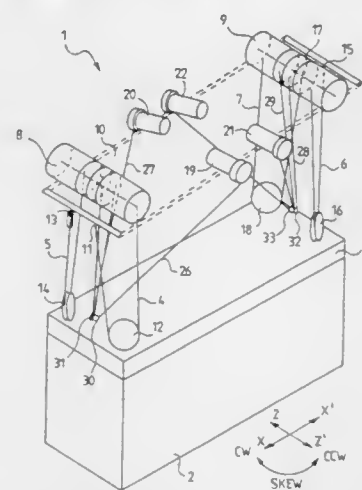
PCT No. PCT/FI96/00462, § 371 Date Apr. 15, 1997, § 102(e) Date Apr. 15, 1997, PCT Pub. No. WO97/08094, PCT Pub. Date Mar. 6, 1997

PCT Filed Aug. 29, 1996, Ser. No. 817,500

Claims priority, application Finland, Aug. 30, 1995, 954062 Int. Cl.<sup>6</sup> B66C 13/06

U.S. Cl. 212—274

26 Claims



1. A method for controlling a loading element suspended from a crane by lifting ropes, said controlling referring to damping horizontal sway and skew of the loading element and precision positioning the loading element in the horizontal direction and in the direction of skew by the use of four control mechanisms mounted in the crane and provided with rope drums controlled by respective

motors, and four auxiliary ropes respectively connected between the control mechanisms and the loading element, said method comprising:

controlling the control mechanisms to adjust forces exerted on the auxiliary ropes by means of the motors and rope drums based upon measured rope forces and motor rotation speeds, and upon a target rope force;

measuring the rope forces and rotation speeds of the motors connected to the respective auxiliary ropes, each of the control mechanisms receiving the measured rope force and rotation speed of only its own auxiliary rope and motor for use in said controlling step so that the forces exerted on the auxiliary ropes prevent the loading element from swaying;

wherein said controlling step processes the rotation speed of each motor and the measured force of each auxiliary rope separately through four respective force controllers for achieving and maintaining a desired rope force, and through four respective speed controllers for counteracting skewing of the corresponding rope drum and skewing of a shaft of the corresponding motor, and further wherein four respective pre-amplifiers preamplify the target rope force for compensating for an effect of force feedback on a moment reference of a corresponding motor.

5,769,251

## CONTROLLING OPERATIONS OF A REACH TOWER CRANE

Minoru Wada; Takeshi Ushioda; Shinichi Ohta, all of Sayama, and Hiroyuki Sawabe, Hannou, all of Japan, assignors to Komatsu Ltd., and Komatsu Mec Kabushiki Kaisha, both of Tokyo, Japan

PCT No. PCT/JP94/01874, § 371 Date May 8, 1996, § 102(e) Date May 8, 1996, PCT Pub. No. WO95/13239, PCT Pub. Date May 18, 1995

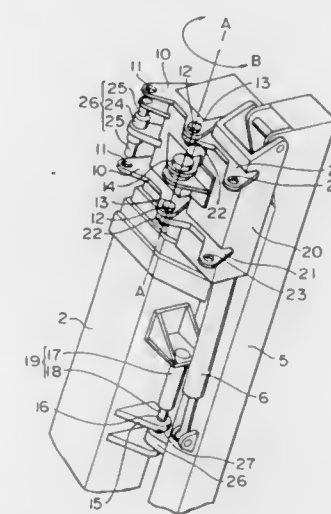
PCT Filed Nov. 8, 1994, Ser. No. 637,804

Claims priority, application Japan, Nov. 8, 1993, 5/302267

Int. Cl.<sup>6</sup> B66C 23/42

U.S. Cl. 212—289

20 Claims



16. A method for controlling an operation of a reach tower crane having a vertical boom capable of being derrick and telescopically moved in multiple stages, and a swingable horizontal boom connected with a head of said vertical boom so that the horizontal boom can be telescopically moved in multiple stages and be derrick, wherein said horizontal boom can be pivoted in a widthwise direction of said vertical boom from an operational position to a storage position parallel to a side of said vertical boom, wherein said horizontal boom can be locked to said vertical

5,769,252

## CONTAINER CLOSURE WHICH CONVERTS FROM A CHILD RESISTANT TO A NON-CHILD RESISTANT CONFIGURATION

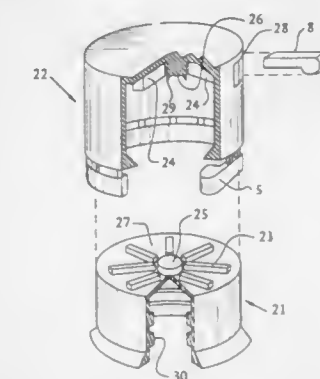
Anthony S. Volpe, Philadelphia, Pa., assignor to Volpe and Koenig, P.C., Philadelphia, Pa.

Filed Dec. 5, 1996, Ser. No. 759,422

Int. Cl.<sup>6</sup> B65D 55/02

U.S. Cl. 215—221

9 Claims



1. A container closure which converts from a child resistant to a non-child resistant configuration, the closure comprising:

an inner member having an interior configured to mate with a container and a patterned exterior;

an outer member which overlies the inner member and has a patterned interior which complements the inner member patterned exterior in a first direction of rotation and slips past the inner member patterned exterior in a second direction of rotation, said outer member further includes an aperture through to the interface of the respective exterior and interior patterns;

a removable tamper evident band removably attached to the outer member; and

a locking element which is removed from the tamper evident band and inserted into the aperture with at least a portion thereof extending into the interface between said patterned surfaces to eliminates slippage in the second direction and render the closure non-child resistant.



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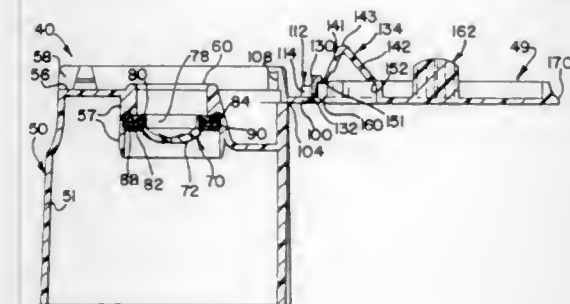
5,769,253  
MOLDED STRUCTURE INCORPORATING A TWO-  
POSITION PANEL AND/OR A BIASED HINGE HAVING  
AN OPERATING RANGE GREATER THAN 180  
DEGREES

Richard A. Gross, Oconomowoc, Wis., assignor to AptarGroup,  
Inc., Crystal Lake, Ill.

Filed Apr. 4, 1996, Ser. No. 627,644  
Int. Cl.<sup>6</sup> B65D 47/08

U.S. Cl. 215—237

20 Claims



1. A unitary hinge structure having a range of motion through more than 180° to at least one self-maintained position, said hinge structure comprising:

- first and second articulating members connected for relative articulation;
- an extension arm extending from said first articulating member;
- a resilient first elbow connecting said extension arm to said first articulating member;
- a spring link comprising a first leg, a second leg, and a resilient second elbow connecting said legs;
- a first film hinge connecting said first leg with said extension arm for relative pivoting movement about a first axis;
- a second film hinge connecting said second leg with said second articulating member for relative pivoting movement about a second axis; and
- a third film hinge connecting said first and second articulating members for relative pivoting movement about a main axis, said main axis being coplanar with said first and second axes only when said articulating members are at an unstable position between the limits of the range of motion, each said elbow being stiffer than any of said film hinges.

5,769,254  
CONTAINER AND CLOSURE WITH ALIGNABLE  
HANDLE

Roger Milner King, Bucks; Roger Edwin Powell, Norfolk, and  
Rodney George Offley, Leicestershire, all of England, assign-  
ors to Beeson and Sons Limited, Ilerts, United Kingdom  
Continuation of Ser. No. 66,546, May 24, 1993, Pat. No.  
5,454,476, which is a continuation of Ser. No. 706,891, May  
29, 1991, Pat. No. 5,213,225. This application Jun. 7, 1995,  
Ser. No. 486,041

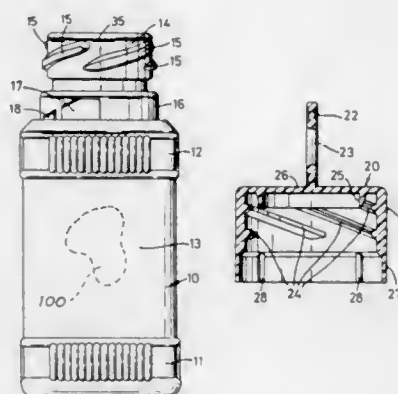
Claims priority, application United Kingdom, May 30, 1990,  
9012041

Int. Cl.<sup>6</sup> B65D 41/04

U.S. Cl. 215—330

54 Claims

- 1. A container assembly comprising:
  - a container comprising a container portion and a container neck extending from said container portion, said container portion comprising four sides and being of substantially rectangular cross-section and said container neck comprising a first thread;
  - a container closure comprising a planar handle portion and a second thread that mates with said first thread such that the closure is movable from fully disengaged from the neck to fully closed by turning the closure relative to the neck by an angle which is less than 360°;
  - at least one stop formation carried by said one of the neck and the closure; and



a stop element on said other of the neck and the closure engagable with the at least one stop formation to hold the closure in a closed position on the neck, the arrangement of the at least one stop formation, the stop element and the first and second threads being such that the stop element is rotated past at least one stop formation without engagement therewith when the closure is screwed on to the neck, engagement of the stop element with the at least one stop formation commencing only when the closed position is neared, wherein the first and second threads, the at least one stop formation and the stop element ensure that said handle portion lies at said closed position within a plane that substantially defines a plane of mirror symmetry of said rectangular cross-section of said container portion so that for each and every point located in said rectangular cross-section there is a corresponding point in said rectangular cross-section that is located on the other side of said plane of mirror symmetry so that said plane of mirror symmetry is a perpendicular bisector of a linear line connecting the points when said handle portion lies within said plane that substantially defines said plane of mirror symmetry said planar handle portion provides a visual indication that said closure is in said closed position on said neck.

5,769,255  
PLASTIC CONTAINER CLOSURE WITH HIGH SEALING  
PRECISION

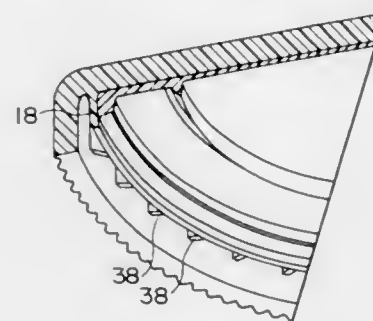
Hidehiko Ohmi; Tateo Kubo, and Tomoya Igarashi, all of  
Hiratsuka, Japan, assignors to Japan Crown Cork Co., Ltd.,  
Tokyo, Japan

Continuation of Ser. No. 395,301, Feb. 28, 1995, abandoned.  
This application Oct. 7, 1996, Ser. No. 720,924

Claims priority, application Japan, Jun. 22, 1994, 6-140056  
Int. Cl.<sup>6</sup> B65D 53/00

U.S. Cl. 215—345

11 Claims



- 1. A plastic container closure for sealing a mouth of a container, comprising:
  - a top panel;
  - a skirt extending downwardly from a peripheral edge of said top panel, and having a threaded portion formed in an inner side of said skirt;

- an annular protrusion extending downwardly from said top panel, being inside the skirt, and near a root of the skirt, thereby maintaining a small gap between said annular protrusion and the skirt; and
  - a sealing liner fitted inside of said top panel, and having a substantially vertical portion formed in place both along and in contact with the inner surface of said annular protrusion; and
  - a plurality of ribs arranged along a circumference between the annular protrusion and a portion near the root of the skirt at an angle that is tilted relative to the radial direction so as to bridge the skirt and the annular protrusion together;
- wherein the substantially vertical portion of the liner maintains a seal with an outer edge of the mouth of the container when the plastic container closure is placed on the container.

5,769,256  
METHOD AND APPARATUS FOR SECURING ONE  
PLASTIC MEMBER TO ANOTHER PLASTIC MEMBER  
James Medal, Cape Coral, Fla., assignor to Unimation, Inc., Ft.  
Meyers, Fla.

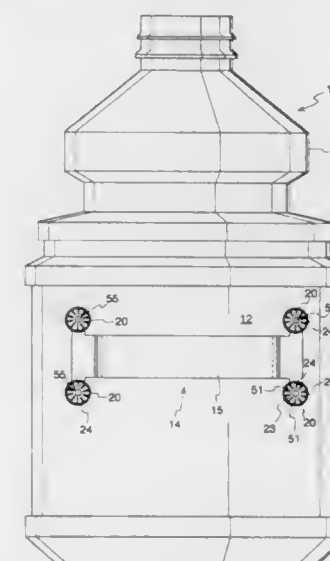
Continuation-in-part of Ser. No. 452,356, May 30, 1995, aban-  
doned, which is a continuation-in-part of Ser. No. 84,699,  
Jun. 29, 1993, Pat. No. 5,391,031, which is a continuation-in-  
part of Ser. No. 887,722, May 22, 1992, Pat. No. 5,222,850.

This application May 21, 1996, Ser. No. 650,988

Int. Cl.<sup>6</sup> B65D 25/28

U.S. Cl. 215—398

4 Claims



- 1. A container comprising:
  - a hollow container having a thin-walled plastic body;
  - a plastic handle for the container;
  - a plurality of integral, plastic bosses on the handle for attaching the handle to the container; and
  - a plurality of integral, energy directing protrusions on the respective bosses being spaced and having received ultrasonic energy and been melted and mixed with container plastic and solidified to attach the handle to the container.

5,769,257  
METHOD AND APPARATUS FOR MINIMIZING BLAST  
DAMAGE CAUSED BY AN EXPLOSION IN AIRCRAFT  
CARGO BAY

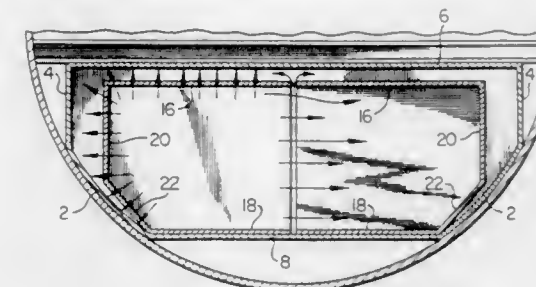
Howard J. Fleisher, Galloway, N.J., and Edward M. Weinstein,  
Völs, Austria, assignors to Galaxy Scientific Corporation,  
Egg Harbor Township, N.J.

Continuation-in-part of Ser. No. 238,232, May 4, 1994, aban-  
doned. This application Jan. 5, 1996, Ser. No. 583,470

Int. Cl.<sup>6</sup> B65D 88/14;90/08;90/32

U.S. Cl. 220—1.5

7 Claims



- 1. A method of loading a cargo bay of an aircraft fuselage in order to minimize the blast damage of an explosion, said cargo bay extending along a predetermined length within the aircraft fuselage and having a width which is bounded by opposite side walls of the fuselage, said method comprising the steps of: providing a first explosion-resistant container including a plurality of high-strength, light-weight panels for resisting a blast of a maximum anticipated magnitude, and a substantially non-explosion-resistant panel which cannot resist a blast of a maximum anticipated magnitude; providing a second explosion-resistant container also including a plurality of high-strength, light-weight panels for resisting a blast of a maximum anticipated magnitude, and a substantially non-explosion-resistant panel which cannot resist a blast of a maximum anticipated magnitude; storing cargo to be transported in at least one of said containers; maneuvering the first and second containers into the cargo bay; arranging the first and second containers in pairs such that the non-explosion-resistant panel of each of the containers is aimed away from the fuselage side wall to which the container is nearest, in a substantially perpendicular direction toward the opposite fuselage side wall across the cargo bay, and; positioning the first and second containers such that the non-explosion-resistant panel of each of the first and second containers are substantially facing and aligned with one another.

5,769,258  
PRESSURE VESSELS  
Ronald Arthur Harrison, North Plymouth, and Angus George  
Peacock, Kent, both of Great Britain, assignors to Pewter  
(No. 2) Limited, London, England

Filed Aug. 2, 1995, Ser. No. 510,417

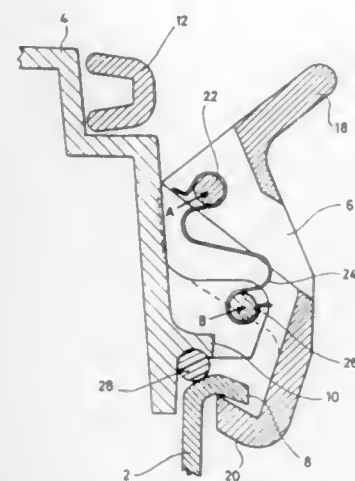
Claims priority, application European Pat. Off., Aug. 3,  
1994, 94305775

Int. Cl.<sup>6</sup> B65D 51/16

U.S. Cl. 220—203.1

12 Claims

- 1. Closure means for a pressure vessel, said pressure vessel comprising a body portion and a lid portion, the closure means comprising: securing means attached to the lid portion of the pressure vessel for releasably securing the body and lid portions together to form a substantially gastight enclosure, the securing means permitting a limited degree of movement between the body and lid portions from a sealing position to a venting position when the pressure within the vessel exceeds the external pressure by a predetermined amount thereby permitting venting of excess pressure, the closure means comprising biasing means acting to bias movement of the body and lid portions from the venting position to the sealing position after venting of excess pressure, said biasing



means comprising a generally S-shaped spring wholly under compression in the sealing position and being further compressed on venting.

5,769,259

**FULL-OPEN END PANEL FOR CONTAINER CLOSURE**

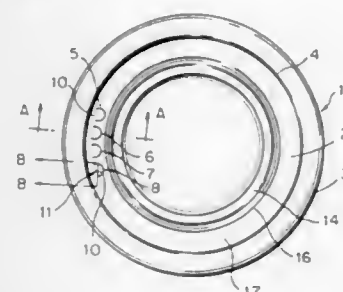
Peter Lewis Revill, St Kilda; Alan George Dalll, Warrandyte; Dietmar Salm, Austinmer, and James Douglas Peck, Hawthorn, all of Australia, assignors to The Broken Hill Proprietary Co Ltd, Melbourne, Australia

PCT No. PCT/AU95/00104, § 371 Date Nov. 12, 1996, § 102(e) Date Nov. 12, 1996, PCT Pub. No. WO95/23741, PCT Pub. Date Sep. 8, 1995

PCT Filed Mar. 2, 1995, Ser. No. 700,360  
Claims priority, application Australia, Mar. 2, 1994, PM4194  
Int. Cl.<sup>6</sup> B65D 17/52

U.S. Cl. 220—284

14 Claims

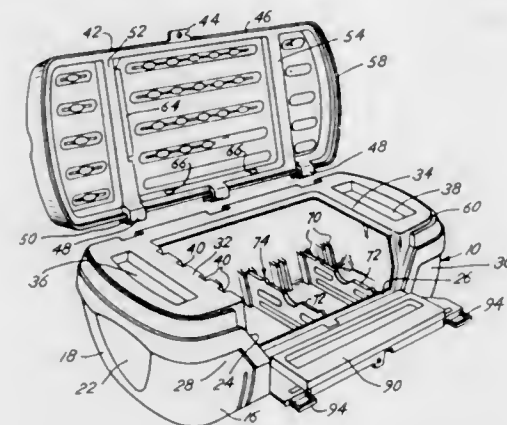


1. An end panel for a full-open end closure for a container, comprising: a rim portion, a removable central panel portion connected to the rim portion for detachment by means of an opening implement, said central panel portion having a plurality of push-in closure members dimensioned to receive the prongs of an opening implement, each push-in closure member having a tab portion severable from the central panel to create an opening dimensioned to receive the prongs without materially affecting the structural integrity of the end panel under high pressure conditions, means hermetically sealing the tab portions to the central panel portion, said tab portions being displaceable by the prongs of the opening implement to create openings not substantially larger than the prongs of the opening implement to thereby allow firm engagement between the opening implement and said central panel and enable detachment of said central panel portion from said rim portion.

5,769,260  
**MOLDED PLASTIC STORAGE CONTAINER**  
Timothy D. Killinger, Mayfield Heights, Ohio, and Donald A. Malcolm, Roanoke Rapids, N.C., assignors to Flambeau Products Corp., Middlefield, Ohio  
Filed Aug. 21, 1996, Ser. No. 697,210  
Int. Cl.<sup>6</sup> B25D 51/00

U.S. Cl. 220—334

10 Claims



1. A plastic storage container comprising, in combination:  
a generally four-sided, molded tub having a bottom, a front side, a back side, opposite end sides connecting the front and back sides, said back side and opposite end sides all having substantially the same uniform height and a portion of the front side also having the same uniform height, the remainder of the front side being shorter in height to define a front access opening to the tub, said front, end and back sides of uniform height being connected by an integrally molded end tray at the opposite ends of the tub;  
a hinged top closure panel fitted over the sides of the tub to close the top opening formed thereby and fitting over the end trays to simultaneously close the trays, said top panel including latch members, said top panel hinged to the back side of the tub; and  
a front panel hinged to the front access opening and coincident with said access opening, said panel pivotal to enclose the container when the top closure panel is in the closed position and including latching members cooperative with the top panel latching members to retain the container parts in closed position.

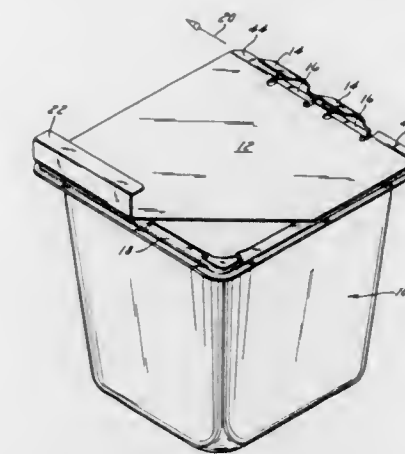
5,769,261  
**FOOD SERVING PAN WITH REMOVABLE COVER**  
Thomas E. Gaffney, Sheboygan; Alan J. Schommer, Fredonia; William C. Heimerl, Hingham, and Michael L. Carpenter, Sheboygan, all of Wis., assignors to The Vollrath Company, L.L.C., Sheboygan, Wis.

Filed May 15, 1996, Ser. No. 648,509  
Int. Cl.<sup>6</sup> B65D 43/24

U.S. Cl. 220—335

14 Claims

1. A covered food serving pan, comprising:  
a pan portion for receiving food and having a pierced flange, wherein the pierced flange defines a tab retainer that extends above the uppermost surface of the flange wherein the flange has lateral opposing edges adjacent to the tab retainer that are depressed below the uppermost surface of the flange;

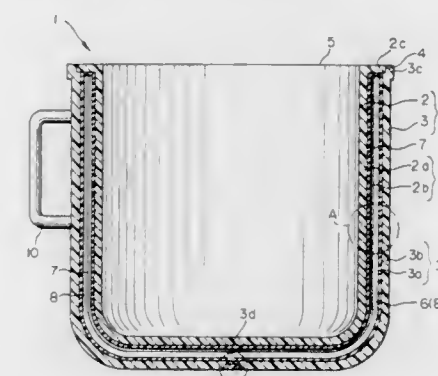


a cover portion having first and second sides, adapted to substantially cover an opening of the food serving pan, and a first tab disposed along the first edge that is adapted to engage the tab retainer.

5,769,262  
**THERMALLY-INSULATED DOUBLE-WALLED SYNTHETIC-RESIN CONTAINER**  
Masashi Yamada; Yasuhiko Komiya; Atsuhiko Tanaka; Seiichi Itoh, and Hidefumi Kamachi, all of Tokyo, Japan, assignors to Nippon Sanso Corporation, Tokyo, Japan  
Filed May 2, 1996, Ser. No. 827,928  
Claims priority, application Japan, May 10, 1995, 7-111892; Mar. 1, 1996, 8-045014

U.S. Cl. 220—426

23 Claims

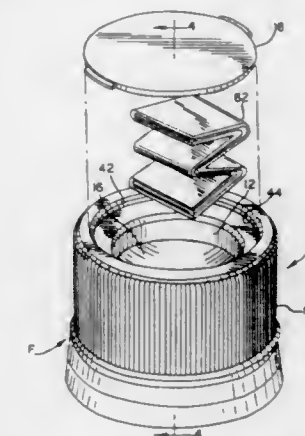


1. A thermally-insulated double-walled synthetic-resin container comprising an inner container and an outer container, the thermally-insulated double-walled synthetic-resin container being formed by unitarily joining the inner container and the outer container to enclose a space therebetween;  
wherein a thermoinsulating layer is formed in the space between the inner container and the outer container by filling the space with at least one low thermoconductive gas selected from the group consisting xenon, krypton, and argon; and  
wherein the inner container and the outer container are multi-layer molded from different synthetic resin materials.

5,769,263  
**COMPARTMENTALIZED TOP COVER PROMOTIONAL CLOSURE**  
Wendell D. Willingham, Zionsville; David W. Smith, Wayne-town; David L. Cerny, Crawfordsville, and Stephen W. McBride, Brownsburg, all of Ind., assignors to Alcoa Closure Systems International, Inc., Crawfordsville, Ind.  
Filed Jan. 21, 1997, Ser. No. 786,809  
Int. Cl.<sup>6</sup> B65D 43/04

U.S. Cl. 220—522

27 Claims

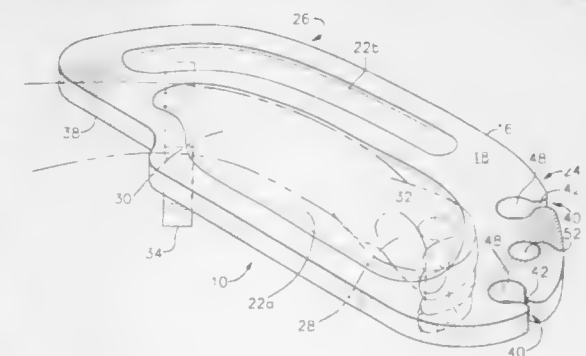


1. A promotional closure for use with an associated container comprising:  
a plastic closure cap having an inwardly recessed, circular top wall portion defining a compartment and a depending annular skirt portion depending from the top wall portion;  
a circumferential lip formed in the closure cap generally at about a periphery of said compartment, said lip defining a circumferential channel-like recess adjacent to said compartment; and  
a removable, circular cover member adapted to cover said compartment by insertion into said circumferential recess, said cover having a pair of circumferentially opposed tab-like, releasable engaging members adapted to be received in said circumferential recess to retain said cover in place in the cap over said compartment and further adapted to release from said recess for removal of said cover member from said top wall portion when pressure is applied to the cap on said skirt portion adjacent to where said engaging members are positioned in said recess to thereby permit access to said compartment.

5,769,264  
**WINE TASTING PALLET**  
John M. Lipkowitz, Las Vegas, Nev., assignor to Rio Properties, Inc., Las Vegas, Nev.  
Filed Mar. 17, 1997, Ser. No. 819,518  
Int. Cl.<sup>6</sup> B65D 25/28

U.S. Cl. 220—575

5 Claims



1. A pallet for use at party gatherings comprising:



a planar body having a first end and a second end, a top surface for holding items and a bottom surface;  
a brace depending from the bottom surface proximate the second end adapted to rest upon the user's forearm between the elbow and wrist; and  
a post depending from the bottom surface proximate the first end and adapted to be grasped with the palm of the hand substantially vertical, the brace and post extending substantially the same distance from the bottom to cooperate to define a stand for the body.

5,769,265

Patent Not Issued For This Number

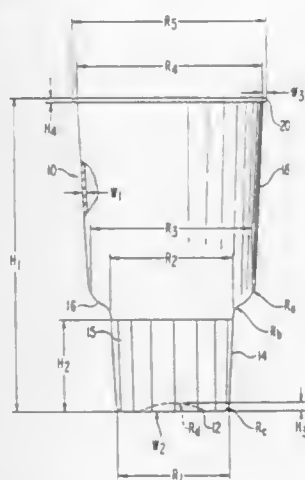
5,769,266

**LARGE DRINK CONTAINER TO FIT VEHICLE CUP HOLDERS**

George A. Willbrandt, Fairfax, Va., assignor to Berry Sterling Corporation, Evansville, Ind.  
Continuation-in-part of Ser. No. 186,419, Jan. 28, 1994, Pat. No. 5,433,337. This application Jul. 18, 1995, Ser. No. 503,474 Int. Cl.<sup>6</sup> B65D 21/02

U.S. Cl. 220—669

29 Claims



1. A beverage container comprising:  
a base having a circumference sized to fit a cylindrically shaped vehicle cup holder;  
a lower body portion extending upward from the circumference of said base sufficiently to extend above the vehicle cup holder;  
a shoulder extending radially outward from said lower body portion; and  
an upper body portion, of a substantially constant thickness, extending upward from said shoulder and including an opening;  
said base, said lower body portion, said shoulder, and said upper body portion being formed of a thermoplastic material into a unitary, fluid tight beverage container, a ratio of a height of the upper body portion to a height of the lower body portion being about 3.0 to about 1.8;  
wherein a wall thickness of said lower body portion increases in an upward direction from said base to said shoulder and each of an inner and outer surface of said lower body portion cants outwardly from said base to said shoulder relative to a center of the container.

**5,769,267  
CONTAINER**

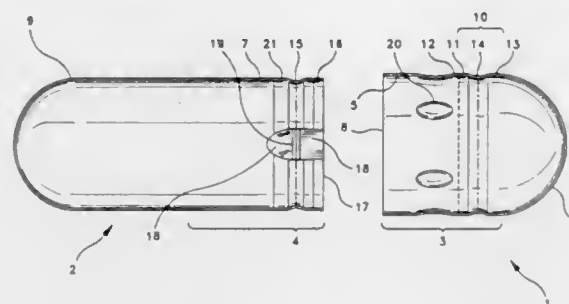
Lieven Duynslager, Kortryk; Paul Maes, Mortsel; Robert Scott, Niklaas, all of Belgium, and Lieve Vanrussett, Aberdeen, United Kingdom, assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 9, 1995, Ser. No. 556,058

Int. Cl.<sup>6</sup> A61J 3/07

U.S. Cl. 220—691

39 Claims



1. A container comprising  
(a) a first part with at least a first pre-connection unit, said first pre-connection unit comprising:  
an elastic hollow-cylindrical inner wall defining a substantially outer-cylindrically delimited cavity and an insertion axis;  
an open end;  
at least a first prelock area on said hollow-cylindrical inner wall, said prelock area comprising several protrusions of elongated shape on said hollow-cylindrical inner wall; and  
(b) a second part with at least a second pre-connection unit, said second pre-connection unit comprising:  
a cylindrically shaped outer wall which is insertable into said outer-cylindrically delimited cavity along said insertion axis through said open end; and  
at least a second prelock area on said cylindrically shaped outer wall, said second prelock area having at least one indentation and being engageable with said first prelock area when said cylindrically shaped outer wall is inserted in said outer-cylindrically delimited cavity, thereby providing a releasable connection between said first part and said second part; further comprising  
at least a first engagement area on the hollow-cylindrical inner wall; and  
at least a second engagement area on the cylindrically shaped outer wall which is engageable with said first engagement area when said cylindrically shaped outer wall is inserted into said outer-cylindrically delimited cavity, thereby providing a permanent connection between said first and said second part.

5,769,268

**FLANGE SHAPE FOR ATTACHING A CLOSURE TO A FILLABLE CONTAINER**

Gene J. Kuzma, Columbus, and Douglas W. Weaver, Troy, both of Ohio, assignors to G. K. Packaging, Inc., Columbus, Ohio  
Continuation of Ser. No. 276,977, Jul. 19, 1994, abandoned.

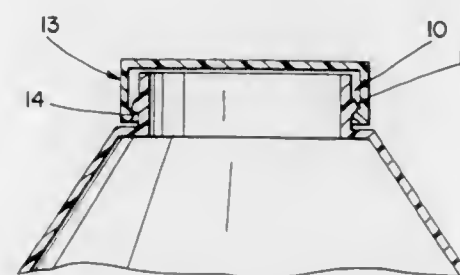
This application Nov. 5, 1996, Ser. No. 743,918

Int. Cl.<sup>6</sup> B65D 41/16

U.S. Cl. 220—780

3 Claims

1. A container having a circular opening therein and provided with a flange encircling said circular opening of said container and comprising:  
a circular member attachable to the opening of said container, said circular member being provided with an internal ring extending around the interior of said circular member, said internal ring being made from a material which is more elastic than the material from which said flange is made,



said flange retaining said circular member on said container when said circular member is forced downwardly over said flange by stretching said internal ring over said flange, said flange being characterized in cross section by a varying slope on the external portion thereof which has at the upper section thereof which first engages said internal ring when said circular member is forced downwardly over said flange, a rapidly expanding diameter of said flange as said circular member moves downwardly over said flange, whereby said internal ring will be stretched rapidly by a desired minimum downward application load, said slope of said flange thereafter gradually changing to a steeper portion essentially flat in cross section, and having a more slowly expanding diameter as said circular member is forced downwardly thereover, said internal ring being further characterized in cross section by having an inwardly extending portion which is semi-circular and of a size and shape so as to be the only portion of said circular member engaging said flange when seated below said flange and the only portion of said circular member engaging said flange on that portion of said flange having a varying slope on the external portion thereof during downward application and prior to being seated below said flange, said internal ring being of a diameter so that when centered over said circular opening of said container said inwardly extending portion of said internal ring will only engage the portion of said flange having a varying slope on the external portion thereof during downward application, such that said minimum downward application load is not substantially altered, whereby said internal ring may be continued to be stretched using the same approximate minimum downward application load until said internal ring is forced over that portion of said flange at its maximum diameter where it terminates in a minimal radius which forms the contact surface when said internal ring has been forced over said flange.

5,769,269

**VENDING SYSTEM**

Steven A. Peters, 2320 NE. 193rd St., N. Miami Beach, Fla. 33180

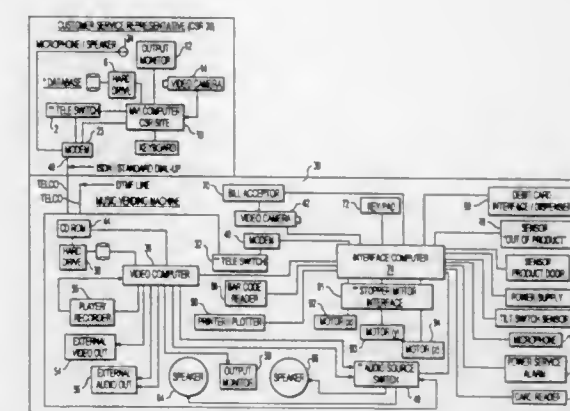
Continuation-in-part of Ser. No. 234,143, Apr. 28, 1994, abandoned. This application Apr. 23, 1996, Ser. No. 636,588

Int. Cl.<sup>6</sup> G07F 11/00

U.S. Cl. 221—7

19 Claims

1. A vending system, comprising:  
a service center including a first computer and a first video monitor; and  
a plurality of vending machines, each including:  
a storage section containing a product inventory;  
a retrieval mechanism operating in the storage section to retrieve selected products from the inventory and deliver the selected products to a vending port accessible to customers;  
a second video monitor,  
a speaker,  
means for driving the second video monitor and the speaker to provide audio/video programming to customers,  
a video camera for generating scene images of a vending machine site including customers,  
input means for accepting product selections and product payments made by customers, and



a second computer connectable to the first computer by a telephone line and operating to control the retrieval mechanism, the driving means, the video camera, and the input means.

5,769,270

**TAPE OR SHEET DISPENSER**

Shin Fujisawa, Kawasaki, and Takashi Sugibuchi, Sagamihara, both of Japan, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

PCT No. PCT/US94/13229, § 371 Date Apr. 16, 1996, § 102(e) Date Apr. 16, 1996, PCT Pub. No. WO95/14578, PCT Pub. Date Jun. 1, 1995

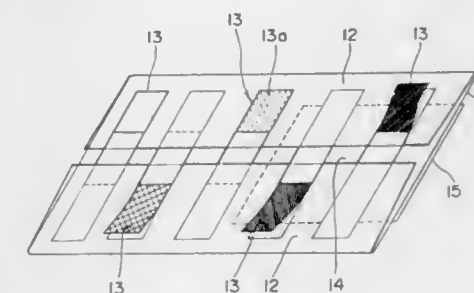
PCT Filed Nov. 16, 1994, Ser. No. 628,681

Claims priority, application Japan, Nov. 25, 1993, 5-295086

Int. Cl.<sup>6</sup> B65H 1/00

U.S. Cl. 221—34

12 Claims



1. A refillable sheet dispenser having a generally flat C-shaped configuration for individually dispensing sheets from a stack arranged within the dispenser, comprising:  
(a) a generally planar bottom section having remote ends; and  
(b) a pair of elastically deformable wing sections each extending from a respective bottom section remote end toward the other wing section in overlapping spaced relation relative to said bottom section, thereby allowing a stack of sheets to be accommodated between the wing sections and the bottom section, each said wing section having a terminal edge spaced from and opposing the other wing section terminal edge, thereby defining an opening therebetween, whereby as sheets are dispensed through the opening, each wing section is alternately urged pivotally away from the bottom section, and further whereby when said stack of sheets is exhausted, the wing sections may be elastically flexed to allow a new stack to be accommodated within the dispenser.

5,769,271

## APPARATUS AND METHODS FOR MONITORING A BEVERAGE DISPENSER, IN PARTICULAR A COUNTER SYSTEM

Hans-Peter Miller, Surheim, Germany, assignor to Wilhelm Handke GmbH, Freilassing, Germany  
PCT No. PCT/EP94/02690, § 371 Date Jan. 24, 1996, § 102(e) Date Jan. 24, 1996, PCT Pub. No. WO95/05337, PCT Pub. Date Feb. 23, 1995

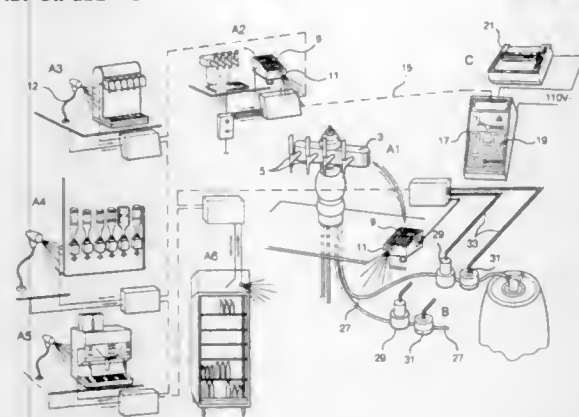
PCT Filed Aug. 11, 1994, Ser. No. 586,887

Claims priority, application Germany, Aug. 15, 1993, 43 27 337.8

Int. Cl.<sup>6</sup> B67D 5/10

U.S. Cl. 222—1

15 Claims



1. A method of monitoring a drinks dispenser in a drink-dispensing installation having an automatic valve and a manually actuable hand-dispensing valve connected in series with the automatic valve and requiring an authorized individual to identify himself by entering a code to dispense the drinks, comprising the steps of:

maintaining the automatic valve open, opening the hand valve and closing the automatic valve at a time subsequent to a start of the opening of the hand valve when a drink is drawn from the dispenser without first entering the code.

5,769,272

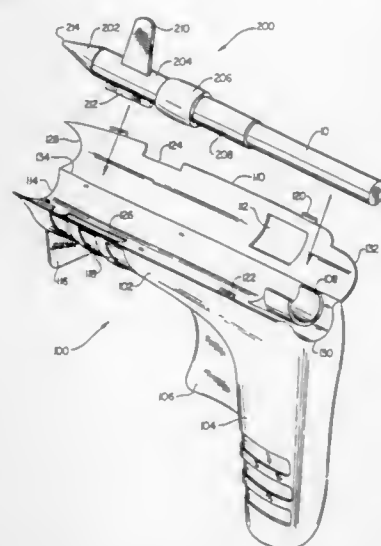
## REMOVABLE CARTRIDGES FOR A GLUE GUN SYSTEM

Leo Massena, 6635 E. Lovers Ln., Dallas, Tex. 75214  
Continuation of Ser. No. 377,842, Jan. 25, 1995, Pat. No. 5,664,701. This application Sep. 27, 1996, Ser. No. 723,190

Int. Cl.<sup>6</sup> G01F 11/00

U.S. Cl. 222—1

21 Claims



1. A removable cartridge for use in a glue gun, said removable cartridge comprising:

a cartridge body having a central passage extending there-through for accepting a stick of a glue, said cartridge body having an exterior portion which is of a size and shape to closely match a portion of the glue gun for removably securing said cartridge body to a body of the glue gun;  
heating means mounted to said cartridge body for releasably coupling to the glue gun and heating a portion of the glue which is within said central passage of said cartridge body; and  
a dispensing tip having an orifice, said dispensing tip secured to said cartridge body for receiving the glue from the central passage of said cartridge body and dispensing the glue therefrom.

2. The removable cartridge according to claim 1, wherein said heating means comprises a thermal conductor which extends from said cartridge body and which is adapted for engaging within a heated recess of the glue gun to transfer heat from the heated recess of the glue gun to said cartridge body, and to removably secure the cartridge body to the glue gun.

8. A removable cartridge adapted for use in a glue gun, wherein the glue gun is of the type having a barrel and a grip secured to the barrel, the removable cartridge comprising:

a cartridge body having an enlarged diameter portion which closely matches an inner diameter of the barrel of the glue gun for removably securing the cartridge body within the barrel of the glue gun, said cartridge body having forward and rearward ends with a central passage extending therebetween which is of a size for accepting a stick of a glue;  
a heating member mounted to said cartridge body for releasably coupling to the barrel of the glue gun and heating a portion of the glue which is disposed within said central passage of said cartridge body; and  
a dispensing tip secured to said forward end of said cartridge body for receiving a melted portion of the glue from said central passage, said dispensing tip having an orifice for dispensing the glue from within said central passage.

5,769,273

## POURING SPOUT

Yasuyuki Sasaki; Takehiko Bizen; Hiroshi Miyama; Takeshi Morisako, and Hiroko Tsukada, all of Tokyo-To, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

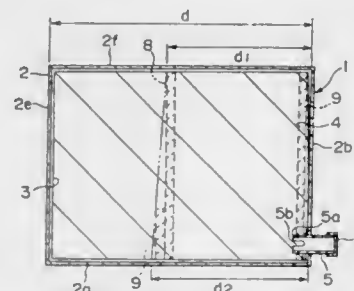
Continuation of Ser. No. 424,629, Apr. 19, 1995, Pat. No. 5,551,600, which is a continuation of Ser. No. 140,470, Oct. 25, 1993, Pat. No. 5,433,345. This application Jun. 11, 1996, Ser. No. 661,638

Claims priority, application Japan, Oct. 28, 1992, 4-312987; Mar. 17, 1993, 5-82683; Mar. 17, 1993, 5-82684; Mar. 17, 1993, 5-82685; Mar. 17, 1993, 5-82686; Jun. 25, 1993, 5-180003

Int. Cl.<sup>6</sup> B65D 17/06

U.S. Cl. 222—81

2 Claims



1. A pouring spout capable of being disposed on a flexible bag, said pouring spout comprising:

a cylindrical portion defining a through-hole that is intended to pierce through the inside and outside of a flexible bag;  
a flange disposed on an outer periphery of said cylindrical portion and capable of being connected to the inner surface of a flexible bag; and

5,769,275

## DUAL DISPENSING VALVE ASSEMBLY

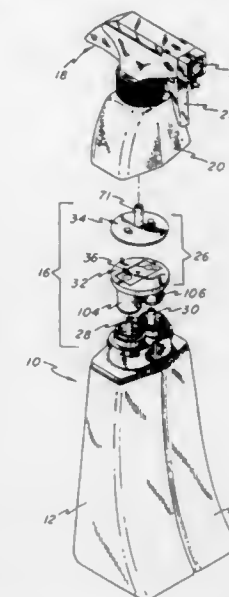
Dennis A. Boehmer, Beavercreek; James C. Bailey, Yellow Springs; Gordon E. Atkinson, Cedarville, and James R. Kunc, Springfield, all of Ohio, assignors to Vernay Laboratories, Inc., Yellow Springs, Ohio

Filed Jul. 8, 1996, Ser. No. 678,557

Int. Cl.<sup>6</sup> B67D 5/52

U.S. Cl. 222—136

23 Claims



1. A valve assembly for controlling flow of fluid from a plurality of fluid supplies, said valve assembly comprising:  
a housing including a base portion and a cap portion;  
an outlet defined in said cap portion for conveying fluid from said housing;  
a plurality of fluid supply inlets defined in said base portion for supplying fluid to said housing;  
a regulator formed of a resilient material and located between said base portion and said cap portion;  
a diaphragm defined on said regulator, said diaphragm having an upper surface and a lower surface;  
an orifice defined through said diaphragm extending between said upper surface and said lower surface and in fluid communication with said outlet;  
fluid passages defined between said regulator and said base portion and located between said supply inlets and said orifice;  
a diaphragm seat defined on said base portion for engagement with said diaphragm whereby a fluid seal is defined between said supply inlets and said orifice; and  
wherein said diaphragm is normally seated in engagement with said diaphragm seat, and said diaphragm is movable out of engagement with said diaphragm seat in response to a negative pressure applied to said upper surface of said diaphragm whereby fluid entering said supply inlets will flow through said orifice and out of said housing through said outlet.

5,769,276

## POWDER ATOMIZER

George R. Alexander, Frankton, Ind., assignor to Terronics Development Corporation, Elwood, Ind.

Filed Jul. 10, 1996, Ser. No. 680,243

Int. Cl.<sup>6</sup> B67D 1/08

U.S. Cl. 222—148

53 Claims

1. A powder atomizer comprising a pan, a cylindrical element, said element being journaled for rotation about an axis, said pan being cylindrical and positioned coaxial of said element, said pan partially surrounding said element, said element and pan defining a cylindrical venturi therebetween into which powder is fed, said

a passage member connected to said flange and capable of extending to the inside of a flexible bag, said passage member and said flange being integrally formed,  
wherein said passage member includes an H-letter-shaped member extending in the direction of said flange, said H-letter-shaped member having a first flat plate member, a second flat plate member, and a rib disposed between said first and second flat plate members.

5,769,274

## PUMP DISPENSER FOR A CONTAINER WITH A FLEXIBLE BAG

Alain Behar, Eu, France, assignor to Sofab, Le Treport, France  
PCT No. PCT/FR95/00440, § 371 Date Dec. 7, 1995, § 102(e) Date Dec. 7, 1995, PCT Pub. No. WO95/27569, PCT Pub. Date Oct. 19, 1995

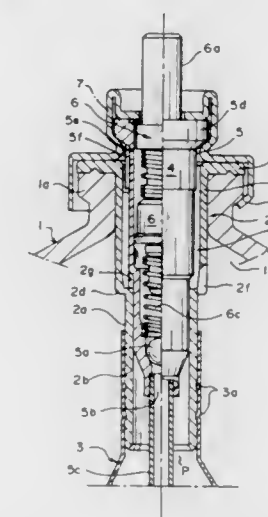
PCT Filed Apr. 6, 1995, Ser. No. 564,189

Claims priority, application France, Apr. 8, 1994, 94 04181

Int. Cl.<sup>6</sup> B05B 11/00

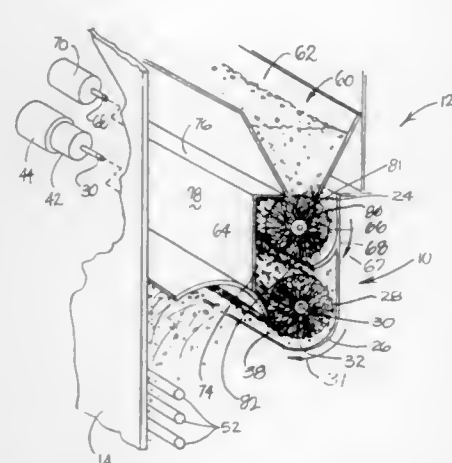
U.S. Cl. 222—95

9 Claims



1. A dispenser for a fluid-like substance comprising:  
an outer casing having an outlet opening;  
a pump including a piston, a tubular body and an axial nozzle, activation of the piston being carried out by displacing the nozzle;  
said pump further including a vent normally closed when the piston is in its rest position, and a counter flange sealingly connecting the pump to the casing at the casing outlet opening;  
a bushing extending into the casing and comprising a sealing connection ring having a lower cylindrical skirt portion and an upper band portion connected to the skirt portion;  
said bushing also including a ferrule portion extending above the band portion and including an enlarged upper flange portion, said ferrule portion extending through said casing outlet and said flange portion arranged to support and center said bushing in said outlet;  
a flexible bag for containing fluid-like substance within the casing and including an outlet sealingly attached to the skirt portion;  
said pump tubular body including a substance flow conduit extending into said upper band portion through said ferrule portion and being sealingly connected to said band portion below said vent;  
a lower intermediate space between said bag and interior of the casing, an upper intermediate space between the pump body and the ferrule, said upper intermediate space being in communication with said vent, and a passage providing communication between said lower intermediate space and said upper intermediate space.





venturi having an inlet and an outlet radially spaced apart, means for rotating said element within said pan at speeds in excess of the speed required to throw powder from said element by centrifugal force, said element drawing gas through said venturi and atomizing powder fed into said inlet to produce a uniform cloud of particulate material.

5,769,277

# DISPENSING CLOSURE HAVING A FORCE-DIRECTING REMOVABLE SEAL

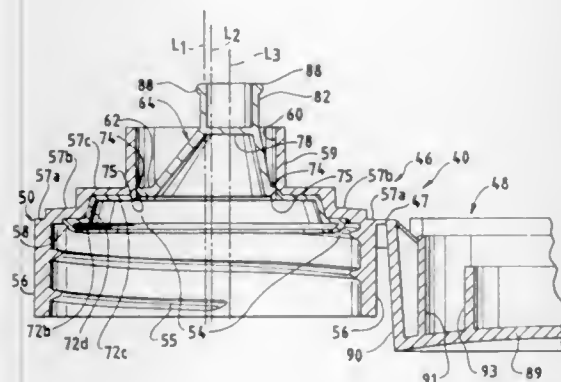
John Elliott, Burlington, Wis., assignor to AptarGroup, Inc., Crystal Lake, Ill.

Filed Jul. 11, 1996, Ser. No. 678,159

Int. Cl.<sup>6</sup> B67B 5/00

U.S. Cl. 222—153.07

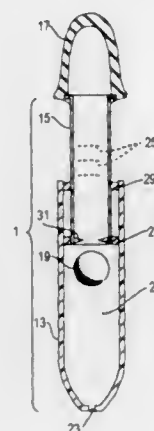
20 Claims



1. A closure for an opening to a container interior, said closure comprising:

- a body for mounting to said container around said opening, said body defining a dispensing orifice for communicating with said container opening; and
- a seal having a removable central portion occluding said orifice and at least a first frangible web defining a closed tear path lying in a plane connecting said seal central portion to a surrounding part of said closure, said seal central portion including a hollow projection having a base located in said plane with one part of the base closer to said first frangible web than is any other part of said base whereby a tension force of sufficient magnitude applied to said projection will produce a tear which extends through said first frangible web at a point on said first frangible web closest to said one part of said projection base and which thereafter propagates from said point around said seal central portion so as to separate said seal central portion from said closure and thereby open said seal.

5,769,278  
ADJUSTABLE MEASURED DOSE DROPPER  
Frederick J. Kummer, 344 82nd St., Brooklyn, N.Y. 11209, and  
Victor H. Frankel, 39 Gramercy Park, New York, N.Y. 10010  
Filed Sep. 27, 1996, Ser. No. 721,457  
Int. Cl.<sup>6</sup> B67D 5/38  
U.S. Cl. 222—158  
28 Claims

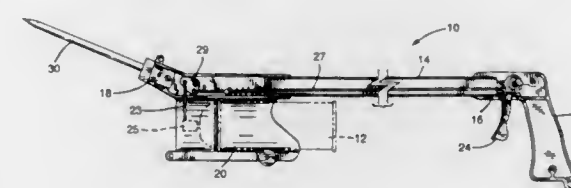


1. A measured dose dropper comprising:

- (a) a hollow barrel having an inner chamber, a first end, and a second end opposite said first end, said first end having a fluid opening and said second end having an extension opening, both said fluid opening and said extension opening communicating with said inner chamber;
- (b) a barrel extension adapted to be received in said extension opening of said hollow barrel, said barrel extension also being hollow and having a first end and a second end opposite said first end, said first end having a barrel opening with an inner diameter and said second end having a suction opening;
- (c) means for adjustably securing said barrel extension to said second end of said hollow barrel such that said barrel opening of said barrel extension communicates with said inner chamber of said hollow barrel, the space between said first end of said barrel extension and said first end of said hollow barrel defining a volume of said inner chamber, said volume being adjusted by moving said barrel extension with respect to said hollow barrel;
- (d) means for providing suction to draw a fluid into said inner chamber, said second end of said barrel extension being adapted to communicate with said means for providing suction, said fluid opening of said hollow barrel being adapted to permit passage of said fluid; and
- (e) a float with an outer diameter greater than said inner diameter of said barrel opening of said barrel extension, said float being disposed in said inner chamber of said hollow barrel between said barrel opening of said barrel extension and said fluid opening of said hollow barrel, said float having a density which is less than a density of said fluid so that when said fluid is drawn into said inner chamber, said float floats against said barrel opening of said barrel extension and prevents more than said volume of said fluid, less the volume of said float, from being drawn into said inner chamber.

5,769,279  
AEROSOL CONTAINER DISCHARGING APPARATUS  
WITH FLAG STAKING CAPABILITY  
Thomas J. Smrt, 10014 S. Grant Hwy., Marengo, Ill. 60152  
Filed Jul. 19, 1996, Ser. No. 684,398  
Int. Cl.<sup>6</sup> B67D 5/64  
U.S. Cl. 222—174  
15 Claims

13. An apparatus for discharging the contents of an aerosol container and for creating an opening in a substrate, the aerosol



container having an actuator which can be moved between discharging and non-discharging positions, the apparatus comprising: a rod member having a front and a rear end; means for holding the aerosol container disposed adjacent the front end of the rod member; actuating means which effects movement of the aerosol container actuator between discharging and non-discharging positions; means for controlling movement of the actuating means; means comprising a stake member for creating an opening in a substrate, the stake member having first and second ends; a flange on the first end of the stake member; and a mounting bracket disposed adjacent the front end of the rod member, wherein at least the flange stake member is retained within a cavity of a mounting bracket.

5,769,280

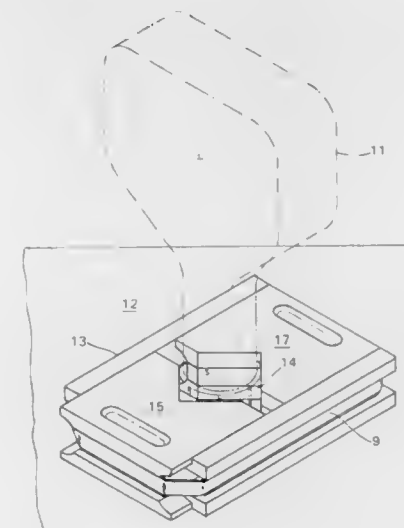
# INVERTED BOTTLE HOLDER AND STAND

Ervin Ehresmann, 33 Hibicus Ct., Doylestown, Pa. 18901  
Continuation-in-part of Ser. No. 783,862, Jan. 16, 1997, abandoned. This application Sep. 10, 1997, Ser. No. 926,936

Int. Cl.<sup>6</sup> B67D 5/06

U.S. Cl. 222—185.1

9 Claims



1. A bottle holder, comprising:

- a substantially planar base, including a fixed jaw and parallel side rails;
- a movable jaw slidably engaged with said side rails such that said movable jaw is guided between positions toward and away from said fixed jaw in a plane of motion occupied by said fixed jaw; and
- resilient means affixed between said base and said movable jaw to bias said jaws toward a closed position.

5,769,281

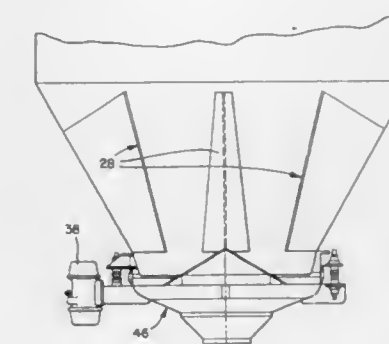
# BULK STORAGE HOPPERS

Lyndon Bates, Sale, United Kingdom, assignor to Martin Engineering Company, Neponset, Ill.  
Continuation-in-part of Ser. No. 438,983, May 11, 1995, Pat. No. 5,651,479. This application May 3, 1996, Ser. No. 642,277  
Claims priority, application United Kingdom, May 6, 1995, 9509285; Jan. 16, 1996, 9600719

Int. Cl.<sup>6</sup> B67D 3/00

U.S. Cl. 222—196

30 Claims



1. An insert system adapted for positioning within the chamber of a hopper having a wall and an outlet, said insert system comprising:

- a flow deflector having a top end and a bottom end, a first edge, a second edge and a support surface, said first and second edges extending between said top end and said bottom end of said flow deflector; and
- a support member attached to said flow deflector, said support member adapted to be attached to the wall of the hopper to support said flow deflector in a spaced relation to the wall of the hopper such that said flow deflector forms a flow region located between said flow deflector and the wall of the hopper, said flow deflector adapted to promote a mass flow pattern of the hopper contents.

5,769,282

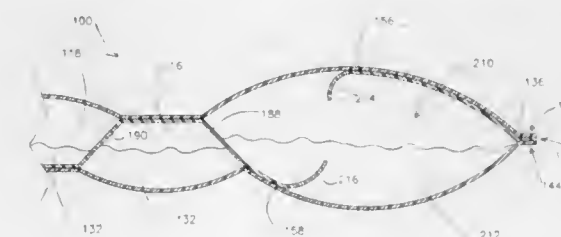
PRESSURE GENERATION SYSTEM FOR A CONTAINER  
Michael L. Lae; Lowell T. Whitney, both of Arvada, and  
Michael D. Gerstenkorn, Golden, all of Colo., assignors to  
Quoin Industrial, Inc., Golden, Colo.

Filed Apr. 12, 1996, Ser. No. 631,480

Int. Cl.<sup>6</sup> B67D 5/42

U.S. Cl. 222—386.5

20 Claims



7. An improved pressure system suited for use in combination with a dispensing container, wherein the improvement comprises: a pouch having

- a first compartment containing at least a first component of an at least two-component gas generating system;
- a second compartment containing at least a second component of said at least two-component gas generating system; and
- a first frangible wall portion separating said first and second compartments.

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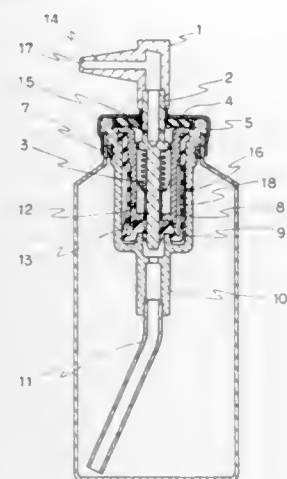
**FIXED-AMOUNT SPRAY TYPE AEROSOL CONTAINER**  
Ryoichi Owada, Uji, and Satoshi Mekata, Ibaraki, both of Japan, assignors to Osaka Shipbuilding Co., Ltd., Osaka, Japan

PCT No. PCT/JP94/01424, § 371 Date Apr. 11, 1996, § 102(e) Date Apr. 11, 1996, PCT Pub. No. WO96/06650, PCT Pub. Date Mar. 7, 1996

PCT Filed Aug. 29, 1994, Ser. No. 615,198  
Int. Cl.<sup>6</sup> B65D 83/14

U.S. Cl. 222—402.2

2 Claims



1. A fixed-amount spray type aerosol container comprising:
- a container body having an opening therethrough leading to a chamber therein;
  - a housing having a main body portion and a flange, wherein said flange is supported on said opening of said container body and said main body portion hangs suspendedly through said opening in said chamber of said container body;
  - a gasket between an outer surface of said housing and an inner surface of said container body;
  - a mounting cap mounted over said opening in said container body so as to be in contact with said flange of said housing;
  - a stem having first and second ends, wherein said first end projects out of said container body through an opening in said mounting cap and said second end projects into said container body within said housing;
  - a stem rubber fitted around said stem;
  - a spring fitted around said second end of said stem and pressing said stem rubber to said mounting cap;
  - a nozzle attached to said first end of said stem;
  - a dip tube connected to said housing within said chamber of said container body;
  - a guide bushing located between said stem and said housing;
  - a tank, having a bottom portion and a side wall, is located between said guide bushing and said housing, wherein said tank is supported by said housing so that said bottom portion of said tank makes sealing contact with said housing and said side wall of said tank is pressed radially inwardly by a pressure of a gas charged in said container body;
  - means for stabilizing a shape of said tank, wherein said shape stabilizer means are located at spaced intervals between said guide bushing and said tank; and
  - a fixed-amount chamber formed between said guide bushing and said tank.

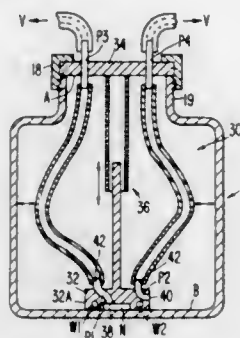
5,769,284

**SELF-ADJUSTING PICK-UP TUBE ASSEMBLY FOR ASPIRATING LIQUID FROM CONTAINERS**  
Santos E. Vargas, Miami Lakes, and Thomas Wollitzer, North Miami Beach, both of Fla., assignors to Coulter International Corp., Miami, Fla.

Filed Mar. 28, 1996, Ser. No. 623,473  
Int. Cl.<sup>6</sup> B67D 5/60

U.S. Cl. 222—464.4

12 Claims



1. A pick-up tube assembly for aspirating a liquid from a liquid-containing container having a filling aperture in a wall thereof, said assembly comprising:
- (a) a platform member adapted to be positioned in contact with the bottom of a container at a location substantially opposite the container's liquid access opening when the pick-up tube is being used to aspirate liquid from such container, such platform having a liquid passageway extending between a pair of surfaces thereof;
  - (b) a disk-shaped member having opposing surfaces and means defining a liquid passageway between such surfaces, such disk-shaped member being adapted to be retained in a position proximate the container's liquid access opening when the pick-up tube is in use;
  - (c) a flexible conduit interconnecting the respective liquid passageways in the platform and disk-shaped members, such flexible conduit being capable of conducting liquid from the container; and
  - (d) mounting means for movably mounting the platform member for movement relative to said disk-shaped member to enable said platform member to move towards and away from said disk-shaped member.

5,769,285

**CALF NIPPLE**

George Lynn Upham, Tulare, and John Dilsaver, Corona, both of Calif., assignors to Veterinarian's Outlet Inc., Tulare, Calif.

Filed Feb. 20, 1996, Ser. No. 603,637  
Int. Cl.<sup>6</sup> B67D 3/00

U.S. Cl. 222—481.5

9 Claims

1. A nipple of resilient material for dispensing liquid to a young animal comprising:
- a base adapted for coupling to a source of liquid;
  - an elongated tubular wall defining a liquid-carrying channel therein, said wall having a proximate end connected to said base and a tip remote from said proximate end substantially enclosing said channel, said tip presenting a liquid passageway therethrough, said liquid passageway comprising an elongated slit having a pair of opposed ends; and
  - a substantially circular tip ridge located on said tip in substantially surrounding relationship to said passageway and radially spaced from said opposed ends of said slit, said tip ridge having opposed, spaced apart, inner and outer walls projecting from and at an angle different from the surfaces of said tip adjacent the ridge inner and outer walls, said ridge forming a



thickened region on the tip relative to the thicknesses of the tip proximal to said inner and outer ridge walls.

5,769,286

**HOSIERY ITEM SPREADING UNIT WITH PNEUMATIC FEED, USABLE WITH PNEUMATIC HOSIERY ITEM CONVENIENCE SYSTEMS EQUIPPED WITH A CENTRALIZED SUCTION**

Stefano Conti, Milan, Italy, assignor to Essedue S.r.l., Milan, Italy

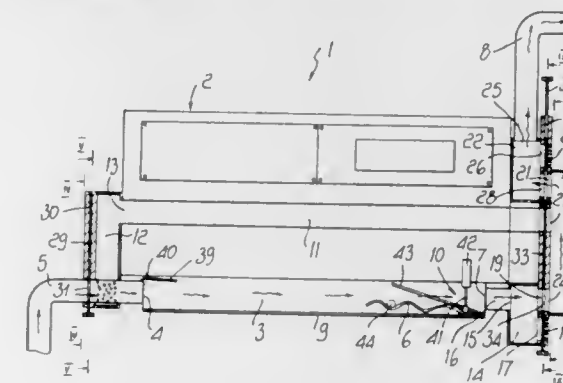
Filed Mar. 12, 1997, Ser. No. 816,184

Claims priority, application Italy, Mar. 18, 1996, MI96 A 000528

Int. Cl.<sup>6</sup> D06C 5/00; B65G 51/34; 47/24

U.S. Cl. 223—75

15 Claims



1. A hosiery item spreading unit with pneumatic feed, usable with pneumatic hosiery item conveyance systems equipped with a centralized suction, comprising: a structure forming an elongated spreading chamber, said chamber being arranged with a longitudinal axis thereof being substantially horizontal; a first opening provided at a first longitudinal end of the chamber; a duct for feeding a hosiery item to be spread, said duct being connected to said first opening; a second opening provided at a second longitudinal end of said chamber; a suction duct connected to said second opening; and suction means connected to said suction duct; a door which can be opened on command to remove the spread hosiery item, said door closing said spreading chamber in a downward region thereof; gripping means for gripping a longitudinal end of the hosiery item being contained in said spreading chamber, said gripping means being spaced from said first opening towards said second opening; an auxiliary duct connecting said hosiery item feed duct to said suction duct; and valve means being actuatable on command selectively into a first operating position, wherein the

5,769,287

**SHAPING CLIP FOR A SHIRT COLLAR**

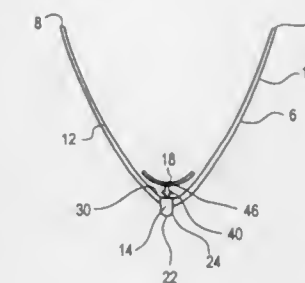
Randy Kim, 7912 Sea Pines Rd., Orland Park, Ill. 60462

Filed Oct. 7, 1996, Ser. No. 727,342

Int. Cl.<sup>6</sup> D06C 15/00

U.S. Cl. 223—83

9 Claims



1. A shaping device for a collar having an outer and an inner surface, an upper edge and a buttoned front center portion, comprising first shaping means for placement along said outer surface of said collar extending in each opposite direction from said buttoned front center portion of said collar for shaping thereof, second shaping means for placement along said inner surface of said collar extending arcuately in each opposite direction from said buttoned front center portion of said collar for shaping thereof, and clamping means to clamp said first and second shaping means together with said outer and inner surfaces of said collar sandwiched therebetween said clamping means including interconnecting members located above said upper edge of said collar when interconnected in place thereon, wherein said first shaping means includes a linearly elongated band of stiffening material having a central portion and an upper edge thereof, a first integrally formed leg extending in one diagonal direction from said central portion of said elongated band and a second integrally formed leg extending in an opposite diagonal direction from said central portion of said elongated band.

5,769,288

**LAUNDERED SHIRT STABILIZER**

Stephen E. Berglund, 5128 N. Palm Ave., Fresno, Calif. 93704

Continuation-in-part of Ser. No. 497,607, Jun. 30, 1995, Pat. No. 5,605,261. This application Feb. 21, 1997, Ser. No. 804,748

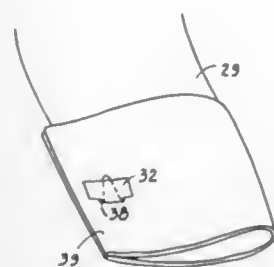
Int. Cl.<sup>6</sup> D06C 15/00

U.S. Cl. 223—84

4 Claims

3. In combination, a garment sleeve with cuff button holes and a disposable stabilizer therefor comprising a stiff yieldably flexible flat blank having a pointed blade attached to a wider bow, said blank having a front and back surface with pressure sensitive adhesive material on the back surface for attachment to the cuff by





inserting the blade through the cuff button holes in order to hold the cuff in place.

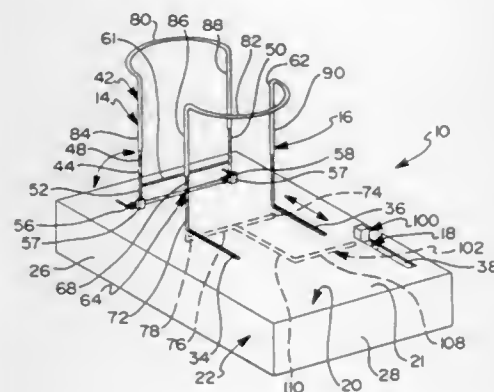
5,769,289

**DEVICE FOR AIDING IN DONNING OF GARMENTS**

Robert A. Lusk, 1411 S. Wilson, Royal Oak, Mich. 48067  
Continuation of Ser. No. 370,266, Jan. 9, 1995, Pat. No. 5,593,071. This application Jan. 14, 1997, Ser. No. 783,500  
Int. Cl.<sup>6</sup> A47G 25/90

U.S. Cl. 223—112

13 Claims



1. An apparatus to assist an individual in donning a garment, the apparatus comprising:

- (a) a base defining a substantially hollow interior, the base having at least one aperture formed therethrough;
  - (b) at least a pair of stands, the pair of stands cooperating to receive the garment, each of the at least a pair of stands comprising:
    - (1) a mounting portion attached to the base;
    - (2) a garment receiving portion attached to the mounting portion;
  - (c) means for laterally adjusting distance between the mounting portions of the at least a pair of stands, the means disposed partially within the base and projecting through the at least one aperture in the base, and
- wherein at least one of the at least a pair of stands is pivotally mounted to the base.

5,769,290

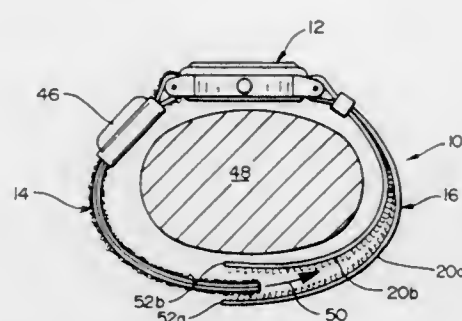
**HOOK AND LOOP FABRIC WRIST BAND**

Alao D. Pestana, P.O. Box 6123, Bellingham, Wash. 98227  
Filed Oct. 4, 1996, Ser. No. 726,128  
Int. Cl.<sup>6</sup> A44B 18/00

U.S. Cl. 224—178

12 Claims

1. A wrist band assembly constructed of hook-and-loop fabric material, said band assembly comprising:  
a first strap member having a loop surface of said hook-and-loop fabric material on both first and second sides thereof, said first strap member comprising a strip of a loop layer of said hook-and-loop fabric folded over at a connection point and bonded together so that said first strap member extends out-



wardly from said connection point with said loop surfaces on said first and second sides thereof; and

a second strap member having first and second leg portions which define a gap for receiving said first strap member between inwardly facing surfaces of said leg portions, said inwardly facing surfaces of said leg portions both having hook surfaces of said hook-and-loop fabric material thereon, said second strap member comprising a strip of a hook layer of said hook-and-loop fabric material folded over at a connection point so that said first and second leg portions thereof extend outwardly from said connection with said hook surfaces facing towards one another;

so that said first strap member can be selectively attached to said second strap member by positioning said first strap member in said gap between said first and second leg portions and pressing said leg portions together so that said hook surfaces on said leg members engage said loop surfaces on said first and second sides of said first strap member.

5,769,291

**SUPPORT PAD ASSEMBLY FOR CARRYING ARTICLES ON VEHICLE ROOF**

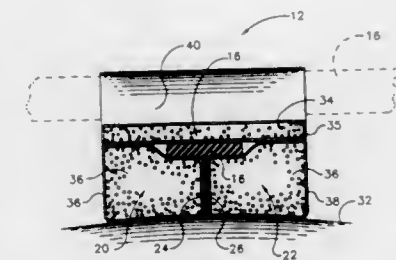
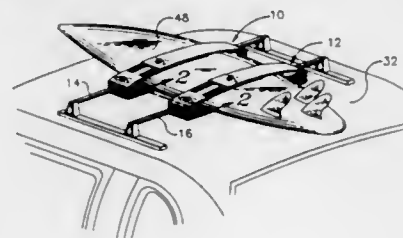
Paul E. Chasan, P.O. Box 675864, Rancho Santa Fe, Calif. 92067

Filed Oct. 22, 1996, Ser. No. 735,250

Int. Cl.<sup>6</sup> B60R 9/048

U.S. Cl. 224—324

18 Claims



1. A support assembly for securing an elongate object on a vehicle roof rack, comprising:

a pair of elongate members for securing to spaced crossbars of a vehicle roof rack, each elongate member comprising an upper elongate pad member for resting on top of a roof rack crossbar, the upper pad having opposite first and second side edges,

a first elongate bolster member hinged along the first side edge of the upper pad and a second elongate bolster member hinged along the second side edge of the upper pad;  
the first and second bolster members having opposing inner faces, one of said inner faces having a first fastener device and the other inner face having a second fastener device for releasable mating engagement with the first fastener device to secure the bolster members together beneath a roof rack crossbar, whereby the elongate member is secured over the crossbar;

the upper pad and bolster members each having a core of cushioning material; and

at least one fastener strap secured to the upper pad member for fastening around an elongate object placed across the upper pad member.

5,769,292

**ADJUSTABLE CLAMP FOR USE WITH A VEHICLE ARTICLE CARRIER**

John S. Cucheran, Lake Orion; Jeffrey M. Aftanas, Sterling Heights, and Jon D. Sparham, Waterford, all of Mich., assignors to JAC Products, Inc., Ann Arbor, Mich.

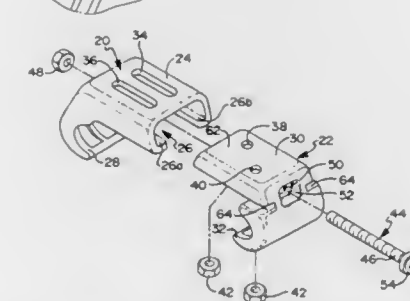
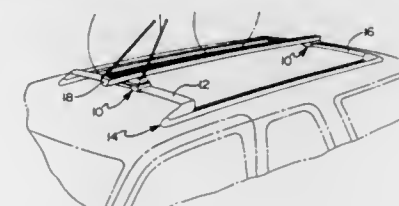
Continuation of Ser. No. 497,211, Jun. 30, 1995, abandoned.

This application Mar. 31, 1997, Ser. No. 828,518

Int. Cl.<sup>6</sup> B60R 9/10; 9/048

U.S. Cl. 224—324

7 Claims



1. An independent adjustable clamp apparatus for use with a support member of an existing vehicle article carrier for securing an external article securing implement to said support member of said vehicle article carrier without disassembly of any portion of the article carrier, said apparatus comprising:

a first body portion and a second body portion;

said first body portion including a channel portion forming a channel, and a hook portion, said channel portion including at least one elongated slot opening into said channel for receiving a fastening element adapted to secure said article restraining implement to said apparatus, a pair of ledges facing one another to partially form said channel portion, and a first opening in communication with said channel;

said second body portion including a base portion, a hook portion and a pair of grooves, with said base portion being operable to slidably engage within said channel portion and to be held within said channel portion by said ledges such that a spacing of said hook portions of said first and second body portions can be adjusted to clampingly engage said support member of said vehicle article carrier;

said base portion of said second body portion including a second opening in longitudinal alignment with said first opening and a third opening extending generally transversely to said channel and in longitudinal alignment with said elongated slot so

as to register with said elongated slot when said base portion of said second body portion is at least partially inserted in said channel portion of said first body portion;

a first fastener having a length sufficient to extend through said first and second openings when said first body portion is engaged with said second body portion for securing said first body portion to said second body portion at a desired spacing such that said first and second body portions can be maintained in secure clamping engagement around said support member of said vehicle article carrier;

wherein said third opening and said elongated slot overlap one another when said first and second body portions are engaged with one another to permit a second fastener to be inserted through said third opening and said elongated slot to enable said external article securing implement to be secured to said apparatus while permitting a degree of adjustable spacing between said hook portions and without interfering with said first fastener; and

wherein said grooves accept a portion of each one of said ledges when said base portion of said second body portion is slidably engaged to permit said first and second body portions to be drawn closely adjacent each other.

3. A vehicle article carrier apparatus for supporting articles above an outer body surface of a vehicle, said apparatus comprising:

a pair of elongated slats adapted to be secured to said outer body surface;

a cross bar adapted to be secured to said slats so as to extend transversely between said slats;

an independent adjustable clamp for securing an external article securing implement to said cross bar without disassembly of said cross bar from said slats;

said clamp including:

a first body portion and a second body portion;

said first body portion including a channel portion forming a channel, and a hook portion, said channel portion including at least one elongated slot opening into said channel for receiving a fastening element adapted to secure said article restraining implement to said cross bar, a pair of ledges facing one another to partially form said channel portion, and a first opening in communication with said channel;

said second body portion including a base portion, a hook portion with said base portion being operable to slidably engage within said channel portion and to be held within said channel portion by said ledges such that a spacing of said hook portions of said first and second body portions can be adjusted to clampingly engage said cross bar;

said base portion of said second body portion including a second opening in longitudinal alignment with said first opening and a third opening extending generally transversely to said channel and in longitudinal alignment with said elongated slot so as to register with said elongated slot when said base portion of said second body portion is at least partially inserted in said channel portion of said first body portion;

a first fastener having a length sufficient to extend through said first and second openings when said first body portion is engaged with said second body portion for securing said first body portion to said second body portion at a desired spacing such that said first and second body portions can be maintained in secure clamping engagement around said cross bar; and

wherein said third opening and said elongated slot overlap one another when said first and second body portions are engaged with one another to permit a second fastener to be inserted through said third opening and said elongated slot to enable said external article securing implement to be secured to said apparatus while permitting a degree of adjustable spacing between said hook portions and without interfering with said first fastener.

5,769,293

## AUTOMOBILE TRUNK ORGANIZER

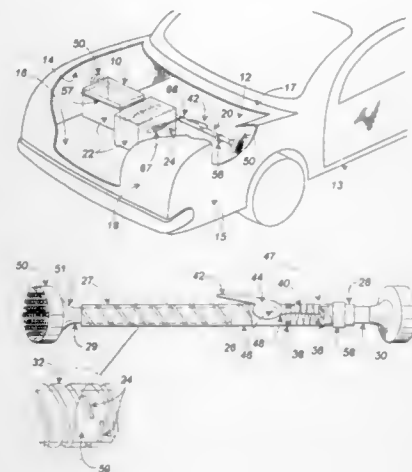
Boris Zaretsky, 5325 Mainstream Cir., Norcross, Ga. 30092

Filed Oct. 25, 1995, Ser. No. 548,040

Int. Cl.<sup>6</sup> B60R 7/00

U.S. Cl. 224—551

15 Claims



1. A trunk organizer for use in an automobile trunk compartment having opposing side walls to restrain movement of the contents of the trunk compartment, comprising:

a holding bar assembly constructed and arranged to extend across the trunk compartment and having two spaced ends that fixedly engage opposing side walls of the trunk compartment, said holding bar assembly having at least a first portion and a second portion adapted to axially move away from each other toward the opposing side walls of the trunk;

biasing means, formed as a part of said bar assembly, for biasing said first and second portions axially away from each other so that said two ends of said holding bar assembly fixedly engage the two side walls of the trunk compartment, comprising a compression spring positioned within said assembly and between said first portion and said second portion;

means for holding said first and second portions in a biased position and handle means for releasing said first and second portions from said biased position means comprising a handle attached to a cam shaped bearing positioned in said first portion and having a tension wire fastened to said second portion, so that as said cam bearing is rotated by said handle it moves said second portion toward said first portion and compresses said spring.

5,769,294

## RECESSED ACCESSORY HOOK FOR AN AUTOMOBILE

Mark F. Heinz, Toledo, Ohio, and Girma M. Gebreselassie, Southfield, Mich., assignors to UT Automotive Dearborn, Inc., Dearborn, Mich.

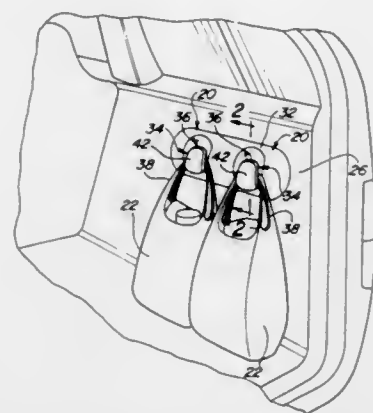
Filed Jun. 18, 1996, Ser. No. 665,740

Int. Cl.<sup>6</sup> B60R 7/08; 7/10

U.S. Cl. 224—567

3 Claims

1. An accessory hook for an automobile comprising: a surrounding wall structure having an opening defined by a peripheral rim; a concave cup disposed in said opening in said surrounding wall structure; a first hook extending in cantilevered fashion from said cup to a distal tip; a recess for recessing said distal tip of said first hook behind said rim to prevent unwanted snagging and abrasions; and



said hook having a base portion extending rearwardly towards a rear wall of said cup, and a fastener securing said base to said cup adjacent said rear wall, a foot pad extending downwardly from said base and contacting said cup adjacent a bottom edge of said cup, said foot pad and said base providing support to said first hook, and said distal tip angled inwardly toward said cup from said base.

5,769,295

## BACK PACK HOLDER

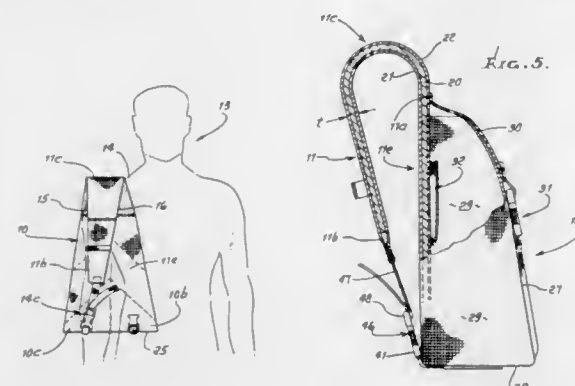
Kasidy W. Alves, 3115 Harbor Blvd., Oxnard, Calif. 93035

Filed Nov. 22, 1996, Ser. No. 754,160

Int. Cl.<sup>6</sup> A45F 3/02

U.S. Cl. 224—613

12 Claims



1. A back pack comprising

a) an elongated strap having upper and lower ends, the strap upper end operatively connected to an upper extent of the back pack, and the strap lower end selectively connectible to either one of two lower extents of the back pack,

b) said strap having a width which widens along the strap length toward said upper end,

c) said back pack having front and rear panels, the rear panel having a width which decreases in an upward direction, toward an upper extent of the rear panel and the strap,

d) said strap and rear panel having unitary sandwich construction, including a padding layer sandwiched between layers of synthetic durable fabric.

5,769,296

## METHOD AND APPARATUS FOR SPLITTING A CATHODE RAY TUBE

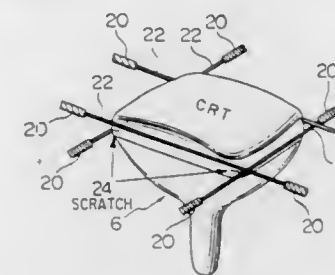
Kouzi Kanehira, Chiba, Japan, assignor to Sony Corporation, Japan

Division of Ser. No. 618,201, Mar. 19, 1996, which is a continuation of Ser. No. 265,768, Jun. 27, 1994, Pat. No. 5,556,018. This application Dec. 20, 1996, Ser. No. 770,816 Claims priority, application Japan, Jul. 9, 1993, 6-170518

Int. Cl.<sup>6</sup> H01J 9/50

U.S. Cl. 225—93.5

4 Claims



1. An apparatus for splitting a cathode ray tube, said cathode ray tube having four sides and four corners and a scratch at each corner, each scratch having two sides, said apparatus comprising: a supporting means for supporting said cathode ray tube, a plurality of linear heating elements, a plurality of springs, there being a spring on each of said plurality of linear heating elements to tension each of said plurality of linear heating elements, each of said plurality of linear heating elements being slightly spaced from one another and said plurality of linear heating elements generally forming a rectangle, whereby a cathode ray tube supported on said supporting means would be contacted and encompassed by said rectangle and each scratch would have one of said linear heating elements on one scratch side and another of said linear heating elements on an opposite scratch side.

5,769,297

## APPARATUS AND METHOD FOR DICING SEMICONDUCTOR WAFERS

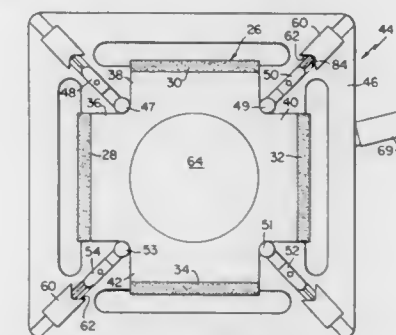
James W. Loomis, 1329 Allyn Ave., St. Helena, Calif. 94574, and Richard T. Tweedie, 4715 Muirfield Dr., Santa Rosa, Calif. 95405

Continuation of Ser. No. 277,622, Jul. 20, 1994, abandoned. This application Sep. 10, 1996, Ser. No. 711,556

Int. Cl.<sup>6</sup> B26F 3/00

U.S. Cl. 225—96.5

20 Claims



1. Apparatus for providing separation between diced members produced by scribing and breaking comprising

a) a symmetrical telescopic expandable frame of four hollow wide members having a central region, two open ends each, four corner members telescoped into the ends of the hollow wide members and four matched resilient members disposed in the hollow side members to exert outward forces on the corner members to provide an expanding force on the frame,

means for compressing said frame, and an elastic material secured to the four side members of the frame.

5,769,298

## GUIDING APPARATUS FOR WEBS HAVING AT LEAST TWO THICKNESSES

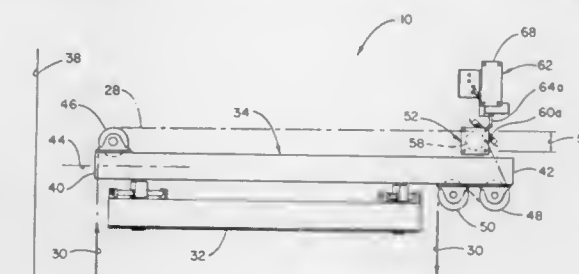
John M. Plumb, Edmond, Okla., assignor to Fife Corporation, Oklahoma City, Okla.

Filed Jul. 25, 1997, Ser. No. 900,908

Int. Cl.<sup>6</sup> B23Q 15/00

U.S. Cl. 226—19

5 Claims



1. A guide apparatus for guiding a moving web of material having a tuft portion mounted on a backing portion such that the backing portion extends outwardly from the tuft portion to form a pair of opposing tuft edges, the web being movable in a web direction through a travel path threaded through the guide apparatus, the guide apparatus comprising:

a base; a platform pivotally mounted on the base to pivot about a pivot range, at least one steering roller being mounted on the platform and disposed transversely of the web direction of travel when the web travels across the platform;

bending means disposed adjacent to the travel path of the web for engaging the backing portion of the web and for forming a bent portion of the web when the web travels across the bending means;

a sensor positioned substantially adjacent to the travel path of the web, the sensor comprising:

a transmitter transmitting a sensor media, the transmitter being positioned adjacent to the tuft portion of the web when the web travels across the bending means;

a receiver positioned adjacent to the tuft portion of the web and being positioned to receive at least a portion of the sensor media transmitted by the transmitter, the transmitter and the receiver being positioned such that at least a portion of the tuft portion of the web is disposed between the transmitter and the receiver when the web travels across the bending means so that at least a portion of the sensor media intersects at least a portion of one tuft edge of the web to sense a lateral position of the tuft edge and to provide an output signal indicative of the lateral position of the tuft edge when the web travels through the travel path;

control means for generating control signals responsive to the signals produced by the sensor for automatically correcting a deviation from a predetermined position of the web position; and

platform drive means responsive to the control signals generated by the control means for pivoting the platform and thereby controlling the angular position of the platform relative to the base.



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5,769,299

## RECORDING SHEET DISCHARGE MECHANISM

Ikuro Negoro, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

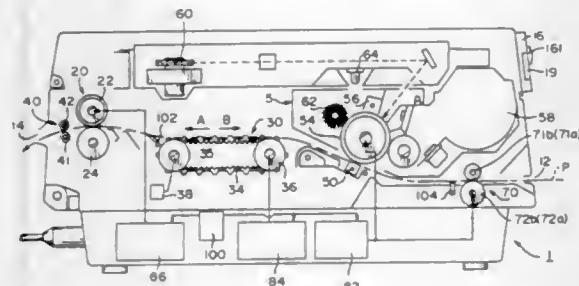
Filed Apr. 9, 1996, Ser. No. 629,848

Claims priority, application Japan, Apr. 14, 1995, 7-113971

Int. Cl.<sup>6</sup> B23Q 15/013

U.S. Cl. 226—24

23 Claims



1. A continuous form printer having a sheet feeding path comprising:

form feeding means for feeding a continuous form along the sheet feeding path, said form feeding means selectively feeding the continuous form in a printing direction and in a reverse direction opposite to said printing direction;

at least one sheet sensor for detecting the continuous form along the sheet feeding path;

control means for controlling said form feeding means to discharge said continuous form from said printer independently of printing operations of said continuous form printer when said control means is initiated, said form feeding means discharging said continuous form, when initiated, by feeding the continuous form in said reverse direction until said at least one sheet sensor detects that the continuous form is not in the sheet feeding path and said control means determines the continuous form is no longer in said continuous form printer; and

an operation switch, connected to said control means, said operation switch exclusively for discharging the continuous form by initiating said control means, wherein said control means controls said form feeding means to discharge the form in response to an operation of said operation switch.

5,769,300

## AUTOMATIC PART FEEDING APPARATUS

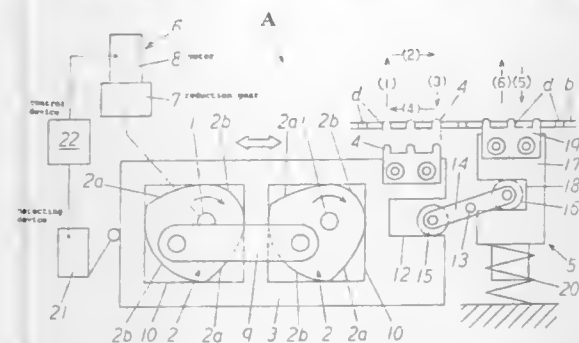
Takami Aono, Hamamatsu, Japan, assignor to Tenryu Technics Co., Ltd., Hamamatsu, Japan

Filed Nov. 18, 1996, Ser. No. 752,184

Int. Cl.<sup>6</sup> G03B 1/22; B65H 23/06

U.S. Cl. 226—69

4 Claims



1. An automatic parts feeding apparatus for transferring a carrier tape having parts thereon and feed perforations in a predetermined pitch, comprising:

a first driving shaft rotated in one direction,

a first cam member fixed to the first driving shaft and having a first cam surface,

a moving member having a frame, a first receiving portion formed inside the frame in which said first cam member is located to contact therewith, a receiving recess formed at one side of the frame, and means for keeping orientation of the frame so that when the first driving shaft is actuated, the moving member is elevated, advanced, lowered and retreated sequentially in order through the rotation of the first cam member without changing the orientation of the frame,

a feed member attached to the moving member, said feed member being elevated, advanced, lowered and retreated together with movements of the moving member, said feed member being adapted to engage a feed perforation of a carrier tape when the feed member is elevated and advanced, and

a positioning mechanism adjacent to the moving member, said positioning mechanism including an elevating and lowering member having a receiving portion at one side thereof, a stop member fixed to an upper portion of the elevating and lowering member, a supporting shaft immovably fixed relative to the moving member and the elevating and lowering member, and an arm pivotally connected to the supporting shaft and having first and second ends, said first end being slidably situated in the receiving recess of the moving member and the second end being slidably situated in the receiving portion of the elevating and lowering member so that when the feed member is lowered and retreated, the stop member is located at an upper position adapted to engage a feed perforation of the carrier tape, and when the feed member is elevated and advanced, the stop member is moved to a lower position.

5,769,301

## METHOD AND APPARATUS FOR PIVOTALLY MOUNTED MEDIA TRANSPORT BRIDGE WITH IMPROVED COUNTERBALANCE SYSTEM

Thomas K. Hebert, Groveland; Mark E. Tellam, Charlestown; Libor Krupica, Methuen; Peter Austin, Wilmington, and Edward L. Kelley, Lexington, all of Mass., assignors to Agfa Division, Bayer Corporation, Wilmington, Mass.

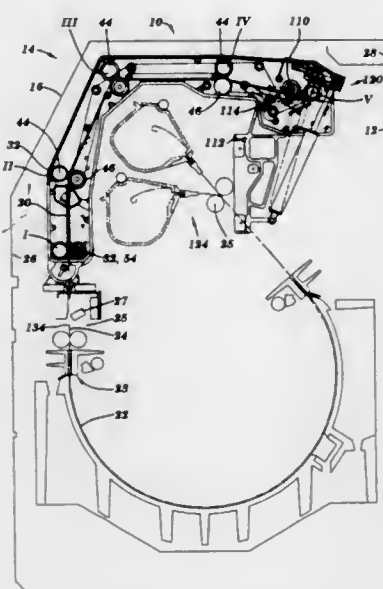
Continuation of Ser. No. 275,166, Jul. 14, 1994, abandoned.

This application Oct. 23, 1996, Ser. No. 736,234

Int. Cl.<sup>6</sup> B65H 20/00

U.S. Cl. 226—108

25 Claims



1. A dual-mode media handling system having a transport mode and a storage mode, comprising:

a. a first stage transport means for accepting and transporting media at a first media handling station during the transport mode of said dual-mode media handling system;

5,769,303

## ENDOSCOPIC SURGICAL STAPLER WITH COMPACT PROFILE

Tim Knodel; Bryan D. Knodel, both of Cincinnati; Anil Nalagatla, West Carrollton, and Dale R. Schulze, Lebanon, all of Ohio, assignors to Ethicon Endo-Surgery, Inc., Cincinnati, Ohio

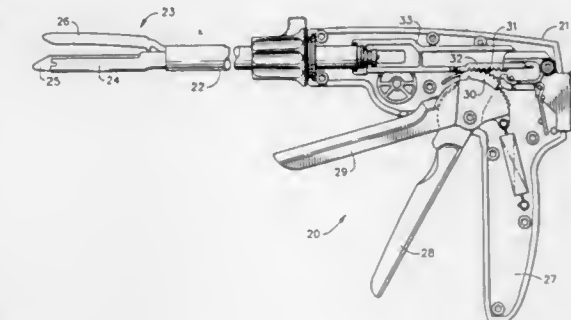
Division of Ser. No. 545,297, Oct. 19, 1995, Pat. No. 5,697,542.

This application Apr. 24, 1997, Ser. No. 842,254

Int. Cl.<sup>6</sup> A61B 17/068

U.S. Cl. 227—176.1

2 Claims



1. An endoscopic surgical stapler capable of clamping bodily tissue prior to firing staples to fasten said tissue, said stapler comprising:

an end effector including an anvil and an elongated channel containing a staple cartridge therein, said anvil facing said channel and movable toward and away therefrom, and said anvil having a first proximal ramped surface and a second ramped surface extending from said first ramped surface, said first and second surfaces having first and second slopes, respectively, said second slope being steeper than said first slope;

wherein said anvil is moveable to first, second and third fixed positions relative to said channel, said first fixed position being a closed position wherein said anvil is in intimate contact with said staple cartridge thereby eliminating any clearance therebetween, said second fixed position being an open position wherein said anvil is spaced from said cartridge for inserting said bodily tissue therebetween, and said third fixed position being a clamped position wherein said anvil is adjacent said cartridge so as to provide a tissue-clamping gap therebetween for clamping said bodily tissue.

5,769,304

## SMD SOLDERING APPARATUS

Friedrich-Wilhelm Kuchenhart, Dusseldorf, Germany, assignor to Fredart Sondermaschinen GmbH, Dusseldorf, Germany

PCT No. PCT/EP94/00844, § 371 Date Aug. 13, 1996, § 102(e) Date Aug. 13, 1996, PCT Pub. No. WO94/21415, PCT Pub. Date Sep. 29, 1994

PCT Filed Mar. 17, 1994, Ser. No. 530,137

Claims priority, application Germany, Mar. 19, 1993, 9304076 U

Int. Cl.<sup>6</sup> B23K 3/047; 1/008

U.S. Cl. 228—9

5 Claims

1. A soldering apparatus for reflow soldering of SMD circuit boards, comprising:

a housing,

a support for circuit boards disposed in said housing,

b. a second stage transport means connected to said first stage transport means for delivering media from said first stage transport means to a second media handling station during the transport mode; and,

c. a storage means for accepting and storing media at said first media handling station during the storage mode, wherein said first stage transport means is detachable from said second stage transport means and removable from said dual-mode media handling system during said storage mode and said storage means is mounted at the first media handling station instead of said first stage transport means upon removal of said first stage transport means from said dual-mode media handling system.

5,769,302

## HORIZONTAL STRIP STORAGE UNIT

Withold Richert, Hückelhoven, and Paul Zembol, deceased, late of Neuss, both of Germany; by Ursula Erika Zembol, heiress, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Düsseldorf, Germany

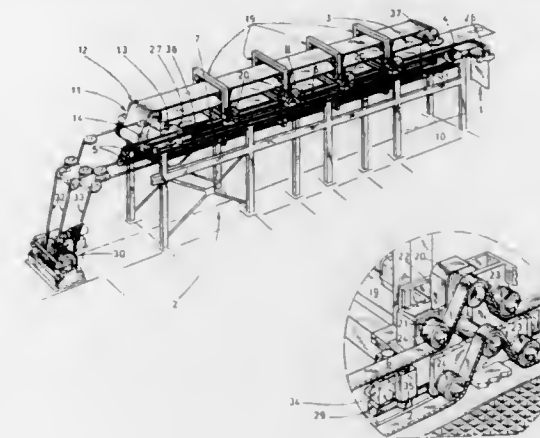
Filed Nov. 8, 1996, Ser. No. 745,967

Claims priority, application Germany, Nov. 13, 1995, 195 42 184.1

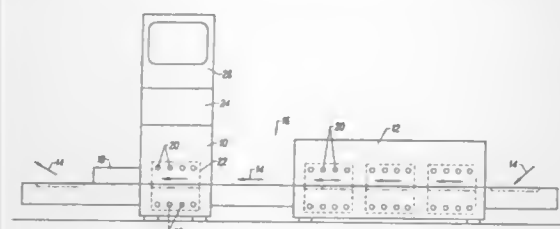
Int. Cl.<sup>6</sup> B65H 20/24

U.S. Cl. 226—118.1

8 Claims

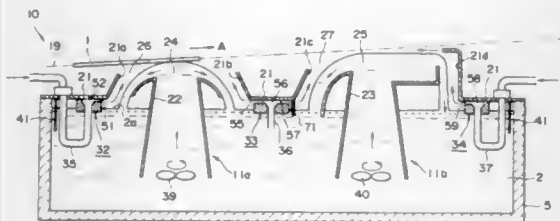


1. A horizontal strip storage unit comprising a frame, a stationary strip guide roller, and a looping carriage movably mounted on a frame at a variable distance relative to the stationary strip guide roller, the looping carriage having at least one guide roller for a strip storage loop of variable length, a plurality of support carriages with support rollers being mounted so as to be movable along a path of movement on the frame between the strip guide roller and the looping carriage, a first flexible endless drive element guided around guide rollers being connected to the looping carriage, the first flexible drive element being guided so as to be in engagement with a first drive wheel of each support carriage for driving each support carriage, further comprising a second flexible drive element tensioned along the frame within the path of movement of the support carriages, the second flexible drive element being guided so as to be in engagement with a second drive wheel of each support carriage, each support carriage comprising a gear unit for kinematically connecting the first drive wheel to the second drive wheel.



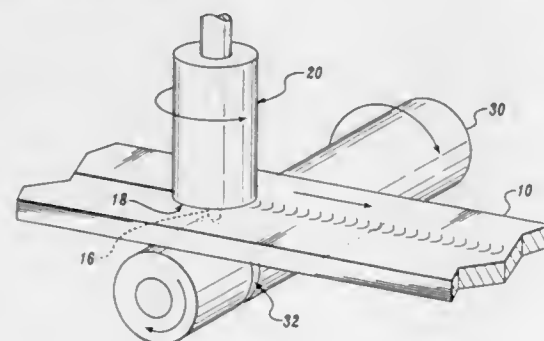
a plurality of spacedly juxtaposed elongate radiation heaters disposed in said housing above said support,  
a video camera disposed in said housing above said heaters and aiming towards said support, said video camera producing signals representative of molten and non-molten solder,  
a video transport device for displacing said video camera relative to said heaters in a first direction parallel to said heaters,  
a heater transport device for displacing said heaters and said camera relative to said housing in a second direction perpendicular to said first direction, and  
a video signal processor which processes said signals, whereby said video camera may look through gaps between adjacent heaters regardless of its position relative to said housing.

**5,769,305**  
**APPARATUS FOR WAVE SOLDERING PRINTED WIRING BOARDS**  
Toshio Takeda, Machida, and Yogo Kaneko, Fujisawa, both of Japan, assignors to Nihon Den-Netsu Keiki Co., Ltd., Japan  
Filed Jul. 19, 1996, Ser. No. 684,587  
Claims priority, application Japan, Aug. 2, 1995, 7-197389  
Int. Cl.<sup>6</sup> B23K 3/06; 35/38  
U.S. Cl. 228—37 5 Claims



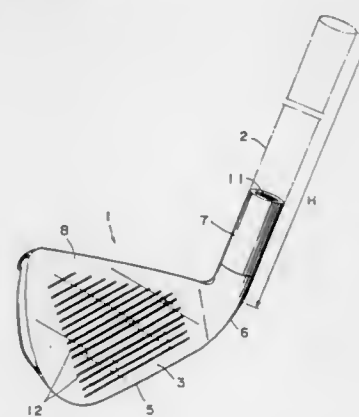
1. An apparatus for wave soldering a printed wiring board, comprising:  
a solder vessel for containing a molten solder;  
solder ejecting means having a wave nozzle disposed in said solder vessel for upwardly ejecting the molten solder therefrom to form a solder wave thereabove;  
transfer means for transferring the printed wiring board along a predetermined path of travel so that the wiring board is contacted with the solder wave during the passage thereof through said path;  
cover means having a cover plate covering over said vessel, said cover plate having an opening such that the solder wave can pass therethrough;  
a nozzle forming body provided adjacent at least one side of the solder wave, said nozzle forming body having a first section secured to a lower side of said cover plate to define a gas chamber therebetween and a second section secured to a lower side of said cover plate and extending from said first section toward said opening to define a thin space between said second section and said cover plate, said thin space being in fluid communication with said gas chamber; and  
gas feed conduit means connected to said first section of said nozzle forming body for feeding a gas to said gas chamber, so that said gas fed to said gas chamber is jetted through said thin space and flows toward the solder wave.

**5,769,306**  
**WELD ROOT CLOSURE METHOD FOR FRICTION STIR WELDS**  
Kevin James Colligan, North Bend, Wash., assignor to The Boeing Company, Seattle, Wash.  
Filed May 31, 1996, Ser. No. 655,840  
Int. Cl.<sup>6</sup> B23K 20/12  
U.S. Cl. 228—112.1 22 Claims



1. A method of friction stir welding a workpiece, the method comprising:  
(a) positioning the workpiece with a proposed weld line aligned with a recess in a backing device;  
(b) welding the workpiece with a tool comprising a rotating non-consumable pin having a tip, the tip of the pin penetrating material of the workpiece at least up to a rear surface of the workpiece proximate the recess in the backing device to form a weld bead comprising commingled material of the workpiece, the bead extending into the recess; and  
(c) machining the bead of the weld to produce a smooth weld surface on the rear surface of the workpiece.

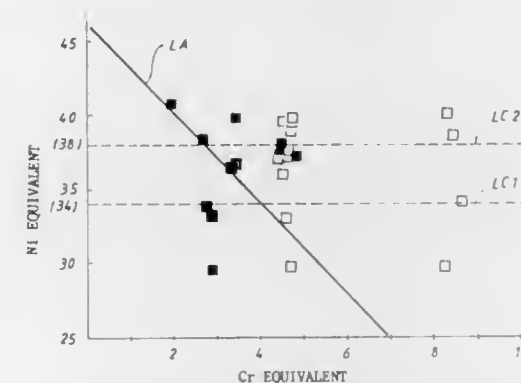
**5,769,307**  
**IRON-TYPE GOLF CLUB HEAD AND PRODUCTION METHOD THEREFOR**  
Hitoshi Takeda, Tsubame, Japan, assignor to Kabushiki Kaisha Endo Seisakusho, Niigata-ken, Japan  
Filed Jun. 19, 1996, Ser. No. 668,092  
Claims priority, application Japan, Aug. 21, 1995, 7-212067; Mar. 12, 1996, 8-054915  
Int. Cl.<sup>6</sup> B23K 20/12  
U.S. Cl. 228—114.5 6 Claims



1. A production method for an iron-type golf club head having a head body defining a face at its front and a hosel provided at its one side for mounting a shaft thereto, which comprises the steps of:  
forming said head body and said hosel from different material having the different specific gravities respectively;

allowing one side of said head body to abut to said hosel, then joining said head body to said hosel by means of a friction welding.

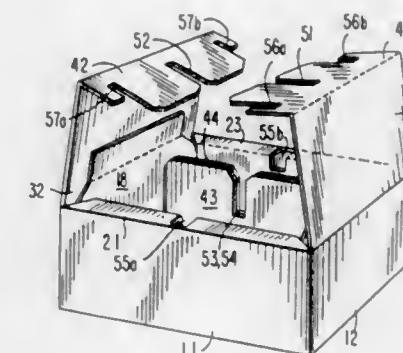
**5,769,308**  
**WELDING MATERIAL FOR USE IN HARD-FACING AND METHOD OF DETERMINING COMPONENTS THEREOF**  
Tsuyoshi Kokusho; Keizou Tanaka; Hideaki Ikeda; Masanobu Ishikawa; Hideo Nakamura, all of Saitama-ken; Shigeru Ohno, and Masami Watanabe, both of Osaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan  
Filed Dec. 23, 1996, Ser. No. 772,364  
Claims priority, application Japan, Dec. 27, 1995, 7-340419  
Int. Cl.<sup>6</sup> B23K 35/32; 9/23; C21D 1/18  
U.S. Cl. 228—200 1 Claim



1. A method of determining components of a welding material for use in hard-facing a cast iron base metal, said welding material being overlaid onto the base metal without preheating the base metal followed by a supercooling treatment for hardening, said method comprising:  
determining a component composition of said welding material to meet a nickel (Ni) equivalent and a chromium (Cr) equivalent to be included in that region in a Schaeffler's structure diagram in which a hardness difference before and after the supercooling treatment in an overlaid condition is above a predetermined value;  
wherein said Ni equivalent is selected to be 34 through 37.5 and said Cr equivalent is selected to be 3.5 through 4 such that said component composition lies within an austenitic region.

**5,769,309**  
**CUSHIONED BOXES**  
Richard N. Beneroff, Chatham, and Jeffrey A. Smith, Clark, both of N.J., assignors to Motion Design, Inc., Linden, N.J.  
Filed Feb. 21, 1996, Ser. No. 604,674  
Int. Cl.<sup>6</sup> B65D 5/28 16 Claims

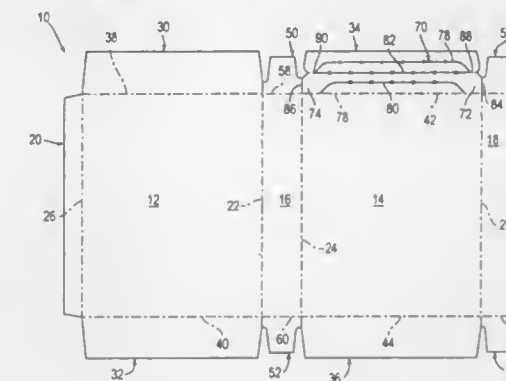
U.S. Cl. 229—167  
1. A box comprising:  
(a) a plurality of outer panels including  
(1) a plurality of outer side panels bounding an internal space, and  
(2) at least one outer closing panel connected to a first edge of one of the outer side panels and foldable with respect to that outer side panel to a closed position; and  
(b) at least one inner side panel and side distancing flap, wherein the side distancing flap is connected to the inner side panel and to a second edge of said one of the outer side panels, the inner side panel is connected to the outer closing panel, and wherein when the outer closing panel is folded to the closed position, the inner side panel is moved toward the center of



the box to a distanced position in which it is displaced from said one of the outer side panels.

**5,769,310**  
**BOX WITH IMPROVED REMOVABLE STRIP**  
Albert A. Benham, Tuscaloosa, Ala., assignor to Gulf States Paper Corporation, Tuscaloosa, Ala.  
Filed Feb. 1, 1996, Ser. No. 595,044  
Int. Cl.<sup>6</sup> B65D 5/54 4 Claims

U.S. Cl. 229—240



1. A box, defining a container space, composed of a foldable sheet material having exterior and interior surfaces defining a thickness therebetween, said box comprising:  
first and second side panels disposed in opposed spaced relation with respect to each other;  
first and second edge panels disposed in opposed spaced relation with respect to each other, each of said first and second edge panels being integral along associated fold lines with at least one of said first and second side panels; and  
first and second end flaps disposed in opposed spaced relation with respect to each other, each of said first and second end flaps being integral along associated fold lines with one of said first and second side panels, said first and second edge panels, and said first and second end flaps defining the container space,  
said box providing an access panel comprising one of said first and second end flaps,  
said box providing a removable strip portion disposed on said access panel, said removable strip portion being constructed and arranged to be removed from said access panel to permit access to said container space, said removable strip portion being defined on an exterior surface thereof by exterior score patterns, and on an interior surface thereof by interior score patterns,  
said removable strip portion being constructed and arranged to be removed by manually grasping a grippable portion thereof and pulling said removable strip portion away from said access panel to progressively delaminate said sheet material between said interior and exterior score patterns



along a predetermined removal path including an extent adjacent an associated fold line of said access panel, said interior score pattern including continuous interior cut lines partially penetrating said thickness from said interior surface and disposed for at least an extent thereof in a closely spaced generally parallel arrangement, said interior score pattern extending along said predetermined removal path to ensure that delamination occurs along said predetermined removal path,

said exterior score pattern including exterior cuts partially penetrating said thickness from said exterior surface and extending along said predetermined removal path to ensure that delamination occurs along said predetermined removal path, said exterior cuts including a plurality of aligned interrupted partial cuts disposed along at least a portion of said associated fold line of said access panel to ensure that the integrity of the exterior surface at said associated fold line of said access panel is retained and to ensure that said access panel is folded about said associated fold line, said exterior cuts further including a continuous exterior cut disposed on said access panel in spaced relation with respect to said aligned interrupted cuts,

wherein said access panel includes a free edge, a portion of one of said continuous interior cut lines is not generally parallel to the other of said continuous interior cut lines, and said removable strip portion includes a line segment extending from one of said continuous interior cut lines to said free edge and comprising aligned interrupted through cuts, and said grippable portion is defined by a portion of said free edge of said access panel, an extent of one of said associated fold lines of said one of said first and second end flaps, said extent of one of said continuous interior cut lines that is not generally parallel to the other of said continuous interior cut lines, and said line segment.

5,769,311  
HEAT INSULATING CUP AND METHOD OF  
MANUFACTURING THE SAME

Noriko Morita, Kawasaki; Makoto Igarashi, Yokohama; Tadayo Hirano, Kanagawa-ken; Sakae Furuki, Sagami-hara; Jun Sada, Urawa; Yoshiaki Take, Tama; Yoshihiro Akima, Hachioji; Hiroya Shiki, Sagami-hara; Teruaki Iyori, Isehara; Nobumasa Yamazaki, Tokyo, and Kunihiro Aso, Koshigaya, all of Japan, assignors to Toppan Printing Co., Ltd., Tokyo, Japan

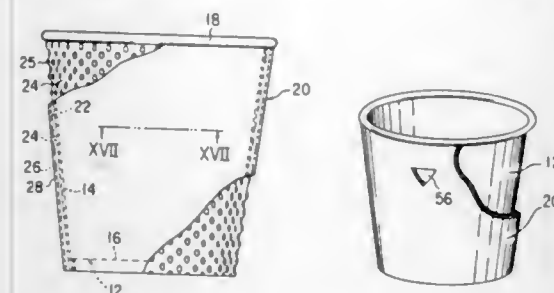
Continuation-in-part of Ser. No. 451,322, May 26, 1995, abandoned. This application Sep. 8, 1995, Ser. No. 525,066

Claims priority, application Japan, Aug. 2, 1994, 6-181149; Feb. 20, 1995, 7-030827

Int. Cl.<sup>6</sup> B65D 3/22

U.S. Cl. 229—403

20 Claims



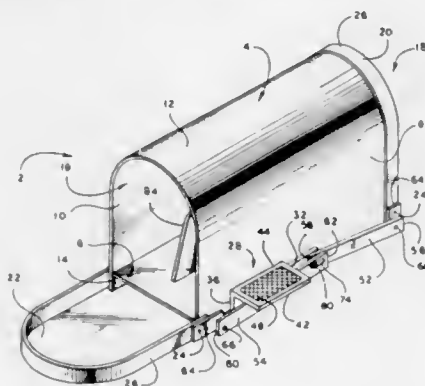
1. A heat-insulating cup, comprising:  
a cup body having a paper side wall and a paper bottom wall;  
and  
a paper protective cover attached to cover the side wall of said cup body,  
wherein said protective cover is prepared by winding a blank of a multi-layer structure including an embossed paper sheet and a paper liner board adhered to said embossed paper sheet, said blank being wound such that said liner board is positioned outside and

wherein said embossed paper sheet has a basis weight falling within a range of between 50 g/m<sup>2</sup> and 180 g/m<sup>2</sup>, and said liner board has a basis weight falling within a range of between 180 g/m<sup>2</sup> and 270 g/m<sup>2</sup>.

5,769,312  
MAILBOX HAVING DUAL ACCESS CLOSURES AND  
INTERLOCKED SIGNALLING MEANS  
Thomas F. Lampe, 3371 Paxton Ct., Marietta, Ga. 30066  
Filed Dec. 10, 1996, Ser. No. 762,841  
Int. Cl.<sup>6</sup> B65D 91/00

U.S. Cl. 232—35

13 Claims



1. A dual access mailbox, comprising:  
an elongated mailbox housing having a front access opening and a rear access opening;  
a front closure on the housing movable toward and away from the front access opening between a closed position and an open position;  
a rear closure on the housing movable toward and away from the rear access opening between a closed position and an open position;  
a signal member pivotally mounted to the housing, the signal member being movable between a non-signalling position and a signalling position, the signal member having a post extending outwardly therefrom;  
an elongated first arm having a first end, a second end and a first slot proximate the second end to receive and slidably engage the post, the first end of the first arm being pivotally mounted to the front closure, the first slot having a first engaging surface;  
an elongated second arm having a first end, a second end and a second slot proximate the second end to receive and slidably engage the post, the first end of the second arm being pivotally mounted to the rear closure, the second slot having a second engaging surface, whereby as the front closure is moved to the open position the first engaging surface engages the post and pivots the signal member to the signalling position and as the second closure is moved to the open position the second engaging surface engages the post and pivots the signal member to the non-signalling position.

5,769,313  
METHOD FOR CONTROLLING A HEATING OF A  
HEATER BASED ON A ROOM TEMPERATURE IN A  
HEATING-TYPE HUMIDIFIER

Sang-Uk You, Kyeongki-Do, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Rep. of Korea

Filed Feb. 28, 1997, Ser. No. 808,359

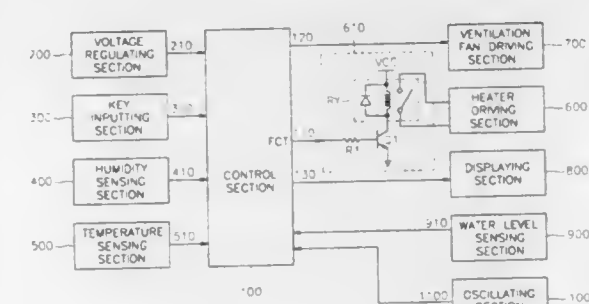
Claims priority, application Rep. of Korea, Feb. 28, 1996, 96-5150

Int. Cl.<sup>6</sup> B60H 1/20; F24D 11/00

U.S. Cl. 236—44 C

17 Claims

1. A method for controlling a heating of a heater based on a room temperature in a heating-type humidifier, said method comprising the steps of:



- inputting parameters related to the performing of a humidifying operation;
- comparing a present humidity inputted in step (i) with an objective humidity inputted in step (i);
- when it is determined in step (ii) that the present humidity is greater than or equal to the objective humidity, determining whether or not water exists in a water tank of the humidifier and generating an alarm when it is determined that water does not exist in the water tank;
- stopping an operation of humidifying when it is determined in step (iii) that the water exists in the water tank; and
- executing the humidifying operation while increasing a heating amount of the heater in proportion to the present room temperature inputted in step (i) when it is determined in step (ii) that the present humidity is less than the objective humidity.

5,769,314  
VARIABLE AIR VOLUME HVAC SYSTEM  
CONTROLLER AND METHOD

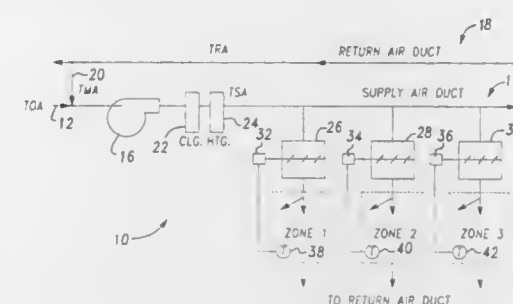
Kirk H. Drees, Cedarburg, and M. Nebil Ben-Alssa, Franklin, both of Wis., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Mar. 20, 1996, Ser. No. 618,745

Int. Cl.<sup>6</sup> F24F 7/00; F25B 7/00

U.S. Cl. 236—49.3

19 Claims



- A multiple input single output controller for controlling a characteristic of supply air to an environmental control unit comprising:  
a first control element receiving a return air characteristic and a desired return air characteristic, and for determining a supply air set point;  
a second control element coupled to receive the supply air set point and for determining a supply air set point error;  
a third control element coupled to receive the supply air set point error and for providing a continuous output control signal;  
a fourth control element for receiving the continuous output control signal and for providing a staged output signal to said environmental control unit.

5,769,315  
PRESSURE DEPENDENT VARIABLE AIR VOLUME  
CONTROL STRATEGY

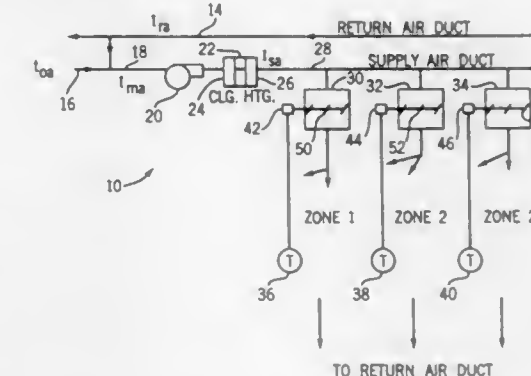
Kirk H. Drees, Cedarburg, Wis., assignor to Johnson Service Co., Milwaukee, Wis.

Filed Jul. 8, 1997, Ser. No. 889,201

Int. Cl.<sup>6</sup> G05D 15/00; F24F 7/00

U.S. Cl. 236—49.3

15 Claims



- A method of minimizing air flow disturbances in a multi-zone air conditioning system, comprising the steps of:  
setting an air flow rate for conditioned air supplied to a climate controlled zone to maintain a zone temperature at a zone setpoint;  
measuring deviation from the zone setpoint at first and second sampling instants within a sampling period;  
estimating a zone heat transfer rate at the second sampling instant based on the setpoint deviation; and  
adjusting the air flow rate in response to the step of estimating a zone heat transfer rate to minimize zone air flow disturbances.

5,769,316  
AIR CONDITIONER FOR VEHICLES

Susumu Ikeda; Toshimi Isobe; Atsuo Inoue, all of Isesaki; Toshihiko Fujita, Sawa-gun; Akihiro Tajiri, Wako; Mitsuru Ishikawa, Wako; Choji Sakuma, Wako, and Nobuyuki Yuri, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, and Sanden Corporation, Gunma, both of Japan

Continuation of Ser. No. 478,240, Jun. 7, 1995, abandoned.

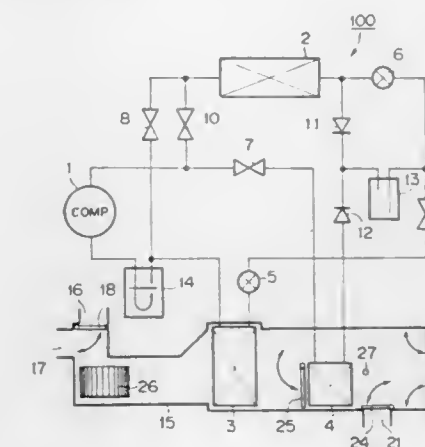
This application May 13, 1997, Ser. No. 855,154

Claims priority, application Japan, Jul. 6, 1994, 6-155025

Int. Cl.<sup>6</sup> F25B 30/02

U.S. Cl. 237—2 B

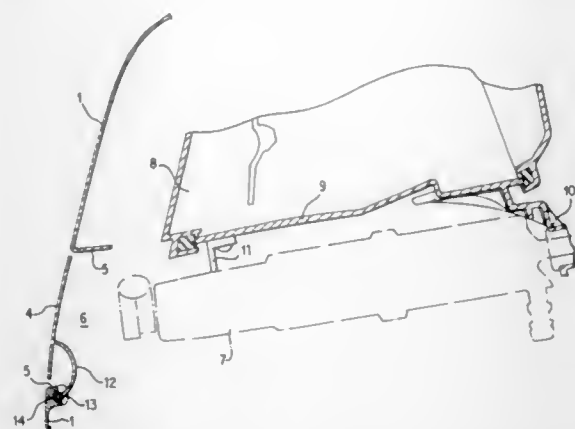
12 Claims



- An air conditioner for a vehicle having a heat pump type refrigerant circuit capable of operating at least in a heating mode and a dry heating mode comprising:







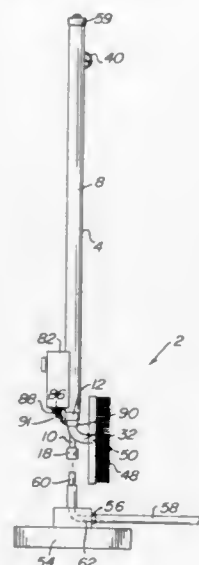
operative position and which is fastened to a headlamp casing, wherein the opening in the outer wall is closed by a cover when the nozzle arrangement is in the non-operative position, and wherein the cover is pivotally mounted proximate a rim of the opening in the outer wall and is held in a closed position by a spring arrangement when the nozzle arrangement is in the non-operative position.

5,769,324  
PORTABLE WASHING DEVICE

David A. Lenhart, P.O. Box 368, Picture Rocks, Pa. 17762  
Filed Nov. 4, 1996, Ser. No. 740,853  
Int. Cl.<sup>6</sup> B05B 9/47

U.S. Cl. 239—320

23 Claims



1. A washing apparatus for holding a supply of a washing liquid dispensed from a pressurized source of the washing liquid at a first pressure, said washing apparatus comprising:  
a portable reservoir for holding the supply of washing liquid, said reservoir having a handle for manual gripping;  
an inlet valve communicating with said reservoir and connected thereto for channeling the washing liquid into said reservoir, said inlet valve having a movable inlet valve element movable between a normally closed and an open position;  
an independent charging stand for filling said reservoir with the supply of the washing liquid from the pressurized source, said stand having a coupling for connection to the pressurized source, said stand further comprising a filling valve interconnectable with the inlet valve, said filling valve comprising a movable filling valve element, said valve elements being biased to the closed position and being movable from the closed to the open position when said valves are forcibly interengaged, thereby allowing the washing liquid to enter said reservoir;

pressurizing means connected to said reservoir for pressurizing the supply of washing liquid held within said reservoir to a second pressure, said pressurizing means being biased to a pressurized status by the pressurized source at said first pressure;  
a nozzle connected to said reservoir, said nozzle having a discharge valve for selectively discharging the washing liquid from said reservoir; and  
means operatively associated with said discharge valve for manually discharging of the washing liquid through said nozzle.

5,769,325  
SPRAY NOZZLE AND A SPRAYER INCLUDING SUCH A NOZZLE

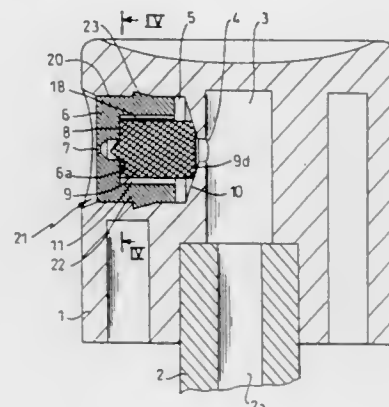
Claude Jouillat, Montigny-sur-Avre, and Olivier de Pous, Paris, both of France, assignors to Valois S.A., Le Neubourg, France

PCT No. PCT/FR94/00613, § 371 Date Apr. 10, 1996, § 102(e) Date Apr. 10, 1996, PCT Pub. No. WO94/27732, PCT Pub. Date Dec. 8, 1994

PCT Filed May 25, 1994, Ser. No. 553,711  
Claims priority, application France, May 28, 1993, 93 06404  
Int. Cl.<sup>6</sup> A62C 11/00

U.S. Cl. 239—337

11 Claims



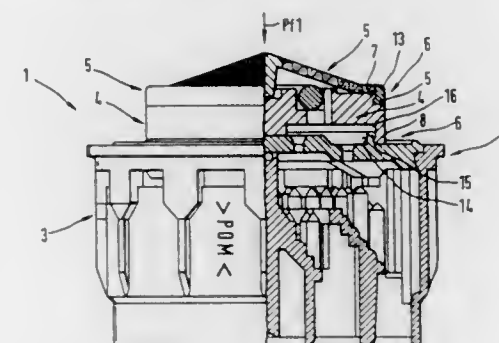
1. A nozzle for spraying a fluid, the nozzle comprising an outlet duct (3, 4) for receiving said fluid and opening out into a distribution chamber (5) in the center of an annular surface (10), said distribution chamber being closed by an end wall (6) pierced by an outlet orifice (7) and which includes an inside face (6a) provided with grooves (8) in communication with the outlet orifice, said distribution chamber being partially filled by a core (9) which extends axially between a front face (9a) close to the end wall and a rear face (9b) remote from the end wall, the core leaving empty at least one lateral passage (11) putting the grooves into communication with the outlet duct, the spray nozzle also comprising a valve adapted to close the outlet duct except during periods when said fluid is being sprayed, and to open under the effect of fluid arriving in the outlet duct, the core co-operating with the annular surface to constitute said valve, and said rear face (9b) of the core bearing with sealed contact against said annular surface (10), wherein the core is a substantially circular cylindrical elastomer member which is resiliently and axially compressed between the end wall of the distribution chamber and said annular surface.

5,769,326  
DETACHABLE ACCESSORY FITTING FOR  
INSTALLATION IN A DISCHARGE ORIFICE  
Claus Muchenberger, and Hermann Grether, both of Mullheim, Germany, assignors to Dieter Wildfang GMBH, Mullheim, Germany

Filed Mar. 25, 1996, Ser. No. 621,355  
Claims priority, application Germany, Mar. 24, 1995, 195 10 734.9

Int. Cl.<sup>6</sup> E03C 1/084  
U.S. Cl. 239—428.5

5 Claims



1. A flow-modifying assembly for installation in a discharge orifice of a sanitary fitting comprising in stacked relation elements each having an upstream and a downstream side, the elements comprising in order approaching the upstream direction an aerator element having an annular resilient male connector on its upstream side, a flow-through volume controller element having an annular resilient male connector on its upstream side and an annular female resilient connector on its downstream side and a filter element having a resilient annular female connector on its downstream side, the male connectors having the same diameter and configuration and the female connectors having the same diameter and configuration and the male and female connectors of adjacent elements being interengaged, whereby the interengaged connectors can be disengaged and the male connector on the aerator element and the female connector on the filter element can be interengaged to each other in the absence of the volume controller element.

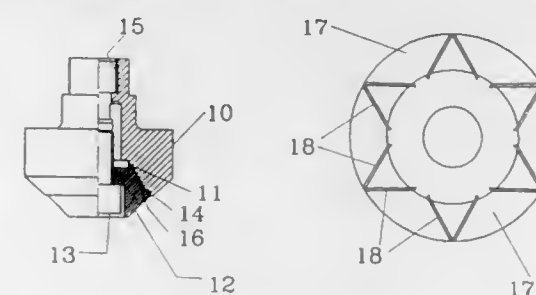
5,769,327  
NOZZLE FOR SPREADING WATER FOG  
Bo Kure, Göteborg, and Anders Kjellberg, Onsala, both of Sweden, assignors to Kure Fastighets & Forvaltnings AB, Gothenburg, Sweden

PCT No. PCT/SE95/00007, § 371 Date Sep. 6, 1996, § 102(e) Date Sep. 6, 1996, PCT Pub. No. WO95/18651, PCT Pub. Date Jul. 13, 1995

PCT Filed Jan. 5, 1995, Ser. No. 666,554  
Claims priority, application Sweden, Jan. 5, 1994, 9400028  
Int. Cl.<sup>6</sup> B05B 1/26

U.S. Cl. 239—543

16 Claims



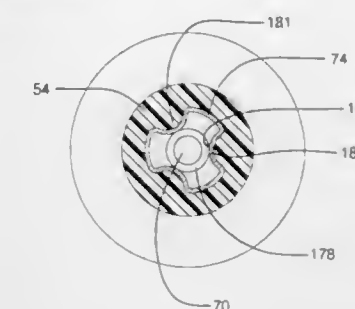
1. A nozzle for generating and distributing a water fog comprising

(a) a head member having a first support surface  
(b) an attachment member, said attachment member comprising means for attaching the attachment member to a water conduit and a hollow body member, said hollow body member being open at a first end to receive water from a water conduit to which the attachment member is attached, and having a second support surface at a second end for receiving the head member, whereby the head member and the attachment member cooperate to control discharge of water from the nozzle, wherein the nozzle has at least two convergent discharge orifices formed between and defined by the contacting first and second support surfaces and wherein water discharged through the orifices collides at a point outside the nozzle determined by the orientation of the orifices.

5,769,328  
FUEL INTERCONNECT FOR FUEL INJECTOR  
Gary Michael Zdyb; Otto Muller-Girard, Jr., both of Rochester, N.Y., and Harrie William Bonnah, II, East Grand Rapids, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 26, 1995, Ser. No. 578,849  
Int. Cl.<sup>6</sup> B05B 1/30  
U.S. Cl. 239—585.4

4 Claims



1. A fuel injector for discharging fuel to an internal combustion engine comprising an injector body having a solenoid actuator including a pole piece with a fuel inlet, an axially extending, thin walled fuel tube having a first end defining an injector fuel inlet, a second end slidably received about said pole piece fuel inlet, and a fuel filter disposed in said fuel tube, said fuel tube encased in a composite jacket and including radially inwardly extending dimples intermediate of said first and second ends, said dimples defining depressions in the outer surface of said fuel tube and operable to deter rotation of said fuel tube within said composite jacket and said dimples defining radial inward projections in said fuel tube operable to limit translation of said fuel filter in said tube.

5,769,329  
ROTARY ATOMIZER  
Gunnar van der Steur, 3415 McCommons Rd., Churchville, Md. 21078

Filed Dec. 5, 1995, Ser. No. 567,704  
Int. Cl.<sup>6</sup> B05B 5/00

U.S. Cl. 239—690.1

36 Claims

1. A rotary atomizer for producing a mist from a liquid for application of the mist onto an article, the atomizer comprising:  
a rotatable bell-shaped member having a first surface on which the liquid is adapted to flow, the first surface having a free end, the bell-shaped member having at least one passageway therein for introducing the liquid to the first surface, a plurality of rows of pits arranged in a matrix pattern adjacent an

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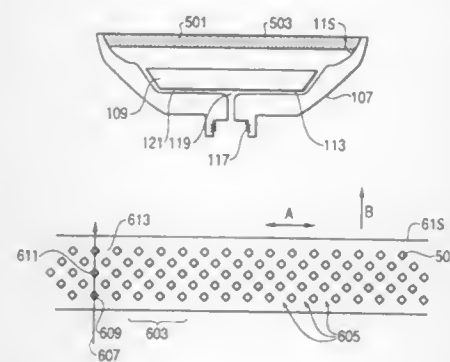
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outer edge of the first surface so that the liquid flows across the pits before the liquid is transformed into the mist.

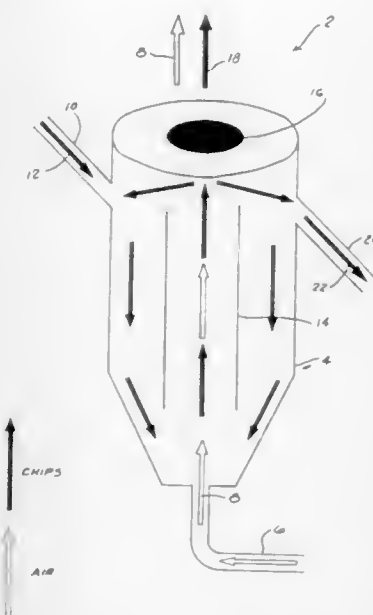
5,769,330

**SPOUTED BED WOOD CHIP DEBARKER/CLEANER**  
Donald Frank Rogowski, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed Apr. 16, 1996, Ser. No. 633,199  
Int. Cl.<sup>6</sup> B02C 19/06; 19/12

U.S. Cl. 241—5

6 Claims



5. A method of debarking/cleaning wood chips wherein said method is comprised of the steps of:

collecting wood chips to be debarked/cleaned into a first end of a bed means;

transporting air to said first end of said bed means;

impinging said air on said wood chips to be debarked/cleaned;

transporting said air and said chips to be debarked/cleaned

through a tube means located substantially within said bed

means to accelerate said air and chips to be debarked/cleaned;

impinging said air and chips to be debarked/cleaned upon a

screen means operatively connected to a second end of said

bed such that bark and other debris attached to said chips is

expelled through said screen and debarked/cleaned chips are

retained within said bed;

feeding said debarked/cleaned chips from said bed, wherein said

step of feeding said debarked/cleaned chips from said bed is

accomplished substantially adjacent to said second end of said

bed; and

feeding wood chips to be debarked/cleaned into said bed means

at location adjacent to said second end of said bed means.

**5,769,331**  
**METHOD AND APPARATUS FOR RECYCLING EMPTY ALUMINUM CANS**

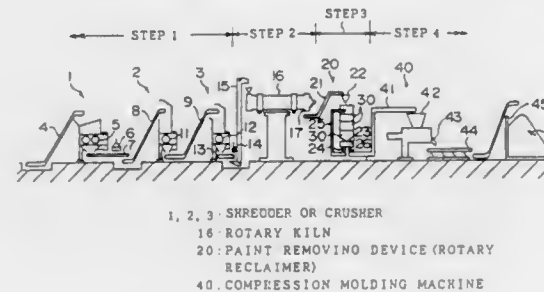
Yoshinao Yamagishi; Kazuyoshi Arikata; Takao Kurozumi, and Toshio Kondo, all of Kanagawa, Japan, assignors to Nippon Chuzo Kabushiki Kaisha, Kawasaki, Japan

PCT No. PCT/JP95/01338, § 371 Date Dec. 11, 1996, § 102(e) Date Dec. 11, 1996, PCT Pub. No. WO96/01332, PCT Pub. Date Jan. 18, 1996

PCT Filed Jul. 5, 1995, Ser. No. 750,575  
Claims priority, application Japan, Jul. 5, 1994, 6-153213  
Int. Cl.<sup>6</sup> B02C 19/12

U.S. Cl. 241—5

8 Claims



1. An aluminum can recycling method comprising:

a first step comprising cutting empty aluminum cans into small pieces of 10 mm squares or less and removing foreign matter mixed in an aggregate of the small pieces;

a second step comprising heating said aggregate of small aluminum pieces processed during said first step at a heating temperature lower than the melting point in order to burn inflammable foreign matter; and

a third step for peeling paints and oxides from surfaces of the small aluminum pieces in an agitating vessel that includes both a rotating drum, comprising a container surrounded by a wall, and a stationary annular rack disposed above and around said rotating drum, said third step comprising feeding the small aluminum pieces into the agitating vessel and rotating the drum at sufficiently high speed so as to cause friction between a first portion of the small aluminum pieces that are fed into the agitating vessel and are accumulated by centrifugal force on a surface of the rotating drum or a surface of the annular rack and a second portion of the small aluminum pieces that are fed into the agitating vessel and are not accumulated on the surface of the rotating drum or the surface of the annular rack, said friction causing peeling of said paints and oxides from the surfaces of the small aluminum pieces.

5,769,332

**EFFICIENT PRODUCTION OF LANDPLASTER BY COLLECTING AND CLASSIFYING GYPSUM FINES**  
Dennis B. Voorberg, Mt. Hope, Canada, assignor to CGC Inc., Ontario, Canada

Filed Apr. 10, 1996, Ser. No. 630,140

Int. Cl.<sup>6</sup> B02C 19/12; 23/08

U.S. Cl. 241—19

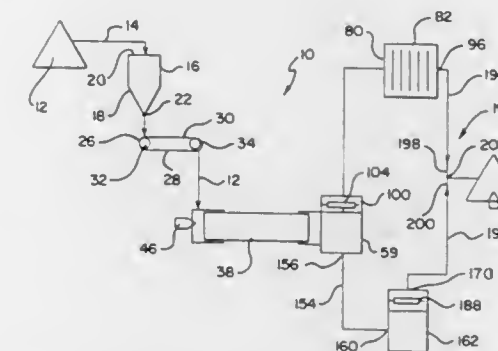
8 Claims

8. A landplaster production method, comprising the steps of: providing a supply of particulate gypsum material; drying said material by passing a stream of heated air thereby at a velocity;

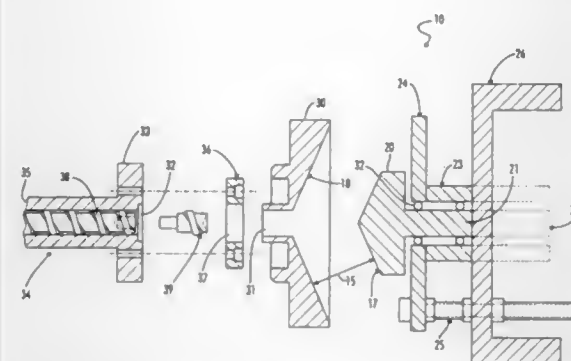
agitating said material simultaneously as it is dried so that a portion of said particulate material becomes suspended in said air stream;

classifying and separating said dried and suspended particulate material into fines and coarse particles;

feeding said fines in said air stream to a collector in a manner which does not diminish said velocity, and so that said fines are removed from a flow of said coarse particles after said classifying and separating step;







c. providing an edge of the gap at an outer margin of the rotor contact surface for removal of the pulverized particles.

5,769,336

# ENVIRONMENTALLY-SAFE APPARATUS FOR DISPOSING OF LIGHT BULBS

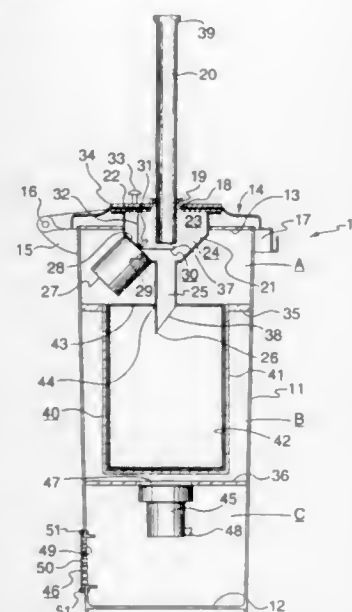
Dana Emmerson, Dartmouth, Canada, assignor to Environmental Disposal Concepts Incorporated, Nova Scotia, Canada

Continuation-in-part of Ser. No. 563,531, Nov. 6, 1995, Pat. No. 5,660,338. This application Dec. 10, 1996, Ser. No. 763,075

Claims priority, application Canada, Jun. 3, 1996, 2178045 Int. Cl.<sup>6</sup> B02C 19/14

U.S. Cl. 241—36

15 Claims



1. A portable unitary device for disposing of light bulbs, comprising:

- (a) an open-topped, multi-compartmented container of circular cylindrical cross-section, said container including (i) an upper operating compartment, (ii) an intermediate collection compartment, and (iii) a lower exhaust compartment having an axial inlet and a radial outlet port;
- (b) a lid hingedly-connected to, and adapted to cover, the top of said container, said lid having an upper surface, and a lower surface adapted to be directed toward said upper operating compartment, said lower surface being connected to (iv) an enclosed reduction chamber, said reduction chamber having (v) an axial inlet means for a bulb to be pulverized and (vi) an axial outlet means leading directly to said collection compartment, (vii) an electric motor provided with an on/off switch said electric motor being disposed within said upper operating

compartment, being secured to said reduction chamber and having a drive shaft extending into said reduction chamber, and (viii) a rigid unitary pulverizing blade secured to said drive shaft;

- (c) a light bulb feed chute extending through said lid and attached thereto, said chute having an inlet opening which is disposed above the upper surface of said lid and an outlet opening which leads to said axial inlet means (v) of said reduction chamber (iv);
- (d) a disposable pulverized light bulb collection bag selectively disposed within said collection compartment in air-sealed relationship to said axial outlet means of said reduction chamber; and
- (e) a vacuum motor operatively-disposed within said lower exhaust chamber and having an axial inlet connected at sub-atmospheric pressure to an axial outlet from said intermediate collection compartment to draw gases and particulates from said collection compartment into said lower exhaust compartment, said vacuum motor expelling gases into said exhaust compartment at an overpressure, for discharge to the environment.

5,769,337

# WASTE CONTAINER MADE OF SYNTHETIC MATERIAL WITH MEANS OF REDUCING THE VOLUME OF SAID WASTE

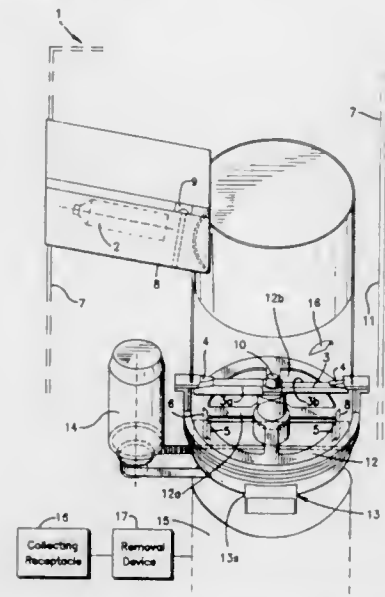
Belindia Gobbin, Dino, Switzerland, assignor to Abilfida (Chilasso) S.A., Chiasso, Switzerland

Filed Jan. 14, 1997, Ser. No. 783,234

Int. Cl.<sup>6</sup> B02C 15/12

U.S. Cl. 241—36

5 Claims



- each of said cutting elements being arranged to be externally tangent to a trajectory that is described by points of said cutting elements that are located radially further outward during rotation of the horizontal wheel, said wheel including a number of spokes arranged between an equal number of passing spaces which allow fragments of waste that are reduced to a predetermined volume to fall through;
- a discharge opening facing outward and mounted on the stationary structure for allowing discharge of already-shredded waste under the combined action of the force of gravity and the overpressure that is created by the propeller blade;
- at least one electric motor mechanically connected both to said wheel and to said blade for causing them to rotate when the motor is activated;
- a first detecting device for detecting the presence of waste in the inlet tube and for activating the electric motor;
- a collecting device for collecting and holding said waste after it has been shredded; and
- a second detecting device for detecting the electric power drawn by the blade and the wheel as they rotate, and for shutting off the power to the electric motor when power is reduced to a predetermined value.

5,769,338

# PULVERULENT BODY PROCESSING APPARATUS AND METHOD OF MANUFACTURING A SLIT MEMBER TO BE USED FOR THE SAME

Saburoh Yashima, 2-8, Nienchaya, Wakabayashi-ku, Sendai-shi, Miyagi-ken; Manabu Abe, Miyagi-ken; Katsumi Ueta, Tokyo, and Kantaro Kaneko, Sakai, all of Japan, assignors to S Fimatec Ltd., a part interest; Saburoh Yashima, a part interest, and Kurimoto, Ltd., all of Japan, a part interest

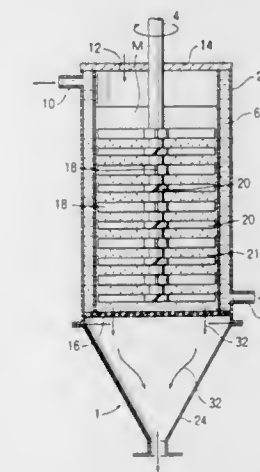
Filed Nov. 13, 1995, Ser. No. 555,838

Claims priority, application Japan, Nov. 14, 1994, 6-304315; Nov. 14, 1994, 6-304316

Int. Cl.<sup>6</sup> B02C 17/16

U.S. Cl. 241—69

13 Claims



1. A pulverulent body processing apparatus comprising:

- a vertically arranged cylindrical housing;
- a slit member having at least one slit sized to prevent unit members of a pulverizing medium from passing therethrough and arranged at the bottom of the cylindrical housing;
- a rotary shaft arranged along the axis of the cylindrical housing; and
- at least one bladed stirring member secured to the rotary shaft, wherein:

the front end of said at least one bladed stirring member and the inner wall of the cylindrical housing have a relationship of

$$2 \leq wh/Db < 16,$$

where wh is the distance between the front end of the bladed stirring member and the inner wall of the cylindrical

housing and Db is the maximum diameter of each unit member of the pulverizing medium.

5,769,339

# CONICAL GYRATORY MILL FOR FINE OR REGRINDING

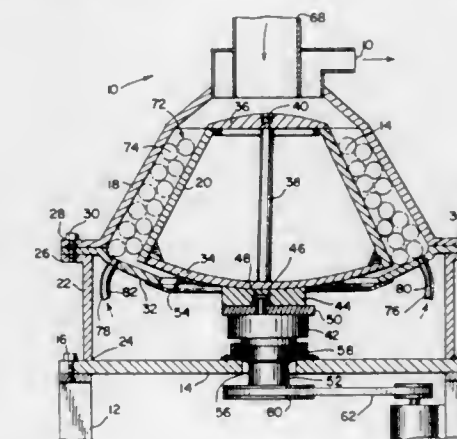
Vijla Kumar Karra, Franklin, Wis., assignor to Nordberg, Inc., Wis.

Filed Nov. 22, 1996, Ser. No. 754,925

Int. Cl.<sup>6</sup> B02C 2/00; 17/14

U.S. Cl. 241—175

20 Claims



1. A mill, comprising:

- a main support member;
- a conical bowl supported on the main support member, the conical bowl having an inner milling surface;
- a conical head positioned within the conical bowl, the conical head having an outer milling surface, the outer milling surface of the conical head being spaced from the inner milling surface of the conical bowl to form a milling space therebetween;
- a gyration assembly supporting the conical head on the main support member for gyration with respect to the conical bowl; wherein the conical bowl has a top, with a first opening in the top for introducing material to be milled into the milling space, the conical bowl and the conical head each having a bottom, the bottoms spaced from each other to permit gyration of the conical head with respect to the conical bowl;
- a flexible seal secured to each of the bottoms to prevent the discharge of material from the milling space between the bottoms, the bottom of the conical bowl having at least one opening therein through which a fluid may be directed into the milling space; and
- a milling media provided in the milling space, such that the gyration of the conical head in the conical bowl causes the milling media to mill the material to be milled, wherein the fluid directed into the milling space is discharged from the milling space via a second opening at the top of the conical bowl, carrying with it the material which has been milled to a desired degree of fineness.

5,769,340

# POSITIONING DEVICE FOR CONCAVE OF CONE CRUSHER

Cheng-Shu Jean, No. 14, Chung Shing N. St., Sanchung Shih, Taipei Hsien, Taiwan

Filed Jun. 17, 1997, Ser. No. 877,177

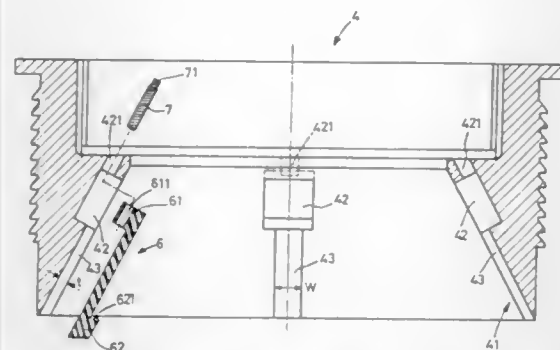
Int. Cl.<sup>6</sup> B02C 2/04

U.S. Cl. 241—207

4 Claims

1. An improved positioning device for concave of cone crusher, comprising:

- a top cell having a cylindrical bell shape which has a larger top portion and a small lower portion and an inclined inner wall being defined between the top portion and the lower portion;



a concave having a cylindrical bell shape which has a larger top portion and a small lower portion, the inner wall of said concave being a working surface for crushing the rocks and the outer wall being shaped to meet complementarily to said inclined surface of said top cell; and

a positioning device which is used to attach fixedly said concave to said inclined inner wall of said top cell;

characterized in that said inclined inner wall of said top cell is provided with a plurality of slots which are symmetrically to each other, a shallow groove being formed below said slot and a through hole which passes through said top cell being disposed above said slot;

said concave being provided with an inclined rib which is corresponding to said slot of said top cell at the lower peripheral, the inclined angle of said bottom inclining surface of the rib being identical to each other;

said positioning device being formed with a projected tab which faces to said slot of said top cell, said tab being provided with a threaded opening in which a locking bolt can be locked thereof through said through hole, the bottom surface of said positioning device which faces said inner surface of said concave being formed with an extension which has a tapered surface corresponding to the bottom inclining surface of said rib;

wherein when said positioning device is readily inserted into said slot and said groove, it can be adjusted by a locking bolt for adjusting the height of said positioning device such that said tapered surface of said extension provides a substantial support to said rib of said concave.

5,769,341

## STABILIZED CRUSHING DEVICE

Sumio Morikawa, Toshiji Ohga, and Nobuyuki Zakohji, all of Osaka, Japan, assignors to Ohyodo Diesel Co., Ltd., Osaka, Japan

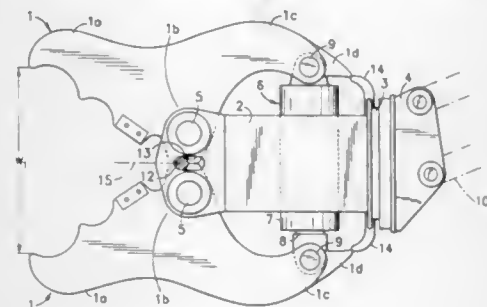
Filed Jan. 22, 1997, Ser. No. 785,949

Claims priority, application Japan, Oct. 15, 1996, 8-272428

Int. Cl.<sup>6</sup> B02C 1/06

U.S. Cl. 241—266

20 Claims



9. A cutting/crushing device, comprising:  
a frame;  
two jaws, each having a forward end, a rear end, and a central portion;

each of said two jaws being pivotally mounted on said frame to pivot about a pivot point in said central portion;

said two jaws being positioned in a substantially symmetrical arrangement defining a plane of symmetry, said plane of symmetry lying between said two jaws;

an actuator having two actuator ends, each actuator end connected to a different one of said rear ends, whereby said rear ends are forcibly separated and brought together to open and close said forward ends;

each of said two jaws having at least one arcuate surface with a center of curvature at said pivot point of said each of said two jaws;

said arcuate surfaces being adjacent;

at least one guide recess on each of said two jaws in said arcuate surface of said each of said two jaws, whereby said crushing device has at least two guide recesses;

each of said at least two guide recesses being located opposite another of said at least two guide recesses in a substantially symmetric arrangement about said plane of symmetry;

at least one synchronization element guided for movement with respect to said frame along a line in said plane of symmetry;

said at least one synchronization element fitting into a respective opposite pair of said at least two said guide recesses such that as one of said two jaws is pivoted, the other of said two jaws pivots substantially symmetrically in synchrony therewith.

5,769,342

## ERGONOMIC ENDCAP, COLLETS, WINDERS, SYSTEMS AND METHODS OF WINDING FORMING PACKAGES USING THE SAME

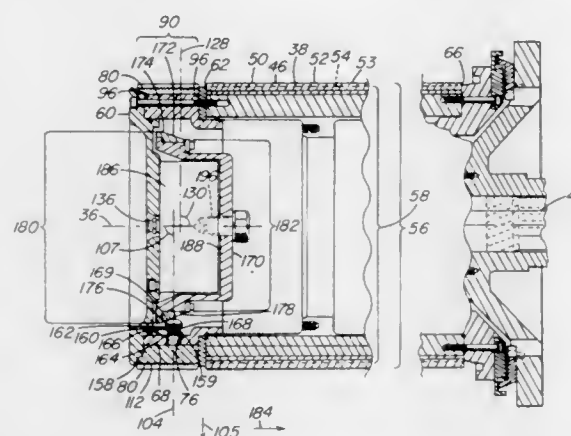
Harry Makitka, Clemmons, N.C., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 13, 1996, Ser. No. 764,375

Int. Cl.<sup>6</sup> B65H 54/00; 75/24

U.S. Cl. 242—18

16 Claims



1. An endcap adapted for mounting upon a mandrel of a collet of a forming package winder, the endcap comprising:

(a) a hub comprising (1) a mounting device for securing a portion of the hub to an end of a mandrel of a collet and (2) a plurality of retainers spaced about a periphery of the hub; and

(b) a plurality of strand engaging members, each of the strand engaging members having a strand engaging surface for retaining a strand, wherein each of the strand engaging members is radially displaceable from the periphery of the hub between (1) an extended position in which the strand engaging surface of each strand engaging member projects from the periphery of the hub and (2) a retracted position in which the strand engaging surface of each strand engaging member is adjacent the periphery of the hub, each strand engaging member being retained by a corresponding retainer of the plurality of retainers of the hub.

5,769,343

## APPARATUS FOR SUPPLYING THE BOBBIN THREAD OF THE SEWING MACHINE

Hiroyuki Tomioka, and Toshinobu Shinozuka, both of Chofu, Japan, assignors to Juki Corporation, Chofu, Japan

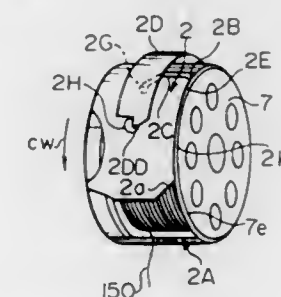
Filed May 24, 1996, Ser. No. 653,003

Claims priority, application Japan, May 25, 1995, 7-150902; May 25, 1995, 7-150903; May 25, 1995, 7-150904

Int. Cl.<sup>6</sup> B65H 54/00; 75/28; 63/00

U.S. Cl. 242—20

10 Claims



1. A lower-thread winder comprising:

a thread winding unit which winds lower thread supplied from a lower-thread supply source around a bobbin which has been loaded into a bobbin case;

a thread guide which includes a stringer for catching the lower thread wound around the bobbin, wherein the thread guide strings the bobbin case with the lower thread caught by the stringer by moving the bobbin case and the stringer relative to each other;

a rotary unit which rotates the bobbin so as to remove slacks of the lower thread between the bobbin and the lower-thread supply source;

a detector which checks a condition of the lower thread between the bobbin and the lower-thread supply source while the bobbin is being rotated by said rotary unit; and

an evaluation unit which evaluates a condition of stringing of the bobbin case based upon a detection result by said detector.

5,769,344

## SPINNING REEL FOR FISHING HAVING A LINE ROLLER FOR REDUCING LINE TWIST

Kyoichi Kaneko, Eiji Shinohara, Masatoshi Katayama, and Wataru Tsutsumi, all of Tokyo, Japan, assignors to Daiwa Seiko, Inc., Hagashikurume, Japan

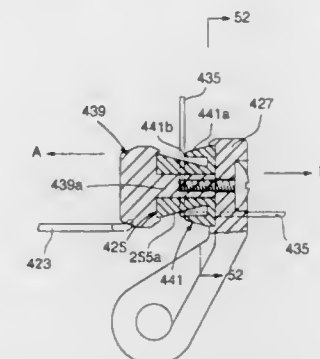
Continuation of Ser. No. 430,821, Apr. 28, 1995, abandoned.

This application Jun. 19, 1997, Ser. No. 878,137

Int. Cl.<sup>6</sup> A01K 89/01

U.S. Cl. 242—231

24 Claims



1. A spinning reel for fishing comprising:

a reel main body;

a spool supported on said reel main body;

a rotor rotatably supported on said reel main body for winding a fishline onto said spool, said rotor including an arm; and,

a first line roller mounted on said arm and rotatable about an axis, said first line roller contacting and guiding said fishline onto said spool during said winding, said first line roller being integrally formed as a unitary body including a first axial end proximate said arm, a second axial end opposite said first axial end, a fishline guide portion extending along said axis between said first and second axial ends, and a first fishline guide projection for contacting said fishline before said fishline guide portion during said winding,

wherein said fishline guide portion has a diameter which increases toward said second axial end to thereby define a taper angle between a longitudinal tangent to said fishline guide portion and said axis.

5,769,345

## SEAT BELT RETRACTOR

Bengt Morner, Hovas, Sweden, and David Bartram, Milton Keynes, England, assignors to Tensator Limited, Bucks, United Kingdom

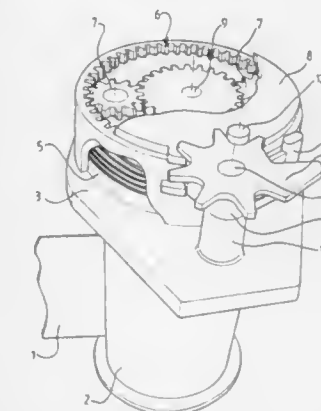
Filed Oct. 21, 1996, Ser. No. 731,871

Claims priority, application United Kingdom, Oct. 23, 1995, 9521672

Int. Cl.<sup>6</sup> B60R 22/44

U.S. Cl. 242—375.3

8 Claims



1. A seat belt retractor, comprising:

a spool having a shaft;

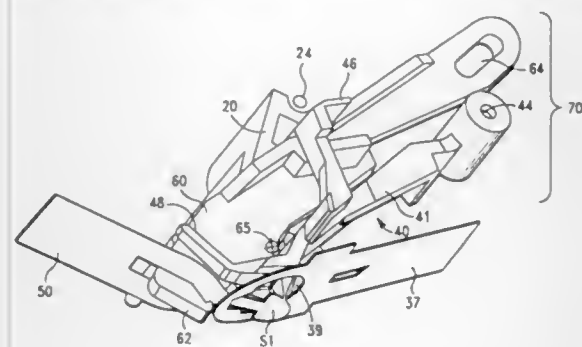
a single spring means adapted to impart a rotational force to the spool tending to wind the seat belt onto the spool during a cycle of operation in which the seat belt is extracted from the spool and later retracted onto the spool; and

force-adjusting means for causing the single spring means to apply to the spool a first force, which is a relatively high force, only during an initial stage of extraction of the seat belt from the spool and during a final stage of retraction of the seat belt onto the spool, and to apply a second lower force to the spool during the remaining part of the cycle of operation of the spool,

wherein the force-adjusting means comprises a planetary gear arrangement which includes a sun gear to co-rotate with the shaft of the spool, at least one planet gear associated with a planet gear carrier and a ring gear, the single spring means connected between the ring gear and the shaft of the spool, the planetary gear arrangement being such that the ring gear is free to rotate and the planet gear carrier is retained in position during the initial stage of extraction of the seat belt from the spool and during the final stage of retraction of seat belt onto the spool, and such that movement of the ring gear is prevented, whilst movement of the at least one planet gear is permitted, during the remaining part of the cycle of operation.



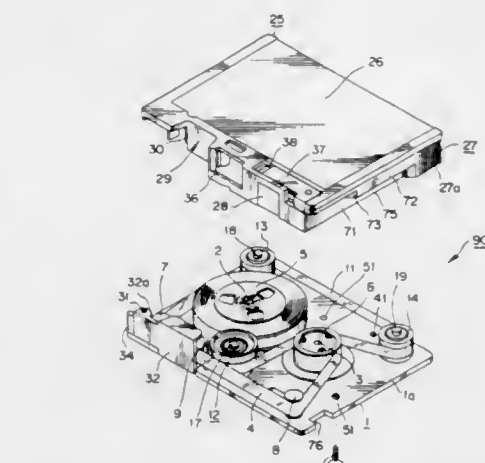
5,769,346  
TAPE BUCKLING MECHANISM FOR SINGLE REEL  
CARTRIDGE TAPE RECORDING  
Keith Daly, Shrewsbury, Mass., assignor to Quantum Corporation, Milpitas, Calif.  
Filed Jun. 19, 1996, Ser. No. 666,854  
Int. Cl.<sup>6</sup> G03B 1/58; G11B 15/66  
U.S. Cl. 242—332.4 6 Claims



1. In a tape drive, a mechanism for guiding a nose and neck of a take-up leader to couple with a hoop of a cartridge leader, the mechanism comprising:  
a pivotable first member;  
a second member coupled to the first member such that rotational movement of the first member creates rotational and translational movement of the second member;  
a hook member defined about the second member for releasably engaging the take-up leader;  
a third member pivotable about a pivot end to provide a biasing force about a biasing end;  
a protruding portion formed about the biasing end, the protruding portion being defined to support and guide the nose and neck of the take-up leader into a locking relationship with the hoop of the cartridge leader wherein the nose and neck penetrate into the hoop;  
the protruding portion being dimensioned to maintain constant biased contact against the nose and neck after the nose and neck have penetrated into the hoop; and  
wherein the protruding portion is adapted to remain in biased contact with the take-up leader after the hook member releases engagement with the take-up leader.

5,769,347  
TAPE CARTRIDGE  
Shuichi Kikuchi; Shintaro Higuchi, both of Miyagi; Toshiro Kobayashi, Kanagawa, and Kazuo Sasaki, Miyagi, all of Japan, assignors to Sony Corporation, Tokyo, Japan  
PCT No. PCT/JP95/02451, § 371 Date Sep. 18, 1996, § 102(e) Date Sep. 18, 1996, PCT Pub. No. WO96/17349, PCT Pub. Date Jun. 6, 1996  
PCT Filed Nov. 30, 1995, Ser. No. 682,552  
Claims priority, application Japan, Nov. 30, 1994, 6-321630  
Int. Cl.<sup>6</sup> G11B 23/087 7 Claims

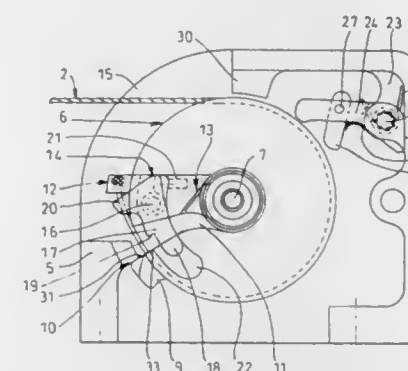
U.S. Cl. 242—347  
1. A tape cartridge for insertion into a tape drive unit comprising:  
a base plate of metal having a top surface side on which are vertically provided a pair of reel support shafts on which a pair of tape reels across which a tape body is laid are rotatably supported in parallel, and a drive roller support shaft on which a drive roller for allowing the tape body laid across the tape reels to undergo traveling operation from one tape reel toward the other tape reel is rotatably pivotally supported;  
a cover member of synthetic resin attached to said base plate in a manner to cover said top surface side of the base plate on which the pair of tape reels and the drive roller are disposed, said cover member having a front surface side;



a pair of first and second groove portions respectively provided at side of the cover member, and positioned so that, at the time of loading into a tape drive unit, supporting members provided on the tape drive unit side are inserted thereto;  
a projecting portion provided within the first groove portion so as to allow admission of a supporting member of the tape drive unit to be smaller with respect to the second groove portion, said projecting portion projecting downwardly from an upper end of said first groove portion at a first end surface portion thereof and having an inclined surface portion at a front end surface position thereof to reduce the impact force when said supporting member contacts said projecting portion;  
fixing connection means for joining the cover member to the base plate and located at least at one joining location provided near a central portion of the base plate; and  
withdrawal preventing means for preventing withdrawal of the cover member with respect to the base plate provided in the vicinity of the first groove portion, said withdrawal preventing means comprising a plurality of supporting pins projecting from a bottom surface of the cover member opposite to said base plate and each supporting pin being provided with an insertion portion having a diameter smaller than that of a penetration hole of the base plate, and slipping-off preventing means provided at a front end side of the supporting pin of the insertion portion when the insertion portion is inserted into the penetration hole, wherein the withdrawal preventing means is a swollen portion of an engagement member attached at a front end of the supporting pin inserted through the penetration hole.

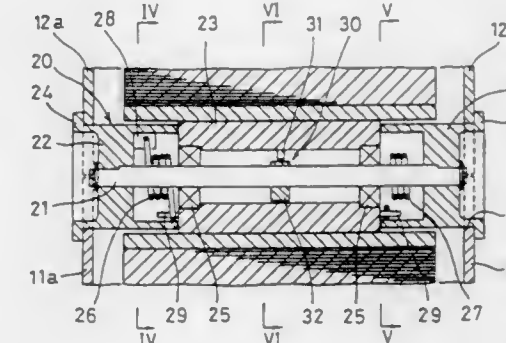
5,769,348  
Patent Not Issued For This Number

5,769,349  
DEVICE FOR AUTOMATICALLY RETRACTING A CONNECTION MEMBER WITH A RELEASABLE OR SEPARABLE ELEMENT  
Daniel Grosselin, Roissy en Brie, France, assignor to R. Alkan & Cie, France  
Continuation of Ser. No. 133,425, Oct. 8, 1993, abandoned.  
This application Apr. 30, 1996, Ser. No. 640,427  
Claims priority, application France, Oct. 13, 1992, 92 12241  
Int. Cl.<sup>6</sup> B65H 75/30; 75/48  
U.S. Cl. 242—385.1 9 Claims  
1. A device for automatically retracting a connection member with a releasable or separable element, which comprises:  
(a) a cable having one end fixed to said connection member,



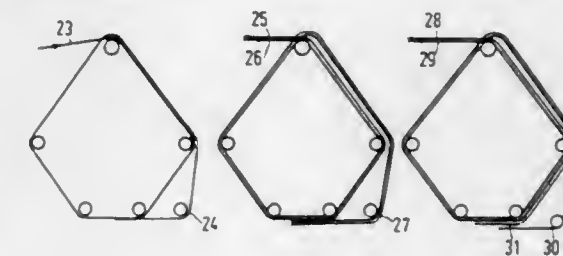
(b) a drum mounted to rotate about an axis and around which said cable is selectively wound and unwound, said drum being disposed within a casing,  
(c) a first spring mounted on said drum and rotatably urging said drum to a first end position in which a first projection on the drum engages a first stop on the casing,  
(d) a hollow part radially provided in said drum,  
(e) a lever pivoted about said drum axis and movable within said hollow part, said lever being fixed at a free end of said cable,  
(f) a second spring disposed around said drum axis and rotatably urging said lever to an end position engaging said drum, said first spring and said second spring exerting urging actions directed in a same direction, and the first spring being stronger than the second spring,  
(g) a stoppage device pivoted to said casing and urged by a holding member to pivot away from said drum against a return action of a third spring to allow, when a first traction force is applied to said cable for connecting said connection member, the drum to rotate to a second end position in which said first projection on the drum engages a second stop on the casing, the rotation of the drum from the first end position thereof to the second end position thereof being slightly less than one revolution, said drum being kept in the second end position thereof by said stoppage device engaging a second projection on said drum, and  
(h) said holding member being pivoted to said lever and engaging said stoppage device to cause said stoppage device to pivot away from said drum when said first traction force is applied to said cable, and when said drum is in the second end position thereof said holding member also urging said stoppage device to pivot away from said drum when a second traction force is applied to said cable by jettisoning a load to which said electric connection is connected, thus allowing said drum to return to said first end position thereof under the action of said first spring.

5,769,350  
PAPER MAGAZINE  
Teruhito Oka, Wakayama, Japan, assignor to Noritsu Koki Co., Ltd., Wakayama, Japan  
Filed Dec. 17, 1996, Ser. No. 761,078  
Claims priority, application Japan, Dec. 19, 1995, 7-330225  
Int. Cl.<sup>6</sup> B65H 16/02; 23/04  
U.S. Cl. 242—422.4 4 Claims  
1. A paper magazine comprising a magazine case having side plates for containing a roll of paper, and a roll support shaft provided on said magazine case for supporting the roll of paper, said magazine case having a paper outlet through which the paper from the roll of paper supported on said roll support shaft is pulled out, said roll support shaft comprising a core support rod, a pair of cylindrical end members nonrotatably supported on both ends of said core support rod by said side plates of said magazine case, a core rotatably supported on said core support rod between said end members for supporting the paper roll, a torsion coil spring mounted so as to be torqued and tightened when said core is rotated in one of two opposite directions, and a rotation angle



restricting means for stopping the rotation of said core when said core has rotated by a predetermined angle in either direction.

5,769,351  
METHOD OF WINDING A SADDLE-SHAPED DEFLECTION COIL  
Hendrik D. Van Den Berg; Jannes Michel, and Antonius W. M. Mols, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.  
Filed Dec. 7, 1994, Ser. No. 350,858  
Claims priority, application Belgium, Dec. 7, 1993, 09301346  
Int. Cl.<sup>6</sup> H01F 3/06  
U.S. Cl. 242—437.3 6 Claims



1. A method of manufacturing a saddle-shaped deflection coil which flares out from a rear end towards a front end and has an arcuate connection portion at the front end, an arcuate connection portion at the rear end and two interposed coil flanks longitudinally extending at both sides of a window, comprising the steps of:  
a. providing a jig having a recessed winding space formed between two jig sections, which space has a shape which corresponds to the desired shape of the coil, for taking up continuously fed winding wire; and  
b. continuously feeding a plurality of wires in a bundle to the recessed winding space for forming a plurality of coil turns in the winding space by means of a plurality of winding arms, thereby simultaneously feeding the wires to the winding space as a plurality of sub-bundles corresponding to respective said winding arms.

5,769,352  
WEB REWINDING MACHINE, ADAPTABLE TO DIFFERENT CORE DIAMETERS  
Guglielmo Biagiotti, Capannori, Italy, assignor to Fabio Perini S.p.A., Lucca, Italy  
PCT No. PCT/IT95/00098, § 371 Date Dec. 2, 1996, § 102(e) Date Dec. 2, 1996, PCT Pub. No. WO95/34498, PCT Pub. Date Dec. 21, 1995  
PCT Filed Jun. 7, 1995, Ser. No. 750,286  
Claims priority, application Italy, Jun. 16, 1994, FI94A0124  
Int. Cl.<sup>6</sup> B65H 18/20; 19/30  
U.S. Cl. 242—521 22 Claims  
1. A rewinding machine for the formation of logs of web material wound on a core comprising:

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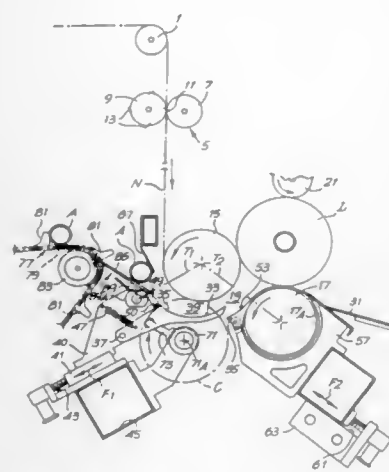
4

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a first winding roller around which the web material is run;  
a second winding roller forming, together with the first winding roller, a nip through which the core and the web material are made to pass;  
a feeder to feed the web material into the nip, said feeder having a speed of advance substantially equal to speed of feeding of the web material;  
an inserter to insert a core on which the web material is to be wound;  
before the nip, with respect to a direction of advance of the web material, a rolling surface forming, together with the feeder, a channel into which the core is inserted;  
an interrupter of the web material, which interacts with the feeder in an intermediate position along the channel, between a point of insertion of a new core and the nip, said interrupter also acting to sever the web material in an intermediate position along the channel;  
wherein the rolling surface forming the channel is at least partially formed by an oscillating cradle.

5,769,353

**METHOD OF INITIATING THE PREMATURE REPLACEMENT OF A ROLL OF MATERIAL**

Hans-Helmut Jühe, Kempen, and Matthias Rauhut, Hagen, both of Germany, assignors to Stora Feldmühle AG, Düsseldorf, Germany

PCT No. PCT/EP95/01282, § 371 Date Sep. 26, 1996, § 102(e) Date Sep. 26, 1996, PCT Pub. No. WO95/27676, PCT Pub. Date Oct. 19, 1995

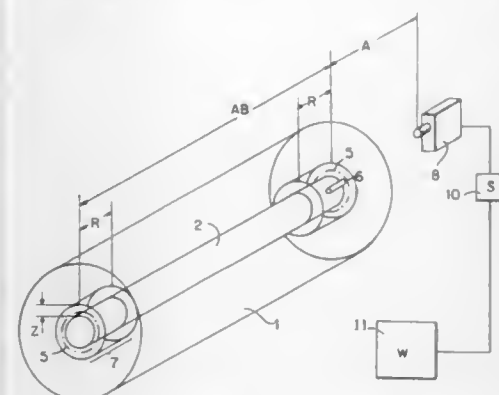
PCT Filed Apr. 7, 1995, Ser. No. 722,114

Claims priority, application Germany, Apr. 8, 1994, 44 12 075.3; Nov. 26, 1994, 44 42 154.0

Int. Cl.<sup>6</sup> B65H 26/00; 18/08; 43/00; 63/00

U.S. Cl. 242—563

5 Claims



1. A process for initiating a premature roll change of a web to be unwound from a roll wound on a spool, comprising the steps of:

measuring temperature of the web at an end of the roll in a zone up to 150 mm away from a surface of the spool in a radial direction during a time that the roll has between 100% and 60% of its fully wound weight, using a non-contact measuring device;  
determining a radial distance from the spool surface when a temperature difference greater than 0.5° C. is found between temperature measurement locations of the web in the zone and cooler adjacent areas; and  
storing the determined distance for triggering a signal that initiates a replacement of the roll when that distance is reached.

5,769,354

**PAPER ROLL CONTAINER ARRANGEMENT**

Ulf Lindh, Ugglevägen 7, Nacka, Sweden, 131 44, and Boris Nauman, Sturegatan 44 B, Stockholm, Sweden, 114 36

PCT No. PCT/EP95/00512, § 371 Date Dec. 5, 1996, § 102(e) Date Dec. 5, 1996, PCT Pub. No. WO95/33401, PCT Pub. Date Dec. 14, 1995

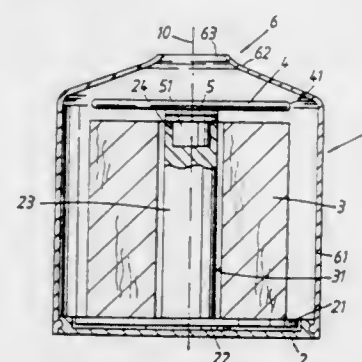
PCT Filed May 9, 1995, Ser. No. 750,252

Claims priority, application Sweden, Jun. 7, 1994, 9401962; Jan. 4, 1995, 9500024

Int. Cl.<sup>6</sup> A47K 10/22; 10/38

U.S. Cl. 242—593

20 Claims



1. A container arrangement which is constructed to enable a web to be drawn from an outer surface of a generally cylindrical roll, wherein the arrangement includes an openable container in which the roll can be rotatably fitted, wherein the container has a web outfeed opening which is generally coaxial with the axis of the roll, wherein the container includes a circular guide member which is positioned between the container outfeed opening and an adjacent end surface of the roll, wherein the circular peripheral edge of said guide member is generally coaxial with the axis of the outfeed opening, and wherein said guide member has a diameter large enough to keep the web out of general web-retarding contact with the edge of the roll, characterized in that the guide member is journaled for rotation in the container about an axis which is generally coaxial with the roll axis.

5,769,355

**ROCKER BEARING DEVICE DESIGNATED TO CARRY ONE END OF A WINDING BAR**

Christian Guttin, Les Abrets, France, assignor to Guttin Christian Sarl, France

Filed Jan. 31, 1997, Ser. No. 792,448

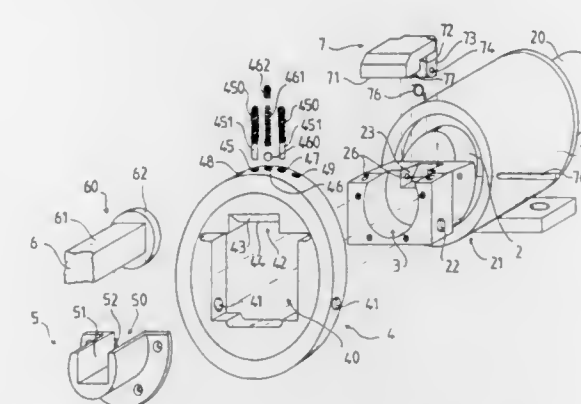
Claims priority, application France, Jan. 31, 1996, 96 01329

Int. Cl.<sup>6</sup> B65H 16/06

U.S. Cl. 242—598.4

3 Claims

1. A rocker bearing device designed to carry a coupling end of a winding rod, for the rolling and unrolling of a sheet of material comprising: a rotatable drive spindle, a flywheel pivotally disposed on a front end of the drive spindle, the coupling end of the winding rod laid in a housing of a wear piece, the coupling end of the



winding rod provided with a coupling lug having a non-round section and at its end with a disk coaxial with the winding rod; the housing of the wear piece includes a drive part with a form complementary to that of the coupling lug and a semi-circular part for partially housing the disk; and a covering piece is fitted to the front end of the drive spindle while being mobile in rotation around a transversal shaft, and pulled back towards the rear by a spring which, at the time of the rocking towards the front of the flywheel, drags the covering piece to bring the covering piece into contact with the coupling lug by passing above the disk, the upper part of which closely lodges itself in a groove of the covering piece, the bottom of the groove being curved in order to join to the disk.

5,769,356

**TAPE GUIDE STRUCTURE FOR USE IN A VIDEO CASSETTE RECORDER**

Hyo-Jong Yoo, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

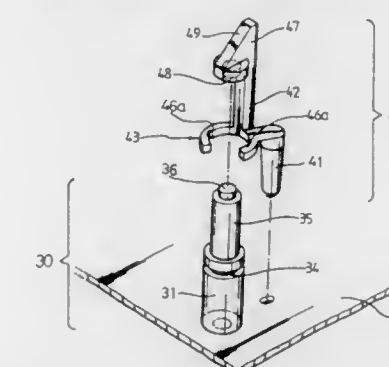
Filed Nov. 26, 1996, Ser. No. 753,524

Claims priority, application Rep. of Korea, Nov. 28, 1995, 95-44360

Int. Cl.<sup>6</sup> B65H 57/00; 20/00; G03B 23/02

U.S. Cl. 242—615

3 Claims



1. A tape guide structure for use in a video cassette recorder ("VCR") into which a tape cassette is loaded, the tape guide structure comprising:

a guide post provided with an upper cylindrical portion and a lower cylindrical portion with a diameter greater than that of the upper portion, the guide post being fixed to a deck; and a post cap provided with a head portion with a slant surface, the post cap being fixed on top of the guide post, wherein the lower cylindrical portion has a circumferential groove formed therearound, and the post cap is provided with a C-shaped claw fitted into the groove, said claw being connected to the head portion through a connection portion, and a support body downwardly extending from a rear side of the claw, said support body being fixed to the deck to prevent the post cap from rotating around the guide post, wherein the slant surface

of the head portion guides the tape of the tape cassette to a predetermined position relative to the guide post.

5,769,357

**TAPE GUIDE ROLLER ASSEMBLY WITH IMPEDANCE CHARACTERISTICS**

Seog-Ha Kwon, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

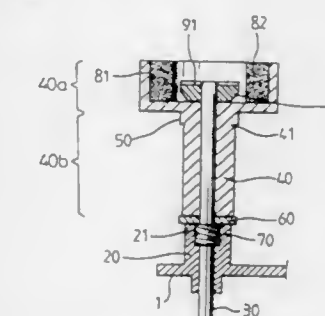
Filed May 22, 1996, Ser. No. 651,488

Claims priority, application Rep. of Korea, Jun. 30, 1995, 95-18642

Int. Cl.<sup>6</sup> B65H 57/14

U.S. Cl. 242—615.2

4 Claims



1. A guide roller assembly comprising:

a stationary shaft having an upper portion and a middle portion; a screw ring disposed on the middle portion of the stationary shaft and having a threaded outer surface;  
a disk-shaped lower flange positioned on the stationary shaft abutting against the screw ring;  
a guide roller rotatably fitted onto the upper portion of the stationary shaft, said guide roller comprising a cylindrical section abutting against the lower flange, an upper flange having a diameter slightly larger than a diameter of the cylindrical section, a drum section having a diameter larger than the diameter of the upper flange and a circular depression on its top surface, an added mass being contained in the circular depression of the drum section; wherein the drum section increases the moment of inertia of the guide roller to dampen lengthwise vibrations of a magnetic tape travelling between the upper and lower flanges; and  
a cap secured on the upper portion of the stationary shaft and extending into the circular depression in the drum section.

5,769,358

**LIFTING-FUSELAGE/WING AIRCRAFT HAVING AN ELLIPTICAL FOREBODY**

Robert W. Hahl, Falls Church, Va., and Joseph Katz, San Diego, Calif., assignors to Redwood Aircraft Corporation, Falls Church, Va.

Filed May 13, 1996, Ser. No. 642,997

Int. Cl.<sup>6</sup> B64C 1/00; 3/26; 3/38

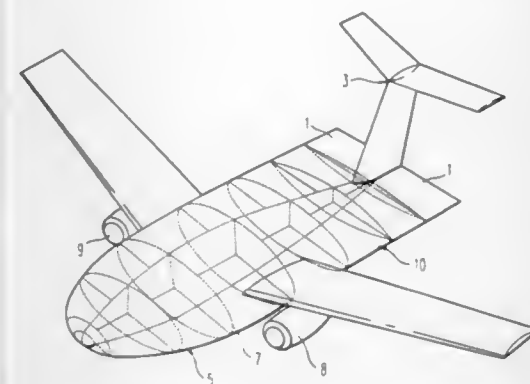
U.S. Cl. 244—36

29 Claims

1. An aircraft comprising:

(a) a lifting fuselage having a cross-section constituting an airfoil in a majority of vertical planes taken parallel to the flight direction, an aspect ratio ( $AR_v$ ) of 0.33 to 1.10, a forebody having a substantially elliptic cross-section in all planes taken normal to the flight direction, and a substantially elliptic planform leading edge;  
(b) wings fixed to the fuselage having an aspect ratio ( $AR_w$ ) of at least 5.0, wherein said wings are without a trailing-edge flap that moves relative to the aircraft to reduce stall speed;  
(c) a mechanism controlling aircraft attitude; and  
(d) a mechanism propelling the aircraft;  
wherein the wings and fuselage produce lift in varying proportions depending upon flight conditions as follows:





- (i) the aircraft has a cruise design point in which the fuselage lift coefficient ( $C_{L_F}$ ) is 0.08 or less, and
- (ii) the fuselage lift coefficient is at least 0.50 at an angle of attack ( $\alpha_{L_{20}}$ ) of 10°, in level flight at sea level (ISA) with all movable lift enhancing devices retracted.

5,769,359

**ACTIVE FEEDBACK LOOP TO CONTROL BODY PITCH IN STOL/VTOL FREE WING AIRCRAFT**

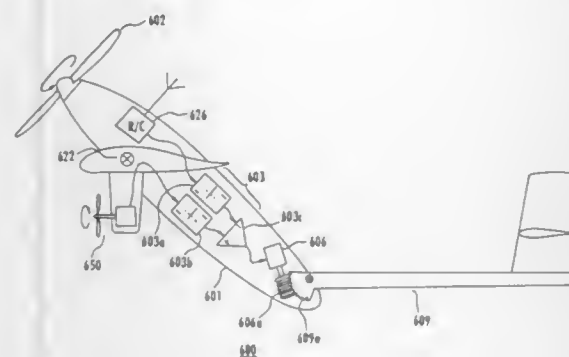
Elbert L. Rutan, Mojave, Calif., and Christophe Chevallier, Alexandria, Va., assignors to Freewing Aerial Robotics Corporation, College Park, Md.

Continuation-in-part of Ser. No. 332,321, Oct. 31, 1994, abandoned, which is a continuation of Ser. No. 7,130, Jan. 22, 1993, Pat. No. 5,395,073. This application Jun. 6, 1995, Ser. No. 468,420

Int. Cl.<sup>6</sup> B64C 13/16

U.S. Cl. 244—76 R

3 Claims



1. In a free wing aircraft including a free wing pivotably coupled to a fuselage, the improvement comprising an aircraft control system comprising:

- an air speed sensor mounted to the aircraft to measure air speed of the aircraft and output an air speed signal, and
- a control processor, coupled to the air speed sensor, for receiving and processing the air speed signal from the air speed sensor and a speed control input signal, and outputting a control surface control signal; and
- a control actuator, coupled to the control processor, for actuating an aircraft control surface in response to the control surface control signal;
- wherein the speed sensor comprises:
- an angular position sensor, coupled to the free wing and the fuselage, for measuring an angle between the free wing and the fuselage and outputting an angle measurement signal as the air speed signal.

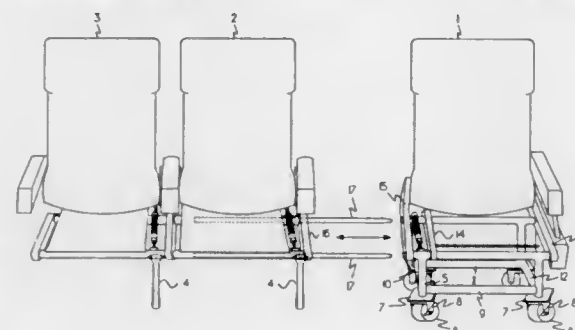
5,769,360  
**EASY TRANSPORT SEAT**  
Steven Kerbls, Niagara Falls, and Daniel D. Cook, Lancaster, both of N.Y., assignors to Research Foundation of the State University of New York, Albany, N.Y.

Filed Mar. 27, 1995, Ser. No. 411,193

Int. Cl.<sup>6</sup> B64D 11/06

U.S. Cl. 244—118.6

17 Claims



1. A system for transporting physically challenged individuals, comprising:
- a fixed seat assembly having a lower frame operatively arranged to be permanently secured to a floor, and having a seat secured to said lower frame;
- a movable seat assembly having a seat supported by a lower frame, said lower frame supported by rolling means which enable said movable seat assembly to be moved from place to place with said physically challenged person in place upon the seat of the movable seat assembly; and,
- locking means located on the lower frame of said movable seat assembly operatively arranged to engage the lower frame of the fixed seat assembly to lock said movable seat assembly to said fixed seat assembly.

5,769,361

**EMERGENCY EXIT ACCESSIBLE FROM THE OUTSIDE FOR AN AIRCRAFT COCKPIT**

Jérôme Charieras, Leguevin, and Pascal Chaumel, Plaisance du Touch, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

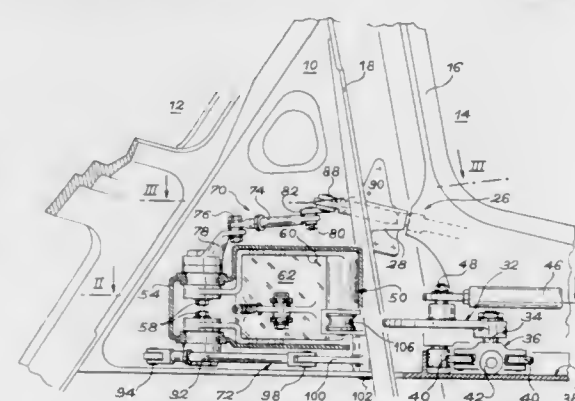
Filed Mar. 11, 1996, Ser. No. 611,548

Claims priority, application France, Mar. 10, 1995, 95 02811

Int. Cl.<sup>6</sup> B64C 1/14

U.S. Cl. 244—129.4

18 Claims



1. An emergency exit accessible from the outside for an aircraft cockpit having at least one window movable with respect to a fixed frame, a manipulating member for the window located within the cockpit, and a window opening mechanism actuated by the manipulating member and incorporating at least one locking member and means for controlling a displacement of the window with respect to the fixed frame, the emergency exit comprising: a handle accessible from the outside of the aircraft and connected to the

window opening mechanism by manipulating means so as to successively control a release of the locking member and an actuation of the window displacement control means during a manipulation of the handle, wherein the locking member is a bolt incorporating an element and a catch and the manipulating means incorporate a first linkage able to act on the end of the bolt element in order to force it out of the bolt catch, and a second linkage able to manipulate with a time lag the window displacement control means.

5,769,362

**AIRCRAFT CONTROL MECHANISM FOR A SPEED BRAKE**

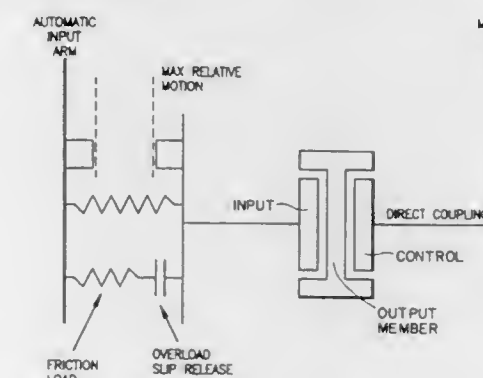
Leonard M. Greene, Scarsdale, and Jack Steiner, Yorktown, both of N.Y., assignors to Safe Flight Instrument Corporation, White Plains, N.Y.

Filed May 1, 1996, Ser. No. 639,521

Int. Cl.<sup>6</sup> B64C 3/58; 9/32

U.S. Cl. 244—197

9 Claims



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(e) determining from the successive voltage and current measurements made at said first unit whether the track between said locations is available or unavailable and, if unavailable, whether the track has a broken rail.

5,769,365

**FIXTURE FOR USE IN ELECTRIC LINE INSTALLATION**  
Yoshio Onishi, 31-19, Ageo-cho 2-chome, Yao-shi, Osaka 581, Japan, and Masakatsu Onishi, 1881-45, Kanaoka-cho, Sakai-shi, Osaka 591, Japan

PCT No. PCT/JP95/00582, § 371 Date Oct. 11, 1995, § 102(e) Date Oct. 11, 1995, PCT Pub. No. WO95/26478, PCT Pub. Date Oct. 5, 1995

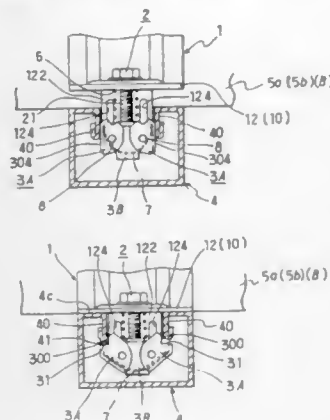
PCT Filed Mar. 28, 1995, Ser. No. 537,723

Claims priority, application Japan, Mar. 29, 1994, 6-082320; Mar. 29, 1994, 6-082329; Dec. 9, 1994, 6-331914

Int. Cl.<sup>6</sup> F16L 3/00

U.S. Cl. 248—49

36 Claims



1. A device for clamping electric line parts, comprising a fixture body attachable to a channel rail and having a through opening at a location where said fixture body is to be attached to the channel rail, said fixture body including a guide plate at the location where said fixture body is attachable to the channel rail, said guide plate including at least one vertical guide slot and having a size such that said guide plate is insertable into a channel inlet of the channel rail; a bolt extending through said through opening of said fixture body; and a clamp threadedly engaged with said bolt, said clamp including a central nut, substantially horizontal pivot pins mounted to said nut, and a pair of right and left clamping elements pivotable about said pivot pins, each of said clamping elements including a clamping surface and guide surfaces extending upwardly from a proximal end of said clamping surface, said clamp including at least one protrusion extending outwardly from one side of said nut and received within said guide slot of said fixture body so that said clamp is oriented in a fixed relation to said fixture body.

5,769,366

Patent Not Issued For This Number

5,769,367

**NURSING BOTTLE PROPPING APPARATUS**

Monica Bradley, and Ronald Bradley, both of 11351 NW 29th St., Sunrise, Fla. 33323

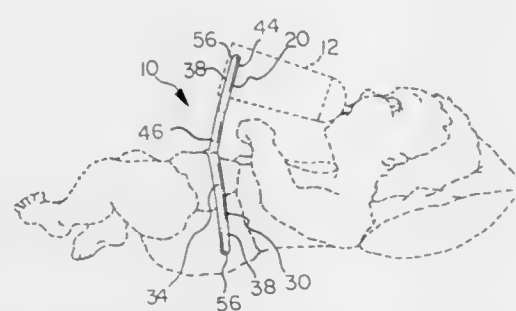
Continuation-in-part of Ser. No. 585,731, Jan. 16, 1996. This application Apr. 15, 1996, Ser. No. 631,597

Int. Cl.<sup>6</sup> A47D 15/00

U.S. Cl. 248—102

18 Claims

1. An apparatus for propping a nursing bottle so that an infant child can drink from the bottle, comprising:



an apparatus mounting portion comprising at least two mutually diverging first flexible members, each said first flexible member comprising a skeleton segment of ductile material bendable by hand beyond its elastic limit to reshape and thereby conform to and fit against the waist of an individual child for abutting the sides of the torso of the infant child to removably secure said apparatus to the child with friction engagements; a bottle holding portion comprising at least two mutually diverging second flexible members, each said second flexible member comprising a skeleton segment of ductile material bendable by hand beyond its elastic limit to reshape and thereby conform to and fit against the sides of said nursing bottle, for abutting the sides of said nursing bottle to removably secure said nursing bottle in said apparatus; and a flexible connecting link interconnecting said apparatus mounting portion and said bottle holding portion, said connecting link comprising a skeleton segment of ductile material bendable by hand beyond its elastic limit to reshape said connecting link to position said nursing bottle holding portion, and thereby position said nursing bottle, relative to the mouth of the child.

5,769,368

**DROP CLOTH HOLDER AND DISPENSER**

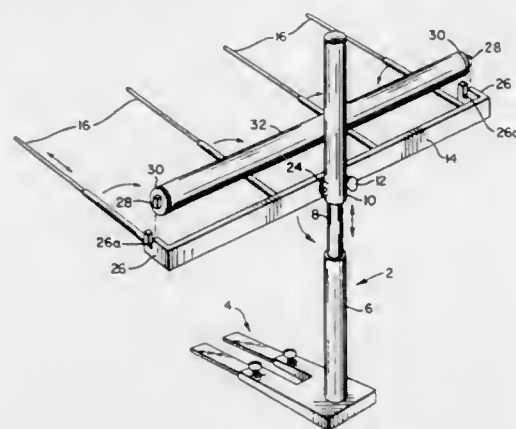
Herman E. Busey, 19140 Martinsburg Rd., Dickerson, Md. 20842

Filed May 6, 1996, Ser. No. 642,924

Int. Cl.<sup>6</sup> A47F 7/17

U.S. Cl. 248—125.7

8 Claims



1. A drop cloth holder and dispenser comprising a stand having a base and a single vertical pole structure extending upwardly from said base, said vertical pole structure having a vertical axis, an elongated spine having two ends secured to said vertical pole structure and having a plurality of arms extending from said spine, said spine and arms adjustable in height along and rotatable about a horizontal axis relative to said vertical pole structure, a roll of material secured to a roller and extendable over and retractable from said arms,

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3721

said spine having notches adjacent its two ends, and said roller having end members seatable in said notches.

5,769,369

**MOBILE OFFICE STAND FOR SUPPORTING A PORTABLE COMPUTER OR ELECTRONIC ORGANIZER IN VEHICLES**

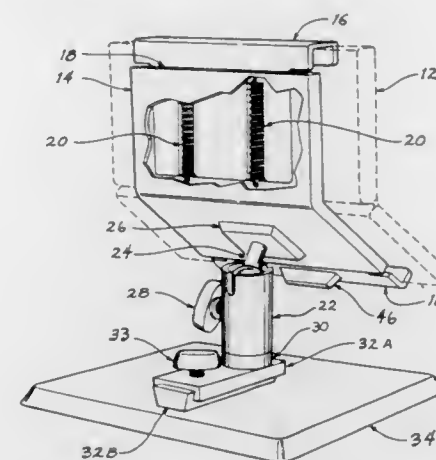
James Meinel, 707 E. 62nd St., Los Angeles, Calif. 90001

Filed Apr. 28, 1995, Ser. No. 431,113

Int. Cl.<sup>6</sup> A47B 19/00; 23/00

U.S. Cl. 248—176.1

35 Claims



1. An apparatus for supporting and holding an electronic organizer device having opposed peripheral sides for use in a vehicle, comprising:

a cradle member generally rectangular in shape and having a peripheral edge for retaining the device;

holding means, attached to said cradle member, for releasably engaging and gripping opposite peripheral device sides, said holding means extending generally perpendicular from said cradle for holding the device in said cradle member generally parallel to said cradle member;

said holding means further comprising at least one pair of opposing jaw members mounted on opposed, peripheral edges of said cradle member, and, biasing means for biasing said jaw members toward one another for releasably holding the device therebetween on said cradle member;

a stand member, attached at a first end to said cradle member, and having a second end adapted for engagement with a surface for supporting said cradle member in a user selected spatial orientation for use by a user.

5,769,370

**KNOCK-DOWN SATELLITE POSITIONING SYSTEM ANTENNA SUPPORTING TRIPOD**

Javad Ashjaee, Saratoga, Calif., assignor to Javad Positioning, LLC, Saratoga, Calif.

Continuation-in-part of Ser. No. 578,169, Dec. 29, 1995. This application May 8, 1996, Ser. No. 647,472

Int. Cl.<sup>6</sup> F16M 11/14

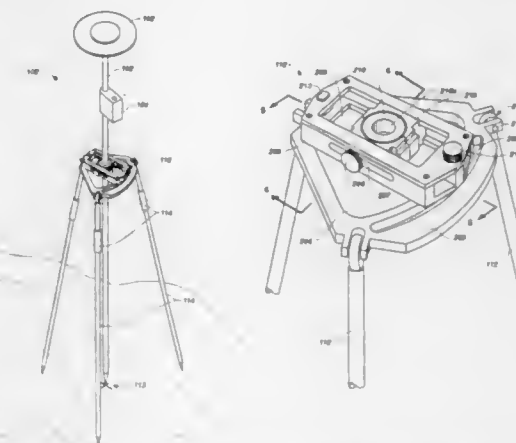
U.S. Cl. 248—181.1

17 Claims

1. A knocked-down portable survey station in kit-form adapted to be assembled on-site for geodetic surveying comprising:

a surveyor's stake having an upper end and a lower end, said stake comprising a plurality of sections, each of said sections including means for releasably attaching a first section to a second section;

a satellite positioning system antenna releasably attachable to the upper end of said stake; and



a tripod having a tripod head and at least three legs releasably and hingedly attachable at their upper ends to said tripod head, each of said legs comprising at least one of said plurality of sections;

said tripod head including:

a base platform releasably attachable to said tripod legs; and

a base positioning assembly movably attached to said platform for providing a pivot assembly at least two dimensional freedom of motion in a planes said base positioning assembly comprising a first housing slidably mounted on said platform to permit said first housing to move along a first directional path, and a second housing slidably mounted to said first housing to permit said second housing to move along a second directional path which is different from said first directional path;

said pivot assembly pivotally being attached to said base positioning assembly for providing at least partial freedom of rotation about at least two orthogonal axes, said pivotal assembly includes a gimbal pivotally mounted to said second housing to permit said gimbal to pivot about both an x-axis and a y-axis, said gimbal including a central cavity for receiving said stake.

5,769,371

**ADJUSTABLE LEVELING STAND**

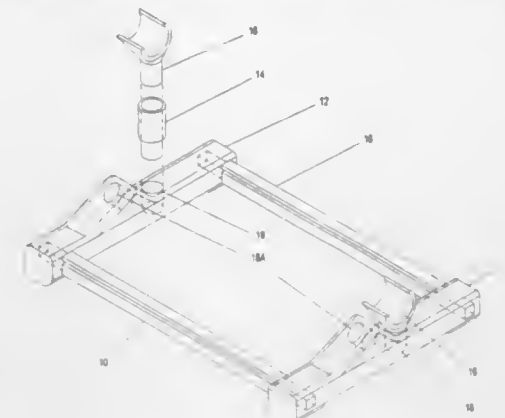
Kenneth B. Bandur, 947 Van Auken Cir., Palo Alto, Calif. 94303

Filed Jun. 5, 1996, Ser. No. 658,759

Int. Cl.<sup>6</sup> F16M 11/20

U.S. Cl. 248—188.2

8 Claims



1. An adjustable stand for supporting a horizontally oriented tubular leg of a seat, table, or bed comprising:

a set of leg brackets, each leg bracket configured to have a saddle portion for receiving a portion of the horizontally oriented tubular leg, said leg bracket having a stem which extends in a direction which is substantially perpendicular to



the horizontally oriented tubular leg when the saddle of said leg bracket is engaged with and supporting the horizontally oriented leg;

a base having a set of leg bracket receiving openings aligned in a plane, each hole being configured to slidably receive a stem of each leg bracket so as to support said horizontally oriented tubular leg when engaged with said saddle portions of said leg brackets in a spaced relationship from said base, wherein said base, prior to engagement with said set of leg brackets, has a substantially flat configuration.

5,769,372

## HUNTING WEAPON HOLDER

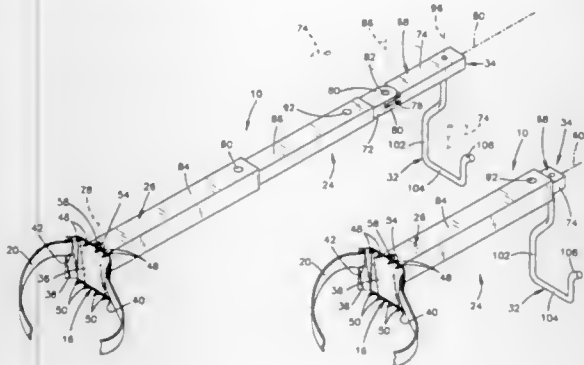
Michael W. Klosterman, Mogadore, Ohio, assignor to Klawhorn Industries Inc., Bay Village, Ohio

Filed May 2, 1996, Ser. No. 641,634

Int. Cl.<sup>6</sup> A47B 96/06

U.S. Cl. 248—219.4

5 Claims



1. A hunting weapon holder for use in supporting a hunting weapon on a trunk of a tree or similar support, said hunting weapon holder comprising a base which is engageable with a trunk of a tree, a strap which is connected with said base and is positionable around the trunk of the tree to retain said base against movement relative to the trunk of the tree, a support assembly having a first end portion pivotally connected with said base and pivotal relative to said base and the trunk of the tree about a first axis which extends along the trunk of the tree when said base is connected with the trunk of the tree by said strap, and a weapon hanger means connected with a second end portion of said support assembly for engaging the hunting weapon and for supporting the hunting weapon on said second end portion of said support assembly, said support assembly including an intermediate section which is pivotally connected with said base and is pivotal relative to said base about the first axis which extends along the trunk of the tree and an outer section which is disposed in a telescopic relationship with said intermediate section, said outer section being axially movable relative to said intermediate section to vary the extent of the telescopic relationship between said outer and intermediate sections to thereby vary the distance between said weapon hanger means and the trunk of the tree, said outer section of said support assembly includes an inner portion which is disposed in a telescopic relationship with said intermediate section of said support assembly, an outer portion which is connected with said weapon hanger means, and a pivot connection which interconnects said inner and outer portions of said outer section, said pivot connection including means for enabling said outer portion of said outer section to pivot about a second axis which extends parallel to said first axis.

5,769,373  
MERCHANDISE DISPLAY HOOK WITH PIVOTABLE,  
LOCKING BACK PLATE

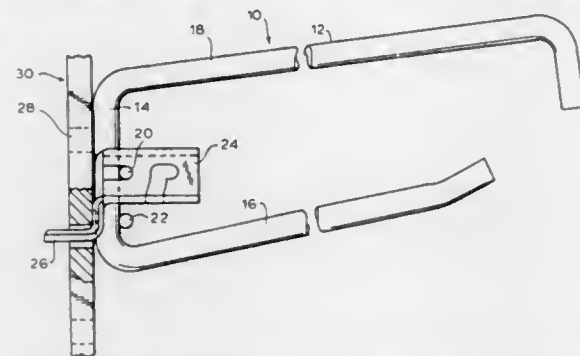
Harold B. Bond, Wilkes-Barre, Pa., assignor to Trion Industries, Inc., Wilkes-Barre, Pa.

Filed Mar. 6, 1997, Ser. No. 812,727

Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 248—220.41

16 Claims



1. A merchandise hook for mounting on an apertured display panel, which comprises:  
(a) a wire-like element having a vertical base portion;  
(b) first and second parallel, spaced-apart cross bars fixed perpendicular to said base portion;  
(c) a back plate pivotally connected to said first cross bar, said back plate being adapted to releasably lockingly engage said second cross bar;  
(d) said back plate having lugs adapted to be inserted into said apertured display panel and to engage a back side thereof for mounting said merchandise hook;  
(e) whereby pivoting said back plate allows for the straight-in entry of said merchandise hook and whereby said locking engagement of said back plate with said second cross bar provides a stable connection between said back plate and said wire-like element.

5,769,374

APPARATUS FOR MOUNTING A COMPUTER  
PERIPHERAL DEVICE AT SELECTIVELY VARIABLE  
LOCATIONS ON A DISPLAY MONITOR

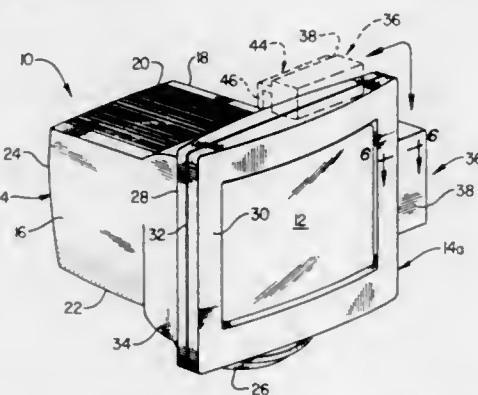
Randall W. Martin, The Woodlands; Mark S. Kimbrough, Austin; Dennis J. Wasserman, Austin; Julie Heard, Austin, and Kit R. Morris, Austin, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed May 17, 1996, Ser. No. 649,220

Int. Cl.<sup>6</sup> A47G 1/16

U.S. Cl. 248—221.11

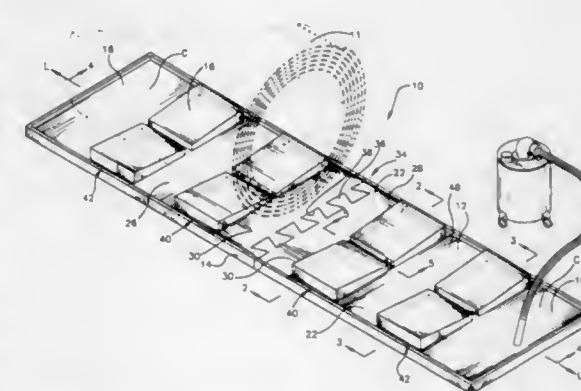
18 Claims



1. An electronic apparatus display monitor comprising:  
a display screen;  
a housing having a front side and a frame portion extending around said display screen and operatively supporting it on said front side of said housing; and

mounting means disposed on said frame portion and being cooperatively associatable with a peripheral device in a manner permitting the device to be removably mounted on said frame portion at selectively variable locations around its periphery, said mounting means including:

first means carried by said frame portion and being removably and slidably interlockable with a portion of the device in a manner permitting the device to be slidably moved to a selectively variable location along the periphery of said frame portion, and  
second means carried by said frame portion and being useable to removably lock the device to the frame portion in a manner precluding sliding movement of the device around the periphery of said frame portion.

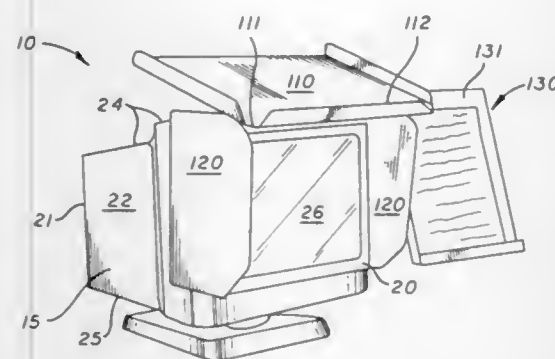


each aperture having a larger inner diameter than an outer diameter of the drive shaft permitting skewing of the drive shaft with respect to an axis extending between the apertures in the end walls; and means, carried on the bracket and engaging the exterior surface of the holder, for restraining bi-directional movement of the holder in both axial and axially transverse directions with respect to the drive shaft while permitting the holder to deform under pivotal movement of the drive nut into co-axial alignment with the drive shaft to provide co-axial alignment of the drive nut with the drive shaft in accommodation of any non co-axial alignment of the drive shaft and the holder.

5,769,378  
COMPUTER MONITOR UTILITY ASSEMBLY  
Carlos Correa, 5756 W. Park Rd., Hollywood, Fla. 33021  
Filed May 9, 1996, Ser. No. 642,928  
Int. Cl.<sup>6</sup> B41J 11/02

U.S. Cl. 248—442.2

26 Claims



1. To enhance the effectiveness of a computer monitor of the type having a front surface, a rear surface, a pair of opposite side surfaces, a top surface and a bottom surface, a computer monitor utility assembly comprising:

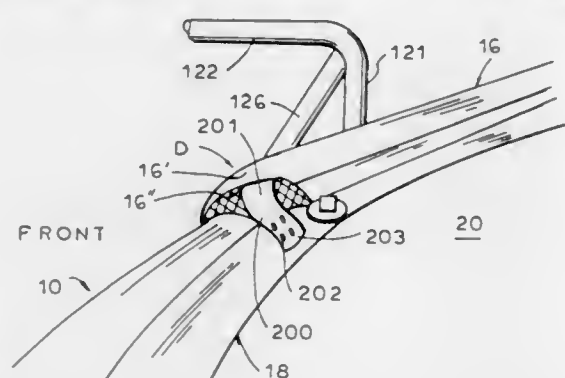
- a universal mount base structured and disposed to be removably, yet securely attached to the top surface of the monitor,
- a generally rigid top panel, said top panel having a width generally equivalent to a width of the monitor,
- upper mount means structured and disposed to secure said top panel to said mount base, in overlying relation atop the monitor,
- said upper mount means being further structured to provide forward and backward, slided movement of said top panel relative to said mount base such that said top panel selectively overhangs beyond the front surface of the monitor in order to selectively shade and screen a screen on the front surface of the monitor from light and glare,
- a pair of generally rigid side panels,
- adjustable side mount means structured and disposed to mount said rigid side panels along the opposite side surfaces of monitors of varying widths,
- said adjustable side mount means being further structured to provide forward and backward, slided movement of said side panels relative to said mount base such that said side panels selectively extend beyond the front surface of the monitor in order to selectively shade and screen the screen on the front surface of the monitor from light and side glare and provide screen privacy, and
- said adjustable side mount means comprising:

- a pair of generally L-shaped members structured to variably extend from opposite sides of said mount base,
- said L-shaped members each including a horizontal leg, which is secured to said mount base, and a downwardly depending, vertical leg, which extends downwardly alone a corresponding one of the side surfaces of the monitor.

5,769,379  
MIRROR STRUT WITH BRIDGING ELEMENT  
Sol Englander, and Benjamin Englander, both of Jamaica, N.Y., assignors to Rosco Inc., New York, N.Y.  
Filed Feb. 27, 1997, Ser. No. 807,657  
Int. Cl.<sup>6</sup> A47F 7/14

U.S. Cl. 248—475.1

6 Claims



1. A strut assembly for supporting a mirror to the body of a vehicle, comprising:

- a plurality of strut portions, a first strut portion which is operatively coupled to the mirror and a second strut portion of which is operatively coupled to a predetermined location on an exterior surface of a front fender of the vehicle; and
- a support bracket for damping vibrations of the mirror, the support bracket operatively engaging, at a first end thereof, both an interior surface of the front fender at a location juxtaposed to the predetermined location of the vehicle and the second strut portion, the support bracket operatively engaging at a second end thereof, a frame of the vehicle and at least one fastener passing through the front fender and connecting the second strut portion and the support bracket.

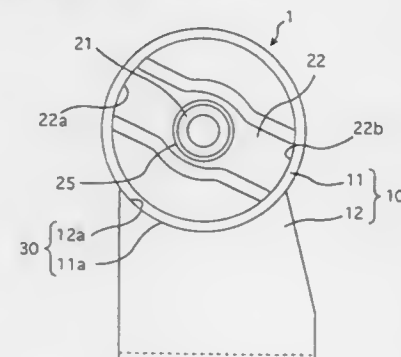
5,769,380  
RUBBER VIBRATION ISOLATOR WITH BRACKET AND METHOD OF MANUFACTURING THE SAME  
Masayuki Hibi, Komaki; Yutaka Tazuke, Kasugai, and Masahiko Hanazaki, Nagoya, all of Japan, assignors to Tokai Rubber Industries, Ltd., Komaki, Japan

Filed Sep. 2, 1994, Ser. No. 299,097  
Claims priority, application Japan, Sep. 2, 1993, 5-243964; Aug. 31, 1994, 5-207330

Int. Cl.<sup>6</sup> F16M 13/00

U.S. Cl. 248—562

3 Claims



1. A rubber vibration isolator comprising:

- a bracket composed of a single piece metallic cylindrical portion and a metallic arm portion integrally secured to an outer surface of said single piece metallic cylindrical portion by welding;
- an inner sleeve disposed inside of said single piece metallic cylindrical portion of said bracket so as to form an annular

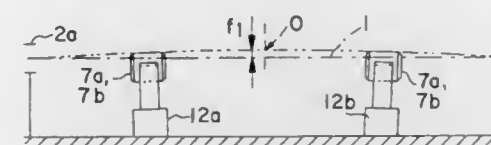
space with an inner surface of said single piece metallic cylindrical portion; and an elastic rubber member disposed in said annular space, said elastic rubber member having a first securing portion secured to said inner surface of said single piece metallic cylindrical portion and a second securing portion integrally bonded to an outer surface of said inner sleeve by vulcanization and being in a precompressed state towards an axial center of said single piece metallic cylindrical portion whereby the cylindrical portion solely maintains the elastic rubber member in the precompressed state; said single piece metallic cylindrical portion being cylindrical sheet metal having opposed free edges facing each other and secured together whereby said single piece metallic cylindrical portion has the free edges spaced apart during the uncompressed securing and vulcanization formation and the free edges secured together to compress the elastic rubber member subsequent to securing and vulcanization formation.

5,769,381  
PROCESS FOR PREVENTING VIBRATION OF CYLINDERS IN A CYLINDER CONVEYOR  
Pierre Patin, 15, rue Buffon, 75005 Paris, France  
Filed Aug. 3, 1995, Ser. No. 510,644  
Claims priority, application France, Aug. 3, 1994, 94 09647

Int. Cl.<sup>6</sup> F16C 3/20

U.S. Cl. 248—618

6 Claims



1. A process for preventing vibrations of cylinders in a cylinder conveyor comprising a plurality of parallel cylinders each having an upper sector for supporting persons or goods, each of said cylinders having a central part supported from below by means of at least one revolving intermediate bearing device extending on a lower sector of said cylinder and leaving free said upper sector of said cylinder opposite said intermediate bearing device in order to support persons or goods, each cylinder having a longitudinal axis and two ends maintained by fixed end centering devices aligned on a line, said cylinders being driven for rotation about their longitudinal axes, said process comprising the step of

- (a) adjusting a position of said at least one intermediate bearing device for decentering a center of said central part of each cylinder away from the line extending through the center of both end centering devices, on a side opposite said intermediate bearing device, and thereby subjecting each cylinder to upwardly convex deformation providing an elastic recall force which maintains said central part of each cylinder in permanent contact with said at least one intermediate bearing device, thereby preventing vibrations.

5,769,382  
SUPPORTING STRUCTURE FOR VIBRATION GENERATING MOTOR USED IN COMPACT ELECTRONIC DEVICE  
Yasuhiro Kobayashi, Tokyo, and Tatsuya Mori, Shizuoka, both of Japan, assignors to NEC Corporation, Tokyo, Japan

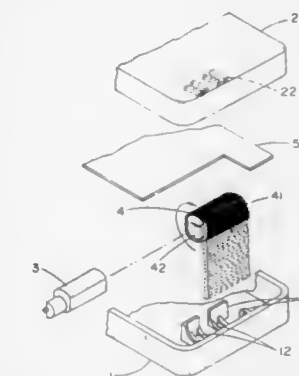
Filed Nov. 3, 1995, Ser. No. 552,846  
Claims priority, application Japan, Nov. 10, 1994, 6-276191

Int. Cl.<sup>6</sup> F16M 3/00

U.S. Cl. 248—638

12 Claims

- 1. A supporting structure of a motor for generating vibration, comprising:
- a motor receiving portion for receiving said motor;

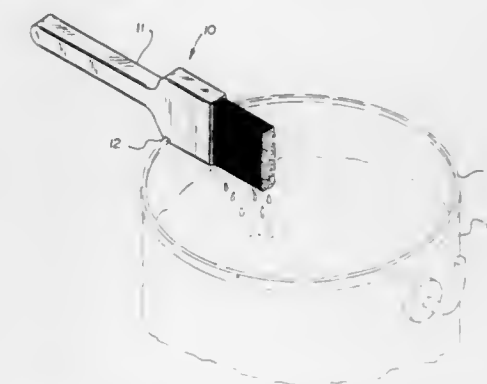


a motor holder formed by tightly wrapping said motor with a thin sheet; an upper casing half having first ribs for supporting said motor; and a lower casing half having second ribs for supporting said motor and having said motor receiving portion.

5,769,383  
BRUSH RETAINING SYSTEM  
Thomas C. Hemler, 332 N. Pine St., Lancaster, Pa. 17603  
Filed Nov. 29, 1996, Ser. No. 753,743  
Int. Cl.<sup>6</sup> A46B 17/00

U.S. Cl. 248—682

7 Claims



1. A brush retaining system for engaging a rim of a paint can comprising:

- a paint brush handle assembly having a handle portion, a pair of broad sides disposed from the handle portion, and a pair of narrow sides disposed from the handle portion; and
- a clipping means for engaging the rim of the paint can, the clipping means integrally molded in one of the narrow sides such that the broad sides are held in a substantially vertical plane when the clipping means engages the rim of the paint can.

5,769,384  
LOW DIFFERENTIAL LIGHT LEVEL PHOTORECEPTORS  
Richard A. Baumgartner, Palo Alto; Travis N. Blalock, Santa Clara; Thomas Hornak, Portola Valley, and Joey Doernberg, San Carlos, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 25, 1996, Ser. No. 591,848

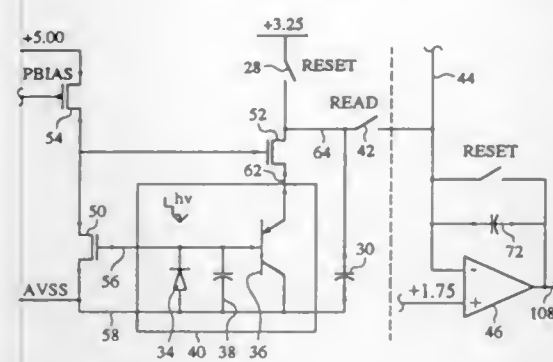
Int. Cl.<sup>6</sup> H03F 1/34

U.S. Cl. 250—214 A

12 Claims

- 1. A circuit for generating an electrical signal responsive to reception of light energy comprising:





a photoelement having an amplification transistor and a photoreceptor, said photoelement having an emitter node and a base node, said photoreceptor being connected to generate a current at said base node in response to reception of light energy; and

servo means for dynamically stabilizing a voltage at said base node during reception of light energy by said photoreceptor, said servo means including a feedback loop connected to bias said base node via said emitter node, said feedback loop including first and second MOS transistors, said first MOS transistor having a gate connected to said base node and having a drain, said second MOS transistor having a gate connected to said drain of said first MOS transistor and having a source connected to said emitter node.

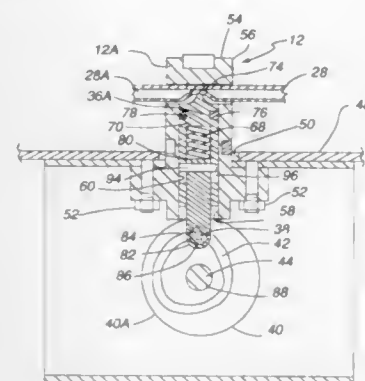
#### 5,769,385 TUBING CLAMPS FOR BLOOD SEPARATING APPARATUS

Dale Burrous, Gilcrest, and Mark T. Patton, Denver, both of Colo., assignors to Medtronic Electromedics, Inc., Parker, Colo.

Filed Jan. 21, 1997, Ser. No. 786,028  
Int. Cl.<sup>6</sup> F16K 7/06

U.S. Cl. 251—7

14 Claims



1. A clamp for occluding the flow of fluid through a deformable, flexible tube comprising in combination, a hollow clamp head having a channel therein in communication with the hollow interior of the clamp head, said channel adapted to removably receive said tube, a clamping element reciprocally positioned in said hollow interior of said clamp head and adapted to cooperate with said clamp head in selectively pinching said tube to occlude the flow of fluid through said tube, said clamping element having a cam follower, a cam track adapted to cooperate with said cam follower to positively reciprocate said clamping element within said clamp head, and drive means for moving said cam track to effect reciprocating movement of said clamping element.

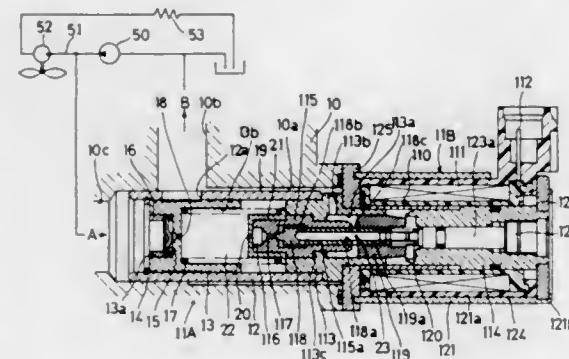
#### 5,769,386 ELECTROMAGNETIC PROPORTIONAL PRESSURE CONTROL VALVE

Hiroaki Sugiura, Hachioji, and Hideki Nakayoshi, Kariya, both of Japan, assignors to Aisin Selki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 24, 1996, Ser. No. 668,945  
Claims priority, application Japan, Jun. 22, 1995, 7-156325  
Int. Cl.<sup>6</sup> F16K 31/12

U.S. Cl. 251—37

3 Claims



1. An electromagnetic pressure control valve comprising: a housing having at least one fluid inlet port and fluid outlet port; a spool slidably accommodated in the housing for opening and closing a passage between the fluid inlet port and the fluid outlet port; plunger means having a pilot valve, the plunger means being housed in the housing and defining a first pressure chamber together with the spool; return passage means that is arranged through the plunger means between the first pressure chamber and the fluid outlet port, and whose opening and closing is controlled by the pilot valve; first flow restricting means for restricting the quantity of flow between the fluid inlet port and the first pressure chamber; electromagnetic means for actuating the pilot valve so as to control the opening and closing of the return passage means; and a second pressure chamber operatively connected with the pilot valve for absorbing fluctuations of the fluid pressure in the first pressure chamber.

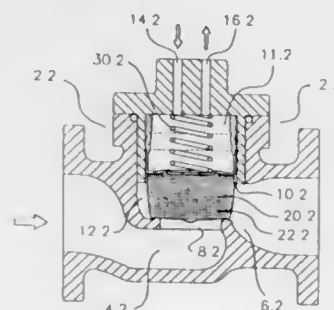
#### 5,769,387 FLOW VALVES OPERATED BY FLOW TRANSFER MEANS WHICH REGULATE SMALL FLOWS OF CONTROL

Sergio Pérez C., Estado 235, Of 511, Santiago, Chile

Filed Nov. 20, 1996, Ser. No. 754,257  
Int. Cl.<sup>6</sup> F16K 31/126

U.S. Cl. 251—61.4

24 Claims



1. A flow valve, comprising:  
a) a valve body including a flow inlet and outlet;  
b) a valve seat disposed within an internal portion of said flow inlet;

c) said valve body including a main cavity having a constant cross-section portion and a broadening portion communicating with said flow inlet and outlet, said main cavity being coaxial with said valve seat;  
d) an elastomeric body having a hollow and open upper portion, said upper portion being disposed within said main cavity; said elastomeric body being slightly compressed in an axial direction such that said elastomeric body exerts a force over said valve seat; said elastomeric body including a first sealing zone, and second radial seal zone;  
e) said first sealing zone being located at a lower base of said elastomeric body, being made of a relatively thick mass body with a slightly smaller cross-section than a cross-section of said main cavity, said first sealing zone being disposed within said broadening portion, said first sealing zone including a lower surface having a slightly greater cross-section than the cross-section of said valve seat, and an upper surface having a cross-section at least equal to the cross-section of said lower surface;  
f) said second radial seal zone being located at said upper portion, and including an external surface having a geometry similar to a side wall surface of said main cavity constant cross-section portion; said external surface being tight against said main cavity side wall surface;  
g) control flow inlet and control flow outlet communicating with said hollow upper portion; and  
h) said first sealing zone being movable axially within said constant cross-section portion, away from or toward said valve seat, when pressure within said hollow upper portion is reduced or increased through said control flow inlet and outlet, thereby to open or close said flow valve.  
8. The flow valve of claim 1, and further comprising:  
a) a compression spring disposed within said elastomeric body;  
b) one end of said spring being in contact with an internal wall of said first sealing zone; and  
c) the other end of said spring being in contact with said main cavity.

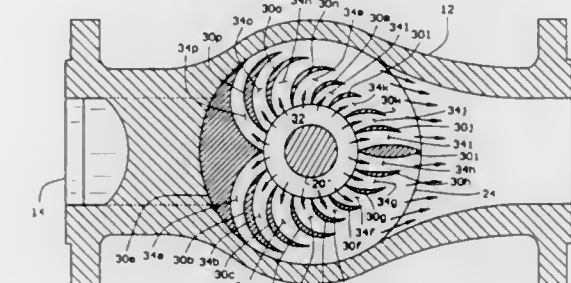
#### 5,769,388 FLOW DIFFUSER AND VALVE

Robert H. Welker, Washington, Tex., assignor to Welker Engineering Company, Sugar Land, Tex.

Filed Apr. 28, 1997, Ser. No. 848,125  
Int. Cl.<sup>6</sup> F16K 47/02; F15D 1/00

U.S. Cl. 251—118

14 Claims



6. A valve for controlling the flow of a fluid and producing a smooth outlet flow comprising:  
a) a body having an inlet port and an outlet port;  
b) a valve seat positioned between said ports;  
c) a poppet retractably positioned on said valve seat, said poppet preventing the flow of fluid through said body except when said poppet is retracted from said valve seat;  
d) a flow diffuser mounted within said body and centered around said poppet, said flow diffuser comprising an annular diffuser body having a top and bottom wall defined by outer top and bottom flat surfaces and, respectively, an inner upper surface and an inner lower surface; an outer curved side surface, an axis, an axial height, a radial annular length, and an outlet flow direction perpendicular to said axis, a cylindrical inlet opening through said diffuser body along said axis; a plurality of vanes extending axially from said inner upper surface to said inner lower surface defining a plurality of outlet passages between said walls, each outlet passage having a start and an end, said start of said outlet passages in fluid communication with and evenly disposed about the outside of said inlet opening, the width of each start being substantially equal to the circumference of said diffuser body divided by the number of said outlet passages, said outlet passages curved toward the axis of said diffuser body until all said outlet passages are adjoining without overlap, and a flow deflector affixed to said poppet, adapted to deflect flow of a given fluid radially away from said poppet and through said inlet opening of said flow diffuser when said poppet is retracted from said valve seat.

said inner lower surface defining a plurality of outlet passages between said walls, each outlet passage having a start and an end, said start of said outlet passages in fluid communication with and evenly disposed about the outside of said inlet opening, the width of each start being substantially equal to the circumference of said diffuser body divided by the number of said outlet passages, said outlet passages curved toward the axis of said diffuser body until all said outlet passages are adjoining without overlap, and a flow deflector affixed to said poppet, adapted to deflect flow of a given fluid radially away from said poppet and through said inlet opening of said flow diffuser when said poppet is retracted from said valve seat.

#### 5,769,389 MOVEMENT ACTUATOR/SENSOR SYSTEMS

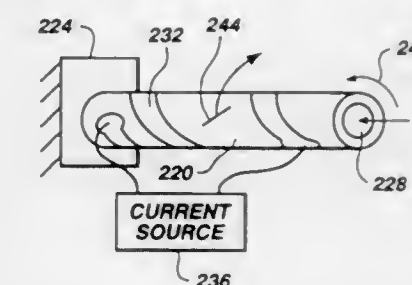
Stephen C. Jacobsen, and David L. Wells, both of Salt Lake City, Utah, assignors to Sarcos Group, Salt Lake City, Utah Division of Ser. No. 480,018, Jun. 7, 1995, Pat. No. 5,594,330, which is a division of Ser. No. 898,216, Jun. 12, 1992, Pat. No. 5,481,184, which is a continuation-in-part of Ser. No. 816,628, Dec. 31, 1991, Pat. No. 5,269,882, which is a continuation-in-part of Ser. No. 647,659, Jan. 28, 1991, Pat. No. 5,106,455.

This application Nov. 7, 1996, Ser. No. 745,003

Int. Cl.<sup>6</sup> F16K 13/00

U.S. Cl. 251—129.06

10 Claims



2. An apparatus for selectively controlling a flow of a fluid, comprising:  
a) a valve body comprising at least one flexible tube defining a fluid inlet and a fluid outlet; and  
b) an actuable element associated with said valve body, said actuable element being responsive to an actuation signal by changing shape when the actuation signal is applied, thereby changing the shape of at least one flexible tube and changing the flow of the fluid through said fluid outlet.

#### 5,769,390 FLOW CONTROL VALVE

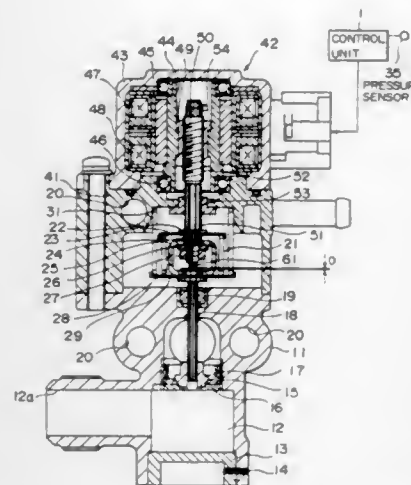
Shosaku Ando, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Jun. 14, 1996, Ser. No. 665,114  
Claims priority, application Japan, Jun. 22, 1995, 7-155834  
Int. Cl.<sup>6</sup> F16K 31/04

U.S. Cl. 251—129.11

8 Claims

1. A flow control valve comprising:  
a) a valve body;  
b) a valve seat in which said valve body is seated for closing the valve;  
c) a valve stem connected to said valve body which is displaced in a valve closing direction according to a compressive load in an axial direction;  
d) elastic means which applies said compressive load to said valve stem;  
e) a rotor shaft coaxial with said valve stem;  
f) a connector which elastically connects said rotor shaft with said valve stem;  
g) a stepping motor which displaces said rotor shaft in an axial direction;



means to drive said stepping motor such that said rotor shaft is set in a predetermined position while compressing said connector, said rotor shaft having a predetermined clearance D relative to said valve stem in a valve body seating position when said rotor shaft is in said predetermined position, means for detecting a fault in the seating of said valve body, and means to drive said stepping motor such that said rotor shaft moves in a direction of said valve stem beyond said clearance D when said fault is detected.

5,769,391

**ELECTROMAGNETICALLY ACTUATED VALVE**

Klaus Noller, Oppenweiler; Jürgen Graner, Sersheim; Peter Asslaender, Bamberg; Peter Stieglitz, Bamberg; Marita Geisendoerfer-Pipp, Forchheim; Detlef Malinowski, Oberhaid; Michael Lips, Bamberg; Rudolf Kalb, Bittenheim; Karl-Heinz Jaeger, Baunach; Robert Trunk, Bamberg; Andre Knackstedt, Gundelsheim; Heidi Arleth, Walsdorf, and Stefan Maier, Schwieberdingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany  
PCT No. PCT/DE96/00064, § 371 Date Jan. 6, 1997, § 102(e) Date Jan. 6, 1997, PCT Pub. No. WO96/24763, PCT Pub. Date Aug. 15, 1996

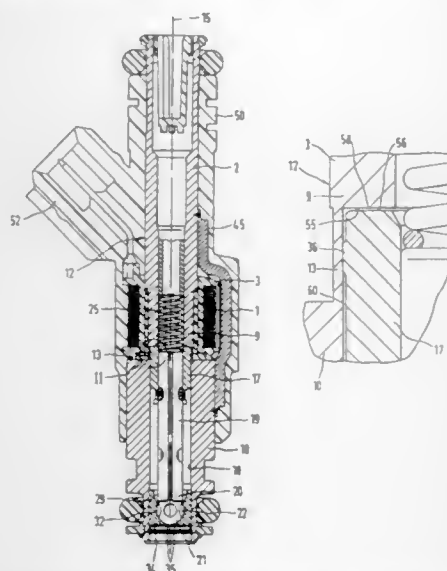
PCT Filed Jan. 18, 1996, Ser. No. 721,983

Claims priority, application Germany, Feb. 6, 1995, 19 503 821.5

Int. Cl.<sup>6</sup> F16K 31/06

U.S. Cl. 251—129.21

23 Claims



1. An electromagnetically actuated valve, comprising:  
a solenoid coil;

a core surrounded by the solenoid coil;  
a valve-closure member interacting with a fixed seat valve;  
an armature actuating the valve-closure member;  
a tubular connection part positioned downstream from the core and at least partially surrounding the armature, the core and the connection part being directly and magneto-conductively interconnected via a magnetic choke sites; the core, the magnetic choke site and the connection part being integrally formed as one component part.

5,769,392

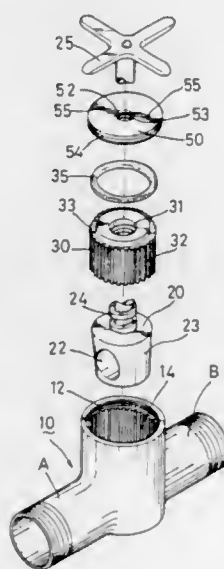
**WATER FLOWRATE CONTROL DEVICE**

Jyh-Shyong Jeon, No.49-1, Pa-Hsien Rd., Chuan-Yin Village,, Tong-San Hsiang, I-Lan Hsien, Taiwan  
Continuation-in-part of Ser. No. 491,213, Jun. 16, 1995, abandoned. This application May 19, 1997, Ser. No. 858,732

Int. Cl.<sup>6</sup> F16K 31/44

U.S. Cl. 251—221

2 Claims



1. An improved hydraulic valve comprising:  
a housing having a first coupling end and a second coupling end, said housing including a receiving recess having an opening atop, the lower section being provided with a cone-shape wall, the inner wall of the middle section defining a plurality of spine, and the upper section having a threaded portion;  
a controlling tap having a cone-shape body which is provided with an inlet opening and an outlet opening, being disposed compactly within said cone-shape wall of said housing, said cone-shape body being connected with a stem having a spiral rib in the middle portion, a handle being connected to the top of said stem;  
a stopping collar having a plurality of spines at the outer peripheral portion, being disposed within said middle section of said receiving recess of said housing wherein said spines of said stopping collar can be readily meshed with the spines of middle section of said receiving recess of said housing, the central portion of said collar being provided with a central hole having a spiral portion extending lengthwise, wherein when said handle is rotated, said spiral rib of said stem can be readily moved along said spiral portion of said stopping collar; and  
a cover lid having an opening for passing of said stem being provided, the peripheral of said cover lid being provided with a threaded portion which can be engaged with the threaded portion of said upper section of said housing and pressed against said stopping collar, wherein when said handle is rotated, said controlling tap can be moved upward or downward.

5,769,393

**LIQUID CRYSTAL ELEMENTS AND METHOD OF PRODUCING SAME**

Hidekazu Kobayashi, and Kiyohiro Samizu, both of Suwa, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan  
PCT No. PCT/JP92/01367, § 371 Date Aug. 16, 1993, § 102(e) Date Aug. 16, 1993, PCT Pub. No. WO93/08497, PCT Pub. Date Apr. 29, 1993

PCT Filed Oct. 21, 1992, Ser. No. 78,204

Claims priority, application Japan, Oct. 22, 1991, 3-274232; Oct. 25, 1991, 3-279123; Dec. 17, 1991, 3-333302; Jan. 22, 1992, 4-009540; Apr. 24, 1992, 4-106899; Jun. 1, 1992, 4-140343

Int. Cl.<sup>6</sup> C09K 19/52; G02F 1/13

U.S. Cl. 252—299.01

55 Claims

1. A liquid crystal element having at least one substrate portion and an optical layer comprising liquid crystal and polymer dispersed in said liquid crystal, said polymer comprising polymer grains being substantially aligned in the same alignment direction as said liquid crystal in absence of an applied electric field, said polymer grains developed from the polymerization of at least one polymer precursor containing at least one polymerizable portion and at least two aromatic rings with a coupling group bonded to said aromatic rings, said at least one polymer precursor containing, as at least one component, a polymer compound without an alkyl group spacer between said polymerizable portion and said aromatic rings.

5,769,394

**METHOD AND APPARATUS FOR FORCE-OPENING DOORS**

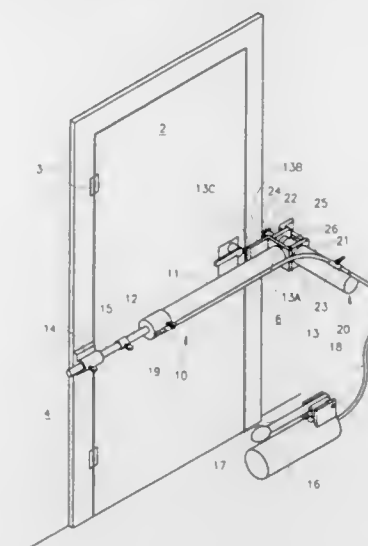
Benyamin Yirmiyahu, 52 Maimon St., Bnei Brak, and Mordechai Yirmiyahu, 17 Enzio Sereni St., Givatayim, both of Israel

Filed Jun. 26, 1996, Ser. No. 669,094

Int. Cl.<sup>6</sup> B66F 3/00

U.S. Cl. 254—93 R

8 Claims



1. A method for force-opening a door by applying a pulling force thereto in the direction of opening, the door being hingedly mounted at a first side in a corresponding first side of a door frame, and secured at the opposite, second side in a closed position by a locking bolt received within a corresponding second side of the door frame, said method comprising the steps of:  
anchoring to the door on edges of its face to be pulled open an anchoring unit carrying a ram unit having a ram member aligned with said second side of the door frame;  
driving said ram member outwardly of said ram unit against said second side of the door frame to force-open the door by applying a pulling force thereto in the direction of opening.

5,769,395

**AUTOMOBILE DRIVE SHAFT REMOVAL DEVICE**

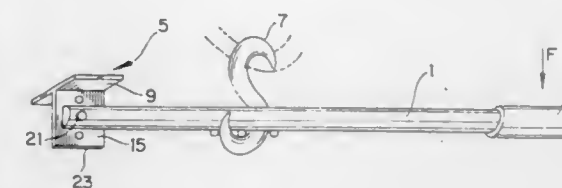
Louis P. Patti, 30 Tower Rd., Arlington, Mass. 02174

Filed Sep. 30, 1996, Ser. No. 723,569

Int. Cl.<sup>6</sup> B66F 3/00

U.S. Cl. 254—129

5 Claims



1. A tool for moving vehicle components comprising:  
an elongated handle having a front and a rear end;  
an S-shaped hook having two curved opposite ends with one of said ends being mounted on said handle along the handle's length between its front and its rear ends and the other of said curved ends being mounted on the vehicle component to be moved; and  
a T-shaped front end piece having a vertically disposed member which is pivotally mounted to the handle's front end and a horizontally disposed portion, said horizontally disposed portion of the T-shaped piece being adapted to fit under a stationary vehicle component, whereby the application of sufficient downward force near the handle's rear end will move the vehicle component mounted on the S-hook.

5,769,396

**MULTI-PURPOSE MOTORCYCLE LIFT**

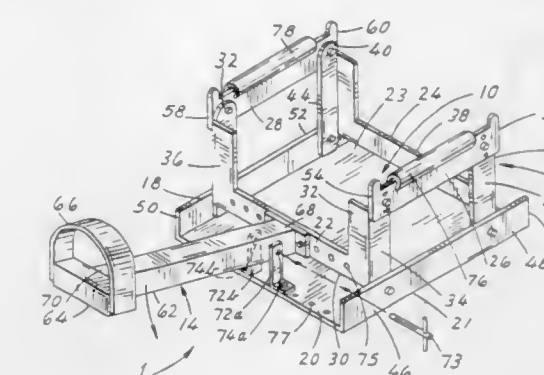
Joseph W. Tischendorf, 1525B Hwy. 175, Hubertus, Wis. 53033

Filed Oct. 21, 1996, Ser. No. 731,860

Int. Cl.<sup>6</sup> B60P 1/48

U.S. Cl. 254—131

12 Claims



1. A multi-purpose motorcycle lift comprising:  
a base having a first end and a second end;  
a left leg having a front side and a rear side, said left leg being pivotally connected to said first end of said base;  
a right leg having a front side and a rear side, said right leg being pivotally connected to said second end of said base;  
a front support having a first end and a second end, said first end of said front support being pivotally connected to said front side of said left leg, said second end of said front support being pivotally connected to said front side of said right leg;  
a rear support having a first end and a second end, said first end of said rear support being pivotally connected to said rear side of said left leg, said second end of said rear support being pivotally connected to said rear side of said right leg;  
a lift bar being fastened to said left leg; and  
a stirrup being fastened to the other end of said lift bar.



5,769,397

## VEHICLE LIFTER ATTACHMENT

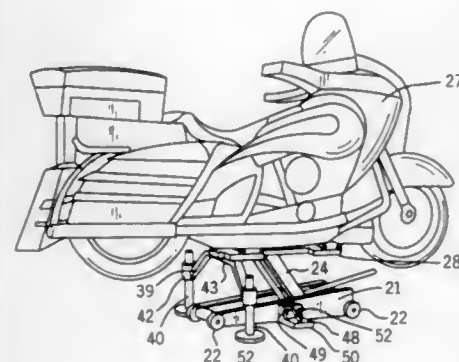
Scott Dhein, 901 Dairyland Dr., Cleveland, Wis. 53015

Filed Oct. 18, 1996, Ser. No. 732,070

Int. Cl.<sup>6</sup> B66F 3/00

U.S. Cl. 254-134

6 Claims



1. An attachment for lifting a two-wheeled vehicle by means of a lifting device, such as an automobile floor jack, the device having a base positionable on the ground and an upwardly movable arm connected to the base, the arm having a hole in an end thereof, the vehicle having frame members supporting wheels spaced in tandem along a longitudinal axis of the vehicle, the attachment comprising:

- a flat base plate having an upper side and a lower side with a plurality of slots extending therethrough;
- at least two pillow blocks mounted in said slots on the upper side of said base plate, said pillow blocks being formed to mate with the frame members of the vehicle when said base plate is brought into proximity with the vehicle, thereby to support the vehicle;
- a kingpin connected to the lower side of said base plate for insertion into the hole in the arm of the device to attach the attachment to the lifting device so that upward movement of the arm raises the vehicle supported by the base plate off the ground; and
- an adjustable stand for additionally supporting the base plate and raised vehicle, the adjustable stand comprising:
  - at least two legs having a plurality of holes extending therethrough;
  - a connecting arm having an upper portion connected to the base plate at a point displaced from the kingpin, and at least two sleeves, one at each end of the connecting arm, for receiving the legs such that the legs are spaced from each other in a direction transverse to the longitudinal axis of the vehicle, said sleeves having holes extending therethrough to match the holes in said legs; and
  - pins for insertion into the matching holes of the sleeves and the legs to connect the connecting arm to the legs, and adjust the length of the legs.

5,769,398

## LEVER HOIST

Yasuhiro Samejima, Osaka, Japan, assignor to Vital Kogyo

Kabushiki Kaisha, Osaka, Japan

Filed May 12, 1997, Ser. No. 854,624

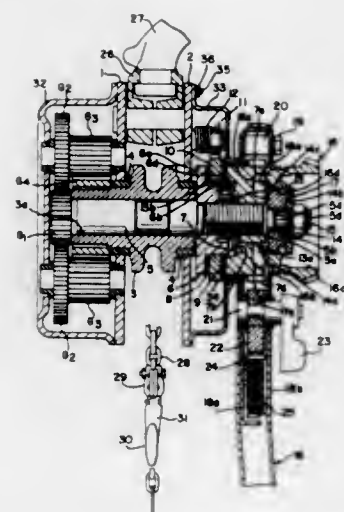
Claims priority, application Japan, Aug. 13, 1996, 8-232603

Int. Cl.<sup>6</sup> B66D 3/14

U.S. Cl. 254-352

4 Claims

1. A lever-type hoist comprising
- a drive shaft connected at its base end to a load sheave through a transmission gear series,
  - a pressure receiving member rigidly secured to said drive shaft,
  - a press drive member threaded onto an axially forward part of said pressure receiving member in such a manner that it may travel forward and backward and can be rotated by means of an operating handle when necessary,



- a reverse rotation stop ring interposed between said pressure receiving member and said press drive member and rotatable in a wind-up direction only,
- a pair of friction members disposed on both sides of said reverse rotation stop ring in such a manner that they may be pressed by said press drive member, characterized in that said hoist further comprises
  - a coil spring interposed between said pressure receiving member and press drive member,
  - said coil spring having a base end engaging portion and a tip end engaging portion at its base and tip, respectively,
  - a first rotation arresting means disposed at the forward side of said pressure receiving member and adapted to engage the base end engaging portion of said coil spring to arrest rotation of the coil spring in the wind-up direction with respect to the pressure receiving member, and
  - a second rotation arresting means disposed at the base side of said press drive member and adapted to engage the tip end engaging portion of the coil spring to arrest rotation of the press drive member in the wind-up direction with respect to the coil spring.

5,769,399

## VIBRATION-REDUCING BEARING

Kurt Fiedler, Zeppelinring 3, 65468 Trebur, Germany

Filed Aug. 13, 1996, Ser. No. 696,338

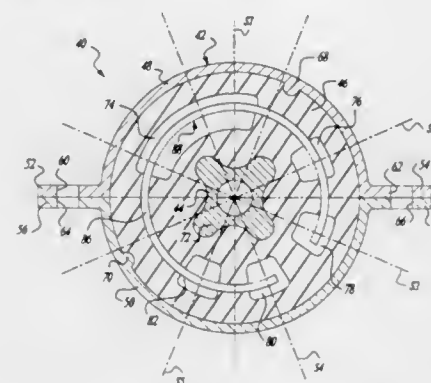
Claims priority, application Germany, Aug. 31, 1995, 295 14

004.6

Int. Cl.<sup>6</sup> F16F 13/06

U.S. Cl. 267-140.11

25 Claims



1. A hydraulically damped bearing for reducing vibration of a unit suspended in a frame, especially for reducing vibration of a mounted motor and a gear unit in a motor vehicle frame, comprising:

5,769,401

## SHIPPING SAFETY DEVICE FOR A PNEUMATIC SPRING

Robert Pradel, Heidenfeld, Germany, assignor to Fichtel &amp; Sachs AG, Schweinfurt, Germany

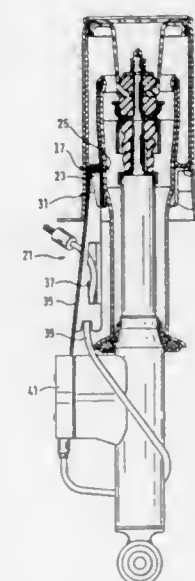
Filed Mar. 8, 1996, Ser. No. 612,552

Claims priority, application Germany, Mar. 11, 1995, 195 08 852.2

Int. Cl.<sup>6</sup> F16F 5/00

U.S. Cl. 267-64.26

19 Claims



- a bearing member connected with a member selected from the group consisting of said unit and said frame;
- a supporting member connected with a member selected from the group consisting of said unit and said frame;
- an elastic supporting body arranged between said bearing member and said supporting member, said elastic supporting body being compressible along a first vibration axis and at least along a second vibration axis, said second vibration axis approximately corresponding to a resultant force resulting from the weight of said unit and the force resulting from the torque of the unit;
- a first compressible cavity filled with a damping fluid, said first compressible cavity contained within said elastic supporting body, said first compressible cavity arranged at least approximately in the region of said first vibration axis; and
- at least a second compressible cavity filled with said damping fluid, said second compressible cavity being connected to said first compressible cavity by means of a connecting member, said second compressible cavity arranged at least approximately in the region of said second vibration axis with said second vibration axis being oriented in a different direction than said first vibration axis.

5,769,400

## HEIGHT AND INCLINATION CONTROL OF A WAGON BODY

Stefan Hölzl; Winfried Hommen; Ralf-Christian Oberthür, and Georg Stauble, all of Munich, Germany, assignors to Knorr-Bremse AG, Munich, Germany

PCT No. PCT/DE93/00980, § 371 Date May 22, 1995, § 102(e)

Date May 22, 1995, PCT Pub. No. WO94/08833, PCT Pub.

Date Apr. 28, 1994

PCT Filed Oct. 13, 1993, Ser. No. 445,700

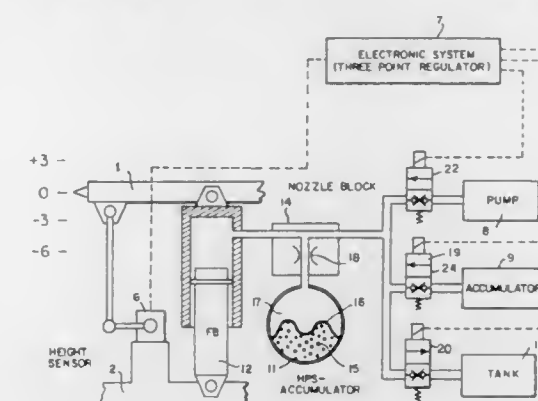
Claims priority, application Germany, Oct. 13, 1992, 42 34

523.5

Int. Cl.<sup>6</sup> B60T 17/02; B60G 17/015; B61F 5/10; 3/00

U.S. Cl. 267-64.16

20 Claims



1. Process for controlling height and inclination of a wagon body for vehicles, having at least one hydropneumatically controlled suspension-damping system which includes a hydropneumatic suspension accumulator, a hydraulic spring strut, a pump, a supply accumulator for a pressure medium, sensors sensing height and inclination of the wagon body and signals of the sensors being fed to an electronic control unit, the process comprising operating the pump to work directly against the hydropneumatic pressure of the hydropneumatic suspension accumulator and pressure medium is removed from the supply accumulator only when delivery volume of the pump is not sufficient for keeping the height of the wagon body constant.

said mechanical transport-safety-device being removably disposed substantially adjacent to said outside surface of said pneumatic-spring chamber, during shipping and before use of the pneumatic-spring shock-absorber assembly;

said mechanical transport-safety-device comprising a mechanical arrangement for occupying a space between said inner suspension tube and said outer suspension tube;

said mechanical arrangement for occupying a space being removably disposed in the space between said inner suspension tube and said outer suspension tube; and

said mechanical arrangement for occupying a space comprises an arrangement for centering said inner suspension tube with respect to said outer suspension tube to orient the longitudinal axis of said inner suspension tube substantially coaxial with the longitudinal axis of said outer suspension tube.

5,769,402

**FLUID-FILLED ELASTIC MOUNT HAVING ORIFICE PASSAGES TUNED TO DAMP INPUT VIBRATIONS IN RESPECTIVE DIFFERENT FREQUENCY RANGES**

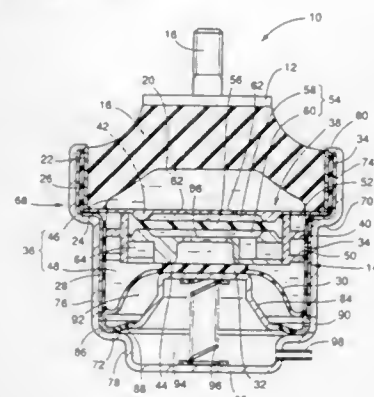
Akiyoshi Ide, Komaki, and Katsuhiko Katagiri, Ichinomiyu, both of Japan, assignors to Tokai Rubber Industries, Ltd., Japan

Filed May 22, 1997, Ser. No. 862,300

Claims priority, application Japan, May 23, 1996, 8-128224  
Int. Cl.<sup>6</sup> F16F 13/00

U.S. Cl. 267—140.14

15 Claims



1. A fluid-filled elastic mount comprising:
- a first and a second mounting member which are spaced apart from each other;
- an elastic body elastically connecting said first and second mounting members and partially defining a pressure-receiving chamber which receives an input vibrational load and which is filled with a non-compressible fluid;
- a flexible diaphragm which partially defines an equilibrium chamber filled with said fluid, said flexible diaphragm being displaceable to permit a change in volume of said equilibrium chamber;
- means for defining a first orifice passage for effecting fluid communication between said pressure-receiving and equilibrium chambers, said first orifice passage being tuned to a first frequency range;
- a movable member disposed between said pressure-receiving and said equilibrium chambers, said movable member being displaceable or deformable so as to permit relative volume changes of said pressure-receiving and said equilibrium chambers;
- means for defining a second orifice passage and a third orifice passage formed between said movable member and one of said pressure-receiving and said equilibrium chambers for permitting fluid flows therethrough based on displacement or deformation of said movable member, said second orifice passage being tuned to a second frequency range which is higher than said first frequency range while said third orifice passage is tuned to a third frequency range which is higher than said second frequency range; and

first control means for permitting or inhibiting the fluid flows through said third orifice passage.

5,769,403

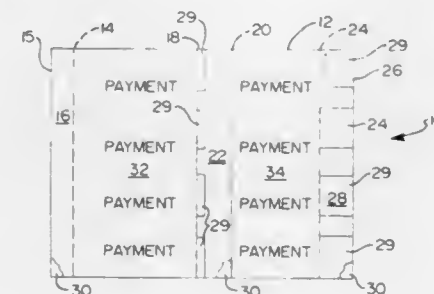
**PRINTING FORM**

Eric S. Tuttleman, 5262 Potomac Run East, West Bloomfield, Mich. 48322

Filed Sep. 20, 1996, Ser. No. 717,480

Int. Cl.<sup>6</sup> B41F 13/54; B65H 39/02; B42D 15/00  
U.S. Cl. 270—1.02

8 Claims



1. An article of paper which, generally, comprises:
- (a) a sheet of stock of substantially rectangular configuration, having an upper surface and a lower surface, the sheet having a first edge and a second edge, the second edge being spaced apart from and parallel to the first edge;
- (b) a first perforation line parallel and proximate to the first edge and having a space therebetween, the space between the first perforation line and the first edge defining a first area therebetween;
- (c) a second perforation line parallel to the first perforation line and spaced therefrom toward the second edge, the space between the first perforation line and the second perforation line defining a second area therebetween;
- (d) a third perforation line parallel to the second perforation line and spaced therefrom toward the second edge, the space between the second perforation line and the third perforation line defining a third area therebetween;
- (e) a fourth perforation line parallel to the third perforation line and spaced therefrom toward the second edge, the space between the third perforation line and the fourth perforation line defining a fourth area therebetween;
- (f) the fourth perforation line being spaced from the second edge of the sheet, the space between the second edge and the fourth perforation line defining a fifth area therebetween; and
- (g) a quantity of adhesive deposited solely on the second surface of the first, third, and fifth areas.

5,769,404

**FINISHING APPARATUS AND IMAGE FORMING SYSTEM INCLUDING THE APPARATUS**

Kunihiko Kanou, Okazaki; Yuusuke Morigami, Toyohashi; Shinobu Seki, Toyokawa; Kazuhito Ozawa, Toyokawa; Shinji Wakamatsu, Toyokawa, and Masahiro Nonoyama, Toyokawa, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Apr. 17, 1996, Ser. No. 633,445

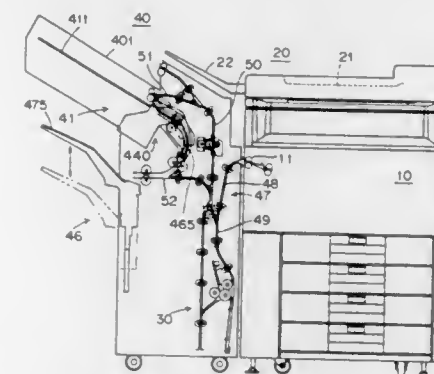
Claims priority, application Japan, Apr. 27, 1995, 7-103372; Apr. 27, 1995, 7-103373; Aug. 18, 1995, 7-210491

Int. Cl.<sup>6</sup> B41L 43/12

U.S. Cl. 270—37

9 Claims

1. A finishing apparatus in which sheets discharged from an image forming apparatus are collected through a predetermined path of sheet transport, and in which a stapling finish is given to a set of collected sheets, comprising:
- sheet folding means for folding a sheet in two generally centrally in a direction of sheet transport, the sheet folding means



removably provided in the sheet transport path and having a pair of forward and reverse rotatable rollers;

control means for controlling the sheet folding means, the control means being operable in a first mode to provide a fold line in the sheet by folding and unfolding the sheet, and in a second mode in which a fold line is provided in the sheet and the pair of rollers are caused to continue to run forward thereby to feed the sheet downstream of the transport path with the sheet kept as folded in two; and

stapling means for driving staples with respect to one of collected unfolded sheet sets and collected folded sheet sets formed by the sheet folding means, the staples to be driven on the fold lines formed on the sheets.

5,769,405

**DEVICE FOR FEEDING A GATHERING SECTION OF A GATHER-STITCHER**

Alfred Glanzmann, Reiden, and Heinz Boss, Strengelbach, both of Switzerland, assignors to GRAPHIA-Holding AG, Hergiswil, Switzerland

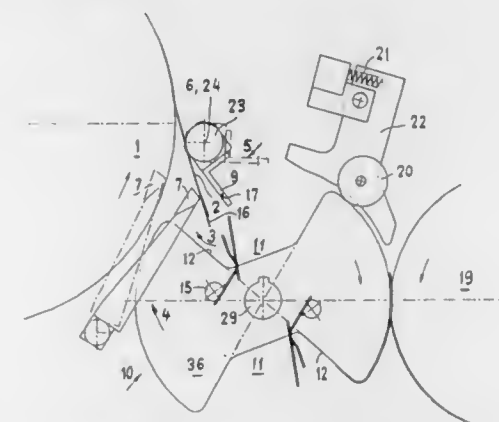
Filed Dec. 19, 1995, Ser. No. 574,681

Claims priority, application Switzerland, Dec. 22, 1994, 0388294

Int. Cl.<sup>6</sup> B65H 39/00

U.S. Cl. 270—52.16

11 Claims



1. In a device for feeding a gathering section of a gather-stitcher including: a rotatably driven conveyor drum which pulls signatures off a stack of a signature magazine with the fold in front and having a circumference to which means are assigned for conveying the signatures in an approximately circular path in which there is disposed an arresting device and then into a trajectory extending in an opposite direction from the arresting device which trajectory terminates in a functional area of a rotating gripper device of an opening mechanism which opens the signatures, the improvement comprising:

a sweeping device comprising a deflecting bar arranged for moving into the trajectory of the signatures; and an adjustable guide bar located opposite the sweeping device during its

movement, the sweeping device sweeping the respective signatures on the oppositely located guide element and into a gripping position associated with the gripper device, the deflecting bar being pivotable parallel with the axis of rotation of the conveyor drum from a position behind the circumference of the conveyor drum to a position which defines, together with the adjustable guide bar, a guide gap for receiving the printed sheets;

wherein said feeding device is utilized for supplying signatures with a post-fold to the gripper device, the gripper device is drum-shaped with a sector-shaped cutout and includes at least one pair of sheet grippers disposed in the sector-shaped cutout, and the adjustable guide bar has an end facing the gripper device which includes a cutout for the passage of one of the sheet grippers which holds the signatures on the gripper device.

5,769,406

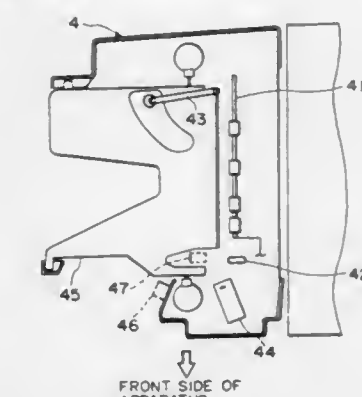
**SHEET PROCESSING APPARATUS FOR SHIFTING SHEETS TOWARD FRONT SIDE OF STACKING TRAY**  
Mitsuhiko Sato, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Japan

Filed Jul. 2, 1996, Ser. No. 677,428

Claims priority, application Japan, Jul. 4, 1995, 7-189723  
Int. Cl.<sup>6</sup> B65H 39/02

U.S. Cl. 270—58.08

10 Claims



1. A sheet processing apparatus comprising:
- a plurality of trays for stacking sheets;
- sheet shifting means for shifting the sheets on a tray so that a portion of the sheets protrudes over said tray;
- selecting means for selecting one of a plurality of processing modes for the sheets in said trays;
- setting means corresponding to each of the processing modes for manually setting whether automatic sheet shifting by said sheet shifting means is to be performed; and
- control means for controlling said sheet shifting means in accordance with the contents set by said setting means and said processing mode selected by said selecting means, wherein with respect to the processing mode selected by said selecting means, said control means automatically operates said sheet shifting means in accordance with the automatic sheet shifting set by said setting means and does not operate said sheet shifting means when automatic sheet shifting is not set.

5,769,407

**MISFEED DETECTOR WITH VOLTAGE RESPONSE ADJUSTMENT**

Paul Hansen, Westminster, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 13, 1997, Ser. No. 782,325

Int. Cl.<sup>6</sup> B65H 5/22

U.S. Cl. 271—3.03

20 Claims

1. In a sheet transport system comprising:



VOL

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2  
1  
1

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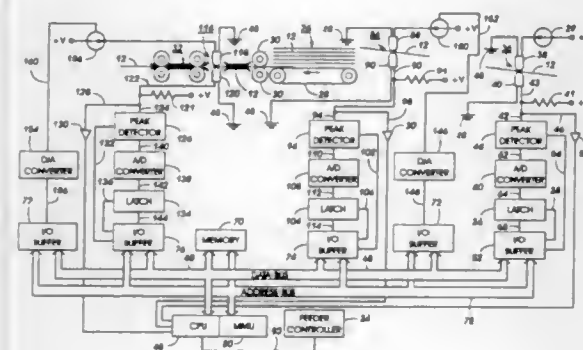
4

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- a. a sensor for sensing a thickness or paper weight value of each sheet passing therethrough;
- b. said sensor comprising an emitter and a phototransistor being so constructed and arranged to receive sheets therebetween;
- c. said emitter emitting light rays towards said phototransistor;
- d. said sensor having a voltage response in accordance with the amount of light sensed by said phototransistor;
- e. condition changing means operably connected to said sensor for changing the conditions of voltage response of said sensor;
- f. said conditions of voltage response being at least one condition for sensing sheets of a first given range of sheet thickness or paper weight value and a second condition for sensing sheets of a second given range of sheets that are thicker or heavier value than said first given range;
- g. said sensor having a voltage response when in said one condition that is higher for a sheet of a given thickness or paper weight value than the voltage response for a sheet of the same given thickness or paper weight value when said sensor is in said second condition; and
- h. said condition changing means being responsive to a signal indicating a thickness or paperweight value of a sheet to be received by said sensor to set the condition of voltage response for said sensor in accordance with the given range of thickness or paper weight value corresponding to the thickness or paper weight value of the sheet to be received.

5,769,408

## APPARATUS FOR FEEDING SHEETS

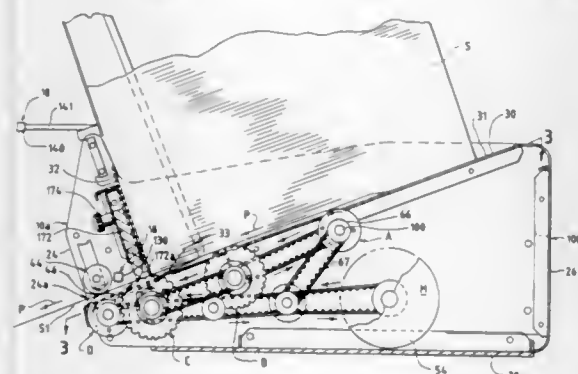
Martin M. Selak, Mt. Prospect, and Vlado Radic, Park Ridge, both of Ill., assignors to Astro Machine Corporation, Elk Grove Village, Ill.

Filed Sep. 22, 1995, Ser. No. 532,494

Int. Cl.<sup>6</sup> B65H 5/00

U.S. Cl. 271—10.03

9 Claims



1. A sheet feeder comprising:
- a platform for supporting a stack of sheets;
- a first roller adapted for contacting at least one sheet from the stack of sheets and feeding the sheet downstream, the first roller including at least first, second and third feed rollers with each feed roller being connected to a first drive means, the first drive means connected to and for driving the first roller, the first drive means including:

a motor driving a motor shaft connected to a motor sprocket, the motor sprocket being entrained with and driving a first drive sprocket connected to a drive shaft having a second drive sprocket;

a first shaft supporting the first feed roller connected to at least two first shaft sprockets, one first shaft sprocket entrained with and being driven by the second drive sprocket;

a second shaft supporting the second feed roller connected to at least two second shaft sprockets, one second shaft sprocket entrained with and being driven by the other first shaft sprocket; and,

a third shaft supporting the third feed roller connected to at least one third shaft sprocket, the third shaft sprocket entrained with and being driven by the other second shaft sprocket;

the second roller being positioned downstream of the first roller and adapted for contacting at least the one sheet fed from the first roller and feeding the one sheet to an output location, the second roller including at least one pair of parallel pull rollers connected to a second drive means;

the second drive means connected to and for driving the second roller;

a first sensor means disposed downstream of the first roller for detecting either the presence or absence of the one sheet and communicating with the first drive means;

the first sensor means controlling the first drive means to change from a driving condition to a non-driving condition when the presence of the one sheet is detected by the first sensor means and to change from a non-driving condition to a driving condition when the absence of the one sheet is detected by the first sensor means;

a second sensor means disposed downstream of the second roller for detecting either the presence or absence of the one sheet and communicating with the second drive means;

the second sensor means controlling the second drive means to change from a driving condition to a non-driving condition when the presence of the one sheet is detected by the second sensor means and to change from a non-driving condition to a driving condition when the absence of the one sheet is detected by the second sensor means;

in a driving condition the first drive means driving the first roller at a first radial speed in a first radial direction, and in a non-driving condition the first drive means not driving the first roller;

in a driving condition the second drive means driving the second roller at a second radial speed; and,

a means associated with the first roller for permitting the first roller to free-wheel in the first radial direction either when the first drive means is not driving the first roller or when the radial speed of the first roller is greater than the first radial speed.

5,769,409

## PAPER REGULATING MECHANISM AND PAPER CASSETTE

Yasuhiro Nakamatsu; Masao Otsuka; Fumio Hatanaka, and Aribiro Tsunoda, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 372,048, Jan. 12, 1995. This application May 15, 1996, Ser. No. 649,964

Claims priority, application Japan, Jan. 14, 1994, 6-002813; Jan. 14, 1994, 6-002814

Int. Cl.<sup>6</sup> B65H 1/00

U.S. Cl. 271—171

5 Claims

1. A paper regulating mechanism in a paper feed cassette for accommodating paper sheets, comprising:

a bottom plate on which paper sheets are placed;

a guide plate disposed below said bottom plate, said guide plate having a slit with a predetermined width;

a paper regulating plate having

an upper plate-shaped paper regulating portion against which the paper sheets come into abutment;

5,769,411

## SHEET FEEDING APPARATUS WITH SHEET SEPARATION FEATURE

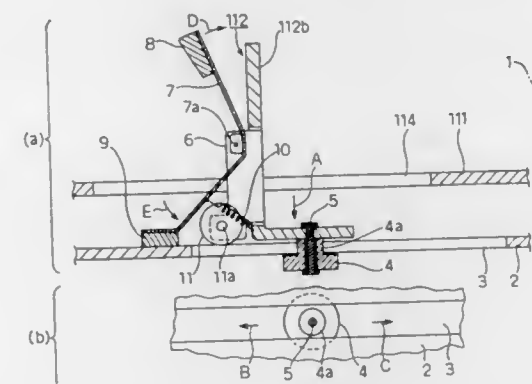
Tomohito Nakagawa, Tokyo; Noriyoshi Ueda, Yokohama, and Masakazu Hiroi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1996, Ser. No. 651,239

Claims priority, application Japan, May 26, 1995, 7-128148 Int. Cl.<sup>6</sup> B65H 3/52

U.S. Cl. 271—122

21 Claims



a lower guided portion connected at a lower end of said upper plate-shaped regulating portion and disposed below said bottom plate and slidingly engaged along said slit by a first roller disposed in said slit;

a second roller connected to said paper regulating plate and rotatable on said guide plate; and

lock means for fixing said paper regulating plate in selected positions with respect to said guide plate.

5,769,410

## LIFT AND DRIVE ACTUATORS FOR FEEDER CRU

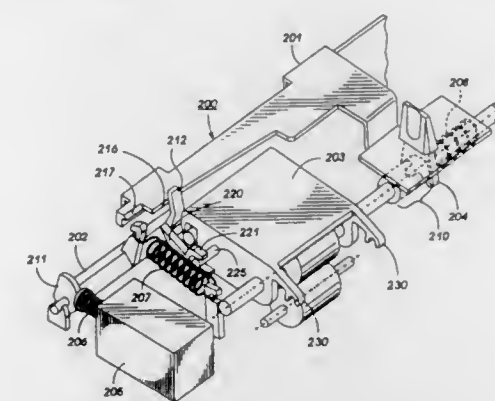
Harry A. Davidson, and Donald J. Lyon, both of Macedon, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 19, 1996, Ser. No. 715,740

Int. Cl.<sup>6</sup> B65H 3/06

U.S. Cl. 271—109

6 Claims



1. An electrophotographic printing machine having a customer replaceable feed roll assembly, comprising:

a print engine which receives sheets from the feed roll assembly for marking images thereon;

an interlock device;

a lift mechanism, cooperating with said interlock device, to raise the replaceable feed roll assembly when said interlock device is moved from a first position to a second position, wherein said interlock device comprises a planar member, said planar member having a protrusion attached to a drive coupling, wherein said drive coupling mates with the replaceable feed roll assembly when said planar member is in the first position wherein said lift mechanism comprises an actuator to cause said lift mechanism to raise a portion of said feed roll assembly when said planar member is moved to the second position.

5,769,412

## PAPER SLIP STORAGE UNIT

Takatoshi Takemoto, Tokyo; Yoshio Ito, and Motohiro Sugawara, both of Hanamaki, all of Japan, assignors to Kabushiki Kaisha Ace Denko, Tokyo, Japan

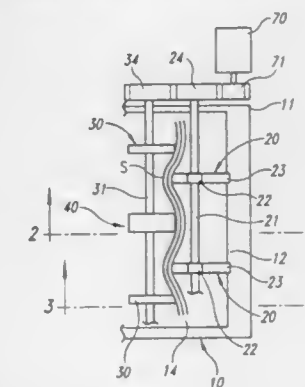
PCT No. PCT/JP95/00346, § 371 Date Sep. 3, 1996, § 102(e) Date Sep. 3, 1996, PCT Pub. No. WO95/23757, PCT Pub. Date Sep. 8, 1995

PCT Filed Mar. 3, 1995, Ser. No. 702,577

Claims priority, application Japan, Mar. 3, 1994, 6-033888 Int. Cl.<sup>6</sup> B65H 29/70

U.S. Cl. 271—188

4 Claims



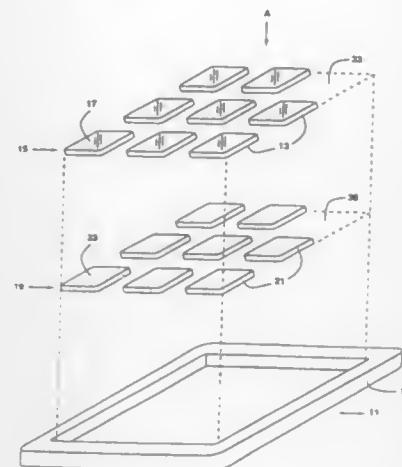
1. In a paper slip storage unit for storing a plurality of paper slips transported from a given direction, a paper slip storage unit comprising:

a storage chamber having an inlet for taking in said plurality of paper slips, a stopper face perpendicular to a transport direc-





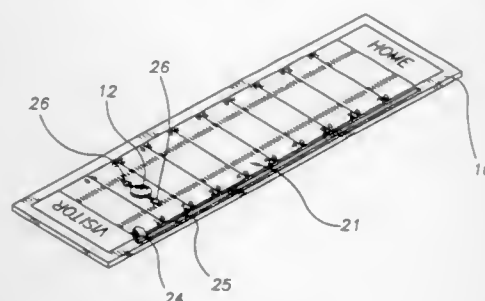
5,769,418  
**TRANSPARENT PUZZLE HAVING AT LEAST TWO  
IMAGE PLANES**  
Daniel B. Gilbert, 261 Ricardo Rd., and Walter L. Good, III,  
493 Lovell Ave., both of Mill Valley, Calif. 94941  
Filed Dec. 11, 1996, Ser. No. 763,470  
Int. Cl.<sup>6</sup> A63F 9/12  
U.S. Cl. 273—157 A



11 Claims

1. A slide puzzle comprising  
a frame having a top image plane and a bottom image plane  
beneath said top image plane, and  
a first set of regularly shaped tiles slidably held in a top image  
plane in said frame and having at least one free space such  
that the tiles of said first set of tiles may be slidably moved  
relative to each other in said top image plane to any position  
within said frame, each of said tiles providing at least a  
portion of a top image formable in said top image plane by the  
proper positioning of said tiles,  
said bottom image plane having a bottom image therein that is  
associated with the formable top image in said top image  
plane, and  
said first set of tiles being transparent such that said bottom  
image plane can be seen through said first set of tiles and such  
that a desired composite image constituting a desired solution  
to the puzzle is formed by said formable top image and said  
bottom image only upon proper manipulation of said first set  
of tiles within said frame.

5,769,419  
**FOOTBALL BOARD GAME**  
Tomas Hill, 461 W. 9th St., #304, Mesa, Ariz. 85201  
Filed Aug. 19, 1997, Ser. No. 914,564  
Int. Cl.<sup>6</sup> A63F 3/00  
U.S. Cl. 273—247



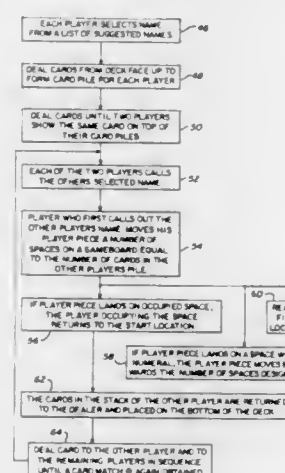
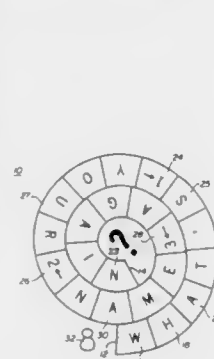
1. A football board game comprising:  
a playing field board having the markings of a football playing  
field printed on a substantially planar side surface thereof;

18 Claims

a ball marker having a pair of pointers that are aligned along the  
same axis and used to indicate a scrimmage line when placed  
on said markings of said playing field board;  
two card placement mats, each card placement mat including  
printing on one side thereof that defines six substantially  
rectangular card positioning areas;  
six decks of playing cards;  
two erasable stat sheets, each said erasable stat sheet having an  
erasable coating provided on one side surface thereof and five  
boxes defined thereon labeled to provide areas for recording  
game statistics;  
a dice board having dice throwing areas that are partially defined  
by a raised perimeter sidewall and a central dividing wall;  
thirty dice, each dice having six side faces with a numeral from  
one-six indicated on each of said six side faces; and  
a first and second outcome charts, the first outcome chart having  
lists in a grid format to show the outcomes of a card turnover  
when a running play is attempted and the offensive and  
defensive players each have drawn a card having a value  
between a 2 and a King, the second outcome chart having lists  
in a grid format to show the outcomes of a card turnover when  
a passing play is attempted and one of the offensive and  
defensive players has drawn an Ace and the other player has  
drawn a card having a value between a 2 and a King.

5,769,420  
**METHOD OF PLAYING A BOARD GAME**  
Caroline R. Sultzbaugh, 16 Stonebriar Way, Frisco, Tex. 75034  
Filed May 28, 1997, Ser. No. 864,764  
Int. Cl.<sup>6</sup> A63F 3/00  
U.S. Cl. 273—249

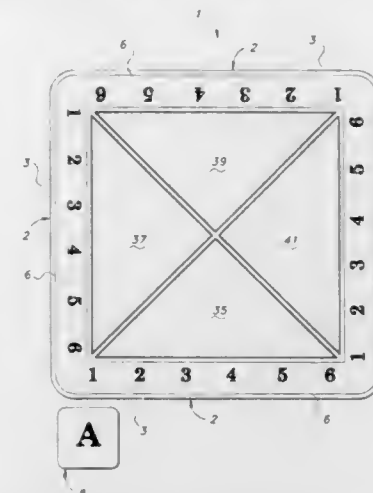
16 Claims



1. A method of playing a board game with a plurality of players  
comprising the steps of:  
providing a board with a path for movement of player pieces  
along a plurality of spaces marked on said path from a START  
location to a FINISH location;  
each player selecting a name other than the player's own name,  
said selected name of each player being told to all other  
players;  
sequentially dealing cards to each player from a deck having a  
plurality of matching cards to form a card pile for each player  
until the last card dealt on the card pile of a first player  
matches the last card previously dealt on the card pile of a  
second player; and  
moving the player piece of one of the first and second players  
who first calls out the selected name of the other player a  
number of spaces along said path equal to the number of cards  
in the card pile of the other player.

5,769,421  
**WORD FORMING GAME**  
Martin A. Wakefield, 199 S. McLean #11, Memphis, Tenn.  
38104  
Filed Nov. 27, 1996, Ser. No. 757,878  
Int. Cl.<sup>6</sup> A63F 3/00  
U.S. Cl. 273—272

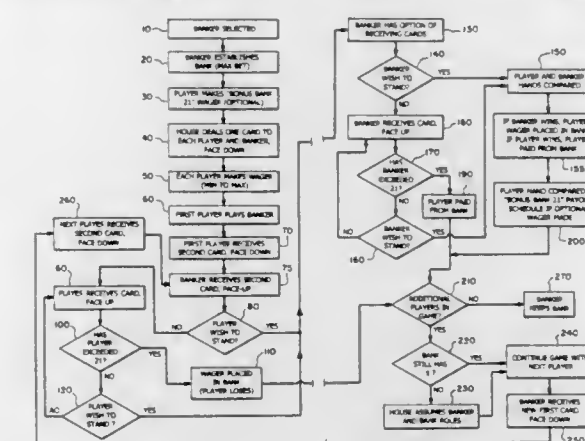
20 Claims



1. A word game apparatus comprising:  
a plurality of letter tiles, each imprinted with at least one letter;  
a game board having a plurality of player areas, each of the  
player areas being provided with an identical set of indicia for  
identifying a position for placement of one or more of said  
letter tiles around the board and adjacent to one or more of  
said player areas during game play; and  
a selection means for randomly selecting at least one of said  
letter tiles placed adjacent to said one or more of the player  
areas.

5,769,422  
**CARD GAME AND APPARATUS**  
Daniel W. Stromer, 500 Gladiola St., Golden, Colo. 80401  
Filed Nov. 14, 1996, Ser. No. 749,187  
Int. Cl.<sup>6</sup> A63F 1/00  
U.S. Cl. 273—274

12 Claims

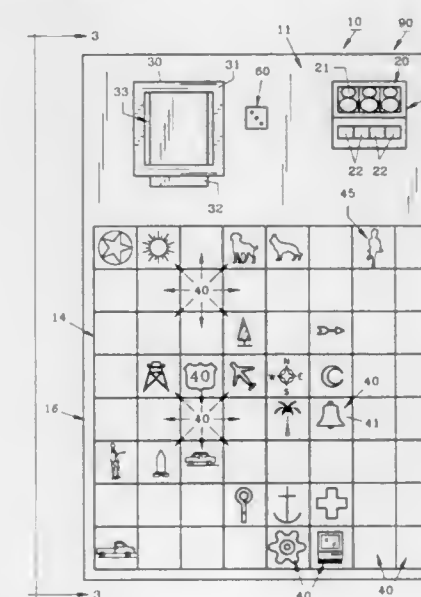


1. A method for playing blackjack wherein at least two players  
play against a banker, the method comprising:  
a) offering the position of banker to at least three players;  
b) the banker placing an initial amount into a bank;  
c) dealing an initial card to the players;  
d) dealing an initial card to the banker;  
e) a first player making an initial wager limited at least by said  
initial amount;  
f) dealing another card to said first player;  
g) dealing another card to the banker;

h) repeating step f until the player chooses not to receive another  
card;  
i) repeating step g until the banker chooses not to receive  
another card;  
j) evaluating the player's cards and the banker's cards in the  
manner of conventional blackjack and determining a winning  
player and a losing player;  
k) if said banker is the winning player, placing said initial wager  
into the bank;  
l) if said first player is the winning player paying the first player  
from the bank;  
m) repeating steps d through l with the banker playing a second  
player;  
n) paying the banker any money remaining in the bank after all  
players have played.

5,769,423  
**BOARD GAME AND METHOD**  
Robin Walker, 503 Martin Luther King Dr., Greensboro, N.C.  
27406  
Filed Jul. 28, 1997, Ser. No. 900,142  
Int. Cl.<sup>6</sup> A63F 3/00  
U.S. Cl. 273—287

15 Claims

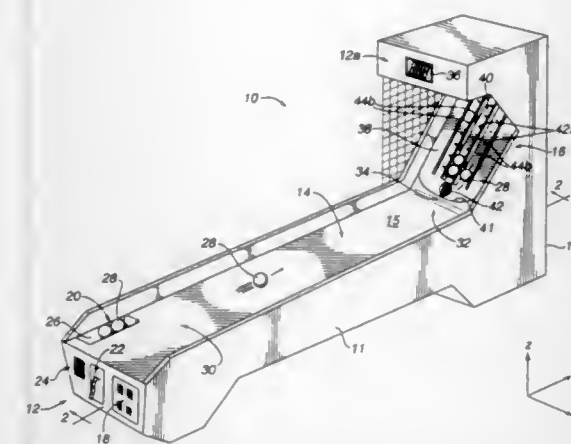


1. A game comprising:  
a) a game board, said board defining a first recess;  
b) means for timing play, said timing means contiguous to said  
game board;  
c) means for containing text, said text containing means posi-  
tioned proximate said game board; and  
d) a plurality of pictorial supports, said pictorial supports dis-  
posed within said first recess.

5,769,424  
**ARCADE GAME FOR STACKING DIRECTED PLAYING  
PIECES**  
Matthew F. Kelly, San Ramon; Bryan M. Kelly, Alamo, both of  
Calif., and J. Richard Oltmann, Scottsdale, Ariz., assignors  
to RLT Acquisition, Inc., Pleasanton, Calif.  
Filed Sep. 24, 1996, Ser. No. 719,016  
Int. Cl.<sup>6</sup> A63D 3/00  
U.S. Cl. 273—352

49 Claims

1. A game apparatus providing a game, said game apparatus  
comprising:  
a playing surface having a player end and a target end;



a target provided near said target end of said playing surface, said target being operative to simultaneously engage a plurality of playing pieces directed from said player end to said target end by said player during said game, said target receiving said playing pieces in a predetermined configuration that causes each additional playing piece to be engaged with said target with greater difficulty by said player due to the presence of previously-directed playing pieces engaged with said target; and  
a detection device provided at said target, wherein said detection device detects the number of said directed playing pieces engaged with said target.

5,769,425

Patent Not Issued For This Number

5,769,426

TWO PERSON TUG OF WAR

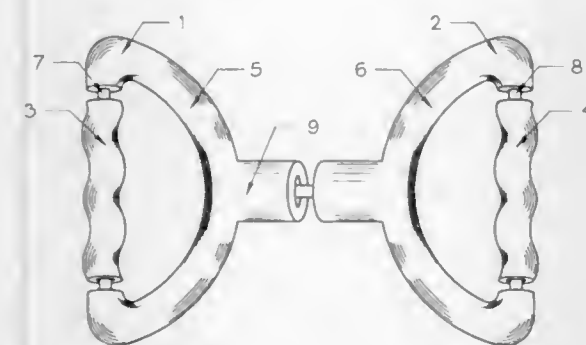
Michael Mintack Gill, 3250 Wilshire Blvd. Suite 2009, Los Angeles, Calif. 90010

Filed May 2, 1997, Ser. No. 850,179

Int. Cl.<sup>6</sup> A63B 67/00

U.S. Cl. 273—452

19 Claims

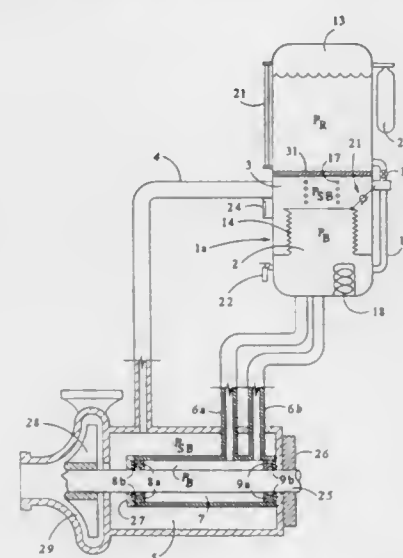


1. A gaming device comprising  
a frame having a first end and a second end and extending longitudinally therebetween;  
a first hand grip rotatably mounted to the frame at the first end about a first axis substantially perpendicular to the longitudinal extension of the frame between the first end and the second end;  
a second hand grip rotatably mounted to the frame at the second end about a second axis substantially perpendicular to the longitudinal extension of the frame between the first end and the second end.

5,769,427  
DUAL SEAL WITH CLEAN BARRIER FLUID AND  
DYNAMIC PRESSURE CONTROL  
Michael H. Ostrowski, Lake Forest, Ill., assignor to Chesterton International Company, Stoneham, Mass.  
Continuation-in-part of Ser. No. 527,458, Sep. 13, 1995, Pat. No. 5,636,847. This application Oct. 8, 1996, Ser. No. 727,194  
Int. Cl.<sup>6</sup> F16J 15/34

U.S. Cl. 277—3

28 Claims



1. In a seal assembly having a stuffing box containing an outboard seal, an inboard seal exposed to process fluid at a stuffing box pressure, and a pressurizable space in said stuffing box in which said outboard and inboard seals are disposed, the improvement comprising:

a container comprising three chambers including a process fluid chamber, a barrier fluid chamber and a barrier fluid reservoir chamber;  
a movable impermeable first wall disposed in said container and separating said process fluid and said barrier fluid chambers;  
an impermeable second wall disposed in said container and separating said barrier fluid and said barrier fluid reservoir chamber;  
means for supplying barrier fluid to said barrier fluid chamber for filling said barrier fluid chamber with said barrier fluid;  
means for supplying said barrier fluid from said barrier fluid chamber to said space in said stuffing box for applying pressure to said outboard seal and to said inboard seal; and  
means for placing said process fluid chamber and said stuffing box in fluid communication for placing said process fluid chamber at said stuffing box pressure and for causing said first wall to constantly assume an equilibrium state at which substantially no pressure differential exists across said inboard seal.

5,769,428

DEVICE FOR SEALING A HOOD THAT PROTECTS A  
TUMBLING BARREL

Mark Rypalla, Hamminkeln, Germany, assignor to A. Friedr. Flender AG, Bocholt, Germany

Filed Oct. 31, 1996, Ser. No. 741,516

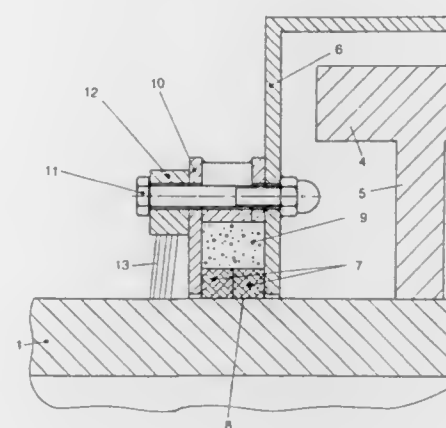
Claims priority, application Germany, Nov. 15, 1995, 195 42 563.4

Int. Cl.<sup>6</sup> F16J 15/24; 15/447

U.S. Cl. 277—350

3 Claims

1. An arrangement for sealing a rotating drum of a tubular mill relative to a stationary hood surrounding said drum comprising: a rotating drum and a stationary hood surrounding said drum; a race with running surface formed on said drum and being a part of said drum, said running surface rotating with said drum about an axis of



rotation; at least one stationary sealing cord comprised of a wear-resistant and temperature dependent material, said cord being held on the hood and being pressed against said running surface; a compressible pre-stressed ring for supporting said cord and producing pressure for pressing said cord to said running surface; a holding plate in form of a cap secured to said hood by screws, said hood having a sidewall, said holding plate and a part of said sidewall demarcating an expansion chamber for receiving said compressible ring and said cord; said screws in combination with said holding plate holding said compressible ring within said expansion chamber under constant pre-stressing; a brush ring secured to said hood on a side of said cord facing away from said hood; said brush ring having bristles lying on said running surface; a narrowest possible gap between said rotating running surface and said hood and said holding ring for preventing a sideways bulging out of said cord.

5,769,429

SEAT FOR AIR VALVES

Robert W. Smetters, and Ted J. Makowan, both of Schaumburg, Ill., assignors to Val-Matic Valve and Manufacturing Corp., Elmhurst, Ill.

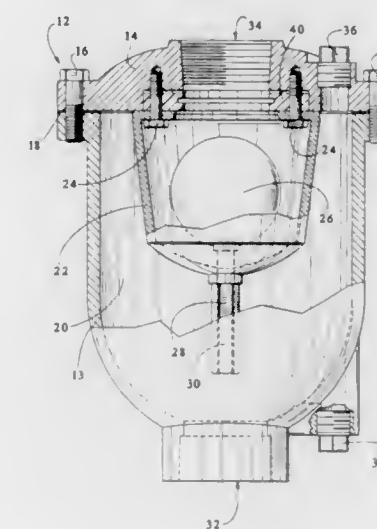
Continuation of Ser. No. 492,931, Jun. 21, 1995, abandoned.

This application Sep. 30, 1996, Ser. No. 724,086

Int. Cl.<sup>6</sup> F16J 15/10; 15/32

U.S. Cl. 277—549

17 Claims



1. An air valve comprising:  
a resilient member having a top surface and a bottom surface and a through hole therebetween, said through hole having a peripheral edge;

a circular raised bead positioned on said bottom surface, said circular raised bead having a diameter larger than that of said through hole, such that a lateral expanse of said bottom surface exists between said peripheral edge of said through hole and said circular raised bead;  
a notch formed in said top surface circumscribing said through hole and having a diameter larger than that of said through hole so that said notch forms a sealing contact surface on said top surface at said peripheral edge of said through hole; and  
a float having a valve surface arranged to compress said circular raised bead said valve surface closing said through hole and sealing against said raised bead.

5,769,430

METAL GASKET WITH BEAD AND THERMAL  
SPRAYED LAYER THEREOF

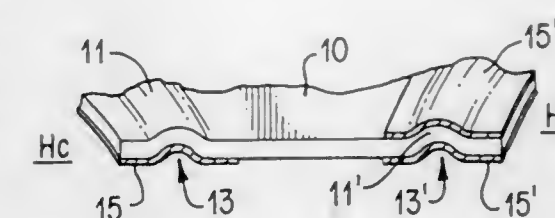
Tsunekazu Udagawa, Ichikawa, Japan, assignor to Ishikawa Gasket Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1996, Ser. No. 723,543

Int. Cl.<sup>6</sup> F16J 15/08

U.S. Cl. 277—592

9 Claims



1. A metal gasket for an internal combustion engine, comprising,  
a metal plate for constituting the metal gasket, said metal plate having a hole and a bead formed around the hole for sealing the same, and  
a thermal sprayed layer formed integrally on at least one side of the bead, said thermal sprayed layer directly contacting and covering the bead without extending a substantially entire area of the metal plate to increase surface pressure of the bead when the bead is compressed.

5,769,431

BACKPACK AND LOAD CONVEYANCE APPARATUS

Paul Cordova, 28881 Hillside Rd., Pueblo, Colo. 81006

Filed Nov. 6, 1995, Ser. No. 553,857

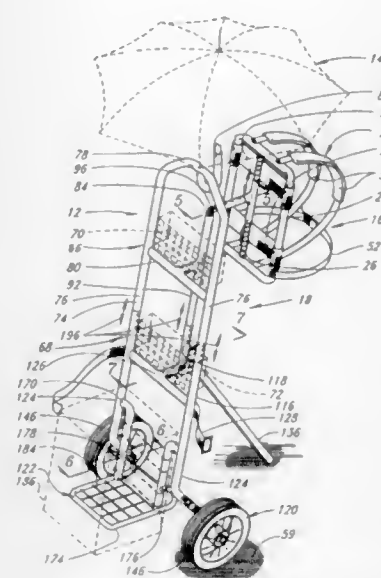
Int. Cl.<sup>6</sup> B62D 51/04

U.S. Cl. 280—1.5

20 Claims

1. A backpack and load conveyance apparatus comprising:  
a) a harness support assembly adapted to be carried on shoulder and waist areas of a user thereof;  
b) a main load conveyance assembly having an upper connector frame assembly which is pivotally, rotatably, adjustably, and releasably connected to said harness support assembly;  
c) said main load conveyance assembly includes a lower support frame assembly which is releasably and adjustably connected to said upper connector frame assembly;  
d) said lower support frame assembly includes a support wheel assembly engagable with a support surface and a foldable nose plate assembly; and  
e) said foldable nose plate assembly includes a nose plate frame assembly pivotally connected to a portion of said lower sup-





port frame assembly and movable from a retracted position to a laterally extended position to receive loads thereon.

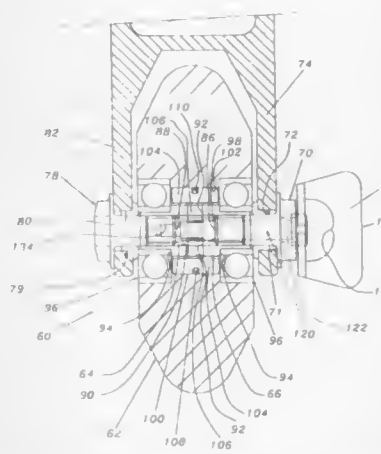
5,769,432

## LOCK ASSEMBLY FOR IN-LINE SKATE

Andrew P. Tybinkowski; Peter A. Tybinkowski, both of 39 Burning Bush Dr., Boxford, Mass. 01921, and Roderick D. Swift, 76 Tobey Rd., Belmont, Mass. 02178  
Filed Dec. 13, 1995, Ser. No. 571,761  
Int. Cl.<sup>6</sup> A63C 17/14

U.S. Cl. 280—11.2

26 Claims



1. An in-line skate having a plurality of wheels in tandem, each of said wheels having a central opening therethrough and being disposed between first and second side frame members, each of said wheels being rotatably mounted on a stationary axle assembly disposed in said wheel opening and comprising bolt means disposed in opposed openings in said side frame members, and a hollow axle member mounted on said bolt means, said skate further comprising ball bearings mounted on said axle member and said wheel mounted on said ball bearings, an inside surface of said wheel and said axle member defining a cavity therebetween, said skate characterized by pad means disposed in said cavity, support means extending from said pad means, each of said support means extending through a hole in said axle, with a free end of said support means disposed in said axle, said actuator means disposed in said axle and engaged with said free ends of said support means, said actuator means being movable in said axle and configured to cause movement of said support means, and thereby movement of

said pad means, into and out of engagement with said wheel inside surface to lock and unlock said wheel respectively.

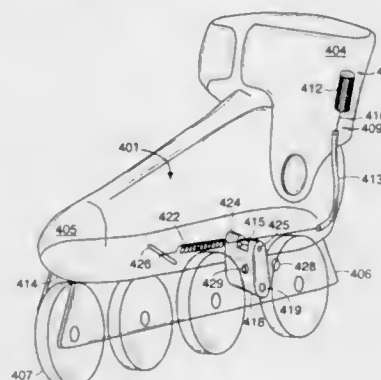
5,769,433

## BRAKING DEVICE PARTICULARLY FOR SKATES

Claudio Zorzi, Paderno Di Ponzano Veneto; Peter Edauw, S. Zenone Degli Ezzelini, and Luca Marconato, Padernello Di Paese, all of Italy, assignors to Nordica S.p.A., Treviso, Italy  
Continuation of Ser. No. 158,113, Nov. 24, 1993, Pat. No. 5,505,469. This application Apr. 5, 1996, Ser. No. 628,254  
Claims priority, application Italy, Nov. 30, 1992, TV92A0149; Nov. 30, 1992, TV92A0151  
Int. Cl.<sup>6</sup> A63C 17/14

U.S. Cl. 280—11.2

14 Claims



1. A skate comprising:  
a longitudinally-extending frame for supporting a set of wheels;  
a quarter mounted above said frame for forward and rearward pivotal movement to said frame about a first axis;  
a braking element mounted below said quarter for pivotal movement about a second axis; and  
at least one traction element which passes rearwardly of and below said quarter and connects said quarter to said braking element, said traction element being arranged such that forward rotation of said quarter creates a traction force in said traction element and causing pivoting of said braking element about said second axis towards a braking surface.

5,769,434

## SPORTS EQUIPMENT OR VEHICLES WITH RUNNERS WITH INTERCHANGEABLE BLADE

Holger Wurthner, Esslinger Strasse 23, D-78054 Villingen-Schwenningen, Germany  
PCT No. PCT/DE93/00913, § 371 Date Mar. 22, 1995, § 102(e)  
Date Mar. 22, 1995, PCT Pub. No. WO94/08668, PCT Pub. Date Apr. 28, 1994

PCT Filed Sep. 24, 1993, Ser. No. 403,927

Claims priority, application Germany, Oct. 8, 1992, 42 33 880.8

Int. Cl.<sup>6</sup> A63C 1/32

U.S. Cl. 280—11.18

23 Claims

1. A runner, said runner comprising:  
a base unit having a top side and a bottom side and an interchangeable runner blade fastened to said bottom side of said base unit,  
said runner blade including a contact blade on a bottom side of said runner blade, said contact blade having gripping ridges embedded into said runner blade,  
a stabilization rail integral with the lower side of the base unit, said stabilization rail having an upper edge and a lower edge, said runner blade being in contact with the stabilization rail and  
wherein a plurality of transverse openings pass through said stabilization rail and said runner blade, respectively, into each

5,769,436

## MOVABLE DEVICE OF THE MOVABLE PARASOL STAND TYPE WITH CONCEALED WHEELS

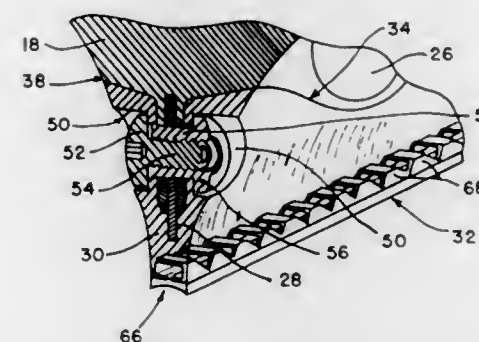
Jean-Pierre Andrey, Saint Paul En Foret, France, assignor to Androll, Saint Paul en Foret, France  
PCT No. PCT/FR95/00409, § 371 Date Sep. 27, 1996, § 102(e)  
Date Sep. 27, 1996, PCT Pub. No. WO95/27169, PCT Pub. Date Oct. 12, 1995

PCT Filed Mar. 30, 1995, Ser. No. 716,452

Claims priority, application France, Mar. 31, 1994, 94 04269  
Int. Cl.<sup>6</sup> B62B 1/22

U.S. Cl. 280—47.17

10 Claims



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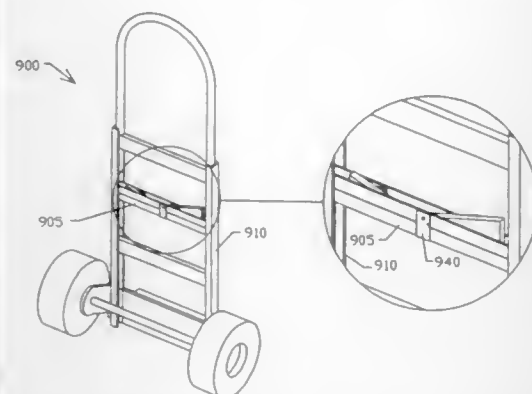
1998

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OFFICIAL GAZETTE

JUNE 23, 1998



cally attracted to one another, coupling said skater's shoe to said top surface of said platform.

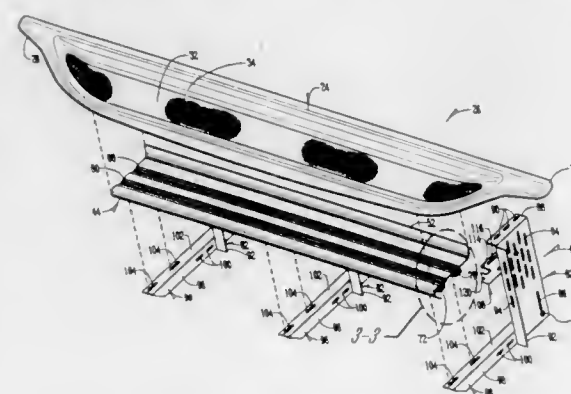
5,769,439  
**UNIVERSAL RUNNING BOARD ACCESSORY,  
PREFERABLY WITH FENDER ATTACHMENT**  
Scott P. Thompson, Des Moines, Iowa, assignor to DFM Corporation, Indianola, Iowa

Filed May 21, 1996, Ser. No. 651,962

Int. Cl.<sup>6</sup> B60R 3/00

U.S. Cl. 280—163

15 Claims



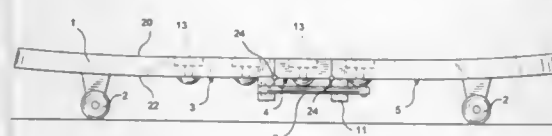
a doorstop holster having:

a rectangular box having a pair of first sides and a pair of second sides each being longer than each of the first sides, and an open top, each of the first sides having a length substantially similar to the leg width of the vertical side legs and the cross-brace width of the horizontal cross-brace;

a first doorstop supported within the rectangular box; and  
a clip connected to the box for attaching the box to the horizontal cross-brace of the handtruck so that the box fits within the leg width of the vertical side legs and the cross-brace width of the horizontal cross-brace, wherein the clip allows the box to be coupled and decoupled from the horizontal cross-brace of the handtruck.

5,769,438  
**SKATEBOARD**  
Felix Svetlov, 2977 W. 33 St., #15C, Brooklyn, N.Y. 11224-1401  
Filed Feb. 19, 1997, Ser. No. 746,600  
Int. Cl.<sup>6</sup> B62M 1/00  
U.S. Cl. 280—87.041

6 Claims



1. A wheeled skateboard and shoe attachment system comprising:

a skateboard consisting of a platform with top and bottom surfaces; said platform comprising first, second and third separate sections, said first and second sections foldably connected to the third section;

a lock; said lock located at said bottom surface of said platform, said lock including a pair of cylindrical rods, each said rod having first and second ends, each said first end pivotally connected to the first section of the platform;

a pair of receiver elements located at said second platform section;

said skateboard occupies one of a folded unlocked position and an extended locked position;

in said extended locked position each said rod is received in one of said pair of receiver elements, the respective second ends of said pair of rods connected to each other by a spring and said three separate sections of the platform being coplanar with one another;

said wheeled skateboard and shoe attachment system including:  
a plurality of magnetic elements recessed within said top surface of said platform, a plurality of magnetically attractable elements having polarity opposite to the polarity of said plurality of magnetic elements, said plurality of magnetically attractable elements recessed within a sole of a skater's shoe;

wherein in use said plurality of magnetic elements and said plurality of magnetically attractable elements are magneti-

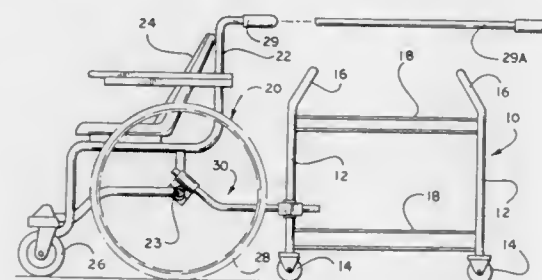
1. A vehicular body extension for attachment to a vehicle having a driver side, a passenger side, and at least one fender, said vehicular body extension comprising:

an elongated running board having a first end, a second end, a midpoint between said first and second ends, and a substantially horizontal support platform between said first and second ends, said support platform being tapered towards both said first and second ends;

said running board being substantially symmetrical about said midpoint so that said running board is attachable to either said driver side or said passenger side.

5,769,440  
**WHEELCHAIR WITH MOBILE ACCESSORY**  
Cardell I. Jones, Savannah, Ga., assignor to St. Joseph's Hospital, Inc., Savannah, Ga., a part interest  
Filed Mar. 5, 1996, Ser. No. 609,598  
Int. Cl.<sup>6</sup> B62K 27/00  
U.S. Cl. 280—204

2 Claims



1. A wheelchair and mobile accessory combination comprising:  
a wheelchair having a frame, said frame having a forward portion and a rear portion that includes a transverse member comprised of two telescopically mounted tubes, at least one front wheel pivotally mounted to said frame forward portion, two rear wheels mounted to said frame rear portion straddling said transverse member, and a seat mounted to said frame;

JUNE 23, 1998

GENERAL AND MECHANICAL

3745

a mobile accessory having a frame that includes an upright member and a plurality of wheels mounted to said mobile accessory frame;

and means for detachably hitching said mobile accessory to said wheelchair in a wheelchair trailing position that comprises two bars, forward clamp means for clamping a forward portion of one of said bars to one of said tubes in a plurality of bar orientations and with the other bar clamped by another of said forward clamp means to the other of said tubes in a plurality of bar orientations, and rear clamping means for detachably clamping said mobile accessory to rear portions of said bars.

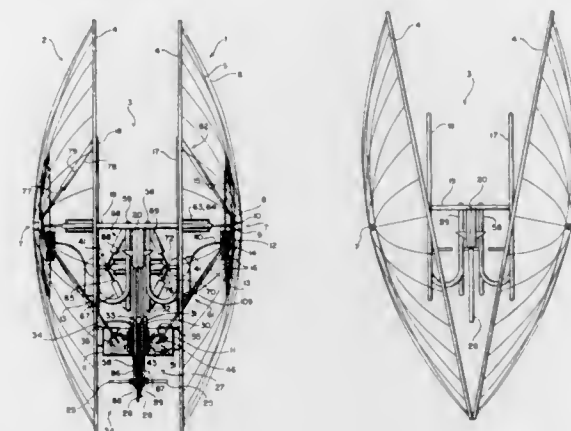
5,769,441  
**VEHICLE HAVING TWO AXIALLY SPACED  
RELATIVELY MOVABLE WHEELS**  
Abdulatif Namngani, P.O. Box 13925, Jeddah 21414, Saudi Arabia

Filed Sep. 19, 1995, Ser. No. 530,086

Int. Cl.<sup>6</sup> B62K 17/00

U.S. Cl. 280—208

58 Claims



1. In a parallel vehicle comprising:

a pair of wheel hubs;

only two side-by-side wheels attached to the parallel vehicle, each rotatably mounted on a respective one of said wheel hubs such that said vehicle includes no wheels other than the two side-by-side wheels; and

an assembly to which said only two side-by-side wheels are rotatably mounted, said assembly including:

a chassis having two sides;

means for connecting the hubs to the chassis such that said hubs are non-rotatable with respect to said chassis;

a support structure positioned between the two sides of the chassis and below a center line connecting the wheels; and

propulsion means depending from said support structure for causing rotation of the wheels relative to said hubs to propel said vehicle, the improvement wherein:

said means for connecting the hubs to the chassis include first and second wheel position control means for changing a relative distance between respective ones of said wheels and the chassis by changing a distance between at least one of said hubs and said chassis during said rotation of said wheels.

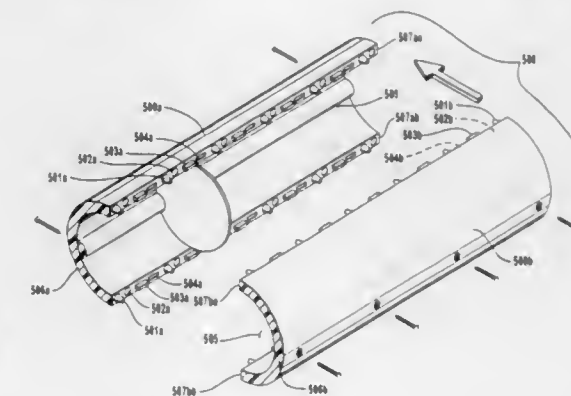
5,769,442  
**STRUCTURAL SHELL FRAMES AND METHOD OF  
MAKING SAME**

Alexander J. Robinson, Salt Lake City, and Christopher O. Paragas, Kearns, both of Utah, assignors to TekSource, LLC, Draper, Utah

Continuation-in-part of Ser. No. 189,590, Jan. 31, 1994, Pat. No. 5,464,240. This application Oct. 10, 1995, Ser. No. 541,371  
Int. Cl.<sup>6</sup> B62K 3/02

U.S. Cl. 280—281.1

48 Claims



1. A lightweight structural component for a human-powered vehicle, the structural component comprising:

a first partial shell, said first partial shell having a proximal side and a distal surface,

a second partial shell, said second partial shell having a proximal side and a distal surface,

said first and second partial shells being joined to form an assembled shell, an outer tube skin on said distal surface of each of said partial shells, said outer tube skins forming an exterior surface of the assembled shell,

an interior cavity located on the proximal side of each partial shell, said interior cavities each having a volume that includes a hollow portion,

a first joining face located along the length of said first partial shell,

a second joining face located along the length of said second partial shell, said first joining face of said first partial shell being in firm contact with said first joining face of said second partial shell in the assembled shell, said second joining face of said first partial shell being in firm contact with said second joining face of said second partial shell in the assembled shell,

a protrusion located in a joining face of said first partial shell,

a receptacle located on a joining face of said second partial shell and

a reinforcing rib located on the proximal side of one of said partial shells said reinforcing rib being adapted to provide structural strength to said assembled shell;

wherein said assembled shell has a first seam where said first joining face of said first partial shell meets said first joining face of said second partial shell;

wherein said assembled shell has a second seam where said second joining face of said first partial shell meets said second joining face of said second partial shell;

wherein said first seam and said second seam define a plane referred to as the joining plane;

wherein in said assembled shell, said protrusion protrudes into said receptacle;

wherein said protrusion protruding into said receptacle impedes movement of said first partial shell with respect to said second partial shell in the joining plane;

wherein said structural component is manufactured from a fiber-reinforced thermoplastic material.



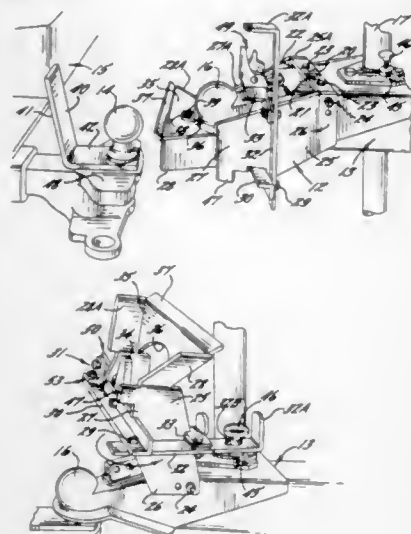
5,769,443  
ALIGNMENT GUIDE ASSEMBLY FOR TRAILER  
HITCHES

John Muzny, Catawba, S.C., assignor to Billy Ray Marcom, Bedford, Tex.

Filed Jan. 11, 1996, Ser. No. 584,102  
Int. Cl.<sup>6</sup> B60D 1/06

U.S. Cl. 280—477

14 Claims



1. An alignment guide assembly for use by an operator in aligning and connecting a hitch ball on a trailer hitch at the rear of a tow vehicle with a socket on the tongue of a trailer, said alignment guide assembly comprising:

- (a) a stop bracket on the trailer hitch at the rear of the tow vehicle;
- (b) an alignment guide on the tongue of the trailer, and
- (c) the alignment guide including means adjustably fixing the alignment guide to the trailer's tongue for movement of the alignment guide between an inoperative position on top of the trailer's tongue and an operative position beneath the trailer's tongue without removing the alignment guide from the trailer's tongue.

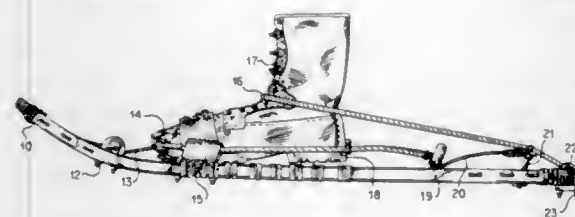
5,769,444  
SNOWSHOE BINDING

James Frederick Mason, P.O. Box 253, Paradise, Mich. 49768  
Continuation-in-part of Ser. No. 417,199, Apr. 5, 1995, abandoned. This application Jul. 30, 1996, Ser. No. 688,356

Int. Cl.<sup>6</sup> A63C 13/00

U.S. Cl. 280—600

7 Claims



1. A snowshoe binding, comprising:

- a first resilient elastic material adapted to strap onto a perimeter of a person's boot;
- anchors adapted to anchor said first resilient elastic material to a snowshoe;
- a connecting device connected to the first resilient elastic material at the front of the first resilient elastic material, and is adapted to connect said first resilient elastic material to a front portion of said snowshoe;
- a second resilient elastic material connects to said first resilient elastic material by said connecting device;

said first resilient elastic material being free to move independently of said anchors where said first resilient elastic material is capable of stretching onto aid perimeter of said boot forming a position of original stretch, and further capable of forming a position of further stretch during use together with said connecting device that permits said first resilient elastic material to move independently of said connecting device; an said second resilient elastic material extends forwardly of a toe area of said boot and is adaptable to being attached to said front portion of said snowshoe which is capable of further stretching from a position of original stretch to a position of her stretch when a heel of said boot is lifted up from said snowshoe and which is capable of returning to said position of original stretch when said heel of said boot is placed contact with said snowshoe, whereby the combination of said stretching of said first resilient elastic material onto said perimeter of said boot together with the stretching of said second resilient elastic material, and the resulting resistance force from said binding caused by he stretching which is thereby capable of assisting said person by causing a spring return motion as a result of said resilient elastic materials stretching back from their position of further stretch to their position of original stretch during use.

5,769,445  
SNOWBOARD

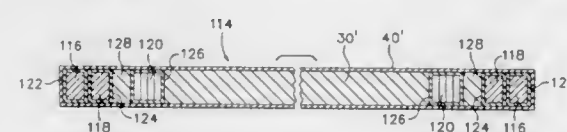
Neil E. Morrow, Salem, Oreg., assignor to Morrow Snowboards, Inc., Salem, Oreg.

Continuation-in-part of Ser. No. 221,857, Apr. 1, 1994, abandoned. This application Sep. 26, 1995, Ser. No. 533,917

Int. Cl.<sup>6</sup> A63C 5/14

U.S. Cl. 280—610

8 Claims



3. A snowboard comprising:

- an elongate core member;
- a first left side torsion box member and a first right side torsion box member, said first side members positioned adjacent at least respective first portions of left and right longitudinal edges of said elongate core member; and
- a second left side torsion box member and a second right side torsion box member positioned adjacent longitudinal edges of said first left and right side torsion box members respectively, and further comprising third left and right torsion boxes spaced between said elongate core and said first and second torsion box members respectively, spacing means positioned between said third left and right torsion boxes and said first and second torsion box members.

5,769,446  
BINDING WITH IMPROVED FIT

Bruno Borsoi, Vittorio Veneto, Italy, assignor to Nordica S.p.A., Treviso, Italy

Filed Jun. 7, 1996, Ser. No. 660,357

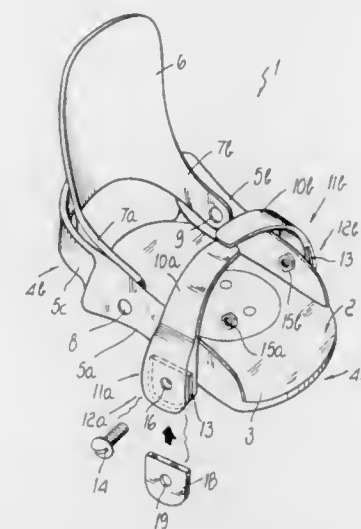
Claims priority, application Italy, Jun. 21, 1995, TV950037 U

Int. Cl.<sup>6</sup> A63C 9/00

U.S. Cl. 280—623

13 Claims

1. A binding with improved fit, particularly for snowboarding, comprising a plate associable with a snowboard and having side walls, said plate being adapted to accommodate a shoe between said side walls, the binding further comprising fastening means that have ends, and at said ends at least one engagement means that can be selectively associated transversely with respect to said side walls of said plates said engagement means comprising at least one



pair of tabs, between which at least one first seat or slot is formed, holes having the same axis being provided on said at least one pair of tabs.

5,769,447  
FOLDABLE STROLLER

Li-chu Chen Huang, No. 99, Fuchou 7th St., Chiayi City, Taiwan

Filed Apr. 1, 1996, Ser. No. 625,940

Int. Cl.<sup>6</sup> B62B 7/06

U.S. Cl. 280—642

7 Claims



1. A foldable stroller comprising:

- a pair of front members each having a lower end to which front wheel means is mounted and a pair of rear members each having a lower end to which rear wheel means is mounted;
- a handle tube having a central portion and two side portions, each with a lower end;
- a controlling device mounted to a central portion of the handle tube, wherein the controlling device includes a front cover, a rear cover, a disk pivotably retained to the central portion of the handle tube between the rear cover and the front cover a latch pivotably retained by the front cover and disposed between the front cover and the rear cover, and a resilient element securely retained between the central portion of the handle tube and the latch to upwardly urge against the latch, wherein the disk includes a lever integrally extending therefrom, a bore defined through a center of the disk, two opposite circumferential grooves, each defined in a periphery of the disk and terminating in a transverse slot, and an arcuate flange integrally extending from a top of a sidewall of the disk;
- a folding device interconnecting an upper end of each of the pair of front members, an upper end of each of the pair of rear members and an associated lower end of the side portions of the handle tube and comprising:
- a positioning seat securely mounted to each of the upper ends of the front members;
- a slidable seat slidably disposed on the upper end of the positioning seat and defining a first receptacle and

a retainer seat mounted on top of the slidable seat and defining a second receptacle, whereby each lower end of the handle tube extends through the second receptacle and the first receptacle and then securely mounted to the positioning seat by a pin; and means for linking the controlling device to the folding device.

5,769,448  
FOLDABLE FRAME ASSEMBLY FOR A TWO-SEAT  
STROLLER

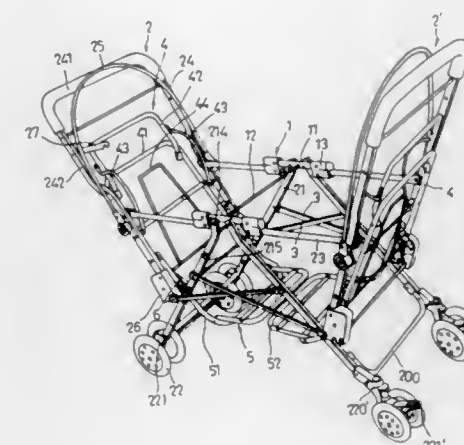
Morgan Wang, 12F, No. 311, Fuhsing N. Rd., Taipei City, Taiwan

Filed Nov. 1, 1996, Ser. No. 742,739

Int. Cl.<sup>6</sup> B62B 7/08

U.S. Cl. 280—642

8 Claims



1. A frame assembly for a stroller, said frame assembly being adapted to mount two seats thereon one behind another so as to permit two babies to sit thereon in a face-to-face relationship, said frame assembly being capable of being pushed to move in a moving direction, said frame assembly comprising:

- an I-shaped spacer unit located at the middle of said frame assembly and including two aligned coupling rods which are adapted to be located on two sides of the seats and which are parallel to said moving direction, and a transverse middle rod which has two ends secured to said coupling rods and which is adapted to be located between the seats, each of said coupling rods having two ends, each of which is provided with a fixed coupling block;
- two main frame units located on two sides of said middle rod and adapted to support the seats thereon, each of said main frame units including two inclined and aligned leg rods adapted to be located on two sides of a corresponding one of the seats and having upper ends pivoted to said coupling rods respectively and lower ends carrying two wheels respectively, a handle frame having two generally vertical side rods which are secured to each other, two pivot rods parallel to said coupling rods and having inner ends pivoted to said coupling blocks respectively and outer ends pivoted to said side rods of said handle frame, and two pivot blocks respectively and fixedly mounted on lower ends of said side rods of said handle frame;
- two aligned pairs of inclined links, said two aligned pairs being adapted to be located on two sides of said seats, each pair of said links being arranged as an X-shape, each of said links being pivoted to an intermediate portion of one of said leg rods of one of said main frame units at an upper end thereof and to one of said pivot blocks of the other one of said main frame units at a lower end thereof;
- two aligned backrest units attached to said main frame units respectively, each of said backrest units being located between two side rods of a corresponding one of said main frame units;

two aligned footrest units respectively attached to lower end portions of said handle frames and located between said handle frames; and  
a locking unit attached between said pivot blocks of one of said main frame units so as to lock said main frame units relative to said spacer unit, said locking device being operable to permit said main frame units to be folded by pushing one of said handle frames toward the other one of said handle frames.

5,769,449

## TRUNK TRUCK TRAILER

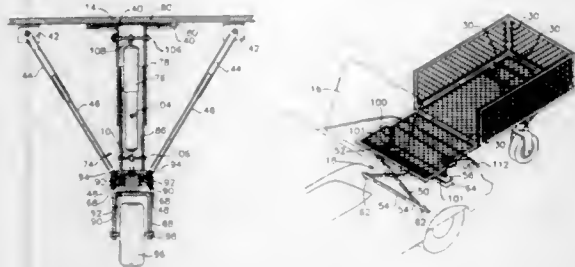
Oliver F. Keese, 605 Dean Rd., Clarksville, Tenn. 37040

Filed Nov. 22, 1995, Ser. No. 561,066

Int. Cl.<sup>6</sup> B62D 63/08

U.S. Cl. 280—656

16 Claims



1. A trailer attachable to a rear portion of a vehicle comprising:  
a main body including a flat bed assembly having front, sides, and tailgate flat panels which are hingedly and releasably connected to a central flat floor panel,

an attachment mechanism having an upper portion adapted to be releasably connected to said main body and a lower portion adapted to be received within a rear portion of the vehicle and releasably secured thereto,

an air shock wheel assembly including a flat plate, a cylindrical casing having an upper housing affixed to said flat plate and depending downwardly therefrom and a lower housing slidably received within said upper housing, an air shock piston mounted within said cylindrical casing and connected to said upper and lower housings for telescoping movement therewith, a swivel mechanism formed at a lower end of said lower housing, a wheel supporting frame pivotally attached to said swivel mechanism, and a plurality of telescoping support arms having upper ends pivotally connected to brackets secured to the underside of said central flat floor panel and lower ends pivotally connected to brackets secured to said swivel mechanism, and

coupling means for releasably mounting said flat plate of said air shock wheel assembly to an underside of said central flat floor panel.

5,769,450

## STEERING WHEEL ASSEMBLY CONTAINING AN AIR BAG MODULE

Makoto Kanai, Gifu; Atsushi Nagata, and Katsunobu Sakane, both of Aichi, all of Japan, assignors to Toyota Gosei Co., Ltd., Aichi, Japan

Filed Jul. 31, 1996, Ser. No. 688,726

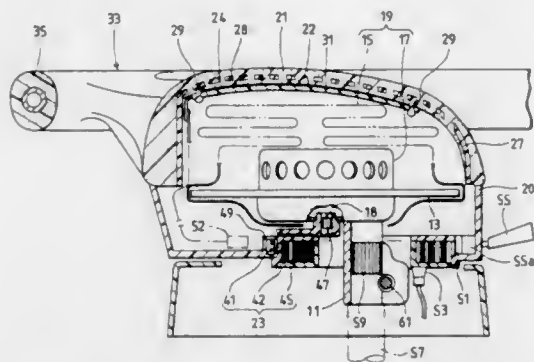
Claims priority, application Japan, Jul. 31, 1995, 7-195326

Int. Cl.<sup>6</sup> B60R 21/16

U.S. Cl. 280—731

18 Claims

1. An air bag inflator actuating assembly comprising:  
an air bag module including an expandable air bag retained in a folded position and an inflator containing a first leadless connector; and  
a transmitter containing a second leadless connector;



wherein one of said first and second leadless connectors is receivable by the other leadless connector to provide a direct electrical connection between said inflator and said transmitter;

wherein said first leadless connector is operatively maintained in a stationary position relative to said inflator, and wherein said second leadless connector is operatively maintained in a stationary position relative to said transmitter when said inflator is electrically connected to said transmitter.

5,769,451

## VEHICLE AIR BAG APPARATUS

Haruhiro Inada, Hiroshima; Yasunori Iwamoto, Hatsukaichi; Shigefumi Kohno, Hiroshima, and Toshiaki Kuroda, Higashihiroshima, all of Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Continuation of Ser. No. 300,937, Sep. 6, 1994, abandoned,

which is a continuation of Ser. No. 11,491, Jan. 29, 1993,

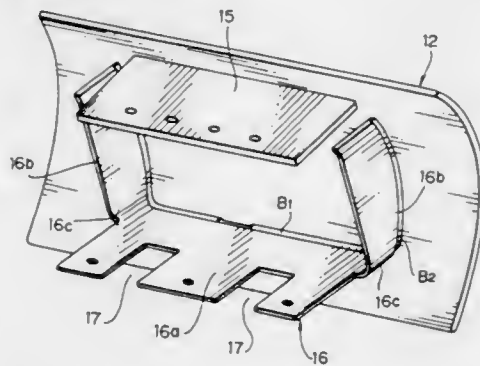
abandoned. This application May 20, 1997, Ser. No. 859,254

Claims priority, application Japan, Jan. 30, 1992, 4-015404

Int. Cl.<sup>6</sup> B60R 21/16

U.S. Cl. 280—732

55 Claims



30. A vehicle air bag lid for use with an opening formed in a panel, the air bag lid comprising:

a supporting member for supporting the air bag lid on an inner surface thereof in a position which closes the opening in the panel and allows the air bag lid to be rotated along a first side of the air bag lid to open the opening in the panel, the supporting member having a base supporting portion, separate from the supporting member, positioned on the inner surface away from the first side along a second side opposite to the first side of the air bag lid; and

a first connector connecting the base supporting portion to the air bag lid, wherein, upon expansion of an air bag positioned inside the opening in the panel with the air bag lid closing the opening in the panel, the first connector breaks so that the air bag lid is separated from the supporting member to rotate along the first side of the air bag lid and open the opening in the panel,

wherein the base supporting portion has first and second ends, the supporting member further comprises a first arm which

extends away from the first end of the base supporting portion, and a second arm which extends away from the second end of the base supporting portion.

5,769,452

## VEHICLE OCCUPANT PROTECTIVE AIR BAG SYSTEM

Ryoichi Yoshida, Shiga, Japan, assignor to Takata Corporation, Tokyo, Japan

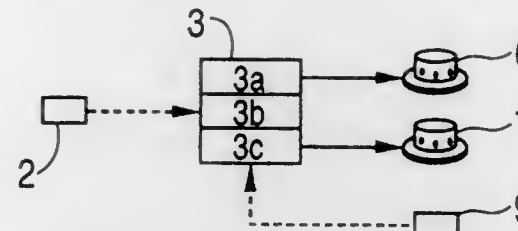
Filed Apr. 8, 1997, Ser. No. 826,821

Claims priority, application Japan, May 15, 1996, 8-120380

Int. Cl.<sup>6</sup> B60R 21/26; 21/32

U.S. Cl. 280—735

24 Claims



1. A vehicle occupant protective air bag system comprising:  
an air bag device having an air bag, a housing that accommodates the air bag, and a gas generator that generates and supplies gas into the air bag;  
a detector that determines whether a vehicle occupant is in an out-of-position location based on an inner gas pressure of the air bag during inflation; and  
a controller that responds to a vehicle impact, actuates the gas generator, and decreases the supply of the gas from the gas generator into the air bag during gas generation when the vehicle occupant is in the out-of-position location.

5,769,453

## ADJUSTING ARRANGEMENT FOR ADJUSTING THE SLOPE OF A SWIVELLABLY CONNECTED CASING TUBE OF A STEERING SPINDLE OF A MOTOR VEHICLE

Karl Peitsmeyer, Aldingen, and Helmut Patzelt, Kernen, both of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

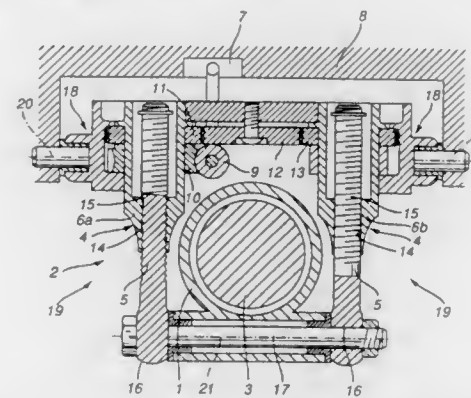
Filed Jun. 19, 1996, Ser. No. 665,907

Claims priority, application Germany, Jul. 3, 1995, 195 24 195.9

Int. Cl.<sup>6</sup> B62D 1/18

U.S. Cl. 280—775

8 Claims



1. Adjusting arrangement for adjusting the slope of a swivellably connected casing tube of a steering spindle of a motor vehicle, having a supporting device which is disposed on the vehicle body and with which the casing tube is connected by way of a spindle

drive of which the casing tube can be adjusted with respect to the vehicle body, at least one steering lever with two mutually spaced, parallel swivel shafts acting between the casing tube and the vehicle body, of which one swivel shaft is assigned to the supporting device,

wherein the other swivel shaft forms a component of the spindle drive and the spindle drive takes over the function of the steering lever.

5,769,454

## DEVICE FOR POSITIONING AN AUTOMOBILE VEHICLE STEERING COLUMN IN THE EVENT OF AN IMPACT

Benoit Duval; Frédéric Gentet, both of Vendome, and Pascal Millet, Meslay, all of France, assignors to Lem Forde Nacm SA, Vendome, France

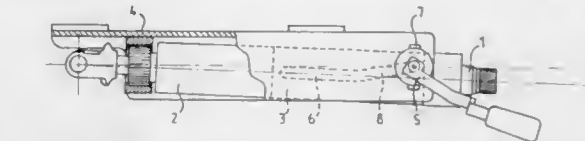
Filed Apr. 30, 1997, Ser. No. 841,686

Claims priority, application France, May 3, 1996, 96 05675

Int. Cl.<sup>6</sup> B62D 1/11

U.S. Cl. 280—777

8 Claims



1. A device for positioning an automobile vehicle steering column in the event of an impact, said steering column including a steering shaft freely rotatable in a tube-body disposed in a support member attached to a chassis of said vehicle, said tube-body being locked in said support member by a system for adjusting the position of said steering column, and

said positioning device comprising additional guide means for said tube-body in the event of an impact, said additional guide means comprising an additional guide slide on said tube-body, such that an angle of said steering shaft and a steering wheel of said vehicle to a horizontal plane is smaller after retraction of said steering wheel in order to allow correct functioning of an air-bag.

5,769,455

## DEVICE FOR ACTIVE RETRACTION, IN THE EVENT OF IMPACT, OF AN AUTOMOBILE VEHICLE STEERING COLUMN

Benoit Duval; Frédéric Gentet, both of Vendome, and Pascal Millet, Meslay, all of France, assignors to Lemforder NACAM SA, Vendome, France

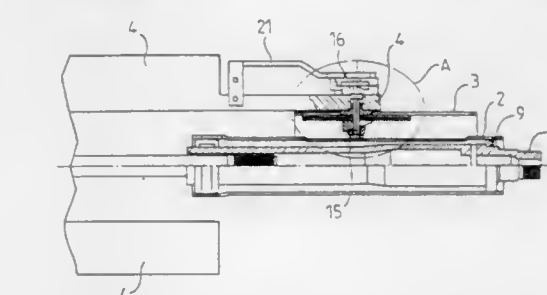
Filed Apr. 30, 1997, Ser. No. 841,687

Claims priority, application France, May 3, 1996, 96-05676

Int. Cl.<sup>6</sup> B62D 1/19

U.S. Cl. 280—777

8 Claims



1. A device for active retraction of an automobile vehicle steering column in the event of an impact, said steering column comprising an adjustment system for positioning said steering column,



a support member fixed to a chassis of said vehicle and locked in a required position by said adjustment system,  
a steering shaft mounted in a tube-body through bearing means, and  
a reinforcing member attached to said tube-body and mounted in said support member,  
said active retraction device comprising inside sloping wedge and outside sloping wedge mounted on an axle of said adjustment system and at least one fusible pin coupling said inside sloping wedge and outside sloping wedge, said inside sloping wedge and outside sloping wedge having conjugate inclinations relative to said axle of said adjustment system,  
said inside sloping wedge being disposed around a depthwise adjustment slide in said reinforcing square and said outside sloping wedge being attached to said axle of said adjustment system so that in the event of an impact said fusible pin is sheared by the triggering of an air-bag and allows said inside sloping wedge and outside sloping wedge to move apart and to release a tension in said axle of said adjustment system in order to allow said steering shaft to move in a predetermined direction.

5,769,456

**PRE-FITTED CARRIER UNIT FOR THE FUNCTIONAL PARTS OF A SAFETY BELT SYSTEM**

Alois Juchem, Maisach; Andreas Bissinger; Edmund Lochbihler, both of München; Ralf Glässner, Dachau; Marcus Plege, München, and Dieter Schaper, Eisenhofen, all of Germany, assignors to Autoliv Development AB, Vargarda, Sweden

PCT No. PCT/SE94/01164, § 371 Date Jul. 26, 1996, § 102(e) Date Jul. 26, 1996, PCT Pub. No. WO95/15270, PCT Pub. Date Jun. 8, 1995

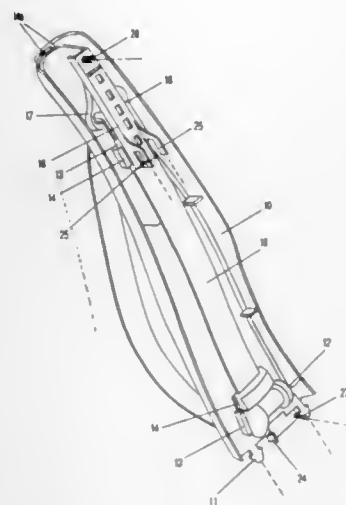
PCT Filed Dec. 2, 1994, Ser. No. 656,248

Claims priority, application Germany, Dec. 2, 1993, 43 41 119.3

Int. Cl.<sup>6</sup> B60R 22/18; 22/34; 22/46

U.S. Cl. 280—808

24 Claims



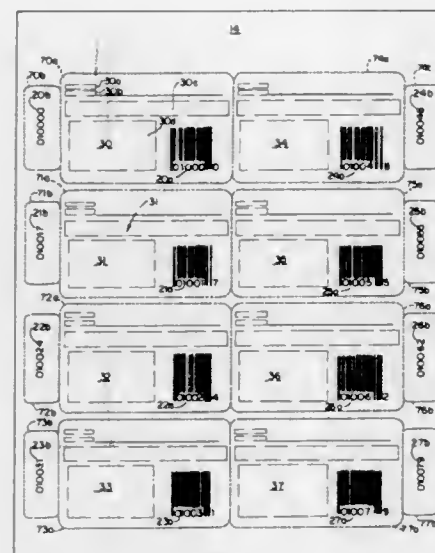
I. A safety belt carrier unit for mounting on a vehicle anchorage, said safety belt carrier unit comprising:  
a carrier unit;  
functional parts of a safety belt system connected to said carrier unit, wherein at least one of said functional parts is displaceable relative to said carrier unit;  
wherein, upon mounting said carrier unit on the vehicle anchorage, said at least one functional part becomes operatively connected to the vehicle anchorage upon displacement relative to said carrier unit.

**5,769,457  
PRINTED SHEET MAILERS AND METHODS OF MAKING**

Richard O. Warther, West Chester, Pa., assignor to Vanguard Identification Systems, Inc., Exton, Pa.  
Continuation-in-part of Ser. No. 191,975, Feb. 4, 1994, Pat. No. 5,495,981, which is a continuation-in-part of Ser. No. 628,236, Dec. 1, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 482,634  
Int. Cl.<sup>6</sup> B42D 15/00

U.S. Cl. 283—61

27 Claims



I. A printed sheet product comprising: a core and a separate strip, the core being planar and having opposing major sides and being printed on one major side in a variable data field with a name and mailing address of a particular person assigned a unique code, the separate strip being permanently secured partially covering one major side of the core while extending completely along the one major side of the core, the separate strip being spaced on the core laterally away from the printed variable data field, the product including an at least generally U-shaped scoring which scoring cuts at least sufficiently through the product to define a card element removable from a remainder of the product, the removable card element including only a portion of the separate strip, and the printed variable data field being left on the remainder of the sheet product.

5,769,458

**CARDS HAVING VARIABLE BENDAY PATTERNS**

James J. Carides, Lawrenceville; Dana Kipland Duke, Gainesville; Benny R. Rich, Oakwood, and Kathryn L. Matson, Norcross, all of Ga., assignors to Dittler Brothers Incorporated, Atlanta, Ga.

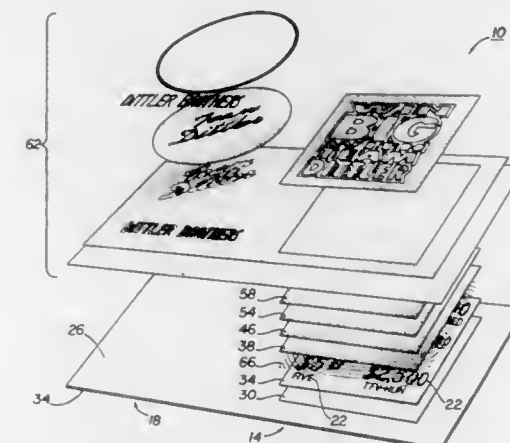
Filed Dec. 4, 1995, Ser. No. 567,364

Int. Cl.<sup>6</sup> B42D 15/00

U.S. Cl. 283—102

31 Claims

I. A game card comprising:  
a. a substrate;  
b. a set of digitized information printed on the substrate using a computerized, non-rotogravure printer, the set of digitized information including:



i. play indicia; and  
ii. a benday pattern; and  
c. a removable, opaque elastomeric coating covering the play indicia and benday pattern;  
wherein the benday pattern printed on the substrate is encoded.

5,769,460

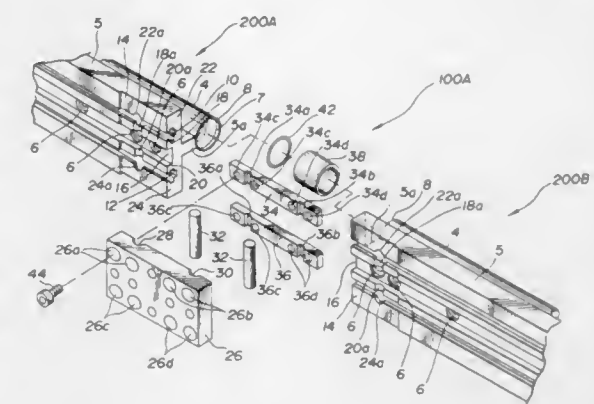
**CONNECTOR FOR TUBULAR GUIDE RAILS**

Kazuhisa Imai, Ojima, Japan, assignor to I. Tech Inc., Japan  
Filed Apr. 24, 1996, Ser. No. 637,093

Int. Cl.<sup>6</sup> F16L 35/00

U.S. Cl. 285—18

15 Claims

**5,769,459  
INSIDE SEALING DEVICE SLEEVE FOR INSERTION OF PIPES**

Eckhard Graf, and Juergen Graf, both of Bad Duerheim, Germany, assignors to Uhrig Kanaltechnik GmbH, Geislingen, Germany

PCT No. PCT/EP96/05146, § 371 Date Jul. 11, 1997, § 102(e) Date Jul. 11, 1997, PCT Pub. No. WO97/21054, PCT Pub. Date Jun. 12, 1997

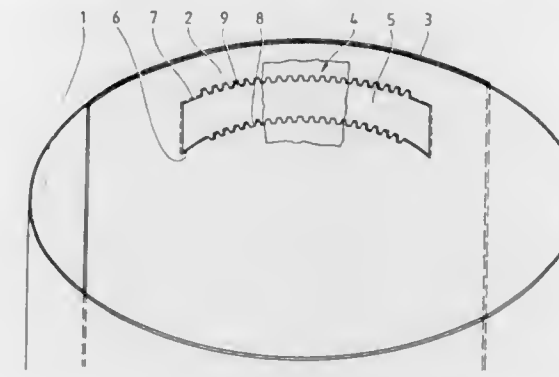
PCT Filed Nov. 12, 1996, Ser. No. 860,998

Claims priority, application Germany, Dec. 1, 1995, 195 44 877.4

Int. Cl.<sup>6</sup> F16L 55/162

U.S. Cl. 285—15

5 Claims



I. An inside sealing sleeve for insertion in pipes for the purpose of sealing leakage points, comprising an expandable band made from sheet steel bent together in the shape of a ring whose band ends overlap in the circumferential direction,

having at least one arresting arrangement in the form of a slot arranged on the internal band end in the circumferential direction, with one longitudinal edge of the slot supporting a row of teeth, and

having a tensioning pinion which is rotatably seated on the external band end, which tensioning pinion engages the row of teeth, and

having a detent element which is under the action of a spring element and which engages the toothing of the tensioning pinion,

characterized by the following features:

a second row of teeth (9) on a second longitudinal edge of the slot, which second row of teeth is disposed opposite of the first row of teeth,

I. A connector for connecting two structures which have mutually facing terminal ends to be mated, comprising:  
means for defining in each of the structures a rounded recess;  
a seal member of elastic material, said seal member located between the terminal ends of the two structures;  
a joint plate having two rounded recesses, said joint plate being connected to the two structures in such a manner that each of the rounded recesses of the joint plate mates with the rounded recess of each structure thereby to define a substantially rounded space;  
two cylindrical pins each received in the substantially rounded space; and  
securing means which, when actuated, gradually presses said joint plate against said structures and finally secures said joint plate to said structures,  
wherein said two structures, said seal member, said cylindrical pins and said joint plate are so arranged as to satisfy the following equation before actuation of said securing means,

$$L < 2 \times L_1 + t$$

wherein:

L: the distance between the two rounded recesses of the joint plate,

L<sub>1</sub>: the distance between the rounded recess of each structure and the terminal end of the same, and

t: the thickness of the seal member in nonstressed state.

5,769,461

**RELEASABLE CONNECTION ASSEMBLY FOR SUPPLY LINES IN A PRINTING MACHINE**

Joerg Hildebrandt, Frankfurt am Main; Joachim Olek, Obertshausen; Herbert Schoppe, Neuss, and Helmut Schild, Steinbach/Taunus, all of Germany, assignors to MAN Roland Druckmaschinen AG, Germany

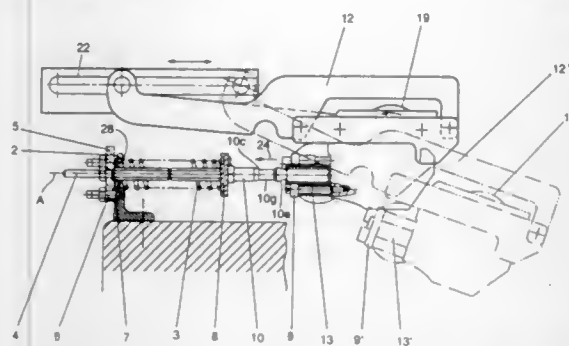
Filed Mar. 13, 1997, Ser. No. 815,969

Claims priority, application Germany, Mar. 13, 1996, 196 09 737.1

Int. Cl.<sup>6</sup> F16L 37/00

U.S. Cl. 285—29

7 Claims



1. An assembly for the releasable connection of fluid supply lines in a printing machine having a fixed frame and fluid supply lines of a movable unit disposed proximate to the fixed frame, the assembly comprising:

- a support having an opening attached to the fixed frame;
- a first coupling subassembly including a first coupling element, a centering bolt secured to the first coupling element projecting outwardly along a longitudinal axis, a second bolt secured to the first coupling element extending opposite to the centering bolt and having a distal end passing through the opening formed in the support, a compression spring concentrically surrounding the second bolt attached to the support at one end to provide a point of connection and attached to the first coupling element at its other end, and a stop with at least one adjusting device attached to the distal end of the second bolt, the first coupling subassembly being adapted for pivotal movement about the point of connection; and
- a second coupling element disposed on the movable unit having a guide sleeve which is matingly engageable with the centering bolt to effect coupling of the fluid supply lines.

5,769,462

**RELEASABLE COUPLING**

Jonathan George Cordy Angell, 2 Vicarage Cottages, Iford, Lewes, East Sussex BN7 3EJ, England

PCT No. PCT/GB94/01471, § 371 Date Mar. 4, 1996, § 102(e) Date Mar. 4, 1996, PCT Pub. No. WO95/02148, PCT Pub. Date Jan. 19, 1995

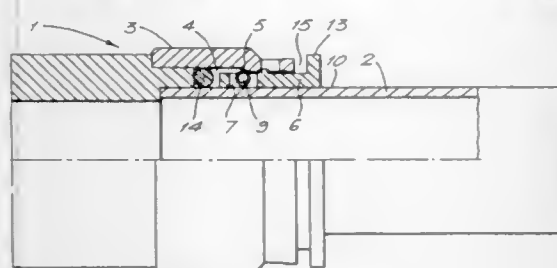
PCT Filed Jul. 7, 1994, Ser. No. 583,069

Claims priority, application United Kingdom, Jul. 8, 1993, 9314094

Int. Cl.<sup>6</sup> F16L 55/00

U.S. Cl. 285—39

24 Claims



1. A releasable coupling comprising:

a hollow body for receiving an object to be retained, said hollow body having a longitudinal axis and being sized and shaped to receive an object to be retained;

an opening in one end of said hollow body through which an object may be inserted into said body;

retaining means within said hollow body for engaging and gripping the outer surface of the object once it has been inserted, said retaining means being arranged such that the object may be inserted into said body past said retaining means, and such that removal of the object is substantially prevented by the gripping action of said retaining means; and

release means for releasing the gripping action of said retaining means to permit withdrawal of the object from said body; wherein

said retaining means includes one or more rotatable members adapted to engage the surface of the object, each of said rotatable members having teeth, serrations or grooves which extend completely about the perimeter of an external surface of each rotatable member whereby different parts of each member's external surface may be brought into engagement with the surface of the object when inserted to retain the object in said hollow body.

5,769,463

**HEAT AND VIBRATION RESISTANT FLEXIBLE METAL HOSE ASSEMBLY**

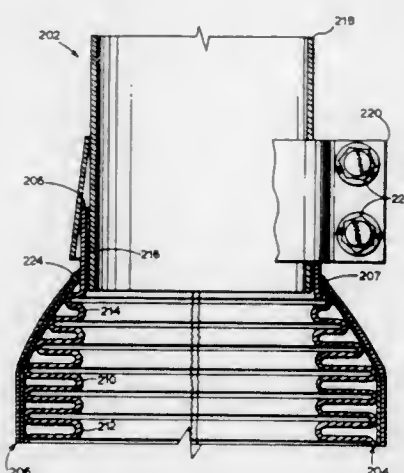
R. Winfield Thomas, West Lebanon, Ind., assignor to Tru-Flex Metal Hose Corp., West Lebanon, Ind.

Filed Jul. 5, 1996, Ser. No. 675,933

Int. Cl.<sup>6</sup> F16L 11/12

U.S. Cl. 285—49

11 Claims



1. A heat and vibration resistant flexible metal hose assembly, which includes:

- (a) a flexible liner having:
  - (1) first and second ends;
  - (2) a bore having a substantially continuous diameter and extending between said ends and open thereat;
  - (3) a corrugated, medial body section;
  - (4) first and second transition sections each tapering inwardly and converging in a respective direction away from the body section;
  - (5) first and second smooth-wall, constant-diameter end sections each located between a respective liner end and a respective transition section; and
  - (6) each said transition section including a plurality of corrugations which progressively decrease in diameter from said body section to a respective end section;
- (b) a sleeve subassembly having:
  - (1) first and second ends each located adjacent a respective liner end;

5,769,465

**SYSTEM FOR CONNECTING A HOUSING TO A TUBE**

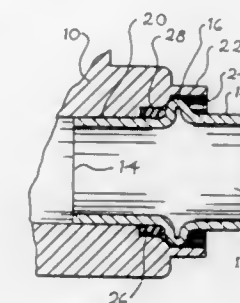
Jeffrey A. Schultz, Pittsville, and Bobby Shelton, Gretna, both of Va., assignors to Bridge Products, Inc., Northbrook, Ill.

Filed Jul. 23, 1996, Ser. No. 685,333

Int. Cl.<sup>6</sup> F16L 25/00

U.S. Cl. 285—328

8 Claims



1. A system for connecting a housing to a tube, said system comprising:

- a tube comprising a sidewall and a raised annular shoulder projecting outwardly from the sidewall;
- a housing comprising a socket sized to receive the tube and to limit movement of the tube into the housing, said tube received in said socket and said housing further comprising a flange positioned radially outwardly of the tube;
- said flange comprising first and second portions, said first portion positioned between the housing and the second portion;
- said flange deformed over the shoulder and the tube such that the first portion of the flange extends radially inwardly over the shoulder, and the second portion of the flange extends generally parallel to the sidewall;
- said flange comprising a radially inwardly directed wall, said wall comprising an array of raised features positioned to enhance frictional engagement between the wall and the tube to inhibit rotation of the tube with respect to the wall;
- said raised features disposed in part in the first portion of the flange and in part in the second portion of the flange such that the raised features engage both the shoulder and the sidewall of the tube.

5,769,464

**FLEXIBLE JOINT FOR METALLIC PIPES**

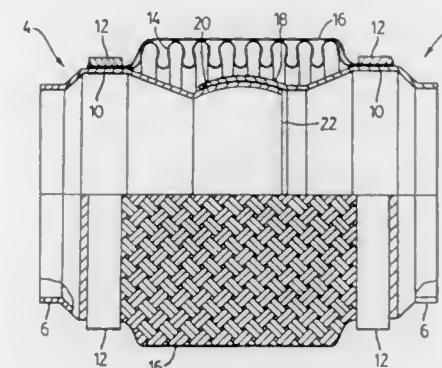
Italo DeBlasi, Manilla, and Stanley Livshitz, Willowdale, both of Canada, assignors to Titeflex Canada Ltd., Richmond Hill, Canada

Filed Apr. 24, 1996, Ser. No. 639,059

Int. Cl.<sup>6</sup> F16L 27/11; 27/04

U.S. Cl. 285—226

7 Claims



1. A flexible gas tight pipe joint comprising a first pipe section of ductile metal having a first end portion expanded into a first spheroidal barrel, having an end orifice of predetermined diameter at an open end of said end portion and a maximum internal diameter greater than the diameter of said end orifice, a second oppositely directed pipe section of ductile metal having a second end portion initially of lesser external diameter than said end orifice of the first end portion, said second end portion having been inserted within said barrel and expanded therein to provide a second spheroidal barrel of maximum external diameter less than the maximum internal diameter of the first barrel, but greater than the diameter of said end orifice, and an external gas tight bellows connected to said pipe sections outwardly of said end portions to provide a gas tight connection between pipe sections; wherein the bellows is secured at its ends to said pipe sections by rings surrounding the ends of the bellows, and by portions of said pipe sections expanded within said ends and said rings.

5,769,466

**THREADED JOINT FOR PIPES**

Thierry Noel, Sebourg, France, and Takuya Tsujimura, Amagasaki, Japan, assignors to Valloirec Oil & Gas, Aulnoye-Aymeries, France, and Sumitomo Metal Industries, Osaka, Japan

Continuation of Ser. No. 452,069, May 26, 1995, abandoned.

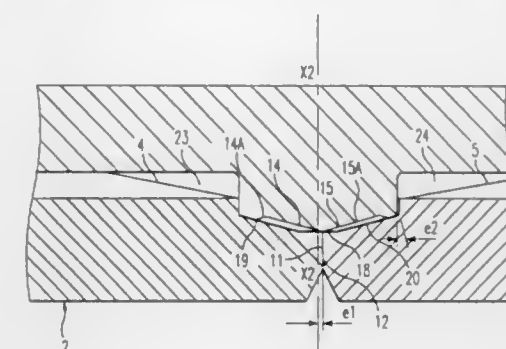
This application Aug. 8, 1997, Ser. No. 907,619

Claims priority, application France, Oct. 13, 1994, 94 12441

Int. Cl.<sup>6</sup> F16L 25/00

U.S. Cl. 285—332

24 Claims



1. A threaded joint for metal pipes comprising:



a sleeve having first and second end portions, each of said first and second end portions of said sleeve defining first and second threaded female housings; and first and second male elements which can be respectively screwed into said first and second threaded female housings, each of said first and second male elements comprising an end with a male non-threaded abutment zone which includes an end face, the end faces of each of said first and second male elements abutting against one another when the first and second male elements are screwed respectively into said first and second threaded female housings to a screwed-down position, so as to produce a first metal-to-metal bearing contact surface between the end faces of said first and second male elements;

wherein:

said male non-threaded abutment zone of each of said first and second male elements further comprises a male non-threaded peripheral zone, said male non-threaded peripheral zone comprising a convex tapering surface in which a generating straight line which extends from the convex tapering surfaces intersects with an axis of the corresponding first and second male elements;

each of said first and second threaded female housings has a female non-threaded abutment zone which comprises a concave tapering surface which corresponds with the convex tapering surface of each of said first and second male elements, such that in said screwed-down position the convex tapering surfaces of each of said first and second male elements come into contact with the concave tapering surfaces of each of said first and second threaded female housings with a positive interference to create a sealing second metal-to-metal bearing contact surface; and

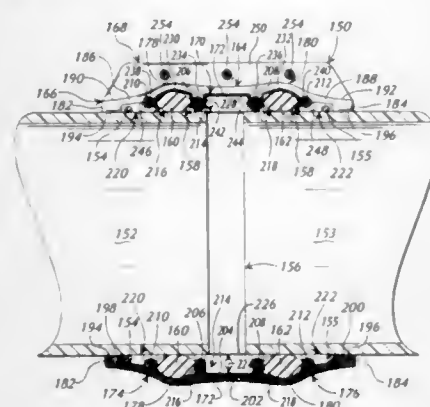
at least one of said first and second male elements further comprises a first male shoulder stop which corresponds to a first female shoulder stop on at least one of said first and second threaded female housings, the first male shoulder stop and the first female shoulder stop being disposed such that in the screwed-down position the contacting end faces of each of the first and second male elements are positioned in a plane which is slightly spaced from the median plane of symmetry of the sleeve.

5,769,467

**PIPE COUPLINGS FOR MISALIGNED OR OUT-OF-ROUND PIPES AND EXPANDING/CONTRACTING PIPES**  
Donald Y. Bridges, 3014 Creek Ct., Roswell, Ga. 30075  
Division of Ser. No. 541,491, Oct. 10, 1995, abandoned. This application Apr. 14, 1997, Ser. No. 837,164  
Int. Cl.<sup>6</sup> F16L 17/04

U.S. Cl. 285—370

12 Claims



1. A pipe coupling for sealing a joint between pipes in a pipeline by compressing annular gasket members against the pipes around the joint, the pipes each having a retaining ring fixed to the pipe proximate the joint for retaining the coupling about the joint, the pipe coupling comprising:

A. an annular coupling member having an axial split defined by first and second axial edges and comprising (1) an annular bridging member extending between the first and second axial edges, (2) opposing annular end members extending from annular edges of the bridging member to distal edges of the end members to form an annular coupling channel bounded by the bridging member and the end members, (3) a pair of inner annular protrusions spaced from one another and respective end members and extending from the bridging member into the annular coupling channel, and (4) a pair of outer annular protrusions, (a) one outer annular protrusion extending from one of the end members into the annular coupling channel and spaced from the distal edge of the one end member and the adjacent inner annular protrusion to form (i) a first expansion channel between the distal edge of the one end member and the one outer annular protrusion for receiving one of the retaining rings and (ii) a first gasket channel between the one outer annular protrusion and the adjacent inner annular protrusion for receiving one of the annular gasket members and (b) the other outer annular protrusion extending from another of the end members into the annular coupling channel and spaced from the distal edge of the other end member and the adjacent inner annular protrusion to form (i) a second expansion channel between the distal edge of the other end member and the other outer annular protrusion for receiving another of the retaining rings and (ii) a second gasket channel between the other outer annular protrusion and the adjacent inner annular protrusion for receiving another of the annular gasket members; and

b. means for joining the first and second axial edges such that the coupling member compresses the annular gasket members against the pipes and the inner and outer annular protrusions prevent movement of the annular gasket members relative to the coupling member during expansion or contraction of the pipes, the first and second expansion channels allowing reciprocation of the respective retaining rings therein and the outer annular protrusions preventing the retaining rings from engaging the annular gasket members.

5,769,468

**POWER-ASSIST MOTOR-VEHICLE DOOR LATCH**  
Stefan Armbruster, Essen, Germany, assignor to Kiekert AG, Heiligenhaus, Germany

Filed May 17, 1996, Ser. No. 650,135  
Claims priority, application Germany, Aug. 18, 1995, 195 30 728.3

Int. Cl.<sup>6</sup> E05C 3/06

U.S. Cl. 292—201

5 Claims

1. A motor-vehicle door latch comprising:

a housing;

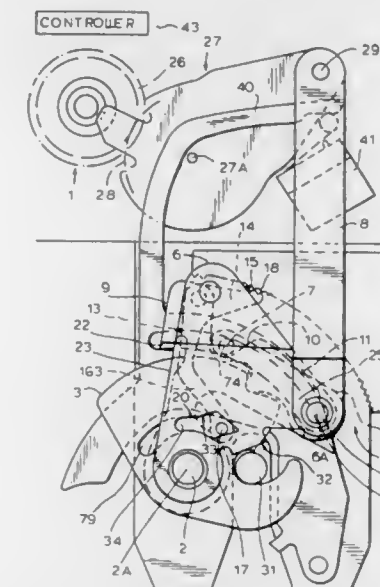
a fork formed with a detent and pivotal about a main axis on the housing from a latched position retaining a bolt deep in the housing, a semilatched position retaining the bolt shallow in the housing, and an unlatched position permitting the bolt to enter and exit the housing;

a main rocker pivotal about the main axis on the housing with the fork between the latched and semilatched positions;

drive means connected to the main rocker for pivoting it about the main axis between the latched and semilatched positions;

a pawl pivoted on the main rocker about a secondary axis offset from the main axis, provided offset from the main and secondary axes with an axially projecting actuator pin, and displaceable between an inner position engaging the detent and rotationally coupling the fork to the main rocker and an outer position clear of the detent and permitting the fork to rotate independently of the main rocker;

a secondary rocker pivoted on the main axis and provided with a cam formation having a lifting portion engageable with the actuator pin to displace the pawl from its inner position to its outer position and a holding portion engageable with the actuator pin to retain it in its outer position; and



means including a coupling and formations on the fork and main rocker for  
in the semilatched position holding the pawl with the holding portion in the outer position, and  
in the unlatched position holding the actuator pin out of engagement with the holding portion.

5,769,469

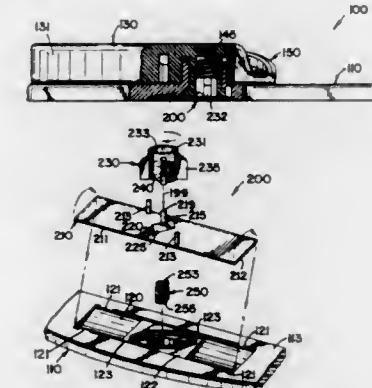
**WINDOW LATCH**

William L. Zemke, 299 S. Shore Dr., Forest Lake, Minn. 55025  
Filed Jun. 14, 1995, Ser. No. 490,387

Int. Cl.<sup>6</sup> E05C 3/04

U.S. Cl. 292—241

30 Claims



1. A window assembly having a frame, a first sash movably mounted within the frame, and a second sash mounted within the frame, the window assembly further comprising;

a keeper mounted on the second sash;

a catch mounted on the first sash in such a manner that when the first sash is moved to a closed position relative to the second sash, said catch is movable to selectively interengage said keeper and lock the first sash in said closed position;

a handle mounted on the first sash in such a manner that movement of said handle in a first direction moves said catch into interengagement with said keeper when the first sash is in said closed position, and movement of said handle in a second, opposite direction moves said catch out of interengagement with said keeper;

a compression spring, a rotor, and a bearing member arranged in series between said handle and the first sash, wherein said rotor rotates relative to said bearing member in response to movement of said handle, and energy stored in said spring forces said rotor toward said bearing member, and interengaging surfaces on said rotor and said bearing member are

configured to minimize compression of said spring in any of at least two discrete orientations relative to one another, wherein in one of said at least two discrete orientations said catch interengages said keeper when the first sash is in said closed position, and in another of said at least two discrete orientations said catch is free of said keeper wherein the movement of said handle is in the plane of rotation of the handle only.

5,769,470

**CONTAINING DOOR LOCK PIN**

Mitsuo Toyomura, Kobe, Japan, assignor to Toyomura Marine Engineering Co., Ltd., Hyogo, Japan

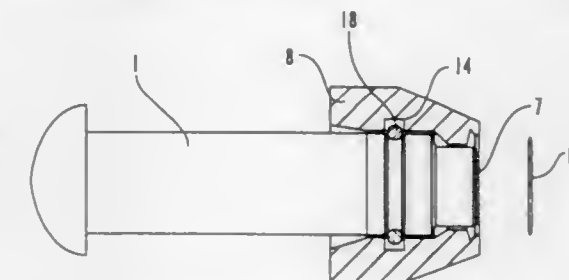
Filed Nov. 15, 1996, Ser. No. 749,840

Claims priority, application Japan, Nov. 25, 1995, 7-329497

Int. Cl.<sup>6</sup> E05B 39/02

U.S. Cl. 292—327

2 Claims



1. A container door lock pin comprising:  
a bolt including a head at its rear end and a shank;  
the shank having a shank annular groove formed in its periphery at a first position spaced from a bolt front end by a first distance;  
a ring spring fitted in the groove;  
a nut having a bore for slidable engagement with the shank, the bore having a first annular groove formed near a nut front end; and  
an elastic rigid confirmation seal plate fitted in the first annular groove;  
the bore including a cylindrical portion which extends between the first annular groove and a second position spaced rearward from the first annular groove by a second distance, and a conical portion which extends between the second position and a nut rear end;  
the cylindrical portion having a diameter adapted for slidable engagement with the shank, the cylindrical portion also having a second annular groove for engagement with the ring spring;  
the second groove being formed at a third position spaced rearward from the first annular groove by a third distance which is shorter than the first distance between the bolt front end and the bolt groove; and  
the conical portion widening rearwardly.

5,769,471

**APPARATUS FOR UNLOCKING A DOOR LOCK FOR A VEHICLE**

Yasuaki Suzuki, Kariya; Naofumi Fujie, Nagoya; Toshimitsu Oka, Okazaki; Kazunori Sakamoto, Chiryu; Kouji Aoki, Nagoya; Osamu Fujimoto, Nishin; Yutaka Kondoh, and Masahiro Miyaji, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, and Toyota Jidosha Kabushiki Kaisha, both of Japan

Filed Sep. 3, 1996, Ser. No. 706,939

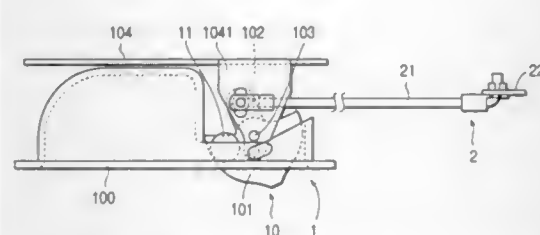
Claims priority, application Japan, Sep. 4, 1995, 7-251838

Int. Cl.<sup>6</sup> E05B 3/00

U.S. Cl. 292—336.3

20 Claims

1. An apparatus for unlocking a door lock for any one of first and second doors provided respectively on opposite first and second side surfaces of a vehicle, comprising:



door locks mountable on the first and second doors of the vehicle and for locking said first and second doors; collision direction detecting means for detecting an impact caused by a collision and applied to the first door on said first side surface of said vehicle; and an unlocking mechanism for unlocking a locked one of said door locks mounted on said second door on said second side surface opposite to the first door to which the impact is applied.

5,769,472

# DRIVE IN HOUSING FOR MOUNTING A LATCH ASSEMBLY IN A DOOR AND A METHOD OF INSTALLING SAME

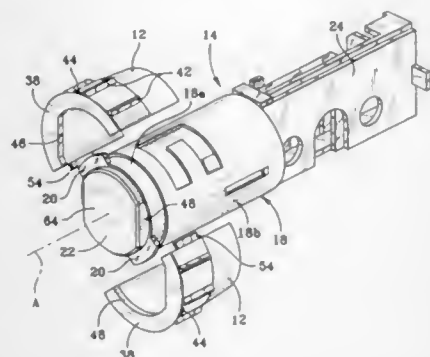
Steven D. Small, San Francisco, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Dec. 30, 1996, Ser. No. 775,472

Int. Cl.<sup>6</sup> E05B 9/00; F16B 21/18

U.S. Cl. 292—337

10 Claims



1. A drive-in housing for securing in a bore of a door a latch assembly of the type including a cylindrical casing having an axis and tabs rigidly fixed to the casing and extending radially outwardly therefrom, the drive-in housing comprising first and second separable housing parts which, when brought together, form a housing having an opening for receiving a casing, each housing part having a slot therein for receiving and capturing a respective tab on a casing received in the opening to thereby limit all axial or rotational movement of a received casing relative to the housing parts by direct engagement of the housing parts with respective tabs.

5,769,473

# APPARATUS FOR DOOR RESTRAINING ASSEMBLY

Martin Sovis, 5279 Duffield Rd., Flushing, Mich. 48433

Continuation of Ser. No. 572,684, Dec. 14, 1995, abandoned.

This application May 8, 1997, Ser. No. 855,747

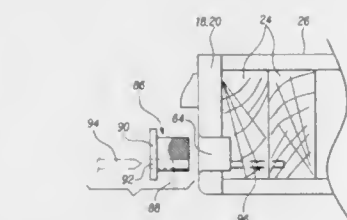
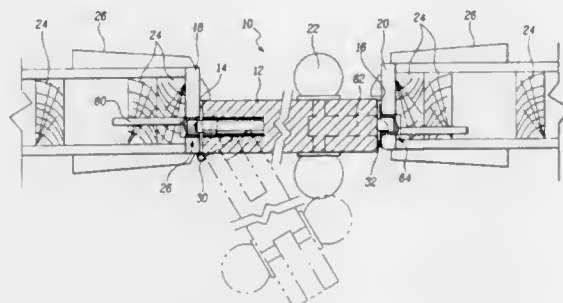
Int. Cl.<sup>6</sup> E05B 15/02

U.S. Cl. 292—340

10 Claims

1. A restraining kit assembly for use in combination with a door hingedly connected to a surrounding doorjamb, the door jamb being formed within a surrounding wall structure having a series of vertically extending wall studs,

the door having a hinge side and a latch side, the door jamb likewise having a hinge side and a latch side and the door and



jamb are positioned between the series of vertically extending wall studs of the wall structure, said kit assembly comprising: a first template having a first aperture formed therein adapted for being secured at a desired location along said hinge side of the door, said first aperture adapted to permit drilling of a first hole within the door;

a first pin member having an elongate body and an axially extending seating portion, said body being adapted to be recess mounted within said first hole drilled within the hinge side of the door, said seating portion including a straight edged portion and a sloping edged portion which terminates in said straight edged portion, said seating portion adapted to project laterally from the door in a direction towards an associated hinge side of the door jamb;

a second template having a second aperture defined therein and adapted to be positioned at a desired location along said hinge side of the door jamb in an aligned and opposing relation to said pin member, said second aperture adapted to permit drilling of a second hole within the door jamb and said second hole corresponding to a circular recess;

a third disk shaped template having a third aperture defined therein and adapted to be inserted within said circular recess in the door jamb, said third aperture adapted to permit drilling of a third hole through one or more of the wall studs; and

a first receiving member having a circular pin receiving portion and a reinforcing portion extending axially beyond said circular pin receiving portion, said circular recess receiving said circular pin receiving portion, said receiving member adapted to be recessed within the door jamb in proximity to said pin member so that said sloping edged portion of said seating portion clears said pin receiving portion and permits said seating portion to seat within said cavity of said pin receiving portion as the door is rotated to a closed position, said reinforcing portion adapted to extend past the door jamb in said hinge side and through said third hole in a substantially horizontal fashion through one or more of the vertical wall studs of the wall structure;

said restraining assembly adapted to incorporate the strength of the wall structure to prevent the door from being forcibly dislodged from the door jamb.

5,769,474

# FLAG INSTALLER APPARATUS FOR UTILITY POLES

Danny Moore, 3701 W. 169 St., Country Club Hills, Ill. 60478

Filed Jan. 24, 1997, Ser. No. 788,664

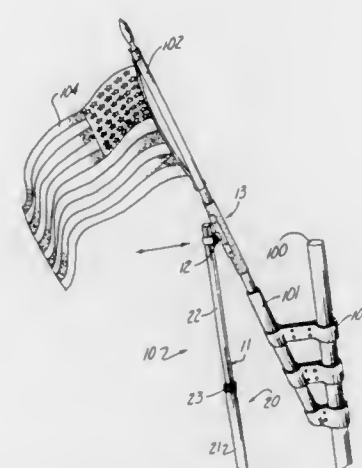
Int. Cl.<sup>6</sup> B25J 1/02

U.S. Cl. 294—19.1

3 Claims

1. A flag staff installer apparatus for installing and removing the flag staff of a flag relative to an elevated angled receptacle mounted on a utility pole wherein the apparatus comprises:

an extensible pole unit having a tubular upper portion and a tubular lower portion;



a flag staff capture and release unit pivotally and adjustably associated with the upper portion of said pole unit wherein the capture and release unit comprises in part an elongated length of resilient tubing having a longitudinally extending slit formed on the outer periphery of the resilient tubing wherein said length of resilient tubing is dimensioned to frictionally engage the periphery of the flag staff; and

an adjustable connector unit disposed intermediate the extensible pole unit and the flag staff capture and release unit wherein the adjustable connector unit comprises:

a generally C-shaped bracket operatively engaged to the upper portion of the extensible pole unit; and at least one bracket element operatively connected on one end to the resilient tubing and pivotally connected on the other end to said C-shaped bracket via a pivot element.

5,769,475

# SHACKLE APPARATUS

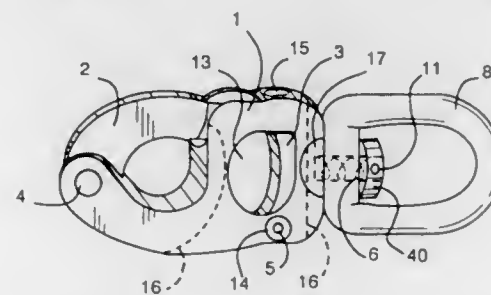
Timothy Tylaska, 138 N. Stonington Rd., Mystic, Conn. 06355

Filed Oct. 3, 1996, Ser. No. 724,846

Int. Cl.<sup>6</sup> F16G 15/08

U.S. Cl. 294—82.2

20 Claims



1. A shackle comprising:

a shackle casing having a hook opening, a finger opening, and a trigger opening;

a hook having a centerline, a pivotal end and a locking end; said pivotal end being pivotally connected within the hook opening of said shackle casing by a pin located offset from said centerline;

a trigger, having a locking end and a pivotal end, said trigger being positioned within the finger opening with its pivotal end being pivotally connected within the trigger opening of said shackle casing;

a shank rigidly attached to said shackle casing, said shank having a spring opening therethrough such that the spring opening communicates with the finger opening of said shackle casing;

a bail rotatably attached to said shank such that said bail and said shackle casing can swivel independent of one another; and

a spring positioned within the spring opening of said shank such that said spring is urged against said trigger; so that when a user urges the locking end of said hook against the locking end of said trigger, said spring is compressed allowing the locking end of said hook to engage the locking end of said trigger until said shackle locks in a closed condition; and so that when said user pulls on said trigger to compress said spring, the locking end of said hook is released from the locking end of said trigger to place said shackle in an open condition.

5,769,476

# APPARATUS AND METHOD FOR HANDLING AND PROCESSING ARTICLES

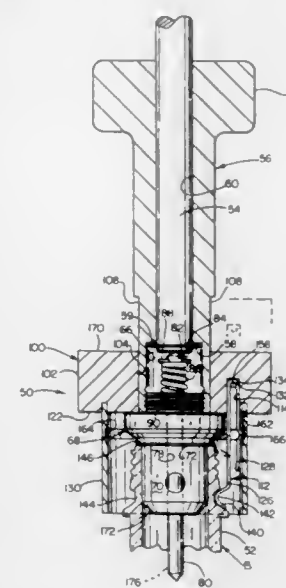
Joseph R. Lawn, Brecksville, and Roger L. Judson, Richfield, both of Ohio, assignors to Feco Engineered Systems Ltd., Cleveland, Ohio

Filed Sep. 16, 1996, Ser. No. 714,639

Int. Cl.<sup>6</sup> B65G 47/90

U.S. Cl. 294—99.1

13 Claims



1. A chuck for use in a machine for handling and treating an article having an opening at one end, said chuck comprising a support having an axially extending nose configured to fit within the opening in the article, a collar mounted on the support for axial movement, a hollow sleeve mounted to the collar and surrounding at least a part of the nose, a first resilient leg having a proximal end portion connected to the collar and a distal end portion for engaging the exterior of the article to hold the article in the chuck, and a second resilient leg having a proximal end portion connected to the collar and a distal end portion engaging the interior of the sleeve to hold the sleeve to the collar.

5,769,477

# COVERING/CARRIER FOR A BOOK

Nicki L. Lehrer, 13304 Ridge Dr., Rockville, Md. 20850

Filed Nov. 7, 1996, Ser. No. 745,176

Int. Cl.<sup>6</sup> B42D 3/18

U.S. Cl. 294—138

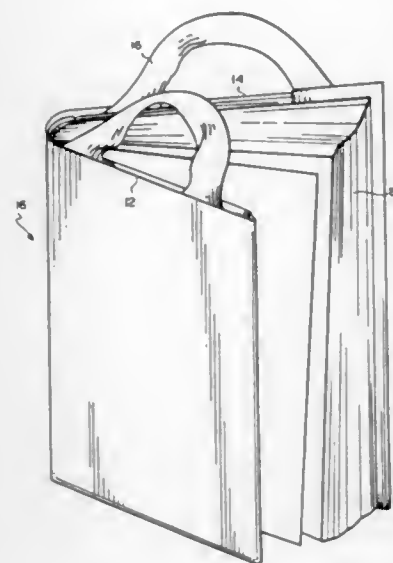
20 Claims

1. A covering for a book having front and back covers comprising:

a sheet of flexible material having top, bottom and opposite side edges and first and second opposite faces;

a bottom panel of said sheet material being folded about a first foldline generally parallel to said bottom edge to overlie a





portion of said sheet material along said first face thereof, said folded bottom panel extending between said opposite side edges;

a pair of side panels extending between said top and bottom edges, and including end portions of said folded bottom panel, folded about second foldlines generally parallel to said side edges and perpendicular to said first foldline to overlie portions of said sheet material along said first face thereof and portions of said bottom panel folded about said first foldline; bottom portions of said folded side panels and the folded bottom end portions thereof forming pockets for receiving respective corners of the front and back covers of a book;

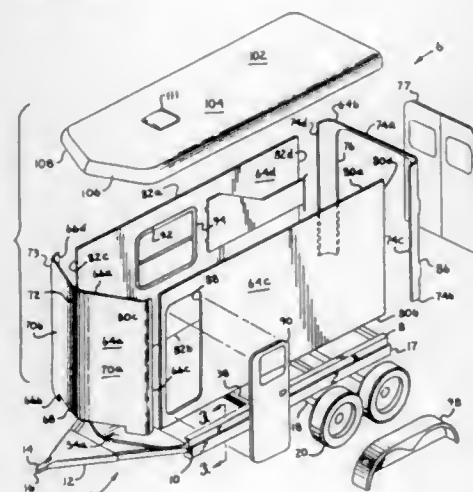
a pair of handles secured to said sheet material along a top portion thereof and between said side edges, said handles projecting from said top portion for carrying a book overlying said sheet material with corners of the front and back covers of the book received in said pockets, respectively.

5,769,478

**TRAILER AND COMPONENT ASSEMBLY METHOD**  
Michael P. Vernese, 11391 Manatee Ter., Lake Worth, Fla. 33467Filed Mar. 27, 1995, Ser. No. 410,699  
Int. Cl.<sup>6</sup> B60P 3/04

U.S. Cl. 296—24.2

1 Claim



1. A trailer, which comprises:

(a) a chassis including:

(1) a front end;

(2) a back end;

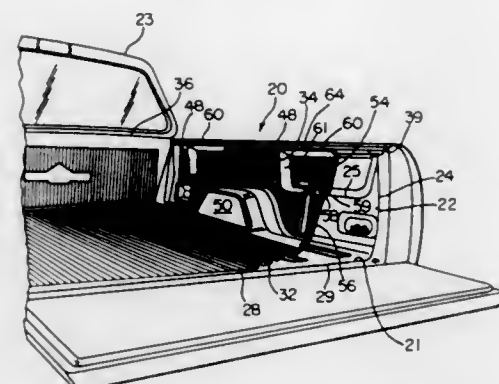
- (3) a frame having opposite side rails and a tongue at the chassis front end, said frame including a plurality of cross pieces extending transversely between said side rails;
- (4) an axle mounted on the frame and extending transversely with respect thereto;
- (5) a pair of wheels mounted on said axle, each said wheel being located on a respective side of said trailer; and
- (6) a floor structure comprising a plurality of juxtaposed tongue-and-groove floor members extending generally longitudinally and overlaying said cross pieces, said floor having a first, rear portion with said tongue-and-groove floor members and a front portion with a fiber reinforced plastic floor; and
- (b) a superstructure including:
- (1) a front wall including upper, lower and opposite side edges, said front wall being mounted on said frame in proximity to said chassis front end;
- (2) a rear wall including a door opening, upper, lower and opposite side edges, said rear wall being mounted on said frame in proximity to said chassis back end;
- (3) first and second side walls each having upper, lower, front and back edges, each said side wall being mounted on a respective frame side rail at its lower edge;
- (4) mounting means for mounting said walls on said frame;
- (5) a roof including a rim extending downwardly and terminating at a lower edge; and
- (6) mounting means for mounting said roof on said wall upper edges with said roof rim overlapping same.

5,769,479

**BEDLINER WITH STIFFENING INWARD FLANGE**  
Phillip L. Emery, Portage, Wis., assignor to Penda Corporation, Portage, Wis.Filed Nov. 1, 1996, Ser. No. 743,017  
Int. Cl.<sup>6</sup> B60P 1/64

U.S. Cl. 296—39.2

8 Claims



1. A thermoformed thermoplastic under-the-rail truck bedliner for mounting within a vehicle cargo bed having opposed upwardly extending side walls, the liner comprising:
- a bottom wall;
- two side walls positioned outwardly of the bottom wall and which extend upwardly from opposite sides of the bottom wall; and
- portions of each bedliner side wall which define inner portions of the side wall which extend from the bottom wall;
- portions of each bedliner side wall which define an outward side panel which is spaced outwardly from the inner portions toward the truck side wall;
- a skirt which extends between and connects the inner portions of the side wall to the outward side panel, the skirt having a horizontally extending segment and upwardly extending front and rear segments; and
- a stiffening flange which extends inwardly, away from the truck side wall, the flange extending upwardly from the outward side panel and being connected to the front and rear segments

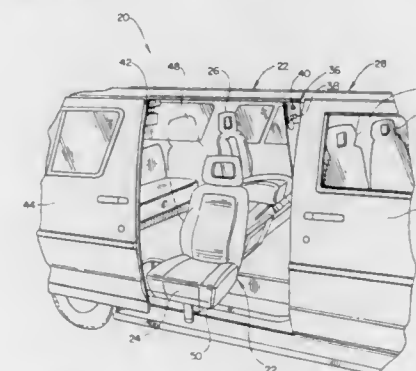
of the skirt, the flange, the skirt and the outward side panel thereby forming a shell which stiffens the bedliner side wall and restricts warpage thereof, and the stiffening flange defining a terminating upper margin of the bedliner.

5,769,480

**POWER SEAT APPARATUS**Robert J. Gebhardt, P.O. Box 282, Waltham, Minn. 55982  
Filed Sep. 30, 1996, Ser. No. 722,662  
Int. Cl.<sup>6</sup> B60N 2/02

U.S. Cl. 296—65.1

21 Claims



1. An apparatus for use in moving a seat in a vehicle while maintaining vehicle seating capacity, the apparatus comprising:
- a frame coupled to the vehicle; and
- means coupled to the seat and frame for moving the seat between a forward facing position within the vehicle and an outward facing position outside the vehicle, having a single power mechanism for moving the seat in a first outward/inward direction and a second raise/lower direction.

5,769,481

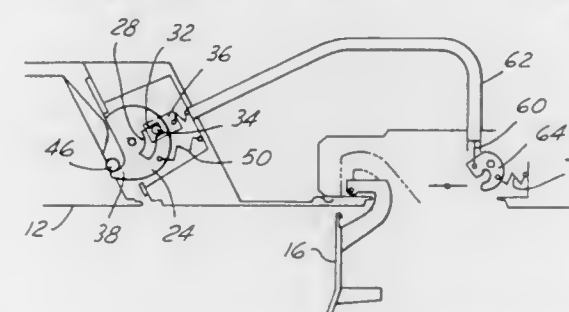
**INTERLOCK MECHANISM FOR VEHICLE SLIDING DOOR AND FUEL FILLER DOOR**

Geoffrey John Cooper, Canton, Mich., assignor to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Jul. 26, 1996, Ser. No. 686,784  
Int. Cl.<sup>6</sup> B62D 25/00

U.S. Cl. 296—97.22

11 Claims



1. An interlock mechanism for an automotive vehicle having a fuel filler door and a sliding door on a same side of a body of said vehicle, the interlock mechanism comprising:
- (a) sliding door latch means for releasably latching the sliding door in a closed position when the filler door is open, having:
- (i) a rotatable cam member mounted within the vehicle body adjacent a door interface edge and movable between a first position with the sliding door in the closed position and a second position with the sliding door in an open position, the cam member having:
- a slot having a circumferential branch and a radial branch a finger portion extending away from said cam exteriorly from said vehicle body, and

- a land along an edge of the cam member circumjacent said finger portion; and
- (ii) pin means movable within the slot between a neutral position in which the pin means can move into the circumferential branch and the radial branch, and a locked position in which the pin means is moved into the radial branch so as to prevent rotation of the cam member to the first position;
- (b) striker means extending from a rear edge of the sliding door for interaction with the cam member, the striker means having a lead portion for interaction with the finger portion to rotate the cam member to the second position such that the circumferential branch of the slot rotates around the pin means when the sliding door is moved to an open position, and a wedge portion cooperative with the land to return the cam member to the first position when the sliding door is moved to the closed position;
- (c) filler door latch means for releasably latching the filler door in a closed position when the sliding door is in the open position; and
- (d) connection means between the filler door latch means and the sliding door latch means to move the pin means within the slot.

5,769,482

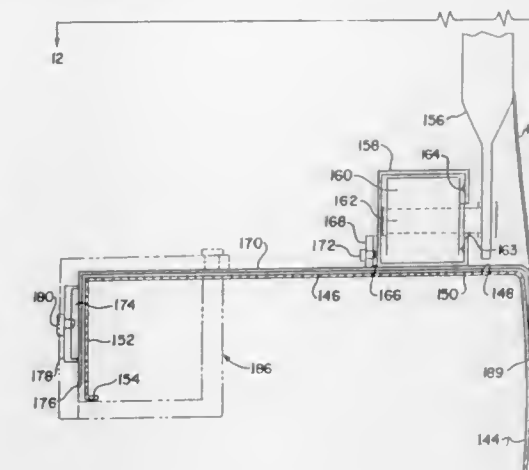
**FLEXIBLE COLLAPSIBLE UTILITY TRUCK BED COVER**

Alan J. E. Kirk, R. D. #2, Box 533D, Rt. 982, Mt. Pleasant, Pa. 15666

Division of Ser. No. 130,282, Oct. 1, 1993, Pat. No. 5,556,156.  
This application Sep. 16, 1996, Ser. No. 717,657Int. Cl.<sup>6</sup> B60P 7/02

U.S. Cl. 296—100

7 Claims



1. In combination with a utility truck having an open bed with front and rear walls projecting upwardly from said bed and first and second lateral walls upwardly projecting from said bed and perpendicularly interposed between said front and rear walls, a truck bed cover comprising a frame section comprising a plurality of rigid frame members and a flexible tarpaulin section, said frame members having first and second terminal ends and being fixed at a first end on the first lateral wall and projecting upwardly then laterally then downwardly and being fixed at its second terminal end on the second lateral wall and said rigid frame members together supporting the flexible tarpaulin section, wherein the plurality of rigid frame members includes a rearwardly positioned rear rigid frame member which is pivotally connected on the first and second lateral walls to pivot longitudinally in a vertical arc, respectively, at its first and second terminal ends and there is a supporting rigid frame member positioned adjacent to and longitudinally forward of the rear rigid frame member and from a point adjacent to where the supporting rigid frame member is connected on one of said lateral walls there is at least one arm means which

extends to be connected to and support the rear rigid frame member and the lateral walls of the truck bed have a planar top surface and the rigid frame members project upwardly from said planar top surface and a longitudinal track for a wheel having a transverse axle is fixed to the top planar surface of at least one of the lateral walls and at least one of the rigid frame members is pivotally attached at one of its terminal ends to said transverse axle to allow longitudinal movement of said terminal end of said rigid frame member.

5,769,483

# **CONVERTIBLE MOTOR VEHICLE ROOF**

Martin Danzl, München; Arpad Fürst, Germering; Johann Mayer, Petershausen; Stefan Miklos, München, and Peter Reihl, Starnberg, all of Germany, assignors to Webasto Karosseriesysteme GmbH, Stockdorf, Germany

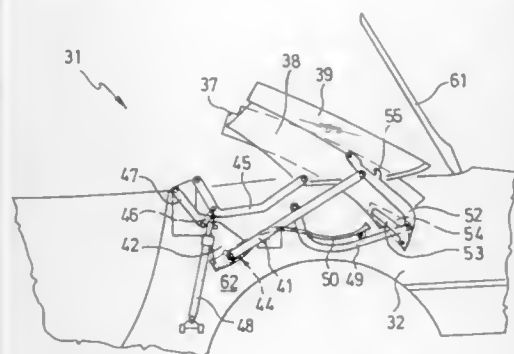
Filed Oct. 2, 1995, Ser. No. 537,447

Claims priority, application Germany, Sep. 30, 1994, 44 35 222.0

Int. Cl.<sup>6</sup> B60J 7/08

U.S. Cl. 296—107

20 Claims



1. Convertible vehicle roof comprising a rigid rear roof part, a rigid rear part which adjoins the rear roof part; a stowage space located in rearwardly of the passenger space, and means for reconfiguring and moving the rear roof part with the rear part and other roof parts from a closed roof configuration for enclosing a vehicle passenger space from above into the stowage space located in rearwardly of the passenger space; wherein the means for reconfiguring and moving includes means for swinging the rear part forwardly over the rear roof part for enabling the rear part to be moved into the stowage space together with the rear roof part.

5,769,484

# **OVERFENDER STRUCTURE ON REAR DOOR OF VEHICLE**

Joutaro Shiino, Hino, Japan, assignor to Hino Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 554,521, Nov. 7, 1995, abandoned.

This application Sep. 15, 1997, Ser. No. 929,407

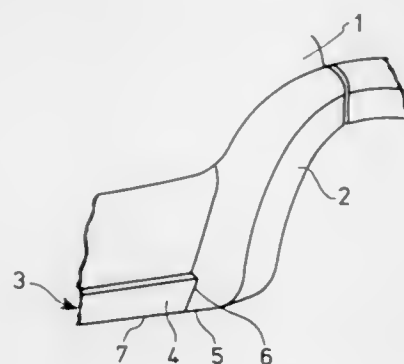
Claims priority, application Japan, Dec. 27, 1994, 6-337007; Jan. 24, 1995, 7-027247

Int. Cl.<sup>6</sup> B60J 5/04

U.S. Cl. 296—151

1 Claim

1. A fender structure on a rear door of a vehicle comprising: a rocker molding attached to a portion of a vehicle body below a lower edge of a substantial portion of the rear door; a fender extension formed on a rear portion of the rear door; said fender extension of the rear door blended to the shape of a rear fender contour of the vehicle at an upper end of the fender extension; and said fender extension continuing at its lower end downward along a rear end of the rocker molding to cover said rear end



of the rocker molding so as to be substantially coplanar with a lower end surface of said rocker molding.

5,769,485

# **TOP LIFT SYSTEM FOR POP-UP CAMPERS**

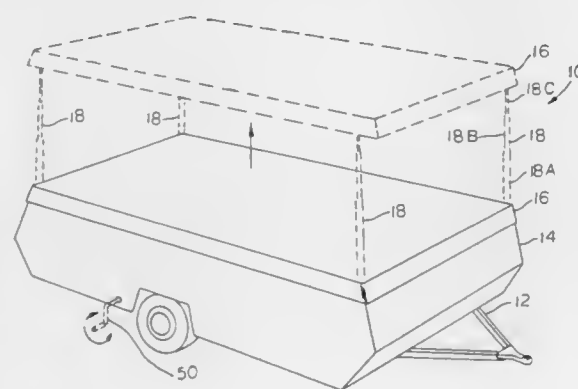
Wilbur L. Bontrager, Middlebury; Wayne W. Miller, Goshen; Levi E. Schmucker, Syracuse, and Larry W. Jones, Ligonier, all of Ind., assignors to Jayco, Inc., Middlebury, Ind.

Filed Aug. 2, 1996, Ser. No. 692,058

Int. Cl.<sup>6</sup> B60P 3/355

U.S. Cl. 296—171

14 Claims



1. On a vehicle having a top portion, a body portion, and a pair of telescoping support posts connecting the top portion to the body portion, a lift mechanism for simultaneously extending or retracting the telescoping support posts to thereby raise the top portion to a raised position above the body portion or lower the top portion to a lowered position on the body portion, said lift mechanism comprising:

- a pair of guide housings, one of said guide housings extending from each of said support posts;
- a block housing mounted to the ends of said pair of guide housings, each of said block housings including an internal pulley, each of said block housings further including one or more passages extending through said block housings substantially tangential to its said pulley;
- a pair of substantially incompressible flexible members, each of said flexible members being slidably mounted in one of said guide housings and attached to a corresponding support post for raising and lowering the latter;
- a continuous drive cable, said drive cable extending between said guide housings and connecting one of said flexible members with the other flexible member whereby movement of said one flexible member is transmitted to the other flexible member for movement of the latter, said drive cable passing through both of said block housings; and
- drive means for moving said drive cable.

5,769,486

# **TRUCK ROOF MOUNTING SYSTEM**

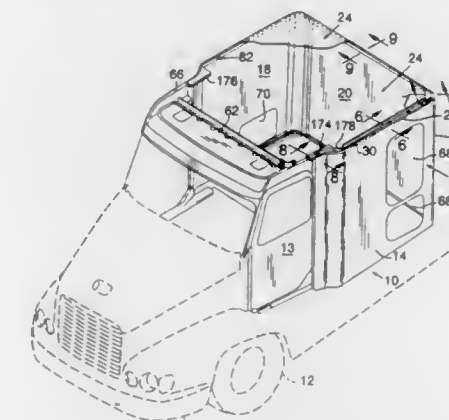
Luis A. Novoa, Portland, Oreg., and Homer Franklin Wright, Jr., Vancouver, Wash., assignors to Freightliner Corporation, Portland, Oreg.

Filed Jul. 3, 1996, Ser. No. 675,738

Int. Cl.<sup>6</sup> B60P 3/32

U.S. Cl. 296—210

29 Claims



1. A truck roof mounting system comprising: a sidewall with a sidewall upper edge portion; an inwardly projecting sidewall flange portion along at least a major section of the sidewall upper edge portion; a roof with a roof lower edge portion; an inwardly projecting roof flange portion along at least a major section of the roof lower edge portion; a first elongated reinforcing element which is longer than it is wide, which is positioned at least in part above the projecting roof flange portion and which extends along a major portion of the length of the projecting roof flange portion; a second elongated reinforcing element which is longer than it is wide, which is positioned at least in part below the projecting sidewall flange portion and which extends along a major portion of the length of the projecting sidewall flange portion; and the first and second reinforcing elements being coupled together to clamp the roof flange portion and sidewall flange portions into fixed relative positions thereby joining the sidewall and roof.

5,769,487

# **CHUCKING DEVICE FOR ACCURATE MUTUAL FIXATION OF TWO MEMBERS**

Gerhard Michler, Ilfeld, Germany, assignor to Fritz Schunk GmbH & Co KG Fabrik Für Spann-und Greifwerkzeuge, Germany

Filed Jul. 10, 1996, Ser. No. 677,523

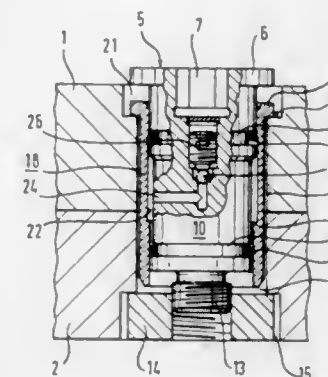
Claims priority, application Germany, Jul. 13, 1995, 195 25 574.7

Int. Cl.<sup>6</sup> B23B 31/40

U.S. Cl. 279—2.08

15 Claims

1. A chucking device for accurate mutual fixation of coaxially positioned members having aligned boreholes, said device comprising: a draw bolt positioned in the aligned boreholes in the members; an expansion sleeve located between said draw bolt and inner walls of said boreholes; and a sealed annular cylindrical pressure chamber between said draw bolt and said expansion sleeve, said pressure chamber being filled with a medium exerting an adjustable expansion pressure on said expansion sleeve, said expansion sleeve being secured in the boreholes in the two members so it cannot be displaced axially; said draw bolt in said expansion sleeve being mounted therein so that said draw bolt can be moved axially, one end of said bolt



5,769,488

# **SELECTIVELY DEFORMABLE SEAT**

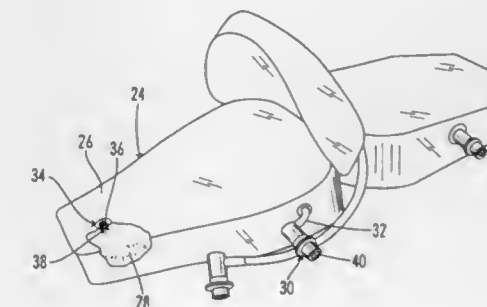
Jerry Daniels, and Michael E. Simonson, both of Ooltewah, Tenn., assignors to Ooltewah Manufacturing, Inc., Ooltewah, Tenn.

Continuation-in-part of Ser. No. 615,615, Mar. 13, 1996, Pat. No. 5,711,573. This application Jun. 5, 1997, Ser. No. 869,373

Int. Cl.<sup>6</sup> B62J 1/26

U.S. Cl. 297—199

8 Claims

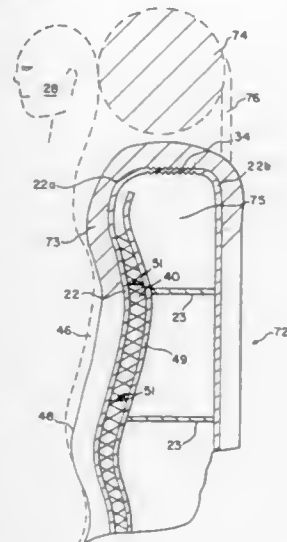


1. A motorcycle seat including a base having an upper surface, a cushion disposed on the base, and filler material disposed on the cushion and the remainder of the upper surface of the base, and a covering disposed over the seat to enclose the base, the cushion and the filler material and defining the exterior surfaces of the seat, said cushion comprising: a resilient multi-cellular foam material capable of holding air within the cellular structure, an air impermeable bladder disposed about said foam material encasing and sealing said foam material within said bladder, a first valve including a conduit extending through said bladder in sealed relationship therewith and terminating within said foam material, said valve including an operator disposed externally of said covering for opening and closing communication between said conduit and ambient air external of said seat, whereby air selectively may be expelled from said foam material through said conduit when said foam material is compressed by a force on said seat and deformed and air may reenter deformed foam material when compression is relieved, and a second valve having an outlet including a portion extending through said bladder in sealed relationship therewith and communicating with the foam and an inlet opening outside said bladder, said second valve having means for permitting air to bleed from said inlet through said outlet slowly to inflate said bladder after air in said bladder has been expelled so as to prevent said



foam from remaining in a compressed state for an excessive period of time after said compression force is removed.

**5,769,489**  
**ENERGY ABSORBING SUPPORT FOR VEHICULAR PASSENGERS**  
Ronald P. Dellanno, 40 Fox Run, North Caldwell, N.J. 07006  
Filed May 9, 1997, Ser. No. 854,119  
Int. Cl.<sup>6</sup> B60N 2/42  
U.S. Cl. 297—216.14 12 Claims

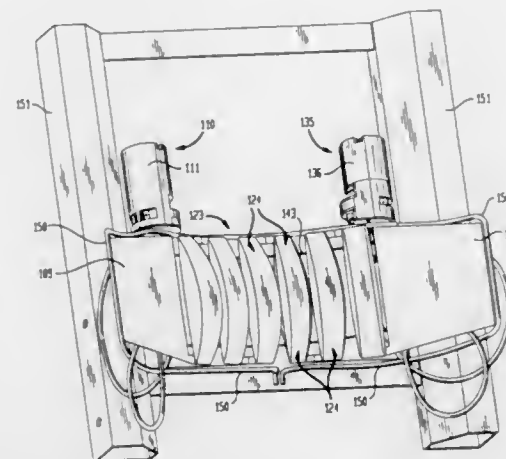


1. Apparatus for preventing or limiting spinal injuries to a passenger seated in a forward facing position in a moving vehicle during vehicular impact or sudden deceleration, said apparatus comprising:

- a vehicle-installed supporting seat for said passenger, said seat having a support portion behind the seated passenger which includes a resilient surface in contact with the supported passenger, said resilient portion being supported on an underlying stiff support shell;
- said support shell being rearwardly displaceable upon being subjected to impressed forces generated from the said passenger pressing against the resilient surface of the support portion as a result of a rear end impact at said vehicle; and
- a controllably deformable energy absorbing crush zone being disposed to the rear of said shell and compressed by said rearward displacement of the shell upon said impact or sudden deceleration; whereby said support portion acts to decelerate the supported spine of the passenger during a vehicle rear end impact, while the controlled deformation of said crush zone absorbs energy, to prevent or limit spinal injuries to the passenger.

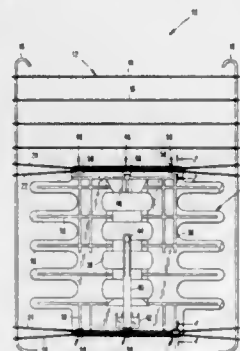
**5,769,490**  
**ADJUSTABLE LUMBAR SUPPORT**  
Mark E. Falzon, Lara, Australia, assignor to Henderson's Industries Pty. Ltd., Australia  
PCT No. PCT/AU94/00790, § 371 Date May 20, 1996, § 102(e)  
Date May 20, 1996, PCT Pub. No. WO95/17840, PCT Pub. Date Jul. 6, 1995  
PCT Filed Dec. 23, 1994, Ser. No. 648,030  
Claims priority, application Australia, Dec. 24, 1993, PM 3146  
Int. Cl.<sup>6</sup> A47C 3/027; 7/46  
U.S. Cl. 297—284.4 33 Claims

1. An adjustable lumbar support for use in a seat backrest, including a flexible band which in use extends longitudinally across said backrest so that opposite ends of the band are adjacent respective opposite sides of the backrest, said band having an



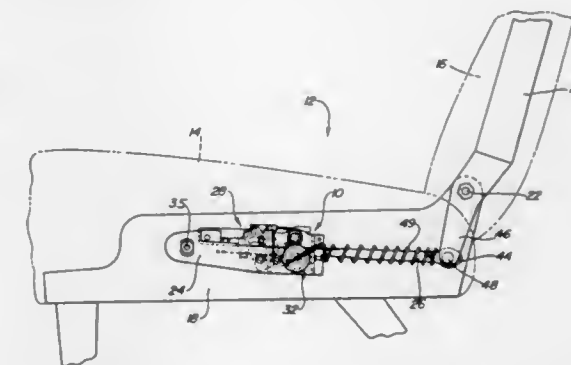
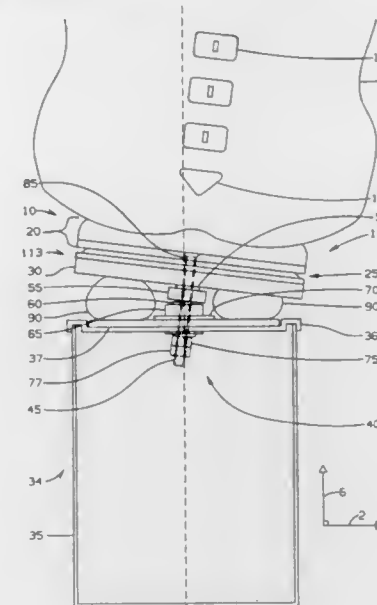
upper region and a lower region which extend in the longitudinal direction of the band and are laterally spaced from one another, each of said region having an effective length in said longitudinal direction which, in use, determines its depth of rearward curvature, and region adjusting means connected to both said upper and lower regions and being operative to decrease the effective length of either one of said regions while simultaneously causing or permitting an increase in the effective length of the other of said regions.

**5,769,491**  
**SEAT WITH ADJUSTABLE SUPPORT ELEMENTS**  
Jörg Schwarzbich, Wertherstr. 15, D-33615 Bielefeld, Germany  
Filed Dec. 2, 1996, Ser. No. 757,634  
Claims priority, application European Pat. Off., Dec. 23, 1995, 95 120 619  
Int. Cl.<sup>6</sup> B60N 2/44  
U.S. Cl. 297—284.4 10 Claims



1. In a seat including a wire grating and a support element mounted on wires of said grating; said support element carrying clamps; each clamp including a slot having a mouth which receives two wires of said grating in a direction of wire insertion/removal, said direction extending generally perpendicular to a length of said wires; a clear width of said mouth measured generally perpendicular to said wire length being greater than a diameter of each of said two wires and less than a sum of said diameters of said two wires, to permit sequential insertion and removal of the two wires while preventing simultaneous insertion and removal of said two wires.

**5,769,492**  
**BACK SAVER SPORT SEAT**  
Robert J. Jensen, 611 NE. 2nd Ave., Stewartville, Minn. 55976  
Filed Dec. 10, 1996, Ser. No. 763,197  
Int. Cl.<sup>6</sup> A47C 1/02  
U.S. Cl. 297—314 13 Claims



13. An apparatus for supporting a user in a seated position, the apparatus comprising:  
a seat for supporting the user in the seated position;  
a base; and  
a connection mechanism coupling the seat to the base and allowing undulatory movement of the seat relative to the base, wherein the connection mechanism comprises:  
an elongated connecting member having a first end coupled to the seat and a second end coupled to the base, the connecting member supporting the user and the seat at a position above the base, wherein the connecting member is coupled to at least one of the seat and the base in a non-rigid manner;  
a first disc positioned between the seat and the base and having a first aperture extending therethrough, wherein the connecting member extends through the first aperture;  
a second disc positioned between the seat and the base and having a second aperture extending therethrough, wherein the connecting member extends through the second aperture; and  
a first pad positioned between the first disc and the second disc and having a third aperture extending therethrough, wherein the connecting member extends through the third aperture, the third aperture having an area larger than a cross sectional area of the connecting member.

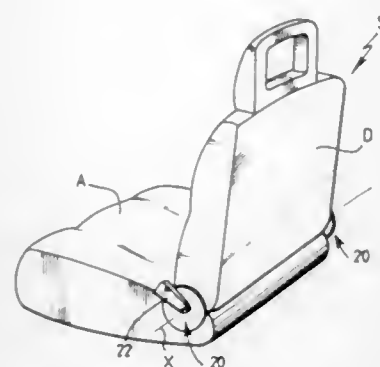
**5,769,493**  
**LINEAR RECLINER WITH EASY ENTRY MEMORY FEATURE**  
Srinivas Pejathaya, St. Clair Shores, Mich., assignor to Fisher Dynamics Corporation, St. Clair Shores, Mich.  
Continuation-in-part of Ser. No. 607,949, Feb. 28, 1996, Pat. No. 5,660,440. This application Jan. 29, 1997, Ser. No. 789,838  
Int. Cl.<sup>6</sup> B60N 2/02  
U.S. Cl. 297—362.12 22 Claims

1. A linear recliner assembly for use with a seat assembly having a seatback supported for pivotal movement relative to a seat bottom, comprising:  
a housing secured to the seat bottom;  
a recliner rod having a first end attached to the seatback and a second end supported for sliding movement relative to said housing and having teeth formed thereon;  
a latching mechanism operable in a latched mode for securing said recliner rod in a fixed position relative to said housing for

retaining the seatback in a reclined position, said latching mechanism further operable in an unlatched mode for releasing said recliner rod for movement relative to said housing;  
a recline actuator mechanism for selectively shifting said latching mechanism from its latched mode into its unlatched mode to permit adjustment of the reclined position of the seatback;  
a memory mechanism operable in a non-actuated mode for permitting independent actuation of said latching mechanism, said memory mechanism further operable in an actuated mode for automatically shifting said latching mechanism into its unlatched mode to permit movement of the seatback from its reclined position to a forward dumped position, said memory mechanism including a gear that is disengaged from said teeth of said recliner rod when said memory mechanism is in its non-actuated mode and which is adapted to meshingly engage said teeth on said recliner rod at a position corresponding to the reclined position of the seatback when said memory mechanism is shifted into its actuated mode, wherein said gear is rotatably indexed in a first direction through a certain amount of angular motion in response to movement of said recliner rod in a first direction caused by movement of the seatback from its reclined position to its forward dumped position, and wherein said gear is thereafter rotatably indexed in a second direction through said certain amount of angular motion in response to movement of said recliner rod in a second direction caused by movement of the seatback from its forward dumped position to its reclined position for causing said memory mechanism to be shifted into its non-actuated mode and said latching mechanism into its latched mode for relatching the seatback in its reclined position, said memory mechanism further including a seatback stop arrangement for inhibiting rearward reclining movement of the seatback past its reclined position when said memory mechanism is in its actuated mode; and  
a dump actuator mechanism for selectively shifting said memory mechanism from said non-actuated mode to said actuated mode.

**5,769,494**  
**ARTICULATION FOR A SEAT, AND SEAT FOR A MOTOR VEHICLE EQUIPPED WITH THIS ARTICULATION**  
Eric Barrere, Olivier Delatte, Francois Fourrey, Jean Marie Blanchard, and Michel di Luccio, all of Nogent-sur-Vernisson, France, assignors to Cesa-Compagnie Européenne De Sieges Pour Automobiles, Levallois-Perret Cedex, France  
Filed Oct. 16, 1996, Ser. No. 733,066  
Claims priority, application France, Oct. 17, 1995, 95 12159  
Int. Cl.<sup>6</sup> B60N 2/02 29 Claims

1. An articulation for a seat, especially for a motor vehicle, comprising:  
two substantially parallel cheeks (24, 26), one of which, which is stationary, is intended to be fixed to a seat part of the seat and the other of which, which is mobile, is intended to be fixed to a backrest of the seat, these cheeks being able to



rotate one with respect to the other about an axis of articulation (X) which is perpendicular to them, and means (30) for coupling the cheeks (24, 26) together, controlled by a member (32) which can be actuated in a direction for adjusting the inclination of the backrest with respect to the seat part and in the opposite direction from the previous direction for temporarily folding this backrest down, wherein: the coupling means (30) comprise at least one lever (34a, 34b) which has two ends (36A, 36B), each of which can be secured directly to an associated cheek (24, 26) by interaction of complementary shapes (SA, SB, TA, TB), the member (32) for controlling the coupling means actuating maneuvering means (44A, 44B, 52; 86A, 86B) intended to secure the lever to just one of the cheeks (24, 26) or the other, depending on the direction of actuation of the control member (32), by tilting the lever (34a, 34b) about a fulcrum embodied by the complementary shapes (SA, SB, TA, TB) for securing one end (36A, 36B) of the lever or the other to its associated cheek (24, 26).

5,769,495

**ADJUSTING MECHANISM FOR A SUPPORT ELEMENT INCLUDED IN A SEAT AND PIVOTABLE IN THE VERTICAL PLANE**

Erkki Vairinen, Yliskulma, Finland, assignor to Jukova Oy, Yliskulma, Finland

PCT No. PCT/FI93/00489, § 371 Date Jul. 7, 1995, § 102(e) Date Jul. 7, 1995, PCT Pub. No. WO94/12081, PCT Pub. Date Jul. 7, 1995

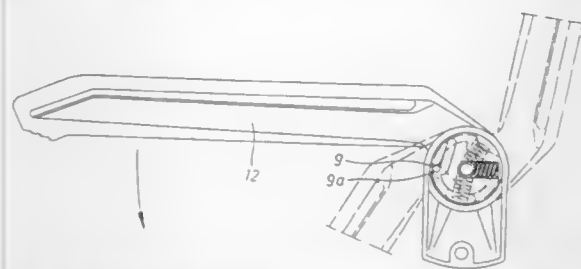
PCT Filed Nov. 18, 1993, Ser. No. 436,319

Claims priority, application Finland, Nov. 20, 1992, 925275

Int. Cl.<sup>6</sup> A47C 7/54; B60N 2/46

U.S. Cl. 297—411.32

1 Claim



1. In an adjusting mechanism for an armrest (2) included in a seat and pivotable in the vertical plane, said mechanism being of a type having a fastening element (1) adapted to be mounted on a seat or a separate body member and provided with a transverse through-hole (10) for a fulcrum pin to facilitate the pivotable fixing of the armrest (2), and a fastening member (3) adapted to be included in the armrest (2) and provided with a through-going opening (8) for the fulcrum pin, the improvement comprising:

said opening (8) being elongated and having a first end and a second end;

a bushing (6) provided at said first end and adapted to receive said fulcrum pin, said bushing being adapted for a relative

movement in the longitudinal direction of said opening (8) towards said second end of said opening (8);

a spring member (7) applying an impulsive force between said bushing (6) and the fastening member (3); and

first guiding and locking elements (4, 5) included in the fastening member, and second guiding and locking elements (9a) included in said fastening element (1), said first and second guiding and locking elements (4, 5, 9a) being in cooperation with each other with said bushing (6) located at said first end and loaded by said spring member (7), wherein the pivoting of the armrest (2) to a desired position is effected by shifting the armrest (2) in the longitudinal direction of said opening (8) against the action of said spring member (7) towards the fulcrum pin remaining stationary relative to said fastening element (1), said guiding and locking elements (4, 5, 9a) being released from the relative engagement thereof for facilitating the pivoting motion of said armrest (2) to a desired locking position, wherein the spring member (7) is adapted to force the armrest (2) back to a position in which said bushing (6) is again at said first end of said opening (8) and said guiding and locking elements (4, 5, 9a) are in relative engagement;

said guiding and locking elements comprising a guide slot (4) formed in the fastening member (3) and provided with at least one arrest shoulder (5) located between the extreme ends of the slot, and a guide and locking member (9a) which is included in said fastening element (1) and movable relative to said slot (4) and engageable with said arrest shoulder (5) for locking said armrest (2) in a desired pivoted position, and said guide slot (4) forming a sickle-shaped path, said at least one arrest shoulder (5) being provided at the junction of a substantially circular arc shaped sickle section (14) and a substantially straight handle section (13).

5,769,496

**ADJUSTABLE ARMREST APPARATUS**

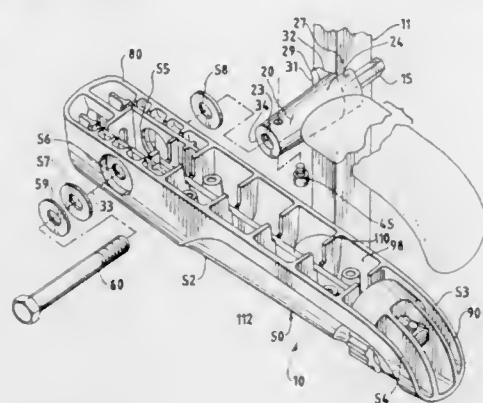
Dennis J. Gryp, East Moline, Ill., assignor to Sears Manufacturing Company, Davenport, Iowa

Continuation-in-part of Ser. No. 613,416, Mar. 11, 1996. This application Feb. 27, 1997, Ser. No. 807,064

Int. Cl.<sup>6</sup> A47C 7/54

U.S. Cl. 297—411.32

9 Claims



1. An adjustable armrest assembly mounted to a seat having a frame comprising:

a shaft having two ends mounted to and extending laterally from the seat frame, the shaft including at least one stop member and one end of the said shaft having a plurality of longitudinally extending surfaces abutting the seat frame to resist radially directed forces applied to said shaft;

an armrest frame rotatably mounted on the shaft and including stop engaging means to permit limited rotation of the armrest frame on the shaft, the frame having a distal end;

an actuator positioned proximate the distal end;

a rod disposed between the actuator and the shaft engageable with the stop member whereby the actuator can be operated to

limit rotation of the frame about the shaft and for adjusting the degree of rotation of the armrest frame on the shaft.

5,769,497

**ARM SUPPORT STRUCTURE**

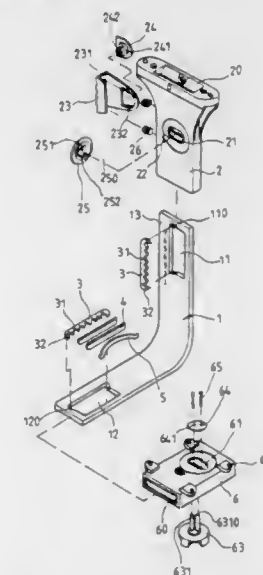
Ching-Tao Tsai, Taipei, Taiwan, assignor to Fusco Industrial Corporation, Taipei, Taiwan

Filed Apr. 4, 1997, Ser. No. 825,996

Int. Cl.<sup>6</sup> A47C 7/54

U.S. Cl. 297—411.36

2 Claims



1. An arm support which is adjustable to set a height of a chair armrest and a distance between a pair of the armrest on a chair, said arm support comprising:

an L-shaped support pole having a vertical part and a horizontal part,

said vertical part having a plurality of digits next to a first oblong orifice with a concave recess on each end thereof;

a first toothed member having spaced teeth along one side and a convex projection on each end thereof engaged respectively in each concave recess of said first oblong orifice;

a jacket formed with an elliptical orifice and a circular orifice and having an interior spacing for receiving the vertical part, the elliptical orifice showing the teeth of the first toothed member fixed inside the first oblong orifice and the circular orifice showing one of the digits on the vertical part;

a U-shaped elastic button having a channel defined by two sides to receive a width of one side of the jacket and engage said one side with a plurality of resilient members interposed between the button and the one side of the jacket, one side of the elastic button being longer and formed with a semi-circular orifice corresponding to the elliptical orifice of the jacket;

a first locking plate provided with two locking poles engaged between the teeth of the first toothed member fixed inside the first oblong orifice and a slab having a given thickness between the first plate and the locking poles;

a second locking plate formed with a cavity having two bores having an inner diameter smaller than the outer diameter of the locking poles of the first locking plate and an overhead piece extending above the cavity to define a distance therebetween which is substantially equal to the thickness of the slab of the first locking plate, and receiving securely the first locking plate by engaging the locking poles of the first locking plate within the bores of the second locking plate when extended through the semi-circular orifice of the elastic button, the elliptical orifice of the jacket and spacing between teeth of the first toothed member and the slab of the first locking plate inserted into the distance between the inner side of the cavity and overhead piece;

means on said, horizontal part for adjusting a distance between a pair of the chair armrest on the chair;

wherein, when the elastic button is pressed from a normal position to disengage the locking poles of the first locking plate from the teeth of the first toothed member, the jacket can be raised or lowered with respect to the vertical part so as to adjust the height of the chair armrest,

wherein, after the adjustment is complete the elastic button is released and the elasticity of the elastic button returns to the normal position, the locking poles engage teeth of the first toothed member and then support the jacket at a new position relative to the vertical part.

5,769,498

**DETACHABLE VEHICLE SEAT BOLSTER**

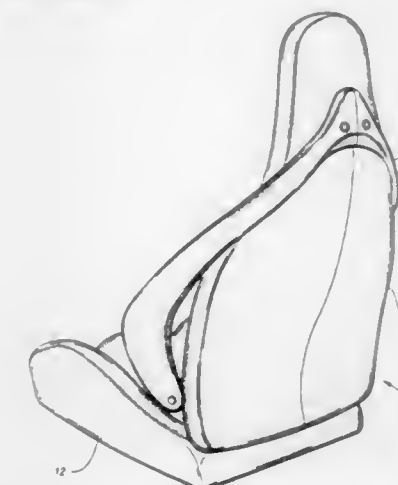
Michael L. Smith, Troy; Ronald L. Miotto, Wayne, and Denise A. Wilson, West Bloomfield, all of Mich., assignors to Lear Corporation, Southfield, Mich.

Filed Apr. 28, 1997, Ser. No. 848,047

Int. Cl.<sup>6</sup> A47C 7/00

U.S. Cl. 297—440.1

13 Claims



13. A vehicle seat assembly, comprising: a seat back having first and second sides and front and rear portions;

a seat bolster having a center portion including an attachment component for removable attachment to the rear portion of the seat back, and first and second opposing arms extending from the center portion, each said arm having a distal end including a lobe-shaped attachment member extending therefrom for removable attachment to the respective first and second sides of the seat back such that the seat bolster provides lateral support for the seat back; and

an attachment housing secured to each of said first and second sides of the seat back, each said attachment housing adapted to receive the lobe-shaped attachment member and to secure the lobe-shaped attachment member when the seat bolster is rotated with respect to the seat back.

5,769,499

**MOTOR VEHICLE SEAT**

Eugene S. Dudash, Wixom; Mark Stanisiz, Waterford; Eric A. Smitherberg, Berkley; L. Keith Hensley, Farmington Hills; Sanford E. Cook, Belleville, and Kevin J. Fudala, Dearborn Heights, all of Mich., assignors to Lear Corporation, Southfield, Mich.

Filed Jun. 7, 1996, Ser. No. 660,523

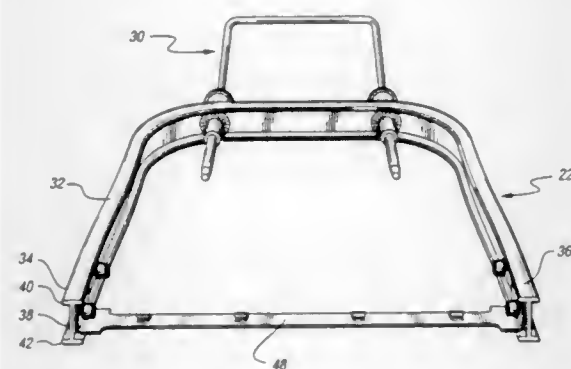
Int. Cl.<sup>6</sup> B60N 2/44

U.S. Cl. 297—452.18

6 Claims

1. An apparatus for supporting a seat back in a vehicle, comprising an extruded fully age hardened solid aluminum I-beam formed





after such age hardening into a generally U-shaped configuration and having opposing ends supported with respect to the vehicle, said I-beam forming a seat back frame for supporting a seat back without any further such age hardening, wherein said I-beam comprises a center support positioned between first and second flanges extending the length thereof, and said center support comprises first and second apertures formed therethrough, and said apparatus further comprises a pair of head rest guide tubes disposed in said first and second apertures, and a headrest bar supported within said guide tubes, each said guide tube having first and second swaged portions with an enlarged diameter for securing the guide tubes to the center support.

5,769,500

## FURNITURE AND METHOD OF ASSEMBLY

Richard Holbrook, Pasadena, Calif., assignor to Tropitone Furniture Co., Inc., Irvine, Calif.

Filed Feb. 1, 1996, Ser. No. 595,547

Int. Cl.<sup>6</sup> A47C 15/00

U.S. Cl. 297—463.2

8 Claims



1. A method of forming an article of furniture for seating thereon, said method comprising:

- positioning a segment to extend between a pair of members of a frame of the article of furniture, said segment having an intermediate portion formed between first and second shaped side portions, said side portions having first and second widths, said intermediate portion substantially equal in length to the distance between said pair of members such that heating and stretching of said segment is not required;
- sliding said first shaped side portion of said segment into a first channel formed in one of said members, said first channel having an opening, said opening having a third width, said first width being greater than said third width; and
- sliding said second shaped side portion of said segment into a second channel formed in the other of said members said second channel having an opening, said opening having a fourth width, said second width being greater than said fourth width, thereby providing a supporting surface of said article between said members of said frame.

5,769,501  
MULTI-COMPARTMENTALIZED DUMPING BODY WITH MOVABLE FLOOR AND BULKHEAD LATCH

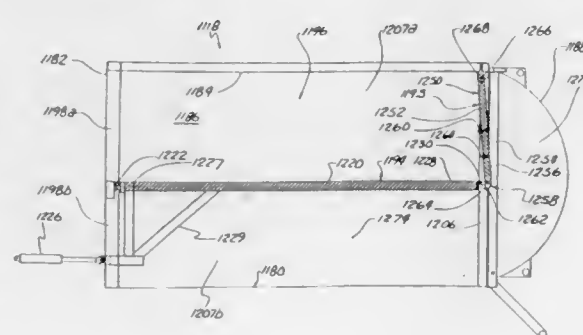
Dirk C. Kann; Virgil L. Collins, and Andy B. Appleton, all of Guttenberg, Iowa, assignors to Kann Manufacturing Corporation, Iowa

Continuation-in-part of Ser. No. 655,430, May 28, 1996, Pat. No. 5,716,103. This application May 28, 1996, Ser. No. 655,028

Int. Cl.<sup>6</sup> B60P 1/28

U.S. Cl. 298—23 R

8 Claims



1. A multiple compartment storage body for a refuse collection vehicle, the body comprising:

- a floor;
- a roof;
- a plurality of walls extending between the floor and the roof, the plurality of walls including a front wall, a rear wall, and side walls between the front wall and the rear wall, wherein the roof, floor and walls define an interior storage space and wherein the walls define a discharge opening;
- partition having first and second opposing end portions, wherein the first opposing end portion is pivotally supported intermediate the floor and the roof between the side walls to allow the second opposing end portion to pivot between the floor and the roof; and
- a bulkhead latch movable between a first engaged position and a second disengaged position, wherein the bulkhead latch engages the second opposing end portion of the partition in the first engaged position to support the second opposing end portion above the floor and wherein the bulkhead latch is disengaged from the second opposing end portion of the partition in the second disengaged position to permit the second opposing end portion to pivot to the floor.

5,769,502

## LEVELING SYSTEM FOR MOTOR VEHICLES

Marco Bettini, 40010 Bentivoglio (Bologna) Fr., San Marino, Italy

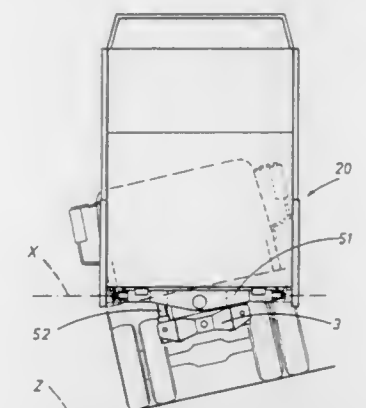
Filed May 23, 1996, Ser. No. 652,806

Int. Cl.<sup>6</sup> B60P 1/16

U.S. Cl. 298—175

16 Claims

- A leveling system for vehicles comprising:
  - a supporting structure for supporting a load to be carried by the vehicle;
  - a loading structure for containing the load and being pivotally connected to the supporting structure to pivot about a first axis;
 means for pivoting the loading structure about the first axis to thereby deploy the load;
 the supporting structure including:
  - a supporting frame secured to move with an axle of the vehicle;
  - an auxiliary frame connected to the supporting frame;
 means for adjusting the inclination of the loading structure relative to the supporting structure about a second axis, substantially perpendicular to the first axis, the means for adjusting including at least two variable extension elements



disposed on opposite sides of the second axis for pivoting the loading structure about the second axis;

a sensor for providing an output signal corresponding to the inclination of the loading structure with respect to the horizontal; and,

a control circuit for controlling the variable extension elements according to the output signal from the sensors, said control circuit cooperating with a warning device to warn an operator of the vehicle when the inclination of the loading structure about the second axis exceeds a defined angle.

5,769,503

## METHOD AND APPARATUS FOR A ROTATING CUTTING DRUM OR ARM MOUNTED WITH PAIRED OPPOSITE CIRCULAR POLARITY ANTENNAS AND RESONANT MICROSTRIP PATCH TRANSCIEVER FOR MEASURING COAL, TRONA AND POTASH LAYERS FORWARD, SIDE AND AROUND A CONTINUOUS MINING MACHINE

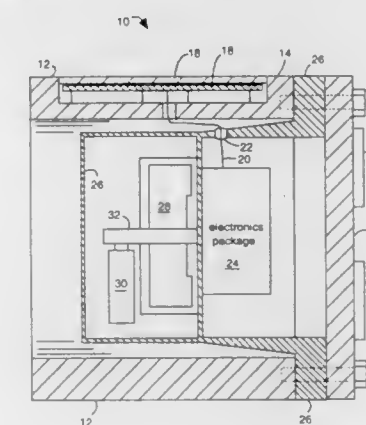
Larry G. Stolarczyk, and Gerald L. Stolarczyk, both of Raton, N. Mex., assignors to Stolar, Inc., Raton, N. Mex.

Filed Jul. 23, 1996, Ser. No. 685,214

Int. Cl.<sup>6</sup> E21C 35/24; 39/00

U.S. Cl. 299—1.2

16 Claims



12. A method for determining the thickness of underground geologic deposits over twelve inches in thickness, the method comprising the steps of:

- transmitting a series of synthetic-pulse stepped-frequency ground-penetrating radar signals from a circularly polarized microwave microstrip transmitting antenna into an underground geologic deposit;
- receiving a reflected series of signals with a second microwave microstrip receiving antenna having a circular polarization opposite to said transmitting antenna;
- using a fast Fourier transform to generate amplitude versus time data;

signal processing said data to determine a time "t" between a first amplitude peak corresponding to a near interface of said underground geologic deposit and a second amplitude peak corresponding to a far interface of said underground geologic deposit, where "t" is the travel time of said transmitted signals reflected through the thickness of said underground geologic deposit; and

estimating the dimension of said thickness of said underground geologic deposit by multiplying the speed of light by the time "t" and dividing the product by the square root of a predetermined dielectric constant of the material of said underground geologic deposit.

5,769,504

## EQUIPMENT FOR SHORTWALL MINING USEFUL FOR EXTRACTION OF PILLARS IN UNDERGROUND COAL MINES

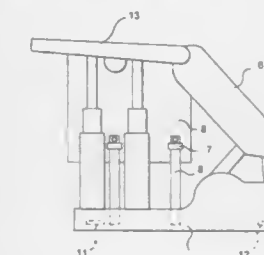
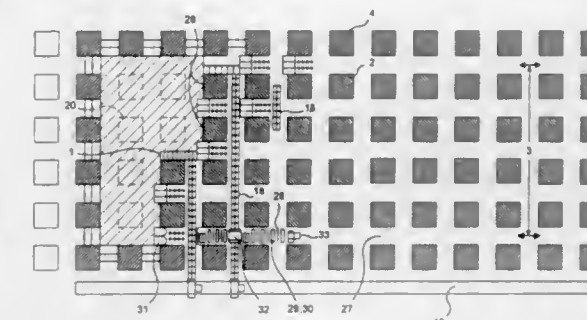
Sibnath Malty; Bharat Bhushan Dhar, and Sibnath Mukherjee, all of Bihar, India, assignors to Council of Scientific & Industrial Research, New Delhi, India

Filed Mar. 11, 1996, Ser. No. 613,297

Int. Cl.<sup>6</sup> E21D 23/03; E21C 41/16

U.S. Cl. 299—11

1 Claim



1. Shortwall mining equipment for extraction of pillars in an underground coal mine the equipment comprising:

- a series of self-advancing powered roof supports (1) for placement along pillars (2) under extraction, the pillars under extraction being located within a panel (3) which is surrounded by barrier pillars (4);
  - an armoured face conveyor (5) fixed to said barrier pillars;
  - a light duty chain conveyor (18); and
  - a belt conveyor (19),
- wherein each of the self advancing powered roof supports (1) has at a goaf end a support mechanism (6) on a base frame (14) with a side shield (7) including a plate (8) and hanging steel guards (9), hydraulic ram side arms (10), a front side hook (11) and a back side hook (12), the side shield (7) being hung from canopy (13) on a top of the support mechanism (6), at least two of the hanging steel guards (9) being freely hung from an inner side of the side shield (7), the hydraulic ram side arms (10) being horizontally fixed within the support mechanism (6) to support the side shield (7), the base frame (14) being provided with the front and back side hooks (11 & 12) to facilitate pulling of the support mechanism (6), wherein the armoured face conveyor (5) is provided with a shearer (15) having a cutter drum (16) coupled with a centrally located ranging arm (17), an outbye end of the

armoured face conveyor (5) being at a right angle to and set upon the light duty chain conveyor (18) as a freely advancing bridge, and wherein the light duty chain conveyor (18) is connected to the belt conveyor (19) at an outbye of the panel (3).

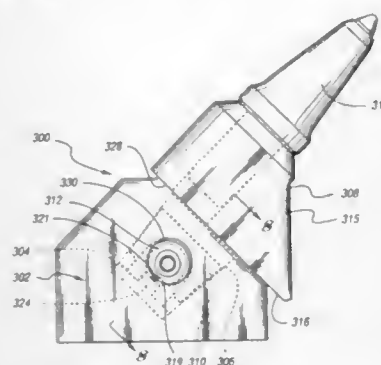
5,769,505

**CUTTING TOOL HOLDER RETENTION SYSTEM**  
David R. Siddle, Greensburg, and Ted R. Massa, Latrobe, Pa., assignors to Kennametal Inc., Latrobe, Pa.  
Continuation-in-part of Ser. No. 510,451, Aug. 2, 1995, Pat. No. 5,607,206. This application Apr. 24, 1996, Ser. No. 639,050

Int. Cl.<sup>6</sup> E21C 35/193

U.S. Cl. 299—102

51 Claims



17. An excavation cutting tool holder for use with a support block having a tool holder bore into which the cutting tool holder is inserted and a pin having a pin engagement surface, the pin being movably mounted to the support block, the cutting tool holder comprising:

an outer wear region and a shank portion, the shank portion having a pin bore defining a holder engagement surface, at least one of the holder and pin engagement surfaces defining an inclined surface such that when the pin is moved the pin engagement surface will wedgingly engage the holder engagement surface, so as to draw the shank portion into the tool holder bore of the support block.

5,769,506

**METHOD AND DEVICE FOR MANUFACTURING BRUSH BODIES**

Bart Gerard Boucherie, Izegem, Belgium, assignor to Firma G.B. Boucherie, nv, Belgium

Filed May 10, 1996, Ser. No. 644,460

Claims priority, application Belgium, May 10, 1995, 09500425

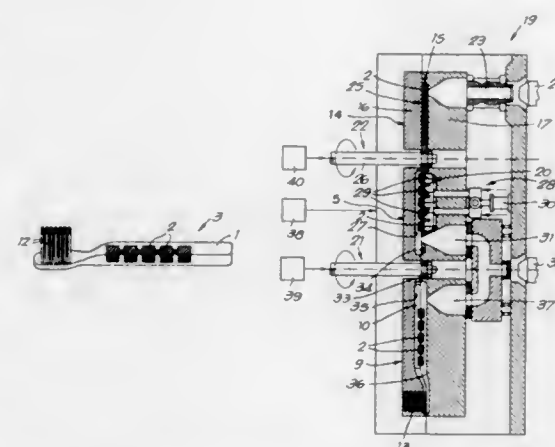
Int. Cl.<sup>6</sup> A46D 3/00

U.S. Cl. 300—2

15 Claims

7. A device (19) for manufacturing brush bodies (1) made of molded synthetic material including at least one insert (2) embedded in each brush body, comprising:

- at least a first die (5) including a first die molding cavity for molding a semifinished product (8) constituting a portion of each brush body (1);
- an insert holding arrangement (15,20,25) organized to hold at least one insert (2) in the wall of said first die (5) during molding so that the insert protrudes into the first die molding cavity;
- a second die (9) having a second die molding cavity configured to mold the brush body (1);
- a movable transfer device (21) arranged to move each semifinished product (8) molded in the first die (5) together with said at least one insert (2) partly embedded therein after molding in the first die molding cavity from the first die (5) to the second die; and



a filling means (32) for filling the die molding cavities with synthetic material.

5,769,507

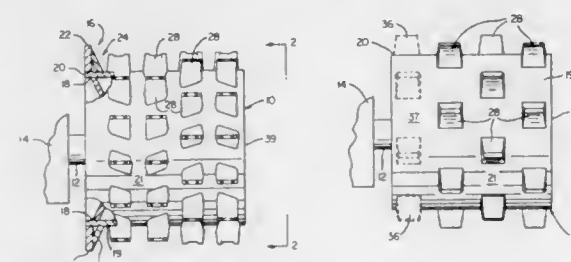
**COMPACTOR WHEEL AXLE GUARD SYSTEM**  
Robert John Brockway, Caledonia, Wis., assignor to Terra Compactor Wheel Corp., Sheboygan, Wis.

Filed Oct. 17, 1996, Ser. No. 732,901

Int. Cl.<sup>6</sup> B60B 15/02

U.S. Cl. 301—43

20 Claims



1. A compactor wheel mountable on an axle of a compaction machine, said compactor wheel comprising:

- a hub mountable to an axle of a compaction machine;
- a rim mounted around the outer circumference of said hub, said rim having a face and an inner circumferential edge and an outer circumferential edge;
- a plurality of compaction cleats circumferentially spaced on, transversely spaced across and mounted to said face of said rim; and
- an axle guard system comprising a cleat-free area formed circumferentially around said rim on said face and extending widthwise from said inner edge across said rim toward said outer edge at least about the width of one of said cleats.

5,769,508

**HYDRAULIC POWER UNIT FOR A BLOCK-PROTECTED VEHICLE BRAKING SYSTEM**

Leo Gilles, Koblenz, and Helmut Gegalski, Mülheim-Kärlich, both of Germany, assignors to Lucas Industries public limited company, West Midlands, United Kingdom

Filed Mar. 28, 1996, Ser. No. 623,404

Claims priority, application Germany, Apr. 5, 1995, 195 12 804.4

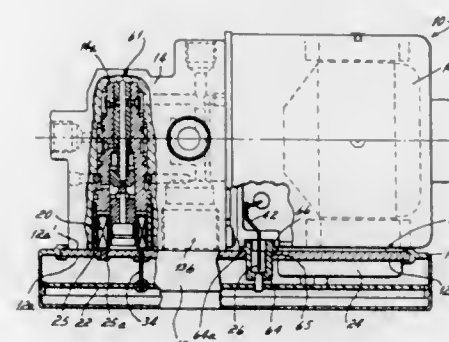
Int. Cl.<sup>6</sup> B60T 8/40

U.S. Cl. 303—116.4

13 Claims

1. A hydraulic power unit for a block-protected vehicle braking system, comprising:

- an electronic controller (22, 24) arranged in a housing (12);



a valve block (14) for accommodating electromagnetic solenoid valves for the control of hydraulic fluid in the braking system; and

a pump motor (16) for a pump delivering hydraulic fluid, with the housing (12) of the controller (22, 24) being connected with the valve block (14) and the pump motor (16), characterized in that

a wall (12a) of the housing (12) having an outer surface (12a') facing the valve block (14) which carries at least one solenoid (20) for the electromagnetic solenoid valves in the valve block (14) so that the wall (12a) of the housing (12) together with the at least one solenoid (20) forms a sub-assembly which can be handled independently and which can be secured to the valve block (14) directly with the outer surface (12a') of the wall (12a) in direct contact with the valve block (14).

5,769,509

**BRAKE UNIT FOR MOTOR VEHICLES WITH ELECTRIC DRIVE**

Hans-Jörg Feigel, Rosbach v.d.H.; Johannes Gräber, Eschborn; Dieter Kircher, Bad Vilbel, and Thomas Berthold, Darmstadt, all of Germany, assignors to ITT Automotive Europe GmbH, Frankfurt, Germany

PCT No. PCT/EP94/01341, § 371 Date Nov. 1, 1995, § 102(e) Date Nov. 1, 1995, PCT Pub. No. WO94/25322, PCT Pub. Date Nov. 10, 1994

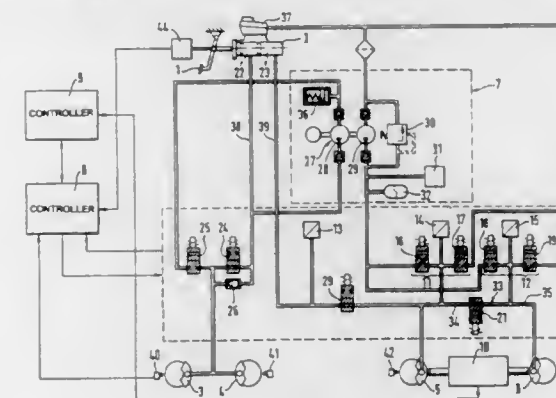
PCT Filed Apr. 28, 1994, Ser. No. 545,749

Claims priority, application Germany, May 3, 1993, 43 14 448.9

Int. Cl.<sup>6</sup> B60T 8/00; B60L 7/26

U.S. Cl. 303—152

17 Claims



1. Brake unit for motor vehicles with an electric drive motor and with a driven axle and a non-driven axle, comprising

- a) a two-circuit brake pressure actuator, which can be actuated by means of a brake pedal, and to which friction brakes acting on the driven axle as well as on the non-driven axle are connected;
- b) an electro-regenerative brake system, which uses the electric drive motor of the motor vehicle for braking and energy recovery; and

c) an electronic controller, which receives information on the state of actuation of said brake pressure actuator, the brake pressure brought about by the actuation, and the velocity of the vehicle, and evaluates it for controlling both the electric drive motor and said friction brakes acting on the driven axle, characterized in that:

- (a) said friction brakes acting on the non-driven axle are connected to a first pressure space of said brake pressure actuator, and said friction brakes acting on the driven axle are connected to a second pressure space of said brake pressure actuator, wherein the connection between said second pressure space and said friction brakes acting on the driven axle is performed via at least one shut-off valve, which can be switched over electrically and is open in the currentless state, and said friction brakes acting on the driven axle can be connected to a hydraulic energy supply unit or auxiliary pressure source via pressure control units, which can be switched over electrically; and
- (b) a hydraulic connection, which can be shut off by means of a second shut-off valve, which can be switched over electrically, is provided between said friction brakes acting on the driven axle.

5,769,510

**PROCESS FOR CONTROLLING WHEEL LONGITUDINAL FORCE IN VEHICLE**

Kenji Akuzawa, and Hiromi Inagaki, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Minato-Ku, Japan

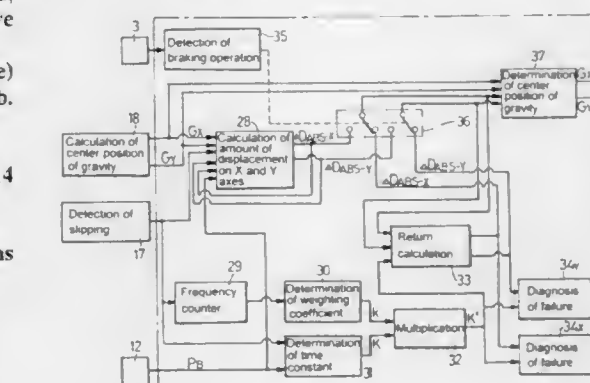
Division of Ser. No. 583,958, Jan. 11, 1996, Pat. No. 5,551,771, which is a continuation of Ser. No. 252,558, Jun. 1, 1994, abandoned. This application Apr. 8, 1996, Ser. No. 629,383

Claims priority, application Japan, Jun. 3, 1993, 5-133508

Int. Cl.<sup>6</sup> B60T 8/30

U.S. Cl. 303—188

1 Claim



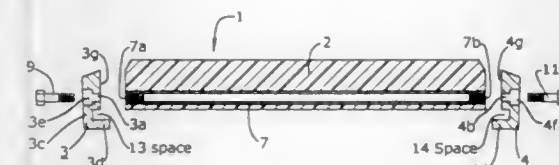
1. A process for controlling a wheel longitudinal force in a vehicle in which longitudinal forces applied to a plurality of wheels are controlled, respectively, the process comprising the steps of:

- detecting or determining a total longitudinal force which is a sum total of the longitudinal forces applied to the plurality of wheels;
- controlling the longitudinal forces applied to the wheels on the basis of respective target wheel longitudinal forces which are determined by distribution of said total longitudinal force at a predetermined distribution proportion;
- determining a center of gravity position of said vehicle in a stopped state of the vehicle;
- providing apparent direction and amount of displacement of the center of gravity position of the vehicle based on a longitudinal acceleration and a lateral acceleration of the vehicle, and determining an apparent center of gravity position of the vehicle in accordance with said apparent direction and amount of displacement of said center of gravity position of the vehicle;



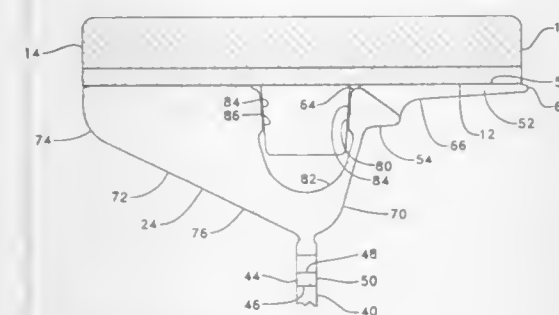
correcting said apparent center of gravity position of the vehicle, when a slip is detected in one of the wheels, so as to move said apparent center of gravity position of the vehicle in a direction away from said one wheel showing the slip on a straight line connecting said one wheel and said apparent center of gravity position of the vehicle; and  
determining the distribution proportion of said total longitudinal force for every wheel based on a corrected apparent center of gravity position of the vehicle.

5,769,511  
**CRAWLER TRACK SHOE COVER FOR PROTECTION OF ROAD SURFACES**  
Tomitaro Hattori, Miyazaki, Japan, assignor to Art Japan Co., Ltd., Miyazaki, Japan  
Filed Jul. 10, 1996, Ser. No. 677,765  
Int. Cl.<sup>6</sup> B62D 55/275  
U.S. Cl. 305—51 14 Claims



1. A road surface protection cover for a crawler track shoe, comprising:  
an elongated main body having an outer road-contacting surface, an inner track-shoe-contacting surface having a groove formed therein and configured to receive a blade of a track shoe, and opposed end faces, the main body formed of an elastomeric material;  
first and second end fixtures fastened to the opposed end faces of the main body, each of the first and second end fixtures comprising a side plate having an inner surface disposed against an associated end face of the main body and a recess formed in the inner surface of the side plate located and configured to receive an end of the blade of the track shoe, the inner surface of the side plate above the recess being acutely angled with respect to the seat plate.

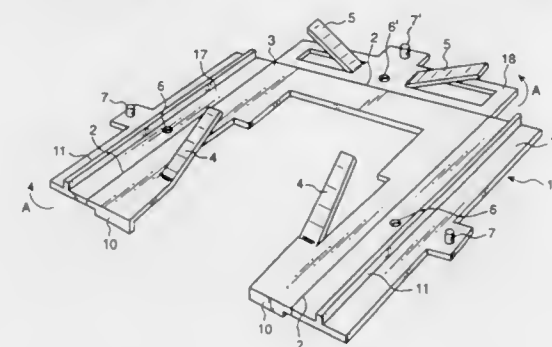
5,769,512  
**SLOTTED DRIVE WHEEL FOR ENDLESS GROUND ENGAGING BELTED TRACKS**  
Dewaine A. Kautsch, Dekalb, Ill., assignor to Caterpillar Inc., Peoria, Ill.  
Filed Sep. 20, 1996, Ser. No. 718,295  
Int. Cl.<sup>6</sup> B62D 55/12  
U.S. Cl. 305—199 16 Claims



1. A work machine comprising:  
a frame carrying an engine;

a pair of drive wheels, each drive wheel being connected to one of the opposite sides of said work machine and each being operatively driven by said engine;  
a pair of idler wheels connected on opposite sides of said work machine;  
a pair of endless rubber belted tracks, each having an inner drive surface and a plurality of centrally disposed guide lugs extending inwardly from said inner drive surface and one of each pair of tracks being entrained about the drive wheel and idler wheel on each side of said frame;  
a tensioning system operatively tensioning each of said pair of endless belted tracks into frictional driven engagement with a respective one of said pair of drive wheels; and  
said drive wheel including a central hub, a pair of arms, and a first and a second plurality of cantilevered driving members, said pair of arms diverging radially outwardly from said hub and defining a central guide groove between said arms for receiving said guide lugs of said belt, said first plurality of driving members extending laterally outwardly from one of said pair of arms and said second plurality of driving members extending laterally outwardly from the other of said pair of arms, each of said driving members being circumferentially spaced apart from its adjacent driving members to define an open ended slot between such adjacent driving members to dispel debris from between the track and the drive wheel.

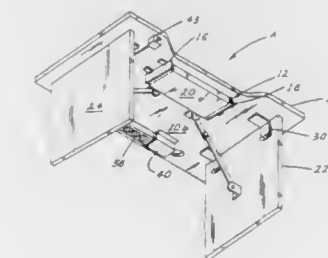
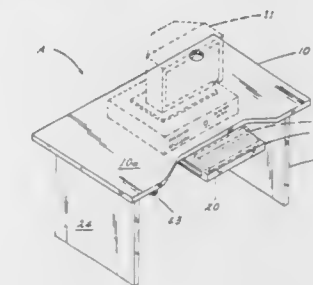
5,769,513  
**BLANK FOR MODULAR ARTICLE STORAGE RACK SYSTEM**  
Ruben Friis, Bennechesgt, 3, N-0169 Oslo, Norway  
PCT No. PCT/NO95/00188, § 371 Date Apr. 17, 1997, § 102(e) Date Apr. 17, 1997, PCT Pub. No. WO96/11606, PCT Pub. Date Apr. 25, 1996  
PCT Filed Oct. 16, 1995, Ser. No. 836,096  
Claims priority, application Norway, Oct. 18, 1994, 943947  
Int. Cl.<sup>6</sup> B65D 85/57; A47B 43/00  
U.S. Cl. 312—108 5 Claims



1. A rack unit for an article storage rack, comprising: a first generally rectangular modular blank having a generally horizontal central element hinged by respective hinges along two laterally opposite edges thereof to two respective side elements and hinged by a hinge along a rear edge thereof to a respective end element to form a first module;  
each of said side and end elements being provided adjacent the respective hinge with at least one upwardly opening recess having a bottom surface out through which opens a respective upwardly opening hole;  
each of said side and end elements being further provided, distally of each said recess, with a respective laterally projecting tab having a downwardly projecting pin based thereon;  
said recesses, holes, tabs and pins being correspondingly sized and placed such that when said two side elements and end elements are folded down at respective right angles to said central element to form a first module while juxtaposed in vertical registration with a closely underlying similar second rack unit modular blank having side and end elements which have been correspondingly folded down to form an under

lying second module, corresponding tabs of said first module are received in corresponding recesses of the underlying second module, corresponding pins of the first module are received in corresponding holes of the underlying second module, and a forwardly opening slot for receiving an article is formed between said side elements and said end element and under said central element of said first module and delimited below by the underlying second module.

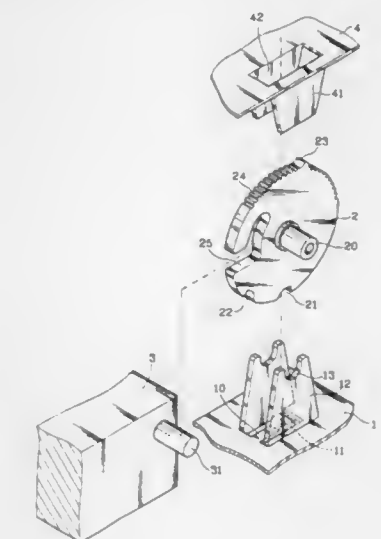
5,769,514  
**READY TO USE FOLDABLE COMPUTER DESK**  
Charles R. Brown, Marion O. Fogle, and Thomas F. Salley, all of Orangeburg, S.C., assignors to Decolam, Inc., Orangeburg, S.C.  
Filed Nov. 22, 1996, Ser. No. 754,887  
Int. Cl.<sup>6</sup> A47B 19/08  
U.S. Cl. 312—195 22 Claims



1. A foldable ready to use computer table comprising:  
a desk top having a support surface for supporting computer equipment;  
a keyboard drawer assembly for containing a computer keyboard carried underneath said desk top;  
the keyboard drawer assembly having a pair of spaced support elements for supporting a slidable keyboard drawer, and said spaced support elements extending away from said desk top and terminating at terminal edges a predetermined distance away from said desk top;  
first and second spaced desk side members pivotally carried by an underneath surface of said desk top, said first and second side members terminating in floor engaging supports for supporting said desk top above a floor;  
displaced pivot hinges attaching said first and second side members to said underneath surface of said desk top, each of said displaced pivot hinges having a first part attached to said desk top, a second part attached to said side members, and a displaced pivot displaced from said first part and desk top about which said first and second side members pivot;  
at least a first of said displaced pivot hinges attaching said first side member to said underneath surface of said desk top so that said first side member pivots about a first pivot axis displaced from said underneath surface between a folded position and an extended position;  
said first side member being generally parallel to and overlying said desk top in said folded position and being extended away from said desk top to engage the floor to support said desk top and the computer equipment thereon in said extended position;

at least a second of said displaced pivot hinges attaching said second side member to said underneath surface of said desk top so that said second side member pivots about a second pivot axis displaced from said second side member between a folded position and an extended position;  
said second side member being generally parallel to and overlying said first side member in said folded position and being extended away from said desk top to engage the floor to support said desk top and the computer equipment thereon in said extended position; and  
said first and second pivot axis being displaced from said underneath surface of said desk top so that said first and second side members fold over said terminal edges of said support elements of said keyboard drawer assembly in said folded position of said first and second side members in a compact, folded configuration for convenient storage and/or transportation.

5,769,515  
**OPTICAL SCANNERS WITH AN IMPROVED CHASSIS LOCKING MEANS**  
Yao-Wen Chang, Miaoli, Taiwan, assignor to Umax Data Systems, Inc., Hsinchu, Taiwan  
Filed Dec. 16, 1996, Ser. No. 773,723  
Int. Cl.<sup>6</sup> A47B 81/00  
U.S. Cl. 312—223.2 5 Claims



1. An optical scanner with an improvement of locking means, comprising:  
a chassis having a strut extending sideward;  
a scanner case having a U-shaped rack located on a bottom surface of said scanner case, the rack having two semi-circular grooves formed on a top of said rack;  
a cover having a rectangular opening and a pair of spaced brackets which are positioned right above said rack; and  
a latch disk being substantially a circular disk with a horizontal shaft for turnably resting on said semi-circular grooves of said rack, said latch disk having a limiting bulge movable within the boundary of said opening of said cover, and a locking slot allowing said strut of said chassis to be freely moved away from said latch disk when the scanner being operative, and causing said strut to be locked from moving when said latch disk is turned to a predetermined angle.

5,769,516

## CABINET FOR DISPLAYING AND STORING COMPACT DISCS

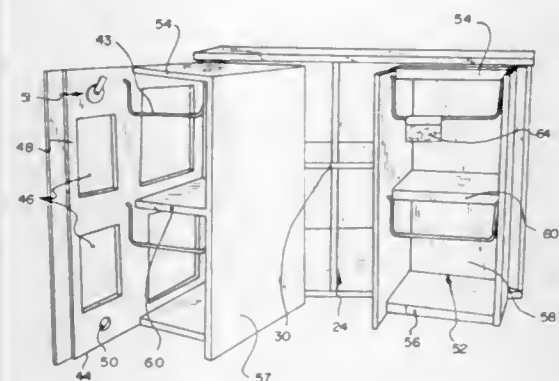
Lorenzo H. Aguilera, 2539 Nebraska Ave., South Gate, Calif. 90280

Filed Feb. 7, 1997, Ser. No. 798,998

Int. Cl.<sup>6</sup> A47B 81/06

U.S. Cl. 312—321.5

1 Claim



1. A cabinet for displaying and storing compact discs within an entertainment center comprising, in combination:

a housing having a rectangular configuration, the housing having an open front, a rear wall, a top wall, a bottom wall, two opposed side walls and a hollow interior, the top and bottom wall extending beyond the side walls, the hollow interior being divided into a front section and a rear section, the rear section having a shelf disposed therein between the two opposed side walls with a plurality of vertical dividers; and a pair of door compartments including a right door compartment and a left door compartment, each of the door compartments including a front panel, the pair of door compartments hingedly secured within the open front of the housing, the front panels each having a pair of windows therethrough, the front panel of the left door compartment having an interior panel integral with an inner edge thereof, the interior panel having a finger aperture therethrough disposed below windows formed therein, each of the door compartments including a rear storage section, the rear storage section secured to an interior surface of the front panel, the rear storage section including an upper wall, a lower wall, a rear panel, one side wall, and an intermediate shelf disposed between the upper wall and the lower wall thereby defining an open side face, the intermediate shelf being disposed between the pair of windows on the front panel, the open side face of each door compartment having a U-shaped containment rod pivotally coupled both above and below the intermediate shelf of the rear storage section, at least one containment rod having at least one hook and loop patch secured thereto, each of the pair of door compartments having a depth equal to a depth of the front section of the hollow interior of the housing.

5,769,517

## DRAWER SAFETY LOCK

Felix Carde, 142 Governors Hill Rd., Oxford, Conn. 06478

Filed Feb. 14, 1996, Ser. No. 601,571

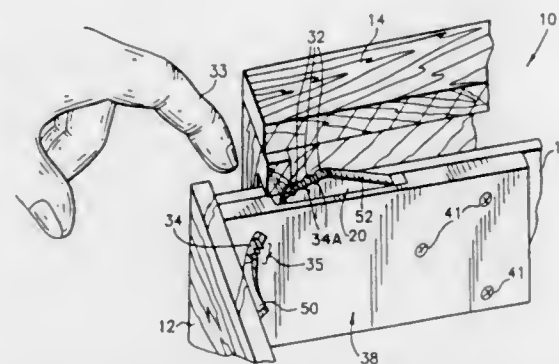
Int. Cl.<sup>6</sup> A47B 88/00

U.S. Cl. 312—333

19 Claims

10. An attachable drawer safety lock for retrofitting attachment to an interior sidewall of a drawer near its front wall, said drawer being slidable in a drawer frame between open and closed conditions, said drawer safety lock comprising:

a substantially flat rigid latch plate pivotally attachable to the drawer's interior sidewall near its upper edge, at a pivot point near the drawer's front wall and pivotally movable between an upwardly pivoted limit position, the latch plate having a latch arm protruding upward for engagement behind the



drawer frame and preventing the drawer from being fully opened beyond a slightly opened locked condition, and manually actuated downwardly pivoted position, wherein the latch plate is disengaged from the drawer frame, freeing the drawer to be fully opened, said latch plate having a manual release arm forwardly extending inside the drawer, and a rearwardly extending counterweight portion positioning the latch plate's center of gravity rearward of said pivot point, so that said latch plate is unbalanced by gravity to rest normally in the upwardly pivoted limit position, protruding above the sidewall; and

a flat housing attachable to said drawer sidewall and enclosing said pivot point and said counterweight portion, incorporating a latch plate blocking stop adjacent to the same sidewall and positioned with respect to said latch plate for preventing pivotal movement of said latch plate beyond the upwardly pivoted limit position, and said housing also incorporating aperture means through which said manual release arm and said drawer frame engaging latch arm protrude beyond said housing.

5,769,518

## PULLOUT ASSEMBLY FOR DRAWERS

Karl-Heinz Grabher, Lustenau, Austria, assignor to Alfit Aktiengesellschaft, Götzis, Austria

Continuation of Ser. No. 499,033, Jul. 6, 1995, abandoned.

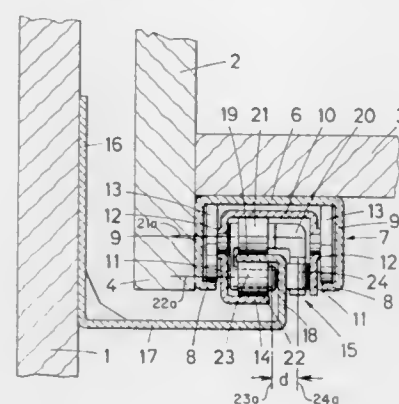
This application Mar. 7, 1997, Ser. No. 816,757

Claims priority, application Austria, Jul. 7, 1994, 1342/94

Int. Cl.<sup>6</sup> A47B 88/00

U.S. Cl. 312—334.6

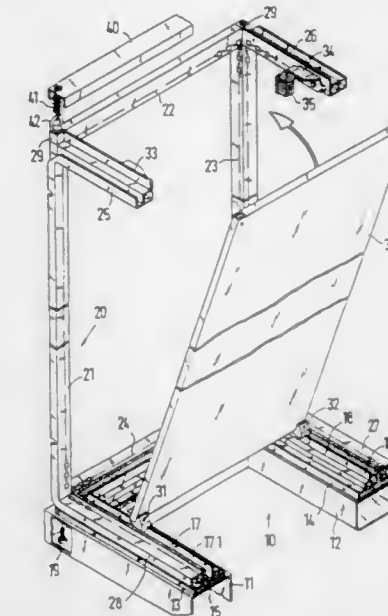
4 Claims



1. A complete pullout assembly for a drawer slidable in a cabinet, which comprises

(a) a stationary cabinet slide member adapted to be affixed to the cabinet, the cabinet slide member having  
(1) an upright flange,  
(b) an intermediate slide member having a tubular profile and comprising  
(1) a flat upper web, and

- (2) two side flanges extending downwardly from the flat upper web,  
(3) the intermediate slide member having an opening between the side flanges opposite the flat upper web,  
(4) the cabinet slide member is adapted to extend from the cabinet to below the opening to the intermediate slide member, and the upright flange of the cabinet slide member extending into the opening and carrying a bent guide for guiding the intermediate slide member along the cabinet slide member,  
(c) a drawer slide member adapted to be affixed to the drawer having a tubular profile and comprising  
(1) a flat upper web and  
(2) two side flanges extending downwardly from the flat upper web and having inwardly bent guide paths for guiding the drawer slide member along the intermediate slide member, the guide paths defining an opening therebetween opposite the flat upper web,  
(3) the flat upper webs of the intermediate slide member and the drawer slide members defining a small gap therebetween, and  
(4) the intermediate slide member and the drawer slide member having at least approximately the same height, and  
(d) four guide rollers, with a first guide roller having a horizontal axis of rotation, a second guide roller below said first guide roller and having a horizontal axis of rotation, a third guide roller carried by said second guide roller and having a vertical axis of rotation, and a fourth guide roller a horizontal distance from said third guide roller and having a vertical axis of rotation;  
said third guide roller and said fourth guide roller in simultaneous roller contact with said upright flange on opposite sides of said upright flange; and  
said first guide roller and said second guide roller in simultaneous roller contact with said bent guide with said first guide roller above said bent guide and with said second guide roller below said bent guide.



of guide bars (17.1, 18.1) for the guide blocks (31, 32) being fastened on the damping frame (15).

5,769,520

## SHELF DEVICE FOR A REFRIGERATOR

Gun Sik Jun, and Sang Yul Lee, both of Changwon-si, Rep. of Korea, assignors to Goldstar Co., Ltd., Rep. of Korea

Division of Ser. No. 693,381, Aug. 6, 1996, which is a division

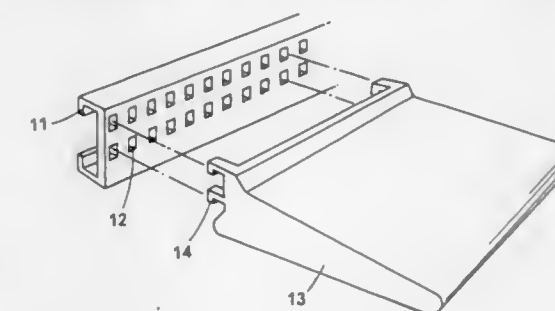
of Ser. No. 100,215, Aug. 2, 1993, Pat. No. 5,549,379. This

application Dec. 5, 1996, Ser. No. 760,270

Int. Cl.<sup>6</sup> A47B 96/06

U.S. Cl. 312—408

2 Claims



1. A shelf device for a refrigerator comprising:  
an elongated bracket mounted at a first position on a back wall of a refrigerating chamber and having a longitudinal axis that extends horizontally along the back wall;  
said bracket having an elongated vertical planar front plate facing forward and having a longitudinal axis that extends horizontally, an upper horizontal row of engaging holes in an upper portion of said front plate, a lower horizontal row of engaging holes in a central portion of said front plate, and an engaging surface on a lower portion of said front plate; and  
a shelf assembly having a width narrower than a length of said bracket along the longitudinal axis, said shelf assembly having a shelf frame having a vertical planar rear wall with a shelf extending forward and with an upper hook and a lower hook at each end of the shelf frame, said hooks extending rearward of said planar wall and selectively engaging the upper and lower engaging holes respectively, said shelf assembly further having a projecting piece protecting below and rearward of said planar wall, configured said projecting piece supporting the shelf assembly together with the hooks and engaging holes, thus holding the planar wall in spaced

5,769,519

## SWITCHGEAR CABINET WITH FRAMEWORK AND BASE

Walter Nicolai, Buseck, Germany, assignor to Rittal-Werk Rudolf Loh GmbH &amp; Co. KG, Herborn, Germany

PCT No. PCT/EP96/00870, § 371 Date Feb. 10, 1997, § 102(e)

Date Feb. 10, 1997, PCT Pub. No. WO96/27930, PCT Pub.

Date Sep. 12, 1996

PCT Filed Mar. 1, 1996, Ser. No. 750,944

Claims priority, application Germany, Mar. 7, 1995, 195 07

728.8

Int. Cl.<sup>6</sup> H02B 1/00

U.S. Cl. 312—351.1

14 Claims

1. In a switchgear cabinet with a rack fastened on a frame base, wherein the rack is assembled with frame legs and the rack is closed by a wall element, the improvement comprising:  
a lower frame of the rack (20) connected by undersides of the frame legs (24, 27, 28) by a plate-shaped damping frame (15) to a top of the base (10) the cabinet further includes a mounting plate (30), a plurality of guide blocks (31, 32) attached to the mounting plate (30), the guide blocks (31, 32) and located near the lower frame of the rack (20) and an interior space of the switchgear cabinet, and a guide frame having

a

plurality



relation to said front plate while the projecting piece abuts the engaging surface below the rows of engaging holes under the influence of gravity;

whereby said shelf assembly can be displaced horizontally along the longitudinal axis of said bracket and wherein a spacing between horizontally adjacent ones of the engaging holes is substantially less than the width of said shelf assembly.

5,769,521

**LIGHT SOURCE DEVICE AND METHOD OF PRODUCING SAME**

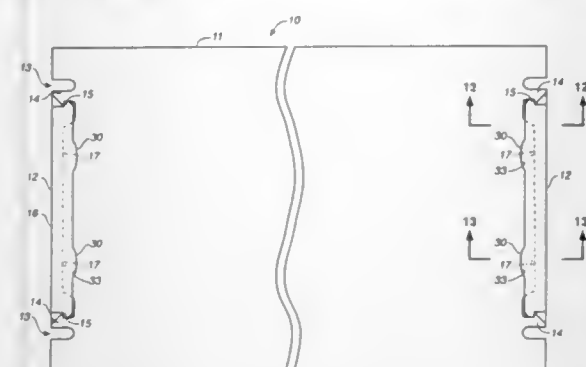
Hideharu Osawa, and Kazuyoshi Tsuji, both of Kyoto, Japan, assignors to Rohm Co., Ltd., Kyoto, Japan

Filed Mar. 25, 1997, Ser. No. 824,204

Claims priority, application Japan, May 2, 1996, 8-111467  
Int. Cl.<sup>6</sup> G01D 11/28; F21V 7/04; H01R 33/00

U.S. Cl. 362—27

9 Claims



1. A light source device comprising:

an elongated rectangular box-shaped reflective case having a bottom part and frame walls which protrude forward from said bottom part to thereby form an open front surface;  
a plurality of terminal plates disposed on said bottom parts;  
a specified number of LED chips bonded to said terminal plates;  
and  
lead lines which extend from said terminal plates and penetrate said reflective case, inner surfaces of said frame walls having thickened parts with increased thickness at positions corresponding to said lead lines.

5,769,522

**SURFACE LIGHT SOURCE DEVICE**

Isamu Kaneko; Hideaki Katoh; Kazuaki Yokoyama, all of Saitama-ken, and Tsuyoshi Ishikawa, Tokyo-to, all of Japan, assignors to Enplas Corporation, Kawaguchi, Japan

Continuation of Ser. No. 294,535, Aug. 23, 1994, abandoned, which is a continuation-in-part of Ser. No. 910,746, Jul. 8, 1992, Pat. No. 5,414,599. This application Jul. 24, 1996, Ser. No. 685,841

Claims priority, application Japan, Sep. 9, 1991, 3-80357 U; Nov. 28, 1991, 3-105342 U

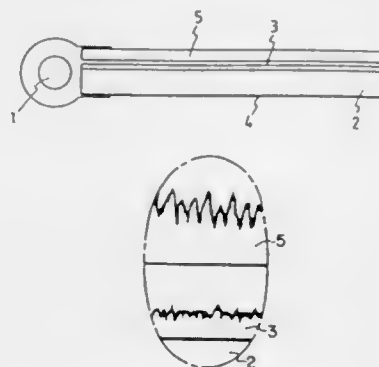
Int. Cl.<sup>6</sup> F21V 13/00

U.S. Cl. 362—31

16 Claims

1. A surface light source device comprising:

a transparent panel made of a transparent material and having a rectangular shaped surface;  
at least one linear light source disposed in a vicinity of at least one edge of said transparent panel;  
a reflecting surface disposed on a rear surface of said transparent panel; and  
a plurality of diffusing members including:  
a first diffusing member made of a transparent material and having at least one randomly varying coarsened surface having a first randomly varying unevenness of a first depth,



said first diffusing member being disposed adjacent a light emitting surface of said transparent panel, and  
a second diffusing member made of a transparent material and having at least one randomly varying coarsened surface having a second randomly varying unevenness of a second depth larger than said first depth;  
said first diffusing member being disposed between said second diffusing member and said transparent panel.

5,769,523

**SURGICAL HEADLAMP WITH DUAL APERTURE CONTROL**

Richard E. Feinbloom, New York, N.Y., assignor to Designs for Vision, Inc., Ronkonkoma, N.Y.

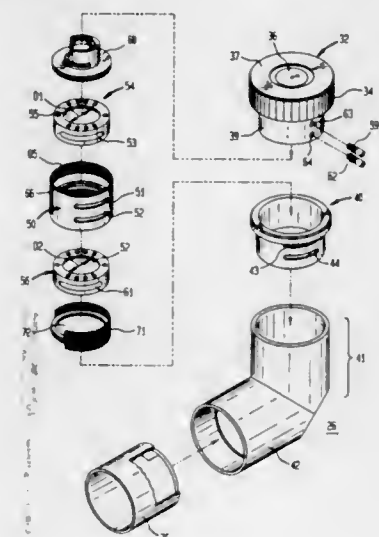
Continuation of Ser. No. 281,915, Jul. 28, 1994, abandoned.

This application May 21, 1996, Ser. No. 650,218

Int. Cl.<sup>6</sup> F21V 8/00

U.S. Cl. 362—32

8 Claims



1. A headlamp apparatus, comprising:

a housing;  
a fiber optic conduit terminating at an output surface in said housing, wherein said fiber optic conduit transmits a beam of light, generated from a remote light source, along an optical path within said housing, said beam of light of a given diameter having a central region of a predetermined brightness and a peripheral region that is less bright than said predetermined brightness;  
a first adjustable optical diaphragm disposed proximate said output surface on said optical path, said first adjustable optical diaphragm selectively controlling the diameter of said beam of light passing therethrough;  
a second adjustable optical diaphragm disposed on said optical path, said second adjustable optical diaphragm selectively

obscuring said peripheral region of said beam of light, thereby enabling only light contained in said central region to pass therethrough; and  
means for simultaneously adjusting said first and second adjustable optical diaphragms in order to simultaneously control both the size and eliminate said peripheral region of said beam of light.

5,769,524

**VEHICLE LIGHTING SYSTEMS WITH SIDE LIGHTS**

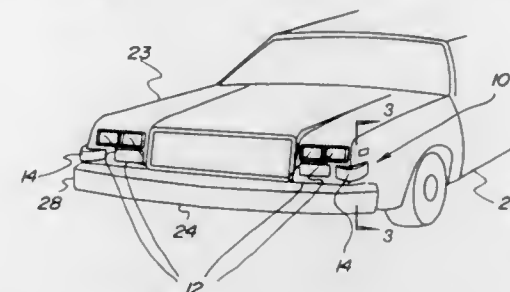
Zhiping Yuan, 9817 High Point Dr., Shreveport, La. 71106

Filed Dec. 12, 1996, Ser. No. 762,878

Int. Cl.<sup>6</sup> B60Q 1/00; 1/02

U.S. Cl. 362—61

8 Claims



2. A lighting system for a vehicle of the type having a body with a front end, a rear end and essentially parallel sides therebetween, and with a pair of headlights located in the front end of the vehicle for directing the central ray of its beams in a parallel forward direction, the system comprising:

a pair of supplemental side lights located adjacent to the front and sides of the vehicle beneath the main headlights, the side lights being angled to project the central rays of their beams outwardly from the central ray of the beams of the main headlights;  
a parabolic reflector operatively associated with each of the side light; and  
a battery with electrical components coupling the main headlights and the side lights with the battery for concurrent operation, wherein the electrical components include a common dimmer switch for increasing and decreasing the intensity of the headlights and side lights concurrently;  
wherein the electrical components include wiring coupling the main headlights and side lights with a common switch for ensuring that the side lights are only activated when the headlights are activated;  
wherein the electrical components include a single pole triple throw-type mode switch for allowing the side lights to be operated in a first mode wherein the side lights are actuated by the turn switch, a second mode wherein the side lights are both actuated concurrently independent of the turn switch, and a third mode wherein both side lights are precluded from actuation independent of the remaining electrical components.

5,769,525

**LOW/HIGH BEAM HEADLIGHT FOR VEHICLES**

Hans Daumueller, Bodelshausen; Karl-Otto Dobler, Reutlingen; Rainer Neumann, Stuttgart; Frieder Liedtke, Dettingen; Lothar Streit, Sonnenbuehl; Albert Vent, Eschweiler, and Doris Boebel, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Sep. 27, 1995, Ser. No. 534,728

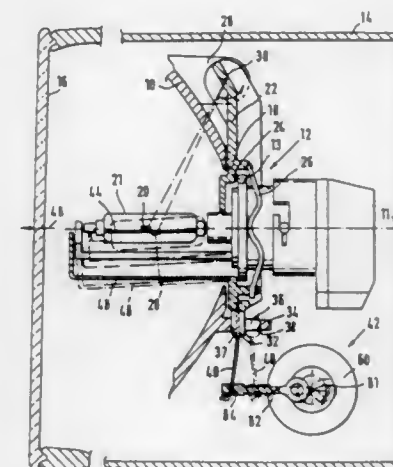
Claims priority, application Germany, Oct. 4, 1994, 44 35 507.6

Int. Cl.<sup>6</sup> B60Q 1/04

U.S. Cl. 362—66

16 Claims

1. A low and high beam headlight for vehicles, comprising a reflector having an optical axis; a light source; an actuator moving



5,769,526

**UTILITY LIGHT FOR USE WITH MOTOR VEHICLE**

Daniel L. Shaffer, 5443 260th St., Sanborn, Iowa 51248

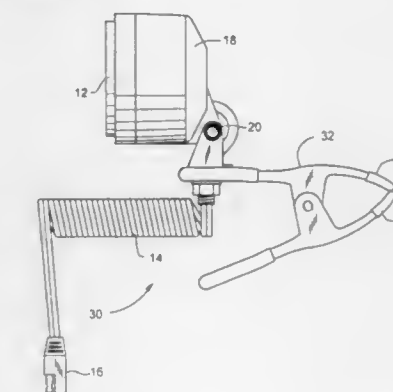
Continuation of Ser. No. 174,153, Dec. 27, 1993, abandoned.

This application Aug. 16, 1995, Ser. No. 515,915

Int. Cl.<sup>6</sup> B60Q 1/00

U.S. Cl. 362—80

17 Claims



1. A utility light for use with a vehicle lighting system, said vehicle lighting system including at least one of a vehicle brake light circuit, a vehicle turning signal light circuit, a vehicle parking signal light circuit and a coupler device connected in circuit with the vehicle lighting system, said coupler device including terminal means including first and second pairs of terminals and constituting a tap adapted to provide a source of electrical power from the vehicle lighting system, with said terminals of said first and second pairs of terminals of said tap being electrically connected to at least one of said vehicle light circuits, said utility light comprising: a lamp having a power cord electrically connected to said lamp for supplying power to said lamp, said power cord terminating in a plug, said plug including first and second prongs and being structurally arranged to be plugged into said tap of said coupler device to selectively engage terminals of only one of said pairs of terminals of said coupler device to connect said lamp in circuit with the

vehicle lighting system to provide electrical power to said lamp when one of said vehicle light circuits is energized.

5,769,527

**COMPUTER CONTROLLED LIGHTING SYSTEM WITH DISTRIBUTED CONTROL RESOURCES**

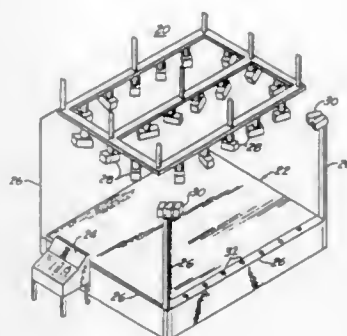
Brooks W. Taylor; Thomas E. Walsh; Mikell D. Nelson, all of Dallas, and Charles H. Reese, Grapevine, all of Tex., assignors to Vari-Lite, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 273,262, Jul. 11, 1994, abandoned, which is a continuation of Ser. No. 122,355, Sep. 14, 1993, Pat. No. 5,329,431, which is a continuation-in-part of Ser. No. 988,821, Dec. 10, 1992, abandoned, which is a continuation-in-part of Ser. No. 898,385, Jun. 9, 1992, Pat. No. 5,209,560, which is a continuation of Ser. No. 766,029, Sep. 26, 1991, abandoned, which is a continuation-in-part of Ser. No. 555,946, Jul. 19, 1990, abandoned, which is a continuation of Ser. No. 249,225, Sep. 22, 1988, Pat. No. 4,980,806, which is a continuation of Ser. No. 120,743, Nov. 12, 1987, abandoned, which is a continuation of Ser. No. 887,178, Jul. 17, 1986, abandoned. This application Jun. 7, 1995, Ser. No. 473,150

Int. Cl.<sup>6</sup> F21V 33/00

U.S. Cl. 362—85

7 Claims



1. A distributed control system for a lighting system, comprising:

- A. at least two control devices for entering parameter-controlling inputs according to a specified format, said parameter-controlling inputs directing operation of said lighting system, each said control devices including a data processor coupled to said parameter-controlling inputs, a memory coupled to said processor, and a data link transceiver coupled to said processor;
- B. one or more computing devices for storing, editing, and displaying data related to said parameter-controlling inputs, said computing devices comprising at least a data processor, a memory coupled to said processor, a data display device coupled to said processor, and a data link transceiver coupled to said processor;
- C. one or more load interface modules each including a data processor for controlling said respective interface module, and at least one data link transceiver couple to said processor, said processor configured to monitor said data link signals, each of said load interface modules supporting at least one device-control data link network;
- D. a control-resources data link network connecting said control devices, said computing devices, and said load interface modules;
- E. at least one said device-control data link network having a common path for connecting said load interface module to a plurality of multiple-parameter lamp units each having means for producing a light beam having a plurality of adjustable parameters relating to beam characteristics and drive means for controlling a plurality of said parameters in response to said parameter-controlling inputs.

**5,769,528  
HEADLAMP WITH OPTIONAL LENS WASHING  
DEVICE, AND A METHOD FOR MAKING SUCH  
HEADLAMP**

Franck Dinant, Virginal, Belgium, assignor to Valeo Vision, Bobigny, France

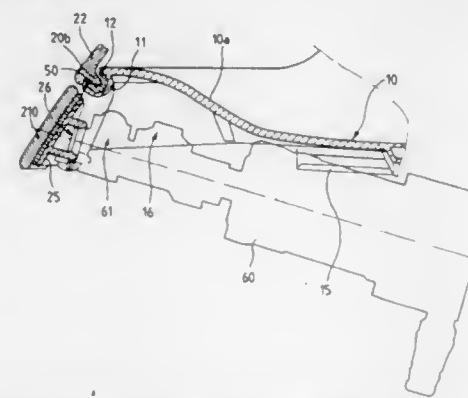
Filed Nov. 19, 1996, Ser. No. 752,217

Claims priority, application Germany, Aug. 26, 1996, 296 14 796 U

Int. Cl.<sup>6</sup> F21V 33/00

U.S. Cl. 362—96

10 Claims



1. A headlamp for a motor vehicle, including a hollow body and a lens closing a front opening of said body, said lens having along one edge thereof a separable secondary portion initially made integral with a primary portion of said lens, said secondary lens portion being adapted to remain integral with said lens when no lens washing device is provided in the headlamp and being adapted to be separated from said primary lens portion when the headlamp is to be equipped with a lens washing device, so as to define a recess through which said lens washing device can project in use.

5,769,529

**LIGHT FIXTURE**

Stephen P. Weinstock, St. Louis, Mo., and Raody L. Jordan, Bethalto, Ill., assignors to International Lighting Manufacturing Company, St. Louis, Mo.

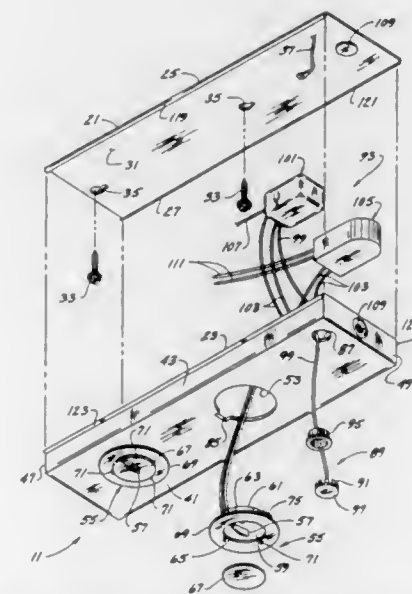
Continuation of Ser. No. 442,528, May 16, 1995, abandoned, which is a continuation of Ser. No. 159,828, Dec. 1, 1993, Pat. No. 5,426,572. This application Feb. 18, 1997, Ser. No. 802,891

Int. Cl.<sup>6</sup> F21V 23/00; 29/00

U.S. Cl. 362—133

7 Claims

1. An under-cabinet light fixture adapted to be mounted on a downwardly-facing surface for illuminating another surface therebelow, said light fixture comprising:
- a backing plate, means for mounting the backing plate flat on said downwardly-facing surface,
  - a cover for the backing plate, said cover having a plurality of side walls interconnected by a bottom wall and being releasably attached to the backing plate in a closed position in which the backing plate and cover combine to form a substantially enclosed interior space,
  - at least one lamp opening in the bottom wall of the cover,
  - at least one lamp assembly mounted adjacent the lamp opening in the bottom wall of the cover, said lamp assembly comprising a lamp housing mounted in said interior space, the housing of the lamp assembly having an open bottom generally in registry with the opening in the bottom wall of the cover, said housing being spaced from the backing plate to minimize the transfer of heat from the lamp assembly to the backing plate, said lamp assembly further comprising a halogen lamp for emitting light in a generally downward direction onto said another surface when the cover is attached to the backing plate in said closed position, and a diffuser closing said open bottom of the housing,



an actuator mounted on the fixture and accessible from outside the cover for energizing said halogen lamp, and a dimmer control in said enclosed interior space electrically connected to said actuator for varying the intensity of light emitted by said halogen lamp, said actuator on the fixture being operable and turning the halogen lamp on and off and also varying the intensity of the light emitted by the halogen lamp.

said backing plate being adapted to be mounted on said downwardly-facing surface without the cover in said closed position, the cover thereafter being releasably attached to the backing plate in said closed position,

said backing plate and cover having sufficiently thin profiles that when the backing plate and cover are mounted on said downwardly-facing surface with the cover in said closed position, the overall height of the fixture is less than about 1 1/2 inches.

5,769,530

**COMPACT FLUORESCENT LAMP WITH EXTENDED  
LEGS FOR PROVIDING A COLD SPOT**

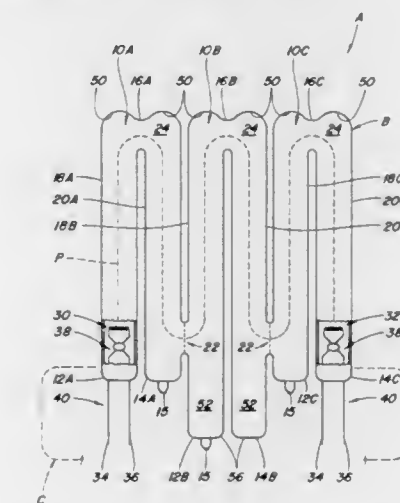
Attila Biro, Kecskemet, Hungary, and Erwin G. Steinbrenner, Parma Heights, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 15, 1996, Ser. No. 698,558

Int. Cl.<sup>6</sup> F21V 29/00

U.S. Cl. 362—216

16 Claims



1. A fluorescent lamp assembly operable in a base-down and a base-up configuration, comprising:

- at least two tubes, each tube having a first elongated section having a closed end and adapted to rise from a base, and a second elongated section adapted to descend toward the base; at least some of the elongated sections including electrodes extending through said closed ends to an exterior of said tubes providing for connection through the base to an associated power source;
- a bridging section connecting the second elongated sections to define a continuous conduit for allowing passage of ionized gases therethrough and between said electrodes; and,
- a cold chamber provided by a lower extension descending from at least one of a group of the second elongated section and the bridging section toward the base.

5,769,531

**STAGE LIGHTING LAMP UNIT AND STAGE LIGHTING  
SYSTEM INCLUDING SUCH UNIT**

Mark Alistair Hunt, Derby; Keith James Owen, Moseley, and Michael Derek Hughes, Wolverhampton, all of United Kingdom, assignors to Light & Sound Design, Ltd., Birmingham, England

Division of Ser. No. 77,877, Jun. 18, 1993, Pat. No. 5,502,627.

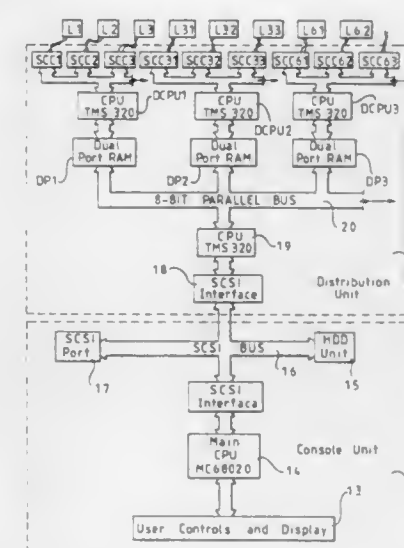
This application May 24, 1995, Ser. No. 448,861

Claims priority, application United Kingdom, Sep. 25, 1992, 9220303; Sep. 25, 1992, 9220309; Apr. 20, 1993, 9308071

Int. Cl.<sup>6</sup> F21M 1/00

U.S. Cl. 362—233

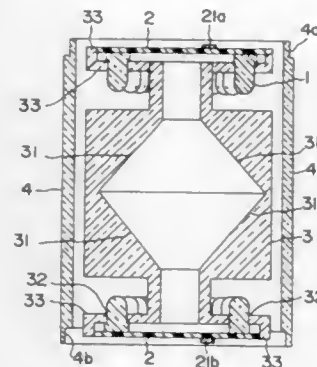
13 Claims



1. A lighting control apparatus which controls a positioning of a beam of a lamp, comprising:
- a main control console accepting user input relating to required beam movements;
  - at least two independently operable lamp units, each situated in a different location, and each situated remotely from the main control console, wherein each of the lamp units includes a servo-mechanism which operates to automatically move the lamp beam about two mutually transverse axes to a desired angular position responsive to an applied command;
  - a data communication element coupled to the main control console and to the lamp units and operating to transmit desired position data to said at least two lamp units, wherein the desired position data is transmitted in the form of a set of three-dimensional absolute linear coordinates, defining a point in space through which the lamp beam is required to pass and each of said at least two lamp units receiving the same absolute linear coordinates; and
  - a calculating device, located in each lamp unit, receiving the absolute linear coordinates and calculating a desired angular position based on relative coordinates and supplying the servo-mechanism with the desired angular position.

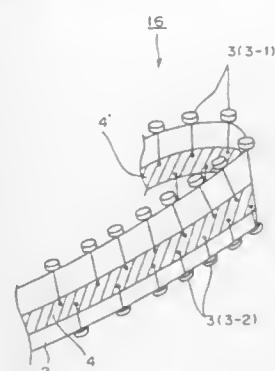


5,769,532  
**SIGNAL WARNING AND DISPLAYING LAMP**  
Hiroki Sasaki, Ikoma, Japan, assignor to Patlite Corporation,  
Osaka, Japan  
Filed Dec. 12, 1996, Ser. No. 764,045  
Claims priority, application Japan, Dec. 15, 1995, 7-347613  
Int. Cl.<sup>6</sup> F21V 13/08  
U.S. Cl. 362—237 4 Claims



1. A signal warning and displaying lamp characterized in that a hollow cylindrical supporting column consisting of a light-transmitting material is installed in an upright position in a center of said signal warning and displaying lamp, a central portion of said supporting column is expanded so that interior surfaces of said central portion are made into reflective surfaces, LEDs are arranged in rows so as to face each other above and below the column, signal light from above and below is reflected in a circumferential direction by said reflective surfaces, and said signal light passes through a diffusing lens of a globe which surrounds an entire lamp assembly and is displayed to a surrounding area.

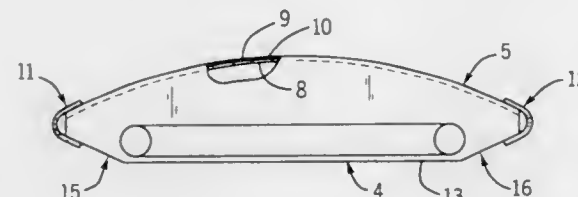
5,769,533  
**ILLUMINATION TAPE**  
Yukio Yamuro, and Kenichi Tamate, both of Tokyo, Japan,  
assignors to Hi-yoshi Electric Co., Ltd., Japan  
Filed Jul. 20, 1995, Ser. No. 504,947  
Claims priority, application Japan, Jul. 21, 1994, 6-169174  
Int. Cl.<sup>6</sup> F21V 21/14  
U.S. Cl. 362—249 8 Claims



1. An illumination tape comprising:  
a flexible tape material having a first face and a second face, a first edge and a second edge and a first end and a second end, said faces being of substantially equal length and being opposite sides of a thickness of said flexible tape material, each of said faces having a width substantially greater than said thickness of said flexible tape material and each of said edges having a length substantially greater than said width;  
a plurality of light sources placed along a length of said first edge of said flexible tape material with light-emitting surfaces

of said light sources substantially aligned and facing outwardly perpendicular from said first edge of said flexible tape material; and  
a plurality of electric conductors attached to said first face along the length of said flexible tape material for connecting said plurality of light sources electrically in parallel.

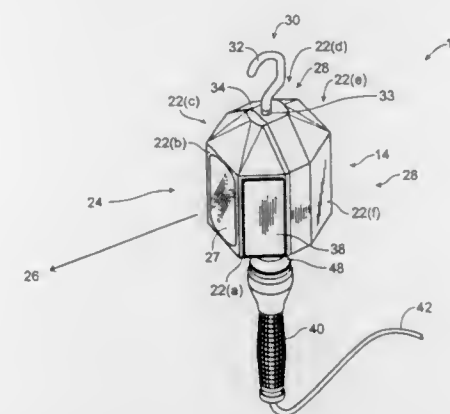
5,769,534  
**ILLUMINATED DISPLAY SIGN APPARATUS**  
Richard G. Lewis, 1601 S. Moorland Rd. Ste. 207, New Berlin, Wis. 53151  
Filed Mar. 21, 1997, Ser. No. 822,114  
Int. Cl.<sup>6</sup> F21L 7/00; G09F 13/04  
U.S. Cl. 362—367 14 Claims



1. An illuminated display apparatus for displaying of illuminated material as a front wall comprising:  
a front panel unit including inner and outer superimposed panels having substantially the same width and aligned first and second side edges, each of said panels being formed of a light transmitting material and adapted to support display material, a support structure including spaced first and second vertical wall members with the spacing being less than the width of a panel unit, a first and a second panel support member secured to the spaced first and second wall members, each said panel support member being a substantially U-shaped member including a first section and a second section joined by a substantially curved base portion, said first section including a pair of spaced walls for attachment engagement with said first spaced vertical wall member, said second section connected to said first section by said curved base portion and locating the second section in predetermined location for receiving of the side edges of the panel unit, said second section including spaced walls defining an open slot for releasably inserting of the corresponding side edges of the panel unit and thereby permitting attachment and detachment of the panel unit directly to and from the second sections of said first and second panel support members.

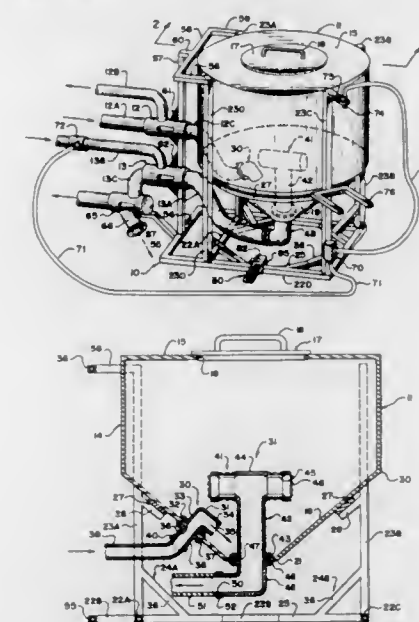
5,769,535  
**PORTABLE LAMP HAVING MULTIPLE BRIGHTNESS PROJECTION**  
Donnie R. Rominger, and Lucille L. Rominger, both of 501 Carroll Rd., Kelso, Wash. 98626  
Filed Aug. 14, 1995, Ser. No. 412,010  
Int. Cl.<sup>6</sup> F21L 15/18  
U.S. Cl. 362—396 12 Claims

3. A portable work lamp, comprising:  
a lamp housing adapted for enclosing a light source, said housing having a top, a bottom and a side wall;  
a first light port disposed in said side wall of said lamp housing and adapted to project a majority of the light from said light source predominately therethrough in a selected direction;  
a filtered light port disposed in said side wall of said lamp housing and adapted to filter the remaining available light from said light source and transmit the filtered light there-through in another direction; and



a magnet secured to said side wall of said lamp housing for attaching said lamp housing to magnetic material.

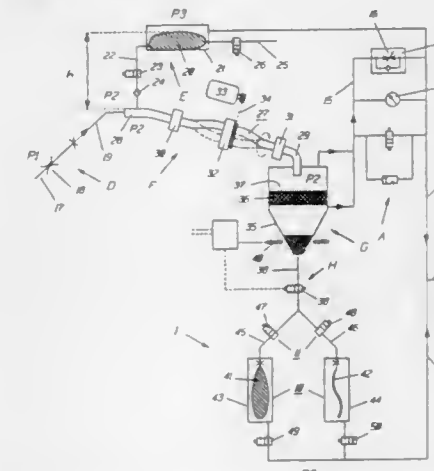
5,769,536  
**MIXING CONTAINER FOR DISSOLVING DRY CHEMICALS IN WATER**  
Clayton Kotylak, P.O. Box 450, Montmartre Saskatchewan, Canada, S0G 3M0  
Filed Nov. 8, 1996, Ser. No. 745,674  
Int. Cl.<sup>6</sup> B01F 5/04  
U.S. Cl. 366—136 15 Claims



14. A mixing container for receiving and mixing chemicals from a supply container comprising:  
a mixing tank having a conical bottom converging to a lowermost apex, a liquid inlet, a liquid outlet at the lowermost apex of the mixing tank and an opening at a top wall of the mixing tank into which the chemicals from the supply container can be discharged from the supply container;  
a first inlet valve having a first inlet and a second inlet and an outlet and being operable for selecting one of said first and second inlets for supplying liquid to the outlet;  
a second outlet valve having a first outlet and a second outlet and an inlet and being operable for selecting one of said first and second outlets for supplying liquid to the selected outlet from the inlet;  
means for connecting the liquid outlet of the mixing tank to the second inlet of the inlet valve;  
and means for connecting the first outlet of the outlet valve to the inlet of the mixing tank;

wherein the liquid outlet of the mixing tank has an outlet control member thereon comprising:  
a vertical cylindrical duct connected to the liquid outlet and standing upwardly therefrom for allowing discharge of liquid from the mixing tank;  
a top portion mounted on a top end of the cylindrical duct and projecting outwardly to sides of the cylindrical duct;  
the cylindrical duct and the top portion both being formed of a perforated screen so as to allow exit of water while preventing escape of dry dissolvable chemicals;  
and an upper surface of the top portion which is shaped so as to shed dry dissolvable chemical material falling onto the top surface.

5,769,537  
**METHOD AND APPARATUS FOR HANDLING AND DOSING OF AN ADDITIVE WHILE COLLECTING A LIQUID**  
Lennart Strömberg, and Per J. Olsson, both of Saltsjöbaden, Sweden, assignors to SBS Medical Projects AB, Stockholm, Sweden  
PCT No. PCT/SE95/00094, § 371 Date Jul. 23, 1996, § 102(e) Date Jul. 23, 1996, PCT Pub. No. WO95/21014, PCT Pub. Date Aug. 10, 1995  
PCT Filed Feb. 1, 1995, Ser. No. 676,403  
Claims priority, application Sweden, Feb. 2, 1994, 9400334  
Int. Cl.<sup>6</sup> B01F 13/00  
U.S. Cl. 366—163.1 13 Claims



1. A method for quickly and effectively mixing fluids, each containing at least one liquid phase, with one another comprising the steps of:  
aspirating at least one fluid by means of a suction nozzle located at a first end of a suction means,  
transporting said fluid through said suction means and a mixing and defoaming unit including an inlet end located at a second end of said suction means,  
dosing a dosing agent into the fluid in said mixing and defoaming unit near said inlet end of said mixing and defoaming unit, from a dosing agent container via a connection conduit, maintaining said dosing agent container under a pressure and controlling the pressure of the dosing agent container such that no dosing agent is supplied to said mixing and defoaming unit when only air is aspirated through the suction means, and whereby dosing agent is supplied to said mixing and defoaming unit when at least one fluid is aspirated through the suction means, the amount of dosing agent supplied being substantially proportional to the amount of the fluid aspirated by said suction means,  
mixing the aspirated fluid with the dosing agent in the mixing and defoaming unit by virtue of subjecting the fluid and the dosing agent to a G-force other than the force of gravity in said mixing and defoaming unit to thereby provide a quick

and effective mixing of the fluid and the dosing agent while eliminating substantially all foam which may be present in the fluid aspirated by the suction means, and collecting the fluid and dosing agent mixture using a calm, laminar flow.

5,769,538

# MIXER HAVING MEANS FOR PERIODICALLY MECHANICALLY STRIKING LIQUID-CONTAINING TUBES TO INDUCE MOTION OF THE TUBES

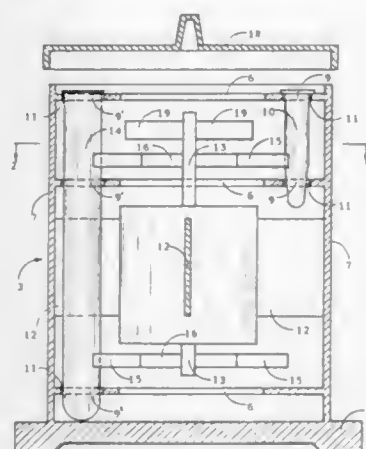
Michael Sherman, 581 Saw Mill Brook Rd., Newton, Mass. 02159; Yury Sherman, 511 Beech St., Roslindale, Mass. 02131, and Katerina Sherman, 85 Strathmore Rd. #43, Brighton, Mass. 02146

Filed Jun. 27, 1996, Ser. No. 671,211

Int. Cl.<sup>6</sup> B01F 13/00

U.S. Cl. 366—198

8 Claims



1. A mixer for mixing substances, resuspending pellets and disintegrating living cells, including yeast cells, placed in tubes comprising: a base, a tube holder and an electric motor with at least one striking attachment;

said base supporting said tube holder;

said tube holder having a supporting structure and at least two rigid spaced apart rings rigidly attached to the supporting structure;

said rings having a number of registered holes the tubes can be supportingly placed in, the at least two rigid rings being located apart at a distance providing contact of each tube with at least two of the at least two rigid rings rings: one ring at the upper part of the tube and another ring at the lower part of the tube;

said holes having diameters larger than diameters of the tubes which are to be placed therein, so that there are gaps between the tubes and the holes, the holes being positioned on the rings so that the distances from the points nearest to the motor shaft, of each of the holes, to the axis of the motor shaft are equal;

said electric motor having an extended shaft with the at least one striking attachment affixed thereto, which extended shaft is located inside the tube holder, coaxial with the rings of the tube holder;

said at least one striking attachment including at least one blade extended from said shaft; and

said at least one blade having a length which provides striking engagement with said tubes when the motor shaft rotates.

## 5,769,539 BACKFLUSH SYSTEM FOR A FILTER MEMBRANE LOCATED UPSTREAM OF A HYDROCARBON ANALYZER APPARATUS

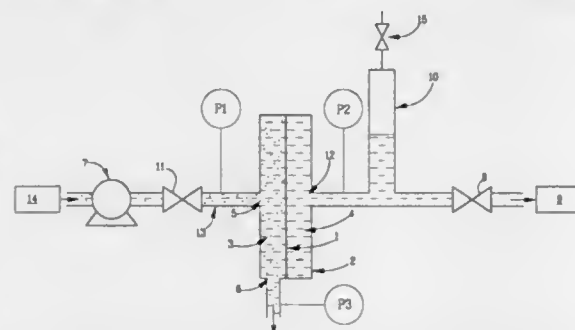
Charles Tsang, Vancouver; Victoria Shien-fern Ker, Richmond, and Adrian H. Wong, Vancouver, all of Canada, assignors to Phase Technology, Richmond, Canada

Filed Aug. 7, 1995, Ser. No. 511,974

Int. Cl.<sup>6</sup> G01N 25/00; B01D 29/00; 41/00

U.S. Cl. 374—16

11 Claims



1. In combination a fluid hydrocarbon analyzer and a filter membrane located upstream of the analyzer, the improvement comprising a backflush system for said filter membrane, wherein the backflush system includes a backflush fluid comprised by a liquid being analyzed by the analyzer, an anticlogging chamber providing a backflush pressure due to energy stored from the pumping, by a pump, of the liquid being analyzed, and a compressible fluid which is operably associated with the liquid being analyzed, and wherein said compressible fluid is contained in said anticlogging chamber and said energy is stored in the compressible fluid.

11. A process for filtering a liquid sample to be supplied to an analyzer through a filter membrane and for backflushing the filter membrane comprising the steps of:

- (a) pumping the liquid sample through the filter membrane to the analyzer;
- (b) storing energy from the pumping of the sample in a compressible fluid contained in an anticlogging chamber downstream of said filter membrane, said anticlogging chamber being operably associated with said sample; and
- (c) stopping the pumping of the sample and lowering the pressure on the upstream side of said membrane thereby releasing the stored energy from said compressible fluid to force the liquid sample back through the filter membrane so as to backflush the filter membrane.

## 5,769,540 NON-CONTACT OPTICAL TECHNIQUES FOR MEASURING SURFACE CONDITIONS

Charles W. Schietinger, and Bruce E. Adams, both of Portland, Oreg., assignors to Luxtron Corporation, Santa Clara, Calif.

Continuation of Ser. No. 999,278, Dec. 28, 1992, Pat. No. 5,310,260, which is a continuation-in-part of Ser. No. 943,927, Sep. 11, 1992, Pat. No. 5,318,362, which is a continuation of Ser. No. 507,605, Apr. 10, 1990, Pat. No. 5,154,512, said Ser. No. 999,278 is a continuation-in-part of Ser. No. 692,578, Apr. 29, 1991, Pat. No. 5,166,080. This application Jan. 12, 1994, Ser. No. 180,852

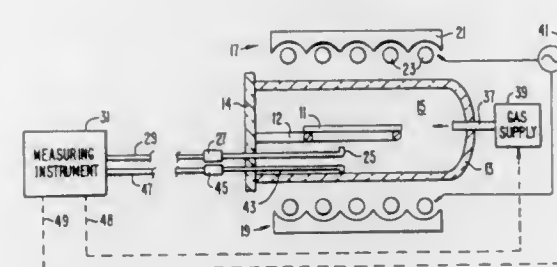
Int. Cl.<sup>6</sup> G01B 11/06; G01J 5/06; H01L 21/66

U.S. Cl. 374—127

33 Claims

1. A method for determining the temperature of a semiconductor wafer comprising the steps of:

- heating said wafer with a modulated heat source such that the temperature of at least one error source is modulated with a selected modulation depth and the temperature of said wafer is substantially unmodulated;
- detecting the radiance of said wafer along with the radiance of said at least one error source; and



determining the temperature of said wafer by calculating the contribution of said at least one error source based upon said modulation depth.

5,769,541

## TEMPERATURE SENSOR FOR AN ICE MAKER

Gun Il Lee, and Joong Yeop Cho, both of Seoul, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

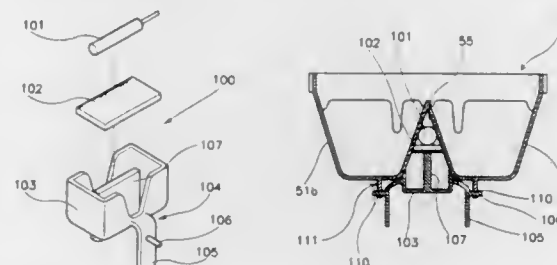
Filed Nov. 27, 1996, Ser. No. 757,547

Claims priority, application Rep. of Korea, Dec. 22, 1995, 95-54800

Int. Cl.<sup>6</sup> G01K 1/14; 13/12; 1/08; 1/00

U.S. Cl. 374—141

6 Claims



1. In combination, an ice making container adapter for use in a refrigerator, and a temperature sensor for sensing a temperature of the container;

the container including a plurality of concave portions for making individual ice cubes, and forming an exterior groove along its bottom between respective rows of the concave portions; two of the concave portions including respective bosses projecting downwardly from the bottom, the bosses forming eyes which are aligned with one another;

the temperature sensor including a temperature-sensitive element disposed in the groove, a housing disposed within the groove beneath the temperature-sensitive element when the container is in an upright position, said housing having a pair of ribs, each rib including a projection fitting into a respective one of the eyes, the ribs being elastically flexible to enable the projections to be inserted into, and removed from, the eyes.

5,769,542

## ELECTRONIC INDUSTRIAL THERMOMETER

Roy E. Buntin; Gerald D. Tribble, both of Troy, and Bruce J. Jarvie, Oak Park, all of Mich., assignors to H.O. Trerice Co., Oak Park, Mich.

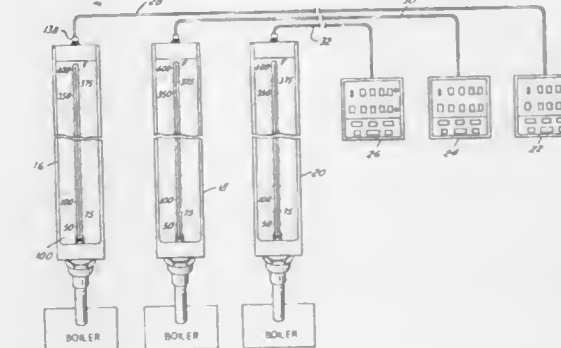
Division of Ser. No. 550,171, Oct. 30, 1995, Pat. No. 5,664,885. This application May 8, 1997, Ser. No. 853,124

Int. Cl.<sup>6</sup> G01K 7/04; 5/04; 5/08; 5/10

U.S. Cl. 374—179

16 Claims

1. An electronic industrial thermometer comprising a casing having a rear wall with inner and outer surfaces, a pair of parallel side walls, said side walls having grooves provided therein, a transparent window forming the front wall of said casing and having the edges thereof received in said grooves, said transparent



window being spaced from the inner surface of said rear wall, a plate with a graduated temperature scale thereon mounted within said casing adjacent the inner surface of said rear wall, an opening provided in said casing adjacent the bottom portion thereof, a hollow stem which is open at one end and closed at the other end being connected on the open end thereof to said casing, said stem having the interior thereof aligned with the interior of said casing through said opening, a closed glass tube filled with mercury mounted in said casing in front of said graduated scale to visually indicate to a viewer the temperature upon changes in the level of mercury within said tube, said tube having an unexposed portion extending through said opening into said stem where said tube portion is spaced from the interior wall of said stem, a thermocouple sensor for measuring temperature secured to the exterior wall of said tube portion located within said stem, a plurality of wires connected to said thermocouple sensor and leading therefrom through said stem and along the backside of said plate adjacent the inner surface of said rear wall, and an electrical receptacle carried by said casing and anchoring the ends of said wires for sending an electrical signal indicating the temperature of said thermocouple sensor as shown on said scale to a remote site.

5,769,543

## SEALING DEVICE FOR LINEAR GUIDE APPARATUS

Toru Tsukada; Yutaka Igarashi; Soichiro Kato, all of Gunma; Toshikazu Yabe, Kanagawa; Fumio Ueki, Kanagawa, and Toshimi Takajo, Kanagawa, all of Japan, assignors to NSK Ltd., Tokyo, Japan

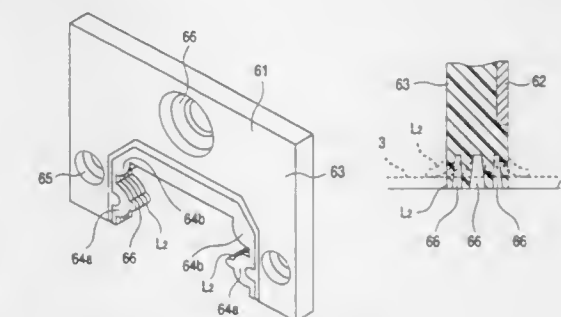
Continuation-in-part of Ser. No. 678,765, Jul. 11, 1996. This application Oct. 11, 1996, Ser. No. 729,418

Claims priority, application Japan, Jul. 11, 1995, 7-174741; Jul. 28, 1995, 7-193671; Aug. 11, 1995, 7-206190; Oct. 11, 1995, 7-263323

Int. Cl.<sup>6</sup> F16C 29/06; 29/08

U.S. Cl. 384—15

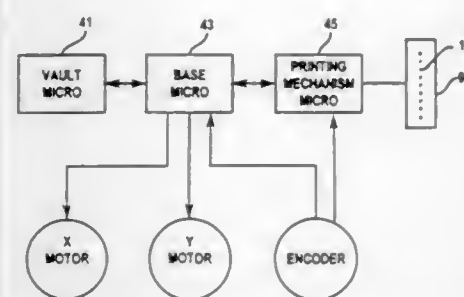
7 Claims



1. A linear guide apparatus comprising: an axially extending guide rail having a first rolling groove on an outer surface of the guide rail; a slider engaged with the guide rail and having a second rolling groove, rolling element return grooves and curved grooves, the second rolling groove confronting the first rolling groove, the rolling element return grooves being coupled to both end



U.S. Cl. 400—279 13 Claims



including a plurality of nozzles that deposit an ink in a dot-matrix pattern, the method comprising the steps of:

- A) moving the printing mechanism and the mailpiece relative to each other along a first direction over a first swath area on the mailpiece;
- B) selectively energizing the nozzles during step A) thereby printing a dot-matrix pattern of a postal indicia within the first swath area;
- C) shifting the printing mechanism and the mailpiece relative to each other along a second direction transverse to the first direction and then moving the printing mechanism and the mailpiece relative to each other along the first direction over a second swath area on the mailpiece, the second swath area in overlapping relationship with the first swath area; and
- D) selectively energizing the nozzles during step C) for printing a dot-matrix pattern of selected portions of the postal indicia which is complementary to the dot-matrix pattern of the postal indicia such that a dot-matrix pattern of the enhanced postal indicia is produced by a combination of the dot-matrix pattern of the postal indicia and the dot-matrix pattern of selected portions of the postal indicia.

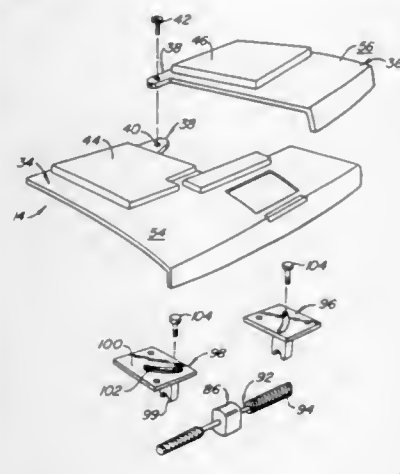
5,769,551  
EXPANDABLE KEYBOARD FOR A PORTABLE  
COMPUTER

Phillips Tsai, Taipei, Taiwan; Richard T. Hsu, San Jose, Calif., and Sohrab Vossoughi, Portland, Oreg., assignors to Acer Advanced Labs, Inc., San Jose, Calif.

Filed Apr. 9, 1996, Ser. No. 630,017  
Int. Cl.<sup>6</sup> B41J 5/10

U.S. Cl. 400—489

13 Claims



- I. A portable computer comprising:
- a housing having an upper casing and a lid movably coupled to the upper casing, wherein the upper casing comprises first and second upper casing sections;
  - first and second keyboard portions fixed to the first and second upper casing sections, respectively, such that the first and second keyboard portions move with the first and second upper casing sections;

a linkage coupled to the housing that enables moving the first and second keyboard portions between a carrying position, where the first and second keyboard portions are arranged close together, and an operating position, where the first and second keyboard portions are spaced apart from each other to define a gap therebetween; and

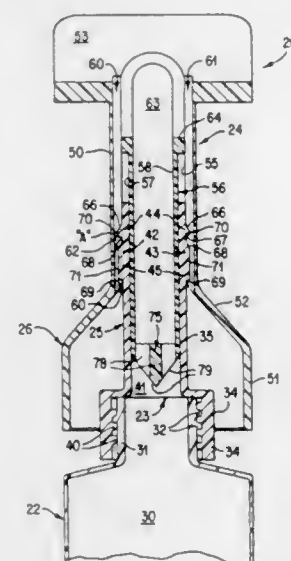
a switch operably positioned within the housing to actuate the linkage when the lid is opened and closed, wherein the linkage comprises a gear shaft, a motor for rotating the gear shaft and first and second couplings attached to the gear shaft and the first and second upper casing sections, respectively, the motor being coupled to the switch.

5,769,552  
FLUID PRODUCT HOLDING AND DISPENSING SYSTEM  
Matthew F. Kelley, Westport, Conn., and Wayne Young, Brewster, N.Y., assignors to Creative Products, Inc., Westport, Conn.

Filed May 6, 1996, Ser. No. 643,368  
Int. Cl.<sup>6</sup> B05C 17/00; B67B 7/26

U.S. Cl. 401—132

21 Claims



- I. A fluid product holding and dispensing system comprising:
- A. a fluid product retaining bottle comprising:
    - a. a product holding zone;
    - b. a portal cooperatively associated with the holding zone for enabling the product to be dispensed therethrough; and
    - c. sealing means cooperatively associated with the portal for sealing the portal to prevent passage of the product through the portal; and
  - B. a product dispensing trigger assembly comprising:
    - a. a first mountable member comprising:
      1. an engaging portion defining an internal cavity and constructed for mounted engagement with the bottle with the internal cavity thereof being in peripheral, surrounding relationship with the portal of the bottle;
      2. an elongated guide portion cooperatively associated with the engaging portion and defining an internal flow channel interconnected with the internal cavity of the engaging portion; and
    3. control means formed on the outside surface of the guide portion and constructed for cooperative engagement with channel means and lock means for providing a first and a second locked position between which the product dispensing trigger assembly is movable; and
  - b. a second movable member cooperatively associated with the first member and comprising:
    1. a body having an inside surface constructed for cooperative association with the guide portion of the first mem-

- ber for movement relative thereto from said first locked position to said second locked position;
2. an elongated, longitudinally extending tube member:
  - i. extending substantially the entire length of the body;
  - ii. constructed for cooperative, telescopic, axially movable engagement with the internal flow channel of the guide portion; and
  - iii. defining a central passageway for delivering the fluid product from the bottle through the second member;
3. puncture means mounted to the elongated axially extending tube member in cooperating relationship with the central passageway, and positioned in juxtaposed, spaced, cooperating relationship with the sealing means of the fluid retaining bottle in said first position, and movable into ruptured engagement with the sealing means when in said second locked position;
4. axially extending channel means formed in the inside wall of the body:
  - i. comprising a width substantially less than the circumference of the inside wall of the body;
  - ii. constructed for slidably retaining the control means of the guide portion therein and controlling the axial movement of the second member relative to the first member; and
5. lock means formed in the channel means for cooperative interengagement with the control means for maintaining the second member relative to the first member in the two alternate locked positions;

whereby a fluid product holding and dispensing system is attained which provides a first locked position wherein the bottle and contents thereof remain completely sealed and quickly and easily moved into a second position when the seal means are automatically ruptured and the fluid is capable of being dispensed therefrom.

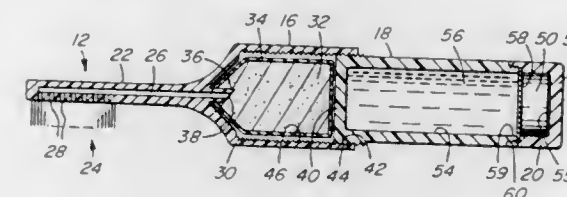
5,769,553  
TOOTHBRUSH

Aslam Chaudhri; Nausheen Chaudhri, and Saima Chaudhri, all of 10951 Gilbert Road, Richmond, British Columbia, Canada, V7E 2H4

Filed Nov. 8, 1996, Ser. No. 745,663  
Int. Cl.<sup>6</sup> A46B 11/02

U.S. Cl. 401—195

2 Claims



1. A toothbrush, comprising:
- a handle and an elongate bristle end portion extending from said handle;
  - said bristle end portion having bristles projecting laterally therefrom, a passage extending longitudinally of said bristle end portion and outlet openings extending transversely of said bristle end portion from said passage to locations between said bristles and communicating with the exterior of said bristle end portion;
  - said handle comprising a first handle portion connected to said bristle end portion and defining a toothpaste chamber communicating with said passage; and
  - said first handle portion having an end opening at an end thereof remote from said bristle end portion, a sealed pouch accommodated in said toothpaste chamber and containing a supply of toothpaste and a tube forming an extension of said passage, said tube having a tapered end projecting into said toothpaste chamber so as to pierce said pouch and thereby provide communication between said passage and said supply of toothpaste;

said handle including a movable handle portion projecting longitudinally through said end opening;

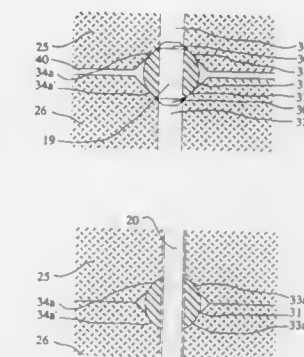
said movable handle portion comprising a ram forming an end of said movable handle portion and located in said toothpaste chamber and said movable handle portion being provided with a mouthwash chamber, a supply of mouthwash in said mouthwash chamber, a floss chamber and a supply of floss in said floss chamber; and

said first handle portion having an internal screw thread extending from said end opening and along said toothpaste chamber and said movable handle portion having an external screw thread in threaded engagement with said internal screw thread and releasably securing said movable handle portion to said first handle portion, whereby said ram is movable along said toothpaste chamber by relative rotation of said first and second handle portions to expel said toothpaste from said toothpaste chamber through said passage to said outlet openings and whereby said second handle portion is separable from said first handle portion by unscrewing said external thread from said internal thread.

5,769,554  
KINEMATIC COUPLING METHOD AND SYSTEM FOR  
ALIGNING SAND MOLD CORES AND THE LIKE AND  
OTHER SOFT OBJECTS AND SURFACES  
Alexander H. Slocum, Bow, N.H., assignor to AESOP, Inc., Concord, N.H.

Filed Aug. 8, 1996, Ser. No. 694,024  
Int. Cl.<sup>6</sup> B22D 33/04; B41B 11/60; F16B 5/02  
U.S. Cl. 403—13

18 Claims



9. A system for kinematically coupling and clamping together a pair of opposing cores, having, in combination, opposing sets of grooves formed in each core, ball elements inserted between corresponding grooves of the cores, the grooves and the ball elements being of significantly different relative hardness; and means for clamping together to enable deformations at the ball-groove interfaces that cause the cores to translate and come together in intimate planar contact, while maintaining precise kinematic location until contact.

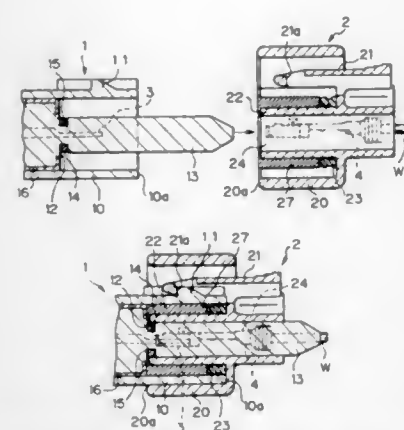
5,769,555  
CONNECTOR ASSEMBLY  
Hajime Okada, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Japan  
Continuation of Ser. No. 697,400, Aug. 23, 1996, abandoned, which is a continuation of Ser. No. 337,748, Nov. 14, 1994, abandoned. This application Apr. 29, 1997, Ser. No. 840,684  
Claims priority, application Japan, Dec. 6, 1993, 5-071388 U  
Int. Cl.<sup>6</sup> H01R 13/64

U.S. Cl. 403—14

5 Claims

1. A connector assembly comprising a male connector and a female connector, said male connector having at least one projecting male terminal and a male hood surrounding said terminal, said





female connector having at least one female terminal complementary to said male terminal and interconnected therewith, a guide rod projecting from one of said male connector and said female connector and having a distal end remote therefrom, a guide complementary to said guide rod, in another of said male connector and said female connector, said other connector having a rearmost face facing away from said one connector, said distal end extending through said other connector and projecting beyond said face.

5,769,556

## BICYCLE CLAMP

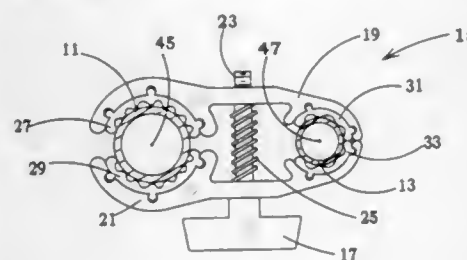
Scott A. Colley, Fort Wayne, Ind., assignor to Universal Consolidated Methods, Inc., Topeka, Ind.

Filed Dec. 2, 1996, Ser. No. 758,909

Int. Cl.<sup>6</sup> F16B 7/04

U.S. Cl. 403—24

4 Claims



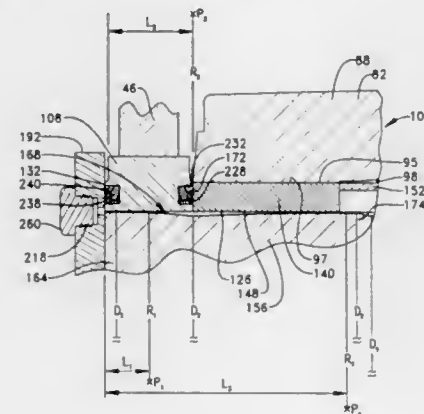
1. In combination with a first cylindrical tubular member comprising a portion of a bicycle frame and a second cylindrical tubular member comprising an upright portion of a bicycle support rack, a bicycle support clamp for joining the first tubular member to the second tubular member with a longitudinal axis of one of said tubular members extending generally parallel to a longitudinal axis of the other tubular member when the first and second tubular members are joined by the clamp, the clamp comprising:

first and second clamp halves each of substantially the same uniform cross-sectional configuration in all planes orthogonal to the longitudinal axes and each of the halves including first and second concave regions for receiving corresponding cylindrical portions of the first and second tubular members respectively;

resilient pad means comprising four rubber-like arcuate segments each lining a corresponding one of the first and second concave regions of each of the first and second clamp halves for engaging the corresponding cylindrical portions of the first and second tubular members when the first and second tubular members are joined by the clamp;

a threaded fastener passing through one of the clamp halves intermediate the first and second concave regions and into the other clamp half for selectively drawing the clamp halves toward one another and the pad means into engagement with the corresponding cylindrical portions of the first and second tubular members.

5,769,557  
SEALED PIN JOINT ASSEMBLY  
Charles E. Beals, Batavia, and Timothy A. Vik, Sparland, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.  
Filed Jul. 12, 1996, Ser. No. 678,798  
Int. Cl.<sup>6</sup> F16C 11/02  
U.S. Cl. 403—162 23 Claims



1. A pin joint assembly, comprising:  
a frame having first and second end portions, each of the first and second end portions having a bore therethrough;  
a member having first and second end portions;  
a first collar disposed within the bore of the first end portion of the frame and a second collar disposed within the bore of the second end portion of the frame with each collar having a bore therethrough;  
a first bearing assembly connected to the first end portion of the member and a second bearing assembly connected to the second end portion of the member with the first bearing assembly being adjacent the first collar and the second bearing assembly being adjacent the second collar, each bearing assembly having a bore therethrough in substantial axial alignment with the respective bore in the respective collar; and  
a pin extending through the bores in the collars and the bearing assemblies for connecting the member to the frame, the pin having first and second ends, each of which diverges radially and axially diverging inwardly from a cylindrical outer surface having a first predetermined diameter and terminating at a surface having a second predetermined diameter at a predetermined location relative to the respective collars and respective bearing assemblies and diverging radially outwardly and axially inwardly at the outer surface established at the predetermined position to establish a surface having a third predetermined diameter at an axially inner location from said predetermined location.

5,769,558

## FLEX JOINT

David W. Jekielek, Houston, Tex., assignor to Radius Metier, Inc., Houston, Tex.

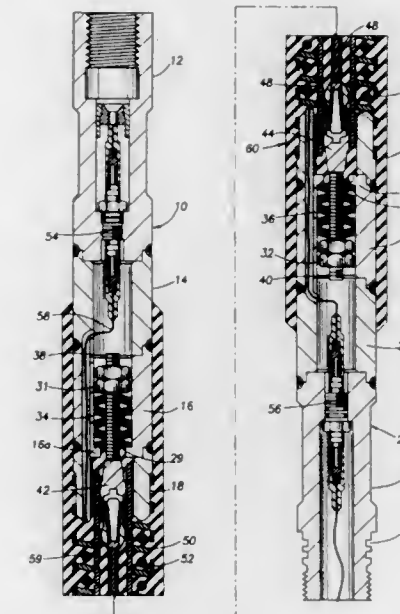
Filed Oct. 17, 1996, Ser. No. 730,821

Int. Cl.<sup>6</sup> F16D 3/00; E21B 7/08

U.S. Cl. 403—229

5 Claims

1. A flex joint for connecting upper and lower elongated stiff instrument housings of a downhole assembly to allow the elongated stiff instrument housings to move through a curved section of a borehole, said flex joint comprising two connectors, one for connecting to one of the stiff instrument housings and the other to connect to the other stiff instrument housing, a flexible electrical cable adapted to extend between the upper and lower instrument housings to transmit electrical signals between the instrument housings, first, second, and third concentric helical springs adapted to extend between the upper and lower instrument housings and a flexible cable extending between and connected to the two connectors.



5,769,560  
PORTABLE STAGE MODULE FASTENING DEVICE  
Grant S. Quam, Owatonna, Minn., assignor to Wenger Corporation, Owatonna, Minn.  
Filed Aug. 7, 1996, Ser. No. 689,319  
Int. Cl.<sup>6</sup> F16B 2/22  
U.S. Cl. 403—325 15 Claims



1. A fastening device adapted for clamping two generally adjacent objects in a generally fixed orientation with respect to each other, comprising:

a pair of generally arcuate, resilient clamp elements, each clamp element presenting a first and second end, and opposed convex and concave surfaces extending between said first and second ends,

said clamp elements being fixedly, operably coupled together at their first ends to present a clamp base, said clamp element convex surfaces oriented in opposed, facing alignment, the second ends of said clamp elements shiftable between a rest position wherein said clamp elements present a generally V-shaped orientation, and a tension position wherein said second ends are brought along a path of travel towards each other, said clamp element second ends being biased towards said rest position, and

said clamp elements having locking means for locking a plurality of adjacent and independent structures into fixed relation when said clamp elements are in said rest position, said locking means comprising at least two locking structures with one locking structure being positioned proximate one of said first ends and one locking structure being positioned proximate one of said second ends of at least one of said clamp elements.

5,769,561

## LEVELLING HEAD

Björn Pettersson, Järfälla, Sweden, assignor to System 3R International AB, Vällingby, Sweden

Filed Apr. 25, 1996, Ser. No. 637,268

Claims priority, application Germany, Apr. 26, 1995, 195 14 851.7

Int. Cl.<sup>6</sup> B25G 3/36

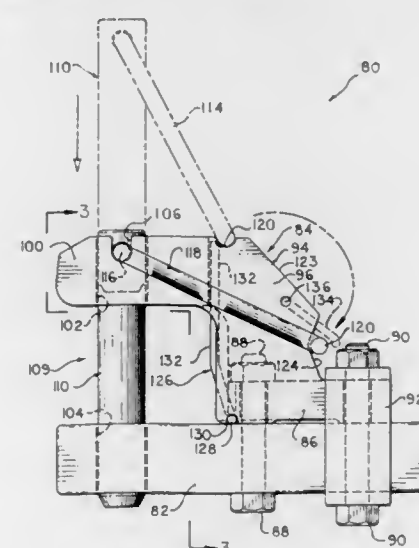
U.S. Cl. 403—393

18 Claims

1. A device for mounting a tool or workpiece to a machine, the device comprising an upper part including a means for affixing a

tors to support the weight of the lower instrument housing of the downhole assembly and to bend as required for the instrument housings to pass through the curved section of the borehole.

5,769,559  
AUTOMATICALLY SETTING DRAW PIN ASSEMBLY  
Brian R. Olson, 3018 Gordon Road, Regina, Saskatchewan, Canada, S4S 2T8  
Filed Jun. 14, 1995, Ser. No. 490,232  
Claims priority, application United Kingdom, Jun. 23, 1994, 9412631  
Int. Cl.<sup>6</sup> B60D 1/02  
U.S. Cl. 403—322 12 Claims



1. A draw pin assembly comprising:  
a draw bar with a draw pin hole;  
a hammer strap mounted on a top side of the draw bar with a hitch receiving space between the hammer strap and the draw bar, the hammer strap having a draw pin hole aligned with the draw pin hole of the draw bar;  
a draw pin having a top end, the draw pin being movable between a retracted position engaged in the draw pin hole in the hammer strap and clear of the hitch receiving space between the hammer strap and the draw bar, and a set position with the top end of the draw pin recessed fully into the

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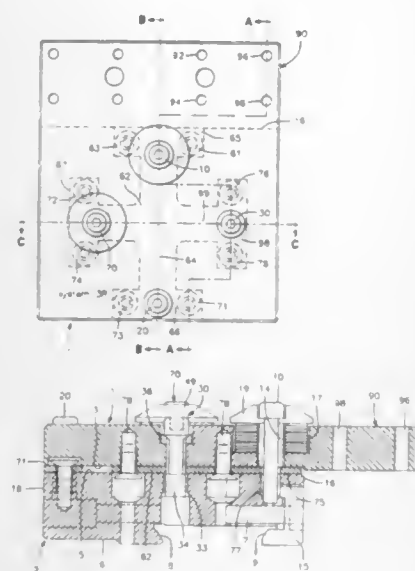
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OFFICIAL GAZETTE

JUNE 23, 1998



tool or workpiece to said upper part, a plate attached to said upper part, a lower part attached to said plate, two adjusting screws each having a shank rotatably passing through a bore in said upper part and engaging a threaded fitting within said lower part, and at least one bolt extending between said upper part and said lower part with a spring clamped around said bolt, wherein one of said two adjusting screws lies along a first center line of said plate and the other of said two adjusting screws lies along a second center line of said plate, said first and second center lines of said plate perpendicular to each other.

5,769,562

**EDGE RESTRAINT APPARATUS HAVING VARIABLE LENGTH SECTIONS**

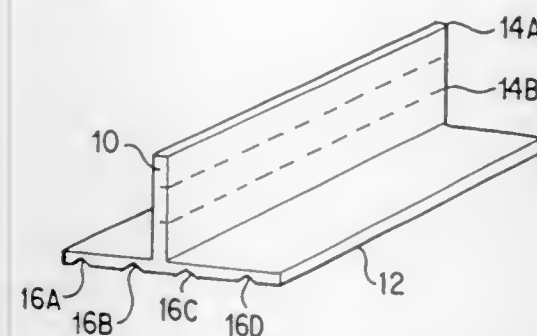
Stephen Jones, 10800 Morris Ave. South, Bloomington, Minn. 55437

Filed Jan. 8, 1997, Ser. No. 780,702

Int. Cl.<sup>6</sup> E01C 11/22; E04B 1/00; E04C 3/30

U.S. Cl. 404-7

24 Claims

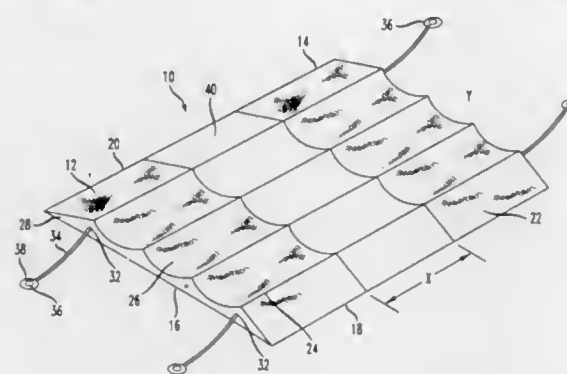


1. An edge restraint apparatus for restraining a hard structure, comprising:  
a substantially upright section having a height; and  
a base section extending from a lower end of said upright section on at least one lateral side of said upright section, said base section being essentially perpendicular to said upright section and having a width;  
wherein at least one of said height of the upright section and said width of the base section is variable.

5,769,563  
**HIGHWAY WARNING DEVICE**  
Gregory Flynn, 8 Avon Way, Brick, N.J. 08724  
Filed Sep. 26, 1996, Ser. No. 722,865  
Int. Cl.<sup>6</sup> E01F 9/06

U.S. Cl. 404-15

5 Claims



1. A portable highway warning device comprising:  
a mat having a substantially flat lower surface and an upper surface, said mat fabricated of a flexible resilient composition having an elongated rectangular periphery characterized by a long length direction having a leading edge and a trailing edge and a short length direction defined by two end panels, said upper surface of said mat having an undulated surface defined by a plurality of wave crests and a plurality of wave troughs positioned between said wave crests, the transition from said wave crest to said wave trough to said adjacent wave crest characterized by a curved incline, said curved incline on said leading edge of said mat defining an up ramp to said mat and said curved incline on said trailing edge of said mat defining a downward incline from said mat, said undulating upper surface and said flat lower surface extend from said opposing end panels in said long length direction, terminating a distance apart on said long length direction thereby enabling said mat to be folded in half so that said lower surfaces of said halves are in abutment, whereby:

when said mat is placed on said road surface with said lower surface in contact with said road surface and said length direction oriented transversely to the direction of vehicular travel, passage of the wheels of a vehicle across said mat and said undulating upper surface produces a discernible audible sound and a discernible vibration to the vehicle operator.

5,769,564

**MANHOLE COVER FRAMES**

David John Drake Hawkins, Carleton, South Africa, assignor to CSR Limited, Sydney, Australia  
Division of Ser. No. 307,310, Sep. 16, 1994, Pat. No. 5,549,411.

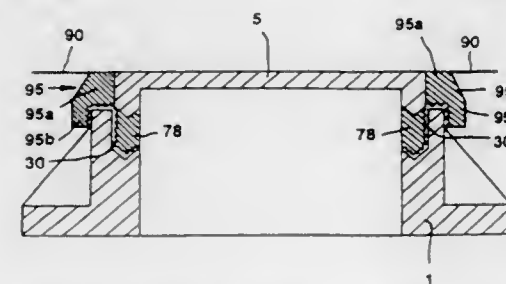
This application May 8, 1996, Ser. No. 646,473

Claims priority, application South Africa, Sep. 24, 1993, 93/7067; Australia, Aug. 23, 1994, PM7622

Int. Cl.<sup>6</sup> E02D 29/14

U.S. Cl. 404-25

10 Claims



1. A spacer arrangement, a manhole cover frame, said manhole cover frame having a mouth, an upper side rim, and a side wall,

JUNE 23, 1998

GENERAL AND MECHANICAL

3789

said side wall having an outer surface, and a manhole cover, said manhole cover having a top surface, said spacer arrangement comprising:

at least one base collar element adapted to be received and located within said mouth of said manhole cover frame and adapted to support said manhole cover, and

at least one separate cap element adapted to be located on said upper side rim of said manhole cover frame, so as to be spaced apart from and above said at least one base collar element, said at least one cap element having a main body portion adapted to extend upwardly from said upper side rim of said manhole cover frame and having an outer downwardly extending lip adapted to engage about said outer surface of said side wall of said manhole cover frame, said main body portion of a top one of said at least one cap element having a top surface when located on said upper side rim of said manhole cover frame, said manhole cover fitting within said at least one cap element, said manhole cover having said top surface when placed within said at least one cap element, when resting on said at least one base collar element, when said main body portion of said at least one cap element extends upwardly from said upper side rim of said manhole cover frame, and when said at least one base collar element is received and located within said mouth of said manhole cover frame, said top surface of said manhole cover being substantially level with said top surface of said main body portion.

5,769,565

**PROTECTIVE HOUSING FOR SEWER OR SEPTIC CLEAN-OUT LINES**

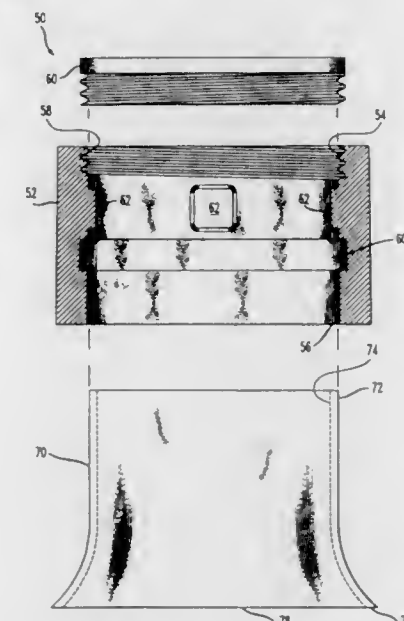
Thomas J. Martin, Jr., and Glenn Martin, both of Kearny, N.J., assignors to C.P. Test Services-Valveco, Inc., Kearny, N.J.

Filed Aug. 19, 1996, Ser. No. 699,508

Int. Cl.<sup>6</sup> E02D 29/14

U.S. Cl. 404-25

9 Claims

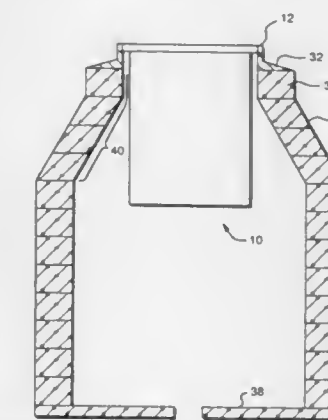


6. A collar member for engagement with a tubular member of dissimilar material for closure of said tubular member, said collar member having an inner diameter and an outer diameter defining a generally planar upper surface, a depending tubular skirt of increasing interior diameter, there being formed on the interior circumference of said skirt an annular circumferential recess having a plurality of protrusion stops formed on said interior circumference above said annular recess, said depending tubular skirt for receipt of said tubular member of a diameter equal to the increased diameter of said tubular skirt of said collar, said tubular member being force fit into said tubular skirt for engagement with said

5,769,566  
**CATCH BASIN SPLASH GUARD**  
Gerald Shea, 3 Gibson Rd., Natick, Mass. 01760  
Filed Mar. 11, 1996, Ser. No. 613,607  
Int. Cl.<sup>6</sup> E03F 5/14

U.S. Cl. 405-52

11 Claims



1. A splash guard for a catch basin having a bottle neck with a lip which is open to a surface and which funnels water incoming from said surface into an enlarged subterranean cavity having basin walls and a basin floor, comprising:  
an upper rim section defining an opening of about the same shape as that of said lip, said rim section adapted to rest on said lip; and  
depending side walls projecting down from said rim section at essentially 90 degrees into said subterranean cavity, to define an outlet of about the same size as the opening so as not to obstruct water flow through and out of said splash guard; wherein said side walls direct water incoming from said surface away from said basin walls and down toward said basin floor, to inhibit basin wall corrosion and erosion caused by said water incoming from said surface.

5,769,567

**PROCESS AND MACHINE FOR THE IMPLEMENTATION OF A BONDING LAYER AND ROAD TYPE COATING COMPRISING SUCH A LAYER**

Graziella Durand, Bois Colombes, and Pierre Montmory, Pruney en Yvelines, both of France, assignors to Colas, Cedex, France

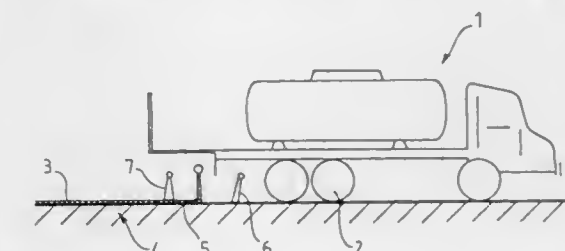
Filed Mar. 27, 1996, Ser. No. 622,831

Claims priority, application France, Mar. 28, 1995, 95 03636

Int. Cl.<sup>6</sup> E01C 3/00; 19/00

U.S. Cl. 404-75

20 Claims



1. A process for forming a bituminous bonding layer capable of bonding a bituminous coated material layer to a support, comprising:



applying a surface-active agent on a support;  
applying a bituminous emulsion on the surface-active agent on the support; and  
applying a breaking agent on the bituminous emulsion to form a bituminous bonding layer.

5,769,568

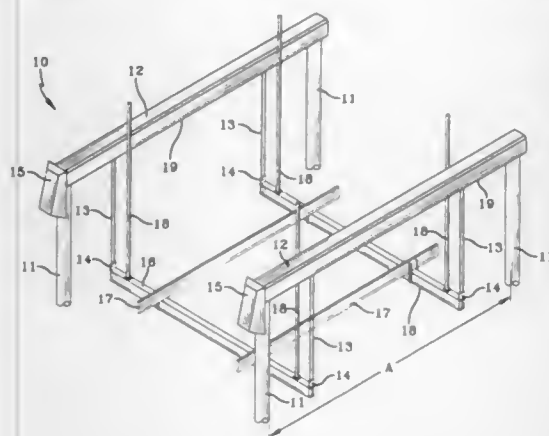
## ADAPTABLE BOAT LIFT

David G. Parkins, Ft. Lauderdale, and John D. Meehan, Sarasota, both of Fla., assignors to ABL Boat Lifts, Ft. Myers, Fla.

Filed Jan. 15, 1997, Ser. No. 783,318  
Int. Cl.<sup>6</sup> E02C 5/00; B63C 3/06

U.S. Cl. 405—3

34 Claims



1. An adaptable boat lift for lifting and supporting a boat, comprising:
- a. a plurality of support pilings spaced so as to form a rectangle;
  - b. a one piece extruded first support beam, attached to the support pilings that form one side of the rectangle;
  - c. a one piece extruded second support beam attached to the pilings that form the side of the rectangle opposite the first support beam;
  - d. at least one drive shaft enclosed within and extending the length of each support beam;
  - e. a mechanism for rotating the drive shaft in a clockwise and counterclockwise direction;
  - f. a plurality of cradle beams, spaced parallel to each other and sufficiently apart to support a boat, located below the support beams and oriented at a ninety degree angle to the support beams; and
  - g. a plurality of lifting members, each lifting member comprising an elongated cable connected on one end to the support beam, attaching to the cradle beam and connected on the opposite end to the drive shaft whereby when the shaft is rotated the lifting member raises or lowers the cradle beams.

5,769,569

## IN-SITU THERMAL DESORPTION OF HEAVY HYDROCARBONS IN VADOSE ZONE

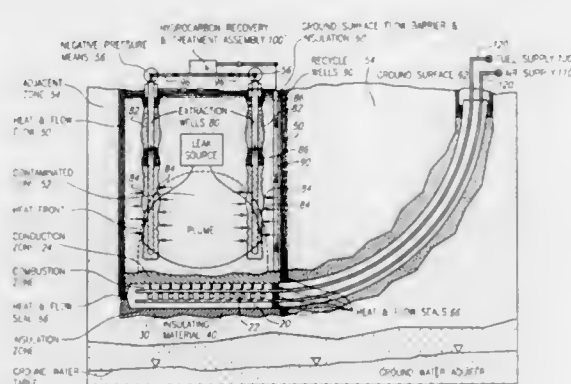
Masood S. Hosseini, Moorpark, Calif., assignor to Southern California Gas Company, Los Angeles, Calif.

Filed Jun. 18, 1996, Ser. No. 665,418  
Int. Cl.<sup>6</sup> B09C 1/06; E21B 36/02

U.S. Cl. 405—128

15 Claims

1. An apparatus for removing contaminants from unsaturated contaminated soils located above the water table by thermal desorption, comprising:
- heating means comprising a horizontal well-casing located below the unsaturated contaminated soil, a natural gas line and an oxygen line which run along the entire length of said



- horizontal well-casing and when ignited combust throughout the entire length of the horizontal well-casing;
- vapor impermeable insulation means placed on the surface of the contaminated soil;
- one or more vacuum extraction wells comprising a well-casings having a perforate lower portion located in the contaminated unsaturated soil and above the water table, acting in cooperation with pressure reducing means connected to said well casing, for collecting at reduced pressure the vapors generated by said heating means;
- insulation means for insulating the underside of said horizontal well-casing;
- contaminant separation means connected to said pressure reducing means for removing from said collected vapors the undesirable contaminants; and
- one or more recycle wells comprising a well casing having a perforate lower portion located in the contaminated unsaturated soil and above the water table, acting in cooperation with said pressure reducing means and contaminant separation means, for recirculating decontaminated vapors from said separation means to the contaminated soil.
9. A method for removing contaminants from unsaturated contaminated soils located above the water table by thermal desorption, comprising:
- burying a heating means below said contaminated soil and essentially parallel to the surface thereof, said heating means comprising a horizontal well-casing insulated on its underside;
  - transferring natural gas from a source of natural gas and oxygen from a source of oxygen located above the earth surface by connecting lines to said horizontal well-casing, said oxygen and natural gas connecting lines running within the entire length of said horizontal well-casing, mixing and igniting said natural gas and oxygen within said horizontal well-casing generating heat to be generated within said horizontal well-casing whereby said contaminated soil above said horizontal well-casing is heated to generate vapors;
  - placing a vacuum extraction well comprising a well-casing having perforate lower portion in the contaminated unsaturated soil and above the water table, said vacuum extraction well acting in cooperation with pressure reducing means connected to said well casing, for collecting at reduced pressure said collected vapors generated by said heating means;
  - separating undesirable contaminants from said collected vapors generated by said heating means.

5,769,570

## CABLE TENSIONING DOME PLATE

John C. Stankus, Canonsburg; Eugene H. Stewart, Pittsburgh, both of Pa., and Kendal L. Taylor, Arthurdale, W. Va., assignors to Jenmar Corporation, Pittsburgh, Pa.

Filed Jun. 3, 1996, Ser. No. 659,076  
Int. Cl.<sup>6</sup> E21D 21/00

U.S. Cl. 405—302.1

12 Claims

1. A mine roof bearing plate comprising:

5,769,572

## BAG DUMPING STATION VACUUM

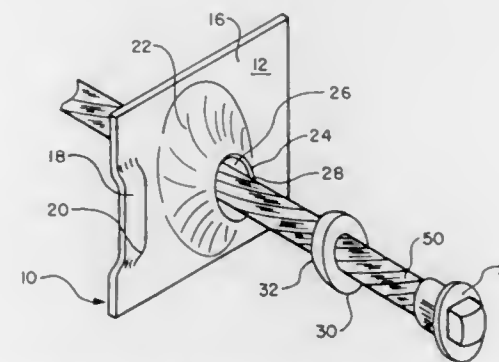
John W. Pfeiffer, Hughesville, Pa., assignor to Young Industries, Inc., Muncy, Pa.

Continuation-in-part of Ser. No. 609,396, Mar. 1, 1996. This application Dec. 17, 1996, Ser. No. 767,787

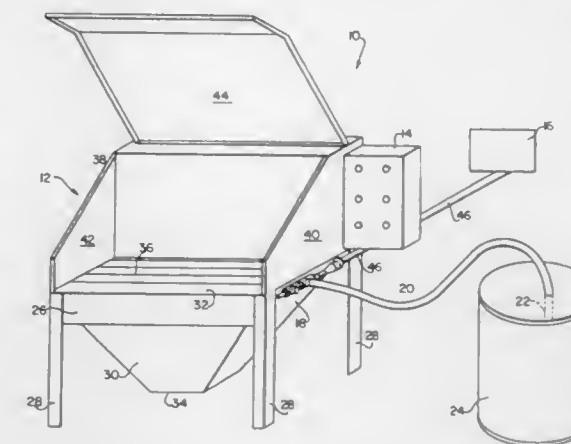
Int. Cl.<sup>6</sup> B65G 53/14

U.S. Cl. 406—153

12 Claims



- a planar member having a topside, an underside, a peripheral flange and a domed portion extending downwardly from said underside; and
- a central section at the outer extremity of said domed portion defining a bolt hole, wherein said domed portion deforms under an installation load and reforms to substantially an original configuration of said domed portion upon release of the installation load.



5,769,571

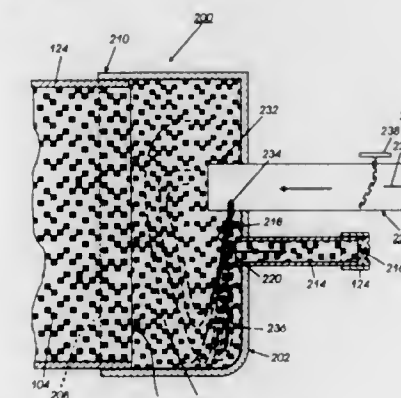
## MATERIAL RE-AERATING AND FLOW CONTROL DEVICE

Fumii Higuchi, Mississauga, Canada, assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 23, 1996, Ser. No. 773,546  
Int. Cl.<sup>6</sup> B65G 53/16

U.S. Cl. 406—137

5 Claims



1. A material re-aerating and flow control device for use in a material pneumatic processing system, the re-aerating and flow control device comprising:

- (a) a housing defining a re-aerating chamber and having an intake end;
- (b) a material intake opening through said intake end of said housing for receiving material into said chamber;
- (c) a short hollow conduit member for discharging the material from said chamber, said hollow conduit member including a first end located outside said housing, and a second end mounted through said housing into said chamber, said second end having a discharge port formed therethrough; and
- (d) a pneumatic conduit for introducing pressurized air into said chamber, said pneumatic conduit including a first end located outside said housing, and a second end mounted through said housing into said chamber, said second end of said pneumatic conduit having a pressurized air release aperture formed and positioned for forming and directing a curtain of the pressurized air radially across said discharge port of said hollow conduit member for re-aerating the material within said chamber, and controlling a discharge rate of the material out of said chamber without a risk of the material packing at said discharge port.

5,769,573

## APPARATUS FOR CONTROLLING AIR FLOW IN AN AIR DUCT

Jürg Faas, Dinhard, and Peter Brüttsch, Neuhausen, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Continuation of Ser. No. 41,679, Apr. 1, 1993, abandoned. This application Sep. 13, 1994, Ser. No. 305,428

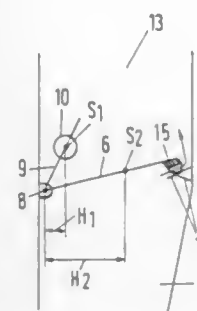
Claims priority, application Switzerland, Apr. 1, 1992, 01 047/92-8

Int. Cl.<sup>6</sup> B65G 53/60

U.S. Cl. 406—171

18 Claims

17. In combination,
- an air duct for conveying an upward flow of air therethrough;
  - a stop disposed in said air duct;
  - a throttle valve for throttling the flow of air in said duct, said valve being pivotally mounted on a pivot axis for pivoting within said duct between a first position resting on said stop and a second position spaced from said stop; and



at least one of said stop and said valve defining a gap between said stop and said valve with said valve in said first position to allow a minimum of air flow therethrough.

5,769,574

**METHOD AND APPARATUS FOR PRECISION BORING OF POCKET-HOLES**

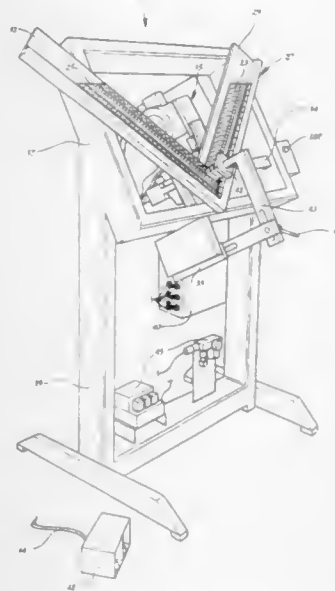
Stephen S. Feinsod, 17256 Ryton La., Boca Raton, Fla. 33496

Filed Mar. 29, 1996, Ser. No. 625,413

Int. Cl.<sup>6</sup> B23B 35/00; 41/00

U.S. Cl. 408—1 R

9 Claims

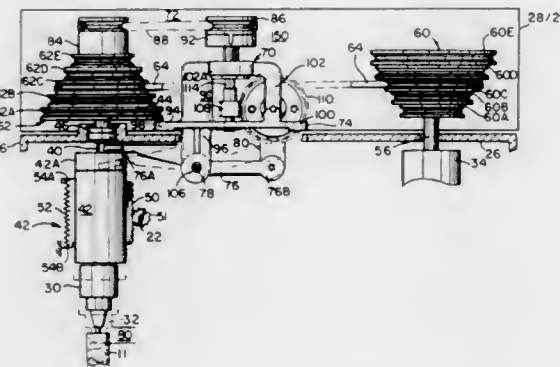


8. A method for precision boring of two frame members to be joined at a miter joint, comprising the steps of: positioning said frame members on a positioning frame accurately at said miter joint by abutting one of said frame members against a first surface on said positioning frame to position said one of said frame members at a first position, and abutting the other of said frame members against a second surface on said positioning frame to position said other of said frame members at a second location; moving a clamp member into engagement with said frame members to hold them together at said miter joint; and moving a boring means along a predetermined path of motion relative to said positioning frame to cause said boring means to form a pocket-hole, said path of motion causing said boring means to form said pocket-hole along a centerline extending through said frame member in said first location, obliquely across said miter joint, and into said frame member at said second location.

5,769,575  
**OSCILLATORY MOTION DEVICE FOR DRILL PRESS**  
Todd Laverne Stofflet; Henry Martin Pollak, and Douglas Allen Bowman, all of Pottstown, Pa., assignors to American Machine & Tool Company, Inc., Royersford, Pa.  
Filed May 29, 1996, Ser. No. 654,426  
Int. Cl.<sup>6</sup> B23B 39/00

U.S. Cl. 408—17

27 Claims



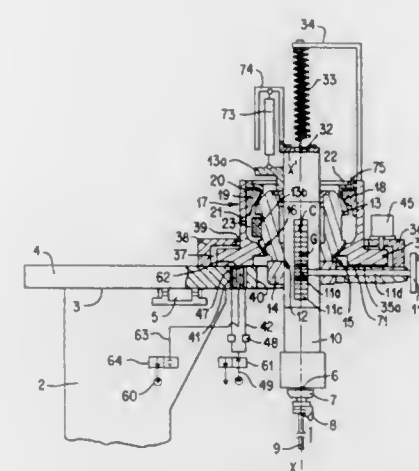
1. A drill press having an axially oscillating chuck comprising: a frame; a motor having an output shaft; a driven shaft; a quill mounted on the driven shaft; a chuck mounted on an end of the driven shaft; a first drive coupling between the output shaft and the driven shaft; a rotating power take-off driven by one of the output shaft, the driven shaft and the first drive coupling; a lever having a first end coupled with the quill, the lever being mounted for movement of the first end with axial movement of the quill on the driven shaft; and a second drive coupling between the lever and the rotating power take-off; wherein the quill is movably supported on the frame and the motor is fixedly supported on the frame with the output shaft and the driven shaft parallel and laterally spaced apart from one another.

5,769,576  
**DEVICE FOR POSITIONING A MACHINING SPINDLE USING ITS PILOT ROD**  
Daniel Gerard, Annemasse, and Fernand Tenand, Annecy Le Vieux, both of France, assignors to Machines Serdi, Annecy, France  
Filed Jun. 12, 1996, Ser. No. 662,135  
Claims priority, application France, Jun. 13, 1995, 95 07253  
Int. Cl.<sup>6</sup> B23B 41/00

U.S. Cl. 408—83.5

21 Claims

1. A device for aligning a longitudinal axis of a rotatable spindle of a machine tool with an axis of a cylindrical aperture, wherein a pilot rod attached to the spindle is used to align the spindle, the device comprising: a pre-adjustment support movably mounted on a bed of the machine tool so that the pre-adjustment support is movable in a horizontal plane; a sphere holder mounted on the pre-adjustment support; a clamp for clamping the sphere holder to the pre-adjustment support; a first support for movably supporting the sphere holder on the pre-adjustment support when the clamp is released such that the sphere holder is movable in the horizontal plane; a spherical core mounted in the sphere holder; a core holder for holding the spherical core fixed relative to the sphere holder;



said means for removably connecting the machining tool holder to the spinning receiver further comprising a dovetail assembly; said dove tail assembly further comprising a movably dovetail member and a stationary dovetail member mounted on the spinning receiver, and a matching slot on the machining tool holder functioning to secure both dovetail members; and said movable dovetail member being movable in a direction perpendicular to the horizontal surface of the spinning receiver, thereby selfcentering the machining tool holder.

5,769,578  
**CRANKSHAFT MILLER AND METHOD OF USE THEREOF**

Masumi Shimomura, Ishikawa-ken, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

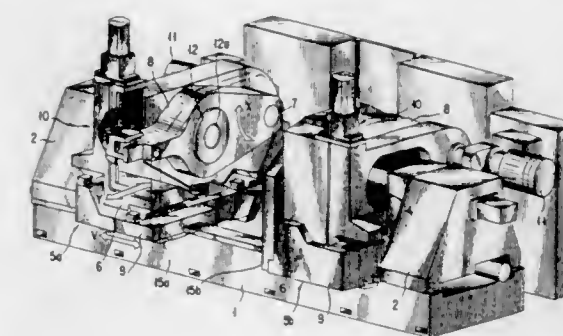
PCT No. PCT/JP94/00806, § 371 Date Nov. 20, 1995, § 102(e) Date Nov. 20, 1995, PCT Pub. No. WO94/26449, PCT Pub. Date Nov. 24, 1994

PCT Filed May 19, 1994, Ser. No. 553,608

Claims priority, application Japan, May 19, 1993, 5-116853 Int. Cl.<sup>6</sup> B23C 3/06

U.S. Cl. 409—82

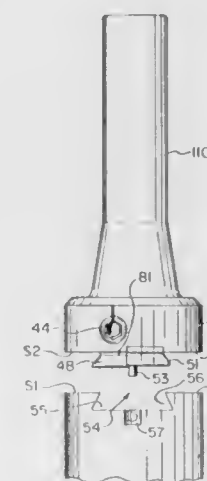
8 Claims



5,769,577  
**REMOVABLE SPINNING TOOL ASSEMBLY**  
Lawrence O. Boddy, 4541 Oakwood Dr., Westminster, Colo. 80030, assignor to Lawrence O. Boddy, Westminster, Colo.  
Filed Jul. 20, 1994, Ser. No. 278,012  
Int. Cl.<sup>6</sup> B23B 51/00

U.S. Cl. 408—231

9 Claims



1. An interchangeable spinning tool assembly comprising: a spinning drive shaft having an axis of rotation and a distal end; a spinning receiver having a horizontal surface and affixed to the spinning drive shaft at the distal end; a machining tool holder; means for removably connecting the machining tool holder to the spinning receiver perpendicular to the axis of rotation, functioning to enable the removal of the machining tool holder without moving it distally from the distal end;

1. A method of using a crankshaft miller constructed by providing two cutter units provided movably in longitudinal direction of a work between a pair of work heads provided on a bed and supporting both ends of the work, providing a cutter for machining a main journal and a first resting device in one of said pair of cutter units, in which a pitch of said cutter for machining a pin journal and said first resting device is selected such that when a counterweight is machined by means of the cutter for machining a main journal, a main journal which is located adjacent a counterweight forming a pair with said counterweight, is clamped by said first resting device, and providing a cutter for machining a pin journal and a second resting device in the other of said pair of cutter unit, in which a pitch of said cutter for machining a pin journal and said second resting device is selected such that when a pin journal is machined by means of the cutter for machining a pin journal, the main journal adjacent said pin journal, is clamped by said second resting device, the method is characterized in that at a condition where neither of resting devices clamps the main journal or where the main journal is clamped by said first resting device, other main journals and said pin journals are respectively machined, and at a condition where the main journal is clamped by said first resting device or said second resting device, said counterweight is machined.



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JUNE 23, 1998

5,769,579

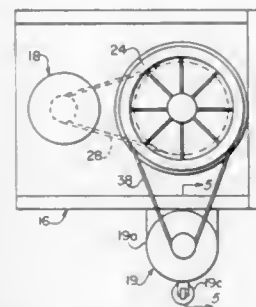
**TOOLHEAD ASSEMBLY FOR MACHINE TOOLS AND METHOD OF MAKING SAME**  
David A. Stutsman, Huntingburg, Ind., assignor to Thermwood Corporation, Dale, Ind.

Filed Apr. 26, 1996, Ser. No. 639,207

Int. Cl.<sup>6</sup> B23C 1/08

U.S. Cl. 409—203

23 Claims



1. A spindle assembly comprising:  
a first housing having a bore provided with a lining formed of a structural polymer;  
a second housing disposed in said bore in sliding engagement with said lining;  
a first spindle journaled in said first housing;  
a second spindle journaled in said second housing in axial alignment with said first spindle and operatively connected thereto for axial displacement relative thereto and rotational movement therewith; and  
means for displacing said second housing relative to said first housing to correspondingly axially displace said spindles.

5,769,580

**SHIFT STICK DEVICE**

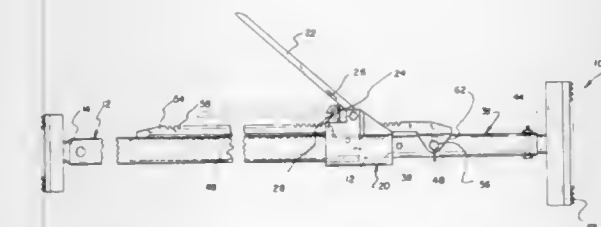
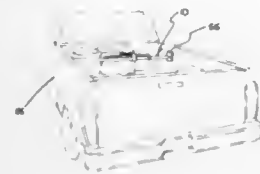
Leonard P. Purvis, 2645 Lower River Rd., Lithia Springs, Ga. 30057

Filed Jun. 3, 1996, Ser. No. 656,828

Int. Cl.<sup>6</sup> B60P 7/15

U.S. Cl. 410—151

1 Claim



1. A shift stick device for securing cargo in a pick-up bed comprising in combination:  
an outer tubular pipe being rigid and having a first foot receiving end, the outer pipe having a length of about 42 inches and a diameter of about 2 inches, the outer pipe having the first axial foot hole therethrough and adjacent the first foot receiving end;  
an inner tubular pipe;  
an adjustment mechanism being positionable over the outer pipe and away from the first foot receiving end, the adjustment mechanism having a movable straight arm with a winged projection and a locking pin with a slot, the movable arm being positionable in a downward orientation for allowing the winged projection to engage the slot of the locking pin for

locking thereof in a parallel orientation to the outer pipe, a gear being interconnected to the inboard end of the movable arm, the gear allowing rotation of the movable arm from a disengaged parallel position above the inner pipe to an engaged locked parallel position in said downward orientation and above the outer pipe;

said inner pipe capable of being received within the outer pipe when passed through the adjustment mechanism, the inner pipe having a length equal to the length of the outer pipe, the inner pipe having a plurality of axial holes therethrough and a second axial foot receiving end, the axial holes of said inner pipe forming a second axial foot hole and at least five support holes, a first hole of the at least five support holes being 2 inches from the second axial foot receiving end and spaced from the second axial foot hole;

an elongated toothed rack being coupled to the inner pipe with a hitch pin, the toothed rack being about 16 inches long; the toothed rack being engaged by the gear of the adjustment mechanism when the inner pipe is positioned within the outer pipe, the rack having a pair of ears at one end that overlap the inner pipe, each ear having an axial opening with the axial opening of each ear being in symmetrical alignment, the openings of the pair of ears capable of being aligned with any of the support holes of the inner pipe for allowing the hitch pin to pass through for coupling, the rack being spaced from the second foot receiving end of the inner pipe when coupled thereto, at least the teeth of the rack being located completely outside the inner pipe;

a pair of T-shaped foot pads with a first of said foot pads being positionable in the second foot receiving end of the inner pipe, each foot pad having a neck portion and a head, the head having a rubber cover, the neck of each foot pad having an axial hole therethrough, the axial hole of said first foot pad capable of being aligned with the axial foot hole of said inner pipe when the respective neck is positioned therein, each foot pad capable of being releasably coupled to each pipe, each foot pad capable of being in contact within one of a pair of side walls of a pickup truck bed when the device is secured therebetween;

the adjustment mechanism having the rack positionable there in, the adjustment mechanism being capable of moving the inner pipe in and out of the outer pipe for decreasing and increasing the length of the device, the arm of the adjustment mechanism capable of engaging the teeth of the rack via the gear with a lever motion, whereby as the arm of the adjustment mechanism is rotated upwardly and downwardly, the toothed rack is pulled into and through the adjustment mechanism, and causes the inner pipe to move into or out of the outer pipe for adjusting the device between side walls of the pick-up truck; and

wherein the second of said pair of T-shaped pads is releasably coupled to the outer pipe via an extension pipe, said extension pipe including first and second ends, said first extension pipe end comprising a third foot receiving end and including an axial hole, the second end of said extension pipe including a necked down smaller diameter portion and another axial hole, the first and second end axial holes of the extension pipe aligning with the axial hole of the second T-shaped pad and the first axial foot hole of the outer pipe respectively wherein the respective aligned holes of the outer pipe, extension pipe, and second pad receive nut and bolt fastening assemblies.

5,769,581

**DIRECT TENSION INDICATING WASHERS**

Ivan Wayne Wallace, Ludlow, Vt., and John A. Herr, West Chesterfield, N.H., assignors to Applied Bolting Technology Products, Inc., Ludlow, Vt.

Filed Feb. 21, 1997, Ser. No. 804,217

Int. Cl.<sup>6</sup> F16B 31/02; G01L 5/00

U.S. Cl. 411—10

4 Claims

1. A direct tension indicating and maintaining washer comprising:  
a first surface having at least one protuberance formed thereon for indicating bolt tension;

JUNE 23, 1998

GENERAL AND MECHANICAL

3795

5,769,584

**NUT FOR A SPOKE**

Ivo Claes, Knokke-Heist, Belgium, assignor to Piminvest, Naamloze vennootschap, Wilrijk, Belgium

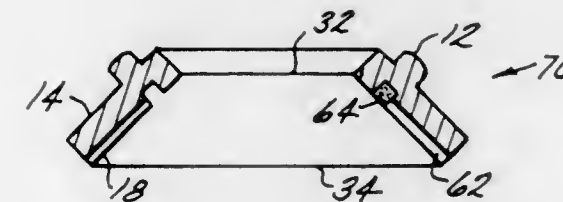
Filed Jan. 31, 1997, Ser. No. 792,215

Claims priority, application Belgium, Jan. 31, 1996, 9600084

Int. Cl.<sup>6</sup> F16B 37/00; 43/02

U.S. Cl. 411—427

7 Claims



- a second surface having at least one indentation formed opposite said protuberance;  
an opening having an inner diameter wall, said inner diameter wall meeting said second surface at an inner diameter edge;  
an outer diameter wall meeting said second surface at an outer diameter edge;  
wherein said inner diameter edge and said outer diameter edge lie in different planes, said first surface and said second surface being planar and defining a frusto-conical shape for maintaining tension on a bolt upon installation.

5,769,582

Patent Not Issued For This Number

5,769,583

**CONNECTING ELEMENT WITH THREAD ON BOTH SIDES**Max Girbinger, Rudolf-Diesel-Str. 10, Gerlinden, Germany  
PCT No. PCT/EP95/00472, § 371 Date Sep. 6, 1996, § 102(e)  
Date Sep. 6, 1996, PCT Pub. No. WO95/22702, PCT Pub. Date Aug. 24, 1995

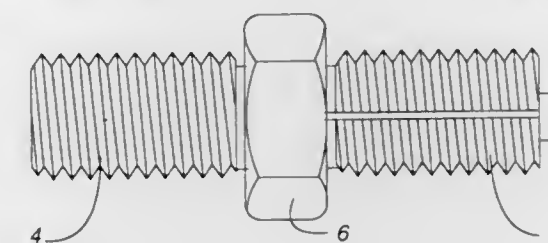
PCT Filed Feb. 9, 1995, Ser. No. 693,244

Claims priority, application Germany, Feb. 18, 1994, 44 05 240.5

Int. Cl.<sup>6</sup> F16B 35/00

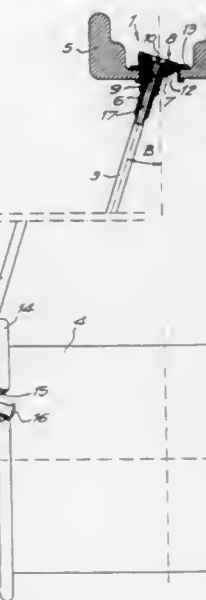
U.S. Cl. 411—389

18 Claims



1. A connecting element having opposing first and second threaded segments for the detachable connection of two objects, the threads being of the same handed direction, comprising:  
a first threaded segment having a plurality of threads and a joining cap screw located at opposing ends of the first threaded segment, the joining cap screw comprising a locking section;  
a second threaded segment having a plurality of threads and a reception cap located at opposing ends of the second threaded segment, the reception cap being turnably received in the locking section; and  
a clamping nut having a central bore extending therethrough including means for receiving a portion of the second threaded segment therein such that the clamping nut can be slid axially onto the portion of the second threaded segment whereby, when the clamping nut is slid axially onto the portion of the second threaded segment, the clamping nut and the second threaded segment are lockably engaged and rotation of the clamping nut causes rotation of the second threaded segment.

179-280 O.G. - 98 - 12 : QL 3



1. A spoke nut comprising:  
an elongated body having flattened side faces at one end area and an enlarged head portion at an opposed end of the body;  
said head portion including a collar portion having a rounded portion forming a transition between the body and the head portion;  
a longitudinal threaded bore within the body;  
wherein said flattened faces transition gradually into the nut body along inclined surfaces extending in the direction towards the head portion.

5,769,585

**TOOTHBRUSH WITH TOOTHPASTE**

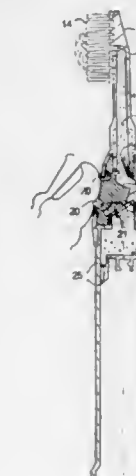
Grigory Podolsky, 33-34 77 St. #5H, Jackson Heights, N.Y. 11372

Filed May 1, 1995, Ser. No. 434,584

Int. Cl.<sup>6</sup> A46B 11/02

U.S. Cl. 401—146

8 Claims



1. A rechargeable dispensing device comprising:

an elongated housing having a housing axis and formed with an opening between opposite ends of the housing;  
a container mounted detachably on one of the ends of the housing and formed with means coaxial with said housing for supplying a paste along a path toward the other end of the housing and formed with:  
a mouth received in said housing and lying in a plane extending at an angle with respect to said axis, and  
a first flap operatively connected with said mouth and swingable from an open position into a closing position about a first axis to close the mouth, said first axis extending perpendicular to the housing axis;  
a resilient hollow pump body mounted in and coaxial with said housing, said resilient hollow pump body being located downstream from said mouth along the path and being formed with:  
a button registered with said opening,  
a piston connected with said button and displaceable arcuately inwardly from an initial position which corresponds to said open position of the first flap into said path upon applying an external pressure to the button, and  
membrane means for biasing said piston back to the initial position upon withdrawing the external pressure;  
a second flap formed along the path and downstream from said resilient hollow pump body and swingable about the second axis parallel to the first axis into a respective closing position, said first and second flaps converging toward one another in respective closing positions to form a chamber in said resilient hollow pump body;  
a longitudinal channel coaxial with said housing and formed with an inlet opening into said chamber and closable by said second flap in the closing position thereof and an outlet, said mouth and said inlet opening being centered on said housing axis;  
bristle means for distributing the paste and formed on the other end of the housing and being in a flow communication with said outlet; and  
stop means between the piston and first flap for swinging the first flap into the respective closing position after receiving the paste in the chamber from the container and upon displacing the piston into the path, said stop means being in contact with the first flap in the open position thereof.

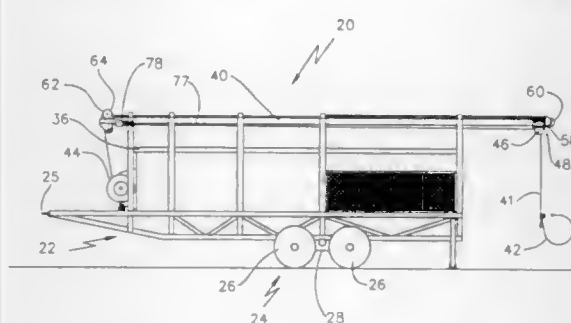
5,769,586

## SELF-LOADING LOG TRANSPORTER

John Edward Schulte, R.R. #1 C. 70 Young Rd., 100 Mile House, British Columbia, Canada, V0K 2E0  
Filed Dec. 14, 1995, Ser. No. 572,418  
Int. Cl.<sup>6</sup> B60P 3/41

U.S. Cl. 414—23

24 Claims



1. A log transporter comprising:  
(a) a vehicle frame;  
(b) a receiving deck on said vehicle frame for receiving logs between first and second walls;  
(c) a rail extending generally parallel to and higher than said receiving deck, said rail having a portion extending rearwardly of a rearward end of said receiving deck;  
(d) a carriage movable along said rail;

- (e) a block mounted on said carriage;  
(f) a winch coupled to said vehicle frame;  
(g) a first cable on said winch, said cable having a free end extending through said block;  
(h) means on said free end of said cable for detachably affixing said free end of said cable to a log; and  
(i) drag means for resisting forward movement of said carriage along said rail;  
the drag means having an applied state and a non-applied state wherein, when said drag means is in said applied state, said drag means prevents forward movement of said carriage along said rail unless a forwardly directed force in excess of a threshold force is applied to said carriage and said drag means permits forward motion of said carriage along said rail if a forwardly directed force in excess of said threshold force is applied to said carriage and, when said drag means is in said non-applied state, said drag means permits forward motion of said carriage along said rail when a forwardly directed force smaller than said threshold force is applied to said carriage.

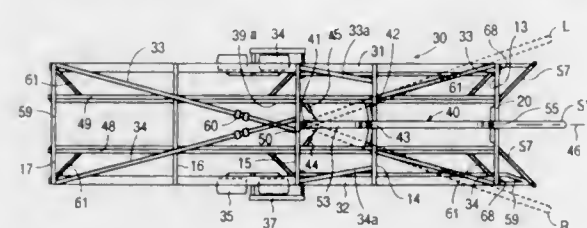
5,769,587

## BALE HANDLING APPARATUS

Gerald B. Gilfoil, Leroy Knudson, and Dwayne Hayworth, all of Calgary, Canada, assignors to Whirlwind Manufacturing, Ltd., Edmonton, Canada  
Filed Nov. 5, 1996, Ser. No. 744,034  
Int. Cl.<sup>6</sup> B60D 01/02

U.S. Cl. 414—24.5

14 Claims



1. A wheeled bale handling apparatus comprising:  
a rigid mobile frame having a front end, a rear end and a central portion, said frame including a spaced pair of longitudinal bale pickup and bale-carrying members extending substantially from said front end to said rear end and a series of cross-members extending generally transversely above and between said pickup and carrying members, said frame forming a chute for recovering a series of hay bales or the like;  
a pulling tongue pivotally attached at a proximal end of said tongue to said frame at a position juxtaposed to a central portion of a first one of the cross-members in a central portion of the frame;  
a first lock in said frame and located along a central longitudinal axis of said frame for locking said pulling tongue in a road-tow position of said pulling tongue;  
an arcuate rail connected to said frame and extending over an arc angle having a bisector on said central longitudinal axis and extending to an arc termini offset from said central longitudinal axis representative of corresponding offset positions of said frame in bale pick-up positions; and  
a rail follower attached to said pulling tongue, said follower being in moving engagement along said arc such that said frame is movable relative to a tow vehicle to either a left-side towing or right-side towing bale pick-up and bale-carrying position.

5,769,588

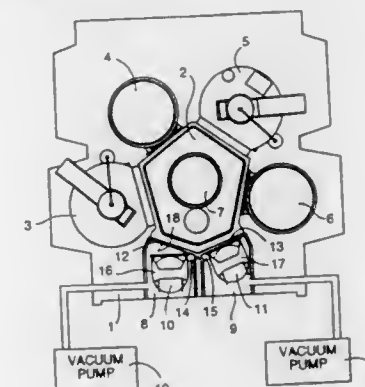
## DUAL CASSETTE LOAD LOCK

Masato M. Toshima, Sunnyvale; Phil M. Salzman, San Jose; Steven C. Murdoch, Palo Alto; Cheng Wang, San Jose; Mark A. Stenholm, San Jose; James Howard, San Jose; Leonard Hall, San Jose, and David Cheng, Sunnyvale, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Continuation of Ser. No. 481,546, Jun. 7, 1995, abandoned, which is a division of Ser. No. 99,983, Jul. 30, 1993, abandoned, which is a continuation of Ser. No. 849,115, Mar. 10, 1992, abandoned, which is a division of Ser. No. 511,481, Apr. 19, 1990, Pat. No. 5,186,594. This application Aug. 20, 1996, Ser. No. 700,267  
Int. Cl.<sup>6</sup> B65G 65/00

U.S. Cl. 414—217

5 Claims



1. In a workpiece processing system comprising multiple vacuum chambers coupled to a central chamber, a workpiece loading interface comprising:

- dual workpiece load/unload chambers coupled to the central chamber, each having an opening for receiving workpieces held in a cassette and for forwarding the cassette of workpieces to the central chamber of the workpiece processing chamber for further transfer to one of the multiple vacuum chambers for processing;  
cassette support mounted within each of said load/unload chambers for dual movements between raised and lowered positions and first and second pivot positions, each cassette support for raising and lowering a cassette of workpieces into and out of the opening of the respective load/unload chamber from the first pivot position of the cassette support, and for positioning the cassette for forwarding of the workpieces to the central chamber from the second pivot position of the cassette support; and  
a vacuum system coupled to said load/unload chambers for independently producing a vacuum in each of said load/unload chambers.

5,769,589

## METHOD FOR TRANSPORTING A CONTAINER AND TRANSPORTING MEANS FOR PERFORMING THE METHOD

Robert Marie Lubbers, Paulus Potterlaan 2, Capelle a/d IJssel, Netherlands, 2902 GP

PCT No. PCT/NL94/00284, § 371 Date Jun. 28, 1996, § 102(e) Date Jun. 28, 1996, PCT Pub. No. WO95/13978, PCT Pub. Date May 26, 1995

PCT Filed Nov. 11, 1994, Ser. No. 640,830

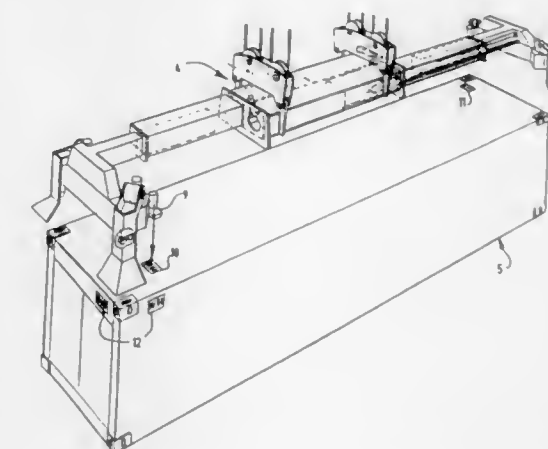
Claims priority, application Netherlands, Nov. 16, 1993, 9301982

Int. Cl.<sup>6</sup> B65G 1/00

U.S. Cl. 414—268

7 Claims

1. A method for transporting a container from a starting station to one of a plurality of final destinations via a container moving means having a container gripping means, comprising the steps of:



providing the container with data identifying the container; positioning a container gripping means to grip the container, the container gripping means having a data reader attached thereto to read the data when the container gripping means is positioned to grip the container; and reading the data with the data reader.

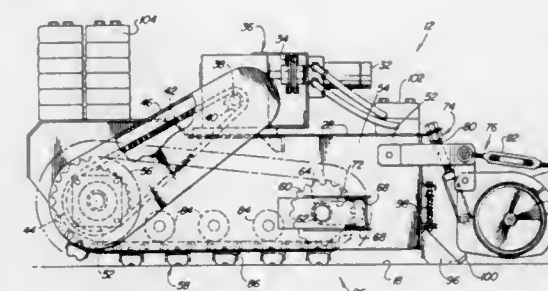
5,769,590

## GRAIN SWEEP DRIVE APPARATUS

Charles W. Weikel, 500 Fulton, Geneva, Ill. 60134  
Filed Aug. 29, 1996, Ser. No. 697,644  
Int. Cl.<sup>6</sup> B65G 65/38

U.S. Cl. 414—321

19 Claims



1. A mechanism comprising:  
a grain sweeper mechanism which extends radially from a central opening into which the grain sweeper directs grain as the grain sweeper travels in a circular path about the central opening, said grain sweeper mechanism further comprising an auger member adapted to direct grain toward the central opening of a grain storage container;  
a housing operatively coupled with the grain sweeper mechanism; and  
a crawler track mounted within the housing said crawler track further comprises laterally extending cleat means for engaging grain and the floor portion of the grain storage container, said cleat means being spaced a distance fore and aft from one another for allowing said cleat means to dig down into and loosen layers of hardened grain, and said cleat means extend a significant distance in a vertical dimension as the cleat means engage the grain and floor portion of the grain storage container, the vertical dimension of said cleat means serving to paddle grain which has been loosened by the cleat means rearwardly and laterally with respect to the cleat means when said cleat means slip with respect to the floor, each of said cleat means having a surface area of sufficient size to establish friction for driving the grain sweeper mechanism about the central opening when said surface engages grain and a floor portion of the grain storage container, and said surface is sufficiently small to allow the cleat means to dig into grain.



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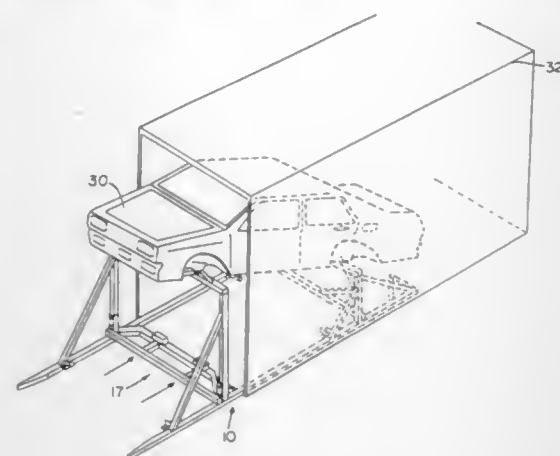
1998

UMI

5,769,591  
**FRAME STRUCTURE AND METHOD OF PACKING  
VEHICLE BODIES**  
Salmon Pienaar, Port Elizabeth, South Africa, assignor to Kar-  
Tainer International, Inc., Decatur, Ga.  
Continuation of Ser. No. 13,302, Feb. 4, 1993, abandoned.  
This application Jun. 15, 1994, Ser. No. 260,058  
Int. Cl.<sup>6</sup> E04H 6/06

U.S. Cl. 414-400

7 Claims



1. A frame structure suitable for packing vehicle bodies into a transport container the transport container having a floor and at least one wall, the frame structure comprising:

- a base which in use rests on the container floor, the base comprises two elongated base members spaced apart from, and substantially parallel to each other thereby to define an elongated base with a front end and a rear end;
- a vehicle support means for supporting a first vehicle body in an inclined position relative to the base, the vehicle support means comprises a lower vehicle support member and an upper vehicle support member, the members being mounted across the base in a horizontally and vertically spaced relationship relative to each other, the lower vehicle support member being relatively close to the base in use to support a lower end of the first vehicle body, and the upper vehicle support member being relatively high from the base in use to support an upper end of the first vehicle body; and
- attachment means for securing the first vehicle body to both the upper support member and the lower support member, the frame structure being adapted in use to fit into the said container and to receive a second vehicle body at least partly beneath the first vehicle body.

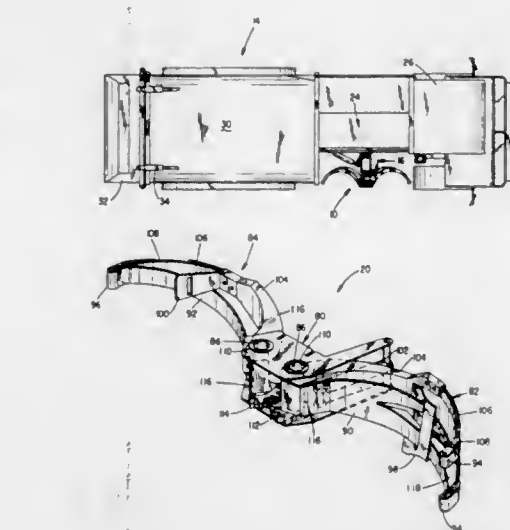
5,769,592  
**CONTAINER GRABBING DEVICE**  
Ronald E. Christenson, Parsons, Tenn., assignor to McNeilus  
Truck and Manufacturing, Inc., Dodge Center, Minn.  
Filed Sep. 20, 1996, Ser. No. 716,999  
Int. Cl.<sup>6</sup> B65F 3/02

U.S. Cl. 414-408

9 Claims

1. A gripping apparatus for grabbing collection containers, wherein a support member of the gripping apparatus is attached to a mechanized arm of a collection vehicle which operates between stowed, extended, lift and emptying positions, said gripping apparatus comprising:

- a) first and second opposed mechanized fingers each having a proximal end and a distal end, said proximal end of each finger being pivotally connected to the support member, said first and second fingers being aligned in spaced relation and disposed to converge and diverge to grasp and release an object of interest;
- b) a first belt having a proximal end attached to the proximal end of said first finger and further having a distal end attached adjacent the distal end of said first finger;

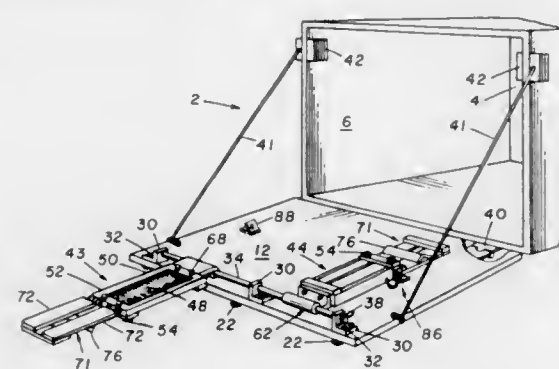


- c) a second belt having a proximal end attached to the proximal end of said second finger and further having a distal end attached adjacent the distal end of said second finger;
- d) wherein the distal end of said first finger is split into an upper and a lower member, such that when the second finger converges on the first finger, the second finger overlaps the first finger between the upper and lower members and wherein the distal end of said first belt is split into upper and lower elements which are aligned with said upper and lower members of said first finger; and
- e) a guide roller rotatable attached to the distal end of each of said upper and lower members of said first finger and said second finger beyond said first and said second belts.

5,769,593  
**RAMP SYSTEM FOR VAN**  
Richard H. Buffalo, 932 Aqua Vista Dr., Killen, Ala. 35645  
Filed Nov. 13, 1996, Ser. No. 748,284  
Int. Cl.<sup>6</sup> B60P 1/43

U.S. Cl. 414-537

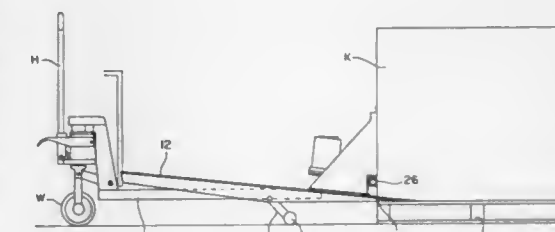
19 Claims



1. In a vehicle having a load carrying bed and a pair of side walls, a ramp system comprising:
- a rear door hinged to the load carrying bed of the vehicle, said rear door forming a first ramp segment and having a closed position and an opened position;
- a second ramp segment having an upper end portion and a lower end portion;
- a third ramp segment having an upper end portion and a lower end portion;
- means for hingedly securing said second ramp segment to said first ramp segment including a plurality of brackets, at least one round hinge bar mounted in said plurality of brackets, and a bearing element rigidly secured to said upper end portion of said second ramp segment and being pivotally secured to said at least one hinge bar;

means for securing said lower end portion of said second ramp segment to said third ramp segment; and

means for latching each of said second ramp segment and said third ramp segment to and against said first ramp segment when said rear door is in its closed position whereby said ramp system is compactly stored in a generally vertical condition to take up limited space within the vehicle when the ramp system is not being used for loading and unloading purposes.



coupling said nut to one of said connectors whereby translation of said nut is operable to move such connector between its latched and unlatched positions, said motor being movable linearly within said housing with said screw and being connected to the other of said connectors to move said other connector between its latched and unlatched positions when said motor is energized and said screw is rotated after said one connector has stopped in one of its positions.

5,769,597

# APPARATUS FOR LOADING ELONGATED WORKPIECES

Ryoichi Tsune, Toyama, Japan, assignor to Tsune Seiki Co., Ltd., Japan

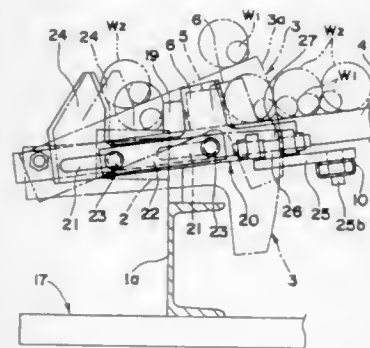
Filed Jun. 17, 1997, Ser. No. 877,547

Claims priority, application Japan, Jun. 17, 1996, 8-155816

Int. Cl.<sup>6</sup> B65G 29/02

U.S. Cl. 414-746.2

4 Claims



1. Apparatus for loading elongated workpieces that have a circular cross-section, the apparatus comprising:

- (i) a horizontal work transfer section having horizontal rollers for longitudinally movably supporting workpieces;
- (ii) a plurality of sloping rails for downwardly rollably supporting workpieces parallel to each other, the rails sloping toward and overhanging from one side said work transfer section;
- (iii) a plurality of movable stoppers for stopping the lowermost of the downwardly rolling workpieces on said rails, each stopper being movable along a sloping rail;
- (iv) a shifter for moving said movable stoppers along said sloping rails;
- (v) a lock for locking said stoppers in place in a preselected moved position;
- (vi) a plurality of work shifters for lifting the lowermost workpiece on said rails and moving it over onto said horizontal rollers in said horizontal work transfer section, said work shifters each having a sloping top support surface for the lifting of workpieces, and being adapted for vertical movement along respective vertical planes disposed at a substantially right angle to said workpieces on said rails;
- (vii) a plurality of fixed positioners disposed on said rails for laterally positioning one side of a workpiece at a preselected position on said horizontal rollers; and
- (viii) a plurality of movable positioners disposed along said horizontal work transfer section on the side of a workpiece thereon that is opposite to the side along which said fixed positioners are disposed, for positioning a workpiece on said horizontal rollers in cooperation with said fixed positioner, by said movable positioners being movable toward and away from said fixed positioners.

5,769,598

# ANTISTACKING WARNING DEVICE AND STACKING DAMAGE DETECTOR

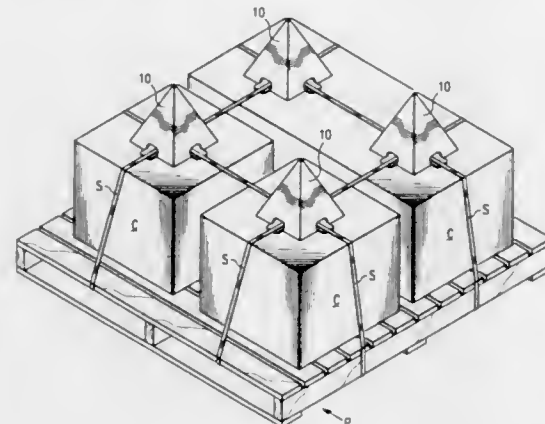
David F. MacNeil, 215 E. First St., Hinsdale, Ill. 60521

Filed Jul. 11, 1996, Ser. No. 680,206

Int. Cl.<sup>6</sup> B65D 19/38

U.S. Cl. 414-786

20 Claims



1. A combination stacking damage detector and antistacking warning device, comprising:

- a body having a bottom and a top;
- means for affixing the bottom of the body to a top of an object to be shipped;
- a height of said body measured in a direction perpendicular to said bottom from said bottom to said top, said height being at least three inches, said body normally upstanding from said object when less than a predetermined force is applied on said top toward said bottom; and
- said body having at least one upstanding wall between the top and the bottom, the upstanding wall permanently deforming responsive to at least said predetermined force being applied to said top toward said bottom, said body when deformed giving a visual indication to an observer located several feet away from said body that an item having a weight that equals or exceeds said predetermined force has been applied to said top of said object.

5,769,599

# METHOD OF AND APPARATUS FOR SUPERIMPOSING DISCRETE ROWS OF PACKETS OF THE TOBACCO PROCESSING INDUSTRY

Wolfgang Schnabel, Reinbek; Joachim Dittrich, and Nirian Junge, both of Hamburg, all of Germany, assignors to Topak Verpackungstechnik GmbH, Schwarzenbeck, Germany

Filed Oct. 25, 1996, Ser. No. 738,395

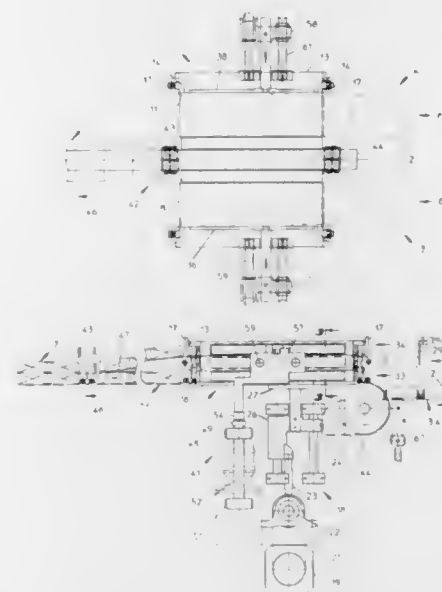
Claims priority, application Germany, Dec. 9, 1995, 195 46 055.3

Int. Cl.<sup>6</sup> B65B 35/44

U.S. Cl. 414-791.6

24 Claims

1. A method of manipulating packets of the tobacco processing industry, comprising the steps of advancing first and second rows of successive packets along first and second paths; assembling in a predetermined plane successive arrays of first and second groups, containing predetermined numbers of packets, from the packets respectively advanced along said first and second paths; displacing the first and second groups of successive arrays from the predetermined plane into first and second additional planes which are disposed at different levels; shifting at least one of the thus displaced first and second groups of successive arrays in the respective additional plane so that the thus shifted at least one group and the other group of the respective array overlap and are spaced apart from each other; and reducing the spacing between the overlapping



first and second groups of successive arrays so that such groups form two contacting superimposed layers of packets.

5,769,600

# BULK HANDLING APPARATUS

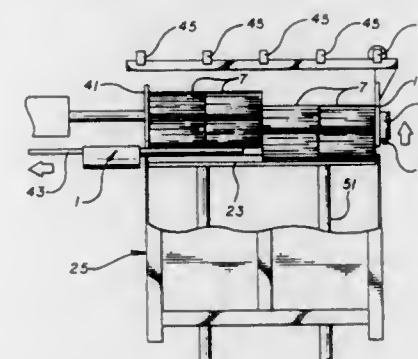
Richard E. Kwasniewski, Fountain Valley; Jose Salinas, Jr., Irvine; Philip Medina, Woodcrest; Edward McLaughlin, Santa Ana; Randall Wienke, South Pasadena; Vernon Bundy, Orange; Klaus Kurz, Monterey Park; Lawrence Foster, Perris, and Gary Fain, Irvine, all of Calif., assignors to Los Angeles Times, a division of The Times Mirror Company, Los Angeles, Calif.

Filed May 17, 1996, Ser. No. 650,918

Int. Cl.<sup>6</sup> B65G 57/11

U.S. Cl. 414-794.3

9 Claims



1. An apparatus for laterally moving one or more sets of stacked articles on a flat surface, each set of stacked articles having at least two opposing sides, comprising:

- a first wall perpendicular to said flat surface for providing lateral support on a first side of a set of stacked articles;
- a pusher plate perpendicular to said flat surface for engaging a second side of said set of stacked articles and pushing said set onto said flat surface, said first pusher plate providing lateral support on said second side of said set of stacked articles;
- an extender for extending said flat surface from a starting position in increments corresponding to the receipt of each set of said stacked articles on said flat surface;
- a second wall extending perpendicularly to said flat surface and forming right angles with said first wall and said pusher plate; and

a compression plate extending perpendicularly to said flat surface and forming right angles with said first wall and said pusher plate and positioned opposite to said second wall, wherein said pusher plate and said compression plate are used to compress said one or more sets of stacked articles on said flat surface against said first and second walls.

5,769,601

# METHOD AND ARRANGEMENT FOR PALLETIZING SUBSTANTIALLY CYLINDRICAL OBJECTS

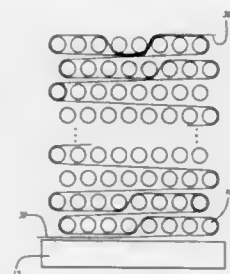
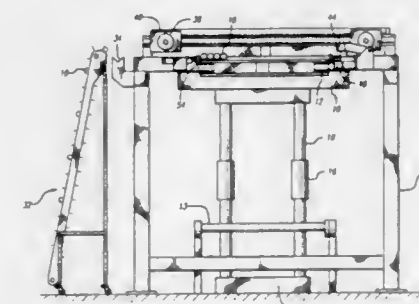
Weine Agné, Algatan 28, S-565 33 Mullsjö; Åke Ljungqvist, deceased, late of Norrahammar, and by Jenny My Ljungqvist, administrator, Bergsgatan 12, S-562 32 Norrahammar, all of Sweden

Filed Oct. 4, 1996, Ser. No. 726,294

Int. Cl.<sup>6</sup> B65G 57/18

U.S. Cl. 414-799

14 Claims



1. An arrangement for loading substantially cylindrical items onto a load carrier comprising:

- pick-up means for picking up the items from a supply position and placing the items as stacked layers onto the carrier at pre-determined lateral positions, and for separating at least one first layer of items placed on the carrier into a first partial base layer of items and a second partial base layer of items;
- material dispensing means including a supply of a locking material, movable laterally over the carrier,
- for dispensing a first base portion of the locking material across the carrier underneath the first layers of items by moving from the first to the second end position;
- for laying a partial top portion of the locking material as a loop around an outermost item in the first partial base layer of the items and over all the items in the first partial layer of items for laying a return portion of the locking material as an extension of the partial top portion underneath the second partial base layer of items, on top of the base portion, and as a loop around an outermost item in the second partial base layer of items;
- the base portion, the partial top portion, and the return portion forming a first continuous locking loop of the locking material, the first partial layer of items thereby being surrounded by the locking material.



5,769,602

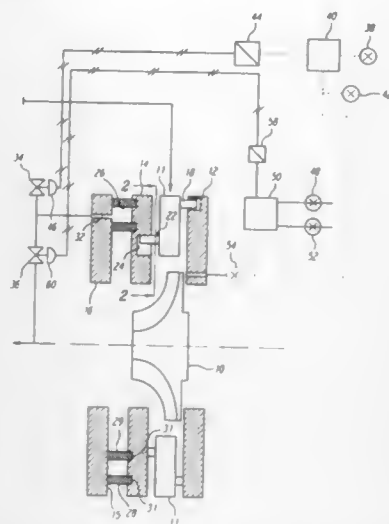
## ACTIVE AUTOMATIC CLAMPING CONTROL

Reza R. Agahi, Granada Hills, and Behrooz Ershagi, Irvine, both of Calif., assignors to Rotoflow Corporation, Gardena, Calif.

Continuation of Ser. No. 427,955, Apr. 26, 1995, Pat. No. 5,564,895. This application Oct. 11, 1996, Ser. No. 731,288  
Int. Cl.<sup>6</sup> F01D 17/16

U.S. Cl. 415—29

8 Claims



1. A variable nozzle system for a radial inflow turbine having an annular inlet with opposed sides to a turbine wheel, comprising: a pivotally mounted inlet vanes in the annular inlet; a mounting ring in the annular inlet, coupled with and adjacent to the inlet vanes, the mounting ring being moveable axially toward and away from the inlet vanes; an axially extendable annular chamber between the mounting ring and one of the sides of the annular inlet and on the other side of the mounting ring from the inlet vanes; a control system including a passageway to the annular chamber, a valve mechanism in communication with the passageway controlling pressure in the annular chamber, a process control signal, a signal indicative of operational deviation from nominal operation as indicated by the process control signal, and a controller determining the relationship between the process control signal and the signal indicative of operational deviation and coupled to actuate the valve mechanism responsive to determination of selected relationships between the process control signal and the signal indicative of operational deviation indicating improper axial positioning of the mounting ring at the inlet vanes in the annular inlet.

5,769,603

## SUBMERGED PUMP

Tetsutaro Fujiwara; Seiichiro Yamada, both of Yokohama, and Seiichi Toguchi, Kawasaki, all of Japan, assignors to Ebara Corporation, Tokyo, Japan

Filed Jul. 18, 1996, Ser. No. 683,090

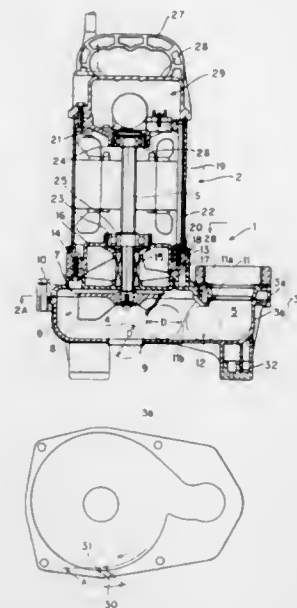
Claims priority, application Japan, Jul. 20, 1995, 7-206589

Int. Cl.<sup>6</sup> F04D 29/44

U.S. Cl. 415—169.1

10 Claims

6. A submerged pump comprising: a pump casing accommodating a shaft rotatably therein and having an inlet portion, a pump chamber and a discharge portion; an impeller integrally mounted on said shaft in said pump chamber; and a motor means for driving said impeller to rotate within said pump chamber, said motor means being integrally secured to said pump casing;



wherein an air vent hole is formed through an outer side wall of said pump casing, said air vent hole being at an obtuse angle with respect to a fluid flow direction in an outer portion of said pump.

8. A vortex-type submerged pump comprising:

a pump casing accommodating a shaft rotatably therein and having an inlet portion, a pump chamber and a discharge portion;

an impeller integrally mounted on said shaft in said pump chamber; and

a motor means for driving said impeller to rotate within said pump chamber, said motor means being integrally secured to said pump casing;

wherein said pump casing comprises at least two subcasings assembled together, at least one of said subcasings having a projection defining a narrowed passage portion between said pump chamber and said discharge portion, wherein a minimum diameter of said passage portion is larger than a minimum diameter of said inlet portion of said submerged pump, and wherein the projection extends beyond a plane of contact of the at least two subcasings.

5,769,604

## FACE SEAL DEVICE HAVING HIGH ANGULAR COMPLIANCE

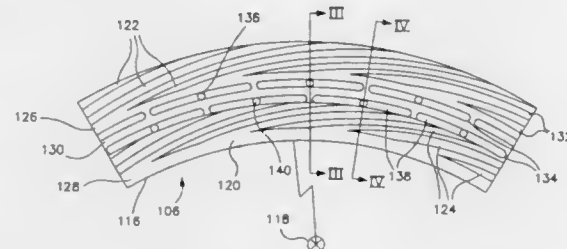
James F. Gardner, and Matthew D. Cunningham, both of Cranston, R.I., assignors to EG&amp;G Sealol, Inc., Cranston, R.I.

Filed May 4, 1995, Ser. No. 434,537

Int. Cl.<sup>6</sup> F04D 29/08

U.S. Cl. 415—170.1

33 Claims



1. A rotary seal assembly for preventing leakage of a fluid from a region of high pressure in a housing to a region of relatively lower pressure, the assembly comprising:

5,769,606

## DE-ICING CONNECTION INSTALLATION FOR ROTORCRAFT ROTOR

Jean Joseph Henri Mondet, Pelissanne, and Serge Louis Roux, Marignane, both of France, assignors to Eurocopter France, Marignane, Cedex, France

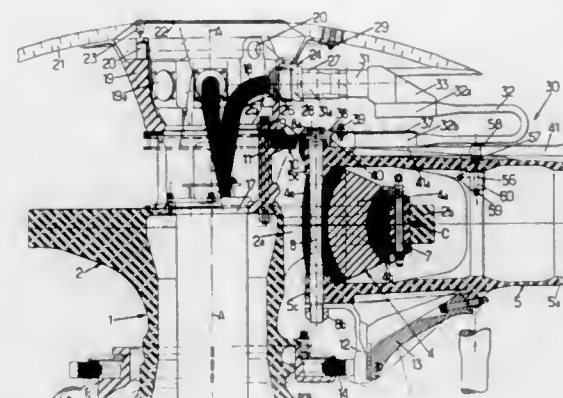
Filed Jul. 12, 1996, Ser. No. 679,218

Claims priority, application France, Jul. 20, 1995, 95 08805

Int. Cl.<sup>6</sup> B64C 27/39; 27/50

U.S. Cl. 416—134 A

18 Claims



5,769,605

## SEALING DEVICE FOR A ROTARY SHAFT

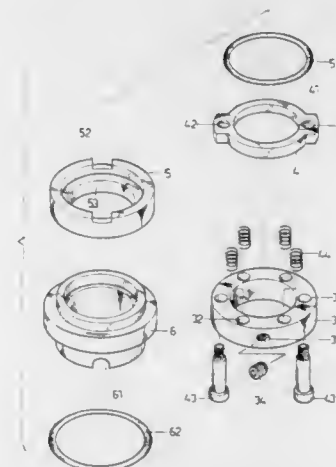
Cheng Ching Kung, 12 Floor, No. 5, Alley 22, Lane 188, Kang-Shan Tung Rd., Kaohsiung, Taiwan, Taiwan

Filed Jun. 27, 1995, Ser. No. 495,318

Int. Cl.<sup>6</sup> F04D 29/12

U.S. Cl. 415—230

1 Claim



1. A sealing device, said sealing device being mounted on an axle of a centrifugal pump, said sealing device including a retainer ring, a supporting ring, a rotor ring, and a fixing ring, the improvement comprising:

said supporting ring having a plurality of tongues extending outwardly and radially therefrom, each of said tongues having a threaded hole for threaded securement to an end threaded bolt member extending through a respective non-threaded through opening formed through said retainer ring for engagement of said supporting ring with said retainer ring, said retainer ring having a plurality of blind holes for insertion of a plurality of spring members bearing against said supporting ring and said retainer ring, on opposite sides thereof, and said rotor ring comprising a plurality of notches each for engaging with an associated one of said tongues, thereby mounting said rotor ring to said retainer ring.

1. An installation for electrical connection in a rotorcraft comprising:

at least one electric supply conductor and at least one electric de-icing conductor of an electric device for de-icing a blade of a rotorcraft rotor which rotor includes a hub integral in terms of rotation with a rotor mast about an axis of rotation of the rotor and at least two blades, each of which said blades is linked to the hub by a linking member which is substantially radial relative to the axis of rotation and which said linking member is linked to the hub by a retaining and articulating means,

at least one connecting cable having at least one elongate electric conducting element coupling said supply conductor borne by the hub to said at least one electric de-icing conductor of said de-icing device borne by the blade, wherein the connecting cable comprises

a first stretch including (a) a first end, in an internal radial position, linked to said supply conductor of the hub by a first connector mounted on the hub, and (b) a second end,

a second stretch of the connecting cable, said second stretch comprising (a) a first end to which said second end of said first stretch is coupled, (b) a first overhead hook in the form of a flattened half loop, and (c) a second end linked to said de-icing conductor of said blade by a second connector fitted on an upper part of the blade, and

at least said first hook having (a) an unscreened structure and exhibiting an elongate part of substantially flattened rectangular transverse section, a largest dimension of which said elongate part is substantially perpendicular to the axis of rotation, as well as (b) a concavity pointing substantially towards said retaining and articulating means, wherein said first hook being deformable in bending and in torsion in order to accommodate angular deflection in terms of pitch, drag and flapping of the blade and of the corresponding linking member relative to the hub.

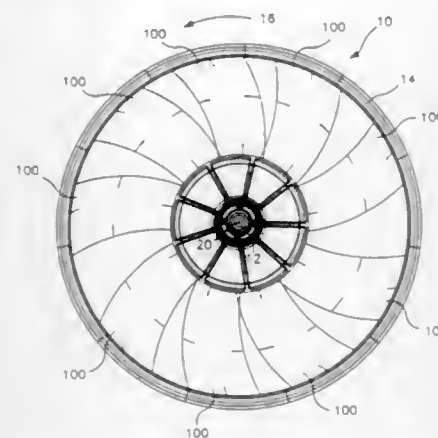
5,769,607

**HIGH-PUMPING, HIGH-EFFICIENCY FAN WITH FORWARD-SWEPT BLADES**

Michael J. Neely, Dayton; Michael Brendel, Centerville, and John R. Savage, Kettering, all of Ohio, assignors to ITT Automotive Electrical Systems, Inc., Auburn Hills, Mich.  
Filed Feb. 4, 1997, Ser. No. 795,417  
Int. Cl.<sup>6</sup> F04D 29/38

U.S. Cl. 416—189

20 Claims



1. A blade adapted for use in a vehicle engine-cooling fan assembly and having a root, a tip, and a span between said root and said tip, said blade comprising:

- a planform having a forward sweep angle continuously increasing in absolute value along said span from said root to said tip; and
- an airfoil having a pitch angle defining three, separate regions:
  - (a) a first region in which said pitch angle continuously decreases from said root to about the 1/2-span location,
  - (b) a second region in which said pitch angle continuously increases from about the 1/2-span location to about the 3/4-span location, and
  - (c) a third region in which said pitch angle continuously decreases from about the 3/4-span location to said tip.

5,769,608

**RESONANT SYSTEM TO PUMP LIQUIDS, MEASURE VOLUME, AND DETECT BUBBLES**

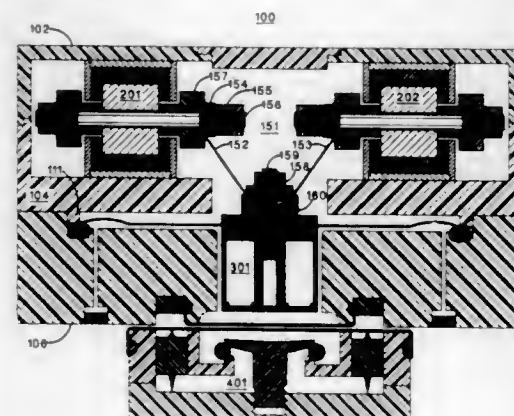
Joseph B. Seale, Gorham, Me., assignor to P.D. Coop, Inc., Bedford, N.H.

Filed Jun. 10, 1994, Ser. No. 258,327

Int. Cl.<sup>6</sup> F04B 17/03

U.S. Cl. 417—53

42 Claims



1. A method for conveying a deliverable liquid from one location to another comprising the steps of:

- a. transforming oscillatory electrical power at a resonant frequency into oscillatory mechanical force;

- b. transforming in a fluid-delivery device having a compliant element coupled to said deliverable liquid said oscillatory mechanical force into resonant motion of the combination of said deliverable liquid and said compliant element so as to produce oscillatory motion of said deliverable liquid;
- c. confining said deliverable liquid such that said oscillatory motion of said deliverable liquid and inertia of said deliverable liquid generate a deliverable-liquid oscillatory pressure; and
- d. converting said deliverable-liquid oscillatory pressure into one-way motion of said deliverable liquid from one location to another.

5,769,609

**LIQUID RING COMPRESSOR HAVING A DISTRIBUTION GROOVE FOR SEALING**

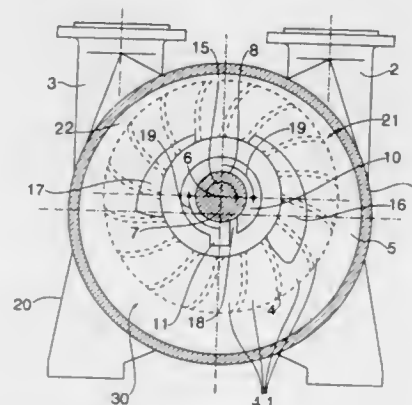
Goerg Plescher, Martinsheim; Bernhard Tews, Altdorf, and Robert Siebenwurst, Nuremberg, all of Germany, assignors to Siemens Aktiengesellschaft, München, Germany  
Filed Aug. 14, 1996, Ser. No. 696,671

Claims priority, application Germany, Aug. 16, 1995, 195 30 152.8

Int. Cl.<sup>6</sup> F04C 19/00

U.S. Cl. 417—68

9 Claims



8. A liquid ring compressor comprising:

- a housing having two ends and a center axis and enclosing a working chamber;
- a rotor provided within the working chamber, the rotor having two end faces, a shaft, a hub, and an axis of rotation, the axis of rotation being arranged eccentrically to the center axis of the housing;
- a side plate attached to one end of the housing and enclosing a suction chamber and a pressure chamber;
- an intake connection and a pressure connection provided on the housing, the intake connection leading to the suction chamber and the pressure connection leading to the pressure chamber;
- at least one control disk attached to the housing adjacent to one end face of the rotor and having a suction slot and a pressure slot, the suction slot connecting the suction chamber to the working chamber and the pressure slot connecting the pressure chamber to the working chamber;
- a distribution groove formed in the control disk, encircling the shaft of the rotor and opening towards the hub of the rotor;
- an axial gap between the control disk and the rotor hub;
- a feed opening located on the control disk and leading into the distribution groove and connecting with a side-plate space, the side-plate space being filled with operating liquid, the operating liquid flowing along the distribution groove and through the axial gap, and
- a blocking element projecting radially into the distribution groove, wherein the blocking element is provided between the feed opening and the suction slot relative to the direction of rotation of the rotor.

5,769,610

**HIGH PRESSURE COMPRESSOR WITH INTERNAL, COOLED COMPRESSION**

Marius A. Paul, and Ana Paul, both of 1120 E. Elm Ave., Fullerton, Calif. 92631

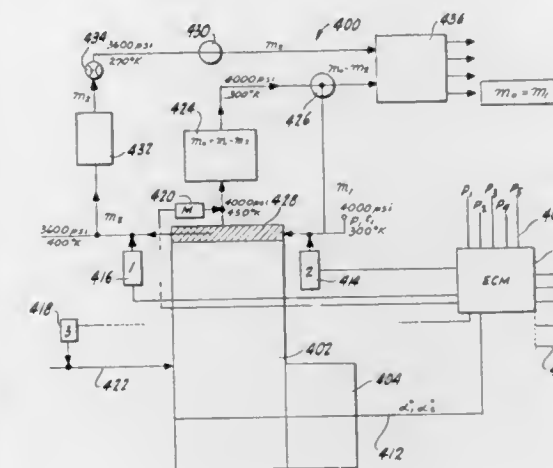
Continuation-in-part of Ser. No. 303,617, Sep. 8, 1994, which is a continuation-in-part of Ser. No. 222,661, Apr. 1, 1994.

This application Jan. 27, 1995, Ser. No. 379,147

Int. Cl.<sup>6</sup> F04B 39/06

U.S. Cl. 417—228

5 Claims



1. A high pressure gas compressor unit adapted for use in combination with a high pressure gas storage receiver having gas stored under high pressure, the compressor unit comprising:

- a housing containing a high pressure gas compression cylinder with a high pressure displacement piston reciprocal in the gas cylinder, the gas cylinder and displacement piston forming in part a gas compression chamber;
- a gas supply passage in the housing connectable to a gas supply from a supply source of gas to be compressed, the gas supply passage periodically communicating with the gas compression chamber, wherein the gas supply delivers a charge of supply gas to the compression chamber for compression on displacement of the piston, the compression chamber having a dead volume at peak compression;
- a compressed gas discharge passage in the housing communicating with the compression chamber and communicating with the high pressure gas storage receiver at peak compression;
- compressed gas regulation means for regulating the discharge of compressed gas from the compression chamber to the high pressure gas storage receiver at peak compression;
- a high pressure gas scavenging passage in the housing communicating with the dead volume of the compression chamber and communicating with a high pressure gas supply having gas stored in cool form;
- high pressure gas regulation means for regulating a supply of high pressure, cool scavenging gas into the compression chamber for scavenging the charge of supply gas during peak compression;
- a high pressure gas scavenging passage in the housing communicating with the dead volume of the compression chamber and communicating with a high pressure gas storage having gas stored at high pressure incrementally lower than the high pressure of the gas storage receiver; and
- high pressure gas regulation means for regulating a discharge of high pressure gas scavenged from the dead volume of the compression chamber during peak compression.

5,769,611

**HYDRAULIC PRESSURE SUPPLY PUMP WITH MULTIPLE SEQUENTIAL PLUNGERS**

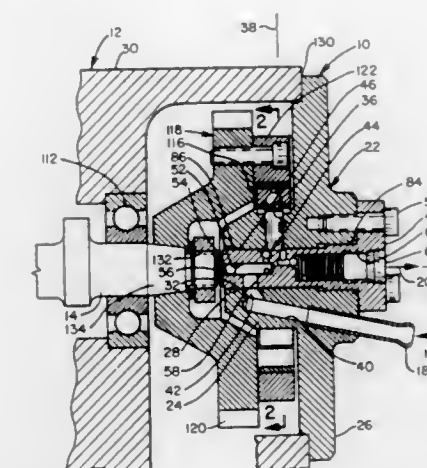
Ilija Djordjevic, East Granby, Conn., assignor to Stanadyne Automotive Corp., Windsor, Conn.

Filed Sep. 6, 1996, Ser. No. 709,260

Int. Cl.<sup>6</sup> F04B 1/04; 27/04

U.S. Cl. 417—273

17 Claims



1. A pressure diesel fuel supply pump comprising:  
a body having,

- an elongated hub portion defining first and second ends of the body and including a central bore extending between the first and second ends, along a central axis,
- a plurality of plunger bores spaced uniformly about the axis and extending radially through the hub portion into the central bore, and
- a fuel supply passage extending through the hub portion into the central bore;
- a valve housing distinct from said hub portion and having an elongated portion extending along a valve housing axis and situated in the central bore in close coaxial relation within the hub portion, and including,
  - a closure wall for each plunger bore,
  - a fuel inlet chamber situated on one axial side of the plunger bores, and in fluid communication with the fuel supply passage,
  - inlet check valve means for fluidly connecting the inlet chamber with each of the plunger bores, through a respective closure wall,
  - a discharge chamber situated on another axial side of the plunger bores, and coaxially extending along the central axis,
  - outlet check valve means for fluidly connecting each plunger bore with the discharge chamber, through a respective closure wall;
- a plurality of plungers, each having radially inner and outer ends, and supported for reciprocal movement in a respective plunger bore;
- cam gear means coaxially supported for rotation around the central axis;
- a cam actuating ring rigidly mounted on the cam gear means eccentrically relative to the central axis, and surrounding the plungers;
- cam shoe means in contact with the actuating ring and the outer end of each plunger, for sequentially driving each plunger to a radially inward limit position through a respective plunger bore and thereafter permitting each plunger to move to a radially outward limit position, as the cam gear means is rotated;
- whereby fuel is periodically drawn at a relatively low pressure into each plunger bore through a respective inlet check valve means as each plunger moves toward its radially outer limit position and fuel is periodically delivered to the discharge chamber at a relatively high pressure from each plunger bore



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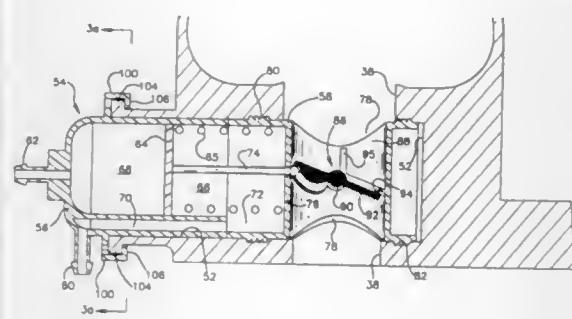
3806

OFFICIAL GAZETTE

JUNE 23, 1998

through a respective discharge check valve means as each plunger moves to its radially inner limit position.

5,769,612  
**MODULAR BYPASS SYSTEM FOR A SUPERCHARGER**  
 Daniel L. Thelen, Marshall, and Glen R. Alden, Homer, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio  
 Filed Jan. 16, 1997, Ser. No. 784,797  
 Int. Cl.<sup>6</sup> F04B 49/00  
 U.S. Cl. 417—310 16 Claims







tive force generated by the thermal power generation element to provide a voltage-boosted electromotive force for charging the battery and to provide a current flow at a predetermined level to the electromagnetic safety valve; the electromagnetic safety being maintained in an open condition only if the current flow is provided to the electromagnetic safety valve at a level at least as high as the predetermined level.

5,769,623

## OIL FIRED BURNER

Graham Albert John Lake, Wellington, and Guy David Lowman, Henyock, both of United Kingdom, assignors to Don Heating Products Limited, United Kingdom

PCT No. PCT/GB94/01088, § 371 Date Jul. 29, 1996, § 102(e) Date Jul. 29, 1996, PCT Pub. No. WO94/28358, PCT Pub. Date Dec. 8, 1994

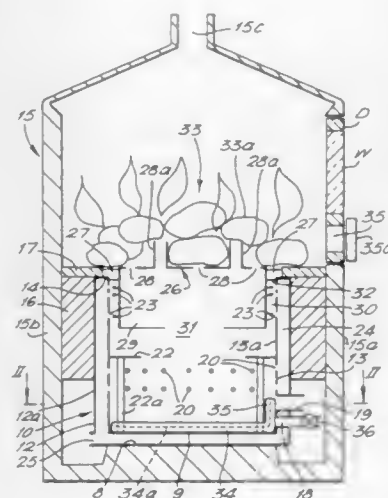
PCT Filed May 20, 1994, Ser. No. 553,487

Claims priority, application United Kingdom, May 20, 1993, 9310392

Int. Cl.<sup>6</sup> F24C 5/08; F23K 5/22; F23D 5/04

U.S. Cl. 431—125

20 Claims



1. An oil fired burner comprising

a body including a lower end and an upper end defining an oil vaporizing chamber in which an oil vapor is produced, an inlet in the body for oil, an inlet in the body for air through which air enters the oil vaporizing chamber for mixing with the oil vapor to provide an oil vapor/air ratio such that the oil vapor is non-combustible, a baffle positioned to lie adjacent the upper end, the baffle being sized to receive the flow of the non-combustible oil vapor/air mixture therethrough, an air outlet adjacent the baffle feeding secondary air to the non-combustible oil vapor/air mixture to provide a second vapor/air ratio such that the oil vapor is combustible, and a bed of imitation solid fuel positioned over the baffle, the bed of imitation solid fuel which receives the mixture of air and oil vapor from the oil vaporizing chamber and the air outlet for combustion around the imitation solid fuel, heat generated by such combustion being arranged to vaporize oil in the oil vaporizing chamber received from the oil inlet.

5,769,624

## VARIABLE FLAME BURNER CONFIGURATION

Russell Estcourt Luxton, Eastwood, and Graham Jerrold Nathan, Blackwood, both of Australia, assignors to Luminis Pty. Ltd, Adelaide, Australia

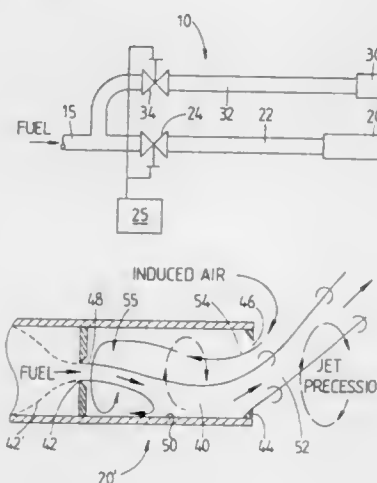
PCT No. PCT/AU93/00476, § 371 Date May 15, 1995, § 102(e) Date May 15, 1995, PCT Pub. No. WO94/07086, PCT Pub. Date Mar. 31, 1994

PCT Filed Sep. 17, 1993, Ser. No. 403,706

Claims priority, application Australia, Sep. 18, 1992, PL4827 Int. Cl.<sup>6</sup> F23D 23/00

U.S. Cl. 431—284

7 Claims



1. A burner comprising a plurality of nozzles, at least one of said nozzles being a processing jet nozzle having a first fuel/air mixing characteristic to provide a first flame and at least one additional nozzle having a second fuel/air mixing characteristic different from said first mixing characteristic for providing a second flame different from said first flame, said nozzles being disposed adjacent each other to provide a combined flame different from said first and second flames,

wherein said at least one processing jet nozzle is comprised of a fluid mixing nozzle in which operation of a primary flow of a first fluid separates from an internal wall structure and reattaches itself asymmetrically to the wall structure upstream of a nozzle outlet whereby a flow of a second fluid is induced through the outlet swirling in a chamber between a point where said first fluid separates from said wall structure and a second point where said fluid reattaches itself to said wall structure for inducing precession of the separated and reattached flow which exits said nozzle asymmetrically.

5,769,625

## SAFETY LIGHTER WITH SMOOTH STRIKER WHEEL EDGES

Tak Chi Sher, North Point, Hong Kong, assignor to Polycity Industrial Limited, and Tak Fi International (Holdings) Limited, both of Quarry Bay, Hong Kong

Continuation-in-part of Ser. No. 583,214, Jan. 4, 1996, abandoned. This application Nov. 12, 1996, Ser. No. 745,477

Int. Cl.<sup>6</sup> F23D 11/36

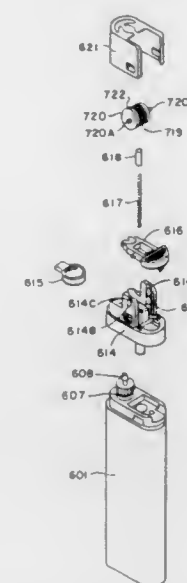
U.S. Cl. 431—153

12 Claims

1. A lighter comprising:

a lighter body having a top end;

a striker wheel, said striker wheel having an axis, and an outer annular surface, said outer annular surface of said striker wheel having



an annular recessed center portion with a rough surface formed thereon, and annular unrecessed lateral portions disposed beside said annular recessed center portion, said annular unrecessed lateral portions having smooth surfaces; a mounting frame attached to the top end of the lighter body, said

mounting frame having

a complimentary pair of mounting slots formed therethrough to rotatably receive said axis of said striker wheel in a first position and in a second position, and a spring receptacle; a spring received within the spring receptacle; and a flint;

the spring exerting a compressive force against the flint and forcing the flint into contact with the rough surface of the annular recessed center portion of the striker wheel, the compressive force exerted by the spring being insufficient to cause the flint to generate sparks when the axis of the striker wheel is in the first position and the compressive force exerted by the spring being sufficient to cause the flint to generate sparks when the axis of the striker wheel is in the second position.

5,769,626

## EVACUATION SYSTEM WITH EXHAUST GAS CLEANING AND OPERATING PROCESS FOR IT

Alfred Hauff, and Volker Kinzig, both of Gelnhausen, Germany, assignors to Ebara Germany GmbH, Hanau, Germany

Filed Apr. 25, 1996, Ser. No. 637,869

Claims priority, application Germany, Apr. 25, 1995, 195 15 145.3; European Pat. Off., Mar. 21, 1996, 96104466

Int. Cl.<sup>6</sup> F04B 23/02; F27D 17/00

U.S. Cl. 432—72

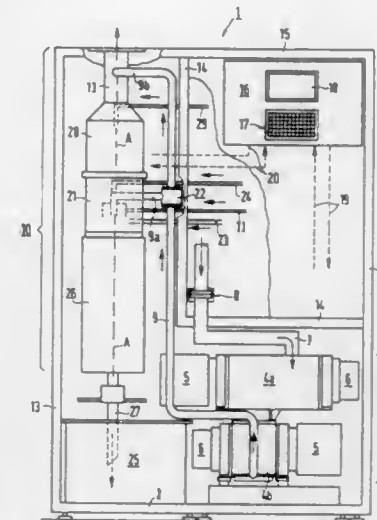
15 Claims

1. A combined evacuator and cleaning system comprising

a support base;

a vacuum unit including a vacuum pump mounted on said support base to draw off gases in a cleaning system for a semiconductive manufacturing process; and

a gas cleaning station connected to said vacuum unit through a relatively short conduit; the length of said conduit being selected based on its capability to maintain a temperature above the condensation temperature of constituents removed



by said vacuum unit without the addition of heat beyond the heat of compression of the vacuum unit.

5,769,627

## VERTICAL TYPE CALCINATION KILN

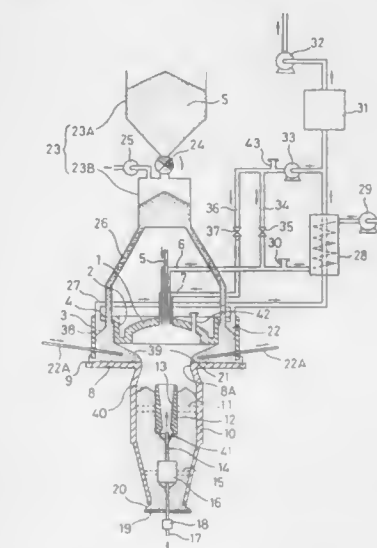
Tatsu Chisaki, Kawaguchi, and Dalzo Kunii, Tokyo, both of Japan, assignors to Chisaki Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1996, Ser. No. 659,840

Claims priority, application Japan, Jun. 9, 1995, 7-167123 Int. Cl.<sup>6</sup> F27D 1/08

U.S. Cl. 432—95

19 Claims



1. A vertical type calcination kiln comprising an annular hearth adapted to rotate about a vertical axis and having in a central portion thereof a drop port for dropping a raw material; and a kiln cover disposed fixedly at a position above said hearth, wherein an inner hollow cylindrical portion having an outside diameter larger than a diameter of said drop port and provided continuously from said kiln cover, and an outer hollow cylindrical portion connected at an upper portion thereof to said inner hollow cylindrical portion are provided around said kiln cover, said outer hollow cylindrical portion being formed in such a manner as to extend more downwardly than said inner hollow cylindrical portion, a fuel supplying sort being provided in said kiln cover for supplying a fuel from the outside into a combustion chamber formed immediately below said kiln cover, a sealing device which is airtight with the outside being provided between said hearth and a lower end of said outer hollow cylindrical portion so as to permit relative rotation of said hearth

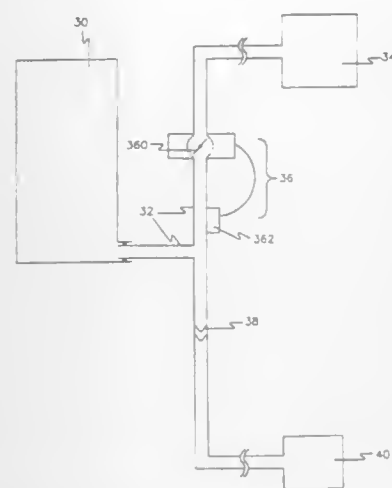
with respect to said kiln cover, a raw-material supplying pipe being provided in an annular preheating space formed by being surrounded by said hearth and said inner hollow cylindrical portion and said outer hollow cylindrical portion connected to each other at upper portions thereof so as to dropwise supply the raw material from the outside into said preheating space, said preheating space being open radially inwardly so as to communicate with said combustion chamber, a kiln body of a vertical hollow cylindrical shape being provided in such a manner as to extend downward from a rim portion of said drop port formed in the central portion of said hearth, the raw material in said preheating space being adapted to drop from a side facing said combustion chamber, a discharge port being formed in a lower portion of said kiln body for discharging as a product the raw material calcined in said kiln body after being dropped from said drop port, said vertical type calcination kiln characterized in that a storage device for storing the raw material to be calcined is provided at a position above said kiln cover, that said storage device is connected to said preheating space in such a manner as to be capable of dropwise supplying the raw material into said preheating space by means of said raw-material supplying pipe, and that an airtight supplying mechanism for dropwise supplying the raw material in a state in which the influx of air from the outside is prevented is provided between said storage device and said raw-material supplying pipe, wherein an upper portion of said preheating space and said combustion chamber are connected to each other by a combustion-gas introducing pipe for forming a feedback passage whereby part of a combustion gas flowing through the raw material in said preheating space and exhausted upward can be fed back to said combustion chamber.

5,769,628

**FURNACE EXHAUST SYSTEM WITH REGULATOR**  
Lien-Fang Lin, Chia-I Hsien, Taiwan, assignor to Vanguard International Semiconductor Corporation, Hsinchu, Taiwan  
Filed May 3, 1996, Ser. No. 642,488  
Int. Cl.<sup>6</sup> F27D 17/00

U.S. Cl. 432—241

7 Claims



1. A semiconductor furnace system comprising:  
a reaction chamber for holding a semiconductor process, said semiconductor process generating a liquid or gas by-product;  
an exhaust pipe for carrying said by-products, said exhaust pipe diverging into a gas pipe for carrying said gas by-products and a liquid pipe for carrying said liquid by-products;  
an air pressure controller connected to the reaction chamber via the exhaust pipe and the gas pipe, said air pressure controller for maintaining the pressure of the exhaust gas in the reaction chamber and the exhaust pipe, said air pressure controller including  
(i) a sensor for monitoring the pressure of the by-products in the exhaust pipe, and

- (ii) a valve for controlling the passage of the by-products according to the sensor; and  
a regulator placed inside the liquid pipe, said regulator comprising at least one cup-shaped structure with at least one hole in the bottom of the cup-shaped structure, said hole allowing condensed liquid from the furnace to be drained out.

5,769,629

**SEALING APPARATUS FOR INLET/OUTLET OF ATMOSPHERE HEAT TREATMENT FURNACE**

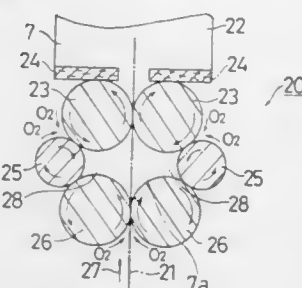
Teruhisa Nakamura, Shinnanyo, Japan, assignor to Nisshin Steel Co., Ltd., Tokyo, Japan  
PCT No. PCT/JP95/01100, § 371 Date Feb. 7, 1996, § 102(e) Date Feb. 7, 1996, PCT Pub. No. WO95/33860, PCT Pub. Date Dec. 14, 1995

PCT Filed Jun. 5, 1995, Ser. No. 592,345  
Claims priority, application Japan, Jun. 7, 1994, 6-125549; Dec. 27, 1994, 6-326163

Int. Cl.<sup>6</sup> D06B 23/18

U.S. Cl. 432—242

21 Claims



1. A sealing apparatus for hermetically sealing the inlet and/or outlet of an atmosphere heat treatment furnace while holding a strip between a pair of elastic rolls, said apparatus comprising:  
a pair of additional elastic rolls for holding the strip outside said atmosphere heat treatment furnace and spaced from said pair of elastic rolls;  
a pair of intermediate rolls disposed between said pair of elastic rolls and said pair of additional elastic rolls;  
said pair of intermediate rolls contacting said pair of elastic rolls and said pair of additional elastic rolls over full lengths thereof in an axial direction thereof; and  
a space surrounded by all said rolls being formed under a condition that the strip is held between said pair of elastic rolls and said pair of additional elastic rolls.

5,769,630

**SUBPERIOSTEAL BONE ANCHOR**

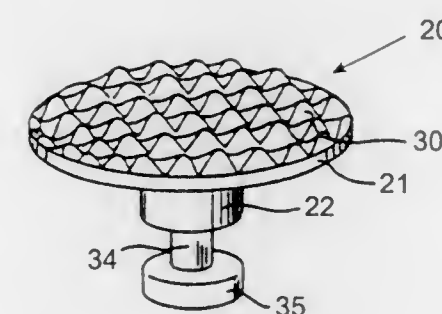
Joan M. Hoffman, Mandeville, and Michael S. Block, Metairie, both of La., assignors to Louisiana State University, Baton Rouge, and Darman, Inc., Metairie, both of La.  
Continuation-in-part of Ser. No. 143,711, Nov. 1, 1993, Pat. No. 5,538,427, which is a continuation-in-part of Ser. No. 792,855, Nov. 18, 1991, abandoned, which is a continuation-in-part of Ser. No. 659,680, Feb. 25, 1991, Pat. No. 5,066,224.  
This application Jul. 11, 1996, Ser. No. 679,338

Int. Cl.<sup>6</sup> A61C 3/00

U.S. Cl. 433—7

18 Claims

1. A subperiosteal bone anchor having:  
a) a first surface, being the entire area on one side of the subperiosteal anchor, said first surface being substantially flat to match the cortical surface of the palatal bone, said first surface comprising a bone interface surface;  
b) said first surface comprising a means for attachment to the original exterior cortical surface, said attachment means comprising a calcium hydroxylapatite coating whereby said first surface osseointegrates with the original exterior cortical surface of said bone;



5,769,632

Patent Not Issued For This Number

5,769,633

**CUSTOM DENTAL TRAY AND MATERIAL**

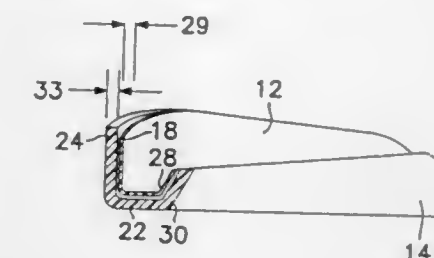
Allison J. Jacobs, 10795 Skinner Rd., N. E., Bainbridge Island, Wash. 98110, and Scott Jacobs, 12105 W. Cedar Ave., Lakewood, Colo. 80228

Continuation of Ser. No. 630,067, Apr. 15, 1996, Pat. No. 5,616,027, which is a continuation-in-part of Ser. No. 423,895, Apr. 18, 1995, Pat. No. 5,562,449. This application Mar. 5, 1997, Ser. No. 811,609  
Int. Cl.<sup>6</sup> A61C 9/00

U.S. Cl. 433—37

14 Claims

- c) said first surface having a major axis from one to two times its minor axis;  
d) said subperiosteal bone anchor having a second surface opposite said first surface and said second surface having means thereon to attach an orthodontic or orthopedic device;  
e) said subperiosteal bone anchor being substantially rigid and thin at its periphery;  
f) said subperiosteal bone anchor preformed to be located entirely on the original exterior cortical surface of the palatal bone;  
WHEREBY said subperiosteal bone anchor permits said orthodontic or orthopedic device to apply or resist a continuous force to an adjacent tooth or bone, is applied in a simple single surgical procedure, does not disturb the cortical surface or invade the medullary contents of the bone, is designed for temporary application and is easily retrievable.



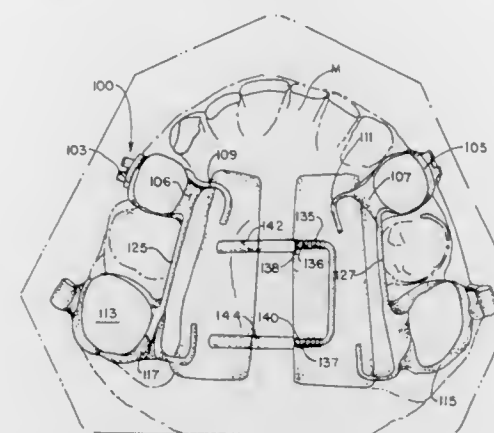
5,769,631

**ORTHODONTIC DEVICE**

Michael O. Williams, 58 Shoreline La., Gulfport, Miss. 39503  
Continuation-in-part of Ser. No. 526,686, Sep. 11, 1995, Pat. No. 5,645,422. This application Jul. 29, 1996, Ser. No. 688,110  
Int. Cl.<sup>6</sup> A61C 3/00

U.S. Cl. 433—7

14 Claims



1. A fixed maxillary arch expander comprising:  
a first forward orthodontic band and a second forward orthodontic band;  
an expansion means between said first and second orthodontic band;  
a first rear orthodontic band;  
a first spring-loaded telescopic rod and tube assembly connecting said first forward orthodontic band to said first rear orthodontic band;  
a second spring-loaded telescopic rod and tube assembly connecting said second forward orthodontic band to said second rear orthodontic band;  
wherein said expansion means between said first and second forward orthodontic bands effects lateral maxillary arch

1. A material for use in making dental impressions, comprising:  
means for forming an impression of the patient's teeth, said means comprising a thermoplastic compound including 50% to 80% by weight polycaprolactone and 10% to 40% by weight of ethylene vinyl-acetate.

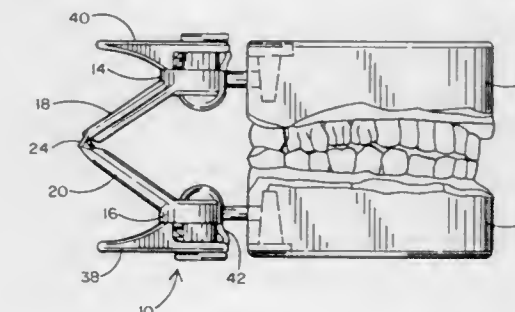
5,769,634

**DENTAL ARTICULATOR**

John Choi, 1140L S. Cypress St., La Habra, Calif. 90631  
Filed Jun. 2, 1997, Ser. No. 867,616  
Int. Cl.<sup>6</sup> A61C 11/00

U.S. Cl. 433—64

20 Claims



1. A dental articulator comprising:  
first and second bodies being attached together by at least first, second and third legs, each of said first, second and third legs having a self-hinge, said first and second bodies and said first, second and third legs being unitarily molded of synthetic polymer composition material;  
first and second attachment members;  
first and second ball and socket attachment means, respectively, between said first and second bodies and said first and second attachment members, said ball and socket attachment means



being such that ball and socket attachment means can be selectively locked to lock said attachment members in position with respect to said body;  
first and second tapered spines respectively formed on said first and second attachment members, said spines being configured to be releasably inserted into a corresponding recess in a dental cast so that the spline can be removed from one dental cast and used in another dental cast.

5,769,635

## SALIVA EJECTOR BITE BLOCK

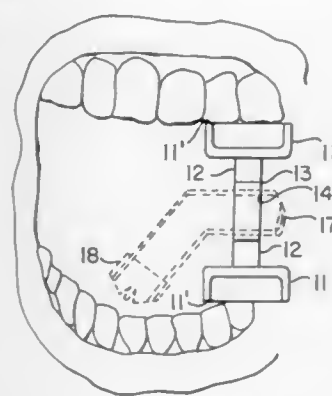
Mary Anne Eldreth, 6340 Whispering Oaks Dr. N., Jacksonville, Fla. 32277

Filed Feb. 24, 1997, Ser. No. 805,135

Int. Cl.<sup>6</sup> A61C 17/06

U.S. Cl. 433—93

18 Claims



1. A dental apparatus for insertion into the mouth of a patient during a dental procedure by a person comprising an elongated body having a longitudinal axis and opposite end portions, a pair of bite pads extending laterally of said axis and being respectively attached to said end portions for respective engagement by the upper and lower jaws of a patient, first attaching means located generally medially of said body for removably securing a tube of saliva and debris ejector thereto and positionable in the mouth of a patient, said body having a narrow arm extending between each said pad and said first attaching means to maximize visual field of a mouth to the person performing a dental procedure, each said bite pad having a plurality of spaced openings for drainage of fluid and debris therefrom.

5,769,636

## SYSTEM FOR DIAGNOSIS, PLACEMENT AND PROSTHETIC RESTORATION OF ROOT FORM IMPLANT

Francesco Di Sario, V. Garibaldi 29, Canosa Sannita, 66010, Italy

Filed Aug. 16, 1996, Ser. No. 698,886

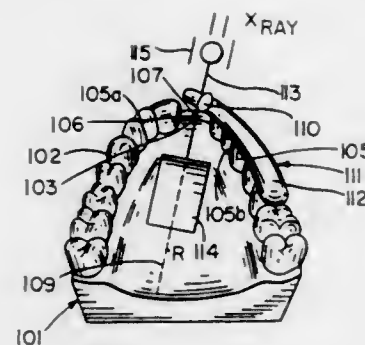
Int. Cl.<sup>6</sup> A61C 11/00; 3/00

U.S. Cl. 433—213

40 Claims

1. A system for accurately positioning a tooth implant in an implant site located along the alveolar ridge of a patient's mouth comprising:

- a dental impression cast of said mouth;
- first means for defining an optimal plane of lateral inclination for placing said implant in said site in order to produce a planar surface of lateral inclination along said cast which reflects said defined optimal plane;
- means for determining dental bone location in said alveolar ridge adjacent where said implant site is located in order to record said bone location on said planar surface of lateral inclination produced along said dental cast;



second means for defining an optimal anterior/posterior inclination along said planar surface of lateral inclination produced along said dental cast for placing said implant in said site; and means for directing placement of said tooth implant in said implant site based on 1) said anterior/posterior inclination defined along said planar surface of lateral inclination and 2) the recorded bone location on said planar surface.

5,769,637

## DENTAL IMPLANT AND ALVEOLAR PROCESS AUGMENTATION STRUCTURES AND METHOD OF INSTALLATION

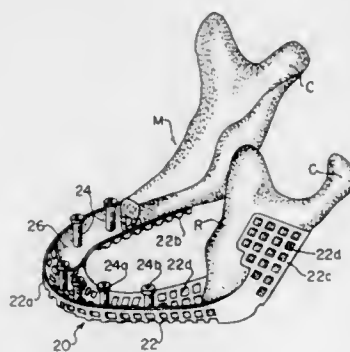
Frank H. Morgan, Las Vegas, Nev., assignor to Sofamor Danek Properties, Inc., Memphis, Tenn.

Filed May 22, 1996, Ser. No. 647,429

Int. Cl.<sup>6</sup> A61C 8/00

U.S. Cl. 433—176

16 Claims



1. Prosthetic apparatus for promoting and supporting guided bone tissue regeneration in at least missing or excised portions of the human mandible or maxilla and in bony defects of the mandible or maxilla comprising:

- a) a bone attachment tray formed of tissue-biocompatible material having an inner surface and having at least one perforation therethrough for receiving at least one fastener to affix said tray to stump portions and ridge sections of the mandible or maxilla proximate the missing or excised portions or defects thereof; and
- b) one or more tissue-biocompatible dental tooth root replacement implants releasably affixed at one end to the inner surface of said tray and adapted to depend therefrom into said missing or excised portions or bone defects of the mandible or maxilla for incorporation and support in bone tissue regenerated within said tray; and
- c) one or more layers of a biologically and chemically inert microporous membrane sheet material affixed to said tray to promote guided tissue regeneration of replacement bone within said tray and protect the space thereunder from entry of unwanted bacteria cells and competitive tissues during the healing and bone regeneration period.

5,769,638

TOOTH FILLING MATERIAL AND METHOD OF USE  
Mahmoud Torabinejad, Loma Linda, and Dean J. White, San Dimas, both of Calif., assignors to Loma Linda University, Loma Linda, Calif.

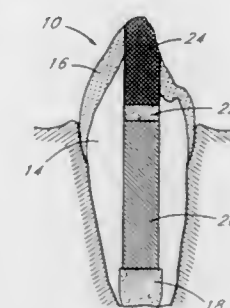
Continuation of Ser. No. 52,411, Apr. 23, 1993, Pat. No.

5,415,547. This application May 16, 1995, Ser. No. 442,193

Int. Cl.<sup>6</sup> A61C 5/00

U.S. Cl. 433—228.1

14 Claims



1. A method of filling a tooth cavity, comprising the steps of:
- (a) identifying the cavity of the tooth to be filled;
  - (b) preparing a filling material, comprising portland cement; and
  - (c) introducing the filling material into the tooth cavity whereby the path of communication between an inner portion of the cavity and the outer surface of the tooth is sealed.

5,769,639

## MULTI-EDUCATIONAL DEVICE

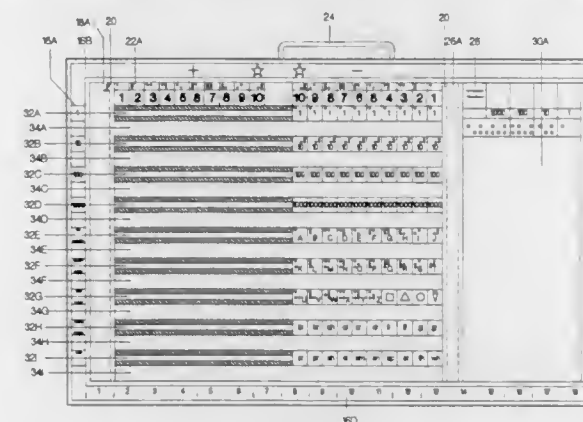
Anne Foster, P.O. Box 7241, Port Aransas, Tex. 78373

Filed Apr. 19, 1994, Ser. No. 229,840

Int. Cl.<sup>6</sup> G09B 1/14

U.S. Cl. 434—159

15 Claims



1. A multi-educational device comprising:
- (a) a framework comprising an inner frame portion and outer frame portion,
    - (i) said outer frame portion comprising a first vertical part having at least one vertical groove extending therealong, a second vertical part having at least one vertical groove extending therealong, a first horizontal part having a slot therethrough, and a second horizontal part, each of said first horizontal part and said second horizontal part having ends which are respectively connected to each of said first vertical part and said second vertical part, and
    - (ii) said inner frame portion comprising a first vertical element connected at respective ends to said first and second horizontal parts, and means for slidably carrying a plurality of educational workpieces on said framework;
  - (b) a number line on said framework, said number line comprising numbers arranged in a first linear group and numbers

- arranged in a second linear group, said first group numbers being arranged in an ascending numerical order and said second group numbers being arranged in a descending numerical order relative to said first group numbers;
- (c) two inverse operational mathematical symbols, said symbols comprising a first operational mathematical symbol located on said framework and above said first group numbers and a second operational mathematical symbol located on said framework and above said second group numbers;
- (d) a plurality of educational workpieces, each of said workpieces having at least first and second opposite surfaces with at least one of said surfaces bearing educational indicia, and each of said workpieces comprising means for allowing slidable engagement relative to said carrying means;
- (e) at least one answer-backboard slidably and removably held by said first vertical groove and said second vertical groove, said answer-backboard comprising educational indicia for comparison to said educational indicia on said workpieces; and
- (f) at least one easily erasable surface affixed within said framework, said easily erasable surface being in abutting position with said first vertical element, said first horizontal part, said second horizontal part, and said second vertical element.

5,769,640

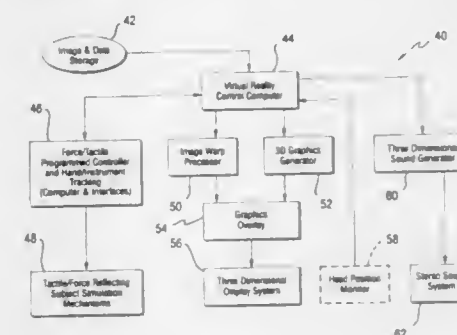
METHOD AND SYSTEM FOR SIMULATING MEDICAL PROCEDURES INCLUDING VIRTUAL REALITY AND CONTROL METHOD AND SYSTEM FOR USE THEREIN  
Charles J. Jacobus, and Jennifer Lynn Griffin, both of Ann Arbor, Mich., assignors to Cybernet Systems Corporation, Ann Arbor, Mich.

Continuation of Ser. No. 87,653, Jul. 6, 1993, abandoned, which is a continuation-in-part of Ser. No. 984,324, Dec. 2, 1992, Pat. No. 5,389,865. This application Aug. 10, 1995, Ser. No. 513,488

Int. Cl.<sup>6</sup> G09B 23/28

U.S. Cl. 434—262

22 Claims



1. A method of providing a virtual reality in response to a position and orientation of a member representative of a medical instrument, the method comprising the steps of:
- providing a first medical instrument having sensors for position and pressure;
  - performing an actual medical procedure using the first instrument;
  - measuring and recording during the actual medical procedure data representative of the position and orientation of the first instrument and the pressures experienced by the first instrument;
  - providing a member representative of the first medical instrument;
  - generating an electrical signal for each of a plurality of degrees of freedom of the member as a function of the position and orientation of the member in three-dimensional space;
  - generating at least one virtual reality force field in response to the generated electric signals as a function of the recorded position and pressures experienced by the first instrument;

generating a force signal for each degree of freedom as a function of the force field; and  
directing a force on the member for each force signal, the generated forces providing the virtual reality.

5,769,641

**APPARATUS AND METHOD FOR SYNCHRONIZING  
CARDIAC RHYTHM RELATED EVENTS**

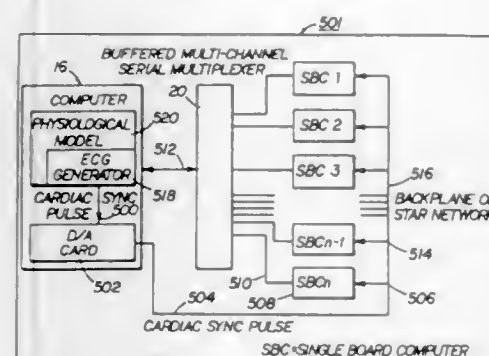
Samsun Lampotang; Willem L. van Meurs; Michael L. Good; Joachim S. Gravenstein, and Ronald G. Carovano, all of Gainesville, Fla., assignors to University of Florida Research Foundation, Inc., Gainesville, Fla.

Division of Ser. No. 188,383, Jan. 27, 1994, Pat. No. 5,584,701, which is a continuation-in-part of Ser. No. 882,467, May 13, 1992, Pat. No. 5,391,081. This application Dec. 17, 1996, Ser. No. 767,947

Int. Cl.<sup>6</sup> G09B 23/28

U.S. Cl. 434—272

21 Claims



1. An apparatus for synchronizing output devices related to a cardiac rhythm in real time in an integrated patient simulator during simulated medical surgery, comprising:

- a manikin;
- at least one output device associated with the manikin;
- a first programmed computing means capable of generating at least one electric cardiac rhythm synchronizing pulse;
- a distributed processing network connected to said first programmed computing means and said at least one output device for transmitting said at least one electric cardiac rhythm synchronizing pulse; and
- a second programmed computing means connected to said distributed processing network for calculating a simulated response to the at least one cardiac rhythm synchronizing pulse and for actuating via the distributed processing network the at least one output device associated with the manikin in real time.

5,769,642

**AUDIO-BOOK PLAYER**

Hiromu Shinohara, Ueda, Japan, assignor to Shinano Kenshi Kabushiki Kaisha, Nagano-ken, Japan

Filed Nov. 13, 1996, Ser. No. 747,646

Claims priority, application Japan, Nov. 13, 1995, 7-294024

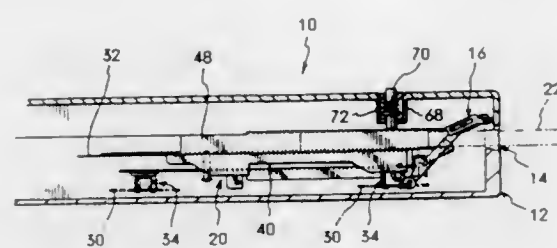
Int. Cl.<sup>6</sup> G09B 21/00

U.S. Cl. 434—317

6 Claims

1. An audio-book player, which reproduces written data recorded on a recording medium as voice, comprising:

- a body proper into which said recording medium can be loaded and unloaded; and
- means for identifying a loading state, in which said recording medium is loaded in said body proper, and an unloading state, in which said recording medium is unloaded therefrom, said



identifying means identifying said states by changing tactile impression.

5,769,643

**INSTRUCTION COMMUNICATION SYSTEM**

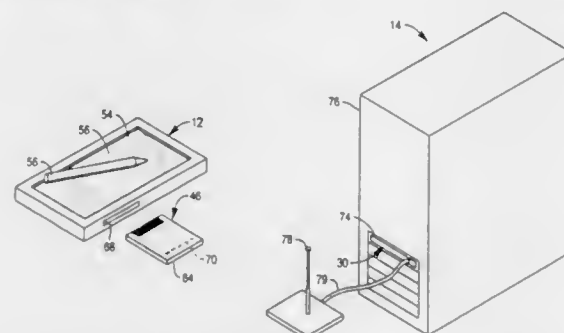
Harden E. Stevens, III, Lexington, S.C., assignor to NCR Corporation, Dayton, Ohio

Filed Feb. 7, 1996, Ser. No. 597,729

Int. Cl.<sup>6</sup> G09B 3/00; 5/00; 7/00

U.S. Cl. 434—350

13 Claims



1. An instruction communication network comprising:  
a first computer operated by a student including a first cordless telephone transceiver; and  
a second computer operated by a teacher which transfers instruction data to the first computer including a second cordless telephone transceiver;  
wherein the first and second cordless telephone transceivers have a transmission range less than five thousand feet operate at cordless telephone frequencies designated by the FCC.

5,769,644

**SHELF FOR HOUSING PRINTED CIRCUIT BOARDS**

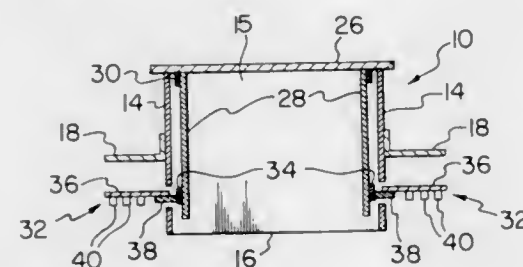
Richard G. Murphy, Nepean, and Bruce I. Dolan, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Sep. 6, 1996, Ser. No. 722,431

Int. Cl.<sup>6</sup> H01R 9/09

U.S. Cl. 439—61

6 Claims



1. A shelf for housing printed circuit boards, the shelf having an open front, a pair of sides extending from a rear to the front of the shelf, the sides being spaced apart at opposite ends of a shelf space,

5,769,646

**INTEGRATED ELECTRICAL CONNECTOR GUARD  
DEVICE FOR USE IN A PERSONAL COMPUTER**

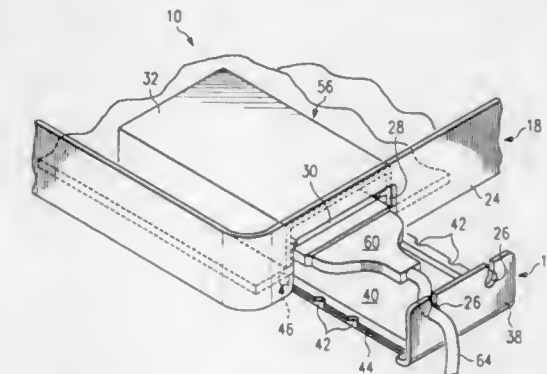
Christopher Cavello, and Russell B. Smith, both of Austin, Tex., assignors to Dell U.S.A., L.P., Austin, Tex.

Filed Jul. 25, 1995, Ser. No. 506,527

Int. Cl.<sup>6</sup> H01R 13/44

U.S. Cl. 439—136

26 Claims



a back plane extending across a rear of the shelf, a plurality of side-by-side receiving stations for printed circuit boards to be received through the open front for connection to the back plane, the receiving stations located in the shelf space, at least one back plane extender printed circuit board electrically connected to the back plane and extending forwardly adjacent one side of the shelf, and a connector structure comprising a connector structure printed circuit board which is electrically connected to the extender printed circuit board, the connector structure printed circuit board extending sideways from the back plane extender printed circuit board and sideways away from the housing, the connector having terminals each of which extends in a front to rear direction of the shelf for outside access.

5,769,645

**ELECTRICAL CONNECTOR FOR DUAL PRINTED  
CIRCUIT BOARDS**

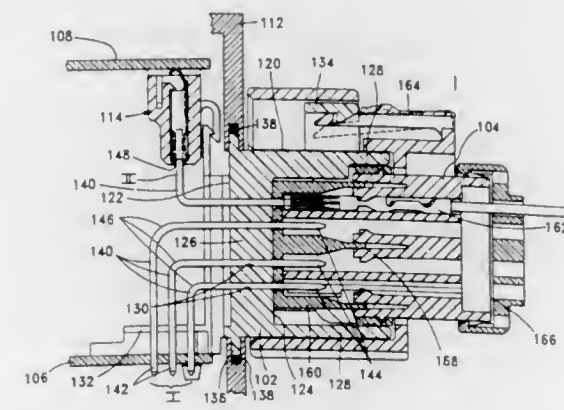
Galen Monroe Martin, Jamestown; Larry George Novotny, Clemmons; Donald Kent Hughes, Kernersville, all of N.C., and Samuel Garner Bouse, Jr., Huntsville, Ala., assignors to The Whitaker Corporation, Wilmington, Del.

Continuation of Ser. No. 785,728, Jan. 12, 1997, Pat. No. 5,709,557, which is a division of Ser. No. 354,197, Dec. 12, 1994, abandoned. This application Aug. 15, 1997, Ser. No. 912,217

Int. Cl.<sup>6</sup> H01R 9/09

U.S. Cl. 439—79

12 Claims



1. An input/output electrical connector header for use with multiple printed circuit boards, comprising:

- a plurality of terminal pins in multiple rows;
- an insulative housing having a common housing wall comprising a common internal wall forming at least a portion of a mating interface for engaging a mating electrical connector receptacle, the common internal wall comprising an integrally molded portion of the insulative housing with openings extending through the common internal wall, terminal pins in all of the multiple rows extending through the openings in the common internal wall;

board contact tails, for connection to a first printed circuit board, on the terminal pins in a first row, the pins in the first row extending in a first direction on the rear of the insulative housing for connection to the first printed circuit board; and  
a second printed circuit board connection at the rear of the terminal pins in a second terminal row, terminal pins in the second row extending in a second direction, on the rear of the insulative housing, different from the first direction for connection to a second printed circuit board, the second printed circuit board connection being separable from the insulative housing and including a separable electrical connector disengagable from the terminal pins in the second row.

5,769,647

**MODULAR OUTLET EMPLOYING A DOOR ASSEMBLY**

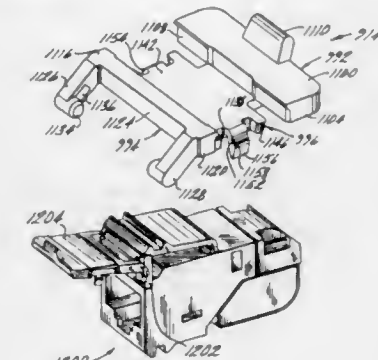
Brian Tulley, Ansonia; Denny Lo, Danbury; John A. Siemon, Woodbury, and Art Bauer, Ivoryton, all of Conn., assignors to The Siemon Company, Watertown, Conn.

Continuation-in-part of Ser. No. 562,373, Nov. 22, 1995. This application May 23, 1996, Ser. No. 652,230

Int. Cl.<sup>6</sup> H01R 13/44

U.S. Cl. 439—144

25 Claims



1. An electrical connector comprising:  
a connector housing having an opening for receiving a mating connector;  
a door pivotably disposed at said opening, said door being movable between an open position where access to said opening is provided and a closed position where access to said



opening is precluded, said door being retained in said open position and said closed position when said door is positioned thereat;  
a door holder having said door pivotably attached thereto, said door holder including a base having a retaining surface for engaging said door to maintain said door in said open position; and  
wherein said connector housing includes a channel receiving said door holder.

5,769,648

## SIMPLE WATERPROOF CONNECTOR

Hiroyuki Hayashi, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Japan

Continuation of Ser. No. 375,483, Jan. 19, 1995, abandoned.

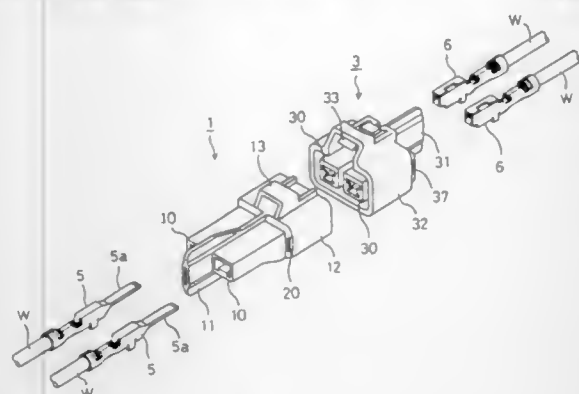
This application May 22, 1997, Ser. No. 861,704

Claims priority, application Japan, Jan. 31, 1994, 6-029073

Int. Cl.<sup>6</sup> H01R 4/60; 15/00

U.S. Cl. 439—206

7 Claims



1. A water resistant electrical connector comprising male and female components, the male component having a male hood with an inner surface, and the female component having a female hood adapted to receive said male hood and having a plurality of projecting female terminal housings adapted to receive female terminals, said female housing having respective outer surfaces which are surrounded by an inner surface of said male hood, wherein the outer surfaces of said female terminal housings and the inner surface of said male hood are separated by a gap of sufficient size to substantially avoid the movement of water therebetween under capillary action and thereby define a flow-down space therebetween, one or more water extraction apertures being provided in one of the male and female hood in fluid communication with said flow-down space to allow water in the flow-down space to escape from the connector without entering the female terminal housings, and wherein the female component further includes a hollow female partition wall between two adjacent female terminal housings at inner ends of said two adjacent female terminal housings, said hollow female partition wall projecting rearwardly and outwardly from the female terminal housings, whereby the hollow female partition wall prevents a leakage of current at a back portion of said female component between the female terminals.

5,769,649

MODULAR ELECTRICAL DEVICE FOR AUTOMOBILES  
Jörg Welschholz, Herscheid, and Lothar Widlitzki, Castrop-Rauxel, both of Germany, assignors to Leopold Kostal GmbH & Co. KG, Germany

Filed Jun. 8, 1995, Ser. No. 488,687

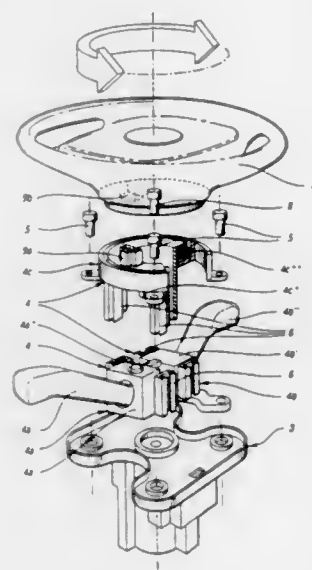
Claims priority, application Germany, Jun. 17, 1994, 44 23 305.6

Int. Cl.<sup>6</sup> H01R 35/04

U.S. Cl. 439—164

27 Claims

1. An electrical device for use in motor vehicles, including at least one steering column switch situated below the steering wheel,



the steering wheel being attached to the steering spindle, the steering column switch and base housing extending radially outwardly from the steering spindle; a carrier member which is firmly fixed to, and at least partially surrounds, the steering column; a signal transfer device which is attached to the steering wheel and concentrically surrounds the steering spindle and which is provided with two housing sections rotatable in relationship to one another; wherein the improvement comprises:

- a modular unit (4) fixed to the carrier member (3) including: one or more of the steering column switches (4a/4b) and the signal transfer device (4c), and
  - a direct connection of the base housing (4a', 4b') of the at least one steering column switch to the fixed housing portion (4c') of the signal transfer device comprising at least one discrete keyed in connector;
- the housing portion (4c') of the signal transfer device (4c) which rotates according to movement of the steering wheel (7) being provided with a canceling extension (4c\*) which cooperates with a finger-like canceling element (4a\*) on the associated steering column switch (4a or 4b) in order to provide cancellation of the turn signal.

5,769,650

## CONNECTOR AND COVER THEREFOR

Masahiko Aoyama, and Keigo Atsumi, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan

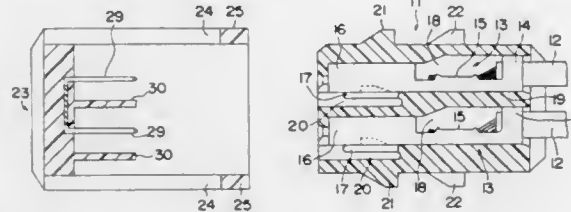
Filed Jun. 14, 1996, Ser. No. 663,639

Claims priority, application Japan, Jun. 19, 1995, 7-176826

Int. Cl.<sup>6</sup> H01R 29/00

U.S. Cl. 439—189

10 Claims



1. A connector, comprising:

- a connector housing (11; 41) formed with a plurality of terminal cavities (18; 42) for housing terminal fittings (13; 44), elastic engaging members (17) in proximity to said respective terminal cavity (18; 42), said elastic engaging members (17) being displaceable into a deformation permitting space (20) during insertion of the respective terminal fittings (13; 44) into the terminal cavities (18) and elastically moving out of said

deformation permitting space (20) upon complete insertion of the respective terminal fitting (13).

a cover (23; 50) fittable on an end of the connector housing (11; 41) where connection ends of the terminal fittings (13; 44) are arrangeable,

a locking mechanism (21, 22, 25; 60, 52) for holding the cover (23; 50) in a first mount position where the cover (23; 50) is at least partly engaged with an end of the connector housing (11; 41) and in a second mount position where the cover (23; 50) is more deeply engaged with the connector housing (11; 41) than in the first mount position,

at least one joint terminal (28; 15) mounted in the cover (23; 50), the joint terminal (28; 15) being spaced from the terminal fittings (13; 44) when the cover (23; 50) is in the first mount position, and contacting the terminal fittings (13; 44) when the cover is in the second mount position,

an insufficient insertion detection member (30) integrally formed with the cover (23) for projection into the deformation permitting space (20) when the cover (23) is in the second mount position, said insufficient insertion detecting member (30) being blocked by any of said elastic engaging members (17) in the deformation permitting space (20), thereby preventing movement of the cover (23; 50) into the second mount position and indicating incomplete insertion of at least one said terminal fitting (13).

5,769,651

## MOVABLE CONNECTOR

Naomi Omura, and Shinji Kodama, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

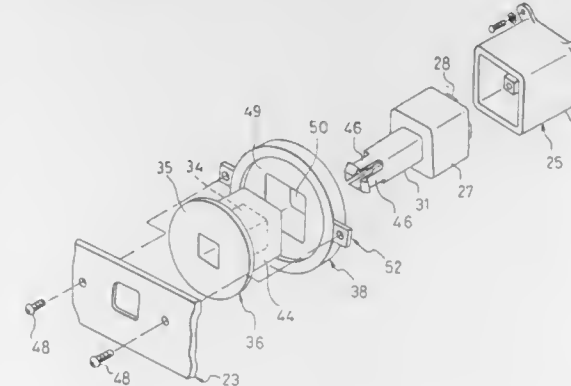
Filed Dec. 10, 1996, Ser. No. 763,001

Claims priority, application Japan, Dec. 11, 1995, 7-321773

Int. Cl.<sup>6</sup> H01R 13/73

U.S. Cl. 439—248

5 Claims



1. A movable connector provided with a connector housing to be movably attached to an instrument panel, comprising:
- a flange fitting portion projected from a rear end of said connector housing in a connector-fitting direction;
  - an inner flange including a pipe portion and a flange portion, said pipe portion being fitted to an outside of said flange fitting portion and permitting said connector housing to move within a predetermined range in the connector-fitting direction, and said flange portion being extended from said pipe portion in an outward direction perpendicular to the connector-fitting direction;
  - an outer flange in which said inner flange is loosely inserted, said outer flange being fixed to the instrument panel for slidably nipping said flange portion; and
  - an elastic body including a first region disposed between said inner and outer flanges so that said pipe portion is fitted into said first region, and a second region extended from said first region in the connector-fitting direction so that said flange fitting portion is fitted into said second region.

5,769,652

## FLOAT MOUNT COAXIAL CONNECTOR

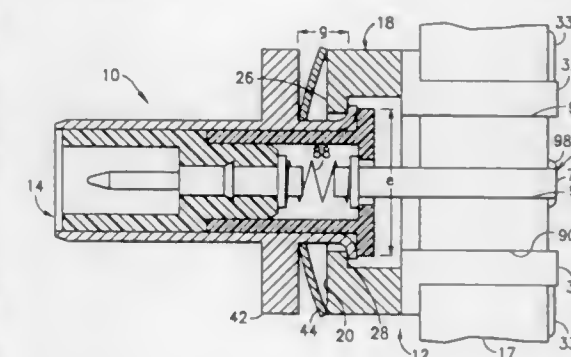
Eric S. Wider, East Haven, Conn., assignor to Applied Engineering Products, Inc., Conn.

Filed Dec. 31, 1996, Ser. No. 777,808

Int. Cl.<sup>6</sup> H01R 13/64

U.S. Cl. 439—248

8 Claims



1. A coaxial connector for mounting to a circuit board, said connector comprising:
- a body assembly having a rear body with means for secure mounting to the circuit board, a front body floatably moveable relative to the rear body and a spring between the front and rear bodies for maintaining electrical contact therebetween for all relative positions of said front and rear bodies; and
  - a contact assembly comprising a rear contact concentrically fixedly supported within said rear body, said rear contact having means for secure mounting to the circuit board, a front contact spaced from said rear contact and being concentrically supported with said front body, and a resiliently deflectable connecting means extending between said front and rear contacts for maintaining signal transmission between said front and rear contacts for all relative floatably moveable positions of said front contact relative to said rear contact.

5,769,653

## WIRING DEVICE CIRCUIT IDENTIFICATION

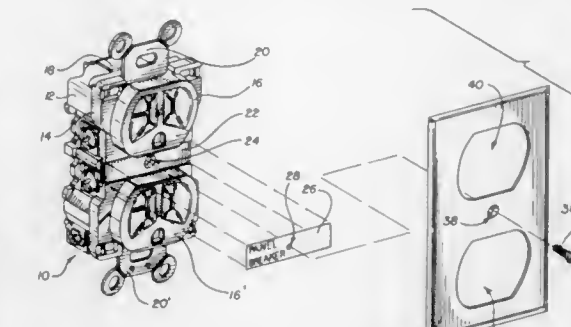
James A. Osterbrock, Central Square, and Michael R. Bryndzia, Baldwinsville, both of N.Y., assignors to Pass & Seymour, Inc., Syracuse, N.Y.

Division of Ser. No. 589,483, Jan. 22, 1996, abandoned. This application May 9, 1997, Ser. No. 853,787

Int. Cl.<sup>6</sup> H01R 3/00

U.S. Cl. 439—491

7 Claims



1. The method of identifying, from a plurality of separate circuits in an electrical installation, the specific circuit in which a wiring device is connected, said method comprising:
- (a) affixing to a predetermined surface area of said device a sheet of material having an inner surface contacting said surface area and an outer surface capable of receiving and retaining visible markings from a conventional pen or pencil;
  - (b) electrically connecting said device in said specific circuit;

- (c) installing said wall device in a wall opening with said outer surface facing outwardly;  
(d) marking upon said outer surface with a conventional pen or pencil indicia uniquely associated with and thereby identifying said specific circuit; and,  
(e) removably securing a wall plate in covering relation to said wall opening and to portions of said device including said sheet, whereby said indicia is visible only when said wall plate is removed.

5,769,654

## PRESS-CONNECTING TERMINAL

Katsuhiko Onoda, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Continuation of Ser. No. 495,841, Jun. 28, 1995, abandoned.

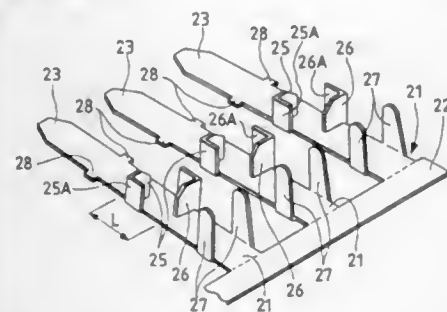
This application Jul. 29, 1997, Ser. No. 902,284

Claims priority, application Japan, Jun. 29, 1994, 6-148012

Int. Cl.<sup>6</sup> H01R 4/24

U.S. Cl. 439—393

16 Claims



1. A press-connecting terminal comprising:  
a base portion having one end portion serving as a connection terminal portion; and  
a single pair of press-connecting blades alternately disposed at a predetermined interval on opposite sides of said base portion to form a meandering space between said press-connecting blades for accommodating a wire to be press-connected.

5,769,655

## C-TYPE LIGHT BULB SOCKET STRUCTURE

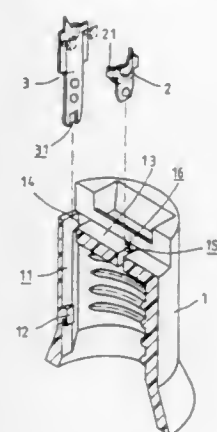
Chin-Sung Tsai, No. 65, Shien-cheng II Street, Chupei, Hsinchu Shien, Taiwan

Filed Apr. 18, 1996, Ser. No. 634,578

Int. Cl.<sup>6</sup> H01R 4/24

U.S. Cl. 439—419

2 Claims



1. A C-type socket structure for coupling to a light bulb, comprising:  
a socket having a longitudinally extending cylindrical wall and a bottom wall, said socket having (1) a longitudinally extended groove formed in an internal surface of said cylindrical wall,

- (2) a T-shaped projection formed at a bottom end of said groove, (3) a hole formed through said bottom wall in alignment with said groove, (4) a slotted opening formed centrally in said bottom wall, and (5) a pair of transverse openings formed on opposing ends of said slotted opening;  
a side conducting plate disposed in said groove and having an arched contour, said first conducting plate having a U-shaped end for engagement of said T-shaped projection and a pair of arms formed on an opposing end thereof, each of said pair of arms being bent in a U-shaped configuration for engagement within said hole in said bottom wall;  
a central conducting plate extending through said slotted opening in said bottom wall, said central conducting plate having a pair of curved arms formed on one end thereof, said pair of curved arms being respectively positioned in said pair of transverse openings for securing said central conducting plate therein; and,  
a cap coupled to said bottom wall in overlaying relationship with an external surface thereof.

5,769,656

## WOUND WIRE TERMINAL ASSEMBLY

David C. Bamberg, 325 Albany, Shreveport, La. 71105

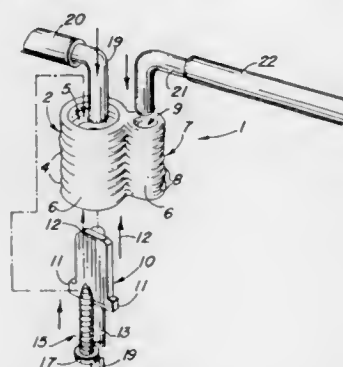
Continuation-in-part of Ser. No. 743,131, Nov. 1, 1996. This

application Dec. 23, 1996, Ser. No. 772,728

Int. Cl.<sup>6</sup> H01R 4/26

U.S. Cl. 439—431

20 Claims



1. A wound wire terminal assembly for connecting at least one pair of wires, said terminal assembly comprising a length of wound wire defining:  
primary connector means having open ends for receiving at least one wire of said at least one pair of wires, and  
secondary connector means connected to said primary connector means for receiving the other wire of said at least one pair of wires; and  
engaging means for insertion in one of said open ends of said primary connector means with said at least one wire, whereby said engaging means engages said one wire and said primary connector means and secures said one wire in said primary connector means.

5,769,657

## ATTACHMENT STRUCTURE OF BATTERY PACK TO POWER-DRIVEN TOOLS

Masayoshi Kondo, Takahide Kawakami, Norio Isogai, Youichi Kato, and Katsumi Tozawa, all of Anjo, Japan, assignors to Makita Corporation, Aichi-pref., Japan

Filed Feb. 22, 1996, Ser. No. 604,869

Claims priority, application Japan, Feb. 23, 1995, 7-035745; Feb. 23, 1995, 7-035748; Feb. 23, 1995, 7-035755; Jan. 16, 1996, 8-005290

Int. Cl.<sup>6</sup> H01R 3/00

U.S. Cl. 439—500

27 Claims

1. An attachment structure to make a battery pack including a plurality of secondary cells detachably attached to a battery holder

5,769,659

## PLASTIC TERMINAL BOX

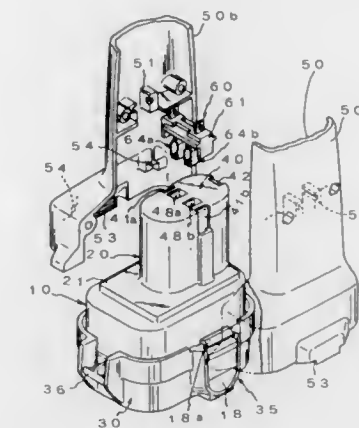
Muzaffer Ceylan, Alsdorf, Germany, assignor to Copeland Corporation, Sidney, Ohio

Filed Dec. 13, 1995, Ser. No. 571,369

Int. Cl.<sup>6</sup> H01R 13/52

U.S. Cl. 439—521

11 Claims



in a power-driven tool and realize electrical connection of said battery pack with said battery holder of said power-driven tool, said attachment structure comprising

- an insertion slot formed in a connection surface of said battery pack, said insertion slot having a predetermined width and defining at least one contact surface,  
a side slot formed in a side wall of said battery pack and connecting with said insertion slot, and  
a connection terminal projecting from said battery holder and arranged at a position corresponding to one of said insertion slot and said side slot,  
wherein said connection terminal is inserted into one of said insertion slot and said side slot to make said battery pack electrically connect with said battery holder.

5,769,658

## JUMPER CABLE APPARATUS

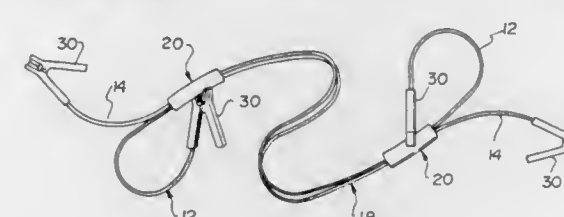
LaDell O. Glazier, 1233 W. 6930 S., Spanish Fork, Utah 84660

Filed Aug. 8, 1996, Ser. No. 694,035

Int. Cl.<sup>6</sup> H01R 11/00

U.S. Cl. 439—504

5 Claims



1. A jumper cable apparatus comprising  
a first electrical cable having opposite ends;  
a second electrical cable having opposite ends and a length longer than the first electrical cable; said first and second electrical cables each having a layer of insulative material formed about said electrical cable and extending substantially the entire length from one end to the other end of said cable;  
a clamping means mounted on each said end of the first and second electrical cables for clamping on an object in an electrically conducting relationship;  
at least two protective tubular bands looped about both the first and second electrical cables at spaced locations along said electrical cables, each said protective tubular band being located at a distance from a pair of ends of said first and second electrical cables sufficient to permit the clamping means mounted at the nearest ends of the electrical cables to be clamped onto said protective tubular band, said tubular band having sufficient wall thickness to protect the insulative material of the electrical cables from damage from the clamping means; and  
packing material located between the insulative material on said electrical cable and the interior of each said protective tubular band to provide additional protection to the insulative material from the clamping means.

5,769,660

## CONNECTOR HOUSING

Toshikazu Sakurai, Yokkaichi, and Satoru Aoki, Wako, both of Japan, assignors to Sumitomo Wiring Systems, Ltd., and Honda Giken Kogyo K.K., both of Japan

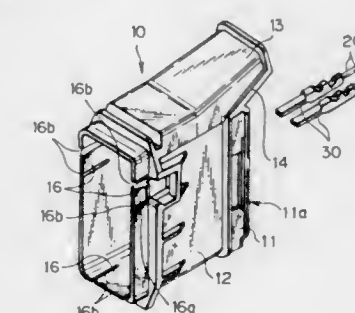
Filed Jan. 24, 1997, Ser. No. 788,281

Claims priority, application Japan, Jan. 29, 1996, 8-013046

Int. Cl.<sup>6</sup> H01R 13/52

U.S. Cl. 439—521

5 Claims



1. A connector comprising a front end portion, a rear end portion, an upper surface, a lower surface, and two laterally spaced



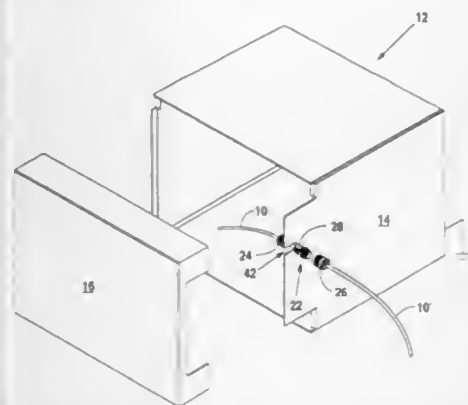
apart side walls extending between said lower surface and said upper surface thereby defining a hollow interior, said interior having a rear opening with a terminal receiving portion adjacent thereto, said terminal receiving portion adapted to receive at least one terminal, said at least one terminal being connected to an electrically conductive wire at a rear end thereof adjacent said rear opening, said at least one terminal being adapted to receive a mating terminal at said front end portion remote from said rear end portion,

a visor on said upper surface extending from adjacent said front end portion rearwardly to beyond said rear end portion, said visor having a trough adjacent said front end portion, whereby liquid contacting said visor is substantially prevented from entering said rear opening and contacting said wire.

**5,769,661**  
**IN-SERVICE REMOVABLE CABLE GROUND CONNECTION**  
Edwin J. Nealis, Cary, N.C., assignor to Ericsson, Inc.,  
Research Triangle Park, N.C.

Filed Jan. 23, 1997, Ser. No. 788,122  
Int. Cl.<sup>6</sup> H01R 13/74  
U.S. Cl. 439—551

7 Claims

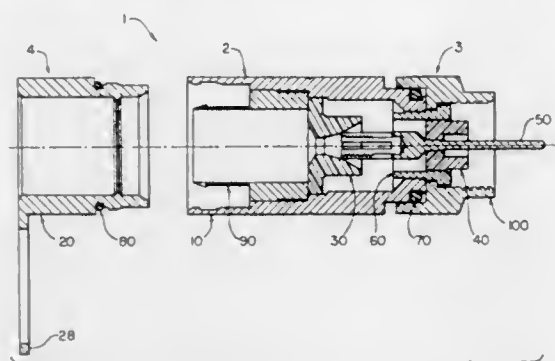


1. A ground connection for a cable having a ground member, comprising:  
a grounded first panel forming a wall surface and a second panel positionable in at least partially overlapping relationship with a predefined portion of the first panel, said first panel having defined internal and external planar surfaces, at least one edge extending between said planar surfaces that is exposed in response to removing said second panel and a slot having a predetermined width extending inwardly from said edge to a position spaced from said edge; and  
an electrical connector assembly including a body electrically connectable to said ground member of the cable and adapted to be received within said slot at a position spaced from said edge of the first panel, said body having an externally threaded first end portion, a second end portion, and a radial flange extending outwardly from said body at a position between said first and second end portions, an internally threaded member attachable to the first end portion of the body and arranged to secure said body to said first panel in response to tightening the internally threaded member on said externally threaded first end portion of the body whereby said internally threaded member is maintained in biased tightly abutting electrical contact with said defined internal surface of the first panel and said radial flange of the body is maintained in biased tightly abutting electrical contact with said defined external surface of the first panel.

**5,769,662**  
**SNAP TOGETHER COAXIAL CABLE CONNECTOR FOR USE WITH POLYETHYLENE JACKETED CABLE**  
David J. Stabile, Horseheads, and Ronald Peter Locati, Elmira, both of N.Y., assignors to Augat Inc., Mansfield, Mass.  
Filed Jul. 15, 1996, Ser. No. 680,486  
Int. Cl.<sup>6</sup> H01R 17/04

U.S. Cl. 439—578

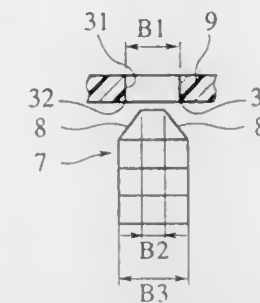
8 Claims



1. A snap together coaxial cable connector for polyethylene or other stiff jacketed coaxial cables comprising:  
a collar open on each of two ends, having a bore centrally disposed therethrough, a first end having a first mating area, and a second end having a second mating area;  
a sleeve open on each of two ends, having a bore centrally disposed therethrough, a first end configured to receive a coaxial cable, and an internal annular ridge;  
a second end of said sleeve having a mating area that is snap fit engageable with the first mating area of the first end of said collar;  
a threaded nut open on each of two ends, having a bore centrally disposed therethrough;  
a first end of said nut disposed coaxially around and rotatable about the second mating area of said collar;  
a back insulator open on each of a first end and a second end, having a central bore disposed therethrough;  
said back insulator centrally disposed within said collar along a common longitudinal axis;  
an insulator open on each of two ends, having a bore centrally disposed therethrough;  
said insulator centrally disposed about a common longitudinal axis within said nut;  
a terminal having a first end and a second end, having a bore partially disposed longitudinally therein at a second end;  
said terminal centrally disposed along a common longitudinal axis within said nut, having the first end extending beyond a second end of said nut, and having the second end disposed within the second end of said back insulator;  
said terminal bore having a plurality of serrations on an interior surface adjacent said bore second end;  
a stem open on each of two ends, having a bore centrally disposed therethrough, and having said insulator centrally disposed therein;  
said stem centrally disposed along a common longitudinal axis within the second end of said collar and the first end of said nut;  
a post open on each of two ends, having a length less than approximately 0.5 inches, having a first end configured to receive a coaxial cable having a polyethylene jacket, and having a bore centrally disposed therethrough configured to receive a center conductor of a coaxial cable; and  
said post centrally disposed along a common longitudinal axis within said collar, and disposed within said collar such that the second end thereof abuts the first end of said back insulator;  
wherein said sleeve is capable of mechanically securing a jacket and a sheath of a coaxial cable between an inner surface of said sleeve and an outer surface of said post when said sleeve is snap fit engaged with said collar.

**5,769,663**  
**CONNECTOR HOUSING**  
Shinji Kodama, Shizuoka-ken, Japan, assignor to Yazaki Corporation, Tokyo, Japan  
Filed Dec. 8, 1995, Ser. No. 569,427  
Claims priority, application Japan, Dec. 9, 1994, 6-306396  
Int. Cl.<sup>6</sup> H01R 13/40  
U.S. Cl. 439—595

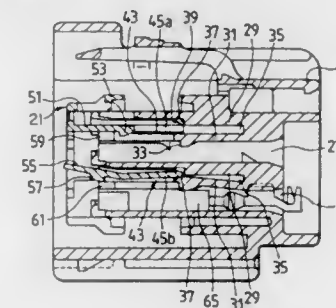
15 Claims



1. A connector housing for accommodating terminals therein, said connector housing comprising:  
a housing body having a plurality of cavities formed adjacent to each other for accommodating said terminals therein a plurality of flexible lances, one for each of said cavities, arranged in said housing body, each of said flexible lances being engageable with a respective one of said terminals, thereby to fix said respective one of said terminals in position;  
means for allowing said lances to be displaced in a disengagement direction with respect to said terminals, said allowing means being formed in walls defining said cavities; and  
stop means for stopping an excessive displacement of each of said lances, said stop means being disposed on each of said lances so as to interfere with said allowing means and to restrict the excessive displacement of said each of said lances in the disengagement direction by interfering with said allowing means;  
wherein said allowing means comprises cavity orifices, each said cavity orifice penetrating a respective one of said walls defining said cavities, each said wall being arranged opposite a respective one of said lances;  
wherein said stop means comprises slanted surfaces formed slanted relative to an upper surface of each of said lances, said upper surface facing each of said cavity orifices.

**5,769,664**  
**MECHANISM FOR DETECTING HALF-INSERTION OF A TERMINAL FOR A CONNECTOR**  
Hitoshi Saito, and Hisashi Tsukamoto, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan  
Filed Apr. 17, 1996, Ser. No. 632,324  
Claims priority, application Japan, Apr. 17, 1995, 7-090968  
Int. Cl.<sup>6</sup> H01R 13/514  
U.S. Cl. 439—595

8 Claims

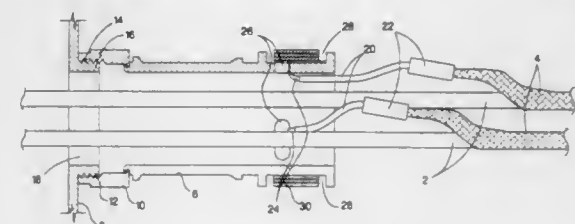


1. A mechanism for detecting whether a metal terminal is half-inserted into a connector, said mechanism comprising:  
a housing including a terminal receiving chamber into which a metal terminal is to be inserted; a flexible engagement arm

projecting into said terminal receiving chamber for engaging the metal terminal inserted into said terminal receiving chamber to thereby prevent disengagement of the metal terminal from said terminal receiving chamber; and a wall defining, in conjunction with said engagement arm, a deformation space, said engagement arm being deformable into said deformation space;  
a front holder, insertable into the deformation space from a front of said housing so as to prevent the metal terminal from being disengaged from said terminal receiving chamber, and having a half-insertion detector for detecting half-insertion of the metal terminal into said terminal receiving chamber;  
said wall including an abutment surface which said half-insertion detector abuts when the metal terminal is half-inserted into said terminal receiving chamber, said abutment surface being located rearward of a free end of said engagement arm; and  
abutment surface guide means for deforming said half-insertion detector towards said abutment surface.

**5,769,665**  
**BACKSHELL ADAPTER CABLE CONNECTION ASSEMBLY AND METHOD FOR GROUNDING BRAIDED CABLE SHEATHINGS**  
Nick Neely, 260 Peak Dr., Alpharetta, Ga. 30202, and Joseph M. Reilly, 7620 E. Osie, Wichita, Kans. 67207  
Filed Jan. 21, 1997, Ser. No. 786,224  
Int. Cl.<sup>6</sup> H01R 9/03  
U.S. Cl. 439—610

9 Claims



1. A cable connection assembly for electrical grounding of a plurality of braided cable sheathings comprising:  
(A) A connector backshell adapter having a first end and a second end, having a hollow interior bore extending there-through from the first end to the second end, having an annular, outwardly opening, spring receiving channel within the connector backshell adapter's outer peripheral surface, the spring receiving channel having a floor and a pair of side-walls, and having a plurality of fly lead receiving apertures extending from the interior surface of the bore of the connector backshell adapter to the floor of the spring receiving channel, the first end of the connector backshell adapter comprising a backshell adapter attaching means for fixedly attaching the connector backshell adapter to a solid apertured surface;  
(B) A plurality of electrically conductive fly leads, each fly lead having a first end and a second end, the first end of each fly lead forming a hook, and the second end of each fly lead having fixedly attached thereto a braid attaching means for fixedly attaching and electrically connecting the fly lead to a braided metal cable sheathing, the hooks being positioned within the bore of the connector backshell adapter, within the fly lead receiving apertures and within the spring receiving channel so that the first ends of the fly leads extend through the bore of the connector backshell adapter, thence through a fly lead receiving aperture, and thence to a position overlying the floor of the spring receiving channel; and  
(C) A spring means in the form of a coil arranged to lie within the spring receiving channel and to be wrapped around the floor of the spring receiving channel, the coil including a resilient ribbon arranged to be wrapped around the floor of the spring receiving channel in a plurality of overlapping turns, the coil providing a compressive force between the interior

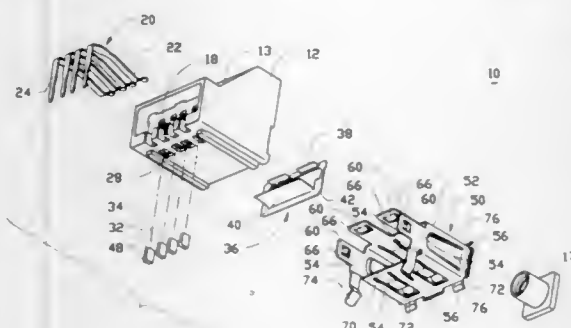
surface of the coil and the floor of the spring receiving channel, the compressive force pressing the first ends of the fly leads against the floor of the spring receiving channel, securing and electrically connecting the fly leads to the connector backshell adapter.

5,769,666  
FILTERED CONNECTOR

Kun-Tsan Wu, Tu-Chen, Taiwan, assignor to Hon Hai Precision Ind. Co., Ltd., Taipei Hsien, Taiwan  
Filed Dec. 27, 1996, Ser. No. 773,609  
Int. Cl.<sup>6</sup> H01R 13/66

U.S. Cl. 439—620

18 Claims



1. An electrical filtered connector comprising:  
an insulative housing defining a cavity with a platform horizontally extending therein;  
a plurality of horizontal passageways disposed lengthwise in the housing for receiving a corresponding number of contacts therein;  
a plurality of vertical apertures upward extending from an under-surface of the housing corresponding to and communicative to the corresponding passageways, respectively, for receiving therein a corresponding number of capacitors wherein a first end of each of said capacitors abuts against the corresponding contact;  
a holding shell including at least a lower horizontal section wherein the horizontal section presses against a second end of each capacitor for holding the capacitors in position in the corresponding apertures, respectively; and  
an internal shielding including a circumferential section for shielding the cavity and means for abutment with the holding shell for retaining the holding shell in position in the housing.

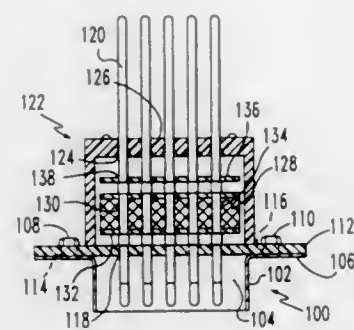
5,769,667  
LOW COST FILTERED AND SHIELDED ELECTRONIC CONNECTOR

Yakov Belopolsky, Harrisburg, Pa., assignor to Berg Technology, Inc., Reno, Nev.  
Continuation of Ser. No. 608,686, Feb. 2, 1996, Pat. No. 5,639,264, which is a division of Ser. No. 332,691, Oct. 31, 1994, Pat. No. 5,580,279. This application May 21, 1997, Ser. No. 861,349  
Int. Cl.<sup>6</sup> H01R 13/66

U.S. Cl. 439—620

24 Claims

1. An electrical connector comprising:  
(a) a front retaining means comprising a conductive shell having a peripheral flange and a pin receiving passageway;  
(b) a plurality of conductive pins extending through the passageway of the front retaining means;  
(c) a concave insulative rear retaining means having a plurality of apertures through which the conductive pins pass; and  
(d) a capacitive means comprising a printed wiring board having a plurality of central apertures and being interposed between



said front retaining means and rear retaining means so as to receive the pins in said apertures, and said board having a component side oriented toward the rear retaining means, and a reverse side oriented toward the front retaining means and fixed to the peripheral flange thereof and a peripheral edge, and on the component side of said board there is a conductive strip adjacent the peripheral edge on said component side, and outwardly adjacent at least some of the central apertures there are conductive bands and a capacitor is positioned between at least some of said conductive bands and the conductive strip adjacent the peripheral edge, and on the reverse side of said board a non-conductive area surrounds at least some of the central apertures and said non-conductive areas are surrounded by conductive areas; and  
(e) a ferrite element filter means positioned within the rear insulating member.

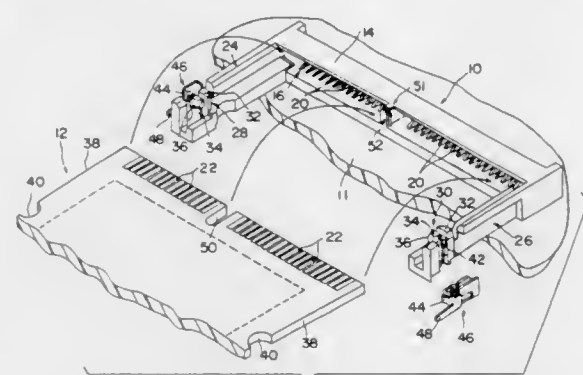
5,769,668  
MODULE ALIGNMENT APPARATUS FOR AN ELECTRICAL CONNECTOR

Robert J. Tondreault, Louisville, Ky., assignor to Robinson Nugent, Inc., New Albany, Ind.

Filed Mar. 8, 1996, Ser. No. 612,545  
Int. Cl.<sup>6</sup> H01R 23/70

U.S. Cl. 439—633

18 Claims



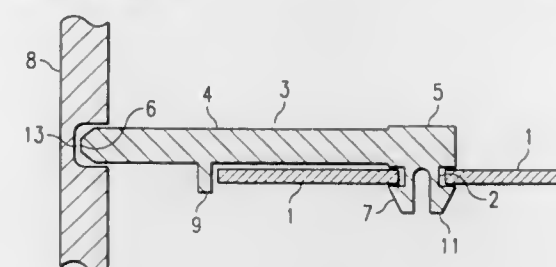
1. An electrical connector apparatus for electrically coupling a module having an end edge including a keyway and a plurality of conductive pads to a mother printed circuit board, the apparatus comprising an insulative housing formed to include an elongated slot configured to receive the end edge of the module, a plurality of contacts located in the slot which are configured to engage the conductive pads on the module, and an alignment apparatus including a key formed integrally with the insulative housing and an alignment clip coupled to the key, the alignment clip including at least one movable spring beam configured to engage the keyway of the module during insertion of the module into the elongated slot to align the module relative to the housing.

5,769,669  
APPARATUS AND METHOD FOR KEYING AN ELECTRICAL ASSEMBLY WITH A WIRING BACKPLANE

D'Anne Beukelaar Hanks, Santa Rosa, Calif., assignor to DSC Telecom L.P., Plano, Tex.  
Filed Aug. 26, 1996, Ser. No. 702,985  
Int. Cl.<sup>6</sup> H01R 13/64

U.S. Cl. 439—681

5 Claims



1. An apparatus for keying an electrical assembly with a wiring backplane comprising:  
a removable guide member not adapted to have electrical contacts therein, the removable guide member having a body, the body having a first projection extending perpendicular to the body and operable to be received by a first opening in the electrical assembly, the first projection operable to couple the removable guide member to the electrical assembly, the body having a second projection extending parallel to the body; the wiring backplane operable to receive the second projection of the removable guide member, wherein the second projection has a third projection extending perpendicular to the second projection and parallel to the first projection, the third projection operable to align the removable guide member on the electrical assembly, the third projection operable to extend beyond an edge of the electrical assembly.

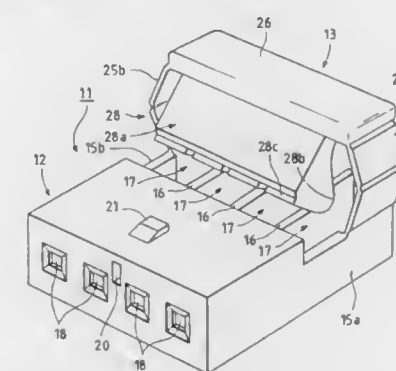
5,769,670  
CONNECTOR WITH REAR HOLDER

Kimihiro Abe, Shizuoka, Japan, assignor to Yazaki Corporation, Tokyo, Japan

Filed Jun. 19, 1996, Ser. No. 665,860  
Claims priority, application Japan, Jun. 30, 1995, 7-166109  
Int. Cl.<sup>6</sup> H01R 13/436

U.S. Cl. 439—752

9 Claims



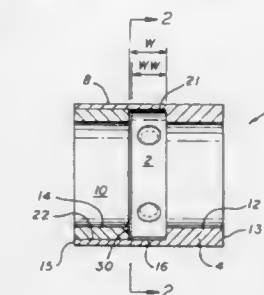
1. A connector, comprising:  
a connector housing having a terminal receiving chamber for receiving a terminal; and  
a rear holder adapted to be attached to said connector housing to retain the terminal in the terminal receiving chamber, said rear holder including an upper plate which is pressed when attaching said rear holder to said connector housing, and a press member suspended via a hinge from a lower, inwardly facing surface of the upper plate said press member adapted to retain the terminal.

5,769,671  
CONNECTOR SPRING

Wisit Lim, Palmdale, Calif., assignor to Pacesetter, Inc.  
Filed Feb. 5, 1997, Ser. No. 795,920  
Int. Cl.<sup>6</sup> H01R 13/53

U.S. Cl. 439—843

12 Claims



1. A connector comprising:  
an elongated housing extending along a central axis; said housing having a generally cylindrical opening extending coaxially with said central axis;  
said opening in said housing being defined by first and second cylindrical surfaces each defined by a first diameter, an annular radially directed gap disposed within said opening and extending axially between said first and second cylindrical surfaces, said annular gap extending radially outwardly from said central axis and outwardly beyond each of said first and second cylindrical surfaces, said gap having a given width as measured along said axis extending in a direction parallel thereto;  
a spring having a width sufficient to be received within said gap and having at least one portion extending perpendicularly to said central axis and into said opening;  
wherein said spring being a stamped formed metallic spring having a generally closed shape as defined by four opposed sides each connected by a corner portion interposed therebetween and facing said central axis; and  
said spring on each side thereof carrying said at least one portion which is a deformed portion of an associated one of said sides extending inwardly beyond the respective side thereof and toward said central axis.

5,769,672  
CONTACT SPRING WITH CONTACT PREOPENING

Richard Flieger, Stammham, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany  
Filed Sep. 26, 1996, Ser. No. 721,563  
Claims priority, application Germany, Sep. 27, 1995, 195 35 960.7

U.S. Cl. 439—850

Int. Cl.<sup>6</sup> H01R 11/22

5 Claims

1. A contact spring, comprising:  
a terminal part for an electrical conductor;  
a contact part having a spring leg base and spring legs extending from said spring leg base for contacting a plug contact in a contact zone; and  
said spring legs having long edges, and at least one of said spring legs having a protrusion in said contact zone pointing at and contacting the other of said spring legs for maintaining a minimal distance between said spring legs in said contact



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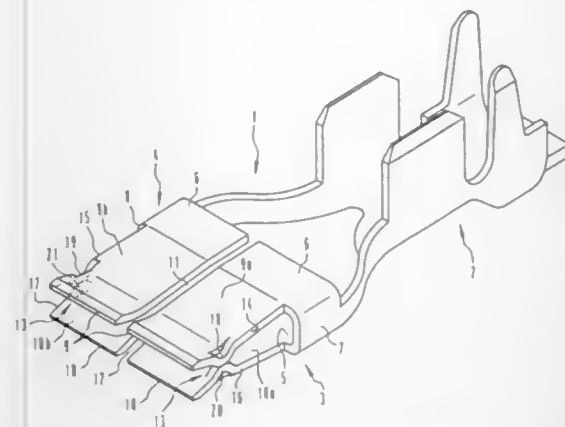
4

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23

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UMI



5,769,673

## FEMALE TERMINAL

Yukio Obta, and Takeya Miwa, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

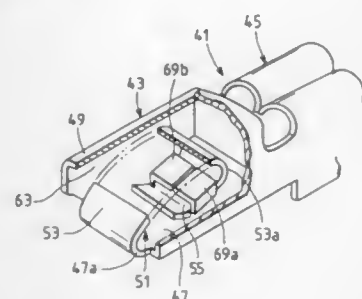
Filed Jul. 12, 1996, Ser. No. 679,490

Claims priority, application Japan, Jul. 12, 1995, 7-176288

Int. Cl.<sup>6</sup> H01R 11/22

U.S. Cl. 439—852

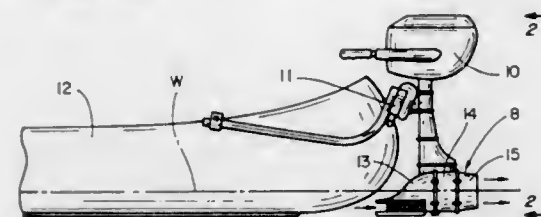
11 Claims



1. A female terminal, comprising:

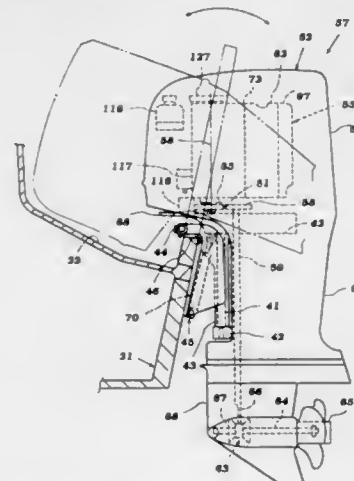
- an electrically conductive plate including a wire connecting portion for clamping a wire thereto and a hollow contact portion for mating with a male terminal, said hollow contact portion including a flat bottom plate portion;
  - a resilient contact piece portion provided within said hollow contact portion, said resilient contact piece portion including a first folded piece portion folded back from a distal end of said bottom plate portion, and a second folded piece portion folded back from a distal end of said first folded piece portion toward the distal end of said bottom plate portion and lying between said first folded piece portion and said bottom plate portion; and
  - a deformation prevention folded portion bent at a side portion of said second folded piece portion toward said first folded piece portion to form a first bend,
- wherein said deformation prevention folded portion supports said first folded piece portion in a predetermined flexed position of said first folded piece portion, and
- wherein when the male terminal is inserted into said hollow contact portion, a predetermined gap is formed between said first folded piece portion and said deformation prevention folded portion.

5,769,674  
JET DRIVE FOR OUTBOARD MOTOR  
Richard C. Stallman, Alameda, Calif., assignor to Specialty Manufacturing Co., San Leandro, Calif.  
Filed Aug. 8, 1996, Ser. No. 694,928  
Int. Cl.<sup>6</sup> B63H 11/00  
U.S. Cl. 440—38  
22 Claims



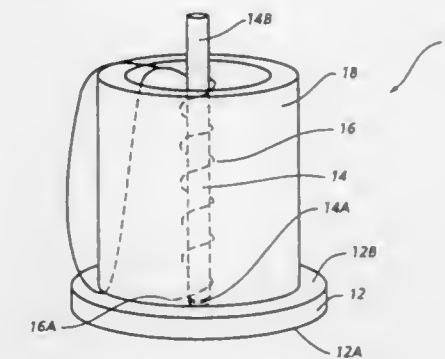
1. A jet propulsion system for propelling a water craft through a body of water comprising:
- a housing having a conduit formed therein for the passage of water, upper and lower baffles, an inlet port between said upper and lower baffles for delivering water to said conduit, and an outlet port for expelling water from said conduit, said upper and lower baffles each having a peripheral edge, said inlet port being spaced inwardly of said peripheral edges of said upper and lower baffles such that said inlet port has a flow area less than the flow area of the opening between the peripheral edges of said upper and lower baffles such that water flowing between the peripheral edges of said upper and lower baffles has a lower velocity than water flowing through said inlet port;
  - an impeller positioned in said housing between said inlet port and said outlet port, said impeller being rotatable by a drive assembly for drawing water inwardly through said inlet port, driving the water past said impeller in an axial/rotational flow, and moving the water through the outlet port; and
  - a coolant delivery system for delivering a supply of water for cooling the drive assembly, said coolant delivery system including a coolant passageway for transporting water from said conduit to a pump reservoir coupled to the drive assembly, said coolant passageway including an inlet aperture positioned between said impeller and said outlet.

5,769,675  
COMPONENT LAYOUT FOR AN OUTBOARD MOTOR  
Masanori Takahashi, and Hitoshi Watanabe, both of Hamamatsu, Japan, assignors to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan  
Filed Aug. 26, 1996, Ser. No. 703,008  
Claims priority, application Japan, Aug. 30, 1995, 7-222215  
Int. Cl.<sup>6</sup> B63H 5/13  
U.S. Cl. 440—83  
13 Claims

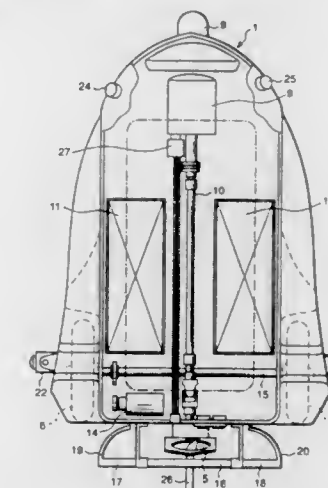


1. An outboard motor comprised of a power head containing an internal combustion engine having at least one combustion cham-

ber containing an element driven by the combustion in said combustion chamber, an engine output shaft drivingly coupled to said element for affecting rotation of said engine output shaft about a generally vertically disposed axis in response to combustion in said combustion chamber, a protective cowling encircling said engine and completing said power head, a drive shaft housing and lower unit depending from said power head and containing a propulsion device for propelling an associated watercraft, said propulsion device having a single transmission input shaft rotating about a generally vertically disposed axis, a steering shaft affixed to said drive shaft housing, a swivel bracket journaling said steering shaft for steering movement of said outboard motor about a generally vertically disposed steering axis, said transmission input shaft being disposed to the rear of said steering shaft and contiguous thereto when mounted on an associated watercraft, said engine output shaft rotating about an axis that is offset forwardly from said transmission input shaft axis and not rearwardly of said steering axis, and drive means for coupling said engine output shaft to said transmission input shaft.



5,769,676  
AQUATIC SEARCH DEVICE  
Antoni Ortiz-Flotats, Ciudad de Elche, 9, 08027 Barcelona, Spain  
Filed Dec. 4, 1996, Ser. No. 760,314  
Claims priority, application Spain, Dec. 5, 1995, 9503097  
Int. Cl.<sup>6</sup> B63B 22/00  
U.S. Cl. 441—13  
8 Claims



1. Aquatic search device comprising:
- a body which can float in water and has wheels for movement on land,
  - said body having independent means for driving the wheels and for movement in water, and having one of internal-combustion and electric drive means, as well as steering means, rescue means, remote vision means and auxiliary means, all of said means being operable by remote control both on land and in the water.

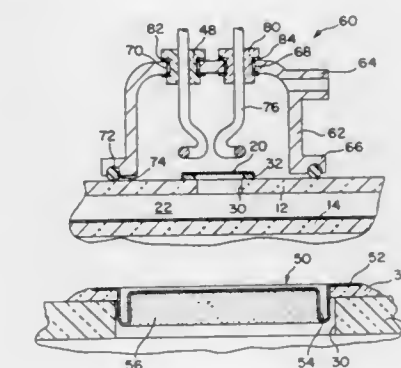
5,769,677  
MARKER BUOY  
Richard E. Bell, Corpus Christi, Tex., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.  
Filed Feb. 3, 1997, Ser. No. 794,522  
Int. Cl.<sup>6</sup> B63B 22/18  
U.S. Cl. 441—24  
17 Claims

1. A marker buoy, comprising:

- a base;
- a post made of flexible material coupled to and extending from said base;

- a line attached at a first end thereof to said post and wrapped about a portion of said post; and
- a float attached to a second end of said line wherein, when said marker buoy is deployed near the bottom of a body of water, said base sinks to the bottom and said float rises to the surface of said body of water causing said line to unwrap from said post and causing said post to flex towards a substantially perpendicular orientation with respect to the surface of said body of water.

5,769,678  
METHOD OF SEALING VACUUM PORTS IN LOW PRESSURE GAS DISCHARGE LAMPS  
Ferenc Mohacsi, Kalamazoo, Mich., assignor to Fallon Luminous Products, Inc., Spartanburg, S.C.  
Division of Ser. No. 273,713, Jul. 12, 1994, Pat. No. 5,587,622.  
This application Nov. 27, 1996, Ser. No. 758,638  
Int. Cl.<sup>6</sup> H01J 9/40; 9/39  
U.S. Cl. 445—25  
11 Claims



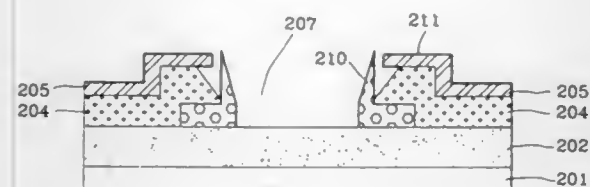
1. A method of sealing an evacuation port of a flat glass low pressure gas discharge lamp comprising the steps of:
- providing a flat glass low pressure gas discharge lamp having an evacuation port;
  - surrounding said evacuation port with solder;
  - providing a cover having getter thereon for absorbing chemicals when positioned within said low pressure gas discharge lamp;
  - positioning said cover over said evacuation port associated with said solder such that said solder bonds said cover to said flat glass, hermetically sealing said low pressure gas discharge lamp.

5,769,679  
METHOD FOR MANUFACTURING FIELD EMISSION  
DISPLAY DEVICE

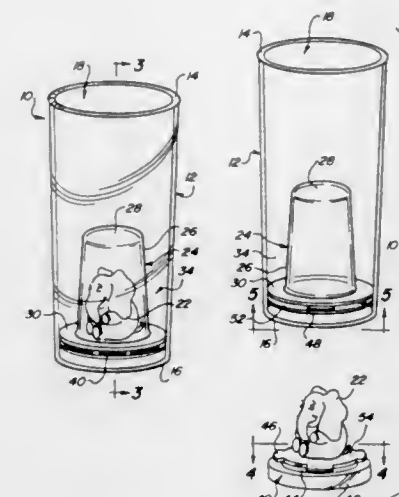
Jong-Moon Park; Yeong-Cheol Hyeon, and Kee-Soo Nam, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

Filed Sep. 18, 1996, Ser. No. 710,528  
Claims priority, application Rep. of Korea, Dec. 22, 1995, 95-54549

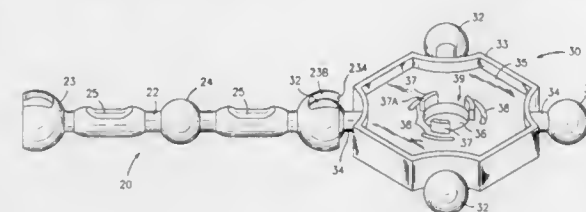
Int. Cl.<sup>6</sup> H01J 1/30; 9/18  
U.S. Cl. 445—50 6 Claims



1. A method for manufacturing a field emission display device, comprising the steps of:  
sequentially forming a first insulating film and a first conductive film on a substrate and patterning the first conductive film to form a plurality of electron emission cathode lines, each having a predetermined width;  
depositing a second insulating film, a second conductive film and a third insulating film over the whole surface of the substrate, in due order;  
selectively etching the third insulating film, the second conductive film and the second insulating film, to form a gate electrode and a trench through which a predetermined area of the electron emission cathode line is exposed;  
forming a fifth insulating film at the lateral side of the gate electrode;  
forming a blanket of a third conductive film over the resulting structure and selectively etching the third conductive film, to form an electron emission cathode at the sidewall of the trench; and  
removing the second insulating film pattern and the fifth insulating film pattern and partially etching the side of the gate insulating film, simultaneously, to spatially separate the gate electrode from the electron emission cathode.



5,769,681  
OPEN-ENDED TOY CONSTRUCTION SYSTEM  
Donald Lee Greenwood, Sr., 3117 Lakeshore Dr., Longmont, Colo. 80503; Donald Lee Greenwood, Jr., 2200 Tulip St., Longmont, Colo. 80501, and Heidi Greenwood Pate, 1196 Garfield Ave., Louisville, Colo. 80027  
Filed Jan. 25, 1996, Ser. No. 591,709  
Int. Cl.<sup>6</sup> A63H 33/08  
U.S. Cl. 446—120 44 Claims



1. A toy construction system including a plurality of elongated rod members and a plurality of substantially flat connector members each of which may be interconnected in a variety of different combinations by the engagement of ball elements provided on certain of said members with complimentary socket elements provided on other of said members, wherein said socket elements each include retaining means for positively retaining said ball elements therein and spring bias means for facilitating the insertion of said ball elements into said socket elements and the removal therefrom, said system further including a plurality of flat, hinged connector members each including at least one ball element for releasably mounting said hinged connector members to other members, wherein said hinged connector members each include an outwardly extending rod and a set of opposed, outwardly extending fingers and wherein at least two of said hinged connector members may be interconnected by engagement of the rod on at least one of said hinged connector members with and between the fingers of another of said hinged connector members.

5,769,680  
DRINKING VESSEL WITH AN INTERNALLY FORMED  
DISPLAY CHAMBER

Edward J. Hoffman, 2/F, Flat A, 21 Sampan St., Wanchai, Hong Kong

Continuation-in-part of Ser. No. 570,600, Dec. 11, 1995, abandoned. This application Nov. 27, 1996, Ser. No. 758,008  
Int. Cl.<sup>6</sup> A63H 33/00; B65D 1/04  
U.S. Cl. 446—75 9 Claims

1. A drinking vessel, the drinking vessel comprising:  
a decorative element;  
a generally flat bottom surface;  
a first generally cylindrical sidewall upwardly extending from said generally flat bottom surface;  
a fluid retention cavity at least partially defined by said first generally cylindrical sidewall; and  
an internally formed display area at least partially defined by a second generally cylindrical sidewall positioned within said first cylindrical sidewall, said internally formed display area operative for receiving the decorative element, said decorative element being in a desired stationary position in said display area for enhancing viewing of the decorative element, said internally formed display area upwardly extending into said fluid retention cavity;

5,769,682  
SQUEEZABLE PLAYTHING SIMULATING HUMANOID  
FIGURE

Joseph G. DiResta; James DiResta, both of 1078 W. Broadway, and Perry Gargano, 92 Horatio St. #4L, all of Woodmere, N.Y. 11598

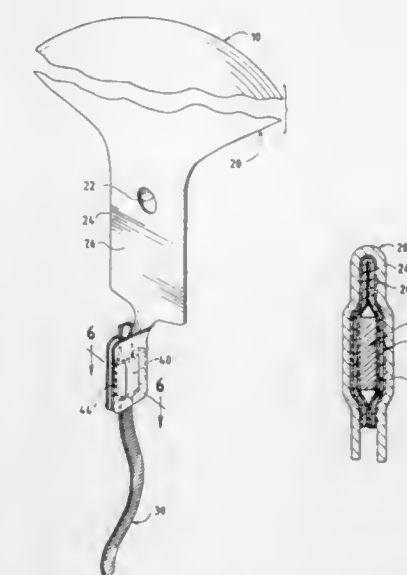
Continuation-in-part of Ser. No. 543,615, Oct. 16, 1995, Pat. No. 5,577,723. This application Sep. 16, 1996, Ser. No. 714,417  
Int. Cl.<sup>6</sup> A63H 3/28; A63B 41/00  
U.S. Cl. 446—184 5 Claims



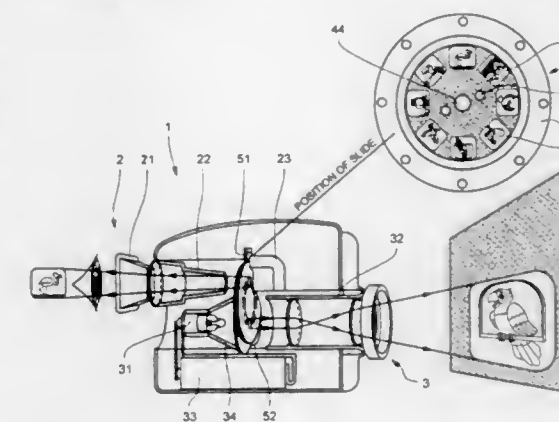
1. A squeezable toy plaything comprising:  
A. a globular outer shell formed of flexible transparent plastic film;  
B. a hollow core encased in the shell having an orifice therein to render the core collapsible, said core being molded of resilient plastic material whose outer surface is contoured to define a humanoid figure which is entrapped within the shell; and  
C. a charge of viscous liquid injected into said core through the orifice whereby when the plaything is squeezed to deform the figure, air and said liquid is discharged through said orifice into a confined space between said core and said shell, and when the plaything is then released to cause the figure to resume its normal form, the air and said liquid are then sucked back into the core, these actions generating gurgling sounds.

5,769,683  
ATTACHMENT FOR BALLOON TETHER  
Young-ho Park, 1639 Holly Ave., Northbrook, Ill. 60062  
Filed Feb. 10, 1997, Ser. No. 798,434  
Int. Cl.<sup>6</sup> A63H 3/06  
U.S. Cl. 446—220 19 Claims

1. A balloon system which includes a metalized sheet balloon, a tether, and a fastener for attaching the tether to the balloon, the system comprising:  
a metalized sheet metal balloon which includes a flexible elongated neck, the neck defining an external surface;  
a double-sided flexible adhesive strip which includes a balloon facing side and an outward-facing side, each of the sides supporting a layer of adhesive material, wherein the strip is attached by the adhesive layer supported by the balloon-facing side to the external surface defined by the neck, wherein the neck and the strip are flexed so as to define and bring into contact two opposed portions of the outward-facing adhesive layer, and wherein each of the opposed portions adheres to the other of the opposed portions; and



5,769,684  
COMPACT LOW-COST PORTABLE SLIDE  
PRESENTATION TOY  
Tsz-Ming Lou, Kowloon, Hong Kong, assignor to Lup Shun Metal & Plastic Ware Factory Limited, Hong Kong, Hong Kong  
Filed Apr. 14, 1997, Ser. No. 837,093  
Int. Cl.<sup>6</sup> A63H 33/22; G03B 23/10  
U.S. Cl. 446—219 9 Claims



1. A compact slide presentation toy comprising a slide viewer section and a slide projector section wherein:  
said slide viewer section comprises  
a first slide slot adapted to receive a slide member,  
a background light source on one side of said slide slot,  
an elongate chamber on the other side of said first slide slot, wherein said elongate chamber has an opaque enclosure and has first and second ends through which light from said background light source enters from said first end and leaves at the said second end, and  
an eye-piece adjacent to said elongate chamber, said eye-piece being adapted to accommodate a user's eye and keep out stray light from interfering with the light originating from said light source;  
said slide projector section comprises  
a second slide slot adapted to receive a slide member,  
a concentrated light source on one side of said slide slot,



an elongate chamber on the other side of said second slide slot, wherein said elongate chamber has an opaque enclosure and has first and second ends through which light from said concentrated light source enters from said first end and leaves at the said second end, and  
said elongate chamber comprises an inverting means for inverting an optical image as it travels through said chamber from said first end to said second end; and  
said first and second slide slots are communicable with each other and have a common slot plane which is adapted to receive a slide member on which a plurality of image cells are distributed.

5,769,685

**BALLOON DECORATION ASSEMBLY AND BALLOON UNITS**

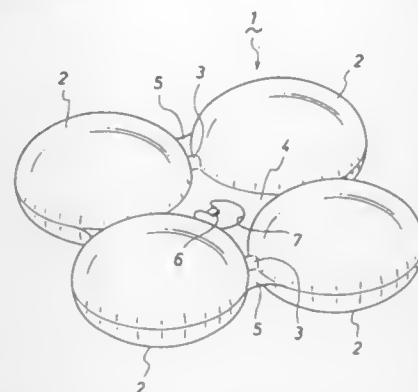
Akira Nakamura, Yamato, and Takemi Morita, Yokohama, both of Japan, assignors to Takara Kosen Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1996, Ser. No. 637,577

Claims priority, application Japan, Apr. 27, 1995, 7-127020  
Int. Cl.<sup>6</sup> A63H 3/06

U.S. Cl. 446—221

23 Claims



1. A decorative balloon assembly, comprising:  
a plurality of balloon elements coupled in an integral annular arrangement;  
a plurality of air passageways linking adjacent balloon elements;  
a center sheet located in an inner portion of the annular arrangement, the center sheet having a shape defined by inner edges of the balloon elements and by inner edges of the air passageways, the center sheet including a central hole; and  
an insert located in the central hole, the insert having a central opening, wherein the plurality of balloon elements and the plurality of air passageways form a balloon unit, and wherein a plurality of balloon units are connectable by passing an elongated flexible member through the central openings of each balloon unit.

5,769,686

**YO-YO HAVING AN IMPROVED AXLE AND INSERT RETAINER**

Donald F. Duncan, Tucson, and Thomas J. Van Dan Elzen, Oro Valley, both of Ariz., assignors to Playmaxx, Inc., Tucson, Ariz.

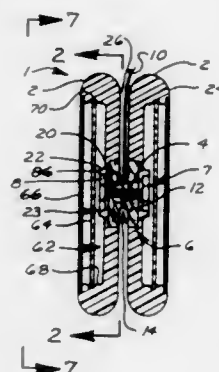
Filed Jul. 29, 1996, Ser. No. 681,835

Int. Cl.<sup>6</sup> A63H 1/30

U.S. Cl. 446—250

21 Claims

1. A yo-yo comprising:  
first and second end members;  
an axle block located between said end members and having an outer diameter less than an outer diameter of each of said end members;



a securement means for securing together said end members and said axle block and wherein said axle block is engaged to said end members whereby said axle block will rotate when said end members rotate;  
a tether secured to said axle block and adapted to be wound thereon; and  
wherein said axle block includes a groove having a compound shape, wherein said axle block has a transverse axis and wherein a vertical axis is defined as an axis perpendicular to said transverse axis, wherein an inner portion of said groove has sidewalls that are inclined at a first angle relative to the vertical axis, wherein said groove has an outer portion that has sidewalls that are non-parallel to the sidewalls of the inner portion of said groove and are oriented at an angle to the vertical axis that is less than said first angle, and wherein said inner portion of said groove functions to center said tether between said end members and wherein when the yo-yo is sleeping and a tension force on said tether is reduced to a predetermined level, the orientation and size of the sidewalls of the outer portion of said groove enables an engagement between an intermediate portion of said tether and said axle block which would cause the tether to wind about the axle block.

5,769,687

**ROTATABLE TOY EYE**

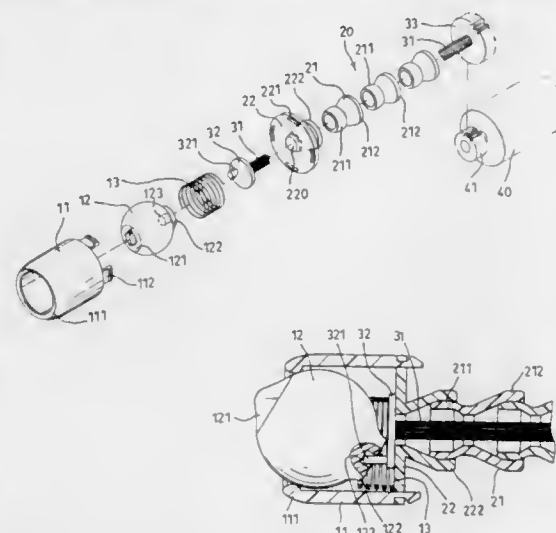
Lung Ching Ko, No. 8-1, Tzu Chlang 3rd Road, Nantou City, Nantou Hsien, Taiwan

Filed Mar. 24, 1997, Ser. No. 823,340

Int. Cl.<sup>6</sup> A63H 3/40

U.S. Cl. 446—343

5 Claims



1. A toy eye comprising:  
a housing,

an eye ball rotatably received in said housing, said eye ball including a rear end having a hole, and  
means for rotating said eye ball, said rotating means including a pin engaged in said hole of said eye ball, and means for actuating said pin and for rotating said eye ball, said actuating means including a cap secured to said housing and having an orifice, a disc rotatably engaged in said housing, and a wire having a first end engaged in said orifice of said cap and secured to said disc for rotating said disc and said pin.

5,769,688

**ATHLETIC BREAST AND CHEST PROTECTOR**

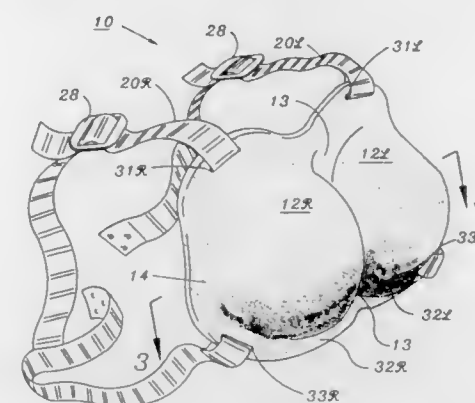
David L. Holliday, 903 Blockade La., Charleston, S.C. 29412

Filed Mar. 15, 1996, Ser. No. 617,507

Int. Cl.<sup>6</sup> A41C 3/00; A41D 13/00

U.S. Cl. 450—57

4 Claims



1. A chest and breast protector for women athletes, comprising, in combination:

- a hard internal breast plate formed to provide a right and left cup of equal size, said hard internal breast plate conforming to the contour of a woman's breasts and front torso;
- a soft rubberized foam exterior and interior surrounding the entirety of said hard internal breast plate;
- a center sternum area connecting said right and left cups; and
- a sternum hinge member having flexibility along a longitudinal axis passing between said right and left cup.

5,769,689

**COMPOSITIONS AND METHODS FOR POLISHING SILICA, SILICATES, AND SILICON NITRIDE**

David Cossaboon, Christiana; Jiun-Fang Wang, Hockessin, both of Del., and Lee Melbourne Cook, Steelville, Pa., assignors to Rodel, Inc., Newark, Del.

Filed Feb. 28, 1996, Ser. No. 608,287

Int. Cl.<sup>6</sup> B24B 1/00

U.S. Cl. 451—41

18 Claims

10. A method for polishing a workpiece comprised of silicon dioxide, silicates, or silicon nitride wherein the surface of said workpiece is exposed to a polishing composition comprising: water, submicron SiO<sub>2</sub> particles, a soluble inorganic salt at a concentration below the critical coagulation concentration for said composition, wherein the pH of said composition is adjusted to within the range of about 9 to 10 by addition of a soluble amine.

5,769,690

Patent Not Issued For This Number

5,769,691

**METHODS AND APPARATUS FOR THE CHEMICAL MECHANICAL PLANARIZATION OF ELECTRONIC DEVICES**

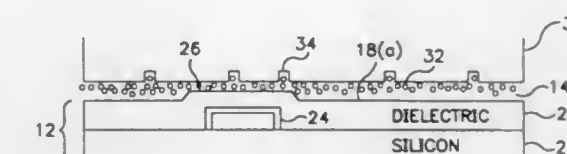
Clinton O. Fruitman, 3 N. Galaxy Dr., Chandler, Ariz. 85226

Filed Jun. 14, 1996, Ser. No. 662,678

Int. Cl.<sup>6</sup> B24B 7/00

U.S. Cl. 451—41

19 Claims



1. A process of chemically and mechanically planarizing a surface of a silicon wafer, comprising the steps of:  
providing a non-cellular lapping pad and a polishing slurry which in combination are capable of planarizing the surface of said silicon wafer; and  
planarizing the surface of said wafer by contacting said lapping pad and the surface of the wafer with sufficient pressure in the presence of said polishing slurry.

5,769,692

**ON THE USE OF NON-SPHERICAL CARRIERS FOR SUBSTRATE CHEMI-MECHANICAL POLISHING**

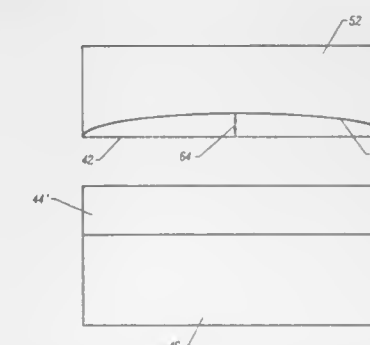
Nicholas F. Pasch, Pacifica; David J. Heine, Pleasanton, and Jayashree Kalpathy Cramer, Milpitas, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Dec. 23, 1996, Ser. No. 772,310

Int. Cl.<sup>6</sup> B24B 13/02

U.S. Cl. 451—41

23 Claims



1. A substrate holder assembly for immobilizing an integrated circuit (IC) wafer during polishing, said substrate holder comprising:

- a base plate having a substantially planar surface sized to support said integrated circuit (IC) wafer;
- a circumferential restraint member arranged with respect to the base plate to engage the IC wafer's edges; and
- a carrier assembly disposed above said substantially planar surface of said base plate and below said IC wafer, said carrier assembly including a film having a surface that is characterized by a substantially oblate spheroid or non-spherical hyperboloid surface of rotation, wherein during polishing said surface of said film supports said IC wafer in a manner causing said IC wafer to bow according to said surface of rotation.

5,769,693

## IMPELLER WHEEL

Jost Wadehul, Ketzendorfer Grund 23, D-21614 Buxtehude, Germany

PCT No. PCT/EP96/04178, § 371 Date May 30, 1997, § 102(e) Date May 30, 1997, PCT Pub. No. WO97/12726, PCT Pub. Date Apr. 10, 1997

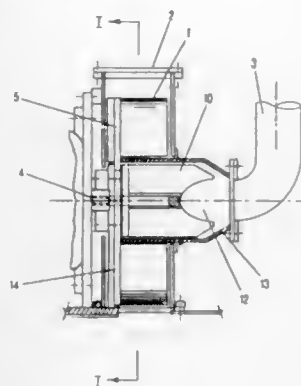
PCT Filed Sep. 25, 1996, Ser. No. 849,656

Claims priority, application Germany, Sep. 30, 1995, 195 36 723.5

Int. Cl.<sup>6</sup> B24C 5/06; 7/00

U.S. Cl. 451—95

6 Claims



1. An impeller wheel comprising:

at least one lateral disk;

an impeller cage connected centrally on a first face of said lateral disk, wherein a blasting material to be distributed with said impeller wheel is introduced in an axial feeding direction into a central area of said impeller cage;

radial blades connected to said first face of said lateral disk; guide blades connected to said first face of said lateral disk and positioned between said radial blades;

said radial blades having radially inner ends spaced at a first distance from a center of said lateral disk and said guide blades having radially inner ends spaced at a second distance from said center of said lateral disk;

said second distance being greater than said first distance;

said impeller cage embodied as an auxiliary impeller wheel comprising auxiliary blades;

said auxiliary blades having a greater axial length than said radial blades.

5,769,694

## APPARATUS FOR THE SURFACE MACHINING OF WORKPIECES

Werner Hesse, Fockbek, and Hans-Peter Boller, Fockbek, both of Germany, assignors to Werkzeugmaschinen GmbH, Rendsburg, Germany

Filed Dec. 10, 1996, Ser. No. 763,199

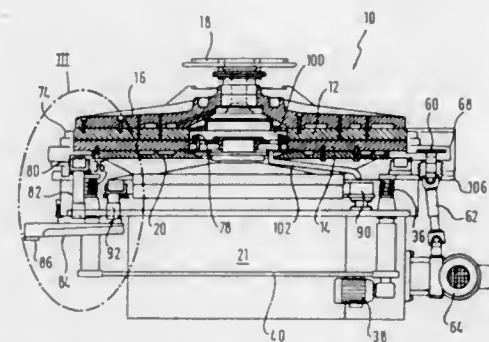
Claims priority, application Germany, Dec. 15, 1995, 195 47 086.9

Int. Cl.<sup>6</sup> B24B 5/00; 29/00

U.S. Cl. 451—269

11 Claims

1. An apparatus for the surface machining of the workpieces by grinding, polishing, lapping or the like, comprising a frame, a lower and upper working wheel supported by the frame, at least one thereof being rotatably driven by driving means, at least one runner wheel between said working wheels, that runner wheel having apertures for the accommodation of said workpieces and having further teeth at the circumference thereof, an inner and an outer ring radially outwardly and radially inwardly of said working wheels, respectively, adapted to accommodate a row of circularly arranged pins, at least the outer pin ring being rotatably supported by said frame and driven by second driving means, said runner wheel camming with said outer and said inner row of pins, the improvement being characterized by the pin ring being rotatably



supported by an outer annular bearing ring stationarily supported by said frame through a plurality of circumferentially spaced cylindrical rollers with beveled upper and lower edges, the rollers being rotatably supported by said bearing ring about a stationary axis, and said pin ring having a beveled groove extending at its circumference to cooperate with the circumference of said rollers.

5,769,695

## CHAMFER GRINDING SYSTEM FOR WAFER

Ichiro Katayama, Mitaka, Japan, assignor to Tokyo Seimitsu Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 560,931, Nov. 20, 1995, abandoned.

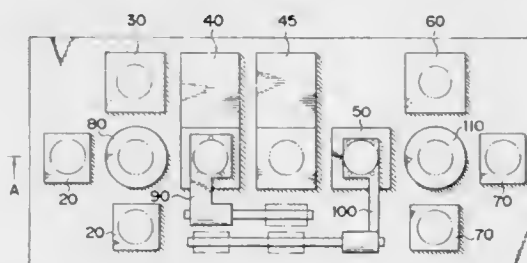
This application May 29, 1997, Ser. No. 865,048

Claims priority, application Japan, Nov. 28, 1994, 6-317608

Int. Cl.<sup>6</sup> B24B 5/00

U.S. Cl. 451—290

8 Claims



1. A wafer chamfering machine comprising:

at least one supplying part in which a storage cassette containing a wafer is mounted;

a pre-setting part for measuring the thickness of a wafer which has not been chamfered, and for setting a circumferential directional position of said wafer;

a plurality of processing parts for chamfering an outer circumference of said wafer, said processing parts having a delivering part;

a cleaning part for cleaning the wafer after it has been chamfered;

a post-measuring part for measuring a shape and size of the wafer after it has been cleaned and chamfered;

a storage part at which a storage cassette is disposed for containing the wafer after it has been measured;

said supplying part having a delivering part for picking up wafers one by one from said storage cassette mounted in said supplying part and delivering the picked-up wafers to said pre-setting part, and for delivering said wafer from said pre-setting part to the delivering part of said processing parts after it has been pre-set by said pre-setting part;

said delivering part of said processing parts receiving said wafer delivered by said delivering part of said supplying part, and supplying the received wafer to a one of said processing parts which is not chamfering another wafer while another of said processing parts is chamfering another wafer;

said cleaning part having a delivering part for picking up wafers chamfered by said processing parts, and for delivering said wafers to said cleaning part; and

a delivering part of said storage part for picking up wafers cleaned by said cleaning part and delivering said wafers to said post-measuring part and for picking up wafers measured by said post-measuring part from said post-measuring part and storing said wafers in said storage cassette disposed at said storage part.

5,769,696

## CHEMICAL-MECHANICAL POLISHING OF THIN MATERIALS USING NON-BAKED CARRIER FILM

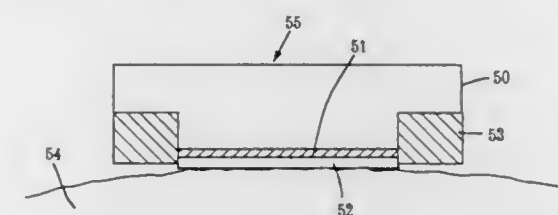
Dawn M. Lee, Fremont, and Subramanian Venkatkrishnan, Los Altos, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 10, 1995, Ser. No. 388,057

Int. Cl.<sup>6</sup> B24B 5/00

U.S. Cl. 451—287

7 Claims



5. A method of manufacturing a semiconductor device, comprising:

adhering a porous polymeric carrier film to a base plate of a carrier assembly with an adhesive without the application of heat;

placing a patterned wafer adjacent to the carrier film; and planarizing the patterned wafer by chemical-mechanical polishing, wherein chemical-mechanical polishing is conducted in three separate phases.

5,769,697

## METHOD AND APPARATUS FOR POLISHING SEMICONDUCTOR SUBSTRATE

Mikio Nishio, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

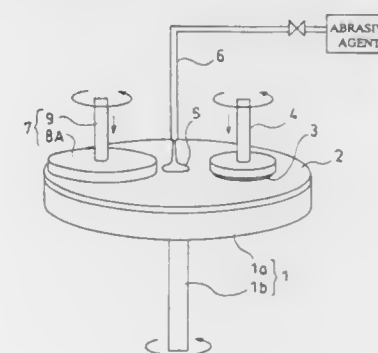
Filed Aug. 7, 1996, Ser. No. 692,065

Claims priority, application Japan, Aug. 24, 1995, 7-216262; Dec. 14, 1995, 7-325319

Int. Cl.<sup>6</sup> B24B 1/00

U.S. Cl. 451—288

16 Claims



1. An apparatus for polishing a semiconductor substrate, comprising:

a platen having a flat surface conducting a two-dimensional movement;

an elastic polishing pad disposed on the flat surface of said platen;

substrate holding means for holding and rotating a semiconductor substrate to be polished, while pressing said semiconductor substrate against a circular first region of said polishing pad;

abrasive supply means for supplying a slurry onto said polishing pad; and

pad pressing means having a smooth pressing surface formed from resin for pressing a second region of said polishing pad to cause elastic deformation thereof, so as to minimize elastic deformation of said first region of said polishing pad, which first region deformation is caused when said semiconductor substrate is pressed against said first region of said polishing pad.

5,769,698

## POLISHING DISC FOR HOLDING CONNECTOR-MOUNTED OPTICAL FIBERS

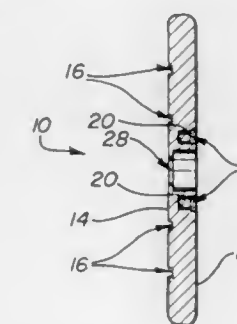
Paul Chudoba, Shohola, and Jerome Polizzi, Morrisville, both of Pa., assignors to NuVisions International, Inc., Shohola, Pa.

Filed Feb. 13, 1997, Ser. No. 799,847

Int. Cl.<sup>6</sup> B24B 19/00

U.S. Cl. 451—386

15 Claims



1. Apparatus for use in frictionally polishing coplanar terminal end surfaces of optical fibers and ferrules wherein said fibers are mounted, said ferrules being coupled to industry-standard, fiber optic connector assemblies, said apparatus comprising a body member having:

a) a top side;

b) a planar, bottom surface;

c) at least one through opening having an axis perpendicular to said bottom surface, said opening being dimensioned for axial extension therethrough of one of said ferrules from said top side to position said end surfaces in a plane parallel to and spaced slightly outwardly from said bottom surface; and

d) means for rotationally locking said ferrule with respect to said body member, said locking means comprising:

i) a cavity extending into said top surface;

ii) an element dimensioned for removable insertion into said cavity;

iii) means for transmitting rotational movement of said body member to said element;

iv) engagement means on said element for cooperative engagement with one of said connector assemblies to transmit rotational movement of said element to said connector assembly and thereby to said ferrule.

5,769,699

## POLISHING PAD FOR CHEMICAL-MECHANICAL POLISHING OF A SEMICONDUCTOR SUBSTRATE

Chris Chang Yu, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 54,167, Apr. 30, 1993, Pat. No. 5,435,772.

This application May 19, 1995, Ser. No. 446,093

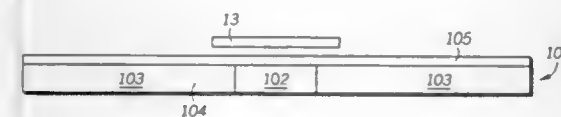
Int. Cl.<sup>6</sup> B24B 1/00

U.S. Cl. 451—528

7 Claims

1. A polishing pad for polishing a semiconductor substrate, wherein the polishing pad comprises:





an edge;  
a first region having a first compressibility and that is adjacent to the edge;  
a second region:  
that is adjacent to the first region;  
that is further from the edge compared to the first region; and  
has a second compressibility, wherein the second compressibility is less than the first compressibility.

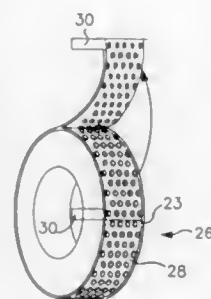
#### 5,769,700 GRINDING WHEEL

Robert L. Holden, West Boylston, and John P. McNamara, Clinton, both of Mass., assignors to Norton Company, Worcester, Mass.

Filed Sep. 10, 1996, Ser. No. 711,636  
Int. Cl.<sup>6</sup> B23F 21/03

U.S. Cl. 451—541

30 Claims



1. A molded grinding wheel comprising:  
bonded abrasive particulate;  
a substantially curved peripheral surface; and  
a plurality of surface protuberances spaced in a predetermined pattern along the substantially curved peripheral surface to define a textured grinding face, wherein the plurality of surface protuberances are formed by selectively molding at least one insert in-situ about the substantially curved peripheral surface and removing the insert from the substantially curved peripheral surface after molding.

#### 5,769,701

#### HAIR SINGEING APPARATUS FOR ANIMALS

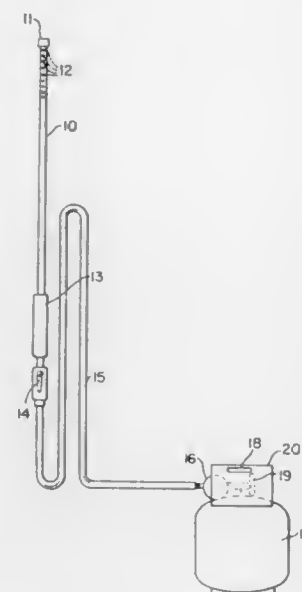
Clyde E. Barber, Green Cove Springs, Fla., assignor to Dry Enterprises, Inc., Green Cove Springs, Fla.

Filed Oct. 23, 1996, Ser. No. 736,347  
Int. Cl.<sup>6</sup> A22B 5/08

U.S. Cl. 452—73

19 Claims

1. A hair singeing apparatus for cow's udder and tail comprising an elongated inflexible pipe having opposite end portions and a hollow therebetween, an elongated flexible hose having opposite end portions, one of said end portions of said pipe being conductively connected to one of said end portions of said hose, another said end portion of said hose adapted for conductive connection to a source of low pressure burnable gas, said one end portion of said pipe including an insulated handle and a selectively controllable valve for opening and closing said hollow in said pipe, said other end portion of said pipe including a closure cap sealing off said hollow and being pierced by a plurality of openings adapted to conduct gas from said hollow to outside of said pipe, said openings



being generally arranged in alignment lengthwise of said pipe so as to produce a planar flame when ignited.

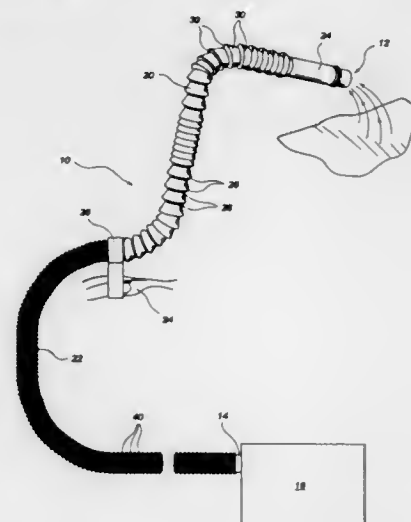
#### 5,769,702 VARIABLE POSITIONING GASEOUS CONDUIT ORIFICE AND METHOD OF USE

Sean P. Hanson, Salt Lake City, Utah, assignor to Sorenson Critical Care, Inc., West Jordan, Utah

Filed Feb. 1, 1996, Ser. No. 593,145  
Int. Cl.<sup>6</sup> B08B 15/04

U.S. Cl. 454—63

39 Claims



1. A selectively positionable gaseous fluid conduit for gas removal from or introduction to a specific environment comprising:

- an orifice;
- a malleable positioning tube having a proximal end and a distal end, wherein the distal end of the positioning tube is in gaseous communication with the orifice, wherein the malleable positioning tube can be manipulated into various configurations, wherein the malleable positioning tube comprises tubular bellows formed from a plurality of alternating large and small diameter rings joined by frusto-conical walls, and wherein the positioning tube maintains the last chosen configuration; and
- a flexible tube having a proximal end and a distal end, wherein the distal end of the flexible tube is attached to the proximal

end of the positioning tube, and wherein the proximal end of the flexible tube is configured for attachment to either a gas evacuator or to a pressurized gas source.

#### 5,769,703 PAINT SPRAY BOOTH WITH PROTECTIVE CURTAIN

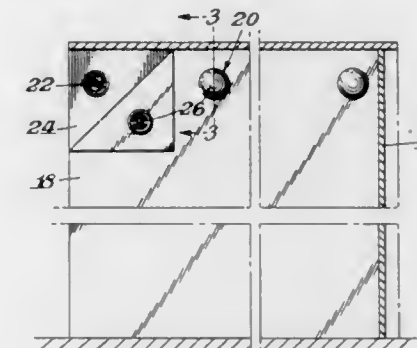
Douglas Conlio, 737 Ambleside Dr., Wilmington, Del. 19808

Filed Dec. 16, 1996, Ser. No. 764,993

Int. Cl.<sup>6</sup> B05B 15/12

U.S. Cl. 454—50

19 Claims



1. In a paint spray booth having a plurality of walls to define an enclosure, a conveyor in said enclosure to carry articles to be painted through said enclosure, said walls including a pair of oppositely disposed walls, an inlet opening in one of said pair of walls and an outlet opening in the other of said pair of walls with said conveyor being mounted therebetween, and a paint spray mechanism in said enclosure for paint spraying articles conveyed by said conveyor through said enclosure, the improvement being in that a protective curtain is mounted to at least one of said walls to minimize paint being sprayed against each wall having said protective curtain, said protective curtain being removably detachably mounted to its said wall to readily permit a fresh protective curtain to replace a protective curtain having paint sprayed thereon, and said curtain being made of a material having non-stick characteristics.

#### 5,769,704 AIR RETURN BULKHEAD FOR REFRIGERATION TRAILERS

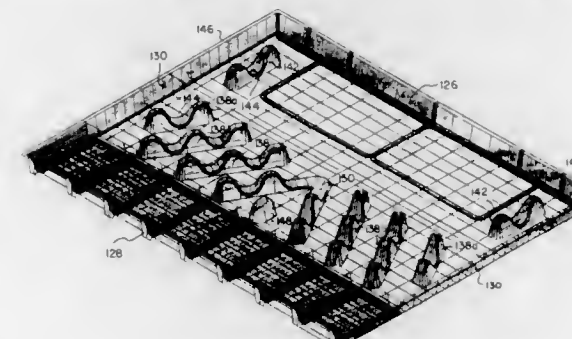
Steven A. Henning, Anderson, Ind., and Richard J. Gothier, Mesa, Ariz., assignors to Aero Industries, Inc., Indianapolis, Ind.

Continuation-in-part of Ser. No. 701,215, Aug. 21, 1996, abandoned. This application Feb. 18, 1997, Ser. No. 801,214

Int. Cl.<sup>6</sup> B60H 1/32

U.S. Cl. 454—118

20 Claims



1. An air return bulkhead adapted for mounting adjacent a refrigeration unit in spaced relation from a front vertical wall of a refrigeration trailer, comprising

- (a) a generally rectangular panel including a front wall and side, top, and bottom walls extending normal to said front wall to define a cavity behind said front wall;
- (b) said panel front wall including a plurality of horizontally spaced tapered sections in the lower portion thereof extending toward the rear of said bottom wall, said tapered sections defining therebetween a plurality of pallet stops co-planar with said front wall, said tapered sections containing a plurality of openings which enable air to enter said cavity;
- (c) first angled baffle means extending from a rear surface of said front wall above said tapered sections for directing air upwardly toward an upper central portion of said panel; and
- (d) second baffle means extending from said front wall rear surface above said first baffle means and adjacent to said side walls for directing air laterally toward the upper central portion of said panel, whereby air from the trailer is drawn from the bottom and sides of the trailer and directed to the refrigeration unit by said panel to improve the overall cooling of the trailer and to eliminate hot and cold spots.

#### 5,769,705

#### THERMOSTATICALLY CONTROLLED ENCLOSURE FOR TEMPERATURE SENSITIVE EQUIPMENT

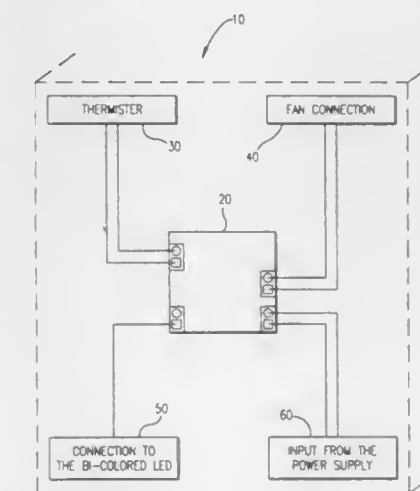
John O'Callaghan, Buchanan County, Mo.; John Nelson, Johnson County, Kans.; Paul G. Mandel, and R. Paul McGraw, both of Jackson County, Mo., assignors to Alliance Peripheral Systems, Inc., Kansas City, Mo.

Filed Aug. 16, 1996, Ser. No. 698,932

Int. Cl.<sup>6</sup> H05K 5/00

U.S. Cl. 454—184

2 Claims



1. A thermostatically controlled enclosure for a small computer device comprising:  
a housing suitable for enclosing a small computer device;  
a circulating fan mounted to the housing for circulating air through the housing;  
a temperature sensor responsive to the temperature within the housing and outputting a signal varying with the housing inside temperature;  
circuit means connected to said temperature sensor and to said circulating fan for varying the speed of the circulating fan as the temperature inside of the housing changes;  
a light emitting diode having an on state and an off state; and  
an oscillator circuit having a frequency of oscillation connected to said light emitting diode and said temperature sensor for alternately energizing and deenergizing said light emitting diode, thereby causing said light emitting diode to operate between said on state and said off state at said oscillator circuit frequency to thereby generate a flashing display when the temperature within the housing reaches a predetermined temperature.

5,769,706  
SLOT VENTILATOR

Ron Cheek, Witham, England, assignor to Tilton Hardware Limited, England

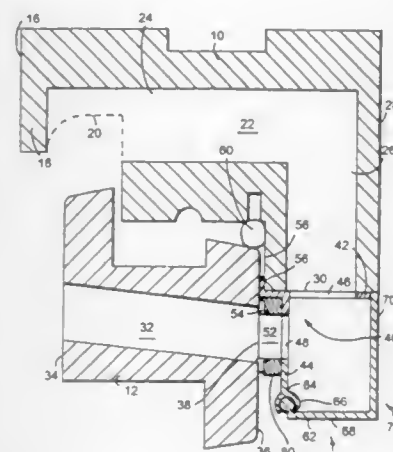
Filed Mar. 8, 1996, Ser. No. 613,967

Claims priority, application United Kingdom, Mar. 10, 1995, 950487

Int. Cl.<sup>6</sup> F24F 7/00

U.S. Cl. 454—195

17 Claims



1. A window or door assembly comprising a first building element defining a first ventilation slot through the first element, a second building element defining a second ventilation slot through the second element, and a slot ventilator comprising a housing, the housing having a ventilation inlet portion, the housing being located on one of the first and second building elements with the inlet portion located adjacent the first and second ventilation slots through the first and second elements, the inlet portion comprising first and second separate inlets formed as slotted portions of an inlet wall of the housing, the inlet wall of the housing including a first slotted portion which is aligned with a slot in the first building element, the inlet wall of the housing including a second slotted portion which is aligned with a slot through the second building element, the slotted portions of the inlet wall being each generally planar, and the slotted portions of the inlet wall being orientated a slant to one another.

## 5,769,707

## METHOD AND APPARATUS FOR BROADENING AN AIR DISCHARGE PATTERN FROM A ROOM AIR CONDITIONER

Kyung-Seog Jaang, and Gab-Youl Lee, both of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 6, 1996, Ser. No. 764,108

Claims priority, application Rep. of Korea, Dec. 12, 1995, 1995-48876; Apr. 13, 1996, 1996-11136; Apr. 13, 1996, 1996-11137

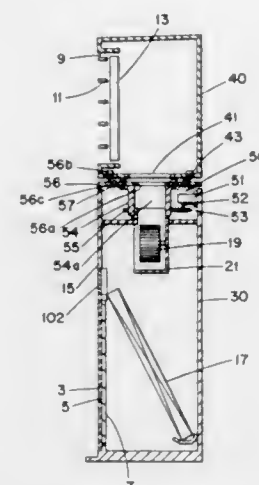
Int. Cl.<sup>6</sup> F24F 13/06

U.S. Cl. 454—233

11 Claims

9. A method of controlling an air discharge path of a room air conditioner, the air conditioner comprising a housing having a lower portion in which is formed an air inlet for receiving room air, an upper portion in which there is formed an air outlet for discharging the air back into the room, a heat exchanger disposed in a travel path of the air for changing the air temperature, and a blower for circulating the air through the housing, the method comprising the steps of:

- A) manually inputting a rotation signal into a controller;  
B) operating the blower and heat exchanger to conduct room air through the housing while changing the temperature thereof; and



C) oscillating the upper portion of the housing relative to the lower portion of the housing about a vertical axis.

## 5,769,708

## FABRIC AIR DISPERSION SYSTEM WITH AIR DISPERSING PANELS

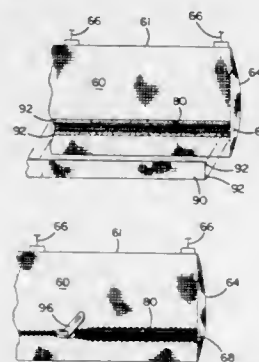
Nick Paschke, Platteville, Wis., assignor to Rite-Hite Corporation

Filed Oct. 22, 1996, Ser. No. 735,086

Int. Cl.<sup>6</sup> F24F 13/072

U.S. Cl. 454—306

24 Claims



1. An air dispersion system for conveying and distributing a source of forced air, the air dispersion system comprising, in combination:

- an inflatable fabric tube having a proximal end coupled to the source of forced air, a distal end opposite the proximal end, and at least one vent formed therein, the tube being constructed of an air-permeable material which allows a controlled leakage rate of air therethrough; and  
an air dispersing panel covering said at least one vent, said panel being constructed of an air-permeable material having a different relative porosity than the material of the tube so as to provide a dissimilar leakage rate of air therethrough.

## 5,769,709

## AIR CONDITIONER HAVING AIR PORTS OPENED AND CLOSED BY ROTATABLE BLADES

Do-Yeon Kim, Euwang, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Mar. 18, 1997, Ser. No. 819,976

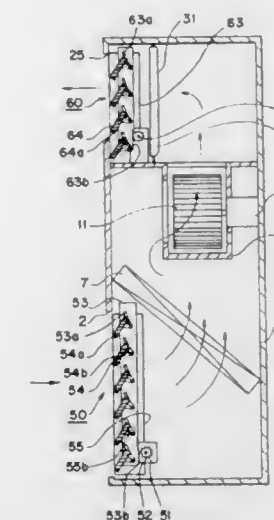
Claims priority, application Rep. of Korea, Mar. 21, 1996, 1996-7770; Mar. 21, 1996, 1996-7773; Dec. 3, 1996, 1996-61289

Int. Cl.<sup>6</sup> F24F 13/15

U.S. Cl. 454—318

11 Claims

9. An air conditioner comprising:  
a body forming an air port;



a plurality of parallel horizontal blades extending across the air port for opening and closing the air port, the blades being rotatable about respective horizontal axes;  
a stationary guide member connected to the blades for guiding the rotational movement of the blades; and  
a motor-driven cam member movable linearly up and down and connected to the blades for producing rotation of the blades about the respective axes by different respective angles.

## 5,769,710

## DISCHARGE OUTLET OPENING AND CLOSING APPARATUS OF AIR CONDITIONER

Do-Yeon Kim, Incheon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

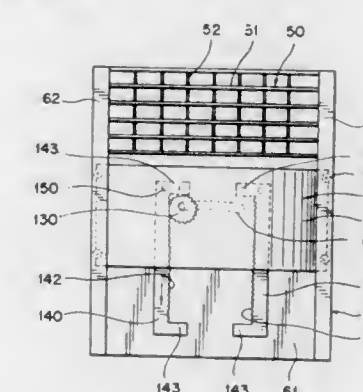
Filed Oct. 30, 1996, Ser. No. 741,358

Claims priority, application Rep. of Korea, Oct. 31, 1995, 95-38847; Oct. 31, 1995, 95-38849

Int. Cl.<sup>6</sup> F24F 13/12

U.S. Cl. 454—324

7 Claims



1. An air conditioner comprising:  
a housing forming a cool air outlet;  
an outlet closing mechanism mounted to the housing and including:  
a shutter movable vertically between outlet-open and outlet-closed positions;  
a motor having a drive axle rotatable in only one direction of rotation;  
a pinion fixed to the axle to be rotated thereby in the one direction of rotation; and  
a vertical rack structure connected to the shutter the rack structure being engageable with the pinion and driven by the pinion to at least one of the outlet-open and outlet-closed positions, wherein the rack structure comprises horizontally spaced first and second vertical racks, the pinion being shiftable into mesh with only the first rack for mov-

ing the shutter in one vertical direction into the outlet-open position in response to rotation of the pinion in the one direction of rotation, the pinion being shiftable out of mesh with the first rack and into mesh with the second rack for moving the shutter in another vertical direction opposite the first vertical direction into the outlet-closed position in response to rotation of the pinion in the one direction of rotation.

## 5,769,711

## HARVESTER THRESHER

Alfons Roberg, Harsewinkel, Germany, assignor to CLAAS KGaA, Harsewinkel, Germany

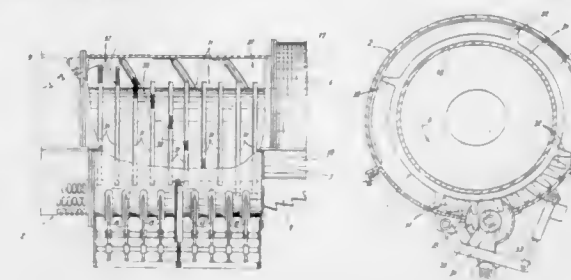
Filed Jun. 17, 1996, Ser. No. 664,418

Claims priority, application Germany, Jun. 17, 1995, 195 22 031.5; Jan. 8, 1996, 196 00 390.3

Int. Cl.<sup>6</sup> A01F 12/18; 12/40

U.S. Cl. 460—73

30 Claims



1. A harvester thresher, comprising a threshing mechanism; a separating device operating in accordance with the principle of an axial flow and having a separating rotor provided with transporting elements and a housing surrounding said separating rotor; at least one receiving axle which is axis-parallel to a rotary axis of said separating rotor; a chopping device associated with said separating device for chopping straw, said chopping device being formed as an axial flow chopping device and being located inside a region of a transporting path of said separating rotor, said transporting elements of said separating rotor being provided for chopping with outwardly open radial slots, said chopping device having a plurality of chopping cutters arranged on said at least one receiving axle at a distance from one another in a circumferential path of said transporting elements so that each of said chopping cutters is located for a cutting process inside a respective one of said radial slots for a short time.

## 5,769,712

## COMBINE UTILIZING BELT CONVEYOR ROLLER AS AN ACCELERATOR ROLL

Robert Honas, Independence, Mo., assignor to AGCO Corporation, Independence, Mo.

Filed Apr. 9, 1996, Ser. No. 629,726

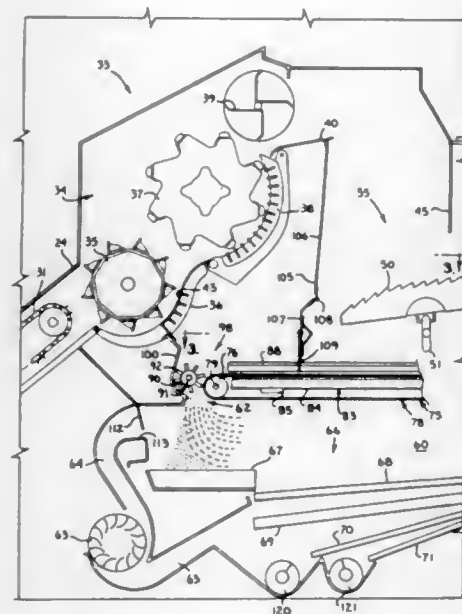
Int. Cl.<sup>6</sup> A01F 12/00

U.S. Cl. 460—74

9 Claims

5. In a combine having a threshing assembly, a separator positioned generally behind said threshing assembly and a cleaning section including a shaker shoe assembly positioned below said threshing assembly; the improvement comprising:  
a. a conveyor including a front conveyor roller and a conveyor belt; said conveyor positioned below at least a portion of and extending forward of said separator for carrying threshed material passing through the separator forward therefrom; said front conveyor roller rotatably mounted at a front end of said conveyor below said threshing assembly and above said shaker shoe assembly and being disposed on a generally horizontal axis;  
b. an accelerator roll rotatably mounted in said combine on a generally horizontal axis in closely spaced relation in front of said front conveyor roller and extending parallel therewith;





- c. drive means for rotating said front conveyor roller and said accelerator roll in opposite directions such that threshed material falling from a concave of said threshing assembly and carried forward by said conveyor passes between said accelerator roll and said conveyor belt as it passes around the front conveyor roller and is accelerated downward thereby to said shaker shoe assembly; and
- d. air delivery means for directing a stream of air rearward through and transverse to the accelerated threshed material to blow chaff and straw particles rearward from kernels of grain which pass downward to said shaker shoe assembly.

5,769,713

## DATA PROCESSING APPARATUS FOR BASEBALL GAME

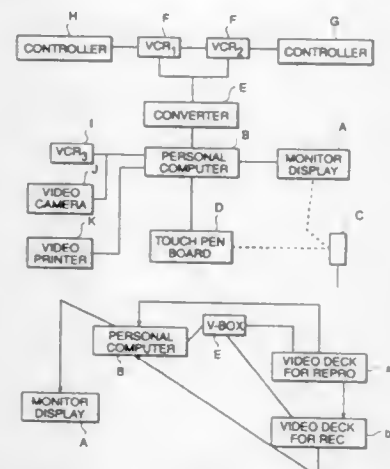
Muneomi Katayama, 1-12 Wakaba, Shinjuku-ku, Tokyo, Japan

Filed Dec. 4, 1995, Ser. No. 566,849

Int. Cl.<sup>6</sup> A63F 9/00

U.S. Cl. 463—3

21 Claims



1. A system for analyzing offensive and defensive actions of teams in baseball games, comprising:
- means for inputting data on offensive/defensive actions to be analyzed, said offensive/defensive action data including data on individual player actions to be analyzed;
- means for displaying said offensive/defensive action data including at least means for displaying graphical representations of

said data on said individual player actions, and means for displaying graphical representations of game result and individual player action result data;

means for recording and playing back video images of an actual game for analysis; and

means for combining at least said playing back of said video images from said recording and playing back means with said displaying of said offensive/defensive action data, whereby video images of said game are extracted and displayed in coordination with outputting and displaying of offensive/defensive action data selected for viewing.

5,769,714

## METHODS AND APPARATUS FOR PLAYING BASEBALL GAMBLING GAMES

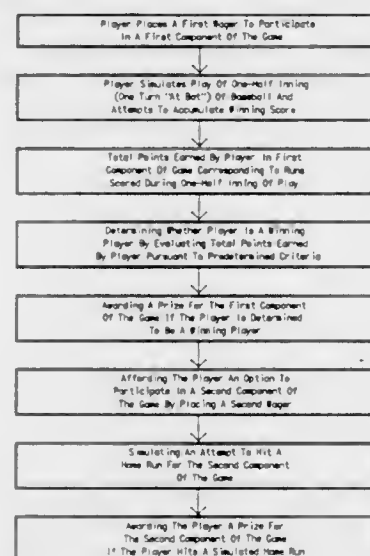
Herbert Wiener, 3220 Netherland Ave., Apt. 2F, Bronx, N.Y. 10463; Michael Steven Budlow, 3220 Netherland Ave., Apt. 2F, Riverdale, N.Y. 10463, and Robert D'Alessio, 3 - Cloud Dr., Montville, N.J. 07045

Filed Jun. 19, 1996, Ser. No. 667,984

Int. Cl.<sup>6</sup> A63F 9/22

U.S. Cl. 463—3

17 Claims



1. A method of playing a baseball gambling game on an electronic gaming device, comprising the steps of:
- affording at least one player an opportunity to place an initial wager to participate in the game;
- simulating at least one turn at bat by displaying representations of at bat events of a baseball game on a video display selected under computer program control;
- totalling points earned by said at least one player corresponding to runs scored during said simulated at least one turn at bat;
- determining whether said at least one player is a winning player by evaluating total points earned by said at least one player pursuant to predetermined criteria; and
- awarding a prize to said at least one player if said player is determined to be a winning player.

5,769,715

## APPARATUS AND METHOD OF PLAYING POLITICAL GAMES

Laurence R. Brown, 6404 Bardu Ct., Springfield, Va. 22152

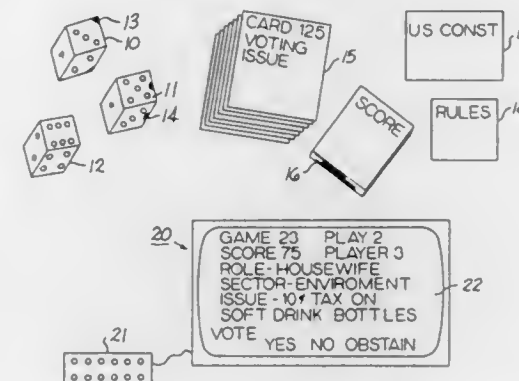
Filed Aug. 30, 1996, Ser. No. 707,208

Int. Cl.<sup>6</sup> A63F 9/18

U.S. Cl. 463—10

9 Claims

1. The method of playing a political game with one or more players, comprising in combination the steps of:



presenting a set of randomly chosen political issues for player resolution by casting a vote,

randomly presenting each player with a role to exercise in voting upon said political issues in the set of issues,

providing predetermined preferred voting criteria including evaluation of voter roles for at least part of said political issues with accompanying voting score evaluations referenced to no, yes and abstain votes; and

determining a winning score for each play by comparison of votes of each player as a function of the role presented to the respective players by comparison of said preferred voting criteria scores.

5,769,716

## SYMBOL FALL GAME METHOD AND APPARATUS

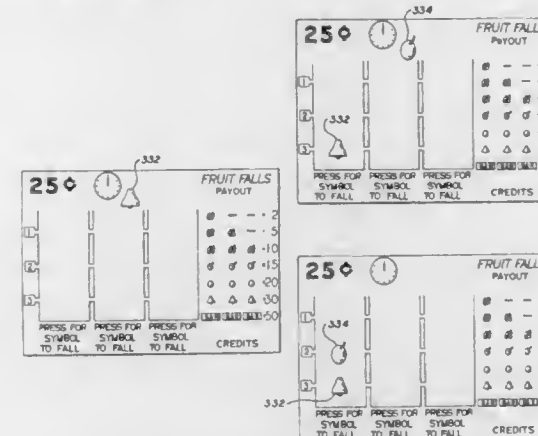
Ali Saffari, Reno; Robert Breckner, Sparks; Mark Bansemer, and Evelyn Liao, both of Reno, all of Nev., assignors to International Game Technology, Reno, Nev.

Filed Sep. 30, 1996, Ser. No. 720,490

Int. Cl.<sup>6</sup> G07F 17/34

U.S. Cl. 463—20

16 Claims



1. A computer-implemented process for playing a game by a user to achieve a game outcome, the computer having a memory and coupled to at least a first user input device, the method comprising:
- storing, in memory, an indication of symbol alignments that are winning alignments;
- displaying, on a display device coupled to said computer, a game region defining a plurality of positions in a plurality of vertical columns, including initially displaying a plurality of unoccupied positions in each of said vertical columns wherein no symbols are displayed in the unoccupied positions;
- displaying at least a first symbol on said display device wherein said first symbol is initially displayed in an area remote from any of said plurality of positions;
- controlling said display device to move said symbol to one of said plurality of positions, said one position being a lower-

most unoccupied position in a column selected using the status of said user input device;

positioning a plurality of symbols over at least some of said plurality of positions;

outputting an indication of a win if an alignment of symbols corresponds to a winning alignment; and

wherein the skill with which said user provides input via said user input device affects the outcome of the game.

5,769,717

Patent Not Issued For This Number

5,769,718

## VIDEO GAME APPARATUS AND MEDIUM READABLE BY A COMPUTER STORED WITH VIDEO GAME PROGRAM

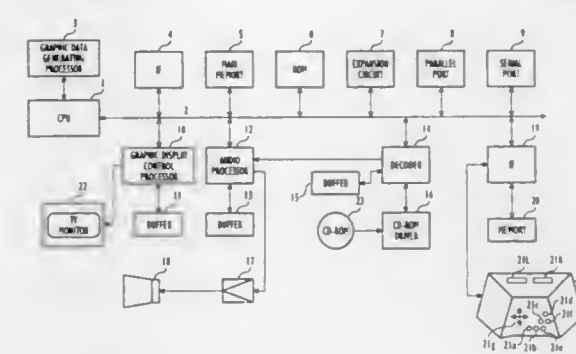
William R. Rieder, c/o Konami Computer Entertainment Chicago Inc. 900 Deerfield Pkwy., Buffalo Grove, Ill. 60089-4510

Filed May 15, 1996, Ser. No. 648,418

Int. Cl.<sup>6</sup> G09G 3/00

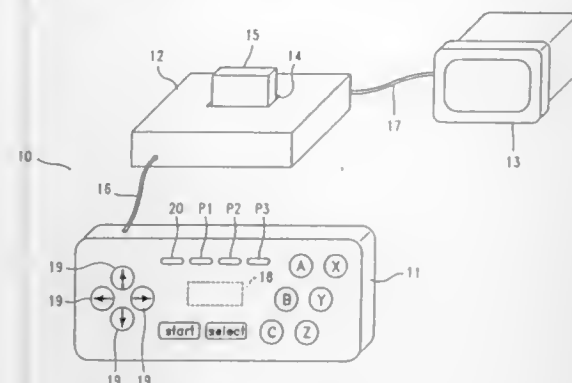
U.S. Cl. 463—31

2 Claims



1. A video game apparatus comprising:
- player image data generating means for generating image data of a player character;
- background's image data generating means for generating image data of a background that expresses a floor and walls partitioning a virtual three-dimensional space as a bird's-eye view;
- player character's position determining means for determining a position of the player character in the virtual three-dimensional space in accordance with an operation made by a game player;
- image synthesizing means for synthesizing the image data of the player character generated by said player image data generating means with the image data of the background generated by said background's image data generating means in accordance with the position determined by said player character's position determining means; and
- image data processing means for processing, if the position of the player character in the virtual three-dimensional space that is determined by said player character's position determining means is a position hidden behind by the floor or the wall, the image data synthesized by said image synthesizing means so that the floor or the wall concealing the player character is transparentized, thereby and the rear of the wall or the floor is displayed.

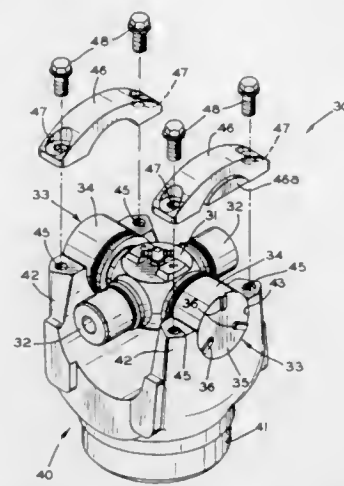
5,769,719  
VIDEO GAME SYSTEM HAVING MEANS FOR  
DISPLAYING A KEY PROGRAMMING  
Jerry Hsu, Hsin-Chu, Taiwan, assignor to United Microelec-  
tronics Corp., Hsin-Chu, Taiwan  
Filed May 26, 1995, Ser. No. 451,429  
Int. Cl.<sup>6</sup> G06F 3/02; A63F 9/24  
U.S. Cl. 463—37 14 Claims



1. A video game system comprising:  
(1) a video display for displaying a key programming process, and for displaying video output of the video game system;  
(2) a game cartridge having a video game software stored in the game cartridge;  
(3) a game control unit having a program key and a plurality of control keys, said game control unit having no processing unit for processing the program key and said plurality of control keys; and  
(4) a game box comprising:  
(a) an electrical cable for connecting the video display;  
(b) a slot for receiving the game cartridge wherein the game cartridge is removable when the game cartridge is plugged in the slot;  
(c) a memory unit and a central processing unit (CPU) for program execution;  
(d) a system software for controlling operations of the game box; the system software comprising a displaying software for controlling operations of displaying the key programming process over the video display after the program key is pressed and terminating display of the key programming process after the program key is pressed again; the key programming process defining a function of a control key by using a key sequence which is formed by a plurality of other control keys of the game control unit, said key sequence being stored in said game box;  
wherein the video game software stored in the game cartridge is executed by the CPU when playing the video game, and the game box receives input signals from the game control unit to control proceedings of the video game and displays video outputs over the video display.

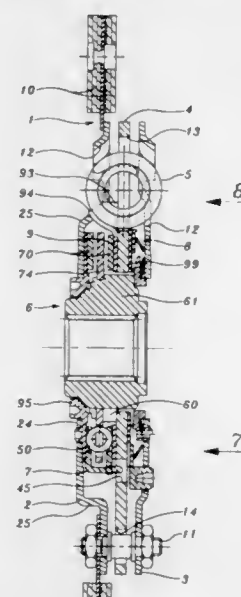
5,769,720  
ANTI-ROTATION BEARING CAP AND RETAINER FOR  
UNIVERSAL JOINT  
Albert Aiken, and Johnny N. Smith, both of Toledo, Ohio,  
assignors to Dana Corporation, Toledo, Ohio  
Continuation-in-part of Ser. No. 490,788, Jun. 15, 1995, Pat.  
No. 5,647,799. This application Mar. 1, 1996, Ser. No. 609,656  
Int. Cl.<sup>6</sup> F16D 3/40 14 Claims

1. A universal joint assembly comprising:  
a yoke including an arm having a recess formed therein;  
a cross having an outwardly extending trunnion;  
a bearing cap rotatably mounted on said trunnion, said bearing cap including an outer circumferential surface and an end surface, wherein a portion of said outer circumferential sur-



face engages said recess formed in said yoke arm, said end surface having at least one axially extending protrusion provided thereon; and  
a retainer strap removably secured to said yoke arm for retaining said bearing cap within said recess, said retainer strap including a slot which receives said protrusion of said bearing cap to prevent rotation of said bearing cap relative to said yoke arm.

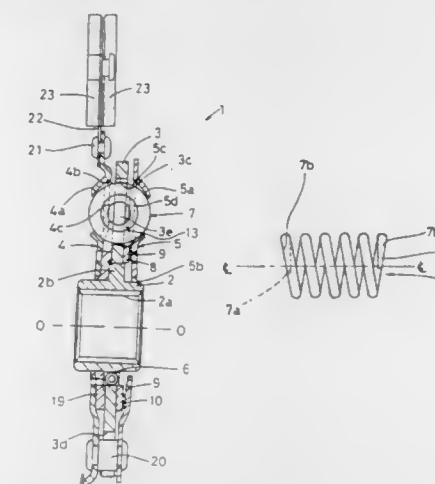
5,769,721  
TORSION DAMPER WITH A CONTROL RING, IN  
PARTICULAR A MOTOR VEHICLE FRICTION CLUTCH  
Fabrice Tavron, Creteil, and Sylvain Thomire, Levallois, both  
of France, assignors to Valeo, Paris, France  
Filed May 2, 1996, Ser. No. 643,100  
Claims priority, application France, May 2, 1995, 95 05461  
Int. Cl.<sup>6</sup> F16D 3/14 16 Claims



1. A torsion damper comprising:  
an input element fixed to two guide rings which are mounted on either side of a damper plate, and which are connected and fastened to each other by means of spacers; first housings formed in facing relationship with each other in the guide rings and the damper plate respectively; first circumferentially acting resilient members mounted in the housings so as to couple the guide rings resiliently to the damper plate; an output element surrounded by the guide rings and the damper plate; loose coupling means interposed operatively between the inner periphery of the damper plate and the outer periph-

ery of the output element, for coupling the damper plate with the output element for rotation together after a circumferential clearance, defined by the loose coupling means, has been taken up; a predamper, which is mounted, firstly, radially inwardly of the first resilient members, and secondly, axially between the damper plate and one of the guide rings, referred to as the first guide ring; and axially acting friction means comprising at least one friction ring and an axially acting resilient ring bearing on the other guide ring, referred to as the second guide ring, so as to act on the friction ring and clamp the predamper between the damper plate and the first guide ring, wherein the predamper comprises an input part coupled in rotation to the damper plate, an output part coupled in rotation to the output element, and circumferentially acting second resilient members interposed between the input part and the output part, and wherein a control ring, having an abutment means projecting radially so as to come into engagement with one of the circumferential ends of one of the first resilient members, is acted on by the friction means, being arranged between the damper plate and the first guide ring, wherein the control ring is interposed axially between the input part of the predamper and the damper plate, and the abutment means of the control ring is adapted to cooperate with at least one of the lateral edges of the first housing in the first guide ring associated with the first resilient members.

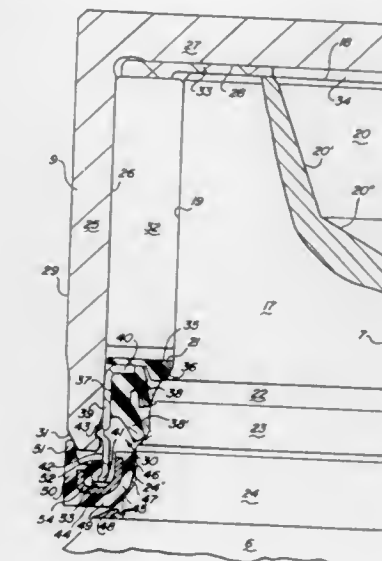
5,769,722  
TRAPEZOIDAL SHAPED COIL SPRING FOR A DAMPER  
DISC APPARATUS  
Hiroshi Uehara, Hirakata, Japan, assignor to Exedy Corpora-  
tion, Osaka, Japan  
Filed Mar. 8, 1996, Ser. No. 612,996  
Claims priority, application Japan, Mar. 17, 1995, 7-058864  
Int. Cl.<sup>6</sup> F16D 3/12 6 Claims



1. A coil spring comprising:  
a plurality of wire coils which spirally extend at a generally constant pitch, said wire coils defining a generally straight center line and including a first coil and a last coil, said first and last coil springs diverging away from one another defining in combination with remainder of said wire coils a generally trapezoidal shape with said wire coils in a torsion and compression free state, wherein said first coil includes a first end portion and said last coil includes a second end portion; and  
wherein each of said first and second end portions include a tapered surface disposed in a plane defined by a portion of said first and said last coils, respectively.

5,769,723  
CROSS MEMBER UNIT FOR UNIVERSAL JOINTS  
Gerd Faulbecker, Hattingen; Manfred Meineke, Witten, and  
Rolf Sedlmeier, Kamp-Lintfort, all of Germany, assignors to  
GKN Automotive AG, Lohmar, Germany  
Filed Oct. 22, 1996, Ser. No. 736,022  
Claims priority, application Germany, Jun. 5, 1996, 196 22  
446.2 7 Claims

Int. Cl.<sup>6</sup> F16D 3/40  
U.S. Cl. 464—131



1. A cross member unit for universal joints comprising a cross member with four arms, two arms defining a common longitudinal axis;  
a bearing bush provided per arm, said bearing bush including a casing, a base, and an open end with its casing being arranged coaxially around a cylindrical running face of the associated arm at a distance therefrom, a space is formed between the inner face of the casing and the running face;  
a ring of rolling contact members in the form of rollers or needles constituting a bearing means is arranged in said space, a preseal and a main seal being arranged towards the open end between the arm and the casing, said preseal and main seal being at least partially of an elastomer and said main seal positioned within the bearing bush;  
a storage chamber for storing lubricating grease on each arm, said storage chamber being tapered, starting from said end face;  
each main seal including an externally positioned carrier having an outer face engaging with an interior surface of the associated bearing bush, said carrier projecting beyond the open end of the bearing bush, each main seal including at least two sealing lips projecting towards the associated arm, said lips for contacting a sealing face of the arm, and said lips extending around said arm, said lips, while being directed away from the bearing bush, extending at an angle towards the arm;  
each preseal including a first leg firmly positioned on a seat face of the associated arm, said preseal including a web extending transversely to the longitudinal axis and a second leg extending toward the base of the bearing bush;  
a first sealing lip projecting from said second leg contacting the bearing bush in the region of the open end, and a second sealing lip extending at an angle towards the base of the bearing bush contacting the outer face of the carrier that is projecting beyond the open end.



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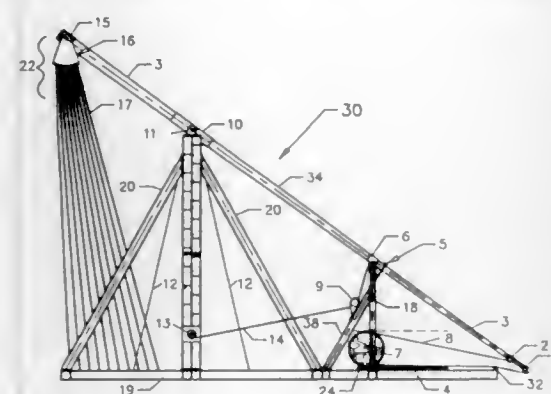
5,769,724

## HUMAN FREE-FLIGHT CATAPULT

Theodore F. Wiegel, P.O. Box 1731, Goldenrod, Fla. 32733  
Filed Nov. 8, 1996, Ser. No. 745,833  
Int. Cl.<sup>6</sup> A63G 31/08

U.S. Cl. 472-49

18 Claims



1. A catapult amusement ride comprising:  
a base divided into a drive support area at a first end, a conveyance support area at a second opposite end, and a pivot post support area located between said first and second ends;  
a pivot post having a first end attached to said base;  
a lever beam rotatably attached to said pivot post at a distal second end;  
an attachment point between said pivot post and said lever beam which divides said lever beam into a drive segment and a conveyance segment;  
a plurality of bungee/shock cords attached between the drive segment of said lever and the drive support area of said base;  
a conveyance vehicle attached to the end of said conveyance segment and resting on the said conveyance support area of said base during a pre-launch configuration;  
a triggered locking assembly attached to said base between said pivot post support area and said conveyance support area of said base;  
wherein when said lever device is held by said trigger locking assembly and, upon release of said lever by said trigger locking assembly, said bungee/shock cords pull on said drive segment of said lever causing said conveyance vehicle to be projected into the air by said conveyance segment along a predictable trajectory.

5,769,725

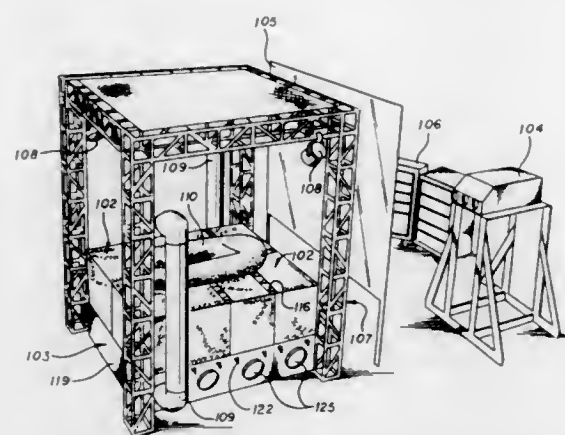
## INFLATABLE MOTION BASE

Andrew M. Ogden, Pasadena; Marshall M. Monroe, La Canada, and David F. Barnett, Simi Valley, all of Calif., assignors to Disney Enterprises, Inc., Burbank, Calif.  
Filed Jul. 16, 1996, Ser. No. 680,908  
Int. Cl.<sup>6</sup> A63G 31/12

U.S. Cl. 472-59

25 Claims

1. An inflatable motion base for use with a fluid to move a load through various degrees of freedom, comprising:  
a plurality of inflatable cells, each of said cells provided with an inlet for receiving fluid into said cell and a flow control device that controls the fluid flow passing through said inlet, wherein at least one of said cells includes a load-bearing surface connecting to the load-bearing surface of another cell to create a continuous load-bearing surface that is flexible in at least one degree of freedom; and



a reaction structure, wherein each cell is directly connected to said reaction structure.

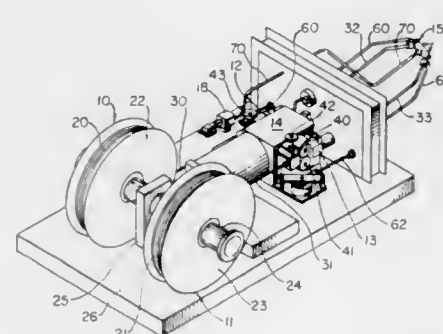
5,769,726

## SPARK GENERATING APPARATUS

Philip C. Cory, 10474 Santa Monica Blvd. Suite 305, Los Angeles, Calif. 90025  
Filed Apr. 24, 1997, Ser. No. 842,265  
Int. Cl.<sup>6</sup> A63G 31/00

U.S. Cl. 472-66

7 Claims



1. A spark generating apparatus comprising:  
(a) metal source means for providing at least two independent sources of cylindrical, metal wire;  
(b) first and second wire guides each having an input and an output, the input of each of said first and second wire guides being adapted to be coupled to one of the sources of metal wire;  
(c) motive means coupled to said first and second wire guides for imparting synchronous, linear movement to the wire from the input to the output of said wire guides;  
(d) a non-conducting member having a pair of obliquely oriented, cylindrical apertures disposed therethrough;  
(e) first and second conductive feed tips having first and second ends, each of said first and second conductive feed tips mounted within one of the apertures of said non-conductive member, the first ends of said first and second feed tips being coupled to the output of said first and second wire guides, respectively;  
(f) power source means for atomizing the metal wire being coupled to said first and second feed tips; and  
(g) air flow means for providing a directed stream of air being coupled to said non-conductive member adjacent the second ends of said first and second feed tips.

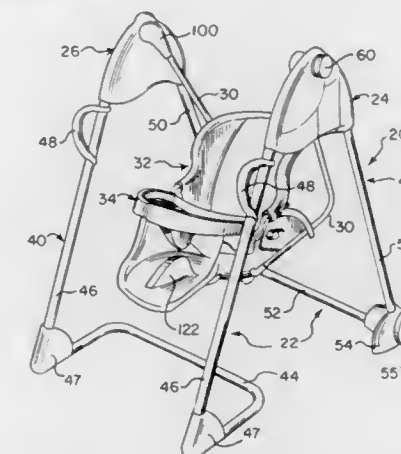
5,769,727

## SWING

Paul F. Fair, Denver, and Mark D. Jankowski, Thornton, both of Colo., assignors to Lisco, Inc., Tampa, Fla.  
Filed Dec. 27, 1996, Ser. No. 774,217  
Int. Cl.<sup>6</sup> A63G 9/00

U.S. Cl. 472-118

4 Claims



1. A swing for a child, comprising:  
a support structure, the support structure including at least two floor-contacting members, each floor-contacting member having a floor-contacting surface thereon and a wheel rotatably mounted on the floor-contacting member in a position to support the swing structure with the floor-contacting surface when the swing is in an operational position and to support the structure with the wheels when the swing is in a transporting position; and  
a child support attachable to the support structure.

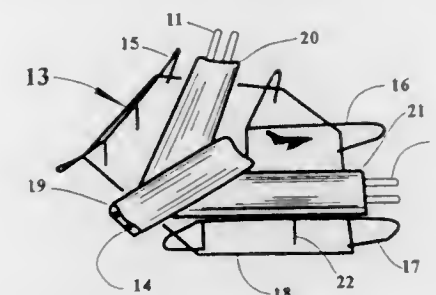
5,769,728

## BALL TRACKER TRICK SHOTS ON A POOLTABLE OR HOME FLOOR OR TABLE

Pete Kasino, Alcott Post Office 3700, Tennyson, Denver, Colo. 80212  
Filed Mar. 25, 1996, Ser. No. 621,217  
Int. Cl.<sup>6</sup> A63B 37/00

U.S. Cl. 473-2

13 Claims



1. A track system in combination with a pool table having a surface, the system for guiding a ball over the surface of the pool table, the system comprising:  
a pool table having a flat playing surface and at least two sections of track adapted for accepting a ball, the sections of track including:  
at least one flat section of track for accepting a ball, said flat section of said track having connection means for attaching said section of track to another section of track, at least one raised section of track for allowing a ball on the track to roll over another ball, the raised section of track having:  
a base, said base having an opening for accepting a ball, the raised section of track extending over the opening at a distance that allows placement of a ball in said opening; means on said section of track engaging said connection means so that said flat section of track is attached to said raised section of track such that a ball propelled to roll along said flat section of track will roll over a ball placed within the opening in said base of said raised section of track.

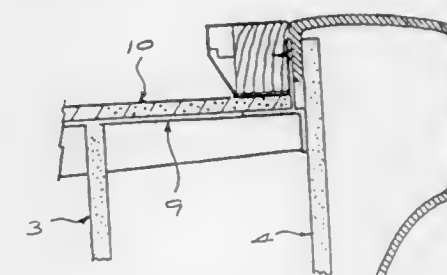
5,769,729

## POOL TABLE

David M. D'Aguiar, Cape Town, South Africa, assignor to League Pool Table Technology CC, Cape Town, South Africa  
Filed Jun. 16, 1997, Ser. No. 876,339  
Claims priority, application South Africa, Jun. 20, 1996, 96/5228; Apr. 18, 1997, 97/3336  
Int. Cl.<sup>6</sup> A63D 15/00

U.S. Cl. 473-24

5 Claims



1. A coin operated pool table having a hollow moulded base supporting a top providing a playing surface and including ball collection means comprising ball collecting channels extending from sheet material substantially co-extensive with and positioned below the table playing surface.

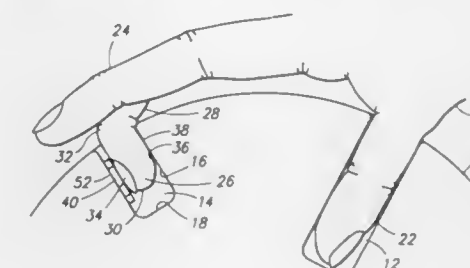
5,769,730

## BOWLING BALL FINGERTIP POSITIONER

Roger Haskell, 25246 106th Ave. SE., Apt. A-106, Kent, Wash. 98031  
Filed Dec. 9, 1994, Ser. No. 353,083  
Int. Cl.<sup>6</sup> A63B 37/00

U.S. Cl. 473-128

8 Claims



1. A bowling ball for positioning a finger in a finger hole; comprising:  
substantially cylindrical finger hole having an interior wall and a length adapted to receive a fingertip portion of a finger, said fingertip portion comprising the portion of a finger from the first knuckle to the end of the finger, including a fingernail and finger pad portion; and  
a fingertip positioner means protruding into said finger hole and adapted to position a finger to grip said bowling ball with the pad portion of said finger pressed against said interior wall of the finger hole when the finger is positioned in said finger hole with the fingernail of the finger in contacting relationship with the fingertip positioner.

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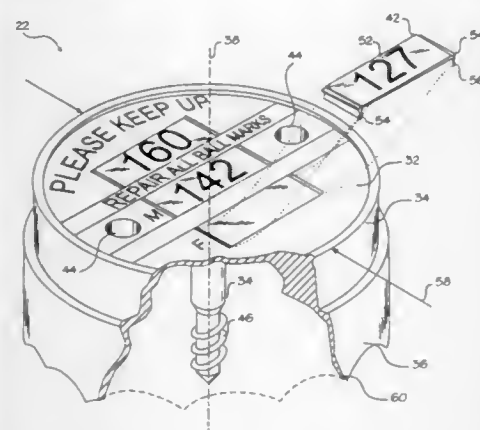
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wherein in use, the fingertip portion of a finger is placed in said finger hole with the fingernail of said finger in contacting relationship with said fingertip positioner such that said pad portion of said finger is positioned to grip the interior wall of the finger hole.

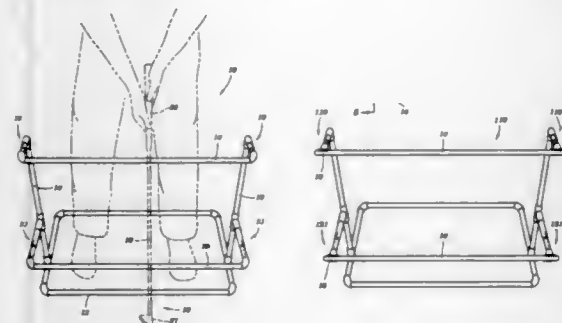
5,769,731  
GOLF COURSE DISTANCE MARKER AND METHOD OF USING THE SAME  
Thomas H. Relmer, 129 Stanley Rd. 915, Burlingame, Calif. 94010

Filed Mar. 12, 1997, Ser. No. 815,738  
Int. Cl.<sup>6</sup> A63B 57/00  
U.S. Cl. 473—150 17 Claims



1. A distance marker for golf courses adapted for seating flush with the surface of the ground, comprising in combination: a) a cap having means on a top surface for displaying information; b) an annular hole stop shoulder integral with and depending down from the cap providing a support surface spaced a distance H below the top surface of the cap; c) a circumferential blade integral with and depending downward from the outside periphery of the annular hole stop shoulder having a width D, the width D is at least equal to the distance H to enable the blade to dig a hole for the distance marker.

5,769,732  
GOLF TRAINING AID  
James Edward O'Neal, 70 Canning Rd., Saranac, N.Y. 12981  
Continuation-in-part of Ser. No. 679,456, Jul. 9, 1996, abandoned. This application Sep. 12, 1996, Ser. No. 713,041  
Int. Cl.<sup>6</sup> A63B 69/36  
U.S. Cl. 473—258 19 Claims

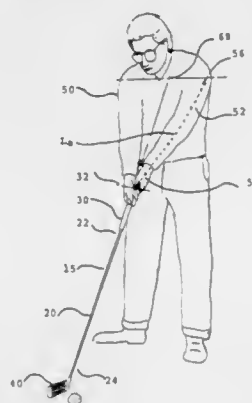


1. A golf practice device for use with a golf club having a shaft extending between a handle and a head, a predetermined shaft to head angle, and the golf club being of sufficient size to enable a user standing substantially upright on a ball playing surface to

swing the club for hitting a ball disposed proximate the user on the ball playing surface, said golf practice device comprising:  
a base adapted for supportive contact with the ball playing surface;

first and second guide members supported by said base, said first and second guide members being adapted to slidably engage a portion of the club shaft located closer to the club handle than the club head and a portion of the club shaft located closer to the club head than the club handle along a notional surface defined by said first and second guide members, at least one of said first and second guide members being adapted for selective movement within a predetermined range of movement wherein said notional surface is selectively positionable at selected angles of incline relative to the ball playing surface so that said notional surface is positionable at an angle complementary to the shaft to head angle of the golf club, said selective movement being adapted to selectively increase distance between said first and second guide members as said selected angles of incline decrease.

5,769,733  
METHOD FOR BALANCING A SET OF GOLF CLUBS  
Stan A. Williams, 1216 Scholl Rd., Ames, Iowa 50014, and Tae N. Kim, 220 S. 28th St., West Des Moines, Iowa 50266  
Filed Apr. 22, 1996, Ser. No. 636,045  
Int. Cl.<sup>6</sup> A63B 53/00  
U.S. Cl. 473—291 6 Claims

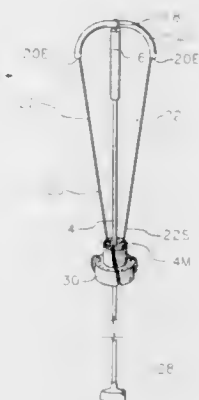


1. A method for balancing a set of golf clubs, each of the clubs having a shaft with an upper end and a lower end, a grip, and a head with a ball-striking face, the head mounted on the lower end of the shaft and the grip mounted on the upper end of the shaft, the pitch of the head increasing through the set and the length of the shaft of each club decreasing through the set as the pitch of each head increases, the method comprising the steps of:

- selecting a reference club from the set to be balanced;
- calculating a dynamic moment of inertia for the reference club, the dynamic moment of inertia including a component with relation to a center of grip axis and a component with relation to a golfer's axis of rotation;
- calculating appropriate parameters for the shafts, grips and heads of the remaining clubs within the set to be balanced so that their dynamic moments of inertia, which include a component with relation to the center of grip axis and a component with relation to the golfer's axis of rotation, are all substantially equivalent to that of the reference club; and
- calculating a first moment of mass of the reference club relative to the center of grip axis.

5,769,734  
GOLF SWING TRAINING DEVICE  
Royal Ellis Qualey, Sr., 2713 Russell Rd., Centralia, Wash. 98531

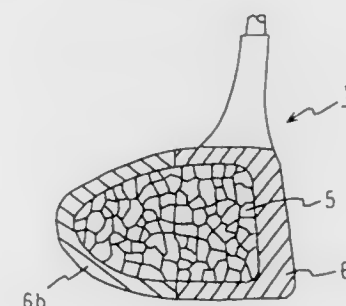
Filed Dec. 13, 1996, Ser. No. 763,131  
Int. Cl.<sup>6</sup> A63B 69/36;15/00  
U.S. Cl. 473—233 10 Claims



1. A golf swing training device for increasing golf club swing resistance during the power zone portion of a golf swing and adapted for attachment to a golf club having a golf head, a shaft and a grip with a recess, comprising:

- a weight having a central bore and communicating therewith a shaft-receiving groove having a predetermined width, which groove extends radially from the bore to the periphery of the weight and axially from the top to the bottom thereof, thereby defining apposing, flexible clamp portions of the weight that permit the weight to be mounted on the shaft for reciprocal sliding movement between a mid portion of the shaft and the head without being inadvertently dislodged from the shaft;
- an eyelet for insertion into the recess in the grip; and
- an extensible cord inserted through the eyelet and having first and second weight support portions of equal and adjustably variable length attached to the weight and terminating in first and second ends, respectively; whereby a downward swing of the club forces the weight to slide against resistance of the cord from a mid portion of the shaft along the shaft toward the golf club head, thereby stretching the cord and causing a person swinging the club to experience increased swing resistance primarily during the power zone portion of the swing only.

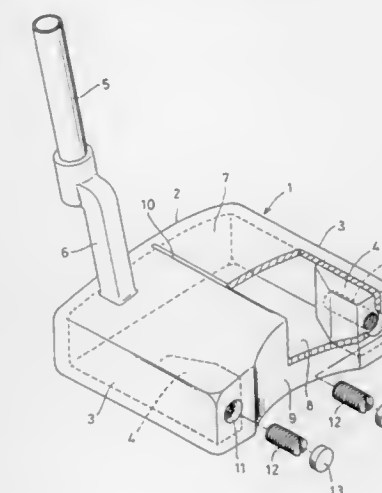
5,769,735  
METAL WOOD GOLF CLUB HEAD  
Toshihiro Hosokawa, Izumi, Japan, assignor to Kabushiki Kaisha Hosokawaseisakusho, Izumi, Japan  
Continuation of Ser. No. 526,851, Sep. 11, 1995, abandoned. This application Dec. 9, 1996, Ser. No. 762,048  
Int. Cl.<sup>6</sup> A63B 53/04  
U.S. Cl. 473—332 6 Claims



1. A metal wood golf club head comprising:  
a metal outer shell; and

a foamed aluminum inside portion having a sequence of cells distributed throughout the entirety of said foamed aluminum inside portion and having an apparent specific gravity of about 0.2-0.3 and porosity of about 65-78%, and fixedly attached within the metal outer shell and formed integrally with said metal outer shell.

5,769,736  
GOLF PUTTER  
Shozaburo Sato, Minoo, Japan, assignor to Yugen Kaisha Koshinsha, Osaka, Japan  
Continuation of Ser. No. 620,323, Mar. 22, 1996, abandoned. This application Jun. 20, 1997, Ser. No. 879,648  
Int. Cl.<sup>6</sup> A63B 53/04  
U.S. Cl. 473—335 7 Claims



7. A golf putter including a putter head comprising:  
a face portion having a first end and a second end;  
a first side wall structure connected to said first end of said face portion and extending rearwardly thereof;  
a second side wall structure connected to said second end of said face portion and extending rearwardly thereof;  
a top wall extending from an upper portion of said face portion and between an upper portion said first side wall structure and an upper portion of said second wall structure;  
a bottom wall extending from a lower portion of said face portion and between a lower portion of said first side wall structure and a lower portion of said second side wall structure;  
a rear wall connecting said first side wall structure, said second side wall structure, said top wall, and said bottom wall;  
a first weight provided only at a rear end portion of said first side wall structure; and  
a second weight provided only at a rear end portion of said second side wall structure, wherein said first and second side wall structures each has a length which is substantially equal to but slightly shorter than the length of said face portion so that the center of gravity is spaced rearwardly of said putting face toward the rear of the putter head,  
wherein said first weight and said second weight are connected to an inside surface of said first side wall portion and an inside surface of said second side wall portion, respectively, and said first and second weights each include a threaded opening for receiving a threaded adjusting weight.



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JUNE 23, 1998

5,769,737

## ADJUSTABLE WEIGHT GOLF CLUB HEAD

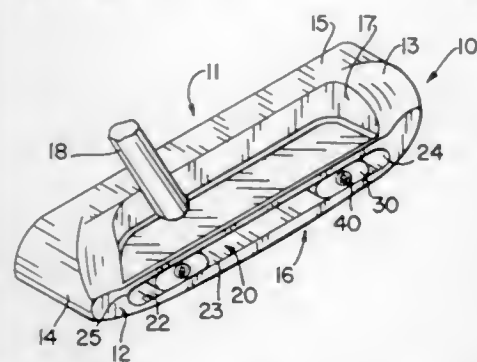
Brice R. Holladay, 741 Old Hickory Rd., Jacksonville, Fla. 32207, and Richard B. Hendrickson, 8335 Freedom Crossing Trail #4201, Jacksonville, Fla. 32256

Filed Mar. 26, 1997, Ser. No. 824,811

Int. Cl.<sup>6</sup> A63B 53/06

U.S. Cl. 473—336

6 Claims



1. A golf club head having a striking face, a toe end, a heel end, a rear wall, a sole and a top surface, further comprising a generally horizontally disposed weight receiving cavity extending laterally through said club head from an access opening in said rear wall toward said striking face and extending longitudinally through said club head the majority of the distance between said toe end and said heel end, said weight receiving cavity having a generally parallel upper surface and lower surface, and further comprising at least one weight member fitting within said weight receiving cavity, and weight member securing means to releasably secure said at least one weight member at a fixed position contacting said upper and lower surfaces within said weight receiving cavity, where said at least one member is comprised of a first weight component and a second weight component connected to each other by said weight member securing means, and where said first weight component has a non-threaded bore and said second weight component has a threaded bore, and where at least one of said first and second weight components has a bevelled contact wall, and where said weight securing means comprises a threaded bolt member inserted through said non-threaded bore and said threaded bore, whereby tightening said threaded bolt member causes said at least one weight member to be wedged against said upper and lower surfaces of said weight receiving cavity.

5,769,738

## GOLF PUTTER

Timothy Kershaw, 4 The Vale off Skull House La., Wigan, England, WN6 9HD, and Christopher Gardner, Iby House Farm Station rd., Northwich, England, CW8 2RQ

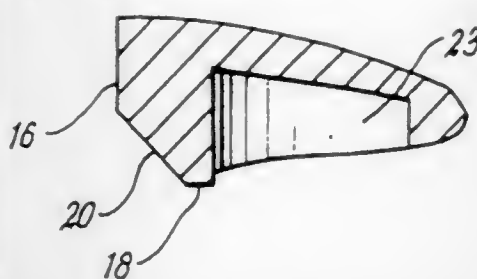
Filed Nov. 7, 1996, Ser. No. 747,018

Claims priority, application United Kingdom, Nov. 8, 1995, 9522895; Apr. 12, 1996, 9607582

Int. Cl.<sup>6</sup> A63B 53/04

U.S. Cl. 473—340

9 Claims



1. A golf putter comprising a putter head with a front surface intended to make contact with a golf ball and a base surface intended to rest on or be closely adjacent to the ground when the

front surface makes contact with a golf ball, said front surface being located above the level of the base surface and said front surface and the base surface being not adjacent, the center of gravity of the putter head being located above the level of the center of a golf ball resting on the ground when the base surface of the putter is closely adjacent to the ground.

5,769,739

Patent Not Issued For This Number

5,769,740

## GOLFING ACCESSORY APPARATUS

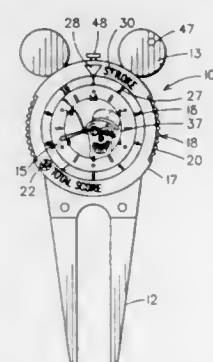
David Colangelo, St. Petersburg, Fla., assignor to Sun Time Enterprises, Inc., Clearwater, Fla.

Filed Jul. 10, 1997, Ser. No. 889,923

Int. Cl.<sup>6</sup> A63B 57/00

U.S. Cl. 473—408

18 Claims



1. A golf club tool, timepiece and scoring apparatus comprising: an elongated body having front and back sides and a pair of ends and having a pair of prongs on one said end thereof shaped to form a divot tool, said body also having a pair of lobes formed on the other end thereof shaped to cradle a golf club shaft therebetween and said body having an opening formed between the ends thereof for mounting a timepiece therein, said timepiece opening extending through said body; a timepiece mechanism having a display face and a bezel therearound having predetermined markings thereon mounted in said elongated body timepiece mounting opening and having the display face open to the front side thereof; and a scoring bezel rotatably mounted to the front side of said body adjacent said one bezel and rotatable therearound and marked for keeping a golf score when rotated on said one bezel, whereby a golf tool can keep a golfer's score and time.

5,769,741

## SPORT SWING TRAINING DEVICE

Gregory Ritchie, Box 933, Mineral, Va. 23117

Continuation-in-part of Ser. No. 264,698, Jun. 23, 1994, Pat. No. 5,470,055. This application Jun. 7, 1995, Ser. No. 487,807

Int. Cl.<sup>6</sup> A63B 69/36

U.S. Cl. 473—422

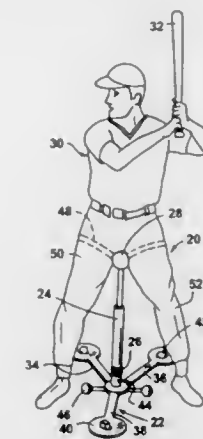
5 Claims

1. A swing training device comprising:  
a) a base assembly;  
b) a height adjustable stanchion on said base assembly;  
c) a spring for flexing built into said stanchion permitting tipping of said stanchion;  
d) an adjustable saddle suitable for supporting a player; and  
e) a ball joint rotatively securing said seat to said adjustable stanchion permitting said seat to rotate while steadying said player astride said stanchion, so as to help said player to

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GENERAL AND MECHANICAL

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perform a proper weight shift through the executing of a pre-swing stage and a swing stage for hitting a ball.

5,769,742

## MECHANICAL ATHLETIC TRAINING DEVICE

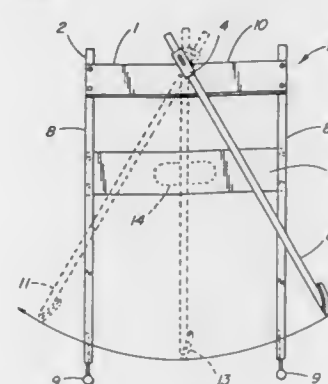
Ron Bristow, 5367 - 36A Street, Innisfail, Alberta, Canada, T4G 1E6

Filed Dec. 24, 1996, Ser. No. 772,927

Int. Cl.<sup>6</sup> A63B 69/00

U.S. Cl. 473—446

17 Claims



1. An apparatus for training athletes on a playing surface, said apparatus comprising:  
a mobile carriage;  
an opponent simulator;  
means for pivotally connecting and securing said opponent simulator to said carriage;  
means for permitting movement of said opponent simulator in an oscillating transverse fashion; and  
means for locking said carriage in a desired location on a playing surface.

5,769,743

## BASKETBALL PRACTICE AID

Paul B. Stephan, 15222 Warwick Cir., Westminster, Calif. 92683; Joe Edmond Pryor, 560 W. 43rd St. Apt. 3D, New York, N.Y. 10036, and Montel Brian Williams, 200 Rector Pl. #44B, New York, N.Y. 10280

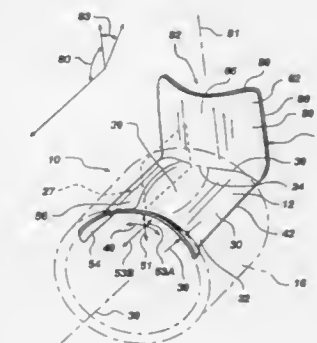
Continuation of Ser. No. 355,029, Dec. 13, 1994, Pat. No. 5,651,743. This application Jun. 3, 1997, Ser. No. 867,015

Int. Cl.<sup>6</sup> A63B 69/00

U.S. Cl. 473—450

34 Claims

1. An apparatus for attaching to an arm of a user, the arm being comprised of an upperarm and a forearm hingedly associated at an elbow, the forearm having a wrist at an end opposite the elbow, the apparatus comprising:



a base securable on the arm of the user;  
a yoke attached to the base to extend a distance away from the base in a direction selected to orient the forearm of the user with respect to the upperarm of the user, the yoke having a radius and comprised of a material selected to be deflectable when loaded in a direction toward a center of the radius of the yoke for deflecting upon impact; and  
means connected to the base for securing the base to the arm of the user.

5,769,744

## TABLE TENNIS NET MOUNTING ASSEMBLY

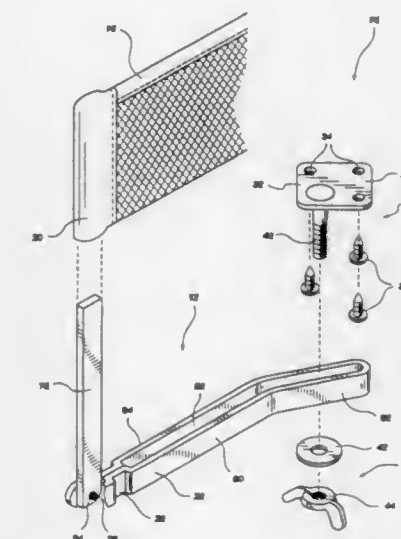
Glenn Merrill, Ogden, and Carl Stanford, Clinton, both of Utah, assignors to Lifetime Products, Inc., Clearfield, Utah

Filed Feb. 2, 1996, Ser. No. 595,717

Int. Cl.<sup>6</sup> A63B 39/00

U.S. Cl. 473—493

30 Claims



1. A net mounting assembly for securing a net above a table for use in playing the game of table tennis, comprising:  
a pair of net brackets, each net bracket comprising:  
a net post for selectively securing the net, and  
an arm pivotally mounted to the net post; and  
an attachment assembly corresponding to each net bracket and configured for pivotally securing the corresponding net bracket to the table enabling the net bracket to pivot in response to a sufficient lateral force applied in the net bracket, thereby preventing the lateral force from damaging the net mounting assembly, each attachment assembly including a mounting bracket which may be secured to the table.

5,769,745

## REMOVABLE PITCHING RUBBER

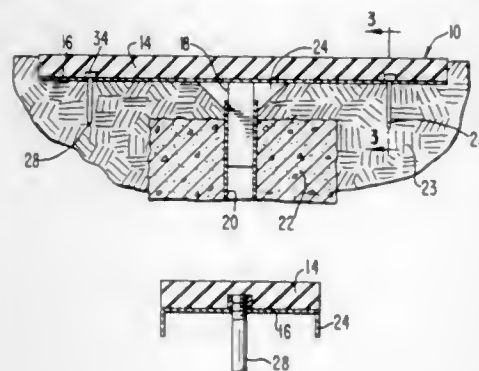
Ronald W. Bartoli, Penn Valley, Calif., assignor to Schutt Manufacturing Co., Inc., Litchfield, Ill.

Filed Nov. 4, 1996, Ser. No. 744,353

Int. Cl.<sup>6</sup> A63B 71/00

U.S. Cl. 473—497

4 Claims



1. A removable pitching rubber adapted to be firmly but removably mounted in the ground, comprising:

a pitching pad securely but removably mounted to a rigid metal plate, said pad and said plate being of similar length and width,

a metal post extending downwardly from said plate and adapted to be inserted into a prearranged ground anchor embedded in the ground so as to provide a stationary mount for said pitching rubber, and

a pair of spikes extending downwardly from the bottom of said plate between said metal post and ends of said plate, said spikes, when embedded in the ground, serving to prevent the movement of outer edges of said pitching pad and said plate, each of said spikes being formed with a threaded upper end which extends through a threaded opening in said plate into an internally threaded nut mounted in the bottom surface of said pitching pad, the spikes serving when threadedly engaged to firmly secure said pitching pad to said plate in the area of said spikes, but when threadedly disengaged to permit separation of the pad from the plate for replacement of the pad as desired.

5,769,746

## TENNIS RACKET WITH STRATEGIC PLAY VALUE

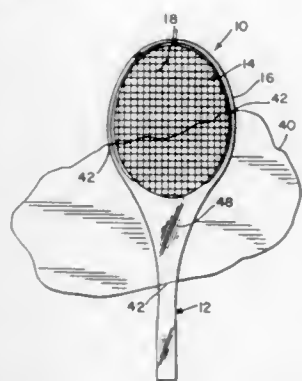
William B. Siegel, 186 W. Montauk Hwy., Hampton Bays, N.Y. 11946

Filed Apr. 18, 1997, Ser. No. 839,374

Int. Cl.<sup>6</sup> A63B 49/10

U.S. Cl. 473—524

1 Claim



1. A tennis racket of a type used by opponents on opposite sides of a net of a tennis court measuring 78 feet between opposite base lines thereof, said tennis racket being further of a type having a

gripping handle, an opening-bounding frame integral to said gripping handle, and a crossing arrangement of strings supported from said frame in said opening, said tennis racket characterized by a clear plastic construction of said handle and said frame, whereby in simultaneously occupied playing positions at said base lines a position of said racket by a user is not visibly detectable by an opponent so as to be factored into a playing strategy of said opponent.

5,769,747

## BELT TENSIONING MECHANISM WITH STOP FEATURE

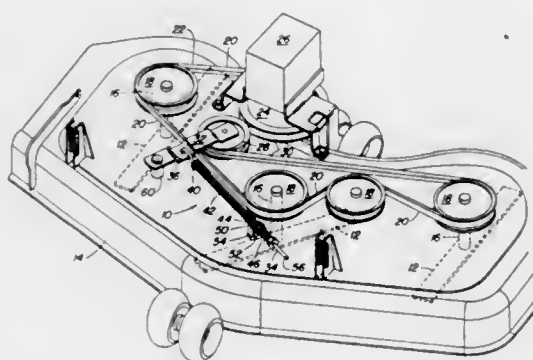
John Boyd Kuhn, Rubicon, and Timothy Milton Post, Portage, both of Wis., assignors to Deere &amp; Company, Moline, Ill.

Filed Sep. 5, 1996, Ser. No. 708,568

Int. Cl.<sup>6</sup> F16H 7/12

U.S. Cl. 474—135

9 Claims



1. A tensioner mechanism adapted for placing tension in a drive belt of a mower deck, said mower deck including a drive pulley in driving engagement with the belt, a plurality of blade pulleys engaged with and driven by the belt, a plurality of mower blades operatively mounted with respective blade pulleys for rotation therewith beneath the mower deck for cutting vegetation, an idler pulley engaged with the belt for placing tension in said belt, and an idler arm to which the idler pulley is mounted, said idler arm is operatively pivotally mounted for allowing the idler pulley to swing toward engagement with the belt for placing tension in the belt, said tensioner mechanism comprising:

an elongate member operatively coupled between the idler arm and a support member operatively carried by the mower deck, and

a compression spring carried on the elongate member between the idler arm and the support member for operatively pressing the idler pulley toward engagement with the belt, said compression spring being generally completely compressed during normal mowing operations for generally blocking the idler arm and idler pulley from swinging away from engagement with the belt during operation.

5,769,748

## GIMBAL EMPLOYING DIFFERENTIAL COMBINATION OF OFFSET DRIVES

Bruce N. Eyerly, Torrance; Vytas J. Katilius, Manhattan Beach, and Umesh S. Ketkar, Redondo Beach, all of Calif., assignors to Hughes Electronics Corporation, Los Angeles, Calif.

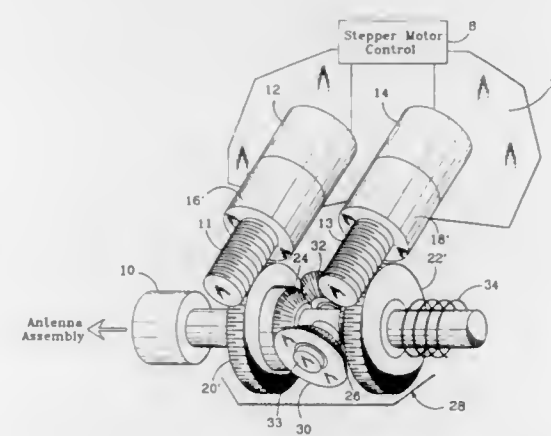
Filed Jan. 16, 1997, Ser. No. 786,353

Int. Cl.<sup>6</sup> F16H 37/06

U.S. Cl. 475—5

15 Claims

1. A gimbal system, comprising:  
a plurality of stepper motors,  
a plurality of drive actuators driven by respective ones of said stepper motors,



a differential drive assembly having simultaneous drive engagements with each of said drive actuators, and  
an output shaft rotated by said differential drive assembly, said stepper motors operating collectively to produce a net output shaft rotation, and each operating individually to produce mutually different output shaft rotations per step.

5,769,749

## AUTOMATIC TRANSMISSION

Makoto Funahashi; Hiroshi Ito; Teruhumi Miyazaki, and Seitoku Kubo, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

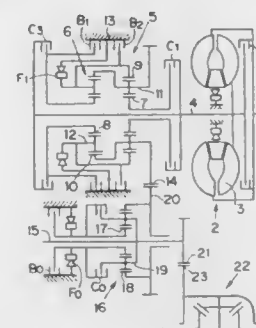
Filed Aug. 22, 1996, Ser. No. 684,982

Claims priority, application Japan, Sep. 7, 1995, 7-255681

Int. Cl.<sup>6</sup> F16H 3/44

U.S. Cl. 475—276

13 Claims



1. An automatic transmission which has: first and second planetary gear mechanisms arrayed on a common axis and each including three components of a sun gear, a ring gear and a carrier such that any two of the components of said first planetary gear mechanism are connected one-by-one to any two of three components of said second planetary gear mechanism to construct four rotary elements; and a third planetary gear mechanism arranged on an axis parallel to the common axis of said first and second planetary gear mechanisms and including three components of a sun gear, a ring gear and a carrier such that first ones of said four rotary elements and any of the three components of said third planetary gear mechanism are connected to transmit power, comprising:

an input member for inputting drive power;

first clutch means for connecting the second one of said four rotary elements and said input member selectively;

second clutch means for connecting said input member and the third element of said four rotary elements selectively;

an output member connected to a component other than such one of the three components of said third planetary gear mechanism that is connected to said first rotary elements;

a one-way clutch arranged between any of the three components of said third planetary gear mechanism and a stationary member and adapted to be switched to an applied state when said third planetary gear mechanism is to be switched between a

5,769,750

## EPICYCLIC CHANGE GEAR SYSTEM

Stephen Terence Rickels, Nottingham, England, assignor to Sturmev-Archer Limited, Nottingham, United Kingdom

PCT No. PCT/GB95/01106, § 371 Date Jan. 27, 1997, § 102(e)

Date Jan. 27, 1997, PCT Pub. No. WO95/31365, PCT Pub.

Date Nov. 23, 1995

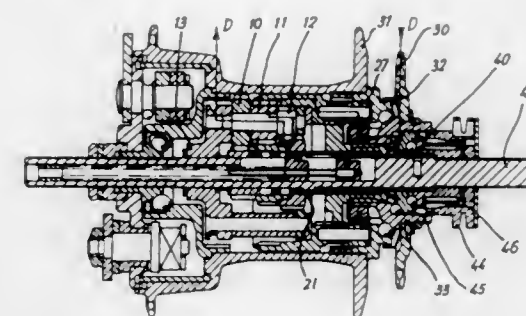
PCT Filed May 16, 1995, Ser. No. 737,485

Claims priority, application United Kingdom, May 17, 1994, 9409844

Int. Cl.<sup>6</sup> B62M 11/16; F16H 3/66

U.S. Cl. 475—298

15 Claims



1. An epicyclic change speed gear comprising a fixed spindle (4), an input member (33) and an output member (31) planet pinions (10, 11, 12) disposed in a planet cage (13), a gear ring (27) is operatively connected to the output member (31) or input member (33), a clutch (25) operative to connect the input member (33) to the planet cage (13) or the input member (33) to the gear ring (27), side-by-side sun pinions (1, 2, 3) rotatable on the spindle (4) any one of which is operable to provide a reaction member when locked to the spindle (4) and a gear selector key (5) disposed radially inwardly of said sun pinions (1, 2, 3) and adapted for selective cooperative engagement with said only one of the said sun pinions (1, 2, 3) on movement of the selector key (5) in the axial direction of the hub in order to lock the corresponding sun pinion (1, 2, 3) to the spindle (4) to provide the reaction member, and means for operating the selector key (5) to provide said selective cooperative engagement characterised by said means for operating the selector key (5) comprises a sleeve (15) disposed for rotational movement relative to the spindle (4), relative rotational movement of the sleeve resulting in axial movement of the selector key.



5,769,751

## HUB SYSTEM

Franz Forster, Karlstadt-Mühlbach, Germany, assignor to Linde Aktiengesellschaft, Germany

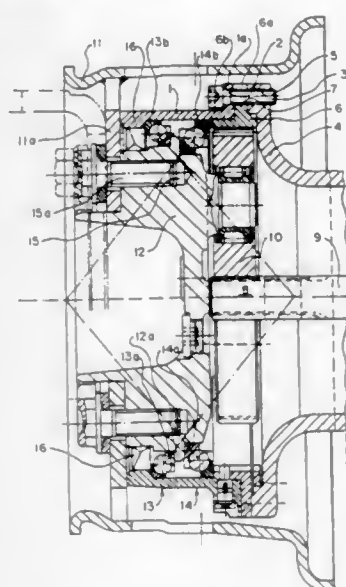
Filed Sep. 21, 1995, Ser. No. 531,629

Claims priority, application Germany, Sep. 23, 1994, 44 34 102.4

Int. Cl. F16H 57/08

U.S. Cl. 475—346

17 Claims



1. A hub system for mounting a wheel, said hub system having a stationary hub carrier and a web of a planetary gear forming a rotating hub, planet wheels mounted on said web of said planetary gear, a ring gear connected to said stationary hub carrier and to a component adapted to be connected to a vehicle; two angular contact roller bearings positioned in an X-arrangement mounted inside said stationary hub carrier rotationally mounting said rotating hub on said stationary hub carrier, means for biasing said two angular roller bearings with respect to one another; and a sun gear on a drive shaft located in said planetary gear wherein each of said roller contact bearings has an outer race and said outer race of one of said angular contact roller bearings axially abutting against said stationary hub carrier and said outer race of the other of said angular contact roller bearing axially abutting against said ring gear, and wherein said angular contact roller bearings are positioned between said ring gear and said outer race which is abutting said stationary hub carrier.

5,769,752

## CONTROL SYSTEM FOR A VEHICLE TRANSMISSION TO PREVENT A STOPPED VEHICLE FROM ROLLING ON A SLOPE

Jong-Ho Kim, Seoul, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

Filed Dec. 19, 1996, Ser. No. 769,392

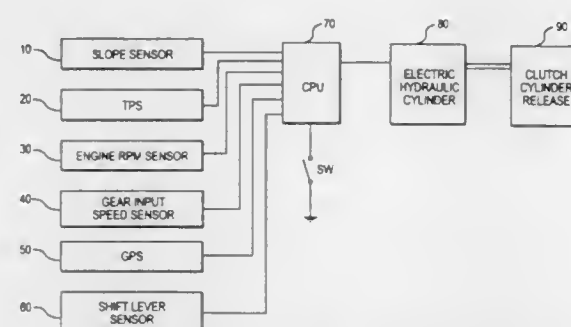
Claims priority, application Rep. of Korea, Dec. 19, 1995, 95-52034

Int. Cl. F16H 61/20

U.S. Cl. 477—114

12 Claims

1. A control system for a vehicle transmission comprising:  
a slope sensor for sensing a degree of a slope on which the vehicle is positioned, for converting the sensed degree of slope into an electrical signal, and for outputting the electrical signal;  
a processor for receiving the electrical signal from the slope sensor and, when the vehicle is stopped on the slope, for generating a clutch control signal;  
a hydraulic pressure cylinder for generating hydraulic pressure in response to the clutch control signal; and



a clutch cylinder for receiving the hydraulic pressure and for maintaining a partial engagement of the clutch, thereby preventing the stopped vehicle from rolling down the slope.

5,769,753

## CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Munee Kusafuka, Anjo; Kazuhiro Mikami, Kariya; Yoshihisa Yamamoto; Hiroshi Tsutsui, both of Nishio, and Akihito Iwata, Hekinan, all of Japan, assignors to Aisin AW Co., Ltd., Japan

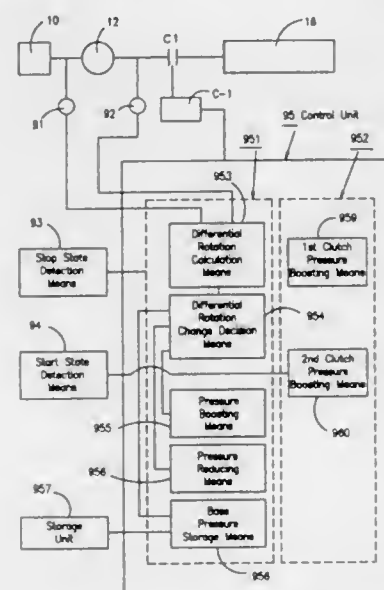
Filed Oct. 31, 1995, Ser. No. 550,965

Claims priority, application Japan, Oct. 31, 1994, 6-290571

Int. Cl. F16H 61/20

U.S. Cl. 477—116

11 Claims



1. A control system for a vehicle automatic transmission including a speed change unit and a fluid transmission unit for transmitting the rotation of an engine to the speed change unit, said control system comprising:

- a clutch which is applied responsive to selection of a forward running range;
- a hydraulic servo for applying said clutch responsive to an oil pressure;
- an input R.P.M. sensor for detecting input R.P.M. of the fluid transmission unit;
- an output R.P.M. sensor for detecting output R.P.M. of the fluid transmission unit;
- stop state detection means for detecting that the vehicle is stopped;
- start state decision means for detecting a start of the vehicle from a stop; and
- a control unit for controlling the oil pressure fed to said hydraulic servo including reduction of the oil pressure to said hydraulic servo when the vehicle is stopped to establish a neutral control in which said clutch is released, said control unit comprising:

release means for reducing the oil pressure to said hydraulic servo responsive to detection that the vehicle is stopped, said clutch release means including:

differential rotation calculation means for calculating the difference between said input R.P.M. and said output R.P.M.;

differential rotation change decision means for deciding whether or not said difference has changed;

pressure increasing means for increasing the oil pressure fed to said hydraulic servo responsive to a decision that the difference has not changed;

pressure reducing means for reducing the oil pressure fed to said hydraulic servo responsive to a decision that said difference has changed; and

base pressure storage means for storing the oil pressure before reduction as a base pressure, when the oil pressure fed to said hydraulic servo is successively increased by said pressure increasing means and then reduced by said pressure reducing means; and

clutch application means for applying the clutch responsive to detection of a shift of the vehicle from a stop to start and including:

first clutch pressure boosting means for boosting the oil pressure fed to said hydraulic servo, by adding a set shelf pressure increments to the base pressure until said clutch comes into a partially applied state after the shift of the vehicle from the detected stop to the detected start; and second clutch pressure boosting means for further boosting the oil pressure fed to said hydraulic servo, until said clutch becomes completely applied.

regard to time change are different each other, and performs the kickdown control according to the selected duty control pattern.

5,769,755

## WORKOUT LEVEL INDICATOR

George F. Henry, Woodinville, and James S. Birrell, Seattle, both of Wash., assignors to Precor Incorporated, Bothell, Wash.

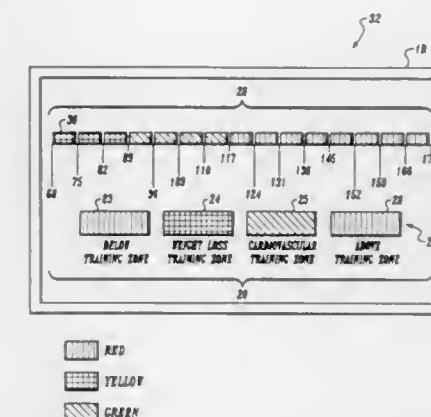
Continuation of Ser. No. 494,107, Jun. 23, 1995, abandoned.

This application Jun. 24, 1997, Ser. No. 881,871

Int. Cl. A61B 5/00

U.S. Cl. 482—8

45 Claims



## KICKDOWN CONTROL METHOD FOR AUTOMATIC TRANSMISSION

Sung-Hong Kil, Seoul, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea

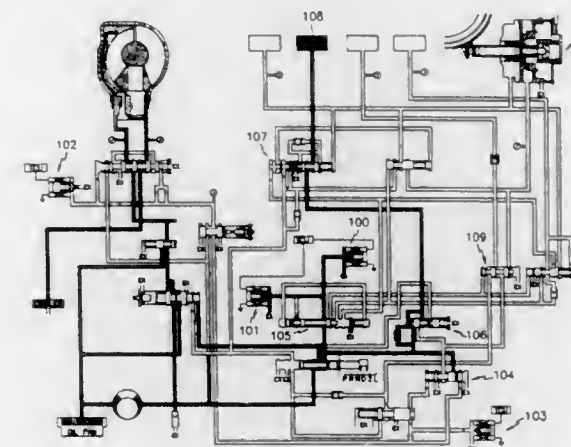
Filed Dec. 18, 1996, Ser. No. 769,727

Claims priority, application Rep. of Korea, Dec. 20, 1995, 95-52782

Int. Cl. B60K 41/10

U.S. Cl. 477—133

6 Claims



1. A kickdown control method for an automatic transmission, the method comprising steps of detecting operation of an accelerator pedal for rapid acceleration, turning on two shift control solenoid valves by applying control currents thereto, and performing duty control to a pressure control solenoid valve,

characterized in that a transmission control unit TCU receives signals regarding three variables for the throttle opening rate just prior to an abrupt operation of the accelerator pedal, the vehicle speed and the throttle opening rate changes during the operation of the accelerator pedal, compares the detected values with reference values, selects one pattern among a plurality of duty control patterns where duty rate change with

1. An exercise display system for aiding a user in maintaining a desired exercise intensity level while exercising, the display system comprising:

- (a) input means for inputting relevant physiological information about the user;
- (b) calculation means for calculating the appropriate exercise intensity levels for a particular user based in part on the input physiological information about the user, the intensity levels being zones within which a particular exercise benefit may be obtained;
- (c) sensor for detecting the physiological condition of the user during exercise; wherein the calculation means uses the physiological condition of the user to determine within which zone the user is currently performing; and
- (d) display means for displaying the user's exercise intensity based on the detected physiological condition during exercising, the display means including a first scale of at least two levels of possible exercise intensities, the first scale being composed of major subdivisions that correspond to the zones calculated by the calculation means, the first scale including indicia indicating the benefits of each zone.

5,769,756

## SPORTS TRAINING APPARATUS FOR VERTICAL JUMP AND BALANCE IMPROVEMENT

John Gerald Parks, 4526 N. Tenth St., Fresno, Calif. 93726

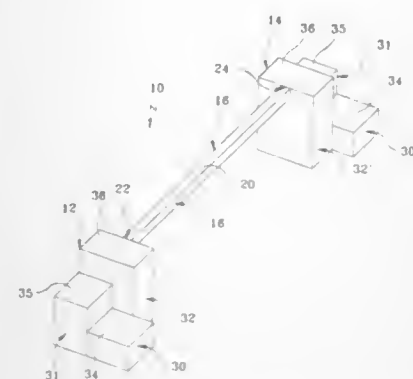
Filed Nov. 22, 1996, Ser. No. 755,418

Int. Cl. A63B 4/00

U.S. Cl. 482—34

20 Claims

1. A sports training apparatus for training athletes, comprising:  
a first jump unit, said first jump unit having a first side face and one or more jump steps, said one or more jump steps defining one or more generally planar platforms spaced above and substantially parallel to the ground surface;  
a second jump unit, said second jump unit having a second side face and one or more jump steps, said one or more jump steps defining one or more generally planar platforms spaced above and substantially parallel to the ground surface;

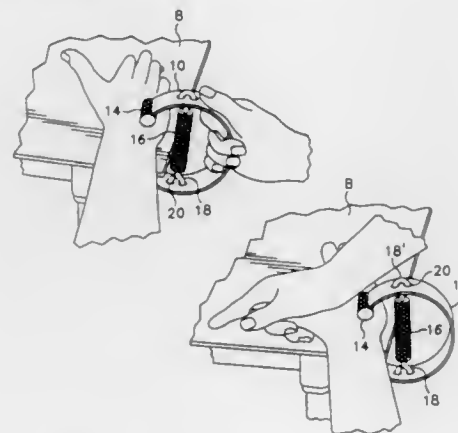


**5,769,758**  
**METHOD AND DEVICE FOR EXERCISING THE WRIST AND HAND**  
Stanley L. Sarkinen, 14803 NE. 212th Ave., Brush Prairie, Wash. 98606

Filed Dec. 6, 1996, Ser. No. 761,270  
Int. Cl.<sup>6</sup> A63B 23/16

U.S. Cl. 482—44

10 Claims

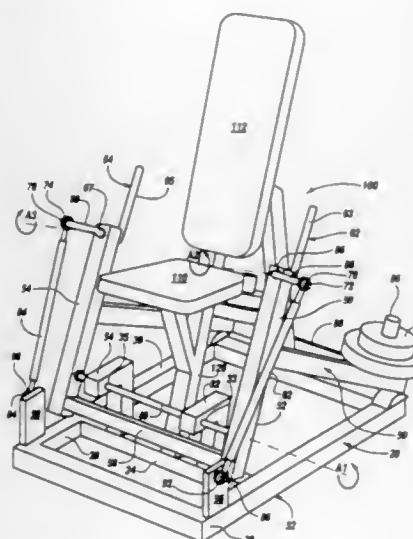


a center section, said center section having a first end, a second end and a generally rectilinear balance member, said balance member having a top face, said top face in substantially planar relationship with one of said one or more jump steps on said first jump unit and on said second jump unit;  
first connecting means for releasably connecting said first end of said center section to said first jump unit; and  
second connecting means for releasably connecting said second end of said center section to said second jump unit.

**5,769,757**  
**METHOD AND APPARATUS FOR EXERCISE WITH FORCED PRONATION OR SUPINATION**  
Kent Fulks, 9710 Amberly Dr., Dallas, Tex. 75243  
Filed Jun. 21, 1996, Ser. No. 667,428  
Int. Cl.<sup>6</sup> A63B 23/12;21/08

U.S. Cl. 482—45

12 Claims



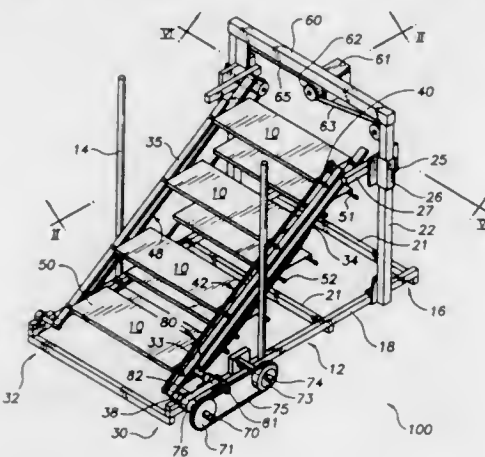
1. An exercise device comprising:  
a frame including a first axis;  
at least one lever having first and second ends;  
means supporting the lever, at the first end thereof, on the frame for pivotal movement about the first axis;  
means operatively connected to the lever for resisting pivotal movement of the lever about the first axis;  
a handle;  
means supporting the handle on the lever, at the second end thereof, for pivotal movement about a second axis substantially perpendicular to the first axis; and  
means for pivoting the handle about the second axis in a predetermined relationship relative to the lever when the lever is pivoted about the first axis.

**5,769,759**  
**STAIR CLIMBING APPARATUS**  
Joseph W. Alter, 78 S. Woodland Ave., Woodbury, N.J. 08096, and James A. Deola, 2584 S. Lincoln Ave., Vineland, N.J. 08360

Filed Jan. 30, 1997, Ser. No. 791,398  
Int. Cl.<sup>6</sup> A63B 22/02

U.S. Cl. 482—37

18 Claims



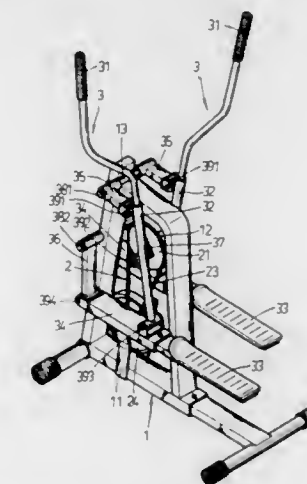
1. An apparatus for simulating stair climbing comprising:  
a frame having a base;  
a first conveyor attached to the frame and traveling in a first path;  
a second conveyor attached to the frame and traveling in a second path;  
a platform having a first side and a second side, with a front corner on the first side and a rear corner on the second side; and

an inclined member mounted to the frame at an angle with respect to the base, wherein the platform travels, at least in part, along the member;  
wherein the first conveyor is attached to the front corner of the platform and the second conveyor is attached to the rear corner of the platform.

**5,769,760**  
**STATIONARY EXERCISE DEVICE**  
Michael Lin, and Hui-Nan Yu, both of 5-F-23, 70, Fu-Shing Road, Taoyuan, Taiwan  
Filed Jul. 22, 1997, Ser. No. 898,031  
Int. Cl.<sup>6</sup> A63B 69/16;22/00

U.S. Cl. 482—52

1 Claim



1. A stationary exercise device comprising a base frame, a load carrier unit, and two symmetrical exercising units, said load carrier units comprising a main drive chain wheel, a driven chain wheel, a chain and a fly wheel, wherein each of said exercising unit comprises a hand grip, a guide link, a pedal, a connecting plate, a first oscillatory arm, a second oscillatory arm, and a crank, said first oscillatory arm and said second oscillatory arm being respectively pivoted to said base frame, said crank having one end pivoted to the center of the drive chain wheel of said load carrier unit and an opposite end pivoted to a middle part of said guide link, said guide link having a top end fixedly connected to said hand grip and pivoted to said first oscillatory arm and a bottom end pivoted to a top side of said connecting plate, said connecting plate having a front end pivoted to said second oscillatory arm and a rear end fixedly connected to said pedal, the top and bottom ends of said guide link being moved along a respective oval path and the middle part thereof turned on an axis when the stationary exercise device is operated.

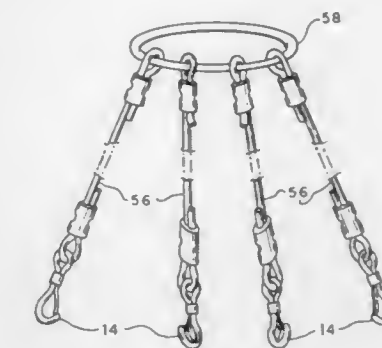
**5,769,761**  
**STRIKING BAG TRAINING APPARATUS**  
Ronald Zagata, Jr., 1570 King Arthur Way, Streetsboro, Ohio 44241

Filed Jul. 7, 1997, Ser. No. 889,130  
Int. Cl.<sup>6</sup> A63B 69/00

U.S. Cl. 482—87

16 Claims

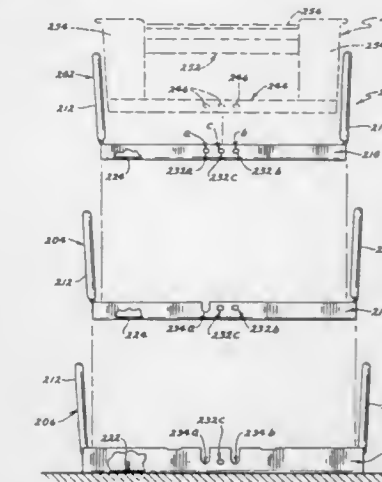
1. A striking bag training apparatus for use with a conventional training bag having a plurality of support rings, said training apparatus comprising:  
an axial tube;  
a head torus having a first center axis and a first center axis hole extending along said first center axis, said axial tube being fixed within said first center axis hole; and  
means for hanging the training bag from a support, said means for hanging the training bag from the support being threaded



**5,769,762**  
**EXERCISE WEIGHT SYSTEM**  
Carl K. Towley, III, Severn, Md., and Gregory S. Olson, Owatonna, Minn., assignors to Intelbell, Inc., Owatonna, Minn.  
Filed Jul. 3, 1996, Ser. No. 678,468  
Int. Cl.<sup>6</sup> A63B 21/06;21/068

U.S. Cl. 482—93

15 Claims



1. An exercise weight system having an adjustable exercise resistance or mass, which comprises:  
(a) a plurality of individual weights having overlying portions;  
(b) a plurality of sets of aligned holes and slots placed in the overlying portions, wherein each set has a unique arrangement of holes and slots; and  
(c) a connecting pin selectively insertable through any one set of holes and slots to select for use a particular weight or weights as determined by the hole and slot arrangement in the set through which the pin passes.

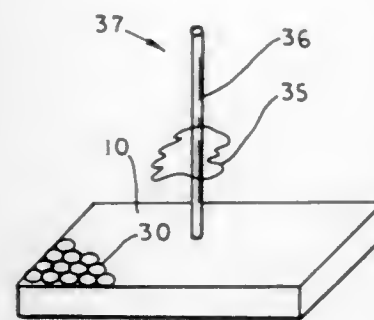
**5,769,763**  
**STABILIZER FOR AQUATIC EXERCISE**  
Kenneth Lochbaum, 3002 E. 38th St., Erie, Pa. 16510  
Division of Ser. No. 451,674, May 26, 1995, Pat. No. 5,611,763, which is a continuation-in-part of Ser. No. 365,498, Dec. 28, 1994, Pat. No. 5,533,960. This application Dec. 23, 1996, Ser. No. 772,433  
Int. Cl.<sup>6</sup> A63B 21/008

U.S. Cl. 482—111

15 Claims

1. A stabilizing device for use with aquatic exercise equipment comprising a base resting on the bottom of a body of water; said base having an aperture;





a support member having a first end received in said aperture; said support member having a second end spaced from said aperture; body engaging means fixed to said support member for engaging the body above the feet of an exercising person while leaving the hands and arms free; said body engaging means comprising a flexible belt.

5,769,764

## TENSION-TORSIONER EXERCISING DEVICE

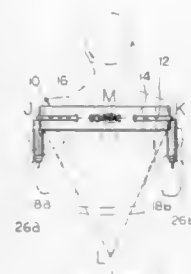
Andrew Tilberis, 156 E. 82nd St., New York, N.Y. 10028-1803

Filed Oct. 17, 1996, Ser. No. 731,693

Int. Cl.<sup>6</sup> A63B 21/02

U.S. Cl. 482—124

9 Claims



1. The tension-torsioner exercise device comprising a non-elastic strap having opposed ends and adapted to be placed around the upper back, shoulders and upper arms of a user's body, said strap having an axis, and handles coupled to and at each of the opposed strap ends, a non-elastic strap section being interposed between each handle and the associated end of the strap, and a releasable buckle connecting the strap section with the associated end of the strap, whereby upon gripping the handles, the user tenses the upper body muscles to any extent desired and at the same time twists the upper body about the axis of the user's body while the handles remain substantially parallel to the axis of the user's body and at the same distance therefrom during the twisting of the upper body.

5,769,765

Patent Not Issued For This Number

5,769,766  
EXERCISE MACHINE FOR BUILDING ABDOMEN AND LEGS

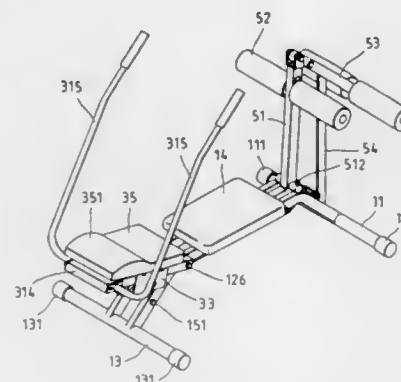
Chin-Lien Huang, 2F, No. 14, Ning Hsia E. 5 St., Taichung, Taiwan

Filed Jan. 2, 1997, Ser. No. 778,365

Int. Cl.<sup>6</sup> A63B 23/02

U.S. Cl. 482—140

4 Claims



1. An exercise machine comprising:  
a base having a front inclined segment, a rear inclined segment, and a horizontal segment which is provided thereon with a seat fastened therewith, said rear inclined segment provided with a connection rod having two rolling members fastened pivotally with one end of said connection rod;  
an abdomen-building mechanism comprising a slide rail frame having two parallel slide bars and two pull arms, said slide rail frame fastened pivotally with said horizontal segment of said base and provided with a slide seat having a backrest pad mounted thereon, said slide seat capable of moving in relation to said slide rail frame; and  
a leg-building mechanism comprising a main support rod fastened pivotally with said horizontal segment of said base, said leg-building mechanism further comprising a first leg rod, a second leg rod, a first connection rod and a second connection rod, with said first leg rod being mounted on said main support rod, with said second leg rod being fastened pivotally at one end thereof with said main support rod, with said first connection rod being fastened pivotally at one end thereof with said second leg rod such that another end of said first connection rod is fastened pivotally with one end of an L-shaped arm which is in turn fastened pivotally at one end thereof with said front inclined segment of said base and is further fastened pivotally at another end thereof with one end of said second connection rod, said second connection rod being fastened pivotally at another end thereof with said connection rod of said rear inclined segment of said base.

5,769,767

## EXERCISE DEVICE

Marvin Hochberg, 463 Summit Ave., Cedarhurst, N.Y. 11516, and Frank Viggiano, 119 Hampshire Rd., Great Neck, N.Y. 11023-1437

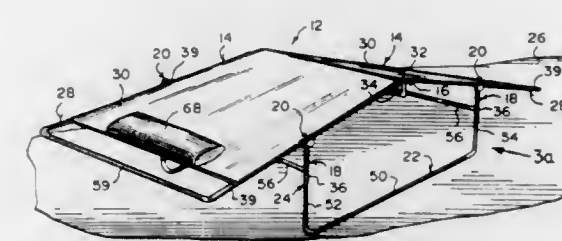
Filed Apr. 7, 1997, Ser. No. 835,330

Int. Cl.<sup>6</sup> A63B 21/068

U.S. Cl. 482—142

22 Claims

1. An exercise device which comprises:  
a) two body support members, each including:  
i) a U-shaped tubular frame; and  
ii) a covering extending over and affixed to said U-shaped tubular frame;  
b) means for pivotally interconnecting abutting ends of said two body support members together;



- c) four legs;
- d) means for pivotally attaching upper ends of two of said legs intermediately between two opposite sides of each said body support member, each pivotally attaching means including:  
i) a collar which slides on a side portion of said U-shaped tubular frame of one said body support member;  
ii) a setscrew having a large knurled head and a threaded shank extending through said collar, to retain said collar in a stationary position on said side portion;  
iii) a yoke extending downwardly from said collar; and  
iv) a pivot pin extending through said yoke and the upper end of one said leg;
- e) two flexible U-shaped braces; and  
f) means for securing upper ends of each said flexible U-shaped brace between lower ends of one said leg on said first body support member and one said leg on said second body support member on the same sides thereof, so that said two flexible U-shaped braces will support said legs upon a floor, to allow said two body support members to tilt in multiple positions to allow a person on said body support members to exercise thereon.

5,769,768

## TOOL GRIPPING APPARATUS

Richard Polacek, Santa Barbara, and Robert J. Watkinson, Long Beach, both of Calif., assignors to Excellon Automation Co., Torrance, Calif.

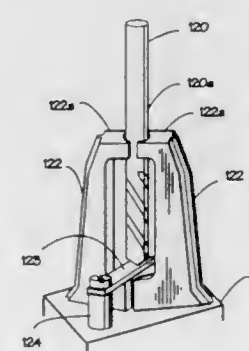
Division of Ser. No. 548,353, Nov. 1, 1995, Pat. No. 5,716,310.

This application Jun. 7, 1996, Ser. No. 660,476

Int. Cl.<sup>6</sup> B23Q 3/157

U.S. Cl. 483—55

9 Claims



1. A tool gripper for gripping at least one tool to be used with a machine tool comprising:  
a. a housing having a support member mounted thereon;  
b. at least two elongated arms rotatably attached to said housing and moveable with respect thereto for releasably engaging said tool;  
c. means for selectively moving said arms between open and closed positions; and  
d. an axial pad mounted between said arms and attached to said support for engaging the tip of said tool.

5,769,769

## POSITIONABLE POWER PAINT ROLLER WITH EDGER DEVICE

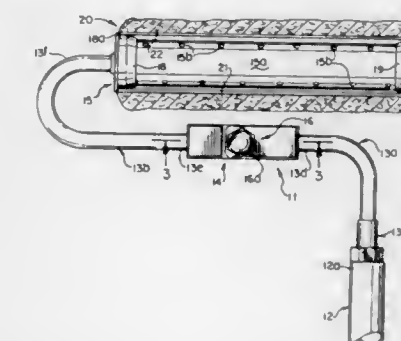
Anthony J. Torntore, Bloomington, Minn., assignor to Wagner Spray Tech Corporation, Minneapolis, Minn.

Filed Apr. 8, 1996, Ser. No. 630,117

Int. Cl.<sup>6</sup> B05C 17/02; 1/10

U.S. Cl. 492—13

11 Claims



1. A positionable power paint roller comprising:  
a) a roller carrying mandril having two ends;  
b) a handle having a first end arranged and constructed to receive paint under pressure and allow paint to flow there-through;  
c) a transfer conduit arranged on the second end of said handle to receive paint from said handle and deliver the same to one end of said roller carrying mandril;  
d) conduit dividing means provided in said conduit dividing said conduit into at least two sections, a first section being secured to and receiving paint from said handle, a second section arranged to deliver paint to said roller carrying mandril; and said first section and said handle positionable to bring said roller carrying mandril into a position in a range between generally parallel to said handle and a position perpendicular to said handle, said conduit dividing means further including:  
i) a connector having a hinging means, with a first portion on the first section of the conduit and a second portion on the second section of the conduit;  
ii) a hinge coupling means receivable into said first and second portions of said connector permitting relative rotation between said sections, wherein said hinge coupling means provides a flow passage therethrough to receive paint under pressure from said first section and transfer such paint to said second section for delivery of paint to the roller mandril;  
said conduit dividing means further permitting displacement of said second section of said conduit to said first section of said conduit such that said second section may be shifted with respect to said handle.

5,769,770

## WRAPPED-BOX

Tommy R. Savage, 14100 Montfort Dr. #2248, Dallas, Tex. 75240

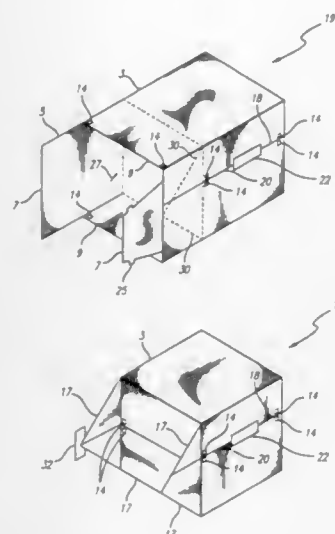
Continuation of Ser. No. 15,209, Mar. 23, 1993, which is a continuation-in-part of Ser. No. 933,493, Aug. 21, 1992, Pat. No. 5,245,815. This application Feb. 6, 1997, Ser. No. 796,264

Int. Cl.<sup>6</sup> B31B 1/00

U.S. Cl. 493—111

25 Claims

1. A method of forming a wrapped box, comprising the steps of:  
forming a thin sheet of material with at least three parallel first creases;  
forming a pair of second creases transverse to the first creases to form a plurality of first flaps at each of a pair of flap ends of the sheet;  
affixing wrapping to a first surface of the sheet;



forming at least one wrapping first flap at each flap end by affixing said wrapping to at least one of said first flaps at each said flap end;  
forming a separable lap joint by connecting a pair of edges of the thin sheet of material transverse to the flap ends;  
folding all first creases to erect a box tube having a first and a second flap end, said box tube surrounded by the wrapping extending past each second crease;  
folding any first flaps that are not wrapping first flaps across the flap ends of the box tube; then  
folding the wrapping first flaps across any previously folded first flaps to form an opposing pair of flaps at each flap end of the box tube; and then  
securing each opposing pair of flaps to form a wrapped box.

5,769,771

**CALENDER ROLLER FOR THE TREATMENT OF PAPER**  
Rolf van Haag, Kerken, Germany, assignor to Voith Sulzer Finishing GmbH, Krefeld, Germany

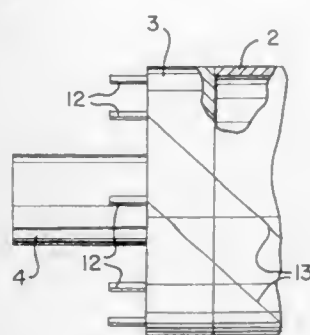
Filed Mar. 20, 1996, Ser. No. 618,852

Claims priority, application Germany, Mar. 27, 1995, 195 11 153.2

Int. Cl.<sup>6</sup> B23P 15/00

U.S. Cl. 492—50

10 Claims



1. A calender roller for the treatment of paper, comprising:  
a thin-walled tube having an outer circumference, a first axial end and a second axial end;  
a first flange disposed adjacent to said first axial end of said tube, a second flange disposed adjacent to said second axial end of said tube, each of said first flange and said second flange being formed in conjunction with a bearing journal;  
a plurality of deflection bodies projecting from an exterior axial surface of each of said flanges; and  
a layer of fiber-reinforced plastic covering said tube circumference and said exterior axial surfaces of said flanges, said fiber-reinforced plastic having fiber rovings which are wound

onto the circumference of said tube and are disposed across said exterior axial surfaces of said flanges and being held in position with respect to said exterior axial surfaces by said deflection bodies.

5,769,772

**PACKAGES MADE WITH BOTH HIGH-FREQUENCY/  
RADIO-FREQUENCY SEALS AND CONVENTIONAL  
HEAT/PRESSURE SEALS USING COMBINATIONS OF  
POLAR AND NON-POLAR POLYMERS**

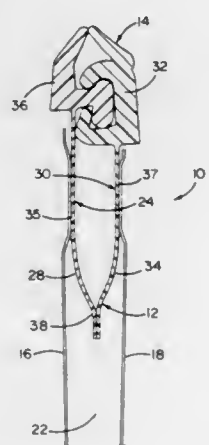
Jay M. Wiley, Victor, N.Y., assignor to Tenneco Packaging Inc., Evanston, Ill.

Filed Aug. 13, 1996, Ser. No. 696,238

Int. Cl.<sup>6</sup> B31B 1/90

U.S. Cl. 493—189

31 Claims



1. A method of manufacturing a polymeric package having multiple seals adjacent to each other, said method comprising the steps of:

providing said package having a segment containing a polar polymer where at least one of said multiple seals is to be placed;  
sealing at least another of said multiple seals by a conventional sealing technique; and  
exposing said segment having said polar polymer to an alternating electromagnetic field.

5,769,773

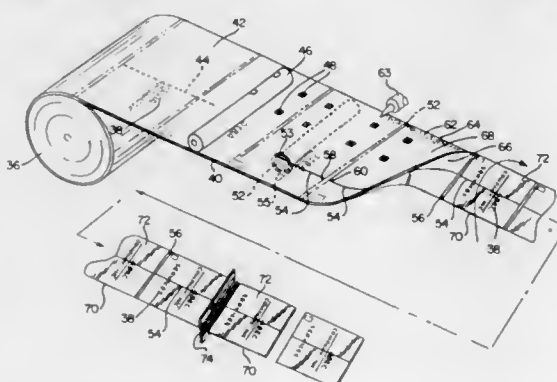
**PAPER PRODUCT AND RELATED METHOD**  
Ronald F. De Santo, 8960 W. 99th Pl., Palos Hills, Ill. 60465

Filed Apr. 23, 1996, Ser. No. 636,528

Int. Cl.<sup>6</sup> B65H 45/30

U.S. Cl. 493—357

11 Claims



1. A method of processing a continuous moving web of paper comprising the steps of:  
providing said continuous moving web of paper;

longitudinally slitting said web at spaced positions to form a plurality of longitudinal slits which are separated from each other by a continuous portion of said web;  
positioning a first portion of said web over onto a second portion of said web, said first portion having said plurality of longitudinal slits thereon;  
providing means for securing said first portion of said web to said second portion to form secured sections, said longitudinal slits thereafter being positioned between said secured sections, and transversely chopping said web to sever the continuous portions of said web between said longitudinal slits.

5,769,774

**FOLDER WITH RECYCLING FEED PATH**

Christian A. Beck, Ridgefield, Conn., and Carl A. Miller, East Parrish, Fla., assignors to Pitney Bowes Inc., Stamford, Conn.

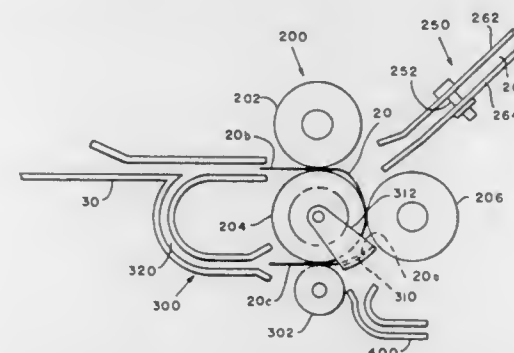
Continuation of Ser. No. 635,488, Apr. 22, 1996, abandoned.

This application Jun. 30, 1997, Ser. No. 885,430

Int. Cl.<sup>6</sup> B65H 45/14

U.S. Cl. 493—421

9 Claims



1. An apparatus for forming at least first and second fold lines in a sheet having a leading edge, comprising:  
a first and a second roller defining a first nip for feeding the sheet into a buckle chute to produce a first buckle in the sheet;  
the second roller and a third roller defining a second nip for forming the first fold line along the first buckle, said second and third rollers having approximately identical diameters; and  
means defining an auxiliary feed path extending between the second nip and the first nip for guiding the leading edge of the sheet out of contact with the second and third rollers and returning the sheet back to the first nip formed by the first and second rollers so that the sheet reenters the buckle chute to produce a second buckle in the sheet and reenters the second nip formed by the second and third rollers to form the second fold line along the second buckle.

5,769,775

**AUTOMATED CENTRIFUGE FOR AUTOMATICALLY  
RECEIVING AND BALANCING SAMPLES**

Michel G. Quinlan, Stephen J. Wright, and Lubomir Markov, all of Peterborough, Canada, assignors to Labotix Automation Inc., Canada

Continuation of Ser. No. 686,946, Jul. 26, 1996, abandoned.

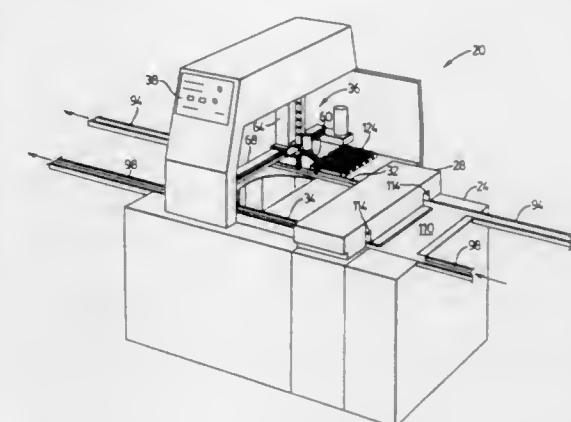
This application Dec. 23, 1996, Ser. No. 777,951

Int. Cl.<sup>6</sup> B04B 9/14

U.S. Cl. 494—10

20 Claims

7. A method of determining an arrangement of a preselected number of sample holding racks to be loaded into a rotor of a centrifuge, said arrangement resulting in the balancing of said rotor about the axis of rotation thereof within a predefined threshold when said rotor is loaded with said sample holding racks, comprising the steps of:



(i) weighing each of said preselected number of sample holding racks to be loaded into said rotor, said weighing determining the total weight and the center of gravity of each sample holding rack with respect to the longitudinal axis of each sample holding rack;  
(ii) examining said determined total weight of each sample holding rack and selecting two subsets of equal numbers of said preselected number of sample holding racks, said two subsets being selected such that the difference between the total of the weights of the sample holding racks in each said selected subset is less than a pre-defined threshold; and  
(iii) examining each said selected subset to determine the orientation of the sample holding racks in each said subset such that the net distance of the determined centers of gravity of the sample holding racks in a subset from the midpoint of the sample holding racks is less than a pre-defined threshold.

5,769,776

**FEED ACCELERATOR SYSTEM INCLUDING  
ACCELERATING VANE APPARATUS**

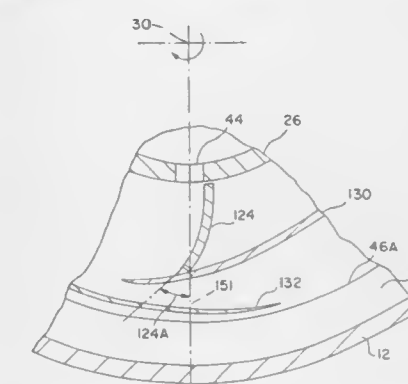
Wallace Woon-Fong Leung, Sherborn, and Ascher H. Shapiro, Jamaica Plain, both of Mass., assignors to Baker Hughes Incorporated, Houston, Tex.

Division of Ser. No. 481,043, Jun. 7, 1995, Pat. No. 5,551,943, which is a continuation of Ser. No. 110,324, Aug. 20, 1993, which is a continuation of Ser. No. 815,432, Dec. 31, 1991, abandoned. This application Aug. 8, 1996, Ser. No. 689,370

Int. Cl.<sup>6</sup> B04B 1/20

U.S. Cl. 494—53

4 Claims



1. A feed accelerator system for use in a centrifuge, the system comprising:  
a conveyor hub rotatably mounted substantially concentrically within a rotating bowl, the hub having an inside surface and an outside surface;  
at least one helical blade mounted to the outside surface of the conveyor hub, the blade having a plurality of turns;  
a feed pipe mounted substantially concentrically within the conveyor hub for delivering a feed slurry to the centrifuge.



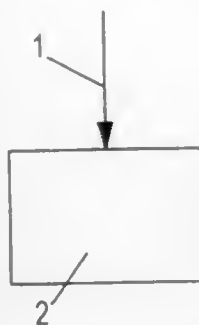
at least one feed slurry passageway between the inside surface of the conveyor hub and the outside surface of the conveyor hub, and  
 a vane apparatus associated with the passageway and disposed between two adjacent turns of the helical blade, the vane apparatus including an accelerator vane extending outwardly from the passageway such that the accelerator vane is forwardly curved in the direction of rotation of the conveyor hub, thereby defining a feed slurry exit having a forward angle up to and including 75 degrees from a radial direction.

5,769,777

**METHOD FOR ABSORBING ORGANIC POLLUTANTS**  
 Bernhard Zinke, Siedlerstrasse 5, D-03044, Cottbus, Germany  
 PCT No. PCT/DE95/00252, § 371 Date Oct. 28, 1996, § 102(e)  
 Date Oct. 28, 1996, PCT Pub. No. WO95/23041, PCT Pub. Date Aug. 31, 1995

PCT Filed Feb. 27, 1995, Ser. No. 696,882

Claims priority, application Germany, Feb. 25, 1994, 44 06 714.3

Int. Cl. B09C 1/08; C09K 3/32; C02F 1/68; 1/28  
U.S. Cl. 588—252 7 Claims

1. A process for absorption of organic, environment-harming pollutants floating and/or suspended in water or a dump designed as a pollutant reservoir containing at least one of a liquid phase, a sludge phase and a deposit of solids, comprising the step of:  
 applying an ash selected from the group consisting of fly ash and cement-activated fly ash onto a surface of the water or the dump containing the pollutant, whereby the ash combines with the pollutant to form a mixture which settles and sinks in solid form, wherein the ash has a hollow spherical structure and a high surface area.

5,769,778

**MEDICAL MAGNETIC NON-CONVULSIVE STIMULATION THERAPY**

Richard S. Abrams, Chicago, Ill., and Conrad M. Swartz, Johnson City, Tenn., assignors to Somatics, Inc., Lake Bluff, Ill.

Continuation-in-part of Ser. No. 231,307, Apr. 22, 1994, and Ser. No. 784,127, Jan. 15, 1997. This application Jul. 7, 1997, Ser. No. 888,494

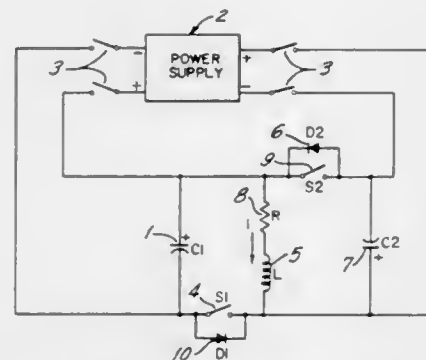
Int. Cl. A61N 1/00

U.S. Cl. 600—14 14 Claims

1. A method in medicine to induce a non-convulsive magnetic stimulation (NCMST) without a convulsive brain seizure in a human patient in order to treat the patient's psychiatric disorder using a combined magnetic stimulator, ECG (electrocardiograph) monitor and EEG (electroencephalograph) monitor, the method comprising:

positioning a magnetic induction coil proximate the head of the patient;

flowing a pulse train of electrical waveforms through the coil to produce a sufficient and varying magnetic field to generate a sufficient electrical stimulus in the patient's brain to induce a therapeutic effect without inducing a convulsive brain seizure;



monitoring the heart beat of the patient using the ECG monitor; monitoring the brain waves of the patient using the EEG monitor; and  
 halting the varying magnetic field if the ECG or EEG monitors indicate the onset of a convulsion or other adverse effect.

5,769,779

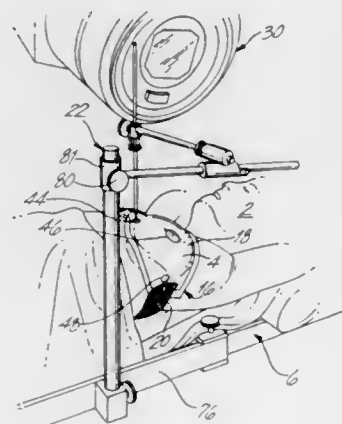
**METHOD AND APPARATUS FOR ACCURATE RADIATION DOSAGE CONTROL IN BREAST CANCER TREATMENT**

Samuel W. Alderson, Beverly Hills, Calif., assignor to Radiology Support Devices, Inc., Long Beach, Calif.

Filed Apr. 27, 1995, Ser. No. 429,477

Int. Cl. A61N 5/00

U.S. Cl. 600—1 19 Claims



1. A brassiere for radiation treatment of a breast of a patient, the brassiere comprising a visually transparent cup having a predetermined shape adapted to hold the patient's breast in the predetermined shape and in a desired position and means for fixing the cup to the patient's body with the cup over the patient's breast, whereby the patient's breast is consistently and repeatably held in the predetermined shape and desired position.

5,769,780

**METHOD OF MANUFACTURING NATURAL TISSUE VALVES HAVING VARIABLY COMPLIANT LEAFLETS**

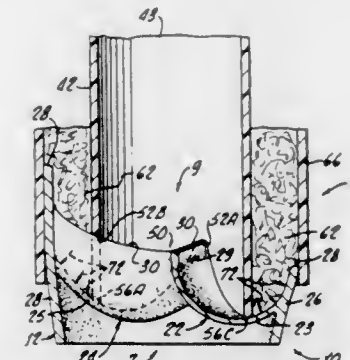
Cary Hata, Alhambra; Roger Tu, Tustin, both of Calif.; Hsing-Wen Sung, Taipei, Taiwan, and Shih-Hwa Shen, Irvine, Calif., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 646,801, May 21, 1996, abandoned, which is a division of Ser. No. 300,025, Sep. 2, 1994, Pat. No. 5,549,666. This application Oct. 9, 1997, Ser. No. 948,365

Int. Cl. A61F 2/24; 2/04; A61L 17/00

U.S. Cl. 600—36 36 Claims

1. A process for fixing a natural tissue valve prosthesis having improved hemodynamic characteristics and resistance to calcification, said process comprising:



(a) obtaining a mammalian natural tissue valve assembly having a circumferential annular margin and one or more valve leaflets pivotally attached to said circumferential annular margin, each of said one or more valve leaflets including a leaflet base section adjacent to said circumferential annular margin and a leaflet tip section disposed radially therefrom;  
 (b) subjecting each of said leaflet base sections of said one or more valve leaflets to a higher pressure than each of said leaflet tip sections on the same side of the valve leaflet; and  
 (c) contacting each of said sections of said pressurized natural tissue valve assembly with a fixing agent.

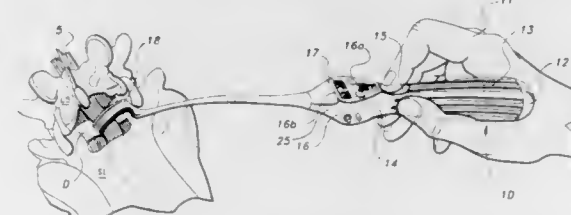
5,769,781

**PROTECTOR RETRACTOR**

James L. Chappuis, 3170 Lake Ridge Dr., Marietta, Ga. 30067  
 Filed Nov. 13, 1995, Ser. No. 556,594

Int. Cl. A61B 11/02

U.S. Cl. 600—202 20 Claims



1. A surgical retractor, comprising:  
 (a) a handle portion including a grip by which the retractor is manipulated;  
 (b) a staff attached to said handle portion and having a distal end;  
 (c) a head on said distal end, said head having a contoured surface;  
 (d) a piezoelectric sensor carried by said contoured surface of said head, said sensor generating signals;  
 (e) a microcomputer electrically connected to said sensor, said microcomputer including means for selectively programming said microcomputer;  
 (f) at least one visual display communicating with said microcomputer to provide displays indicative of the signals from said sensor; and  
 (g) an audible alarm communicating with said microcomputer to provide an audible response indicative of the signals from said sensor.

5,769,782

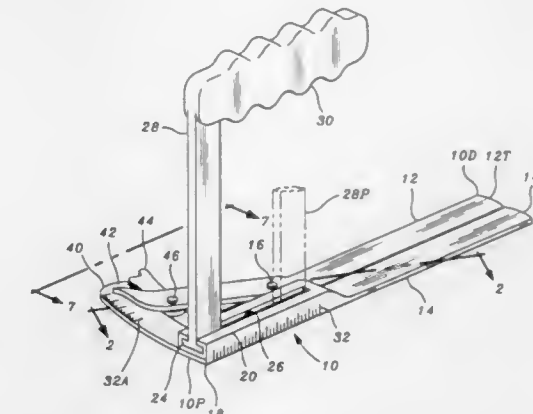
**MEASURED RETRACTOR**

Charlie Dung Phan, 17027 E. Cypress St., Covina, Calif. 91722  
 Filed Apr. 28, 1997, Ser. No. 847,945

Int. Cl. A61B 17/02

U.S. Cl. 600—202 9 Claims

1. A retractor, having a proximal end and a distal end, comprising:



a first blade having a first blade tip, and an arrow end opposite the first blade tip;  
 a second blade having a second blade tip, the second blade attached to the first blade at a pivot point for allowing the first blade tip and second blade tip to move toward and away from each other to create an opening having an opening magnitude, the second blade having a ruler extension, the ruler extension having ruler indicia, and said arrow end refers to the ruler indicia on the ruler extension to indicate the magnitude of opening between the first blade tip and second blade tip;  
 a handle assembly, the handle assembly comprising a hand grip extending parallel to the second blade, and a bar extending between the hand grip and second blade, said bar extending perpendicular to both the hand grip and the second blade.

5,769,783

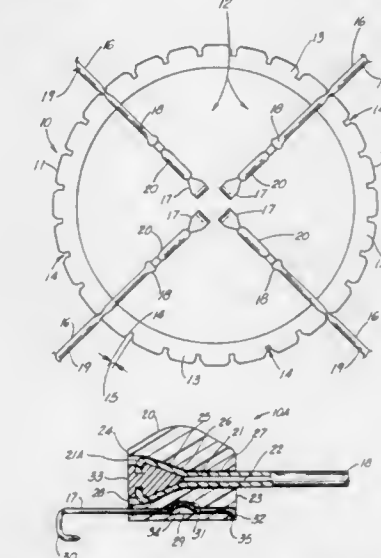
**SURGICAL RETRACTOR STAY APPARATUS**

James M. Fowler, Houston, Tex., assignor to Lone Star Medical Products, Inc., Houston, Tex.

Filed Jun. 27, 1996, Ser. No. 671,405

Int. Cl. A61B 11/02

U.S. Cl. 600—226 19 Claims



1. A surgical retractor stay apparatus comprising:  
 a) frame that conforms to a patient's body at a surgical site;  
 b) a stay connectable to the frame that includes a handle body having proximal and distal ends;  
 c) a first bore with a central longitudinal axis that extends through the handle body, communicating with at least the proximal end of the handle body;  
 d) a second bore that extends at least a partial distance through the handle body and communicating with the proximal end of the body;



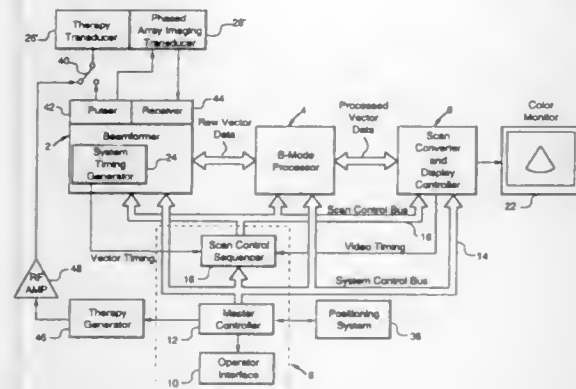


locating a centroid of each of the removed small objects and determining candidate fiducial marker voxels based on said located centroid.

5,769,790  
**FOCUSED ULTRASOUND SURGERY SYSTEM GUIDED BY ULTRASOUND IMAGING**  
Ronald Dean Watkins, Niskayuna, and Christopher Mark William Daft, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.  
Filed Oct. 25, 1996, Ser. No. 738,207  
Int. Cl.<sup>6</sup> A61B 8/00

U.S. Cl. 600—439

13 Claims



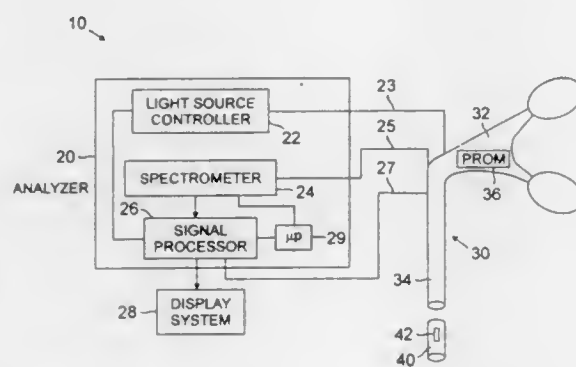
1. A method for employing ultrasound imaging to guide focused ultrasound surgery, comprising the steps of:  
positioning a probe, including an ultrasonic therapy transducer and an ultrasonic imaging transducer, relative to a patient such that a focal point of the therapy transducer is located in tissue of the patient, said transducers being in fixed positional relationship to each other;  
operating said imaging transducer in transmit and receive modes to acquire data sufficient to form an image of tissue to undergo necrosis;  
displaying an image of said tissue to undergo necrosis;  
applying relatively low electrical energy to said therapy transducer, said relatively low electrical energy having an amplitude and duration to cause ultrasound energy to be transmitted by said therapy transducer to the focal point at a level that is insufficient to cause necrosis of tissue at the focal point;  
operating said imaging transducer in the receive mode to acquire data sufficient to form an image of an artifact representing ultrasound energy scattered by the tissue at said focal point in response to application of said relatively low electrical energy to said therapy transducer;  
displaying an image of said artifact; and  
registering said image of said artifact relative to said image of said tissue to undergo necrosis.

5,769,791  
**TISSUE INTERROGATING DEVICE AND METHODS**  
David A. Benaron, Redwood City, Calif.; Daniel S. Goldberger, Boulder, Colo.; David E. Goodman, San Francisco, and Robert S. Smith, Berkeley, both of Calif., assignors to Sextant Medical Corporation, Boulder, Colo.  
Continuation of Ser. No. 437,327, May 9, 1995, which is a continuation-in-part of Ser. No. 944,516, Sep. 14, 1992, Pat. No. 5,460,182, which is a continuation-in-part of Ser. No. 24,278, Feb. 26, 1993. This application Jun. 7, 1995, Ser. No. 472,863  
Int. Cl.<sup>6</sup> A61B 6/00

U.S. Cl. 600—473

53 Claims

1. Apparatus for non-destructive interrogation of tissue comprising:

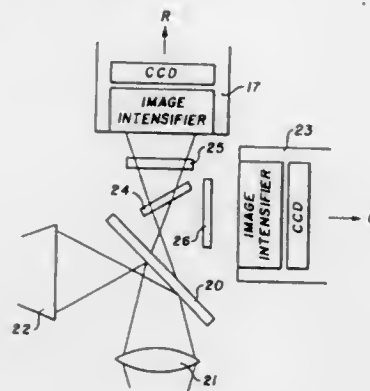


a minimally invasive surgical tool end effector;  
a first element positioned at the end effector to launch one or more discrete wavelengths of radiation into a tissue to be interrogated;  
a second element positioned at the end effector to couple light launched from the first element that has passed through the tissue to be interrogated;  
a photodetector operatively coupled to said second element having an output of electrical signals corresponding to at least a portion of the light coupled by the second element; and  
a processor having an input for receiving said output of electrical signals, the processor being responsive to said output of electrical signals to determine non-destructively at least one characteristic of the tissue to be interrogated.

5,769,792  
**ENDOSCOPIC IMAGING SYSTEM FOR DISEASED TISSUE**  
Branko Palcic; Calum E. MacAulay; Bruno W. Jaggi; Stephen C-T Lam, all of Vancouver, Canada; Amedeo E. Profio, Santa Barbara, Calif., and Jaclyn Y-C Hung, Parkville, Australia, assignors to Xillix Technologies Corp., Canada  
Continuation of Ser. No. 428,494, Apr. 27, 1995, Pat. No. 5,507,287, which is a continuation of Ser. No. 82,019, Jun. 23, 1993, abandoned, which is a continuation of Ser. No. 725,283, Jul. 3, 1991, abandoned. This application Apr. 15, 1996, Ser. No. 632,018  
Int. Cl.<sup>6</sup> A61B 6/00

U.S. Cl. 600—477

36 Claims



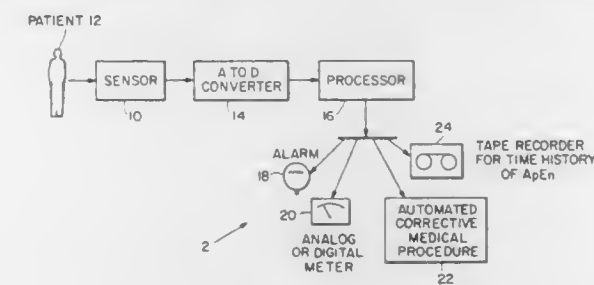
19. Apparatus for imaging diseases in tissue using autofluorescence comprising:  
a visible light source for generating excitation light that includes wavelengths that generate characteristic autofluorescence for abnormal and normal tissue;  
a fiber optic light guide for illuminating tissue with light from the visible light source that includes at least said excitation light thereby exciting tissue to emit said characteristic autofluorescence;  
collecting means for gathering reflected excitation light and emitted autofluorescence light from said tissue;

a dichroic mirror positioned to receive the reflected excitation light and the emitted autofluorescence light gathered by the collecting means, the dichroic mirror operating to separate the spectral components of said autofluorescence light into at least a first spectral band including the reflected excitation light and the emitted autofluorescence light having wavelengths where an autofluorescence intensity for abnormal tissue is substantially different from normal tissue and a second spectral band different from said first spectral band including the emitted autofluorescence light having wavelengths where an autofluorescence intensity for abnormal tissue is substantially similar to normal tissue;  
a first optical filter positioned to receive the light within the first spectral band, said first filter operating to remove the reflected excitation light from light within the first spectral band;  
a first detector array for receiving the autofluorescence light within the first spectral band and for producing a first autofluorescence image of the tissue;  
a second detector array for receiving the autofluorescence light within the second spectral band and for producing a second autofluorescence image of the tissue; and  
a color monitor that simultaneously displays the first and second autofluorescence image.

5,769,793  
**SYSTEM TO DETERMINE A RELATIVE AMOUNT OF PATTERNNESS**  
Steven M. Pincus, 990 Moose Hill Rd., Guilford, Conn. 06437, and Robert A. Neidorff, Bedford, N.H., assignors to Steven M. Pincus, Guilford, Conn.  
Continuation-in-part of Ser. No. 11,409, Jan. 29, 1993, Pat. No. 5,562,596, which is a continuation-in-part of Ser. No. 404,737, Sep. 8, 1989, Pat. No. 5,191,524. This application Sep. 19, 1996, Ser. No. 716,059  
Int. Cl.<sup>6</sup> A61B 5/0402

U.S. Cl. 600—515

49 Claims



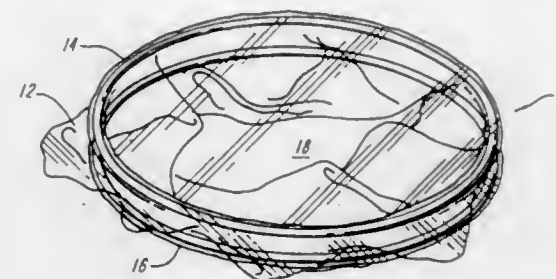
1. In a data processing system, a method of processing a set of data points to determine a relative amount of patternness of the set of data points, comprising the steps of:  
providing a set of data points having values representative of a measured data parameter;  
operating on the set of data points with a processor, comprising the operating steps of:  
a) defining a class of contiguous runs of prescribed length of the set of data points; and  
b) assigning quantitative values representing a measurement of the regularity and the stability of similar patterns among the elements of the defined class to determine a relative amount of patternness.

5,769,794  
**TISSUE RETRIEVAL BAG AND METHOD FOR REMOVING CANCEROUS TISSUE**  
A. Alan Conlan, Worcester; Yuri E. Kazakevich, Andover; Steven W. Ek, Bolton, and Babs R. Soller, Northboro, all of Mass., assignors to Smith & Nephew Endoscopy, Inc., Andover, and University of Massachusetts, Worcester, both of Mass.

Filed Sep. 4, 1996, Ser. No. 707,698  
Int. Cl.<sup>6</sup> A61B 10/00

U.S. Cl. 600—562

20 Claims

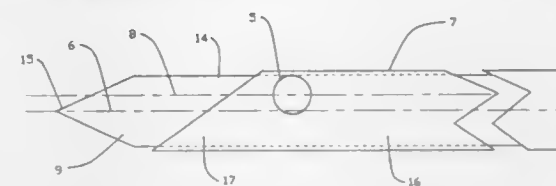


1. A tissue retrieval bag for retrieving tissue from an endoscopic surgical site, such bag comprising  
a floor  
a wall continuous with said floor around its periphery and rising from the floor to a top edge so as to form a substantially cylindrical bag forming a chamber when vertically raised, and  
a collapsible member in said wall, said member holding the wall in an open ring configuration and spreading the floor so that it forms a tray adapted for receiving excised tissue wherein said member is collapsible for insertion or removal of said cylindrical bag through an incision to the surgical site.

5,769,795  
**ECHOGENIC NEEDLE**  
Richard A. Terwilliger, 3321 Rockwood La. South, Estes Park, Colo. 80517  
Continuation-in-part of Ser. No. 400,368, Mar. 8, 1995, abandoned. This application Feb. 14, 1996, Ser. No. 601,457  
Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 600—567

18 Claims



1. A cannula for positioning adjacent to tissue to be biopsied comprising:  
a cannula body with an outer surface and a longitudinal centerline;  
a cannula tip located at a distal end of the cannula body for positioning adjacent to tissue to be biopsied;  
an indentation defined at the cannula tip in order to make the cannula echogenic; and  
said indentation pierces said outer surface of said cannula body and said indentation is directed into said cannula body away from said outer surface, and along an axis that does not intersect the longitudinal centerline, in order not to impede the movement of the cannula through tissue to be biopsied.

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5,769,796

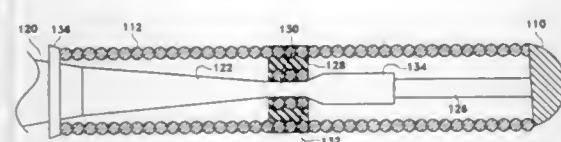
## SUPER-ELASTIC COMPOSITE GUIDEWIRE

Thomas J. Palermo, San Jose; Gene Samson, Milpitas; Gregory E. Mirigian, Fremont; U. Hiram Chee, San Carlos; Erik T. Engelson, Menlo Park, and Edward Snyder, San Jose, all of Calif., assignors to Target Therapeutics, Inc., Fremont, Calif.

Continuation of Ser. No. 451,917, May 26, 1995, abandoned, which is a continuation-in-part of Ser. No. 346,143, Nov. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 62,456, May 11, 1993, Pat. No. 5,409,015. This application Jan. 22, 1997, Ser. No. 789,607  
Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 600—585

29 Claims



1. A guidewire section suitable for guiding a catheter within a body lumen, comprising an elongated, flexible metal wire core having at least a proximal and a distal section wherein the distal section comprises a super-elastic alloy having a UP of 75 ksi±10 ksi, an LP of 25±7.5 ksi measured at 3% strain and a PS of less than 0.25% where measured in a stress-strain test to 6% strain.

5,769,797

## OSCILLATORY CHEST COMPRESSION DEVICE

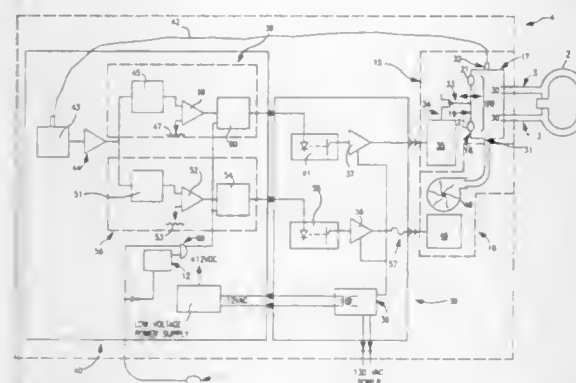
Nicholas P. Van Brunt, White Bear Lake, and Donald J. Gagne, St. Paul, both of Minn., assignors to American Biosystems, Inc., St. Paul, Minn.

Filed Jun. 11, 1996, Ser. No. 661,931

Int. Cl.<sup>6</sup> A61H 31/00

U.S. Cl. 601—41

15 Claims



1. An apparatus for generating oscillatory air pulses in a bladder positioned about a person, comprising:

- an oscillatory air flow generator, comprising an air chamber;
- a reciprocating diaphragm operably connected with the air chamber;
- a rod having a first end and a second end, the first end operably connected with the diaphragm, and the rod extending generally orthogonal to the diaphragm;
- a crankshaft operably connected with the second end of the rod and extending generally orthogonal to the rod; and
- a first motor operably connected with the crankshaft;
- a positive air flow generator operably connected with the oscillatory air flow generator;
- control means operably connected with the oscillatory air flow generator and operably connected with the positive air flow generator for controlling the peak pressure generated by the positive air flow generator; and

a seal extending from an outer periphery of the diaphragm to a wall of the air chamber, the seal comprising first and second generally opposed disks defining an annular region for receiving air, and a pump operably connected with the annular region, the pump maintaining the air pressure in the annular region greater than the peak pressure generated in the air chamber.

5,769,798

## MASSAGE APPARATUS WITH ROTATABLE MESSAGE HEAD HAVING ELASTIC SUPPORTS

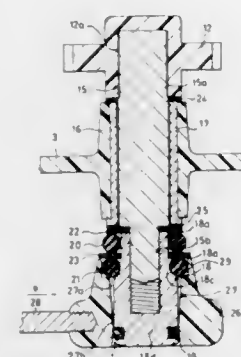
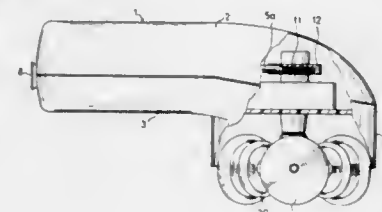
Jean Frajdenrajch, 28 rue Saint-Rome, 31000 Toulouse, France  
Filed Nov. 29, 1995, Ser. No. 564,447

Claims priority, application France, Nov. 30, 1994, 94 14491

Int. Cl.<sup>6</sup> A61H 15/00; H02K 7/10

U.S. Cl. 601—112

14 Claims



1. A massage apparatus, which comprises:

- a motor;
- a rotatable drive shaft driven in rotation by said motor;
- a rotatable message head carrying message fittings and including a central bore enabling the head to be mounted on the drive shaft and be rotatable with said drive shaft, and
- a support supporting the message head in order to rotate said message head by said drive shaft;
- the message head support including an upper abutment fitting and lower abutment fitting permitting axial movement of said message head relative to the drive shaft;
- the central bore of the message head and the drive shaft being shaped so as to allow said message head to undergo angular displacements in all directions relative to said drive shaft;
- radial and axial elastic supports which, on the one hand, provide the message head with stable equilibrium position relative to the drive shaft, and on the other hand, permit angular displacements and axial displacements relative to said message head and said drive shaft from said equilibrium position.

5,769,799

## MASSAGING SUPPORT CHAIR WITH POWERED ROLLERS IN BACK AND SEAT SUPPORT

Dallas K. Daughtry, 6931 Leslie Rd., San Antonio, Tex. 78254  
Filed Jan. 9, 1997, Ser. No. 781,778

Int. Cl.<sup>6</sup> A61H 15/00

U.S. Cl. 601—115

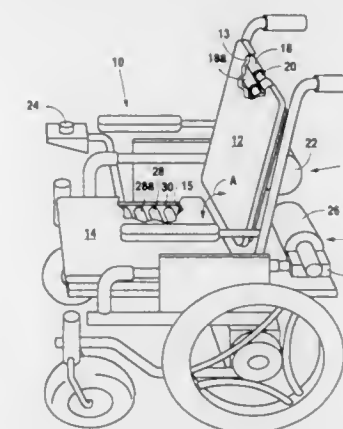
5 Claims

1. A massaging support device for a body comprising: first support frame attached to a support member;

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3865



plurality of first rollers extending transversely across said first support frame and arranged in substantially parallel relationship, each of said first rollers further comprising: an eccentric journal about which each of said first rollers may rotate and a central circumferential depression in the surface of each of said first rollers;

first drive gears attached to each said eccentric journal; first driver connected to said first drive gears to power the rotation of said first rollers in a first rotational direction at a first rotational rate; second support frame spaced apart from said first support frame and attached to said support member; plurality of second rollers extending transversely across said second support frame and arranged in substantially parallel relationship, each of said second rollers further comprising: an eccentric journal about which each of said second rollers rotate with second drive gears attached to each eccentric journal; and

a second driver connected to said second gears to power the rotation of said second rollers in a second rotational direction at a second rotational rate, said first rotational direction and said second rotational direction are opposite.

5,769,800

## VEST DESIGN FOR A CARDIOPULMONARY RESUSCITATION SYSTEM

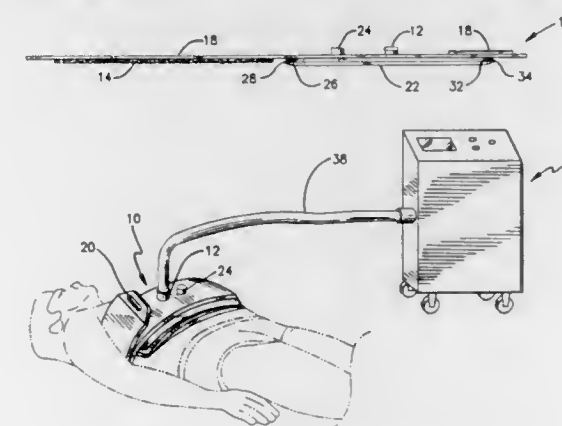
Mark Gelfand, Baltimore, Md.; Greg George Gruben, Stoughton, Wis.; Henry Halperin, Baltimore, Md.; Jeff Koepsell, Alpharetta, Ga.; Neil Rothman, Baltimore, and Joshua E. Tsitlik, Reisterstown, both of Md., assignors to The Johns Hopkins University Inc., and Cardiologic Systems, both of Baltimore, Md.

Filed Mar. 15, 1995, Ser. No. 404,442

Int. Cl.<sup>6</sup> A61H 31/00

U.S. Cl. 601—151

6 Claims



1. An inflatable vest fitting circumferentially around a person's chest comprising:

a belt adapted to be secured circumferentially around the chest, formed of an inextensible material, and having a length sufficient to at least extend circumferentially around the chest;

a bladder to fit in juxtaposition to at least a front portion of the chest and having a width to substantially cover a height of the chest, said bladder defined by an inner surface of the belt, a chest panel adjacent the inner surface and formed of an inextensible material, and at least one side panel formed of an inextensible material and having a first side edge attached to circumferential edges of the chest panel and a second side edge, opposite to the first, attached to the inner surface of the belt;

wherein the chest panel has an external surface adapted to be in substantial contact with the chest of the patient;

wherein the side panel lies substantially flat against the belt when the bladder is deflated, and extends inward towards the chest when the bladder is inflated.

5,769,801

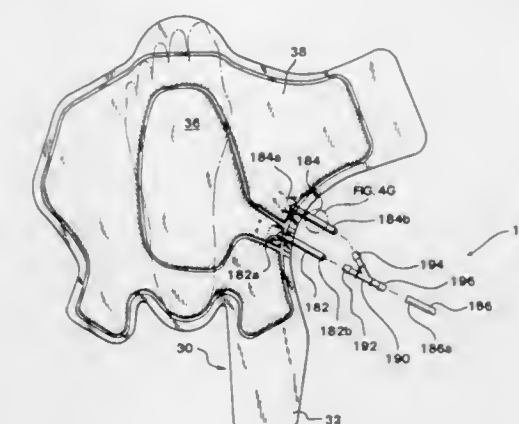
## MEDICAL PUMPING APPARATUS

David Malcolm Tumey, Huber Heights; Robert Louis Cartmell, Bellbrook; Timothy James Riazzi, Kettering; David Bryan McQuain, Dayton, and Abdou Farid DeBan, Centerville, all of Ohio, assignors to NDM Acquisition Corp., Dayton, Ohio  
Continuation-in-part of Ser. No. 76,575, Jun. 11, 1993, Pat. No. 5,443,440. This application Oct. 7, 1994, Ser. No. 320,137

Int. Cl.<sup>6</sup> A61H 9/00

U.S. Cl. 601—152

12 Claims



11. A medical device for applying compressive pressures against a patient's foot comprising:

- first and second panels of flexible material secured to one another to form an inflatable bag to be fitted upon the foot, said bag having first and second separate fluid bladders, said first fluid bladder being adapted to engage a first portion of the foot and said second fluid bladder being adapted to engage a second portion of the foot;
- a fluid supply for applying pressurized fluid to said first and second fluid bladders such that said first fluid bladder applies a first compressive pressure upon the first portion of the foot and said second fluid bladder applies a second compressive pressure upon the second portion of the foot, said fluid supply including a generator for cyclically generating fluid pulses during periodic inflation cycles, and a fluid conductor connected to said first and second bladders and said generator for communicating said fluid pulses generated by said generator to said first and second bladders, said fluid conductor having a wall; and
- a safety vent port in the form of a hole formed through a portion of the wall of said fluid conductor, said vent port being constructed to continuously vent pressurized fluid to atmosphere.



5,769,802

## WATER ACTUATED BATH BRUSH

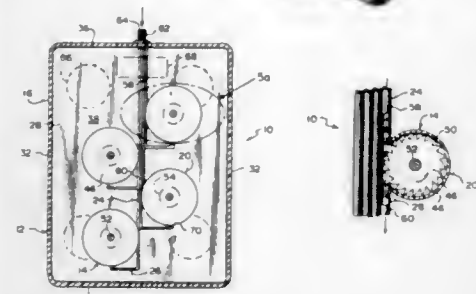
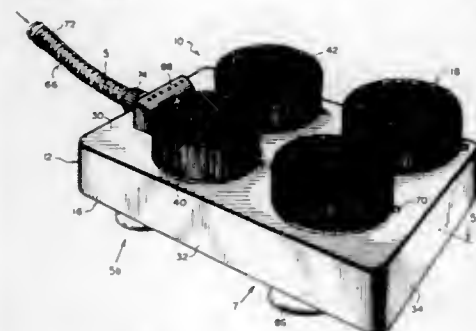
Shareif Wang, 5095 Napilihau St. #315, Lahaina, HI. 96761

Filed Jul. 15, 1996, Ser. No. 680,134

Int. Cl.<sup>6</sup> A61H 9/00

U.S. Cl. 601-160

20 Claims



1. A water actuated bath brush comprising:
- a means for cleaning the skin of a person including:
    - a watertight housing; and
    - a plurality of rotary brushes carried on said housing; and
  - a means for converting kinetic energy of moving water to mechanical power to operate said skin cleaning means including:
    - a plurality of water turbines, with each said water turbine located within said watertight housing below one said rotary brush;
    - a plurality of gear assemblies, with each said gear assembly operable between one said water turbine and one said rotary brush;
    - a plurality of inlet conduits, whereby each said inlet conduit conveys water to one said water turbine; and
    - a plurality of outlet conduits, whereby each said outlet conduit conveys water away from one said water turbine.

5,769,803

## METHOD FOR CONTROLLING THE REFLEX RESPONSE OF THE MUSCLES OF A LUMBAR SPINE

André Brossard, 4053 Barn Street, Rosemère, Québec, Canada, J7A 1Z4

Division of Ser. No. 426,667, Apr. 21, 1995, Pat. No. 5,667,484.

This application Jul. 3, 1997, Ser. No. 887,700

Int. Cl.<sup>6</sup> A61F 5/00

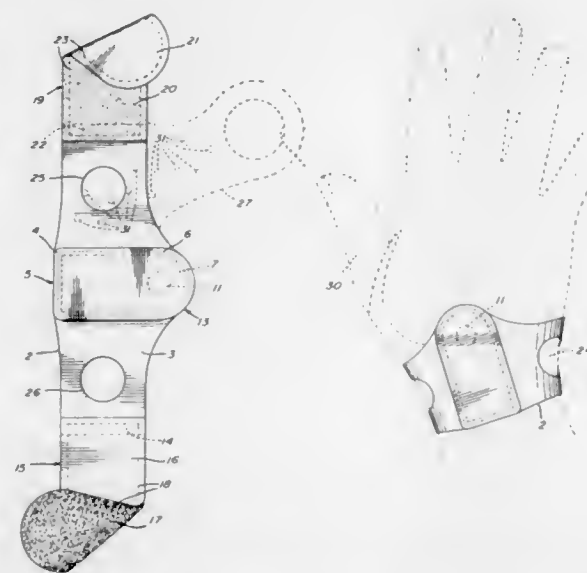
U.S. Cl. 602-19

2 Claims

1. A method of facilitating the reflex response of a muscle or muscular group articulating a lumbar spine of a living body, the living body comprising skin mechano-receptors guiding a natural reflex mechanism of the muscle or muscular group, said method comprising the step of:

mounting a pressure-applying member on the living body directly over at least one of the following muscles and ligaments: intraspinalis muscles, intraspinalis ligaments, intratransverse muscles, intratransverse ligaments, semispinalis muscles, semispinalis ligaments, sacrospinalis muscles, sacrospinalis ligaments, iliopsoas muscles, iliopsoas ligaments, piriformis muscles, and piriformis ligaments; and

lightly applying the pressure-applying member to the living body directly over said at least one muscle or ligament and



maintaining the pressure-applying member lightly applied to the body to thereby apply to the skin mechano-receptors an external pressure having an intensity  $\leq 200$  mmHg for facilitating the reflex response of the muscle or muscular group.

2. A method of inhibiting the reflex response of a muscle or muscular group articulating a lumbar spine of a living body, the living body comprising joint mechano-receptors guiding a natural reflex mechanism of the muscle or muscular group, said method comprising the step of:

mounting a pressure-applying member on the living body directly over at least one of the following muscles and ligaments: intraspinalis muscles, intraspinalis ligaments, intratransverse muscles, intratransverse ligaments, semispinalis muscles, semispinalis ligaments, sacrospinalis muscles, sacrospinalis ligaments, iliopsoas muscles, iliopsoas ligaments, piriformis muscles, and piriformis ligaments; and

firmly applying the pressure-applying member to the living body directly over said at least one muscle or ligament and maintaining the pressure-applying member firmly applied to the body to thereby apply to the joint mechano-receptors an external pressure having an intensity  $\geq 400$  mmHg for facilitating the reflex response of the muscle or muscular group.

5,769,804

## CARPAL TUNNEL SYNDROME WRIST BRACE

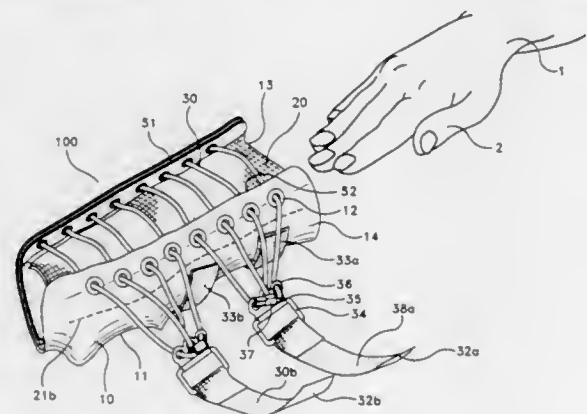
Alvin R. Harris, Hackensack, N.J., and Christopher L. Vaughan, Claremont, South Africa, assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Jul. 26, 1996, Ser. No. 686,885

Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602-21

5 Claims



1. A carpal tunnel syndrome wrist brace comprising:

- a rigid shell formed to immobilize a wrist, said rigid shell comprising a proximal end, a distal end, a thumb hole located at said distal end, and an open top surface having a first edge and a second edge;
- a plurality of eyelets located on said first and second edges of said open top surface of said rigid shell; and
- means for securing said shell to the wrist and activating immobilization of the wrist comprising a pair of non-elastic straps, wherein each of said pair of non-elastic straps includes:
- a lace guide attachment; and
  - a lace having a plurality of strands that are received by said plurality of eyelets on said shell and converge to an apex at said lace guide attachment.

5,769,805

## TOE SPLINT FOR A MIDDLE TOE

Robert D. Lockhart, Sunnyvale, Calif., assignor to Waldemar Link (GmbH &amp; Co.), Hamburg, Germany

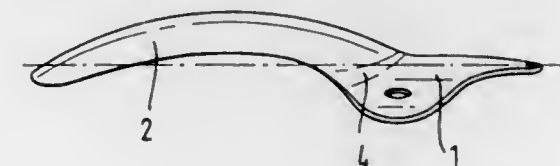
Filed Dec. 16, 1996, Ser. No. 766,968

Claims priority, application Germany, Sep. 19, 1996, 296 16 346.5

Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602-30

8 Claims



1. A toe splint for a middle toe, comprising:
- a rear holding part to be positioned upon dorsal the metatarsus; and
  - a front supporting part to be placed on top of the toe to be supported, said front supporting part comprising a front portion lying in general alignment with and approximately level with said rear holding part, and a raised arched middle part said raised arch middle part being curved in cross section to match the shape of the toe being splinted, and a rear part connecting said front supporting part to said rear holding part at a transition region, said transition region comprising an elevated arched throat.

5,769,806

## ADJUSTABLE PRESSURE EYE PATCH

Brett K. Radow, 6621 Kanahwa Ave. SE., Charleston, W. Va. 35304

Filed Mar. 1, 1996, Ser. No. 609,509

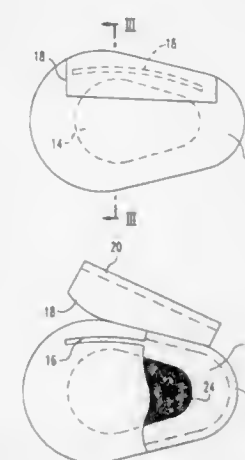
Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602-41

2 Claims

1. A method for adjusting pressure on an eye of a patient comprising the steps of:

- positioning over the eye a patch comprising an outer membrane superimposed over an inner membrane, a cavity interposed between said outer membrane and said inner membrane, and an elongated slit in the outer membrane to allow for the insertion and removal of a cushioning means in order to adjust pressure on the eye; and
- emplacing said cushioning means in said cavity, whereby the pressure applied to the eye may be adjusted by selecting said cushioning means from a variety of differently shaped and



sized cushioning means causes the eye patch to bulge convexly inwardly toward the eye.

5,769,807

## IV CATHETER ADHESIVE DRESSING

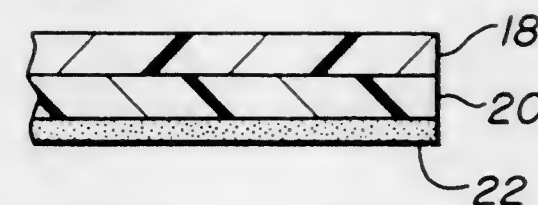
Teresa Haddock, Cranbury, N.J.; Arthur S. Hill, Arlington, Tex., and Shmuel Dabl, Highland Park, N.J., assignors to Chicopee, Inc., North Charleston, S.C.

Continuation of Ser. No. 308,015, Sep. 16, 1994, abandoned, which is a continuation of Ser. No. 72,622, Jun. 4, 1993, abandoned, which is a continuation of Ser. No. 943,263, Sep. 10, 1992, abandoned. This application Oct. 10, 1995, Ser. No. 541,982

Int. Cl.<sup>6</sup> A61F 13/00

U.S. Cl. 602-52

6 Claims



1. A surgical dressing which consists essentially of a continuous film in direct contact with an adhesive layer for securing the dressing to the human body wherein

- said film has a hydration rate of at least 0.1 g/in<sup>2</sup>/min becomes saturated when in contact with liquid water, has a higher MVTR than when in contact with water vapor in the absence of liquid water, said film being coextruded and comprising a hydrophobic top layer and a hydrophilic bottom layer, wherein said adhesive layer is in direct contact with said hydrophilic layer.
- said adhesive layer is porous and allows access of water to the film when water is in contact with said adhesive layer and wherein said dressing has a MVTR of not less than 3000 g/m<sup>2</sup>/day when in contact with liquid water and a MVTR greater than 2000 g/m<sup>2</sup>/day when in contact with water vapor but not in contact with liquid water.

5,769,808

## WRIST SUPPORT BAND

Omer C. Matthijs, and Valerie A. Phelps, both of 1980 N. Box Canyon Pl., Tucson, Ariz. 85745

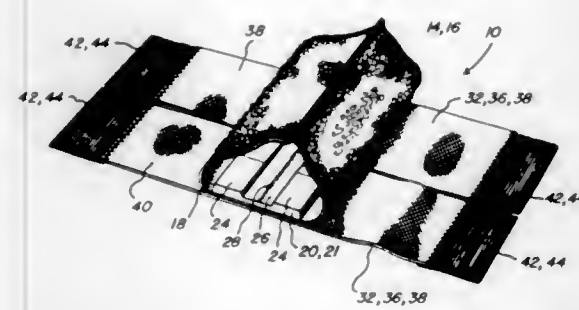
Filed Dec. 2, 1996, Ser. No. 756,889

Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602-64

20 Claims

1. A wrist support band for surrounding a wrist having a proximal carpal row, and supporting movement of the wrist, said wrist support band comprising:

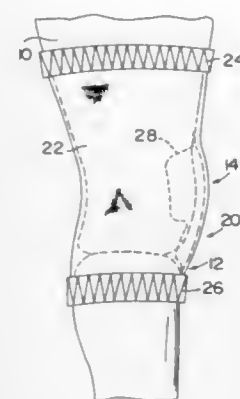


- (a) a sleeve having an interior and an exterior, said sleeve adapted to slide over an individual's hand and wrist;
- (b) a flexible mold support attached to said interior of said sleeve, said flexible mold support having two elongated protuberances and a central recess intermediate said two elongated protuberances, said two elongated protuberances positionable proximate the wrist's proximal carpal row when said sleeve is slid over the wrist;
- (c) at least one strap about said exterior of said sleeve to hold said interior of said sleeve and said mold support in position proximate the wrist and the wrist's proximal carpal row; and
- (d) securement means for securing said strap about said sleeve.

5,769,809  
**BELOW THE JOINT AMPUTATION LIMB PROTECTOR APPARATUS**  
Marshall Witzel, 2445 Hybernla Dr., Highland Park, Ill. 60035  
Filed Mar. 5, 1996, Ser. No. 611,100  
Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602—62

14 Claims



1. A protector apparatus for the facilitated protection of a joint of a human limb, the protector apparatus comprising:
- a substantially tubular portion operably configured to insertingly receive therethrough and thereafter substantially surround a portion of a human limb,
- the tubular portion having a first end for orientation of the joint and a second end for orientation below the joint, the tubular portion being open at the first and second ends thereof,
- the tubular portion having a longitudinal axis;
- the tubular portion further including means for enabling resilient stretching of the tubular portion, at least along a circumferential direction on the tubular portion about the longitudinal axis, from an original configuration to one or more stretched configurations, upon exertion of a stretching force on the tubular portion,
- the means for enabling resilient expansion of the tubular portion further being operably configured to promote circumferential stretching upon said exertion of a stretching force on said tubular portion, the amount of circumferential stretch proximate the first end of the tubular portion having a looser, less compressive degree of elasticity than the amount of circum-

ferential stretch and associated degree of elasticity proximate to the second end of the tubular portion, and

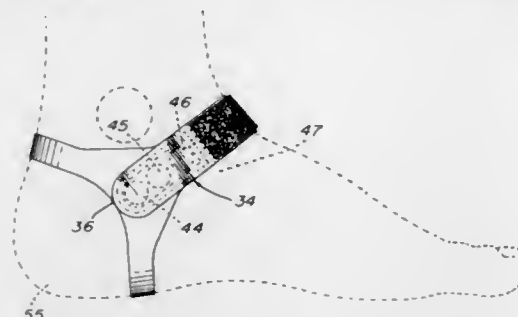
cuff means, operably disposed substantially adjacent said first and second ends of the tubular portion, and extending substantially about the respective end of the substantially adjacent tubular portion for facilitated reinforcement of the tubular portion in the regions thereof adjacent the respective end, while accommodating the differentiated degrees of circumferential elasticity between said first and second ends and wherein said cuff means are disposed, in part, substantially adjacent an upper, first end of the tubular portion, said cuff means thereat possessing a circumferential elasticity no less than that of the portion of the tubular portion proximate thereto,

wherein said cuff means are further disposed, in part, substantially adjacent a lower, second end of the tubular portion, said cuff means thereat possessing a circumferential elasticity no greater than that of the portion of the tubular portion proximate thereto.

5,769,810  
**METHOD FOR CONTROLLING THE REFLEX RESPONSE OF THE MUSCLES OF AN ANKLE JOINT**  
André Brossard, 4053 Barn Street, Rosemère, Québec, Canada, J7A 1Z4  
Division of Ser. No. 426,667, Apr. 21, 1995, Pat. No. 5,667,484.  
This application Jun. 11, 1997, Ser. No. 873,293  
Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602—65

2 Claims



1. A method of facilitating the reflex response of a muscle or muscular group articulating an ankle joint of a living body, the living body comprising skin mechano-receptors guiding a natural reflex mechanism of said muscle or muscular group, said method comprising the step of:

mounting a pressure-applying member on the living body directly over the area of the calcaneofibular ligament, lateral talocalcaneal ligament, and interosseous talocalcaneal ligament; and

lightly applying the pressure-applying member to the living body directly over said area and maintaining the pressure-applying member lightly applied to said body to thereby apply to the skin mechano-receptors an external pressure having an intensity <200 mmHg for facilitating the reflex response of the muscle or muscular group.

2. A method of inhibiting the reflex response of a muscle or muscular group articulating an ankle joint of a living body, the living body comprising joint mechano-receptors guiding a natural reflex mechanism of said muscle or muscular group, said method comprising the steps of:

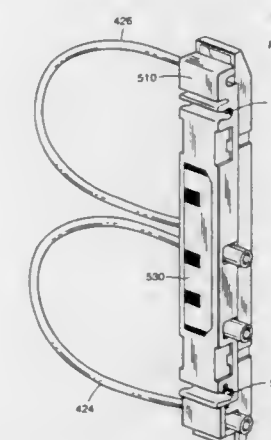
mounting a pressure-applying member on the living body directly over the area of the calcaneofibular ligament, lateral talocalcaneal ligament, and interosseous talocalcaneal ligament; and

firmly applying the pressure-applying member to the living body directly over said area and maintaining the pressure-applying member firmly applied to said body to thereby apply to the joint mechano-receptors an external pressure having an intensity  $\geq 400$  mmHg for inhibiting the reflex response of the muscle or muscular group.

5,769,811  
**BLOOD-PROCESSING MACHINE SYSTEM**  
Gary Stacey, Marshfield; Frederick York, Arlington; David Lamborghini, Mansfield, and Steven Liberatore, Taunton, all of Mass., assignors to Haemonetics Corporation, Braintree, Mass.  
Filed Oct. 31, 1995, Ser. No. 551,150  
Int. Cl.<sup>6</sup> A61M 35/00

U.S. Cl. 604—4

6 Claims



1. A blood-processing machine comprising:
- a. means for collecting whole blood from a donor;
- b. processing means for (i) separating the collected whole blood into isolated blood components and (ii) returning at least some of the blood components back to the donor in accordance with steps defining one of a plurality of protocols;
- c. means for accepting a disposable set comprising blood-compatible tubing configured for at least one specific protocol, and a machine-readable indication for identifying the disposable set to the blood-processing machine;
- d. means for reading the machine-readable indication;
- e. means for removably receiving a computer memory device comprising stored instructions defining one of the protocols;
- f. means for implementing the defined protocol according to the stored instructions; and
- g. control means configured to determine compatibility between the disposable set and the defined protocol and, absent said compatibility, to disable the machine.

5,769,812  
**SYSTEM FOR CARDIAC PROCEDURES**  
John H. Stevens, Palo Alto; Wesley D. Sterman, San Francisco, and Hanson S. Gifford, III, Woodside, all of Calif., assignors to Heartport, Inc., Redwood City, Calif.  
Continuation of Ser. No. 453,426, May 30, 1995, which is a division of Ser. No. 282,192, Jul. 28, 1994, Pat. No. 5,584,803, which is a continuation-in-part of Ser. No. 162,742, Dec. 3, 1993, abandoned, which is a continuation-in-part of Ser. No. 123,411, Sep. 17, 1993, abandoned, which is a continuation-in-part of Ser. No. 991,188, Dec. 15, 1992, abandoned, which is a continuation-in-part of Ser. No. 730,559, Jul. 16, 1991, Pat. No. 5,370,685. This application Oct. 16, 1996, Ser. No. 732,076  
Int. Cl.<sup>6</sup> A61M 37/00

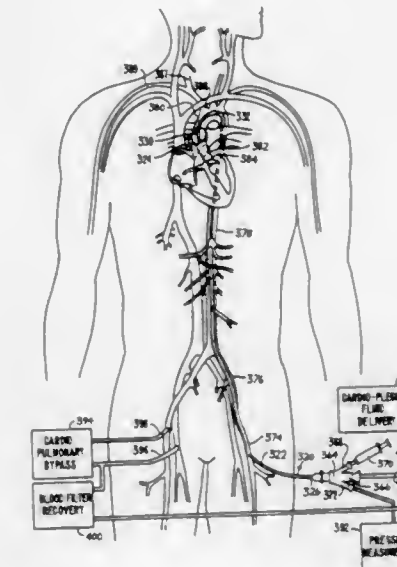
U.S. Cl. 604—4

6 Claims

1. A method of delivering cardioplegia to a patient's heart and placing the patient on cardiopulmonary bypass, comprising the steps of:

providing an aortic occlusion catheter having an occluding member, a lumen, and an outlet coupled to the lumen, the outlet being positioned distal to the occluding member, the occluding member being sized to occlude a patient's ascending aorta;

passing the aortic occlusion catheter through a peripheral artery of a patient so that the occluding member is positioned in the ascending aorta;

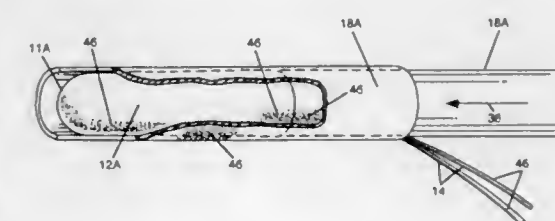


- coupling the lumen to a source of cardioplegic fluid; passing cardioplegic fluid from the source of cardioplegic fluid through the lumen and out the outlet thereby stopping heart contractions;
- providing a coronary sinus catheter having an occluding member, a distal end, a lumen and an outlet coupled to the lumen, the occluding member being configured to occlude the patient's coronary sinus;
- passing the coronary sinus catheter through a peripheral vein and into the patient's right atrium;
- inserting the distal end of the coronary sinus catheter into the patient's coronary sinus;
- occluding the patient's coronary sinus with the occluding member of the coronary sinus catheter; and
- delivering a fluid through the coronary sinus catheter and into the patient's coronary sinus through the lumen.

5,769,813  
**INDICATOR TAMPON APPLICATOR**  
Frances K. Peiler, 45-850 G1 Luana Pl., Kaneohe, Hi. 96744, and Larisa H. Peiler, 40 Givens Ave., Stamford, Conn. 06902  
Continuation-in-part of Ser. No. 477,401, Jun. 7, 1995, abandoned. This application Oct. 9, 1996, Ser. No. 728,187  
Int. Cl.<sup>6</sup> A61F 13/20

U.S. Cl. 604—11

1 Claim



1. A tampon applicator comprising:
- a housing member capable of holding an insertable member; said housing member supporting at least one pH indicator, wherein
- said pH indicator would come into direct contact with a body fluid upon insertion of the applicator into an individual and provide an instant pH reading upon removal of the applicator.



5,769,814

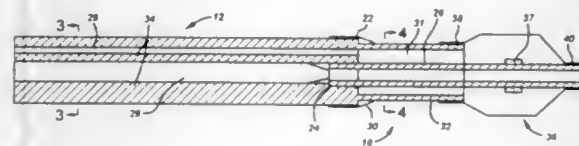
## COAXIAL/DOUBLE LUMEN CATHETER

Bandula Wijay, Houston, Tex., assignor to Leacor, Inc., Houston, Tex.

Continuation of Ser. No. 559,413, Nov. 15, 1995, abandoned, which is a continuation of Ser. No. 221,363, Mar. 31, 1994, abandoned. This application Feb. 26, 1997, Ser. No. 807,865 Int. Cl.<sup>6</sup> A61M 25/00

U.S. Cl. 604—96

19 Claims



## 1. A catheter, comprising:

a proximal section and a distal section;

wherein said proximal section comprises a body having an inflation lumen extending therethrough for inflating a balloon and a perfusion lumen extending therethrough for active perfusion, said inflation lumen having a smaller volume capacity than said perfusion lumen and being at least partially nested within a substantially concave surface of said perfusion lumen; and

wherein said distal section comprises a separate extension segment and said balloon, wherein:

said separate extension segment has flexibility for lateral movement with respect to said distal end of said body; and, said extension segment comprises a first extension lumen therethrough with a proximal end in fluid communication with said inflation lumen and with a distal end sealingly engaged with said balloon, and a second extension lumen therethrough in fluid communication with said perfusion lumen and extending through and beyond said balloon.

5,769,815

## BLOOD CHAMBER WITH INTEGRAL PROJECTIONS

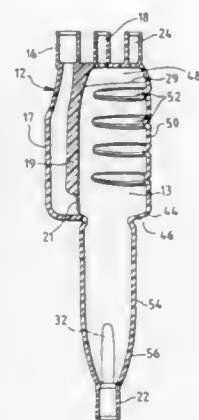
David S. Utterberg, Seattle, Wash., assignor to Medisystems Technology Corporation, Las Vegas, Nev.

Filed May 25, 1995, Ser. No. 451,007

Int. Cl.<sup>6</sup> A61M 5/14

U.S. Cl. 604—80

21 Claims



1. A blood chamber which comprises a chamber-defining wall and an upper end, a lower end, a blood flow chamber inlet, and a blood flow outlet, said blood flow chamber inlet being spaced from the upper end whereby blood can enter said chamber below the upper surface of blood in the chamber, said chamber-defining wall having an upper portion that carries a plurality of projections, said projections being longitudinally spaced in the direction of a chamber longitudinal axis and positioned transversely to said axis, to create blood flow eddies that slow the upward motion of bubbles present.

5,769,816

## CANNULA WITH ASSOCIATED FILTER

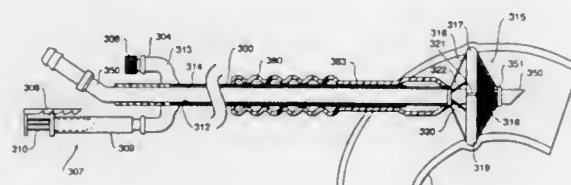
Denise Barbut, New York, N.Y.; Jonathan D. Root, San Francisco; Giovanni Pastrone, Los Gatos, both of Calif.; James M. Sellers, Hampstead, N.H., and Robert Rizzari, Haverhill, Mass., assignors to Embol-X, Inc., Portola Valley, Calif.

Continuation-in-part of Ser. No. 584,759, Jan. 11, 1996, abandoned, which is a continuation-in-part of Ser. No. 580,223, Dec. 28, 1995, abandoned, which is a continuation-in-part of Ser. No. 553,137, Nov. 7, 1995, abandoned. This application Apr. 30, 1996, Ser. No. 640,015

Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 604—96

6 Claims



## 1. An arterial cannula with associated filter, comprising:

a blood cannula having an outer surface, a distal end adapted to enter an artery, a proximal end adapted to receive blood from a bypass-oxygenator machine, and a lumen which extends longitudinally from the proximal to the distal end;

a pressurizing cannula shaped to receive the blood cannula;

an inflation seal attached to the pressurizing cannula which is expandable between a deflated condition and an inflated condition;

a mesh having a first edge attached to the inflation seal; and a handle slidably disposed about the pressurizing cannula and enclosing the mesh and inflation seal when the inflation seal is in the deflated condition, wherein the handle can be moved in a proximal direction to release the inflation seal and allow it to be activated to an inflated condition.

5,769,817

## COEXTRUDED BALLOON AND METHOD OF MAKING SAME

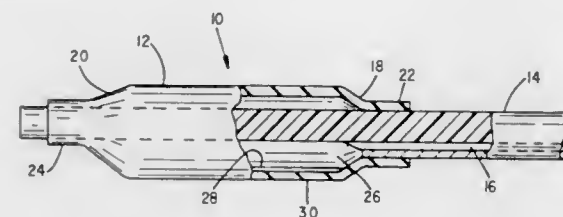
Robert E. Burgmeier, Plymouth, Minn., assignor to Schneider (USA) Inc., Minneapolis, Minn.

Filed Feb. 28, 1997, Ser. No. 810,162

Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 604—96

12 Claims



## 1. An inflatable expander member for a balloon catheter, comprising:

(a) an expandable, double walled tubular member adapted for attachment to a distal end portion of an elongated, flexible catheter body, an outermost wall of the double walled tubular member being polyamide and an inner wall of the double walled tubular member being polyethylene terephthalate, where the percentage by weight of polyamide is in a range of from 20 to 80 percent and with the balance being polyethylene terephthalate, the double walled tubular member exhibiting a compliance factor of about 13 percent or less over a pressure range of from 8 atmospheres to 18 atmospheres.

5,769,818

## BAG CATHETER PROVIDING COMPLETE BLADDER DRAINAGE

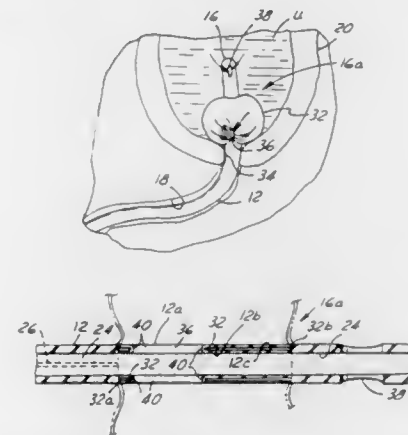
Adel A. El Maoued, 1312 Gnakomis Dr., NE, Albuquerque, N. Mex. 87112, assignor to Adel A. El Maoued, Albuquerque, N. Mex., and Kalil M. Jiraki, Detroit, Mich.

Filed Mar. 17, 1997, Ser. No. 819,116

Int. Cl.<sup>6</sup> A61M 25/00

U.S. Cl. 604—96

18 Claims



## 1. A bag catheter comprising:

an elongated flexible shaft having a proximate end and an opposite distal end, a distal end portion of said shaft including said distal end, said flexible shaft comprising:

a first drainage portal formed in said shaft at a predetermined situs of said distal end portion;

a drainage tube formed in said shaft, said drainage tube fluidically communicating with said first drainage portal;

at least one balloon having a proximal end and a distal end, said balloon being attached to said shaft between said proximal and distal ends of said balloon, wherein said proximal and distal ends of said balloon are located on either side of said first drainage portal; and

channel means fluidically communicating with said at least one balloon for inflating said at least one balloon when a pressurized fluid is introduced into said channel means; wherein said at least one balloon inflates outwardly in relation to said shaft and outwardly in relation to said first drainage portal without occluding said first drainage portal.

5,769,819

## CATHETER DISTAL TIP COMPONENT

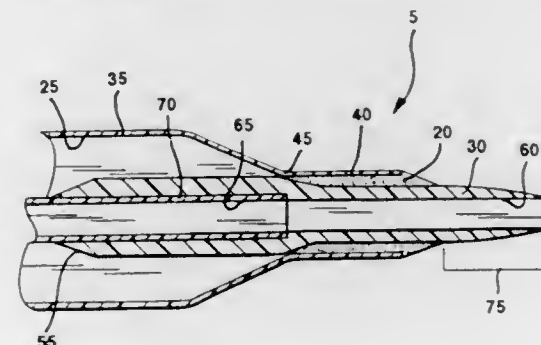
Sharon Schwab, and Maritess E. Minas, both of San Diego, Calif., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 24, 1997, Ser. No. 839,998

Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 604—103

22 Claims



## 1. A medical catheter comprising:

a guidewire shaft having a proximal end and a distal end, the guidewire shaft defining a guidewire lumen sized to accommodate a guidewire;

a distal tip extension having a proximal end, a distal end and an intermediate portion, the intermediate portion located between the proximal end and the distal end of the distal tip extension, the distal tip extension defining a distal tip extension lumen sized to accommodate a guidewire;

the distal tip extension having at the proximal end thereof, the distal end of the guidewire shaft sealingly affixed therein; an inflatable balloon comprising:

a body portion having a proximal end and a distal end; a tail portion having a proximal end, a distal end; and a cone shaped portion, the cone shaped portion extending between the distal end of the body portion and the proximal end of the tail portion, the tail portion being sealingly affixed to the distal tip extension such that the proximal end of the distal tip extension extends proximally from the proximal end of the tail portion;

the distal end of the distal tip extension extends distally from the distal end of the tail portion;

the distal tip extension includes a tapered portion located between the intermediate portion of the distal tip extension and the distal end of the distal tip extension; and

wherein the tail portion is sealingly affixed at the tapered portion of the distal tip extension.

5,769,820

## ABDOMINAL LIFTING APPARATUS AND METHODS FOR TROCAR SURGICAL PROCEDURE

David H. Rammler, 30 Oak Hill Dr., Woodside, Calif. 94062, assignor to David H. Rammler, Woodside, Calif.

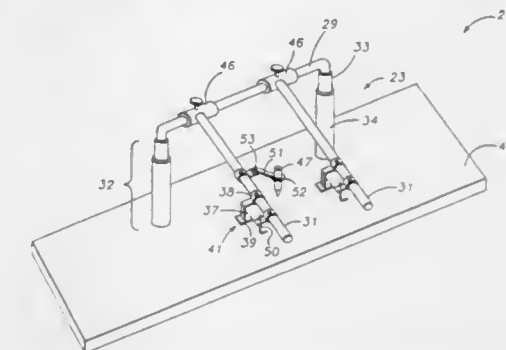
Division of Ser. No. 142,192, Oct. 22, 1993, Pat. No. 5,472,427.

This application Aug. 23, 1995, Ser. No. 518,584

Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 604—104

14 Claims



## 1. An apparatus for lifting the abdominal wall away from the internal abdominal viscera of a patient in a supine position during surgery using an adhesive applied to an external abdominal skin surface of said patient, said apparatus comprising:

horizontal rack; at least two spaced apart horizontal cross-beams extending substantially horizontally from said horizontal rack and supported by said rack;

vertical supporting means for raising and lowering said rack including for raising and lowering said at least two cross-beams synchronously; and

attaching means including an attachment arm extending downwardly from each of said cross-beams to a substantially planar attachment surface, said attachment surface having sufficient area such that when said adhesive is applied between said attachment surface and said exterior abdominal skin surface of said supine patient and then said cross-beams are raised away from said abdominal surface, said abdominal wall is raised away from said internal abdominal viscera without detachment of said attachment surface from said abdominal skin surface.

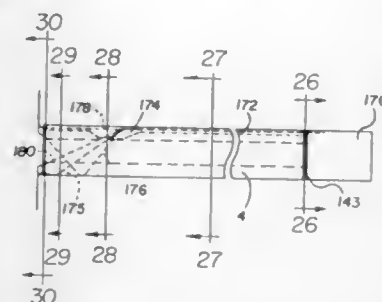
5,769,821

## CATHETER TIP RETAINER

Timothy A. Abrahamson; Pauline R. Young, both of Seattle, and Margo L. Gisselberg, Lynnwood, all of Wash., assignors to Quinton Instrument Company, Bothell, Wash. Continuation of Ser. No. 302,152, Sep. 8, 1994, abandoned, which is a continuation of Ser. No. 137,628, Oct. 15, 1993, abandoned, which is a continuation-in-part of Ser. No. 844,715, Mar. 2, 1992, abandoned. This application Mar. 28, 1997, Ser. No. 825,436 Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 604-104

16 Claims



1. A catheter adapted for insertion into a blood vessel having blood flowing therethrough, comprising:

an elongated tubular member having an internal first lumen for permitting fluids to pass through the catheter and having distal and proximal end portions thereon and a second lumen, said first lumen having a first diameter and said second lumen having a second diameter therein;

a resilient tip immobilizing means at said distal end portion of said tubular member for anchoring said distal end portion of said tubular member within the blood flow of the blood vessel to maintain said distal end portion of said tubular member in a resilient spaced relationship from the blood vessel wall and prevent the distal end portion of said tubular member from contacting a wall of the blood vessel without substantially obstructing fluid flow of blood through the blood vessel, such that catheter failure due to stenosis at said distal end portion of said tubular member is reduced;

a single cable member in contacting engagement with said tip immobilizing means and extending along said second lumen having a second diameter wherein said first diameter of said first lumen is greater than said second diameter of said second lumen and wherein said second lumen extends from said proximal end portion to said distal end portion of said tubular member to actuate movement of said tip immobilizing means upon movement of said cable member in said second lumen; and

said tip immobilizing means includes a plurality of loop members extending from said cable member.

5,769,822

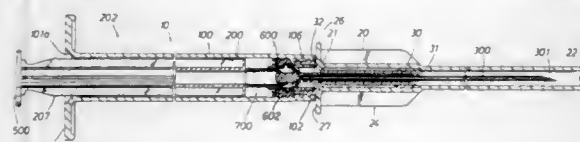
NON-REUSABLE RETRACTABLE SAFETY SYRINGE  
R. Kern McGary, 5802 #B Cougar Dr., Austin, Tex. 78745-3814, and S. William Jentzen, 3000 Artesian Dr., Cedar Creek, Tex. 78612

Filed Sep. 13, 1996, Ser. No. 713,526

Int. Cl.<sup>6</sup> A61M 5/24

U.S. Cl. 604-110

10 Claims



1. A non-reusable retractable safety syringe comprising:

(a) a cylindrical barrel having first and second barrel ends and an inside diameter wall there between;

(b) a chamber for receipt of fluid within said barrel and between said first and second barrel ends;

(c) a plastic hollow plunger having a distal end, said plunger being extendable into said barrel through the first end of said barrel, and selectively movable from expanded position toward an expended position;

(d) means for permitting the plunger to thereafter move to a collapsed position relative to the second end of the barrel;

(e) a hollow needle in secured relationship relative to the second end of the barrel;

(f) biasing means in initially secured relationship relative to the second end of the barrel for biasing the needle toward the hollow plunger;

(g) means for directing forward pressure upon said plunger;

(h) sealing means including an elastomeric sealing member engaged to one end of the plunger for slidable sealing engagement with the inside diameter wall of the barrel;

(i) means for telescopically engaging the plunger distal end to the sealing means and including a series of radially spaced breakable support struts having an external diameter and disposed around and to the distal end of the plunger, the sealing means including a tubular housing having an internal diameter larger than the external diameter of the support struts, whereby the support struts selectively secure the plunger to the sealing means, and upon forward pressure being applied to the plunger sufficient to break the struts, the plunger may thereafter telescopically move within the external diameter of the tubular housing from the expended position to the collapsed position, and

(j) a cutting tip carried by the plunger for cutting through the sealing member such that the biasing means thereafter releases the needle into the plunger when the plunger is at the collapsed position relative to the second end of the barrel.

5,769,823

## IMPLANTABLE INFUSION PUMP

Karl-Heinz Otto, Kiel, Germany, assignor to Tricumed GmbH, Kiel, Germany

PCT No. PCT/DE96/00496, § 371 Date Nov. 25, 1996, § 102(e) Date Nov. 25, 1996, PCT Pub. No. WO96/29105, PCT Pub. Date Sep. 26, 1996

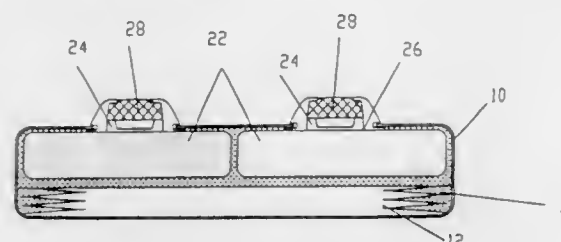
PCT Filed Mar. 22, 1995, Ser. No. 737,842

Claims priority, application Germany, Mar. 23, 1995, 195 10 583.4

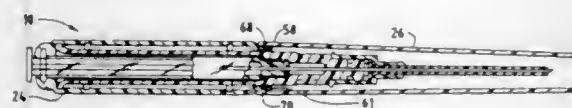
Int. Cl.<sup>6</sup> A61M 31/00

U.S. Cl. 604-141

6 Claims







- B. a needle secured to said first housing, extending beyond said first end, and having a point which can be injected into a patient;
- C. a second housing movably captured by said first housing, said second housing having a first end and an opposite end; and
- D. a removable cap adapted for engaging the first end of said first housing to provide a sheath for said needle, and also adapted for engaging the first end of said second housing to provide a sheath for said needle;
- wherein said first housing and needle are manually movable, with respect to said second housing, between:
- a needle exposing position at which said needle point is outside said second housing, and
- needle sheathing position at which said point is withdrawn into said second housing after said needle is fully withdrawn from a patient to prevent an accidental needle stick.

5,769,828

# **TWO-STAGE VENOUS CANNULA WITH EXPANDABLE REINFORCING MEMBER**

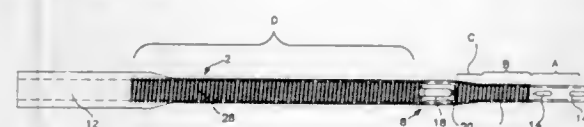
Kenneth R. Jonkman, Grand Rapids, Mich., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jun. 13, 1996, Ser. No. 663,563

Int. Cl.<sup>6</sup> A61M 25/00

U.S. Cl. 604—280

38 Claims



1. A two-staged venous cannula comprising:
- an elongated tubular body having a distal end and a proximal end and an interior lumen extending from the distal end to the proximal end of the body, the interior lumen being open at the proximal end of the body and being substantially enclosed at the distal end of the body, the body having at least one first hole near the distal end of the body extending from the outside of the distal end of the body to the interior lumen, the first hole providing fluid communication between the interior lumen and the exterior of the cannula at the distal end of the body; and
- an atrial basket having a reinforcing member formed therewith, the atrial basket located proximal to the distal end of the body, the reinforcing member having at least one space through which at least one second hole passes to allow blood outside of the cannula to pass through the second hole into the interior lumen.

5,769,829

# **CATHETER GUIDABLE BY MEANS OF FLOW**

Frans Mous, Drachten, Netherlands, assignor to Cordis Corporation, Miami Lakes, Fla.

Filed Nov. 22, 1996, Ser. No. 755,498

Claims priority, application Netherlands, Nov. 28, 1995, 1001763

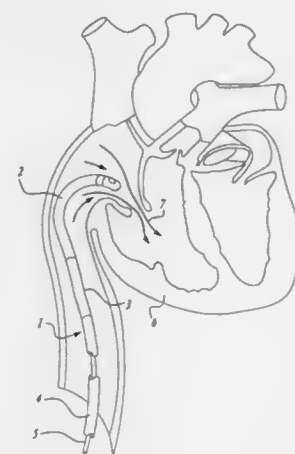
Int. Cl.<sup>6</sup> A61M 25/00

U.S. Cl. 604—280

12 Claims

1. A non-balloon, flow-directed endovascular catheter that can be guided by blood flow within a vessel, wherein said catheter comprises:

- (a) a proximate elongate tubing segment having an inner lumen extending throughout the length thereof;



- (b) a distal elongate tubing segment having an inner lumen extending throughout the length thereof and being connected to an extending from the proximal tubing segment; wherein said proximal tubing segment is relatively stiff and said distal tubing segment is extremely flexible and has modules of elasticity less than 10 Newtons per square millimeter.

5,769,830

# **SOFT TIP GUIDING CATHETER**

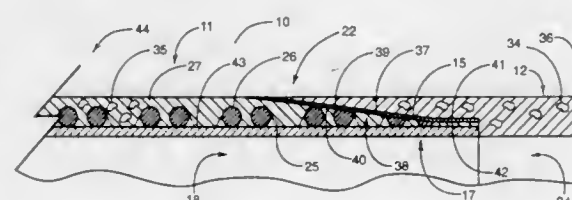
Fred T. Parker, Bloomington, Ind., assignor to Cook Incorporated, Bloomington, Ind.

Continuation-in-part of Ser. No. 80,697, Jun. 22, 1993, abandoned, which is a continuation of Ser. No. 725,754, Jun. 28, 1991, Pat. No. 5,221,270. This application Sep. 1, 1994, Ser. No. 299,773

Int. Cl.<sup>6</sup> A61M 25/00

U.S. Cl. 604—282

19 Claims



1. A soft tip guiding catheter (10) comprising:
- a main tubular portion (11) including a distal outer surface material (27), an inner tube (25) lining a passageway (18) of said main tubular portion and extending proximally from a distal end (17) thereof, and a braiding material (26) positioned around said inner tube;
- a tubular tip (12) of relatively soft material (36) forming a longitudinal passageway (24) with said passageway of said main tubular portion; and
- first (37) and second (38) cooperating bonding surfaces, said first bonding surface on said main tubular portion and said second bonding surface on said tubular tip, said first and said second cooperating bonding surfaces each having a longitudinal portion (42) essentially parallel to said passageway (18) and a tapered portion (41), wherein said longitudinal portion of each bonding surface is distal to said tapered portion, wherein said first and second bonding surfaces form a bond at the interface of said surfaces, and wherein said braiding material further extends along the tapered portions of said first and said second cooperating bonding surfaces.

5,769,831

# **CONVENIENTLY DISPOSABLE OSTOMY APPLIANCE**

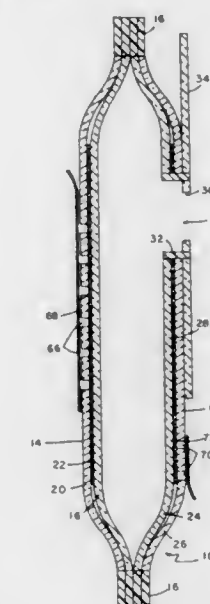
Harvey Alan Freeman, Sparta, N.J., and David Young Phelps, Anchorage, Ky., assignors to Louisville Laboratories, Inc., Louisville, Ky.

Filed May 25, 1996, Ser. No. 670,701

Int. Cl.<sup>6</sup> A61F 5/44

U.S. Cl. 604—332

3 Claims



1. A two-piece waste/fluid collection system, comprising a waste/fluid collection pouch and a patient attachment device, which permits the simple and convenient disposal of said pouch, comprising:

- said pouch having a distal wall and a proximal wall joined at their peripheries to define a waste/fluid cavity, with a flange attached to said distal wall;
- an opening in said proximal wall to permit passage of waste/fluid into said cavity from a patient wearing said pouch;
- said patient attachment device having an adhesive arranged thereon for attachment to both said patient and to said pouch and wherein said flange has a first color, and said attachment component has a second color, which when said components are juxtaposed adjacent to one another, a third resultant color is viewable.

5,769,832

# **ABSORBENT ARTICLE WITH ODOR MASKING AGENTS RELEASED BY THE FASTENING SYSTEM**

Margaret Henderson Hasse, The Procter & Gamble Company, Winton Hill Technical Center 6100 Center Hill Ave., Cincinnati, Ohio 45224

Filed Apr. 17, 1996, Ser. No. 635,221

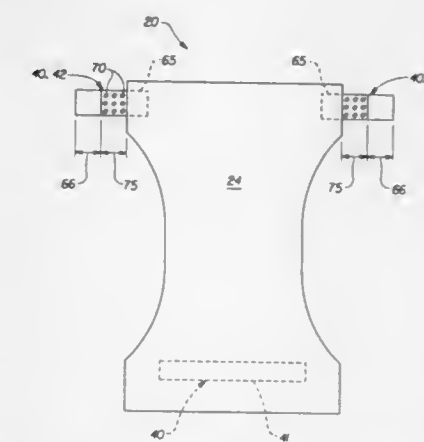
Int. Cl.<sup>6</sup> A61F 13/15

U.S. Cl. 604—359

16 Claims

1. A diaper to be fitted about the lower torso of a wearer having a first waist region and a second waist region, comprising:

- a fluid pervious topsheet;
- a fluid impervious backsheet joined to said topsheet;
- an absorbent core located between said topsheet and said backsheet;
- a fastening system for securing said diaper on a wearer; said fastening system comprising at least one pair of first fastening members disposed in said first waist region and at least one second fastening member disposed in said second waist region, said first fastening members and said second fastening member being attached and positioned in an overlapping configuration such that lateral tensions are maintained about the torso of wearer to maintain said diaper about the wearer; and



- a plurality of perfume-filled release agents disposed on said fastening system, said perfume-filled release agents being released upon disengagement of said fastening system.

5,769,833

# **DIAPER HAVING PERFUME ZONES**

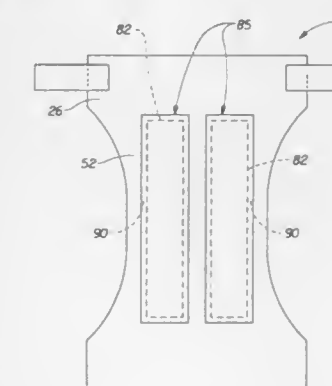
Margaret Henderson Hasse, The Procter & Gamble Company, Winton Hill Technical Center 6100 Center Hill Ave., Cincinnati, Ohio 45224

Filed Dec. 12, 1996, Ser. No. 764,817

Int. Cl.<sup>6</sup> A61F 13/15;13/20

U.S. Cl. 604—359

6 Claims



1. A diaper having a rear waist region, a front waist region opposed to said rear waist region and a crotch region positioned between said rear waist region and said front waist region, said diaper being adapted to fit about the lower torso of a wearer when worn for the collection of urine and solid exudates, the diaper comprising:

- a liquid pervious topsheet;
- a liquid impervious backsheet being joined to said topsheet, said backsheet having an inner surface and an outer surface;
- an absorbent core located between said topsheet and said backsheet; at least one perfume zone located on said outer surface of said backsheet, said perfume zone comprising a pull-strip and a binder securing said pull-strip to said outer surface of said backsheet, said binder comprising release agents dispersed therein for the release of perfume; and
- a fastening system comprising a first fastening member having a pair of fastening tabs disposed in said rear waist region of said diaper and a second fastening member disposed in said front waist region of said diaper, said first fastening members being attachable to said second fastening member about the torso of said wearer to maintain said diaper about said wearer.

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OFFICIAL GAZETTE

JUNE 23, 1998

5,769,834

**ABSORBENT ARTICLE HAVING A FLUID PUMPING ELEMENT**

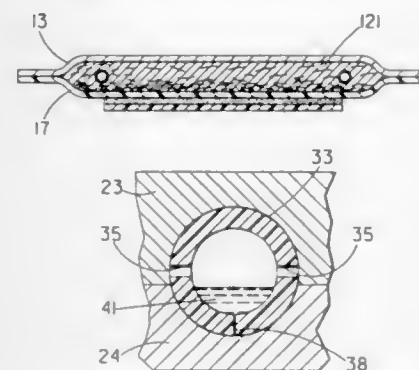
Godfrey Reiter, Cincinnati, and John Billings Burchnell, West Chester, both of Ohio, assignors to The Procter &amp; Gamble Company, Cincinnati, Ohio

Filed Nov. 18, 1996, Ser. No. 746,934

Int. Cl.<sup>6</sup> A61F 13/15

U.S. Cl. 604—385.1

25 Claims



1. An absorbent article useful for absorbing discharged bodily fluids, said article comprising:

- (a) a fluid pervious topsheet;
- (b) a fluid impervious backsheet affixed to said topsheet;
- (c) an absorbent core disposed between said topsheet and said backsheet; and
- (d) a tubular member disposed between said topsheet and said backsheet for delivering said fluids to a predetermined region of said core, said tubular member having a plurality of fluid inlets and a plurality of fluid outlets, said inlets and outlets providing fluid communication between the interior and exterior of said tubular member;

wherein said tubular member is configured so as to permit said bodily fluids to pass through said inlets into the interior of said tubular member, and thereafter out of said interior through said outlets into said predetermined regions of said core.

5,769,835

**ABSORBENT ARTICLE HAVING TUBULAR, ELASTICIZED BUMPERS**

David Arthur Fell, Neenah; David Jerome Arteman; Jerry Alan Johnston, both of Appleton, all of Wis.; Phillip Eugene Keck, Alpharetta, Ga., and Lynn Kirkpatrick LeMahieu, Hortonville, Wis., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

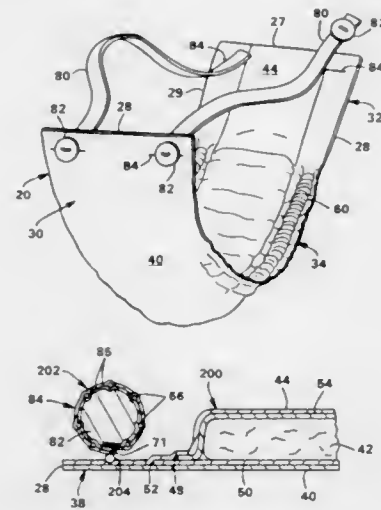
Filed Jun. 7, 1995, Ser. No. 475,309

Int. Cl.<sup>6</sup> A61F 13/15;13/20

U.S. Cl. 604—385.2

9 Claims

1. An absorbent article, comprising:
- a moisture barrier having longitudinal end edges and longitudinal side edges extending between the end edges;
  - a bodyside liner bonded to the moisture barrier;
  - an absorbent structure disposed between the bodyside liner and moisture barrier, at least one of the bodyside liner and moisture barrier forming opposite margins which extend beyond the absorbent structure; and
  - an elasticized bumper disposed in each of the margins, each of the elasticized bumpers comprising:
  - an internal barrier structure; and
  - an elasticized cover operatively joined to one of the margins, the elasticized cover encircling the internal barrier structure and being unadhered to the internal barrier structure, and wherein the elasticized cover comprises a plurality of generally parallel elastic strands wherein at least one of the elastic strands has greater elastic power than at least one other elastic strand;



wherein at least one of the internal barrier structures and the elasticized covers are hydrophobic.

5,769,836

**DISPOSABLE GARMENT WITH NOODLE CUFF AND METHOD FOR MANUFACTURING SAME**

Walter V. Klemp, Houston, Tex., assignor to Drypers Corporation, Houston, Tex.

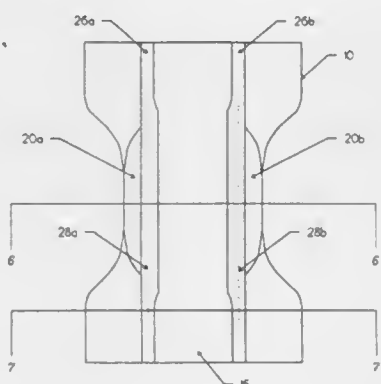
Division of Ser. No. 312,334, Sep. 26, 1994, Pat. No. 5,536,350.

This application May 3, 1996, Ser. No. 642,720

Int. Cl.<sup>6</sup> A61F 13/15

U.S. Cl. 604—385.2

3 Claims



1. A disposable garment comprising:

- an absorbent pad assembly exhibiting an interior surface, an exterior surface, lateral edges and longitudinal edges;
- noodles formed in each longitudinal edge of the absorbent pad assembly and attached to the absorbent pad assembly at a point proximal to a center point of the absorbent pad assembly, said noodles being folded about the point of attachment and into contact with the interior surface of the absorbent pad assembly;
- folding strips formed from or attached to the noodles;
- a trough defined by the folded noodles and the interior surface of the absorbent pad assembly; and
- an attachment means for securing the folded noodles to the interior surface of the absorbent pad assembly.

JUNE 23, 1998

GENERAL AND MECHANICAL

3877

5,769,837

**ABSORBENT ARTICLES WITH INTEGRAL RELEASE SYSTEM AND METHODS OF MAKING SAME**

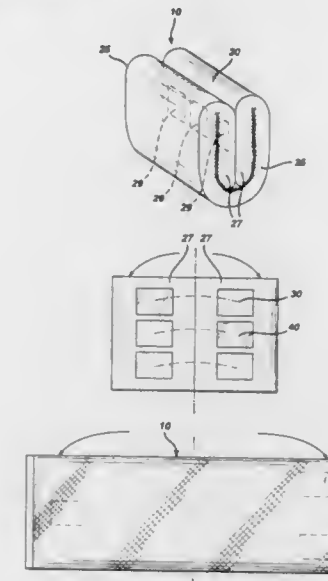
Deborah Jean Parr, Plainsboro, N.J., assignor to McNeil-PPC, Inc., Skillman, N.J.

Continuation of Ser. No. 373,913, Jan. 17, 1995, abandoned, which is a continuation of Ser. No. 935,146, Aug. 24, 1992, abandoned, which is a continuation of Ser. No. 568,913, Aug. 17, 1990, abandoned. This application May 31, 1996, Ser. No. 658,919

Int. Cl.<sup>6</sup> A61F 13/15;13/20

U.S. Cl. 604—390

14 Claims



2. An absorbent article capable of being affixed to a user's undergarment, having a body facing side and a garment facing side, wherein the body facing side comprises an absorbent core having longitudinal edges and transverse ends, and the garment facing side comprises (i) a substrate (ii) at least one attachment zone and (iii) at least one release zone, said attachment zone comprises attachment means located proximate to the transverse ends of the absorbent article, said release zone comprises release means, said attachment means and said release means being attached to said garment facing side with a bond, and at least three fold lines along which said article may be folded such that the attachment means contacts the release means, thereby forming a releasable bond between said attachment means and said release means, whereby said release means protects the attachment means prior to use, and whereby the garment facing side substantially shields the body facing side, said substrate extending transversely beyond the longitudinal edges of the absorbent core thereby forming an extension of said substrate extending from each longitudinal edge, said extension of said substrate being sealed along the peripheral edge of said extension and perforated between said peripheral edge of said extension and said longitudinal edge of the absorbent core.

5,769,838

**DISPOSABLE PULL-ON PANT**

Kenneth Barclay Buell, Cincinnati, and Edward Paul Carlin, Mainville, both of Ohio, assignors to The Procter &amp; Gamble Company, Cincinnati, Ohio

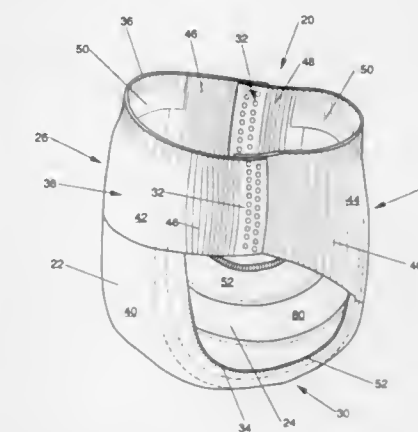
Continuation of Ser. No. 713,054, Sep. 12, 1996, which is a continuation of Ser. No. 415,816, Apr. 3, 1995, Pat. No. 5,569,234. This application Oct. 25, 1996, Ser. No. 738,136

Int. Cl.<sup>6</sup> A61F 13/15

U.S. Cl. 604—396

16 Claims

1. A unitary disposable pull-on garment comprising:
- (a) a nonwoven chassis layer comprising a continuous sheet defining



- (i) a front region having an end edge, side edges, leg edges, a central panel comprising a waistband panel and a medial panel, side panels extending laterally outwardly from said central panel, and a seam panel extending laterally outwardly from each said side panel to said side edge, said seam panels and said side panels extending longitudinally from said end edge to said leg edge;
  - (ii) a back region opposed to said front region, said back region having an end edge, side edges, leg edges, a central panel comprising a waistband panel and a medial panel, side panels extending laterally outwardly from said central panel to said side edge, and a seam panel extending laterally outwardly from each said side panel to said side edge, said seam panels and said side panels extending longitudinally from said end edge to said leg edge; and
  - (iii) a crotch region between said front region and said back region;
- (b) a nonwoven first belt layer positioned so as to extend continuously laterally across said front region from one said side panel to the other said side panel, said first belt layer being joined to said chassis layer;
- (c) a nonwoven second belt layer positioned so as to extend continuously laterally across said back region from one said side panel to the other said side panel, said second belt layer being joined to said chassis layer;
- (d) an elastically extensible breathable front stretch laminate positioned in each said side panel of said front region, each said front stretch laminate comprising a portion of said chassis layer in said side panel, a portion of said first belt layer in said side panel, and an elastic panel member comprising an elastomeric scrim operatively joined with said chassis layer or said first belt layer, each said front stretch laminate being elastically extensible in at least the lateral direction;
- (e) an elastically extensible breathable back stretch laminate positioned in each said side panel of said back region, each said back stretch laminate comprising a portion of said chassis layer in said side panel, a portion of said second belt layer in said side panel, and an elastic panel member comprising an elastomeric scrim operatively joined with said chassis layer or said second belt layer, each said back stretch laminate being elastically extensible in at least the lateral direction; and
- (f) seams joining said front region to said back region adjacent said side edges in said seam panels so as to form two leg openings and a waist opening.

5,769,839

**LONG-TERM BLOOD COMPONENTS STORAGE SYSTEM AND METHOD**

Raleigh A. Carmen, Fullerton; Chi Yong Chong, Placentia, both of Calif., and Randy B. Garcez, Carrboro, N.C., assignors to PALL Corporation, East Hills, N.Y.

Continuation of Ser. No. 339,482, Nov. 14, 1994, abandoned.

This application Sep. 5, 1996, Ser. No. 708,899

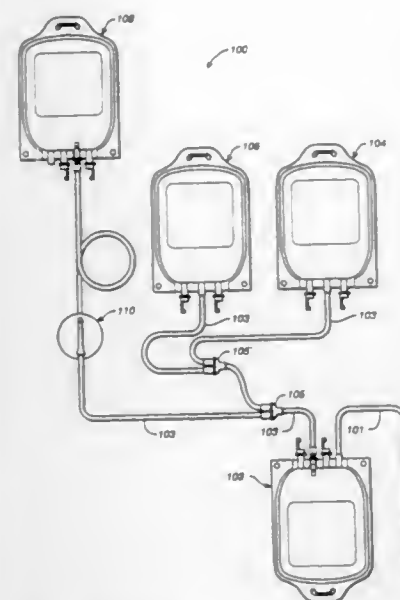
Int. Cl.<sup>6</sup> A61B 19/00

U.S. Cl. 604—408

24 Claims

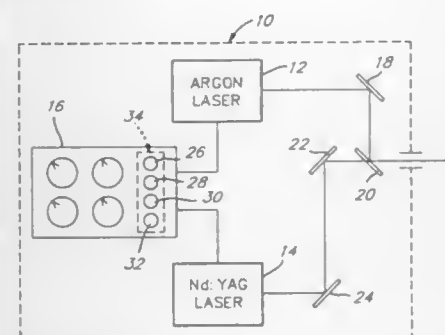
1. A system for storing a blood product, the system comprising:





a plastic bag substantially free of blood extractable plasticizers; and  
an amount of a hypotonic biologically compatible buffered cell preservative solution contained in the plastic bag, wherein said preservative solution comprises:  
dextrose;  
anhydrous sodium phosphate;  
disodium phosphate;  
trisodium phosphate;  
adenine;  
trisodium citrate dihydrate;  
sodium gluconate; and  
mannitol,  
wherein the solution is at about pH 7.0 to about 11.0.

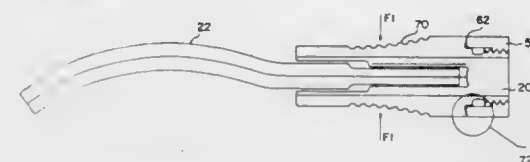
**5,769,840**  
**MICROSURGERY USING ALTERNATING DISRUPTIVE AND THERMAL LASER BEAM PULSES**  
Kurt E. Schirmer, 56 Granville Road, Hampstead, Quebec, Canada, H3X 3B6  
Continuation of Ser. No. 281,510, Jul. 28, 1994, abandoned, which is a continuation of Ser. No. 929,440, Aug. 14, 1992, abandoned, which is a continuation-in-part of Ser. No. 183,049, Apr. 19, 1988, abandoned. This application May 22, 1995, Ser. No. 446,150  
Int. Cl.<sup>6</sup> A61N 5/06  
U.S. Cl. 606—3 10 Claims



1. An apparatus for causing an incision on human or animal tissue, comprising:  
first and second laser beam source means producing a first laser beam for photocoagulation and a second laser beam for photodisruption;

means for directing the laser beams from the first and second laser source means along a confocal path to a target on said tissue;  
switching means for controlling said first and second laser beam source means for directing the first laser beam to said target for a predetermined photodisruptive pulse duration and for directing the second laser beam to said target for predetermined thermal pulse duration to repeatedly complete a controlled cycle having a period of one second or less, whereby the second laser beam pulse coagulates tissue and the first laser beam pulse penetrates further through the coagulated tissue and cuts deeper by disruption, thereby permitting the second laser beam pulse subsequently to be efficiently absorbed, whereby efficient tunneling through solid tissue with a predictable size is provided.

**5,769,841**  
**ELECTROSURGICAL APPARATUS FOR LAPAROSCOPIC AND LIKE PROCEDURES**  
Roger C. Odell, Louisville; Paul H. Emerling, Nederland; David W. Newton, Boulder; Robert C. Steinway, Boulder, and Don R. Boyle, Boulder, all of Colo., assignors to Electro-scope, Inc., Boulder, Colo.  
Filed Jun. 13, 1995, Ser. No. 489,934  
Int. Cl.<sup>6</sup> A61B 17/39  
U.S. Cl. 606—1 16 Claims

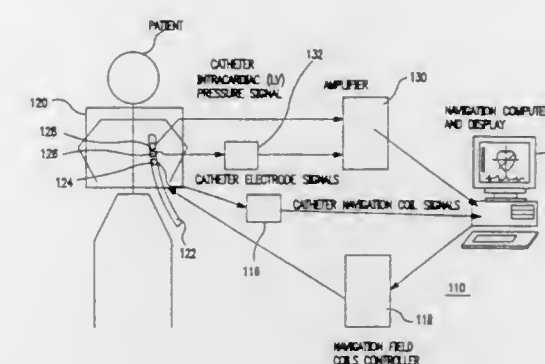


1. An articulating insert for use with a shielded electrosurgical instrument comprising:  
an elongated rod having first and second ends;  
an articulating instrument connected with said first end of said elongated rod; and  
connection means disposed at said first end of said elongated rod for threadably connecting said elongated rod with the shielded electrosurgical instrument;  
wherein said connection means comprises securing means for securing said articulating insert to the shielded electrosurgical instrument, said securing means operating to increase the rotational friction between the shielded electrosurgical instrument and the articulating insert.

**5,769,842**  
Patent Not Issued For This Number

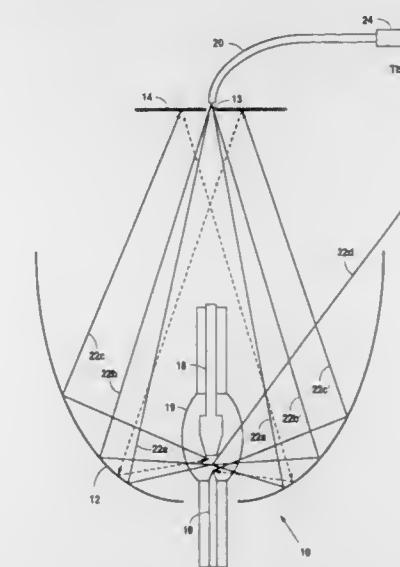
**5,769,843**  
**PERCUTANEOUS ENDOMYOCARDIAL REVASCULARIZATION**  
George S. Abela, Lansing, Mich., and Russell W. Bowden, Tyngsboro, Mass., assignors to CorMedica, Natick, Mass.  
Filed Feb. 20, 1996, Ser. No. 603,484  
Int. Cl.<sup>6</sup> A61B 17/36  
U.S. Cl. 606—10 35 Claims

1. A system for percutaneous myocardial revascularization comprising a catheter, the catheter having a proximal end and a distal end, the distal end of the catheter including:  
an applicator for revascularizing energy operable to revascularize a patient's heart by creating holes partly through a wall of the heart, the revascularizing energy being non-mechanical energy;



a navigation device operable to provide sensing of the position of the distal end and having wires for carrying navigation signals between the navigation device and the proximal end, the navigation device referencing the distal end relative to a frame of reference external to the patient; and  
a pressure sensor operable to sense ventricular pressure during revascularization of a patient's heart.

**5,769,844**  
**CONVENTIONAL LIGHT-PUMPED HIGH POWER SYSTEM FOR MEDICAL APPLICATIONS**  
Shahriar Ghaffari, 8920 Business Park Dr., Suite 250, Austin, Tex. 78759  
Continuation of Ser. No. 359,870, Dec. 20, 1994, abandoned, which is a continuation of Ser. No. 60,300, May 11, 1993, abandoned, which is a continuation-in-part of Ser. No. 721,168, Jun. 26, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 480,537  
Int. Cl.<sup>6</sup> A61B 17/36  
U.S. Cl. 606—16 9 Claims

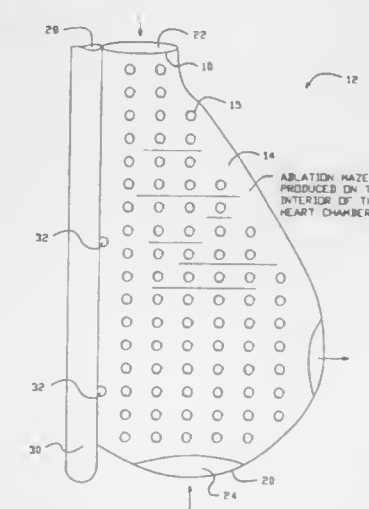


1. A system for producing an intense beam of light for delivery to a portion of tissue, comprising:  
a radiation source;  
a first reflector having first and second focal points, said radiation source being placed at said first focal point, said first reflector being operable to direct radiation from said radiation source toward said second focal point;  
optical means to partially reflect bands of rays having an intensity distribution, originating from said first focal point, to said first focal point such that said intensity distribution of the reflected band of rays is the inverse of said intensity distribution of the originating rays;

optical limiting means for limiting radiation received at said second focal point from said first focal point to a specific numerical aperture;  
an optical receiver at said second focal point having a numerical aperture to accept beams of said radiation passed by said optical limiting means; and  
means for delivering radiation from said optical receiver to a portion of tissue.

**5,769,845**  
Patent Not Issued For This Number

**5,769,846**  
**ABLATION APPARATUS FOR CARDIAC CHAMBERS**  
Stuart D. Edwards, 1681 Austin Ave., Los Altos, Calif. 94024, and Hugh R. Sharkey, Redwood Shores, Calif., assignors to Stuart D. Edwards, Los Altos, Calif.  
Continuation-in-part of Ser. No. 345,142, Nov. 28, 1994, Pat. No. 5,681,308, which is a continuation-in-part of Ser. No. 319,373, Oct. 6, 1994, Pat. No. 5,575,788, which is a continuation-in-part of Ser. No. 286,862, Aug. 4, 1994, Pat. No. 5,558,672, which is a continuation-in-part of Ser. No. 272,162, Jul. 7, 1994, Pat. No. 5,569,241, which is a continuation-in-part of Ser. No. 265,459, Jun. 24, 1994, Pat. No. 5,505,730. This application Apr. 21, 1995, Ser. No. 426,614  
Int. Cl.<sup>6</sup> A61B 17/36  
U.S. Cl. 606—41 36 Claims



1. A cardiac ablation device for ablating tissue within a chamber of the heart, comprising:  
an introducer catheter;  
a plurality of RF electrodes;  
a fluid permeable expandable member surrounding the electrodes;  
a member support attached to the expandable member, the member support, catheter and fluid permeable expandable member being arranged so as to allow blood flow through the heart chamber when the expandable member is expanded adjacent to the chamber;  
an electrical connector device connecting the electrode to an RF energy source; and  
a source adapted to provide an electrolytic fluid to the expandable member to expand the expandable member to conform to at least a portion of the heart chamber and to cause said fluid to create a thermal path between the electrodes and an inner surface of the heart chamber.

5,769,847  
SYSTEMS AND METHODS FOR CONTROLLING TISSUE  
ABLATION USING MULTIPLE TEMPERATURE  
SENSING ELEMENTS

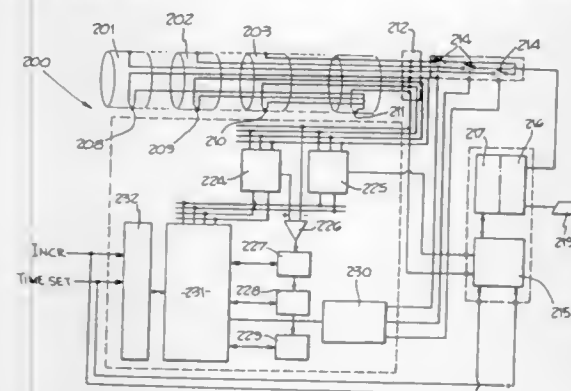
Dorin Nmi Panescu, Sunnyvale; James G. Whayne, Saratoga; Sidney D. Fleischman, Menlo Park, and David K. Swanson, Mountain View, all of Calif., assignors to EP Technologies, Inc., San Jose, Calif.

Continuation of Ser. No. 286,930, Aug. 8, 1994, abandoned, which is a continuation-in-part of Ser. No. 266,934, Jun. 27, 1994, abandoned. This application Apr. 24, 1996, Ser. No. 638,989

Int. Cl.<sup>6</sup> A61B 17/36

U.S. Cl. 606—42

68 Claims



1. A system for ablating body tissue including multiple emitters of ablating energy supported adjacent body tissue by at least one supporting structure comprising

at least one temperature sensing element supported in proximity with each energy emitter for measuring temperature at the emitter,

a power controller coupled to a source of ablating energy and to each energy emitter to convey ablating energy individually from the source to each emitter in a sequence of power pulses, each power pulse having a duty cycle and an amplitude, wherein power delivered to each emitter for ablating tissue is expressed as follows:

$$\text{POWER} = \text{AMPLITUDE}^2 \times \text{DUTY CYCLE}$$

a processing element coupled to each temperature sensing element for periodically reading the temperature measured by each temperature sensing element and comparing the temperature to a desired temperature established for all emitters to generate a signal individually for each emitter based upon the comparison, and

a temperature controller coupled to the power controller and the processing element for causing the power controller to individually vary the power pulse to each emitter based upon the signal for that emitter to maintain the temperatures at all emitters essentially at the desired temperature during tissue ablation.

5,769,848  
ENDOSCOPIC INSTRUMENT  
Somkiat Wattanasirichaigoon, 197 Kent St. Apartment No. 47, Brookline, Mass. 02146

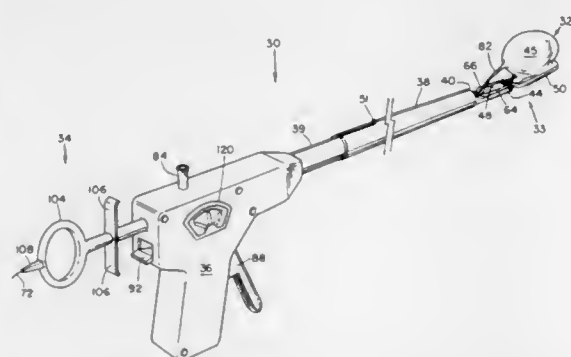
Filed May 14, 1996, Ser. No. 645,520

Int. Cl.<sup>6</sup> A61B 17/36

U.S. Cl. 606—46

24 Claims

1. An endoscopic instrument comprising:  
an elongate body having a proximal end and a distal end;  
actuating mechanism at the proximal end and operating mechanism at the distal end;  
the operating mechanism comprising:  
a pair of V-shaped jaw members,



a first jaw member pointing toward the proximal end of the instrument,  
the second jaw member being pivotally attached to the first jaw member of the open end of the V,  
a cautery wire extending from the second jaw member to the actuating mechanism; and  
a mucosa-protecting balloon attached to and movable with the second jaw member.

5,769,849  
BI-POLAR ELECTROSURGICAL ENDOSCOPIC  
INSTRUMENTS

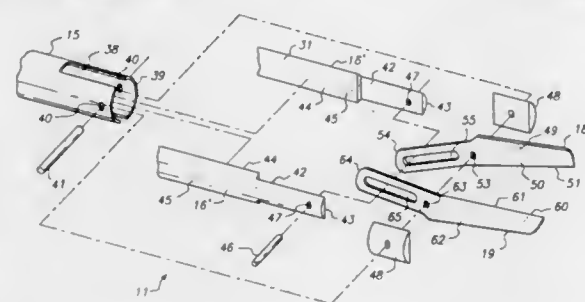
Philip E. Eggers, Dublin, Ohio, assignor to Hemostatic Surgery Corporation, Sausalito, Calif.

Continuation of Ser. No. 257,065, Jun. 9, 1994, abandoned, which is a continuation of Ser. No. 877,704, May 1, 1992, Pat. No. 5,330,471, which is a continuation-in-part of Ser. No. 711,920, Jun. 7, 1991, abandoned. This application May 23, 1995, Ser. No. 447,628

Int. Cl.<sup>6</sup> A61N 17/36

U.S. Cl. 606—48

34 Claims



1. An instrument for hemostatically cutting tissue, the instrument comprising:

an elongated barrel having a proximal end and a distal end;  
first and second blade members disposed on the distal end;  
the first blade member comprising a first composite of an electrically conductive material and an electrically insulative material, the first blade member having a portion defining a first shearing surface, a first cutting edge, and a first electrode extending along, and spaced apart from, the first shearing surface; the second blade member comprising a composite of an electrically conductive material and an electrically insulative material, the second blade member having a portion defining a second shearing surface, a second cutting edge, and a second electrode extending along, and spaced apart from the second shearing surface;

connection means for joining the first and second blade members to the distal end so that the first and second shearing faces oppose one another and the first cutting edge contacts the second cutting edge as the first blade member pivots relative to the second blade member in a scissors-like motion; and

actuating means connected to the proximal end of the elongated barrel for moving the first blade member relative to the second blade member,

wherein the electrically insulative material of the first and second blade members electrically isolates the first electrode from the second electrode when the first and second cutting edges contact each other.

5,769,850  
APPARATUS AND METHOD FOR SUBMERGIBLE, SELF-  
RETAINING DISTRACTION OSTEOGENESIS

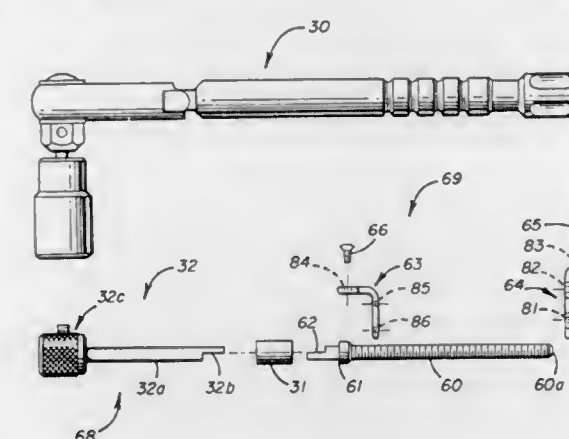
Martin Chin, 20 Hampton Ct., Alameda, Calif. 94502

Filed Oct. 16, 1996, Ser. No. 732,064

Int. Cl.<sup>6</sup> A61B 17/56

U.S. Cl. 606—53

5 Claims



1. An apparatus for distracting a first bone segment from a second bone segment, comprising:

- (a) an implantable first plate for coupling the first bone segment;
- (b) an implantable second plate for coupling the second bone segment;
- (c) submergible means, coupled to the first plate and the second plate, for positioning the first plate a distance from the second plate responsive to a force;
- (d) activating means, coupled to the submergible means, for transferring a force; wherein the activating means includes:
  - (e) a cannula;
  - (f) a torque wrench adapter; and,
  - (g) a torque wrench.

5,769,851  
EXTERNAL FIXATOR  
Wolfgang Veith, Leisberg 7, D-69124 Heidelberg, Germany  
Continuation of Ser. No. 519,586, Aug. 25, 1995, abandoned.

This application Apr. 17, 1997, Ser. No. 839,278

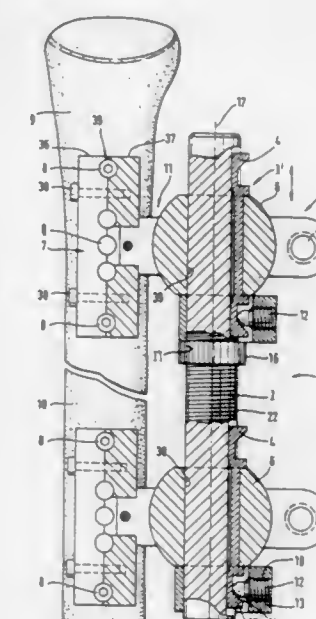
Claims priority, application Germany, Sep. 5, 1994, 44 31 525.2; Aug. 5, 1995, 195 28 839.4

Int. Cl.<sup>6</sup> A61B 17/56

U.S. Cl. 606—57

28 Claims

1. A splint (1) with a carrier (2) on which at least two fastening devices (4) are arranged to receive at least one bone screw receiving part (7), the bone screw receiving part holds at least one bone screw (8) and is axially and radially adjustable and can be locked on the fastening device (4) in various positions, whereby the fastening devices (4) can be affixed onto the carrier (2) by means of at least one locking part (12), said carrier includes at least one flat surface (31) engaged by the at least two fastening devices (4) in order to prevent rotation and axial shifting, the bone screw receiving part (7) can be affixed by means of at least a second locking part (26) on a ball-and-socket joint (6) in any desired position, whereby the ball-and-socket joint is firmly attached to the fastening device, wherein, the ball-and-socket joint (6) and the rod (2) have cooperating grooves (3, 18) to receive an intermediate element (4) designed as a spring, the intermediate element constituting means for preventing rotation between the ball-and-socket

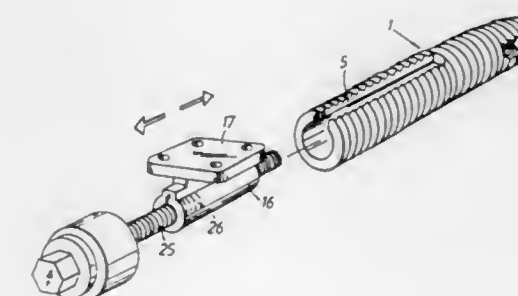


joint (6) and the rod (2), whereby an adjustment of the ball-and-socket joint (6) in an axial direction of the rod (2) is permissible.

5,769,852  
IMPLANTABLE ANCHORING ELEMENT AND  
ANCHORING ASSEMBLY FOR PROSTHESES  
Per-Ingvar Brånemark, Molndal, Sweden, assignor to Med-  
velop AB, Sweden  
Continuation of Ser. No. 233,526, Apr. 26, 1994, abandoned.  
This application May 10, 1996, Ser. No. 644,698  
Claims priority, application Sweden, Apr. 27, 1993, 9301405  
Int. Cl.<sup>6</sup> A61B 17/56; 17/58

U.S. Cl. 606—65

8 Claims



1. A substantially rotationally symmetrical anchoring element intended for implantation in tissue for supporting prostheses or artificial joint components, the anchoring element being comprised of a tissue compatible material, the anchoring element having a peripheral surface which is provided with an external thread, the anchoring element having an insertion end which is the leading end thereof during insertion in tissue, the insertion end being for the attachment of the anchoring element to tissue, the anchoring element having an opposite application end from which prostheses or artificial joint components are attachable to the anchoring element, the anchoring element having a slot defined therein extending radially into the element from one side and only extending partially across the anchoring element and the slot extending substantially axially along a major portion of the axial length of the anchoring element from the application end thereof and ending at a distance from the insertion end, the slot being arranged to receive the prosthesis or artificial joint component.



5,769,853

## BONE RASP

Roswitha Quétin, Jakob-Schober-Strasse 5, 69181 Leimen, Germany

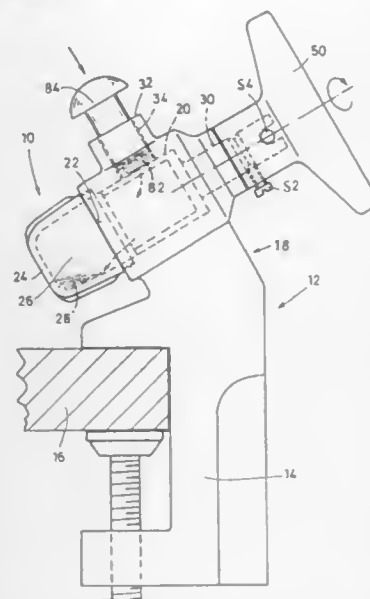
Filed Feb. 27, 1997, Ser. No. 810,997

Claims priority, application Germany, Oct. 31, 1996, 196 44 015.7

Int. Cl.<sup>6</sup> A61B 17/56

U.S. Cl. 606—85

7 Claims



1. A bone rasp comprising a rotatable drum-shaped rasp tool (36) with a cylinder wall (62), a housing (12) provided with a cylindrical reception chamber (20) for the rasp tool (36) and a supply well (34) for bone pieces extending radially from the reception chamber (20), the cylinder wall (62) of the rasp tool (36) is provided with a plurality of through bores (60) arranged adjacent to each other in a plurality axially extending rows (58), the cylinder wall (62) includes at least one tooth (68) between two adjacent through bores (60) and projecting beyond portions (80) of the cylinder wall (62) located in front of said at least one tooth, said at least one tooth (68), being of a substantially tapered V-shape configuration a tip of said at least one tooth (68) pointing in rotational direction (70) of the rasp tool (36), tips of adjacent teeth (68) are connected, forming a cutting edge (72) with arcuate sections (74) arranged directly behind the through bores (60) when viewed in rotational direction (70) of the rasp tool (36), and the cutting edges (72) of through bore rows (58) succeeding each other in rotational direction (70) of the rasp tool (36) radially project in different lengths beyond the cylinder wall (62).

5,769,854

## INSTRUMENT SYSTEM FOR PREPARING A DISTAL FEMUR FOR A POSTERIORLY STABILIZED FEMORAL COMPONENT OF A KNEE PROSTHESIS

Adam C. Bastian, Westwood, N.J.; Marc G. Weissman, Derby, Conn., and Michael E. Wolak, Leonia, N.J., assignors to Osteonics Corp., Allendale, N.J.

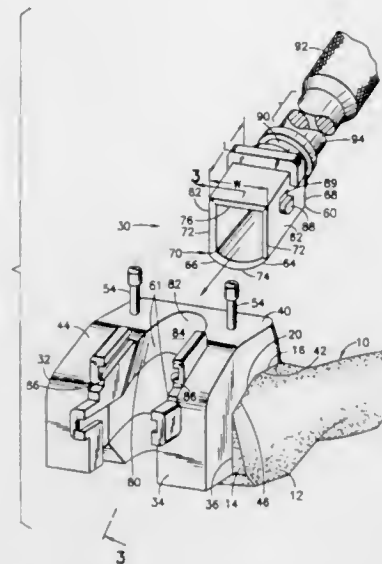
Filed Aug. 23, 1996, Ser. No. 703,597

Int. Cl.<sup>6</sup> A61B 17/58; 17/60

U.S. Cl. 606—88

17 Claims

16. An instrument system for preparation of a longitudinally extending natural bone for the implant of a component of a prosthesis at a site on the natural bone, the preparation including removal of natural bone to prepare a notch in the natural bone subsequent to the execution of cuts establishing at least a longitudinally extending surface and a laterally extending surface at the site on the natural bone, the instrument system comprising:



a notch cutting guide for placement over the longitudinally extending surface and the laterally extending surface at the site, the notch cutting guide having surfaces for overlying the longitudinally extending surface and the laterally extending surface at the site on the natural bone, the notch cutting guide including a first guideway extending along the notch cutting guide in a direction transverse to the longitudinal extent of the natural bone, and a second guideway extending along the notch cutting guide in a generally longitudinal direction; and a notch cutting punch having a length extending between opposite ends, a cutting edge at one of the opposite ends, and coupling means at the other of the opposite ends, the notch cutting punch including follower means extending along the length of the notch cutting punch, the follower means being complementary to each of the first and second guideways such that upon engagement of the follower means with the first guideway and the application of a cutting force at the coupling means the notch cutting punch is advanced transversely, to remove natural bone and establish a portion of the notch, and upon engagement of the follower means with the second guideway and the application of a further cutting force at the coupling means, the notch cutting punch is advanced longitudinally, to remove natural bone to complete the notch.

5,769,855

## FEMORAL MILLING INSTRUMENTATION FOR USE IN TOTAL KNEE ARTHROPLASTY WITH OPTIONAL CUTTING GUIDE ATTACHMENT

Kim C. Bertin, Bountiful, Utah; Dennis W. Burke, Milton, Mass.; Gregory C. Stalcup, Columbia City, and Rodney Bays, Pierceton, both of Ind., assignors to Zimmer Inc., Warsaw, Ind.

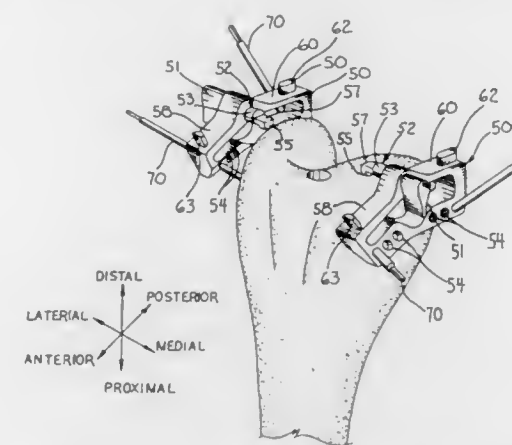
Continuation of Ser. No. 435,103, May 4, 1995, abandoned, which is a division of Ser. No. 169,459, Dec. 17, 1993, Pat. No. 5,474,559, which is a continuation-in-part of Ser. No. 87,933, Jul. 6, 1993, abandoned. This application Mar. 31, 1997, Ser. No. 829,626

Int. Cl.<sup>6</sup> A61B 17/56

U.S. Cl. 606—88

4 Claims

4. A pair of bases for connection to an exposed end of a bone adjacent a surface to be machined, said bases each including a means for the connection of orthopaedic instruments, said bases further including locator means for aligning said instruments with said bases and relative to the bone surface to be machined, each of said bases includes at least two openings for accommodating fastening devices, said bases being configured to be positioned with one of said bases on a medial side of said bone and with one of said bases on a lateral side of said bone, said bases being spaced



relative to one another, said bases being configured to be positioned adjacent to the medial and lateral side of the surface to be machined.

5,769,856

## DRILL GUIDE AND IMPLANT METHOD

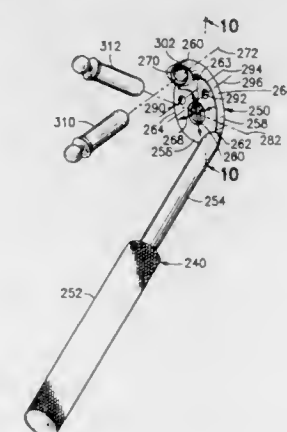
Nicholas N. G. Dong, Little Falls, and Peter J. Abitante, Westfield, both of N.J., assignors to Osteonics Corp., Allendale, N.J.

Filed Jun. 24, 1996, Ser. No. 669,078

Int. Cl.<sup>6</sup> A61F 5/04

U.S. Cl. 606—96

22 Claims



17. A drill guide to be held in place by a surgeon against natural bone for locating holes to be drilled in the natural bone at a site for a prosthetic implant component to be affixed to the natural bone, with the holes arranged in an array complementary to an array of affixation pegs projecting from the prosthetic implant component, the drill guide comprising:

- a guide block having an obverse face and a reverse face, an upper end and a lower end spaced in a longitudinal direction from the upper end, and opposite side edges spaced in lateral directions from one another;
- a handle affixed to the guide block for being gripped by the surgeon to hold the guide block in place against the natural bone;
- a first drill guide bore adjacent the upper end of the guide block and extending in a first transverse direction, transverse to the longitudinal and lateral directions, through the guide block from the obverse face to the reverse face, for guiding a drill to drill a first hole in the natural bone along the first transverse direction when the guide block is held in place by the surgeon gripping the handle, with the reverse face of the guide block seated against the natural bone at the site for the prosthetic implant component;
- a second drill guide bore adjacent the lower end of the guide block and extending in a second transverse direction, trans-

verse to the longitudinal and lateral directions, through the guide block from the obverse face to the reverse face, for guiding a drill to drill a second hole in the natural bone along the second transverse direction when the guide block is held in place by the surgeon gripping the handle, with the reverse face of the guide block seated against the natural bone at the site for the prosthetic implant component;

at least one locator pin for advancement through one of the first and second drill guide bores in a direction from the obverse face toward the reverse face of the guide block; and coupling means for selectively detachably coupling the locator pin and the guide block in response to advancement of the locator pin through the one of the first and second drill guide bores, with the locator pin projecting from the reverse face of the guide block along at least one of the first and second transverse directions for reception within at least one of the first and second holes drilled in the natural bone along a corresponding one of the first and second transverse directions while the guide block is held in place on the natural bone so as to locate the other of the first and second transverse directions for drilling the other of the first and second holes in the natural bone along the other of the first and second transverse directions, such that the first and second holes are arranged in an array corresponding to the first and second transverse directions and complementary to the array of the affixation pegs of the prosthetic implant component.

5,769,857

## LIGATING CLIP APPLIER

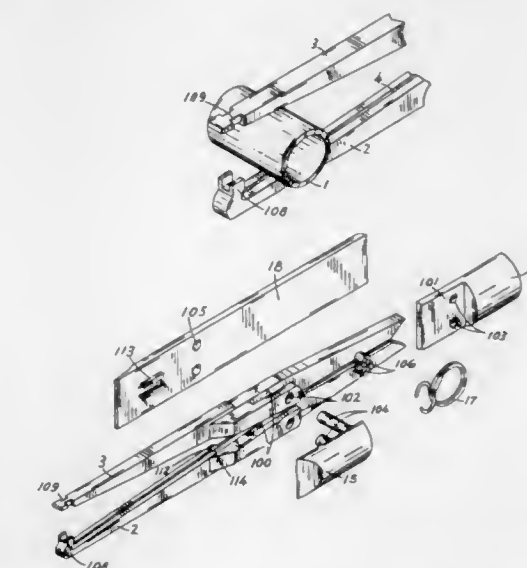
Alexander Vladimirovich Reztov, and Evgeniy Alekseevich Karpov, both of Moscow, Russian Federation, assignors to MGF Group Inc., San Francisco, Calif.

Filed Jun. 11, 1996, Ser. No. 661,499

Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—143

8 Claims



1. A ligating clip applier that permits the isolation and inspection of the tissue to be ligated and produces a ligature that inflicts minimal tissue damage which comprises:

- a handle assembly, including an activating mechanism;
- an elongated shaft, containing a clip driver, connected to said activating mechanism and extending distally from said handle, and
- a pair of jaws connected to the distal end of said elongated shaft said jaws including means, at the distal end of each jaw, for interlocking with each other and being responsive to sequential activation to close then to interlock, forming an enclosure for the isolation of tissue to be ligated, and coordinated tracks on said jaws for guiding a clip advanced by said driver into

the distal end of said interlocked jaws where the distal ends of said clip are converged and pass unopposed to encircle said ligate tissue.

5,769,858  
**LOCKING STYLET FOR EXTRACTING IMPLANTABLE  
LEAD OR CATHETER**

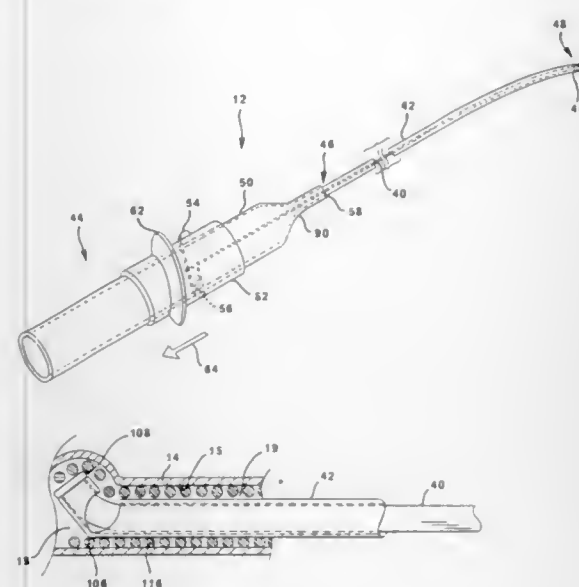
Robert M. Pearson, Woodbury; Thomas C. Bischoff, Minneapolis, and Brian Lee Fidler, Jordan, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 546,163, Oct. 20, 1995, abandoned. This application Mar. 26, 1997, Ser. No. 828,256

U.S. Cl. 606—108

Int. Cl. A61F 11/00

76 Claims



1. A locking stylet for extraction of an elongate, body-implantable lead or catheter, the lead or catheter having a first lumen disposed therewithin, the first lumen having distal and proximal ends, the locking stylet comprising:

an elongate, flexible tubular member having a first length and a second lumen defined by inner sidewalls, the tubular member having proximal and distal ends, the tubular member further having an outer diameter "A" defined by outer sidewalls, the outer diameter being sufficiently small to be received within the first lumen, the tubular member having an aperture formed proximally, propinquant to and a distance "E" from the distal end thereof, the aperture having an axial length "C" and a radial depth "D", the aperture extending through and between the outer sidewalls and the inner sidewalls;

a pull-wire having a second length and proximal and distal ends, the pull-wire being disposed at least partially within the second lumen, the distal end of the pull-wire being affixed to or engaging the distal end of the tubular member, the second length exceeding or equalling the first length, the pull-wire extending along at least the entire first length, and

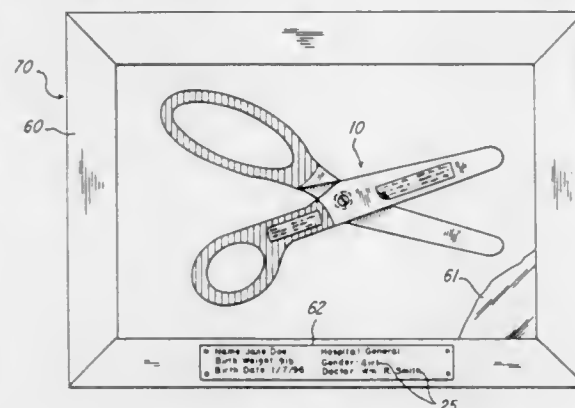
a tractional force imparting mechanism coupled to the proximal end of the pull wire, the tractional force imparting mechanism being adapted to apply proximally-directed tractional force to the pull-wire;

wherein when the tractional force imparting mechanism is manipulated by a user to impart at least a predetermined amount of tractional force to the proximal end of the pull-wire, the distal end of the pull wire causes a first portion of the distal end of the tubular member to sharply bend in a region located propinquant to the aperture such that at least a second portion of the distal end of the tubular member forcibly engages and locally deforms at least a portion of an inner sidewall of the first lumen.

5,769,859  
**UMBILICAL SCISSORS**  
William R. Dorsey, 35 Inverness Ct., Springboro, Ohio 45065  
Filed Apr. 9, 1996, Ser. No. 629,776  
Int. Cl. A61B 17/42

U.S. Cl. 606—119

20 Claims



1. A pair of umbilical scissors in combination with a casing comprising:

a plurality of cutting edges, each of said plurality of cutting edges comprising a handle portion;  
a coupler for coupling said plurality of cutting edges together to enable said plurality of cutting edges to cooperate to cut an umbilical cord; and  
a casing sized and configured for housing said scissors; an indicia for identifying birth data relative to a new born baby being situated on either said casing or said scissors wherein; said casing comprises a frame suitable for receiving and displaying said scissors.

5,769,860

Patent Not Issued For This Number

5,769,861  
**METHOD AND DEVICES FOR LOCALIZING AN  
INSTRUMENT**

Stefan Vilsmeier, Poing, Germany, assignor to Brainlab Med. Computersysteme GmbH, Heimstatten, Germany

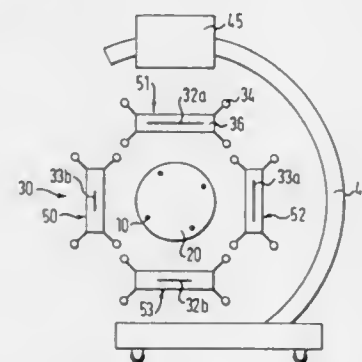
Filed Sep. 12, 1996, Ser. No. 713,212

Claims priority, application Germany, Sep. 28, 1995, 195 36 180.6

U.S. Cl. 606—130

Int. Cl. A61B 6/00

22 Claims



1. A method of localizing an instrument relative to three dimensional corporeal data, particularly for stereotaxis, comprising the following steps:

- connecting an internal marker means fixedly to a body to define an intracorporeal, spatial reference system;
- implementing an analytical scan of the body including said internal marker means to determine the positions of said three-dimensional corporeal data obtained from said analytical scan in said intracorporeal reference system defined by said internal marker means;
- implementing a referencing step, whereby position and orientation of said intracorporeal reference system defined by said internal marker means relative to an extracorporeal reference system defined by an external marker means is determined and said external marker means is located outside of the body in a fixed spatial relationship to the body;
- determining the position and orientation of an instrument in said extracorporeal reference system by means of said external marker means and an instrument marker means attached to said instrument; and
- computing from the position and orientation of the instrument in said extracorporeal reference system the position and orientation of said instrument in said intracorporeal reference system via the relationship between said intracorporeal and said extracorporeal reference system known from step c).

wherein said referencing step comprises a reference scan of said internal marker means and said external marker means, and wherein said external marker means comprises a first external marker means and a second external marker means, the relative spatial positions of which to each other define respective first and second extracorporeal reference systems which rest one in the other, said first marker means being scannable by said referencing scan to thus define the relative position of said intracorporeal reference system to said first extracorporeal reference system, and said second marker means is scannable by an instrument position determining means so as to define the position and orientation of said instrument in said second reference system.

5,769,862

**TUBE KNOT APPLICATOR**

Gene W. Kammerer, East Brunswick; Bruno Bufalini, Creskill; Royce Frederick, South Bound Brook, and Chao Chen, Edison, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

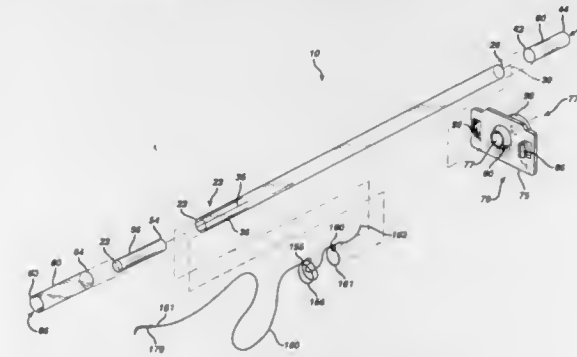
Continuation of Ser. No. 401,754, Mar. 9, 1995, abandoned, which is a continuation of Ser. No. 92,400, Jul. 14, 1993, Pat. No. 5,454,820. This application Apr. 19, 1996, Ser. No.

635,448

Int. Cl. A61B 17/00

U.S. Cl. 606—148

20 Claims



- A surgical suture knot applicator, comprising:  
a tube having a distal end, a proximal end and an axial passage therethrough, the tube having an inner surface and an outer surface, the tube having a constant diameter;  
means for collapsing the distal end of the tube, wherein said collapsing means may be engaged or disengaged, said collapsing means comprising at least two longitudinal slots in the distal end of the tube, and wherein the distal end collapses to a diameter less than the uncollapsed diameter;  
engagement means for engaging or disengaging the collapsing means, said engagement means mounted in the distal end of

the tube, said engagement means comprising a plug member slidably mounted in the distal end of the tube;  
a tubular sleeve having an inner surface and an outer surface mounted over the distal end of the elongated member;  
a surgical suture mounted to the distal end of the tube over the collapsing means;  
a surgical needle mounted to the suture; and,  
at least one pre-tied knot in the suture, the knot mounted on the distal end of the tube between the outer surface of the tube and the inner surface of the tubular sleeve.

5,769,863

**SURGICAL KNOT PUSHER AND METHOD OF USE**

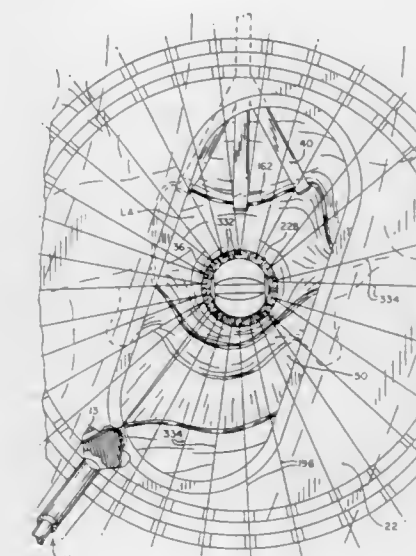
Michi E. Garrison, Belmont, Calif., assignor to Heartport, Inc., Redwood City, Calif.

Continuation of Ser. No. 288,674, Aug. 10, 1994, abandoned. This application Dec. 16, 1996, Ser. No. 767,577

Int. Cl. A61B 17/04

U.S. Cl. 606—148

12 Claims



- A method of tying surgical sutures comprising the steps of:  
a) providing a surgical knot pusher, comprising:  
an elongate shaft having a proximal end and a distal end,  
a knot pushing surface proximate said distal end, said knot pushing surface defining an arc having a convex curvature, said arc having a first end, a second end and an apex intermediate said first end and said second end,  
a first suture path extending along said arc from said apex to said first end and a second suture path extending along said arc from said apex to said second end,  
and an eyelet positioned along said first suture path, said eyelet having an aperture therethrough, said aperture being in alignment with said first suture path;  
b) placing a surgical suture through an article to be sutured, said surgical suture having a standing end and a free end;  
c) passing said standing end of said surgical suture through said eyelet of said surgical knot pusher;  
d) passing said free end of said surgical suture around said standing end of said surgical suture to form a knot in said suture between said surgical knot pusher and said article to be sutured;  
e) aligning said free end of said surgical suture with said second suture path of said surgical knot pusher;  
f) advancing said surgical knot pusher along said surgical suture toward said article to be sutured until said knot contacts said knot pushing surface proximate said apex of said arc.



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5,769,864

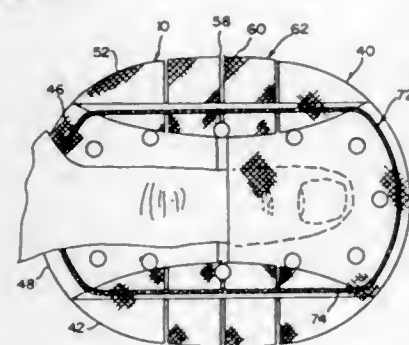
## HERNIA MESH PATCH

Robert D. Kugel, Olympia, Wash., assignor to Surgical Sense, Inc.

Continuation-in-part of Ser. No. 315,249, Sep. 29, 1994, Pat. No. 5,634,931. This application Nov. 22, 1996, Ser. No. 755,108

Int. Cl.<sup>6</sup> A61B 17/04

U.S. Cl. 606—151



## I. A hernia patch, comprising:

a first layer of inert synthetic mesh material sized and shaped to extend across and beyond a hernia;

a second layer of inert synthetic mesh material;

securing means for securing the first and second layers to each other to create a pouch between the first and second layers;

a slit in one of the layers for insertion of a finger into the pouch to position the patch across the hernia; and

a resilient loop adjacent a periphery of the pouch for creating tension in both of the layers.

5,769,865

## INSTRUMENT AND METHOD FOR TRANSECTION OF A LIGAMENT

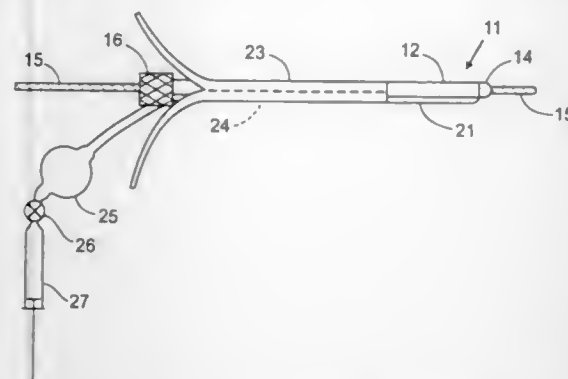
Jim Kermode, Sunnyvale, Calif.; David Kermode, Pella, Iowa; Mark Clifford, Los Altos, and Wade Keller, San Jose, both of Calif., assignors to Surgical Insight, Inc., Sunnyvale, Calif.

Filed Feb. 25, 1997, Ser. No. 805,464

Int. Cl.<sup>6</sup> A61B 17/32

U.S. Cl. 606—167

31 Claims



## I. A device for transecting a ligament, comprising:

a cannula not exceeding twelve inches in length and having proximal and distal ends, each with openings, said cannula defining a lumen and having a lateral opening on one side thereof adjacent to said distal end;

an inflatable member affixed to an external surface of said cannula adjacent to said distal end and opposite said lateral opening, and means for supplying inflation fluid to said inflatable member from said proximal end of said cannula; and

a cutting member on an elongate support equal in length to or longer than said cannula;

said opening at said proximal end being large enough to receive said cutting member and said lumen being large enough to

permit passage of said cutting member from said proximal end opening to said lateral opening.

5,769,866

## INCISION DEVICE

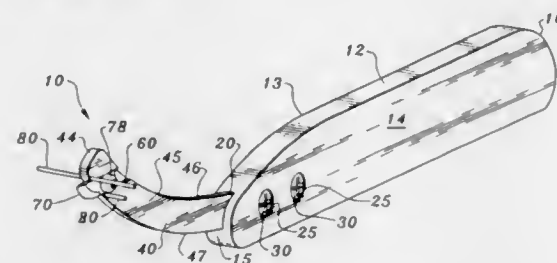
John J. Frantzen, Copperopolis, Calif., assignor to Global Therapeutics, Inc., Broomfield, Colo.

Filed May 14, 1997, Ser. No. 856,363

Int. Cl.<sup>6</sup> A61B 17/32

U.S. Cl. 606—167

17 Claims



## I. An incision device for making incisions of uniform depth on a beating heart, the device comprising in combination:

a handle;

a blade in fixed position relative to said handle, said blade including at least one cutting edge oriented within a cutting plane;

a depth control member located in position intersecting said cutting plane in an orientation substantially perpendicular to said cutting plane;

said depth control member intersecting said cutting plane at a position spaced from said blade tip by an amount equivalent to a preselected cutting depth, such that when said incision device is located with said depth control member abutting tissues being cut, said cutting edge does not cut into the tissues beyond the preselected cutting depth; and

wherein said depth control member includes a depth control pin oriented perpendicular to an elongate arm attached to said handle, said blade attached to said arm, said arm oriented parallel to said cutting plane.

5,769,867

Patent Not Issued For This Number

5,769,868

## ANGIOPLASTY APPARATUS FACILITATING RAPID EXCHANGES

Paul G. Yock, 1216 San Mateo Dr., Menlo Park, Calif. 94025

Continuation of Ser. No. 208,972, Mar. 9, 1994, Pat. No. 5,451,233, which is a division of Ser. No. 10,458, Jan. 27, 1993, Pat. No. 5,300,085, which is a continuation of Ser. No. 937,977, Nov. 2, 1992, Pat. No. 5,350,395, which is a continuation of Ser. No. 774,479, Oct. 10, 1991, abandoned, which is a continuation of Ser. No. 548,200, Jul. 5, 1990, Pat. No. 5,061,273, which is a continuation of Ser. No. 361,676, Jun. 1, 1989, abandoned, which is a continuation of Ser. No. 117,357, Oct. 27, 1987, abandoned, which is a continuation of Ser. No. 852,197, Apr. 15, 1986, abandoned. This application Jun. 7, 1995, Ser. No. 482,094

Int. Cl.<sup>6</sup> A61M 25/10

U.S. Cl. 606—194

11 Claims

## 10. An intraluminal catheter for performing a procedure within a patient, comprising:

a) an elongated catheter shaft having a proximal end and a distal end, a first guidewire port in the distal end and a second

5,769,871

## EMBOLECTOMY CATHETER

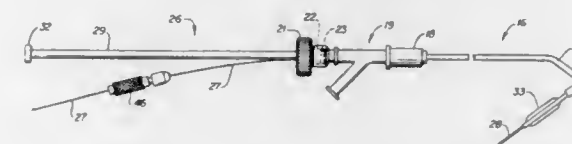
William C. Mers Kelly, Xenia, Ohio, and David Y. Phelps, Louisville, Ky., assignors to Louisville Laboratories, Inc., Louisville, Ky.

Continuation of Ser. No. 559,157, Nov. 17, 1995, abandoned. This application Mar. 6, 1997, Ser. No. 813,798

Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 606—200

3 Claims



guidewire port spaced a short distance from the distal end and a substantial distance from the proximal end; and

b) a distal shaft section which is configured to be disposed entirely within the patient during the procedure, which extends proximally from the first guidewire port, which has a length with a first transverse dimension in a first direction substantially greater than a second transverse dimension perpendicular to the first direction, a first tubular member defining a guidewire receiving inner lumen extending between and in fluid communication with the first and second guidewire ports, and a second tubular member surrounding and coextensive with at least part of the first tubular member and defining part of a second lumen extending from the proximal end of the catheter to a location spaced proximally from the distal end of the catheter.

5,769,869

Patent Not Issued For This Number

5,769,870

## PERFUSION DEVICE FOR MAINTAINING BLOOD FLOW IN A VESSEL WHILE ISOLATING AN ANASTOMOSIS

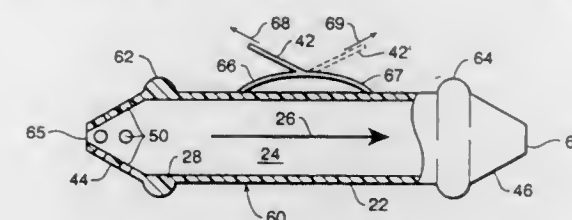
Amr Salahieh, Campbell; Charles S. Taylor, San Francisco; Alfredo R. Cantu, Fremont; Ivan Sepetka, Los Altos, all of Calif., and Robert G. Matheny, Carmel, Ind., assignors to Cardiothoracic Systems, Inc., Cupertino, Calif.

Filed Feb. 20, 1996, Ser. No. 603,415

Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 606—198

22 Claims



## I. A distal perfusion device for maintaining blood flow in a blood vessel to prevent ischemia while further maintaining a dry anastomosis site to facilitate the suturing procedure during the construction of an anastomosis comprising:

a flexible central member having an outer diameter and having a centrally disposed lumen for the passage of fluid and a pair of pointed and tapered end members formed at proximal and distal extremities of the central member having integrally formed now-inflatable annular ridges with pre-selected outer diameters greater than the outer diameter of said central member and at least one perforation for the passage of fluid therethrough.

5,769,872

## ELECTROTHERAPY CIRCUIT AND METHOD FOR SHAPING CURRENT WAVEFORMS

Michael L. Lopin, Newton, and Shervin Avati, Sudbury, both of Mass., assignors to ZMD Corporation, Wilmington, Del.

Filed Dec. 18, 1996, Ser. No. 769,778

Int. Cl.<sup>6</sup> A61N 1/39

U.S. Cl. 607—5

37 Claims

## I. An electrotherapy circuit for administering to a patient a current waveform, comprising:

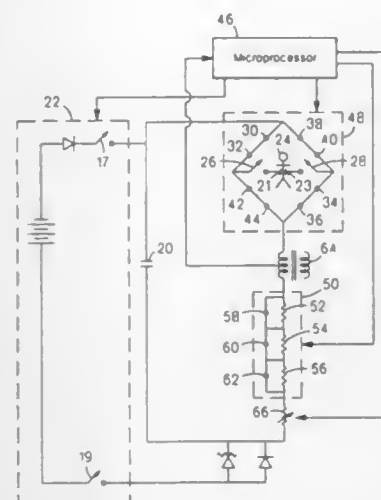
a charge storage device;

at least two discharge electrodes connected by electrical circuitry to opposite poles of the charge storage device;

a resistive circuit connected between the charge storage device and one of the electrodes; and

a control circuit, connected to the resistive circuit, that controls the resistance of the resistive circuit during discharge of the

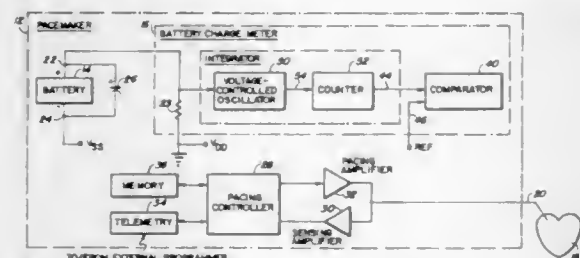
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charge storage device so as to shape a current waveform produced between the discharge electrodes.

**5,769,873**  
**METER FOR MEASURING BATTERY CHARGE DELIVERED IN AN IMPLANTABLE DEVICE**  
Ali Enayat Zadeh, Sierra Madre, Calif., assignor to Pacesetter, Inc., Sylmar, Calif.

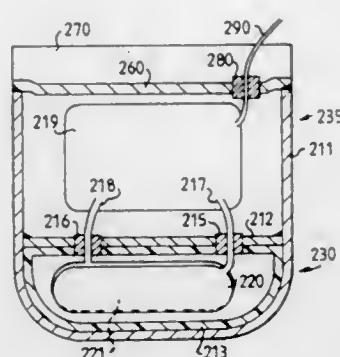
Filed Oct. 15, 1996, Ser. No. 730,262  
Int. Cl.<sup>6</sup> A61N 1/378  
U.S. Cl. 607—29 18 Claims



1. A battery charge meter for use in monitoring the amount of charge delivered by a battery in an implantable device comprising:  
a sensor coupled to the battery, for providing a sense signal corresponding to the electrical current being drawn from the battery;  
a voltage-controlled oscillator circuit that generates a VCO signal having a frequency that corresponds to the sense signal; and  
a counter that counts the cycles of the VCO signal to produce a measurement of depleted battery charge.

**5,769,874**  
**ACTIVE MEDICAL IMPLANT WITH A HERMETICALLY SEALED CAPSULE**  
Kenneth Dahlberg, Stockholm, Sweden, assignor to Pacesetter AB, Solna, Sweden  
Filed Mar. 24, 1997, Ser. No. 823,361  
Claims priority, application Sweden, Mar. 26, 1996, 9601154  
Int. Cl.<sup>6</sup> A61N 1/375  
U.S. Cl. 607—36 10 Claims

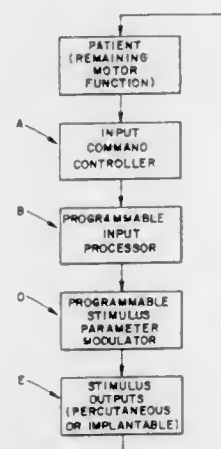
1. In an active medical implant containing a battery unit and an electronics unit, the improvement of a hermetically sealable capsule comprising:  
a first part having a receptacle therein and an open top, and a second part closing said open top, said first part and said second part consisting of biocompatible material;



a partition wall disposed in said first part and forming a substantially closed space in said first part in which said battery unit is disposed, said partition wall and a portion of said first part surrounding said battery unit comprising a hermetically sealed casing for said battery unit as an integral part of said first part; said hermetically sealed casing having surfaces facing said battery unit with an electrically insulating layer, impermeable to battery chemicals, arranged on said surfaces;  
said second part and said partition wall forming a second space in said first part in which said electronics unit is disposed; and  
means for electrically connecting said battery unit in said first space and said electronics unit in said second space.

**5,769,875**  
**FUNCTIONAL NEUROMUSCULAR STIMULATION SYSTEM**  
Paul Hunter Peckham; Brian Smith, both of Cleveland Hts.; James Robert Buckett, Avon; Geoffrey Bart Thrope, University Hts., and Jorge Ernesto Letechipia, Shaker Hts., all of Ohio, assignors to Case Western Reserve University, Cleveland, Ohio

Division of Ser. No. 301,268, Sep. 6, 1994. This application Jun. 7, 1995, Ser. No. 485,327  
Int. Cl.<sup>6</sup> A61F 2/02  
U.S. Cl. 607—48 6 Claims

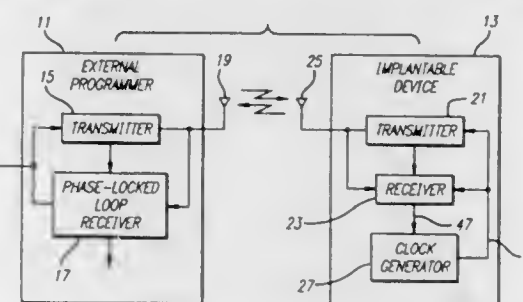


1. An implantable electrical stimulus system including:  
a plurality of implantable electrodes;  
a receiving antenna for receiving radio frequency signals from an external antenna indicative of characteristics of stimulus pulse trains to be applied to the plurality of electrodes;  
a metal capsule defining a hermetically sealed chamber, a first recessed area, and a second recessed area, each recessed area defined by said capsule to include at least one aperture formed therethrough in communication with the sealed chamber, the antenna being mechanically interconnected with the capsule; electrical circuitry mounted within the capsule chamber in electrical communication with the antenna through said at least one aperture of said first recessed area for converting received

radio frequency signals into a stimulus pulse train for each of a plurality of electrodes; and,  
a plurality of electrical leads, each electrical lead being electrically connected at a first end through said at least one aperture of said second recess with the electrical circuitry and at a second end with one of said plurality of implantable electrodes, each of said plurality of electrical leads mechanically interconnected with the metal capsule, whereby said first and second recesses protect the mechanical interconnection of said antenna and the plurality of electrical leads to the capsule, respectively.

**5,769,876**  
**METHOD AND APPARATUS FOR TELEMETERING DATA BIDIRECTIONALLY BETWEEN TWO DEVICES, ONE DEVICE INCORPORATING A COARSE PHASE ADJUSTMENT AND THE OTHER DEVICE INCORPORATING A FINE PHASE ADJUSTMENT**  
Sergiu Silvan, La Crescenta, Calif., assignor to Pacesetter, Inc., Sylmar, Calif.

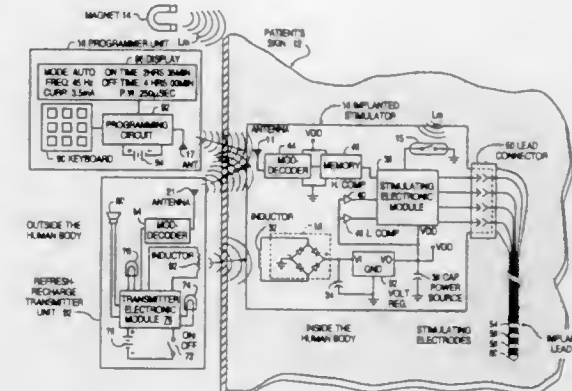
Filed Jul. 2, 1996, Ser. No. 674,486  
Int. Cl.<sup>6</sup> A61M 1/37  
U.S. Cl. 607—60 21 Claims



1. A method for telemetering data bidirectionally between a first device and a second device, wherein the first device includes a clock generator that generates a first clock signal having a nominal frequency, and wherein the second device includes a clock generator that generates a second clock signal having approximately the same nominal frequency, the second clock signal having a first state and a second state, the method comprising:  
transmitting a predetermined start signal from the first device to the second device;  
producing at the second device an adjusted clock signal that is substantially in phase with the second clock signal if the second clock signal is in its first state when the start signal is received by the second device, but that is substantially out of phase with the second clock signal if the second clock signal is in its second state when the start signal is received by the second device; and  
transmitting data from the second device to the first device using the adjusted clock signal.

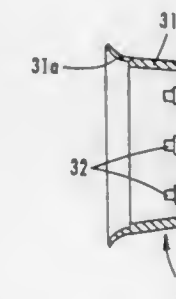
**5,769,877**  
**HIGH VALUE CAPACITIVE, REPLENISHABLE POWER SOURCE**  
Francisco Jose Barreras, Sr., Miami, Fla., assignor to Plexus, Inc., Miami, Fla.  
Continuation-in-part of Ser. No. 368,326, Jan. 4, 1995, Pat. No. 5,591,217. This application Sep. 10, 1996, Ser. No. 711,038  
Int. Cl.<sup>6</sup> A61N 1/18  
U.S. Cl. 607—61 33 Claims

1. A replenishable, power supply system contained within an implantable device, sufficient to supply power to said implantable device on an exclusive basis over at least a portion of a day, said power source including a high value, small size capacitive energy storage unit having a capacitive rating of at least 0.1 farads;



an inductor coil adapted to gather emf power transmissions, rectifying means and means for controlling the level of charge in said capacitive energy storage unit, all electrically coupled to said capacitive energy storage unit and incorporated into said implantable stimulator;  
a low level charge detector, electrically coupled to said capacitive energy source, for detecting and issuing a "charge" low command signal when the charge in said capacitive energy source falls below a predetermined level;  
a telemetry circuit coupled to said detector and receiving said "charge" low command signal, said telemetry circuit transmitting a signal representative of said command signal;  
means, external to said implantable device and not adapted for implantation, for replenishing said capacitive energy storage unit up to its maximum rated voltage by generating said emf power transmissions near said inductor coil;  
said replenishing means having a corresponding telemetry circuit said corresponding telemetry circuit receiving said signal representative of said "charge" low command signal; and  
means for controlling said means for replenishing, said means for controlling being coupled to said corresponding telemetry circuit and activating said means for replenishing upon receipt of said signal representative of said "charge" low command signal.

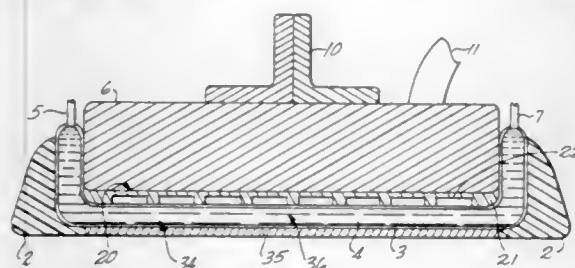
**5,769,878**  
**METHOD OF NONINVASIVELY ENHANCING IMMUNOSURVEILLANCE CAPACITY**  
Tsutomu Kamei, 681-3, Matsuyorishimo-cho, Izumo-shi Shimane, Japan  
Filed Mar. 22, 1996, Ser. No. 620,278  
Claims priority, application Japan, Mar. 23, 1995, 7-091270  
Int. Cl.<sup>6</sup> A61N 5/00  
U.S. Cl. 607—88 10 Claims



1. A method of noninvasively enhancing immunosurveillance capacity comprising the step of applying a pulsed light which has a pulsing frequency in the range of 0.5 Hz to 13 Hz to a user's forehead, from a light source spaced apart from the forehead, without applying said pulsed light to the user's eyes.

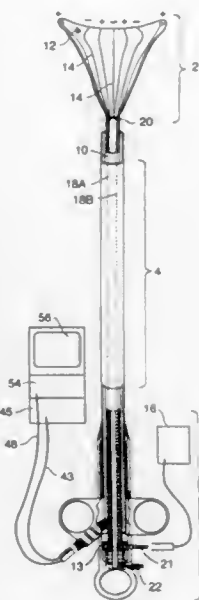


5,769,879  
MICROWAVE APPLICATOR AND METHOD OF OPERATION  
William F. Richards, Tucson, Ariz., and Peter LeVay, Santa Barbara, Calif., assignors to Medical Contouring Corporation, Henderson, Nev.  
Filed Jun. 7, 1995, Ser. No. 480,620  
Int. Cl.<sup>6</sup> A61N 5/02  
U.S. Cl. 607—101 23 Claims



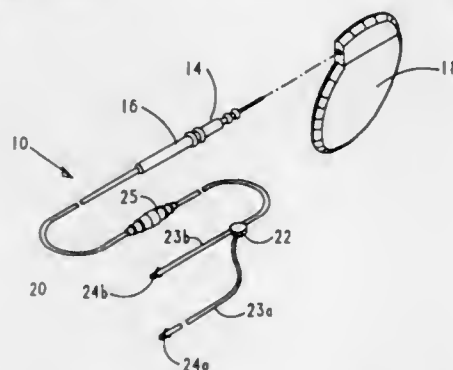
1. A microwave applicator for inducing hyperthermia in target tissue comprising:  
a plurality of antenna elements arranged in an array for launching a plurality of electromagnetic waves having a polarization adapted for generating a plurality of electromagnetic surface waves; and  
a control system including amplitude and phase adjusting elements coupled to the antenna array elements for converging the electromagnetic surface waves at the target tissue, thereby heating the target tissue.

5,769,880  
MOISTURE TRANSPORT SYSTEM FOR CONTACT ELECTROCOAGULATION  
Csaba Truckai, Sunnyvale, Calif., and David C. Auth, Kirkland, Wash., assignors to Novacept, Palo Alto, Calif.  
Filed Apr. 12, 1996, Ser. No. 632,516  
Int. Cl.<sup>6</sup> A61F 2/00  
U.S. Cl. 607—101 33 Claims



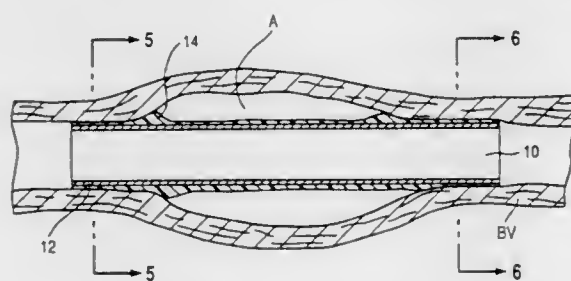
1. An ablation and/or coagulation apparatus for use in delivering energy to tissue for ablation, the apparatus comprising:  
a moisture permeable and/or absorbable electrode carrying member configured to permit moisture generated during ablation to pass into the electrode carrying member and away from underlying tissue;  
electrodes mounted to the electrode carrying member; and  
means for delivering radio frequency energy to the electrodes.

5,769,881  
ENDOCARDIAL LEAD WITH MULTIPLE BRANCHES  
Edward A. Schroepel, and Paul R. Spehr, both of Lake Jackson, Tex., assignors to Sulzer Intermedics Inc., Angleton, Tex.  
Filed May 22, 1997, Ser. No. 862,104  
Int. Cl.<sup>6</sup> A61N 1/05  
U.S. Cl. 607—123 16 Claims



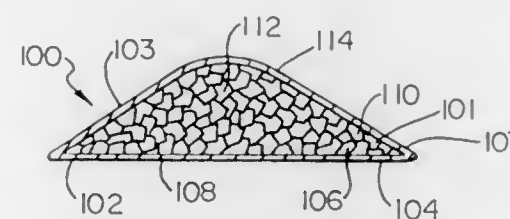
1. A branch assembly for a cardiac lead, said cardiac lead having a proximal tubular portion, a first distal branch, and a second distal branch, said first and second distal branches being adapted to be spatially manipulated by a stylet, comprising:  
a housing having a proximal end adapted to be coupled to said proximal tubular portion, a first flange adapted to be coupled to said first distal branch, a second flange adapted to be coupled to said second distal branch, an inlet passage, and a chamber extending from said inlet passage to said first and second branches; and  
a diverter member coupled to said housing and being disposed in said chamber, said diverter member having a narrowed edge projecting proximally within said chamber whereby said stylet may be selectively wedged to either said first branch or said second branch when said stylet is thrust against said diverter member.

5,769,882  
METHODS AND APPARATUS FOR CONFORMABLY SEALING PROSTHESES WITHIN BODY LUMENS  
Thomas J. Fogarty, Portola Valley; Jay A. Lenker; Brian J. Cox, both of Los Altos; Allan R. Will, Atherton; and Kirsten Freislinger, Menlo Park, all of Calif., assignors to Medtronic, Inc., Minneapolis, Minn.  
Filed Sep. 8, 1995, Ser. No. 525,989  
Int. Cl.<sup>6</sup> A61F 2/06  
U.S. Cl. 623—1 14 Claims



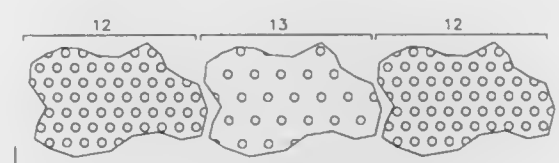
1. In a method for implanting a tubular prosthesis in a body lumen of a type wherein the tubular prosthesis is expanded in situ so that an exterior surface of the prosthesis engages an inner wall of the body lumen over an interface region, the improvement comprising expanding the tubular prosthesis, in a sealing layer disposed in at least a portion of the interface region, the interface region having varying spacing between the prosthesis and the inner wall of the body lumen, the sealing layer conforming to the varying spacing to occlude the interface region.

5,769,883  
BIODEGRADABLE DRUG DELIVERY VASCULAR STENT  
Paul J. Buscemi, Long Lake; Elizabeth A. Stejskal, St. Paul; Donald F. Palme, II, Dayton, and Lixiao Wang, St. Paul, all of Minn., assignors to SciMed Life Systems, Inc., Maple Grove, Minn.  
Division of Ser. No. 372,822, Jan. 13, 1995, Pat. No. 5,500,013, which is a continuation-in-part of Ser. No. 042,412, Apr. 2, 1993, abandoned, which is a continuation-in-part of Ser. No. 944,069, Sep. 11, 1992, abandoned, which is a continuation-in-part of Ser. No. 771,655, Oct. 4, 1991, abandoned. This application Nov. 21, 1995, Ser. No. 561,374  
Int. Cl.<sup>6</sup> A61F 2/06; 2/04  
U.S. Cl. 623—1 6 Claims



1. A stent having a generally tubular main body for insertion into a lumen of a vessel of a living being wherein the tubular main body comprises a substantially biodegradable matrix that includes collagen IV and laminin that enclose voids within the matrix, and a biodegradable strengthening material composed of polylactic acid in contact with the matrix to strengthen the matrix, the tubular main body being essentially saturated with drugs and said tubular main body being expandable within a lumen of a vessel of a living being.

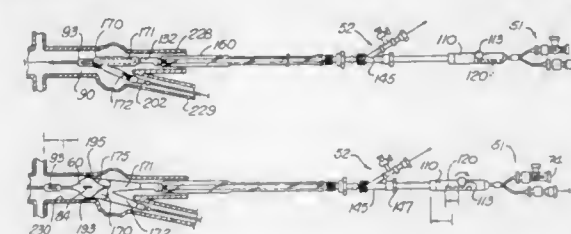
5,769,884  
CONTROLLED POROSITY ENDOVASCULAR IMPLANT  
Kenneth S. Solovay, Fort Lauderdale, Fla., assignor to Cordis Corporation, Miami Lakes, Fla.  
Filed Jun. 27, 1996, Ser. No. 671,387  
Int. Cl.<sup>6</sup> A61F 2/06  
U.S. Cl. 623—1 23 Claims



1. An endoprosthesis implant comprising:  
a) a stent having an expandable frame structure;  
b) a stent covering disposed on said stent, said stent covering having opposed ends, a first region of the stent covering comprising portions of the stent covering adjacent the opposed ends and a second region of the stent covering comprising a middle portion of the stent covering interposed between the first region portions;  
c) the first region having a plurality of pores extending between an inner surface and a spaced apart outer surface of the stent covering defining a first porosity, and the second region having a second porosity different than said first porosity, said second porosity being defined by said second region having fewer pores than said first region; and  
d) each pore in the first region having a pore diameter at the stent covering outer surface of from about 30 to about 120 micrometers.

179-280 O.G. - 98 - 15 : QL 3

5,769,885  
BIFURCATED MULTICAPSULE INTRALUMINAL GRAFTING SYSTEM AND METHOD  
Dinah B. Quiachon, San Jose; Alec A. Piplani, Mountain View; Richard S. Williams; Steve G. Baker, both of Sunnyvale, and Peter K. Johansson, San Jose, all of Calif., assignors to Endovascular Technologies, Inc., Menlo Park, Calif.  
Division of Ser. No. 241,476, May 12, 1994, Pat. No. 5,628,783, which is a continuation-in-part of Ser. No. 66,414, May 21, 1993, Pat. No. 5,489,295, which is a continuation of Ser. No. 684,018, Apr. 11, 1991, abandoned. This application Aug. 16, 1996, Ser. No. 698,787  
Int. Cl.<sup>6</sup> A61F 2/06  
U.S. Cl. 623—1 8 Claims



1. A method for securing a bifurcated graft in a corporeal lumen, the bifurcated graft having a superior end, an ipsilateral inferior end and a contralateral inferior end, the bifurcated graft further having a superior attachment system disposed proximate the superior end, an ipsilateral attachment system disposed proximate the ipsilateral inferior end and a contralateral attachment system disposed proximate the contralateral inferior end, said method comprising the steps of:

- providing a delivery catheter assembly having three distinct capsule means including distal capsule means for containing the superior attachment system of the bifurcated graft, ipsilateral capsule means for containing the ipsilateral attachment system and contralateral capsule means for containing the ipsilateral attachment system;  
positioning the delivery catheter assembly and the bifurcated graft at a desired location within a corporeal lumen;  
moving the distal capsule means distally with respect to the superior end of the bifurcated graft to expose the superior attachment system;  
withdrawing the contralateral capsule means from the contralateral inferior end of the bifurcated graft to expose the contralateral attachment system;  
withdrawing the ipsilateral capsule means from the ipsilateral inferior end of the bifurcated graft to expose the ipsilateral attachment system; and  
removing the delivery catheter from the corporeal lumen, wherein the bifurcated graft remains secured within the corporeal lumen.

5,769,886

Patent Not Issued For This Number

5,769,887  
DELIVERY CATHETER AND GRAFT FOR ANEURYSM REPAIR  
Peter S. Brown, Mountain View; James M. Cannon, Jr., Santa Clara, and Geoffrey A. Orth, El Granada, all of Calif., assignors to Endotex Interventional Systems, Inc., Menlo Park, Calif.  
Continuation of Ser. No. 336,875, Nov. 9, 1994, abandoned.  
This application Jan. 17, 1997, Ser. No. 785,198  
Int. Cl.<sup>6</sup> A61F 2/06  
U.S. Cl. 623—1 14 Claims

1. A graft delivery system comprising:

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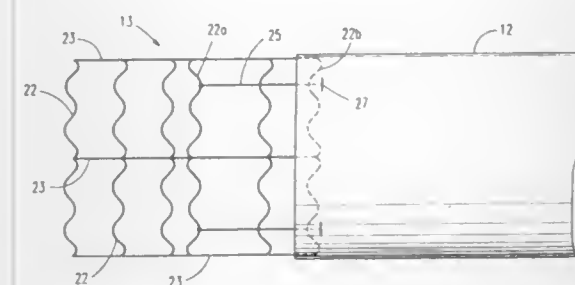
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- a) a catheter having an elongated shaft and a delivery base on a distal portion of the elongated shaft;
- b) a graft having proximal and distal ends, the graft mounted in a compressed state on the elongated shaft;
- c) an anchoring member mounted on the delivery base and having proximal and distal ends, first and second expanding portions and attachment means, the second expanding portion disposed between the first expanding portion and the proximal end of the anchoring member, the attachment means coupling the graft to the first expanding portion so that expansion of the first expanding portion causes the attachment means to pull the distal end of the graft over the second expanding portion; and
- d) means on the delivery base for expanding the anchoring member.

5,769,888

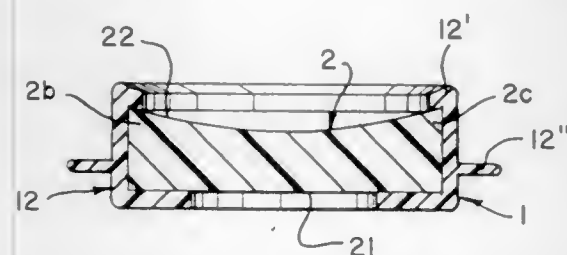
Patent Not Issued For This Number

5,769,889

**HIGH MYOPIA ANTERIOR CHAMBER LENS WITH ANTI-GLARE MASK**Charles D. Kelman, 721 Fifth Ave., New York, N.Y. 10022  
Filed Sep. 5, 1996, Ser. No. 708,467Int. Cl.<sup>6</sup> A61F 2/14

U.S. Cl. 623—6

21 Claims



1. A two piece intraocular lens assembly for insertion of the two-piece assembly through a minimum size incision into the eye for implantation in the eye, comprising:

- a) generally circular high myopia optic member having a first face and a second, concave face forming a thickened peripheral optic region;
- a) ring-shaped frame member having a radially inward enclosing C-shaped cross section providing an inner circumferential groove for receiving and holding the thickened peripheral optic region of said optic member, and an annular fin extending radially outward from said C-shaped member, said annular fin having a diameter at least as large as a diameter of a dilated pupil of the eye, said annular fin being made of substantially flexible material, whereby said annular fin may be bent in a radially inward direction during insertion of the lens assembly into the eye while the ring-shaped frame member securely holds the optic member; and
- a) pair of lateral position fixation means connected with one of said members to position the two-piece lens assembly within the eye.

**5,769,890  
PLACEMENT OF SECOND ARTIFICIAL LENS IN EYE, TO CORRECT FOR OPTICAL DEFECTS OF FIRST ARTIFICIAL LENS IN EYE**

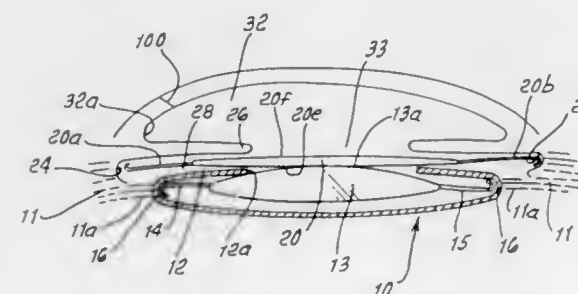
Henry H. McDonald, 525 E. Cordova St., #100, Pasadena, Calif. 91101, assignor to Henry H. McDonald, and William H. Haefliger, Pasadena, Calif., a part interest

Filed Jan. 16, 1997, Ser. No. 786,368

Int. Cl.<sup>6</sup> A61F 2/16

U.S. Cl. 623—6

11 Claims



1. The method of providing corrected vision in an eye wherein a first artificial lens including haptics has been previously placed in the lens capsule of the eye, which includes:

- a) providing a second artificial lens to have opposed surfaces, the second lens also having haptics;
- b) and inserting said second lens in an eye chamber forward of said capsule and generally rearward of the eye iris and pupil area so that one of said opposed surfaces faces toward said first lens, and so that the second lens remains rotatable relative to the first artificial lens;
- c) the second lens characterized as correcting for optical defects associated with the first lens;
- d) and orienting the second lens haptics to be out of alignment with the first lens haptics.

5,769,891

**PROSTHESIS FOR ALLEVIATING TMJ DISCOMFORT**

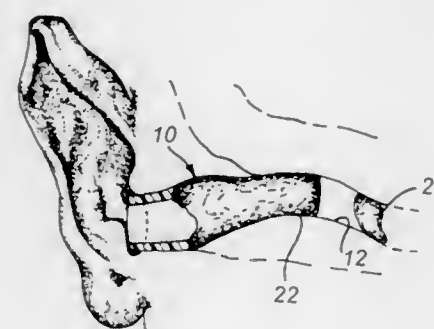
Lawrence G. Clayton, 5330 Parliament Pl., Rockford, Ill. 61107, assignor to Lawrence G. Clayton, Rockford, Ill.

Filed Jun. 13, 1997, Ser. No. 874,819

Int. Cl.<sup>6</sup> A61F 2/18

U.S. Cl. 623—10

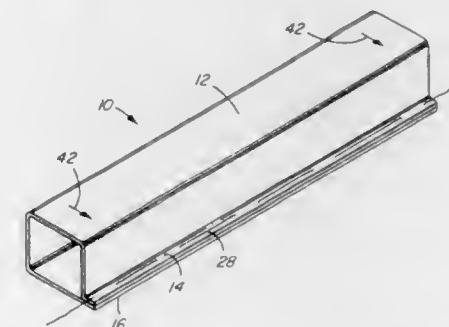
13 Claims



1. A prosthesis adapted to be inserted into an ear canal having an isthmus for treating discomfort in a joint between a mandible and a corresponding temporal bone, the joint having a disc located between the mandible and the temporal bone and associated musculature, the prosthesis having a generally cylindrical core with an exterior surface shaped to substantially conform to a contour of the portion of the ear canal which extends approximately between the entrance to the ear canal and the isthmus, the prosthesis, when inserted, adapted to support the joint and associated musculature for rotational movement of the mandible about the disc, thereby reducing discomfort in the joint.

**5,769,892  
SURGICAL STAPLER SLEEVE FOR REINFORCING STAPLE LINES**  
Brian Gordon Kingwell, Vancouver, Canada, assignor to Mitroflow International Inc., Richmond, Canada  
Filed Oct. 22, 1996, Ser. No. 734,787  
Int. Cl.<sup>6</sup> A61F 2/02; A61B 17/04  
U.S. Cl. 623—11

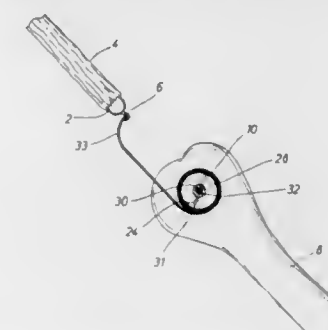
8 Claims



1. A surgical stapler sleeve comprising a unitary sheet of host-compatible material formed into a tube with a generally planar longitudinal face, first and second longitudinal planar edges of the sheet being releasably fastened to one another next to the planar longitudinal face of the sleeve.

**5,769,893  
APPARATUS AND METHOD FOR PROMOTING GROWTH AND REPAIR OF SOFT TISSUE**  
Mrugesh K. Shah, 403 Trails Ct., Houston, Tex. 77024  
Continuation-in-part of Ser. No. 128,809, Sep. 29, 1993, Pat. No. 5,556,428. This application Sep. 17, 1996, Ser. No. 717,530  
Int. Cl.<sup>6</sup> A61F 2/08; A61B 17/08  
U.S. Cl. 623—13

25 Claims



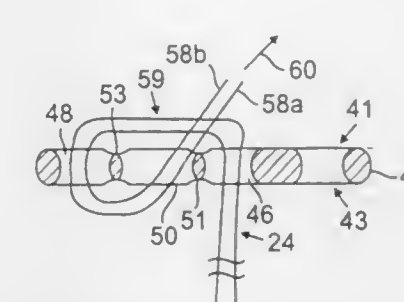
1. A removable biocompatible device for promoting growth of soft tissue comprising:
- spring means having a first end and a second end;
- attachment means for removably securing said first end of said spring means to a soft tissue; and
- fixation means for removably securing said second end of said spring means to a second point, such that tension is created by the spring means in the soft tissue, and in a direction along a line drawn from the attachment means to the second point.

**5,769,894  
GRAFT ATTACHMENT DEVICE AND METHOD OF ATTACHMENT**  
Michael C. Ferragamo, N. Dighton, Mass., assignor to Smith & Nephew, Inc., Memphis, Tenn.  
Filed Feb. 5, 1997, Ser. No. 795,947  
Int. Cl.<sup>6</sup> A61F 2/08

U.S. Cl. 623—13

14 Claims

1. A method of securing a tissue graft within a bone passage comprising the steps of:



- providing a graft fixation member having an opening extending between a first side and a second side of the fixation member and being sized to pass through the bone passage such that the first side engages the bone adjacent to the passage after said member has been passed through the passage;

- attaching a suture having a pair of free ends to the tissue graft; tying the suture to the fixation member by passing the free ends through the opening from the first side to the second side of the fixation member, wrapping the free ends around a portion of the fixation member by passing the free ends from the second side to the first side and passing the free ends back from the first side to the second side, a length of the suture extending between the tissue graft and the fixation member; adjusting the length of the suture by pulling at least one of the free ends; and

- securing the suture to the portion of the fixation member to maintain the suture extending between the tissue graft and the fixation member at the adjusted length.

5,769,895

**DELIVERY SYSTEM FOR BIOLOGICALLY ACTIVE GROWTH OR MORPHOGENETIC FACTORS AND A METHOD FOR PREPARING SUCH A DELIVERY SYSTEM**

Ugo Ripamonti, Johannesburg, South Africa, assignor to South African Medical Research Council, South Africa

Continuation of Ser. No. 875,368, Apr. 29, 1992. This application Apr. 7, 1994, Ser. No. 224,338

Claims priority, application South Africa, Apr. 29, 1991, 91/3225

Int. Cl.<sup>6</sup> A61F 2/54

U.S. Cl. 623—66

13 Claims

1. A method of preparing a delivery system for a biologically active growth or morphogenic factor, comprising the steps of
- (a) selecting an integral structure suitable for use as a prosthetic implant, said structure being a porous carrier having porous interconnection throughout, which structure is composed of an adsorbent material having a specific affinity for the biologically active factor;
- (b) providing said integral structure in a chromatography column;
- (c) dissolving or suspending the biologically active factor in a suitable fluid vehicle therefor;
- (d) introducing into the column the vehicle carrying the biologically active factor at a controlled rate;
- (e) contacting the biologically active factor with the integral structure in the column so that the factor is adsorbed onto the integral structure and
- (f) without an intermediate protein elution step, implanting the integral structure in a region of a body of a primate where growth is required.



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## PROSTHETIC FOOT WITH ANKLE

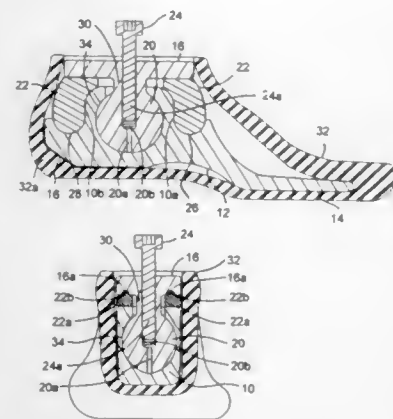
Brent L. Rosendahl, Tualatin, and Terry L. Creamer, Rainier, both of Oreg., assignors to Brent Rosendahl, and Terry Creamer, both of Tualatin, Oreg.

Filed Sep. 30, 1994, Ser. No. 315,814

Int. Cl.<sup>6</sup> A61F 2/66

U.S. Cl. 623—49

3 Claims



1. An energy storing prosthesis comprising:  
a prosthetic foot member including integral heel and toe sections and defining a socket of elliptical shape along a frontal plane therethrough and of circular shape along a sagittal plane therethrough; and  
a prosthetic ankle member including an ellipsoidal ball positioned within and substantially conforming to said socket to thereby form an ankle joint.

5,769,897

## SYNTHETIC BONE

Anton Härle, Drechslerweg 40, D 48161 Muenster, Germany  
Continuation-in-part of Ser. No. 808,191, Dec. 13, 1991, abandoned. This application Feb. 28, 1994, Ser. No. 203,268

Int. Cl.<sup>6</sup> A61F 2/28

U.S. Cl. 623—16

24 Claims



1. A synthetic bone material comprising a first component for sustaining mechanical strength and a second component for enhancing biointegration, said first component containing at least one first biomaterial having a compression strength of at least 1000 N/cm<sup>2</sup> and a first biodegradability sufficiently small to sustain said compression strength, said second component containing at least one second biomaterial having a specific surface of at least 1.5 m<sup>2</sup>/gram and having a second biodegradability larger than said first biodegradability and sufficient to sustain said biointegration, said first component further having a body and a plurality of accessible voids in said body, said body and said voids together forming a tubular structure comprising a plurality of tubular channels each interconnecting a plurality of said accessible voids and said at least one second biomaterial at least partially filling said voids in said tubular structure.

5,769,898

## DEVICE FOR SUPPORTING A MEMBRANE USED FOR PROMOTING BONE GROWTH

Sven Jisander, Bjärred, Sweden, assignor to Nobel Biocare AB, Gothenburg, Sweden

Continuation of Ser. No. 341,196, Dec. 5, 1994, abandoned.

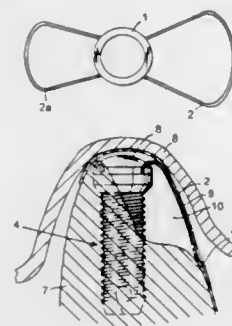
This application Oct. 4, 1996, Ser. No. 725,900

Claims priority, application Sweden, Dec. 9, 1993, 93.04093-9

Int. Cl.<sup>6</sup> A61F 2/28; A61B 17/84

U.S. Cl. 623—16

11 Claims



1. A device for promoting bone growth used with an implant fixture anchored in a bone tissue, the implant fixture having a bone attaching portion and a flange portion, said device including:  
a first part formed as a ring or sleeve sized to be fitted onto the flange portion of the implant fixture; and  
a second part formed of at least one wire loop having its ends secured to said first part and extending outwardly and at least partly substantially transversely to a longitudinal axis of the first part over a space formed underneath said second part in which bone growth is to be established, said wire loop being made of a biocompatible material which is easily bendable to conform to said space but sufficiently stiff to maintain its shape after being bent.

5,769,899

## CARTILAGE REPAIR UNIT

Robert Elliott Schwartz, Old Westbury, and Daniel Anthony Grande, Jr., Seacliff, both of N.Y., assignors to Matrix Biotechnologies, Inc., Melville, N.Y.

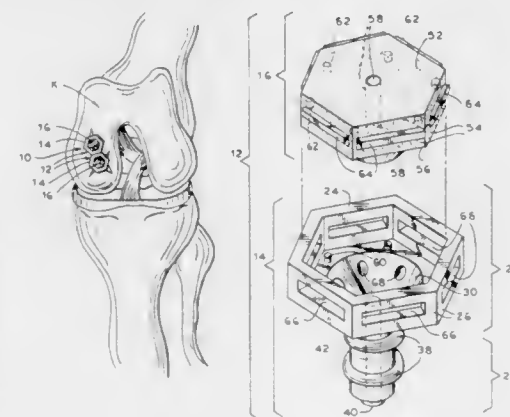
Continuation of Ser. No. 289,387, Aug. 12, 1994, abandoned.

This application Aug. 15, 1996, Ser. No. 698,468

Int. Cl.<sup>6</sup> A61F 2/30

U.S. Cl. 623—18

42 Claims



1. A bio-absorbable cartilage repair system for regenerating damaged or destroyed articular cartilage on a joint surface of a bone by establishing a chondrogenic growth-supporting matrix between an area of damaged or destroyed articular cartilage that has been removed and an adjacent healthy area of articular carti-

lage and subchondral cancellous bone, said system comprising an assembly of:

- (A) a delivery unit consisting substantially of completely bio-absorbable material which is dimensionally stable against substantial expansion by absorption of synovial joint fluid and configured and dimensioned to be mounted in both an area of damaged or destroyed articular cartilage that has been

removed and an adjacent healthy area of articular cartilage and subchondral cancellous bone; and

- (B) a porous insert supported by said delivery unit, consisting substantially of completely bio-absorbable material, and defining at least 95% voids by volume for establishing communication between the removed area and the adjacent healthy area for a chondrogenic growth-supporting matrix.

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## CHEMICAL

5,769,900

ENZYME MIXTURES AND PROCESSES FOR DESIZING  
TEXTILES SIZED WITH STARCH

Wilfried Hahn, Nienburg/Weser; Axel Seitz, Hemmingen; Martin Riegels, Leichlingen; Rainhard Koch, Köln, and Michael Pirkotsch, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, and Genencor International GmbH, Nienburg, both of Germany

Filed Jan. 22, 1997, Ser. No. 787,554

Claims priority, application Germany, Jan. 29, 1996, 196 03 054.4

Int. Cl.<sup>6</sup> D06M 16/00

U.S. Cl. 8—138

1 Claim

1. A process for desizing textiles sized with starch, which comprises treating said textiles with a mixture of starch-degrading enzymes which comprises at least one high temperature amylase (HTA) and at least one low temperature amylase (LTA) in an activity ratio of HTA-to LTA of 10%:90% to 90%:10% and which has at least 60% of its maximum enzyme activity, in temperature range from 30° to 90° C., and which furthermore is optionally diluted with water and optionally further comprises standardizing agents and preservatives at 30° to 98° C. and rinsing.

5,769,901

POWDERED HAIR DYE COMPOSITION AND METHOD  
OF APPLICATION

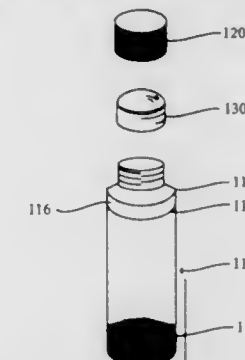
Yoram Fishman, 3300 Wonderview Plaza, Los Angeles, Calif. 90068

Filed Apr. 1, 1996, Ser. No. 627,765

Int. Cl.<sup>6</sup> A61K 7/13

U.S. Cl. 8—406

18 Claims



1. A powdered hair dye composition comprising:  
an oxidative dye component in powdered form in an amount effective for coloring hair;  
an oxidizing component in powdered form in an amount effective to activate the oxidative dye component;  
an effective amount of a thickening component in powdered form; and  
sucrose in powdered form, wherein the sucrose is present in the hair dye composition in an amount of approximately 30–65 weight percent, based on the total weight of the powdered hair dye composition, wherein said powdered hair dye composition is mixed with water before application to the hair.

5,769,902

COMPOSITIONS FOR DYEING KERATINOUS FIBERS  
COMPRISING AN ORTHO-DIAMINOPYRAZOLES, A  
COUPLER OR DIRECT DYE, AND A MANGANESE SALT,  
AND PROCESSES FOR DYEING KERATINOUS FIBERS  
WITH THESE COMPOSITIONS

Henri Samain, Bievres, France, assignor to L'Oreal, Paris, France

Filed Jun. 19, 1996, Ser. No. 666,824

Claims priority, application France, Jun. 21, 1995, 95 07433

Int. Cl.<sup>6</sup> A61K 7/13

U.S. Cl. 8—409

30 Claims

1. A composition for dyeing keratinous fibers, which comprises, in a medium appropriate for dyeing:

at least one ortho-diaminopyrazole or one of its acid addition salts which is incapable of being effectively developed with atmospheric oxygen alone,  
at least one coupler or one direct dye, and  
at least one manganese salt, said at least one manganese salt being present in an amount effective to develop said at least one ortho-diaminopyrazole or one of its acid addition salts in the presence of atmospheric oxygen,  
wherein said at least one ortho-diaminopyrazole, said at least one coupler or direct dye and said at least one manganese salt are each present in an amount effective to dye said keratin fibers.

5,769,903

COMPOSITION FOR THE OXIDATION DYEING OF  
KERATIN FIBERS, COMPRISING AN OXIDATION BASE,  
AN INDOLE COUPLER AND AN ADDITIONAL  
HETEROCYCLIC COUPLER, AND DYEING PROCESS

Marie-Pascale Audousset, Asnieres, and Jean Cotteret, Verneuil sur Seine, both of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 607,720, Feb. 27, 1996, abandoned.

This application Apr. 17, 1997, Ser. No. 838,062

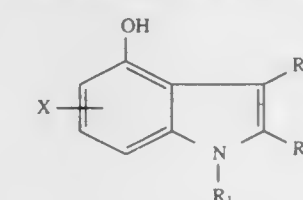
Claims priority, application France, Feb. 27, 1995, 95 02270

Int. Cl.<sup>6</sup> A61K 7/13

U.S. Cl. 8—409

36 Claims

1. A composition for the oxidation dyeing of keratin fibers, said composition comprising, in a medium which is suitable for dyeing:  
(a) at least one oxidation base,  
(b) at least one coupler selected from indole couplers of the following formula (I) and acid addition salts thereof:

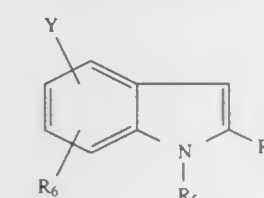


(I)

in which:

R<sub>1</sub> represents a hydrogen atom or a C<sub>1</sub>–C<sub>4</sub> alkyl radical,  
R<sub>2</sub> and R<sub>3</sub>, which may be identical or different, represent a hydrogen atom or a C<sub>1</sub>–C<sub>4</sub> alkyl, carboxyl or (C<sub>1</sub>–C<sub>4</sub>)alkoxycarbonyl radical,  
X represents a hydrogen or halogen atom or a C<sub>1</sub>–C<sub>4</sub> alkyl, C<sub>1</sub>–C<sub>18</sub> alkoxy or acetylamino radical; and

(c) at least one additional heterocyclic coupler selected from:  
(i) the indole derivatives of the formula (II), and the acid-addition salts thereof:



(II)

in which:

R<sub>4</sub> and R<sub>5</sub>, which may be identical or different, represent a hydrogen atom or a C<sub>1</sub>–C<sub>4</sub> alkyl radical;  
R<sub>6</sub> represents a hydrogen atom or a C<sub>1</sub>–C<sub>4</sub> alkyl or hydroxyl radical;

Y represents a hydroxyl radical or a radical NHR<sub>7</sub> in which R<sub>7</sub> represents a hydrogen atom or a C<sub>1</sub>–C<sub>4</sub> alkyl or C<sub>1</sub>–C<sub>4</sub> hydroxyalkyl radical; with the proviso that:

when R<sub>6</sub> denotes hydroxyl, it then occupies the 6-position, Y denotes hydroxyl and occupies the 5-position and R<sub>4</sub> and R<sub>5</sub> represent a hydrogen atom,  
when Y denotes hydroxyl, it then occupies the 6- or 7-position, and R<sub>6</sub> is other than hydroxyl,  
when Y denotes amino, it then occupies the 4-, 6- or 7-position;

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(ii) the benzimidazole derivatives of the formula (III), and the acid-addition salts thereof:  
in which:

$R_8$  represents a hydrogen atom or a  $C_1$ - $C_4$  alkyl radical,  
 $R_9$  represents a hydrogen atom or a  $C_1$ - $C_4$  alkyl or phenyl radical,

$R_{10}$  represents a hydroxyl, amino or methoxy radical,

$R_{11}$  represents a hydrogen atom or a hydroxyl, methoxy or  $C_1$ - $C_4$  alkyl radical;

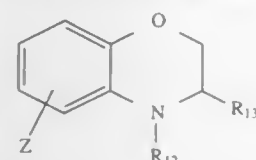
with the proviso that:

when  $R_{10}$  denotes an amino radical, it then occupies the 4-position,

when  $R_{10}$  occupies the 4-position,  $R_{11}$  then occupies the 7-position,

when  $R_{10}$  occupies the 5-position,  $R_{11}$  then occupies the 6-position;

(iii) the benzomorpholine derivatives of the formula (IV), and the acid-addition salts thereof:

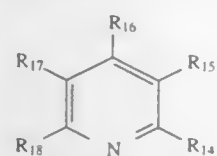


in which:

$R_{12}$  and  $R_{13}$ , which may be identical or different, represent a hydrogen atom or a  $C_1$ - $C_4$  alkyl radical,

Z represents a hydroxyl or amino radical;

(iv) the pyridine derivatives of the formula (V), and the acid-addition salts thereof:



in which:

$R_{14}$  represents a hydrogen atom, a hydroxyl,  $C_1$ - $C_4$  alkoxy,  $C_1$ - $C_4$  monohydroxyalkoxy,  $C_2$ - $C_4$  polyhydroxyalkoxy or amino radical or the  $-OCH_2CH_2COCH_2CH_2OH$  group,

$R_{15}$  and  $R_{17}$ , which may be identical or different, represent a hydrogen atom or a hydroxyl, amino or  $C_1$ - $C_4$  alkyl radical,

$R_{16}$  represents a hydrogen atom or a  $C_1$ - $C_4$  alkyl radical,

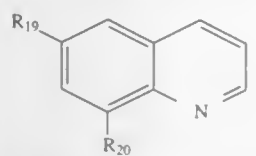
$R_{18}$  represents a hydrogen atom or a hydroxyl,  $C_1$ - $C_4$  alkoxy,  $C_1$ - $C_4$  monohydroxyalkoxy,  $C_2$ - $C_4$  polyhydroxyalkoxy or amino radical,

with the proviso that when  $R_{14}$  represents a polyhydroxyalkoxy radical or the  $-OCH_2CH_2COCH_2CH_2OH$  group,  $R_{15}$  and  $R_{17}$  then represent an amino radical;

and wherein the compounds of formula (V) contain not more than two substituted or unsubstituted amino groups or not more than two hydroxyl groups or not more than one amino group and one hydroxyl group per molecule; said amino, hydroxyl, or amino and hydroxyl groups necessarily being in a meta position relative to each other;

(v) the indoline derivatives chosen from 6-hydroxyindoline, 6-aminoindoline and 5,6-dihydroxyindoline, and the acid-addition salts thereof;

(vi) the quinoline derivatives of the formula (VI), and the acid-addition salts thereof:

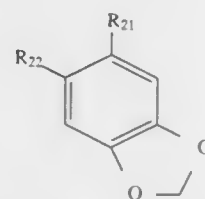


in which:

$R_{19}$  denotes a hydroxyl or  $C_1$ - $C_4$  alkoxy radical,

$R_{20}$  denotes a hydrogen atom or amino radical; and

(vii) the sesamol derivatives of the formula (VII), and the acid-addition salts thereof:



in which:

$R_{21}$  denotes a hydroxyl or amino radical, and

$R_{22}$  denotes a halogen atom or a  $C_1$ - $C_4$  alkoxy radical, wherein said at least one oxidation base, said at least one coupler, and said at least one additional heterocyclic coupler are present in an amount effective to dye said keratin fibers.

5,769,904

PROCESS FOR THE PRODUCTION OF RESISTS OR MULTICOLOR EFFECTS ON NATURAL AND SYNTHETIC POLYAMIDE FIBRE MATERIALS

Guy Achilles Alfons Meerschman, Waregem; Jean-Pierre Troch, Bugenhout, and Serge Charles Jacques Garing, Rhode Saint Genèse, all of Belgium, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Filed May 27, 1997, Ser. No. 863,313

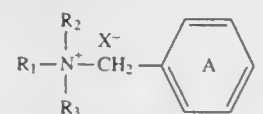
Claims priority, application Switzerland, May 29, 1996, 1346/96

Int. Cl.<sup>6</sup> D06P 5/12

U.S. Cl. 8—455

12 Claims

I. A process for the production of resists or multicolour effects on natural or synthetic polyamide fibre materials, which, to produce resists, comprises locally applying a liquid preparation wet-on-wet before or after treating the textile material with a dyeing liquor or printing paste containing at least one anionic dye, said preparation comprising one or more than one compound of formula



wherein  $R_1$  is a straight-chain or branched  $C_{10}$ - $C_{24}$ alkyl or alkenyl radical,  $R_2$  and  $R_3$  are each independently of the other  $C_1$ - $C_4$ alkyl, X is the radical of an anion, and the benzene nucleus A is unsubstituted or substituted by  $C_1$ - $C_4$ alkyl,  $C_1$ - $C_4$ alkoxy or halogen, or which, to produce multicolour effects, comprises locally applying one or more than one liquid preparation wet-on-wet before or after treating the textile material with a dyeing liquor or printing paste containing at least one anionic dye, said preparation comprising, in addition to one or more than one compound of formula (I), at least one anionic dye, and lastly subjecting the textile goods to a heat treatment to fix the dye.

5,769,905

FABRIC PRINTING

Ian Durham Rattee, N. Yorks, England, assignor to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-ken, and Toyota Jidosha Kabushiki Kaisha, Toyota, both of Japan

Filed Oct. 3, 1996, Ser. No. 725,697

Claims priority, application United Kingdom, Oct. 3, 1995, 9520148; Mar. 6, 1996, 9604738

Int. Cl.<sup>6</sup> D06F 5/15

U.S. Cl. 8—457

15 Claims

I. A process of decorating a cellulose fabric of an original dye color by discharge printing to form a design on the fabric comprising 1) the steps of:

applying a paste in the design to the fabric, said paste comprising a reagent of at least one of thiourea dioxide or formamidine sulfinic acid 2) an amine and 3) calcium, magnesium or

zinc hydroxides or water soluble metal salts or oxides of calcium, magnesium or zinc which, under the conditions of the treatment process, will react with ammonia or an amine to form finely dispersed hydroxides of the said metals; and dry heating the fabric with said paste thereon to react the constituents of the paste and discharge the original dye color.

5,769,906

PROCESS FOR RECOVERING THE SALT CONSTITUENTS FROM HARDENING-SHOP SALT BATHS

Mattias Kremer, Wiesbaden; Georg Wahl, Rodenbach; Eberhard Gock, Goslar; Stefan Wigger, Hanau, and Jörg Kähler, Clausthal-Zellerfeld, all of Germany, assignors to Durrferit GmbH Thermotechnik, Mannheim, Germany

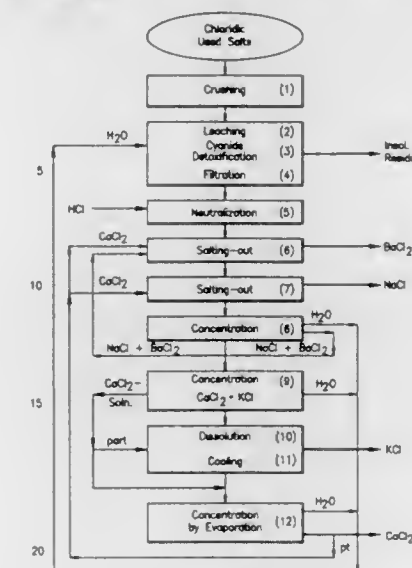
Filed Sep. 27, 1996, Ser. No. 721,658

Claims priority, application Germany, Oct. 6, 1995, 195 37 198.4

Int. Cl.<sup>6</sup> C01D 3/08; C01F 1/00

U.S. Cl. 23—302 R

2 Claims



1. Process for recovering the alkali metal and alkaline earth metal chlorides from used salts that accumulate in the course of the heat treatment of steel parts in salt baths, comprising: dissolving the used-salt constituents in water, separating the insoluble residue, eradicating any cyanides present, and fractionally crystallizing the dissolved salts, by the steps of, removing carbonates and hydroxides by the addition of hydrochloric acid, adding sodium chloride and calcium chloride in a ratio of 1:1 to 5:1, whereby for every 300 g/l of used salt in the solution 150 to 350 g sodium chloride and 30 to 150 g calcium chloride are added maintaining the temperature of the salt bath from  $-5^{\circ}$  to  $+20^{\circ}$  C., crystallizing out barium chloride, adding calcium chloride to a concentration between 150 and 400 g/l, maintaining the temperature of the salt bath from  $40^{\circ}$  to  $120^{\circ}$  C., crystallizing out sodium chloride, concentrating the salt bath solution, crystallizing out sodium chloride and barium chloride, concentrating salt bath solution, crystallizing out a double salt consisting of potassium chloride and calcium chloride, dissolving the double salt at  $35^{\circ}$ - $40^{\circ}$  C. in a 20to 35% solution of calcium chloride, and maintaining the bath temperature at  $5^{\circ}$  to  $20^{\circ}$  C., crystallizing out potassium chloride.

5,769,907

METHOD FOR PRODUCING ALUMINUM ELECTROLYTIC CAPACITOR

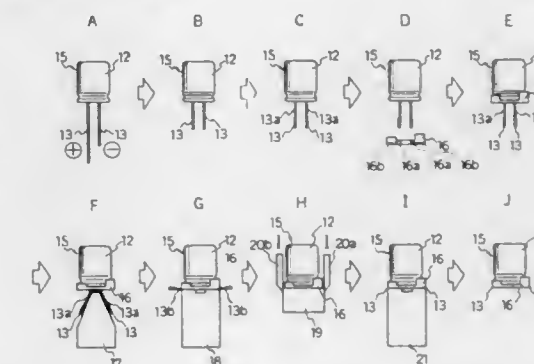
Morihiro Fukuda; Ichirou Yamashita, both of Yamaguchi, and Yasushi Kurasaki, Yoshiki-gun, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Aug. 31, 1995, Ser. No. 521,683

Claims priority, application Japan, Feb. 7, 1995, 7-019377 Int. Cl.<sup>6</sup> H01G 9/15

U.S. Cl. 29—25.03

4 Claims



1. A method for producing aluminum electrolytic capacitors comprising the steps of: encapsulating a capacitor element in a cylindrical case from an opening of said cylindrical case, sealing said openings by a sealing member so as to lead out a pair of lead wires from said capacitor element thereby forming a capacitor body, cutting said pair of lead wires at predetermined lengths of said pair of lead wires extended from an end surface of said capacitor body, mounting an insulation board with through holes onto said opening, so as to make contact with said end surface of said capacitor body and making said pair of lead wires pass through said through holes, said insulation board having grooves on an external surface so as to connect with said through holes, bending said pair of lead wires so as to fit in said grooves, and cutting off projected portions of said pair of lead wires which have been bent to fit in said grooves, at the parts projecting over brim face of said insulation board.

5,769,908

METHOD AND APPARATUS FOR REDUCING THE BY-PRODUCT CONTENT OF CARBONACEOUS MATERIALS

Edward Koppelman, Encino, Calif., assignor to KFX Inc., Denver, Colo.

Continuation of Ser. No. 513,199, Aug. 9, 1995, abandoned.

This application Apr. 1, 1997, Ser. No. 831,115

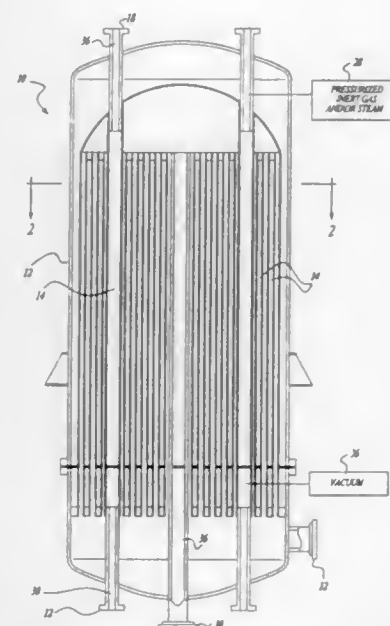
Int. Cl.<sup>6</sup> C10L 9/00

U.S. Cl. 44—621

15 Claims

9. A process for removing by-products from carbonaceous materials, comprising the steps of:

(a) providing a heat exchanger having a least one tube contained within an outer casing, an inlet for introducing carbonaceous material into said at least one tube, an outlet for removing said carbonaceous material from said at least one tube and an inlet for introducing steam into said at least one tube; (b) circulating a heat exchanger medium having a temperature of at least  $250^{\circ}$  F. throughout said outer casing to effectuate an increase in the temperature of said carbonaceous material;



- (c) applying a vacuum to said at least one tube containing carbonaceous material;  
 (d) injected steam through said inlet into said at least one tube containing carbonaceous material; and  
 (e) recovering the carbonaceous material through said outlet; whereby upon applying said vacuum and thereafter introducing said steam, said steam condenses rapidly upon said carbonaceous material thereby speeding the removal of by-products from said carbonaceous material.

5,769,909

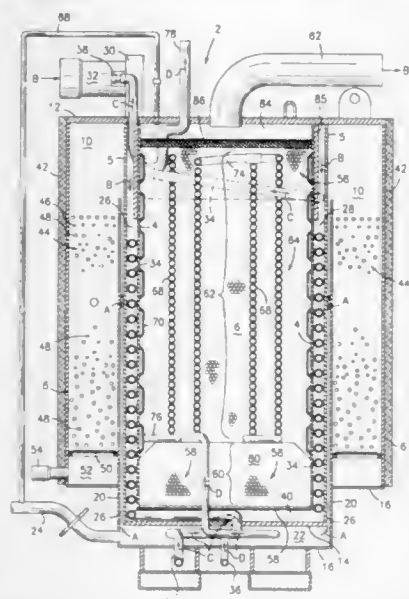
## METHOD AND APPARATUS FOR DESULFURIZING FUEL GAS

Stanley P. Bonk, Tolland; Thomas J. Corrigan, Vernon; Roger R. Lesieur, Enfield; Richard A. Sederquist, Newington, and Donald F. Szydlowski, Ellington, all of Conn., assignors to International Fuel Cells Corp., So. Windsor, Conn.

Filed May 31, 1996, Ser. No. 656,568  
 Int. Cl.<sup>6</sup> B01J 8/06; 8/04; C10L 3/06

U.S. Cl. 48—127.9

11 Claims



1. A hydrocarbon fuel gas hydrosulfurizer assembly comprising:  
 a) an inlet manifold for directing a mixture of the fuel gas and hydrogen into the assembly;

- b) a catalyst bed communicating with said inlet manifold so as to receive a stream of the hydrogen and fuel gas, said catalyst bed containing a noble metal catalyst operable to convert sulfur and sulfur compounds in said hydrogen and fuel gas mixture into hydrogen sulfide, and also containing a hydrogen sulfide absorbent for removing hydrogen sulfide from said hydrogen and fuel gas mixture;  
 c) a heat exchanger section adjacent to said catalyst bed, said heat exchanger section being operable to heat the hydrogen and fuel gas stream prior to the latter entering said catalyst bed;  
 d) a gas conduit for passing a high temperature reformed process gas stream through said heat exchanger section, said heat exchanger section being operable to cool said process gas stream as the latter flows through said heat exchanger section; and  
 e) a shift converter section adjacent to said heat exchanger section, said shift converter section being operable to receive cooled process gas from said heat exchanger section, and said shift converter section being operable to remove carbon monoxide from said cooled process gas in an exothermic reaction so as to produce heat which is at least partially taken up in said heat exchanger section.

5,769,910

## FLOAT BATH FOR MANUFACTURING FLOAT GLASS

Toshiaki Hashimoto, and Tetsuo Kimijima, both of Osaka, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

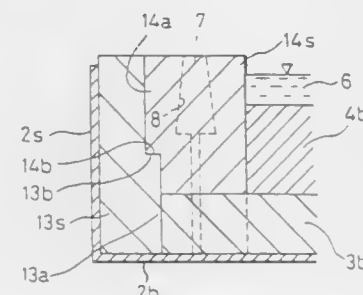
Filed Nov. 19, 1996, Ser. No. 751,952

Claims priority, application Japan, May 17, 1996, 8-123357

Int. Cl.<sup>6</sup> C03B 18/16

U.S. Cl. 65—182.5

12 Claims



1. A float bath for manufacturing float glass, comprising:  
 a metal casing having a casing bottom and casing sides extending upward from edges of the casing bottom,  
 insulating bricks comprising side insulating bricks covering the casing side, each of said side insulating bricks having an upward face extending in a horizontal direction,  
 lining bricks comprising side lining bricks lining the insulating bricks, each of said side lining bricks having a projection projecting toward the side insulating brick and a downward face formed at a bottom of the projection to extend in a horizontal direction, said downward face fitting the upward face of the side insulating brick so that the downward face and the upward face engage with each other to prevent the side insulating brick from moving upward, and  
 a fixing member to fix the side lining bricks to the casing bottom.

5,769,911

## DEVICE FOR THE REMOVAL OF LIQUID AND SOLID CONTAMINANTS FROM A GAS

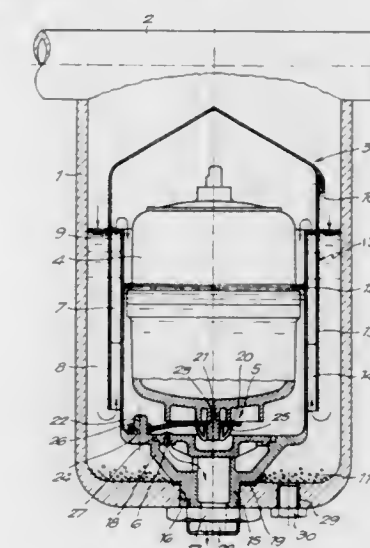
Luc Van De Vijvere, Kontich, Belgium, assignor to Atlas Copco Airpower, n.v., Wilrijk, Belgium

Filed Feb. 25, 1997, Ser. No. 805,294

Claims priority, application Belgium, Feb. 29, 1996, 9600178  
 Int. Cl.<sup>6</sup> B01D 19/00

U.S. Cl. 55—219

9 Claims



1. A device for removing contaminants including liquid and solid materials from air, comprising:  
 an air containing device;  
 a primary receiver having an upper and lower end, with the upper end in liquid flow communication with the air containing device;  
 a secondary receiver disposed within the primary receiver, and substantially isolated from the air containing device; said secondary receiver having upper and lower ends;  
 a generally vertically extending conduit extending from a lower end area of the primary receiver to an upper end area of the secondary receiver;  
 a controllable, normally closed valve in the lower end of the secondary receiver for discharging a liquid contained in the secondary receiver;  
 a float device suspended in the secondary receiver and operably connected to the controllable valve for opening and closing the valve in response to the level of a liquid contained in the secondary receiver.

5,769,912

## SYSTEM AND METHOD OF VAPOR RECOVERY IN INDUSTRIAL WASHING EQUIPMENT

Pierre G. Mansur, Miami, Fla., assignor to Mansur Industries Inc., Miami, Fla.

Filed Oct. 16, 1996, Ser. No. 732,971

Int. Cl.<sup>6</sup> B01D 45/08; B03B 3/02

U.S. Cl. 55—269

9 Claims

1. An apparatus for recovering vapors from a volatile solvent used in industrial washing equipment of the type including a wash area for washing various articles therein and at least one holding tank for containing the solvent;  
 said apparatus including:  
 a hood supported in spaced relation to the wash area,  
 fan means mounted to said hood for creating and maintaining an envelope of negative pressure between said wash area and said hood, causing the vapors rising from said wash area to be drawn to said hood,  
 means in said hood for converting the vapors drawn therein to a liquid state to yield pure solvent and including impactation means, said impactation means including an impeller and an



- impactation surface spaced radially from said impeller, said impeller being structured and disposed to draw the vapors through a center thereof and to direct the vapors tangentially outward therefrom for subsequent impactation against said impactation surface to create droplets of said pure solvent, and  
 means for collecting said pure solvent for subsequent use.

5,769,913

## MULTIFREQUENCY ACOUSTIC CHAMBER FOR THE AGGLOMERATION AND SEPARATION OF PARTICLES SUSPENDED IN GASEOUS EFFLUENTS

Juan A. Gallego Juarez; Enrique Riera Franco de Sarabia, and German Rodriguez Corral, all of Madrid, Spain, assignors to Consejo Superior Investigaciones Cientificas, Madrid, Spain

Continuation of Ser. No. 351,024, Nov. 14, 1994, abandoned.

This application Apr. 14, 1997, Ser. No. 834,619

Claims priority, application Spain, Mar. 11, 1993, 9300507

Int. Cl.<sup>6</sup> B01D 51/08

U.S. Cl. 55—277

20 Claims

1. A multifrequency acoustic chamber for agglomeration and separation of particles suspended in gaseous effluents, comprising:  
 walls, each of said walls facing an opposed parallel wall, said walls defining a polygonal transverse cross section such that acoustic radiation emitted orthogonally from one of said walls will fall orthogonally on a surface of said opposed parallel wall and be reflected by said opposed wall, giving rise to the generation of a stationary acoustic field;  
 said chamber having an input end and an output end, said walls defining a flow path therebetween for the gaseous effluents from said input end to said output end;  
 a plurality of acoustic emitters for emitting acoustic radiation having a pressure level greater than 150 dB within said chamber, said emitters being along said flow path, each of said acoustic emitters emitting radiation at a predetermined frequency in a direction orthogonal to said walls, the emitted radiation of some of said emitters being different than others, and the emission frequency of each of said emitters being related to the position of that emitter along said flow path, whereby a frequency distribution of acoustic radiation is provided along said flow path in relationship to the change of size distribution of the particles in the gaseous effluents due to the acoustic agglomeration process.



**5,769,914**  
**ACCUMULATOR/FILTER ASSEMBLY OF COMPRESSOR FOR COOLANT**

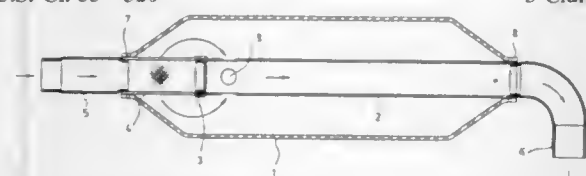
Lei Ku, Taoyuan County, Taiwan, assignor to Divine Pill Industrial Co., Ltd., Taipei, Taiwan

Filed Jun. 6, 1996, Ser. No. 656,978

Int. Cl.<sup>6</sup> B01D 50/00

U.S. Cl. 55—320

3 Claims



1. An accumulator/filter assembly for a coolant compressor of a refrigerator or air conditioner comprising:

an accumulator including first and second ends, the accumulator being tapered towards the first and second ends and having a first opening at the first end and a second opening at the second end;

a tubular filter including first and second ends, the first end being in communication with the first opening and being firmly connected with the first end of the accumulator;

a pipe including a first end firmly connected with and received telescopically in the second end of the tubular filter, a second end in communication with the second opening and firmly connected with the second end of the accumulator, and at least one aperture defined therein; and

a plug received telescopically in the first end of the pipe and blocking longitudinal fluid communication between the filter and the pipe.

**5,769,915**  
**APPARATUS FOR CLEANING DUST-LADEN HOT GAS**  
Günther Dehn, Wesel; Horst Möllenhoff, Mülheim; Rüdiger Wegelin, Dortmund, and Joachim Krein, Aach, all of Germany, assignors to LLB Lurgi Lentjes Babcock Energietechnik GmbH, Düsseldorf, Germany

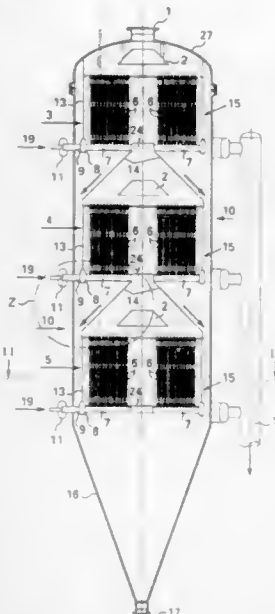
Filed Jul. 25, 1996, Ser. No. 687,228

Claims priority, application Germany, Jul. 26, 1995, 195 27 311.7

Int. Cl.<sup>6</sup> B01D 46/04; 46/02

U.S. Cl. 55—424

7 Claims



1. Apparatus for cleaning dust-laden hot gas, comprising: a filter housing; ceramic filter candles closed at one end and stacked one above the other in a plurality of levels within said filter housing; supporting collectors spaced apart laterally and connected to said

filter candles; each level having a center with a central space free of said supporting collectors; an ash removal mantle; filter candles in one level being separated from filter candles in another level above said one level by said ash removal mantle; said ash removal mantle having a cylindrical section and a conical section and extending from the supporting collectors of said one level to the supporting collectors of said other level, said ash removal mantle being connected to said one level and said other level for deflecting released dust out of the flow path of the gases to be cleaned, said flow path being directed toward the filter candles of said one level; said filter housing having an undivided interior space comprising an entrance chamber for gas to be cleaned and common to all levels.

**5,769,916****FILTER VENTILATOR**

Manfred Immel, Mittenaar-Bicken, Germany, assignor to Rittal—Werk Rudolf Loh GmbH &amp; Co. KG, Herborn, Germany

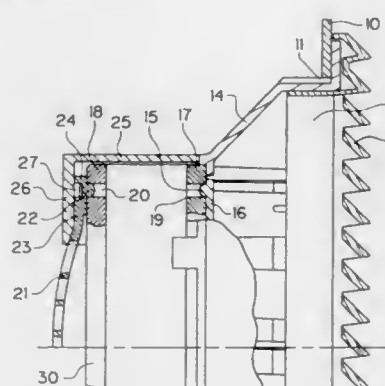
Filed Oct. 4, 1996, Ser. No. 726,144

Claims priority, application Germany, Oct. 4, 1995, 195 36 928.9

Int. Cl.<sup>6</sup> B01D 27/08

U.S. Cl. 55—495

12 Claims



1. In a filter ventilator for installation in an opening of a wall of a structure, having a base housing receiving a filter, which is covered with a finned screen and is connected with a ventilator on a side of the housing away from the finned screen, the improvement comprising:

a plurality of first detent cams (15) molded on the base housing (14), a first flange (17) positioned on a near side of the ventilator (30) having a plurality of first bores (19) which correspondingly engage with the first detent cams (15);

a plurality of L-shaped holding elements (25) attached to the base housing (14) and facing a second flange (18) positioned on a far side which is opposite the near side of the ventilator (30), the far side being positioned further away than the near side from the finned screen (13), each of the L-shaped holding elements (25) having a second detent cam (27), each of the L-shaped holding elements (25) having an end section (26) extending beyond the far side of the ventilator (30), the second flange (18) of the ventilator (30) having a plurality of second bores (20) which correspondingly engage with the second detent cams (27); and

the L-shaped holding elements (25) and the base housing (14) forming a plurality of receivers into which the ventilator (30) is rotated into a locked position with respect to the base housing (14).

**5,769,917**  
**PROCESS FOR PRODUCING LOW SHRINK CERAMIC BODIES**

William C. Belko, 332 La Veta Ave., Encinitas, Calif. 92024, and Randall C. Ragan, Box 951, Rancho Santa Fe, Calif. 92067

Filed Dec. 9, 1996, Ser. No. 762,340

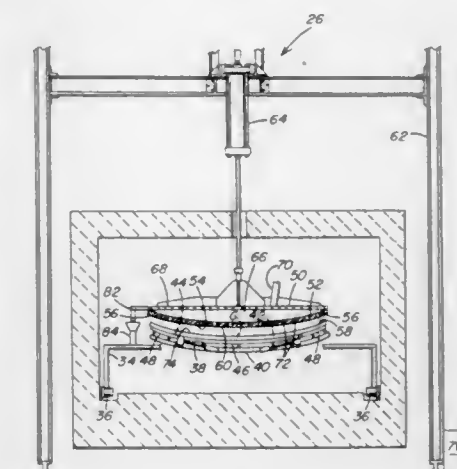
Int. Cl.<sup>6</sup> C03B 19/01; 19/09; D01F 9/00; 6/14

U.S. Cl. 65—17.3

8 Claims

1. A process for making ceramic bodies which will shrink less than about two percent in the X-Y plane in going from a green state to a fired state consisting of the following steps:

- forming an intimate, uniform mixture of at least one refractory material and a binder, the refractory material having a particle size in the range of about 0.1 to about 20 microns;
- milling the mixture of refractory material and binder until there are no agglomerates greater than about 1 to about 9 times the average particle size of the material;
- selecting a glass powder having a melting point below that of the refractory material softening point, a coefficient of thermal expansion not greater than that of the refractory material and being able to adhere to and spread across immediately adjacent particles of refractory material when the mixture is fired;
- separating the glass powder so that there is a selected fraction wherein at least 95 percent of the glass has a particle size greater than about 10 microns and less than about 100 microns;
- adding a quantity of the selected fraction of the glass powder to the refractory material-binder mixture such that there is from about 40 to about 90 percent by volume of refractory material and from about 10 to about 60 percent glass;
- blending the glass-refractory-binder mixture under conditions that will maintain at least 95 per cent of the glass particles above a size of about 10 microns;
- forming the mixture into a desired ceramic body with minimal or substantially no pressure such that the integrity of the glass particles is not degraded below about 10 microns;
- drying the body; and
- firing the body at a temperature sufficient to volatilize the binder and melt the glass so that glass wicks between and substantially fills the interstices of the particles of refractory material.



an outline mold to support a heat softened, preliminarily shaped sheet, said outline mold having a sheet supporting surface corresponding to a desired curvature of a peripheral portion of said sheet and a central area free from any sheet shaping surfaces;

an upper shaping member positioned generally above said outline mold and having a sheet engaging surface with a peripheral area corresponding to said desired curvature of said peripheral portion of said sheet and a central portion with a curvature less than a desired curvature of a corresponding central portion of said sheet;

means to supply heated pressurized gas to said upper shaping member;

means to direct said pressurized gas from said upper shaping member downward toward at least said central area of said outline mold; and

means to move said upper shaping member and said outline mold relative to each other such that said peripheral area of said sheet engaging surface of said upper shaping member is at least in close proximity to said sheet supporting surface of said outline mold.

**5,769,918**  
**METHOD OF PREVENTING GLASS ADHERENCE**

Sandra L. Burt, Horseheads, and Robert S. Pavlik, Jr., Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Sep. 12, 1997, Ser. No. 928,572

Int. Cl.<sup>6</sup> C03B 19/06

U.S. Cl. 65—17.3

14 Claims

1. In a method of preventing a fritted glass body from adhering to a refractory carrier while the glass body is being conveyed through a heating unit to sinter it to a non-porous condition, the improvement comprising coating at least the upper surface of the refractory carrier with a thin, continuous layer of yttrium oxide wherein the yttrium oxide layer prevents the fritted glass body from adhering to the refractory carrier member.

**5,769,919**  
**PRESSURE FORMING OF GLASS SHEETS**

George R. Claassen, New Kensington; Irvin A. Wilson, Apollo; David B. Rayburn, Vandergrift; John L. McLaughlin, Apollo; Rudolph A. Karlo, Creighton, and Jeffrey L. Marietti, Tarentum, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 323,480, Oct. 14, 1994, Pat. No. 5,669,952.

This application Sep. 10, 1996, Ser. No. 711,489

Int. Cl.<sup>6</sup> C03B 23/035

U.S. Cl. 65—287

9 Claims

1. An apparatus for shaping heat softened sheet material, comprising:

**5,769,920**  
**GRAPHITE GUIDE RINGS**

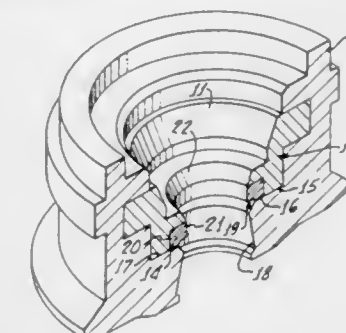
James E. Sweetland, Decatur; Thomas M. Smith, Grapevine; David H. Dodson, Decatur; Timothy A. Stover, Ponder, and Michael E. Easley, Terrin, all of Tex., assignors to Union Oil Company of California, El Segundo, Calif.

Continuation-in-part of Ser. No. 953,726, Sep. 29, 1992, Pat. No. 5,394,910, which is a continuation-in-part of Ser. No. 937,343, Aug. 27, 1992, abandoned. This application Dec. 29, 1994, Ser. No. 366,358

Int. Cl.<sup>6</sup> C03B 9/00

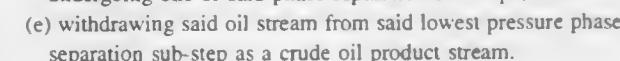
U.S. Cl. 65—374.15

22 Claims



1. A ring-shaped graphite body used in combination with a separate metal insert to form a two-piece guide ring used in combination with a neck ring in fabricating glass containers from hot glass gobs, said ring-shaped graphite body having a substan-

providing an eluent solution containing at least one of a cyanide and a base, and optionally an organic solution, said eluent solution possessing a reference electrochemical potential; contacting said gold-adsorbed activated carbon with said eluent solution, whereby the carbon is at least partially stripped of its gold content to produce a gold-bearing eluate; and providing one of said eluent solution or said gold-bearing eluate with a reducing agent in a quantity sufficient to lower the





5,769,927

## MONOMER RECOVERY PROCESS

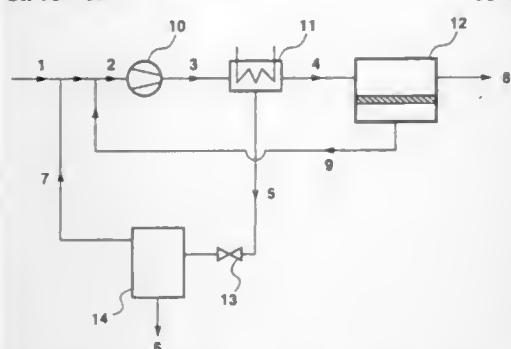
Douglas Gottschlich, Mountain View, and Marc L. Jacobs, Berkeley, both of Calif., assignors to Membrane Technology and Research, Inc., Menlo Park, Calif.

Filed Jan. 24, 1997, Ser. No. 789,377

Int. Cl.<sup>6</sup> B01D 53/22

U.S. Cl. 95—39

35 Claims



1. A process for treating a purge stream from a polymer manufacturing operation, said purge stream comprising a monomer and a purge gas, said process comprising the following steps:

- (a) compressing said purge stream to a pressure no greater than about 1,000 psig;
- (b) cooling said purge stream to a temperature no lower than about -100° C., resulting in partial condensation of said purge stream, thereby dividing said purge stream into a condensed portion enriched in said monomer and an uncondensed portion enriched in said purge gas;
- (c) flash evaporating said condensed portion to at least partially remove additional amounts of said purge gas from said condensed portion as a gaseous flash stream, thereby creating a more-enriched monomer product stream;
- (d) membrane treating said uncondensed portion in a membrane separation unit, to further divide said uncondensed portion into a more-enriched purge gas stream and a mixed stream;
- (e) returning said mixed stream to said purge stream upstream of said partial condensation.

5,769,928

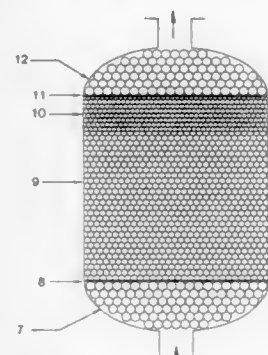
PSA GAS PURIFIER AND PURIFICATION PROCESS  
Frederick Wells Leavitt, Amherst, N.Y., assignor to Praxair Technology, Inc., Danbury, Conn.

Filed Dec. 12, 1996, Ser. No. 766,443

Int. Cl.<sup>6</sup> B01D 53/047

U.S. Cl. 95—95

20 Claims



1. A process for purifying a gas stream, said process comprising passing said gas stream through a pressure swing adsorption vessel containing a bed of adsorbent material capable of selectively adsorbing contaminants present in said feed gas stream at a high adsorption pressure and desorbing said contaminants at a low desorption pressure, the adsorption vessel containing a bed of adsorbent material capable of selectively adsorbing said contaminants present in said feed gas stream at the high adsorption pressure and desorbing said contaminants at the low desorption

pressure, the adsorption vessel having a feed end for the introduction of said feed gas stream thereto and a product end for the recovery of purified feed gas therefrom, wherein said bed of adsorbent material comprises at least two layers of adsorbents, at least one of said adsorbents being comparatively strong and at least another of said adsorbents being comparatively weak with respect to the adsorption of said contaminants, wherein said comparatively strong adsorbent preferentially adsorbs at least one of acetylene or C3-C8 hydrocarbons over CO<sub>2</sub>, and wherein said comparatively strong adsorbent is self-cleaning with respect to said acetylene or C3-C8 hydrocarbons at a lesser purge than would be required for 13X.

5,769,929

## INK COMPOSITIONS FOR THERMAL INK JET PRINTING

Kurt B. Gundlach; Luis A. Sanchez; Cheryl A. Hanzlik, all of Fairport; Kathy-Jo Brodsky, Palmyra; Richard L. Colt, and Aileen M. Montes, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 31, 1997, Ser. No. 961,637

Int. Cl.<sup>6</sup> C09D 11/02

U.S. Cl. 106—31.27

10 Claims

1. An ink composition which comprises water, an anionic dye having at least one anionic functional group and having a cationic counterion associated with each anionic functional group, and a material of the formula  $[(F_{2n+1}C_nCH_2S)_2(CH_3)C-CH_2CH_2COO-][B^+]$ , wherein n is an integer of from about 8 to about 20 and B is a cation, said ink composition containing alkali metal cations in an amount of no more than about  $1 \times 10^{-3}$  moles per liter.

5,769,930

## INK COMPOSITION FOR INK JET RECORDING AND RECORDING PROCESS USING SAME

Tsuyoshi Sano, and Hiroko Hayashi, both of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

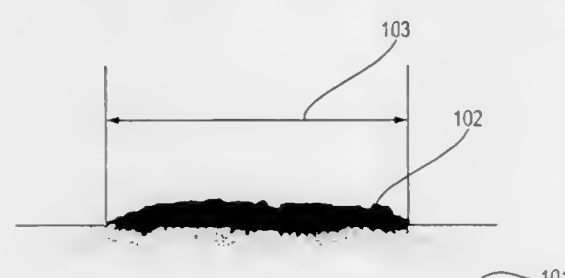
Filed Oct. 3, 1996, Ser. No. 723,640

Claims priority, application Japan, Oct. 6, 1995, 7-260586; Apr. 23, 1996, 8-101753; Jul. 16, 1996, 8-185733

Int. Cl.<sup>6</sup> C09D 11/02

U.S. Cl. 106—31.36

18 Claims



1. An ink composition for ink jet recording comprising (A) a colorant, (B) an alginate, (C) a liquid wetting agent, (D) a penetrant, and (E) water, wherein glycerin is present in said liquid wetting agent (C) in an amount of 8% by weight based on the weight of the ink composition.

5,769,931

## INK COMPOSITION

Aiying Wang, and Barry W. Chadwick, both of Simpsonville, S.C., assignors to BIC Corporation, Milford, Conn.

Filed Jul. 25, 1996, Ser. No. 684,904

Int. Cl.<sup>6</sup> C09D 11/00

U.S. Cl. 106—31.38

20 Claims

1. An ink composition having a shear index greater than about 0.6 and being heat stable at temperature greater than 100° C., said composition comprising:

- a) at least one shear-thinning polysaccharide selected from the group consisting of welan gum, rhamnan gum and mixtures thereof;
- b) at least one essentially non-shear thinning, water soluble polymeric viscosity modifier;
- c) colorant; and
- d) a solvent containing one or more polar, non-aqueous liquids.

5,769,932

## SURFACE TREATMENT MATERIAL REQUIRED IN FUSING DENTAL PORCELAIN WHICH PREVENTS DEPOSITION OF COAT DUE TO ANTIOXIDANT AND STRONGLY BONDS METAL FRAME AND DENTAL PORCELAIN WITH EACH OTHER

Mamoru Tsukaguchi, Osaka, Japan, assignor to Yamamoto Kikinzoku Jigane Co., Ltd., Osaka, Japan

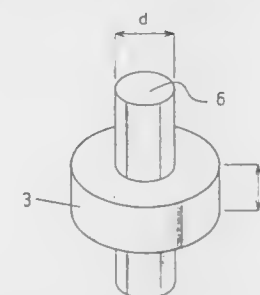
Filed Nov. 7, 1996, Ser. No. 747,025

Claims priority, application Japan, Nov. 13, 1995, 7-294531

Int. Cl.<sup>6</sup> B22F 7/00

U.S. Cl. 106—35

13 Claims



1. A surface treatment material used for fusing a dental porcelain on a metal frame, comprising:  
a powder of gold terpene sulfide; and  
at least one of a powder of silicon terpene sulfide and a powder of aluminum terpene sulfide.

5,769,933

## ACTIVATED CARBON FOUNDRY SAND ADDITIVES AND METHOD OF CASTING METAL FOR REDUCED VOC EMISSIONS

Charles R. Landis, Lake in the Hills, Ill., assignor to AMCOL International Corporation, Arlington Heights, Ill.

Continuation-in-part of Ser. No. 759,087, Nov. 29, 1996, Pat. No. 5,688,313, which is a continuation-in-part of Ser. No. 668,245, Jun. 21, 1996, Pat. No. 5,695,554. This application

May 7, 1997, Ser. No. 852,833

Int. Cl.<sup>6</sup> B22C 1/00; 9/00; 9/02

U.S. Cl. 106—38.2

25 Claims

1. A foundry sand additive comprising a ground ore containing a compound selected from the group consisting of humic acid, a metal salt of humic acid, and mixtures thereof; and a carbon source selected from the group consisting of carbon, graphite, and mixtures thereof, in weight proportions of ground ore/carbon source of 15-95% by weight ground ore to 85-5% by weight carbon source, wherein said carbon source contains organic compounds that volatilize at 1800° F. in an amount less than about 10 mg/g.

5,769,934

## METHOD FOR PRODUCING MICROCRYSTALLINE CELLULOSE

Ewan Y. W. Ha, Twin Falls, Id., and Carol D. Landi, Hamilton, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jan. 15, 1997, Ser. No. 783,776

Int. Cl.<sup>6</sup> C08L 1/02; C08B 15/00

U.S. Cl. 106—162.8

35 Claims

1. A process for the production of microcrystalline cellulose consisting essentially of

- (i) introducing a cellulose source material in divided form into a pressurizable reactor;
- (ii) subjecting the cellulosic material in the reactor to a steam explosion treatment, by contacting the cellulosic material with pressurized steam at a temperature of at least about 170° C. for a period of time sufficient to hydrolyze the cellulosic material, the temperature and time being sufficient to provide a depolymerized cellulosic material containing microcrystalline cellulose having a true level off degree of polymerization of about 100 to about 400, and thereafter explosively releasing the steam pressure when the level off degree of polymerization is reached;
- (iii) extracting the steam exploded cellulosic material to remove hemicellulose and to remove lignin; and
- (iv) recovering microcrystalline cellulose that is substantially colloidal in particle size and that is essentially free of fibrous cellulose.

5,769,935

## USE OF FLUOROCARBONS AS A FUSING AGENT FOR TONERS IN LASER PRINTERS

Ellen Louise Swan, Lancaster, N.Y., assignor to AlliedSignal Inc., Morristown, N.J.

Filed Nov. 26, 1996, Ser. No. 756,751

Int. Cl.<sup>6</sup> C09D 7/12

U.S. Cl. 106—311

24 Claims

1. A toner fusing agent which comprises a stable, uniform mixture of at least one chlorine free hydrofluorocarbon selected from the group consisting of HCF<sub>2</sub>CHF<sub>2</sub>CF<sub>2</sub>CH<sub>2</sub>F, CF<sub>3</sub>CF<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>F, CF<sub>3</sub>CFHCFHCF<sub>2</sub>CF<sub>3</sub>, HCF<sub>2</sub>CHFCHFCF<sub>2</sub>H, CF<sub>3</sub>(CF<sub>2</sub>)<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub>, (CF<sub>3</sub>)<sub>2</sub>CFCH<sub>2</sub>CH<sub>3</sub>, H(CF<sub>2</sub>)<sub>4</sub>CH<sub>2</sub>F, CF<sub>3</sub>(CF<sub>2</sub>)<sub>3</sub>CH<sub>2</sub>CH<sub>3</sub>, and C<sub>8</sub>H<sub>6</sub>F<sub>10</sub> or perfluorinated alkyl alkyl ether or mixture thereof and at least one toner stabilizer.

5,769,936

## METHOD FOR PRODUCING FLY ASH GRANULES

Kenji Mori, Yokohama, Japan, assignor to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Dec. 29, 1995, Ser. No. 581,272

Int. Cl.<sup>6</sup> C04B 14/00; 14/04; 18/04

U.S. Cl. 106—405

17 Claims

1. A method for producing fly ash granules, which comprises mixing 100 parts by weight of fly ash, from 0.001 to 1 part by weight of a water-soluble polymer having repeating units, and having from 2 to 80 mol %, based on the total repeating units, of repeating units having carboxyl groups, and from 40 to 100 parts by weight of water, for granulation, and wherein the parts by weight of polymer and of water are per 100 parts by weight of fly ash.

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JUNE 23, 1998

5,769,937

**HIGH-PURITY FERROMAGNETIC IRON OXIDE PIGMENTS**

Claudius Kormann, Bingen; Ekkehard Schwab, Neustadt, and Reinhold Schlegel, Hassloch, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany  
PCT No. PCT/EP95/03230, § 371 Date Feb. 18, 1997, § 102(e) Date Feb. 18, 1997, PCT Pub. No. WO96/06891, PCT Pub. Date Mar. 7, 1996

PCT Filed Aug. 16, 1995, Ser. No. 793,071

Claims priority, application Germany, Aug. 26, 1994, 44 30 285.1

Int. Cl.<sup>6</sup> C09C 1/24; C09D 17/00; C01G 49/06; 49/08

U.S. Cl. 106—456 4 Claims

1. A process for preparing ferromagnetic iron oxide pigments having an average particle diameter of 2–100 nm, a saturation magnetization above 40 nTm<sup>3</sup>/g, a remanence below 10 nTm<sup>3</sup>/g, which comprises dissolving iron or an iron oxide which contains below 40 ppm Cr, below 40 ppm Cu and below 100 ppm C in a high-purity aqueous mineral acid, and precipitating  $\gamma$ -Fe<sub>2</sub>O<sub>3</sub> from this solution at 5°–40° C. with vigorous stirring using a mineral base, operating under oxidizing conditions in the case of iron or if the iron oxide employed is not present in trivalent form or is only partially present in trivalent form, and washing and drying the fine-particle precipitate obtained in this way.

5,769,938

**WASTE-TREATING AGENT**

Kenji Ueshima; Noboru Ikitsu; Takuji Nomura; Takashi Funahashi, and Masakazu Uekita, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 364,194, Dec. 27, 1994, abandoned.  
This application Apr. 2, 1996, Ser. No. 626,437

Claims priority, application Japan, Dec. 28, 1993, 5-337888; Jan. 28, 1994, 6-008031; Jan. 28, 1994, 6-008032; Apr. 28, 1994, 6-092325

Int. Cl.<sup>6</sup> A62D 3/00

U.S. Cl. 106—718 11 Claims

1. A waste-treating agent for treating waste containing at least one harmful substance selected from the group consisting of lead, cadmium, mercury, chromium, copper, nickel and zinc, which contains at least one solid acid, wherein the content of said solid acid is at least 10% by weight,

and wherein said solid acid is powdery and is at least one member selected from the group consisting of (1) aluminum silicate or silicon dioxide each having a specific surface area of from 150 m<sup>2</sup>/g to less than 1,000 m<sup>2</sup>/g, wherein 50% or more of the Al atoms in said aluminum silicate are four-coordinate aluminum atoms, and 85% or less of the silicon atoms in said silicon dioxide are silicon atoms having a degeneracy of 4, (2) silica gel or alumina to which sulfuric acid, phosphoric acid or malonic acid is adhered, or a carrier of diatomaceous earth, silica gel, quartz sand or titanium oxide to which phosphoric acid is adhered under heat, (3) polyanionic compounds, (4) cation-exchange resins, (5) ZnO, Al<sub>2</sub>O<sub>3</sub>, TiO<sub>2</sub>, CeO<sub>2</sub>, As<sub>2</sub>O<sub>3</sub>, V<sub>2</sub>O<sub>5</sub>, or Sb<sub>2</sub>O<sub>5</sub>, and (6) CuSO<sub>4</sub>, CdSO<sub>4</sub>, SrSO<sub>4</sub>, ZnSO<sub>4</sub>, MgSO<sub>4</sub>, BaSO<sub>4</sub>, KHSO<sub>4</sub>, K<sub>2</sub>SO<sub>4</sub>, (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>, Ca(NO<sub>3</sub>)<sub>2</sub>·4H<sub>2</sub>O, Bi(NO<sub>3</sub>)<sub>3</sub>·5H<sub>2</sub>O, Zn(NO<sub>3</sub>)<sub>2</sub>·6H<sub>2</sub>O, Fe(NO<sub>3</sub>)<sub>3</sub>·9H<sub>2</sub>O, CaCO<sub>3</sub>, Zr phosphate, Ti phosphates, Al phosphates, PbCl<sub>2</sub>, HgCl<sub>2</sub>, CuCl<sub>2</sub>, AlCl<sub>3</sub>, SnCl<sub>2</sub>, CaCl<sub>2</sub>, AgCl<sub>2</sub>, H<sub>2</sub>WO<sub>4</sub>, AgClO<sub>4</sub>, Mg(ClO<sub>4</sub>)<sub>2</sub>, ZnS or CaS.

5,769,939

**CEMENT BASED INJECTION GROUT**

Eldar O. Dingsoyr; Per Fidjestøl, both of Søgne, and Oddny Jørgensen, Høvåg, all of Norway, assignors to Elkem ASA, Norway

Continuation of Ser. No. 646,282, May 13, 1996, abandoned.

This application Jun. 4, 1997, Ser. No. 869,094

Claims priority, application Norway, Dec. 7, 1993, 934443  
Int. Cl.<sup>6</sup> C04B 14/04; 18/14

U.S. Cl. 106—737 8 Claims

1. An injection grout comprising:  
(a) microcement;  
(b) water;  
(c) about 5 to 70% by weight of amorphous silica particles based on the weight of cement, said amorphous silica particles having about 60–100% by weight SiO<sub>2</sub>, a density between about 2.0 and 2.4 g/cm<sup>3</sup>, a surface area of about 10 m<sup>2</sup>/g, and at least about 90% having a particle size of less than about 10 microns;  
(d) about 0 to 10% by weight of water reducing agents based on the weight of the cement;  
(e) said grout having a water to cement and amorphous silica weight ratio of between about 2 and 8;  
(f) said grout having a lower water separation than a comparable grout made with microcement and water without said amorphous silica particles; and  
(g) said grout having a higher penetration into a space into which said grout is injected than a comparable grout made with microcement and water without said amorphous silica particles.

5,769,940

**PROCESS FOR PRODUCING CEMENT AND ELEMENTAL SULFUR FROM A FLUE GAS DESULFURIZATION WASTE PRODUCT**

John W. College, Pittsburgh, Pa., assignor to Dravo Lime Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 852,798, May 7, 1997. This application Jul. 28, 1997, Ser. No. 901,457

Int. Cl.<sup>6</sup> C04B 7/36; 7/43; C01B 17/02

U.S. Cl. 106—745 11 Claims

1. A process for producing cement and elemental sulfur from a flue gas desulfurization process waste product, comprising:  
providing a moist flue gas desulfurization process waste product containing 80–95 percent by weight of solids of calcium sulfite hemihydrate and 5–20 percent by weight of solids of calcium sulfate hemihydrate;  
adding a source of aluminum, iron, carbon, and a siliceous material to said flue gas desulfurization process waste product to form a moist mixture thereof;  
agglomerating said moist mixture while removing water therefrom, by contact with hot air, to provide a dry agglomerated kiln feedstock containing about 6 percent or less water;  
calcining said dry agglomerated kiln feedstock in a rotary kiln to produce a cement clinker and a sulfur dioxide-containing gas;  
discharging said sulfur dioxide-containing gas from said rotary kiln into an indirect heat exchanger to cool said gas;  
contacting the resultant cooled sulfur dioxide-containing gas with hydrogen and carbon monoxide in the presence of a reducing catalyst sufficient to form elemental sulfur;  
separating said elemental sulfur therefrom.

5,769,941

**METHOD OF FORMING SEMICONDUCTOR MATERIAL**  
Hereng-Der Chiou, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed May 1, 1996, Ser. No. 641,398

Int. Cl.<sup>6</sup> C30B 28/02

U.S. Cl. 117—2 15 Claims

1. A method of forming semiconductor material comprising:

JUNE 23, 1998

CHEMICAL

3909

5,769,943

**SEMICONDUCTOR APPARATUS UTILIZING GRADIENT FREEZE AND LIQUID-SOLID TECHNIQUES**

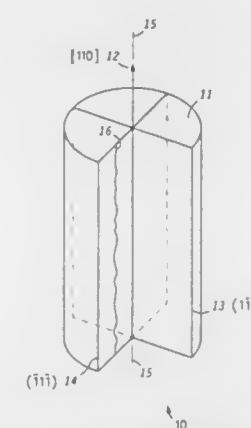
Jean-Pierre Fleurial; Thierry F. Caillat, both of Pasadena, and Alexander Borschchevsky, Santa Monica, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Aug. 3, 1993, Ser. No. 101,901

Int. Cl.<sup>6</sup> C30B 35/00

U.S. Cl. 117—219

12 Claims



forming an ingot of a semiconductor material from a melt of the semiconductor material wherein the ingot has a [110] direction of a crystal lattice orientation of the ingot and wherein the [110] direction is shifted an angle away from a direction parallel to a stem axis of the ingot.

5,769,942

**METHOD FOR EPITAXIAL GROWTH**

Kazuo Maeda, Tokyo, Japan, assignor to Semiconductor Process Laboratory Co., Japan

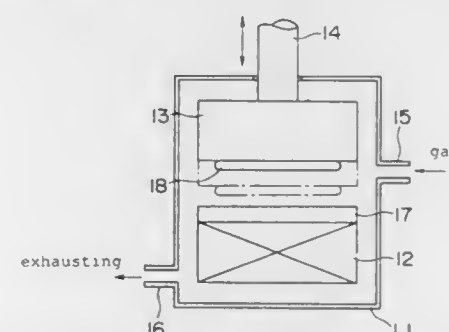
Filed Jul. 24, 1995, Ser. No. 506,039

Claims priority, application Japan, Sep. 29, 1994, 6-235621

Int. Cl.<sup>6</sup> C30B 23/00

U.S. Cl. 117—89

14 Claims



1. A method for epitaxial growth of a crystal on a first planar surface of a growth substrate, said method comprising:  
arranging a solid state source substrate, containing a solid phase reactant, with a second planar surface facing and parallel to said first planar surface to define a gap between said first and second planar surfaces, said first planar surface having an area smaller than the area of said second planar surface;  
heating said source substrate to maintain said source substrate at a temperature higher than the temperature of said growth substrate and to thereby establish a predetermined temperature differential between said source substrate and said growth substrate;  
introducing a reaction gas into said gap for reaction with said solid phase reactant to form a reaction product which deposits on said growth substrate to form the crystal by epitaxial growth;  
moving at least one of said substrates, during deposition of the reaction product on said growth substrate, to adjust said gap and to thereby maintain said predetermined temperature differential; and  
moving at least one of said substrates, during deposition of the reaction product on said growth substrate, to provide planar relative movement between said first and second planar surfaces, whereby every point on said second planar surface is brought into confrontation with said first planar surface and said second planar surface is uniformly etched during said reaction.

5,769,944

**VERTICAL GRADIENT FREEZE AND VERTICAL BRIDGMAN COMPOUND SEMICONDUCTOR CRYSTAL GROWTH APPARATUS CAPABLE OF APPLYING AXIAL MAGNETIC FIELD**

Young Ju Park, and Suk-Ki Min, both of Seoul, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

Filed Aug. 29, 1996, Ser. No. 705,000

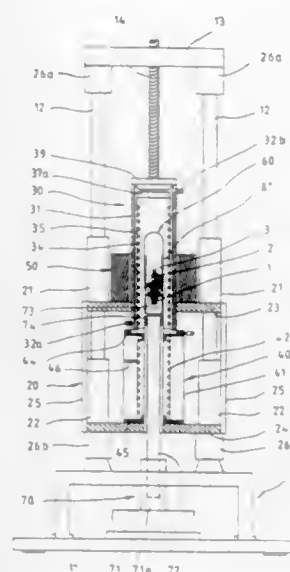
Claims priority, application Rep. of Korea, Dec. 19, 1995, 51993/1995

Int. Cl.<sup>6</sup> C30B 35/00

U.S. Cl. 117—223 9 Claims

1. A vertical gradient freeze and vertical Bridgman compound semiconductor crystal growth apparatus, comprising:  
a furnace arrangement comprising a high temperature electric furnace arranged at an upper portion of the apparatus and a low temperature electric furnace arranged below the high temperature electric furnace;  
a crystal growth reaction tube extending within both the high temperature electric furnace and the low temperature electric furnace of said furnace arrangement and having a reaction container disposed therewithin;  
an electromagnet surrounding an intermediate portion of the high temperature electric furnace in a spaced, proximate relationship with an outer circumferential surface thereof; and  
a lifting/lowering unit for independently lifting and lowering said furnace arrangement and said electromagnet and for allowing the furnace arrangement and said electromagnet to





be either lifted and lowered concurrently or lifted and lowered independently of one another.

5,769,945

## SPIN COATING BOWL EXHAUST SYSTEM

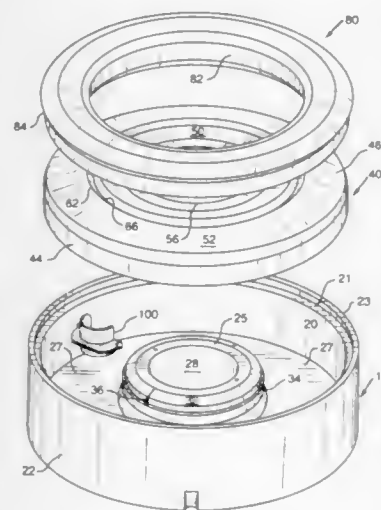
Shawn D. Davis; John S. Molebash, both of Meridian, and Bruce L. Hayes, Boise, all of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jun. 21, 1996, Ser. No. 667,740

Int. Cl.<sup>6</sup> B05C 11/02

U.S. Cl. 118—52

9 Claims



1. A system for spin dispensing a liquid comprising:  
a rotatable chuck;  
a shaft attached to said chuck;  
a spin motor attached to said shaft;  
a dispense assembly positioned to dispense liquid toward said chuck; and,  
a bowl having a bottom and a side defining an interior region, said bottom containing an opening in which said shaft is movably disposed therethrough and said rotatable chuck is disposed within said interior region;  
an exhaust drain attached to said bowl; and,  
a baffle positioned in said bowl to limit access into said exhaust drain to a rotational direction of said chuck.

5,769,946  
COATING NOZZLE AND COATING DEVICE HAVING  
COATING NOZZLE

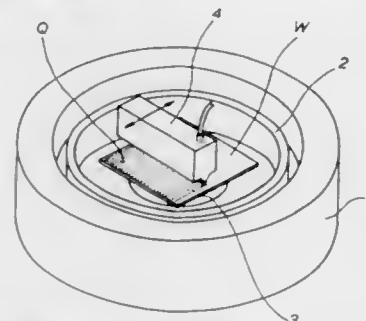
Junji Kutsuzawa; Hiroyoshi Sago; Futoshi Shimai, and Hide-nori Miyamoto, all of Kanagawa, Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Kanagawa, Japan

Filed Mar. 29, 1996, Ser. No. 627,694

Claims priority, application Japan, Mar. 29, 1995, 7-094196  
Int. Cl.<sup>6</sup> B05C 3/02; 3/00; 5/00; B05B 13/02

U.S. Cl. 118—407

19 Claims



1. A coating nozzle comprising:  
an elongate nozzle body having a coating solution reservoir defined longitudinally therein for being supplied with a coating solution from an external coating solution supply, a coating solution holder defined in said elongate nozzle body and opening away from said coating solution reservoir, for holding the coating solution against falling off as drops under surface tension of the coating solution, and a plurality of passages defined in said elongate nozzle body and each held in communication with said coating solution reservoir and said coating solution holder, for supplying the coating solution from said coating solution reservoir to said coating solution holder in a uniform amount along a full length of said holder, each said passage having a substantially uniform diameter along a full length thereof.

5,769,947

APPLICATOR FOR ADHESIVE AND CORRESPONDING  
NOZZLE PLATE

Andreas Krappweis, Monheim-Baumberg, Germany, assignor to LTW Dynatech GmbH Klebetechnik, Erkrath, Germany

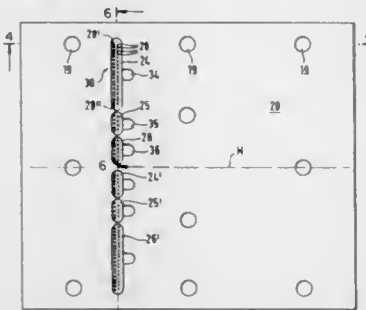
Filed Oct. 23, 1995, Ser. No. 546,754

Claims priority, application Germany, Oct. 22, 1994, 44 37 764.9; Apr. 12, 1995, 295 06 334.3; European Pat. Off., Oct. 14, 1995, 95116217

Int. Cl.<sup>6</sup> B05C 1/16; 5/04

U.S. Cl. 118—411

26 Claims



1. Apparatus for depositing strips of a fluid medium onto a substantially planar substrate as said substrate moves relative to said apparatus, comprising:  
a dispensing plate;  
a plurality of outlet openings defined within said dispensing plate for dispensing a fluid medium outwardly therefrom;  
means for causing relative movement between said plurality of outlet openings defined within said dispensing plate and a substrate onto which said fluid medium is to be dispensed; and

5,769,949

## AUTOMATED COATING PROCESS

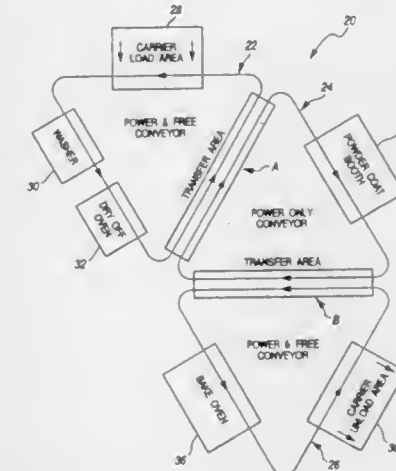
William J. Cienkus, Crete; Stephen A. Gourley, Frankfort, and Frank L. Corral, Crete, all of Ill., assignors to CHS Acquisition Corp., Chicago Heights, Ill.

Filed May 2, 1996, Ser. No. 640,548

Int. Cl.<sup>6</sup> B05B 5/025

U.S. Cl. 118—621

21 Claims



1. A system for applying a coating to an article of manufacture comprising:  
a first conveyor apparatus including a continuous track having carriers suspended therefrom for supporting articles of manufacture and conveying said articles along a portion of an endless first path;  
a second conveyor apparatus including a continuous track having carriers suspended therefrom for supporting articles of manufacture and conveying said articles along a portion of an endless second path;  
a first section of said first conveyor apparatus being longitudinally aligned and positioned in closely spaced relation with a section of said second conveyor apparatus;  
means disposed at said first conveyor section for transferring articles directly from said carriers of said first conveyor apparatus to said carriers of said second conveyor apparatus; and  
apparatus disposed in the path of said second conveyor apparatus for applying a coating on articles transported by second conveyor apparatus;  
wherein an article is successively conveyed along said first conveying apparatus and is transferred from said first conveyor apparatus to said second conveyor apparatus whereupon a coating is applied to said article.

5,769,950

## DEVICE FOR FORMING DEPOSITED FILM

Katsuji Takasu; Hisanori Tsuda; Masafumi Sano, all of Atsugi, and Yutaka Hirai, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 407,242, Mar. 20, 1995, abandoned, which is a continuation of Ser. No. 109,059, Aug. 19, 1993, abandoned, which is a division of Ser. No. 908,891, Jul. 8, 1992, Pat. No. 5,261,961, which is a continuation of Ser. No. 776,684, Oct. 15, 1991, abandoned, which is a continuation of Ser. No. 568,621, Aug. 16, 1990, abandoned, which is a continuation of Ser. No. 368,136, Jun. 16, 1989, abandoned, which is a continuation of Ser. No. 888,233, Jul. 21, 1986, abandoned. This application May 25, 1995, Ser. No. 450,624

Claims priority, application Japan, Jul. 23, 1985, 60-161132; Jul. 23, 1985, 60-161133; Jul. 23, 1985, 60-161134; Jul. 23, 1985, 60-161135; Jul. 23, 1985, 60-161136; Jul. 23, 1985, 60-161137; Jul. 23, 1985, 60-161138

Int. Cl.<sup>6</sup> C23C 16/00

U.S. Cl. 118—715

7 Claims

1. A deposition film forming apparatus comprising:

means for feeding said fluid medium toward said plurality of outlet openings defined within said dispensing plate and under pressurized conditions such that said fluid medium is discharged from said plurality of outlet openings defined within said dispensing plate and deposited onto said substrate;  
wherein said plurality of outlet openings defined within said dispensing plate are arranged within at least two rows extending transversely with respect to the direction of relative movement defined between said plurality of outlet openings and said substrate, and are spaced in said direction of relative movement a predetermined first distance with respect to each other such that at least one row of said at least two rows of outlet openings is disposed behind another row of said at least two rows of outlet openings as considered in said direction of relative movement, said outlet openings disposed within each one of said at least two rows of outlet openings are transversely spaced a predetermined second distance with respect to each other, and said at least two rows of outlet openings are transversely offset with respect to each other such that said outlet openings disposed within said at least one row of said at least two rows of outlet openings will contact side edge portions of said fluid medium dispensed from said outlet openings disposed within said another row of said at least two rows of outlet openings and merge therewith so as to form a continuum of said fluid medium dispensed from said plurality of outlet openings defined within said dispensing plate.

5,769,948

SEMICONDUCTOR FABRICATING APPARATUS HAVING  
VACUUM CONTROL AND DETECTION

Hyun-Don Oh, and Heung-Bok Lee, both of Youngin-goon, Rep. of Korea, assignors to Samaung Electronics Co., Ltd., Sumon, Rep. of Korea

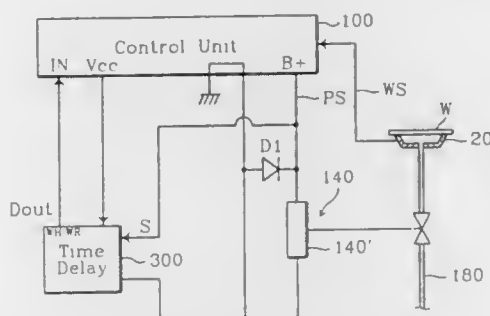
Filed Jun. 10, 1997, Ser. No. 872,183

Claims priority, application Rep. of Korea, Jun. 11, 1996, 1996-20736

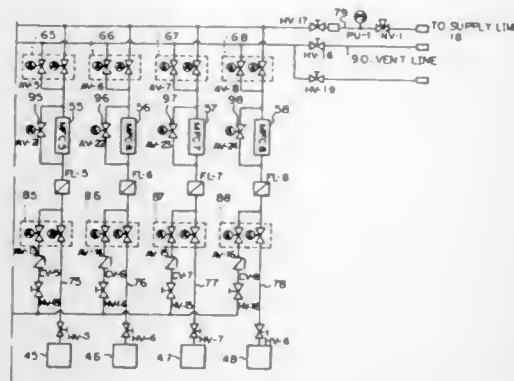
Int. Cl.<sup>6</sup> B05C 13/00; 11/00

U.S. Cl. 118—500

6 Claims



1. In a semiconductor fabricating apparatus having a vacuum line connected to a plate for holding a semiconductor wafer to be processed, a vacuum control and detection system comprising:  
an electromagnetic valve connected to said vacuum line for selectively opening and closing said vacuum line;  
a control unit having a first input terminal for receiving a wafer sensing signal from the plate, and an output terminal for supplying an actuating voltage, responsive to the wafer sensing signal, to the electromagnetic valve to open the vacuum line and securely hold the wafer to the plate via a vacuum force; and  
a time delay device having an input terminal for receiving the actuating voltage from the control unit, and an output terminal for outputting a wafer holding signal to a second input terminal of the control unit after a first predetermined time period has elapsed from receiving the actuating voltage.



a reaction chamber for housing a substrate on which a deposition film is to be formed;

starting gas introducing means including a plurality of mass flow controllers connected via gas lines to a plurality of starting gas sources for controlling the flow rates of starting gases from the plurality of starting gas sources, each mass flow controller corresponding to one of the plurality of starting gas sources; a first line for introducing the starting gases into the reaction chamber; a vent line; and a plurality of first three-way valves provided between said first line and said vent line and the plurality of mass flow controllers for selectively introducing the flow rate controlled starting gases either into said first line or into said vent line;

a purge gas line for supplying a purge gas from a purge gas source to an upstream side of said plurality of mass flow controllers;

a plurality of second three-way valves provided between said purge gas line and said gas lines and said plurality of mass flow controllers for selectively introducing either the starting gases or the purge gas into said plurality of mass flow controllers;

evacuating means for evacuating the reaction chamber; and decomposing means for decomposing the starting gases to form the deposition film on the substrate in the reaction chamber.

5,769,951

#### EXCLUSION GUARD AND GAS-BASED SUBSTRATE PROTECTION FOR CHEMICAL VAPOR DEPOSITION APPARATUS

Everhardus P. van de Ven, 7573 Bollinger Rd., Cupertino, Calif. 95014; Eliot K. Broadbent, 3166 Heritage Springs Ct., San Jose, Calif. 95148; Jeffrey C. Benzinger, 1073 Lancer Dr., San Jose, Calif. 95129; Barry L. Chin, 1116 Spinosa Dr., Sunnyvale, Calif. 94087; Christopher W. Burkhart, 5272 Romford Dr., San Jose, Calif. 95124, and Lawrence C. Lae, 560 Gaundabert La., San Jose, Calif. 95134

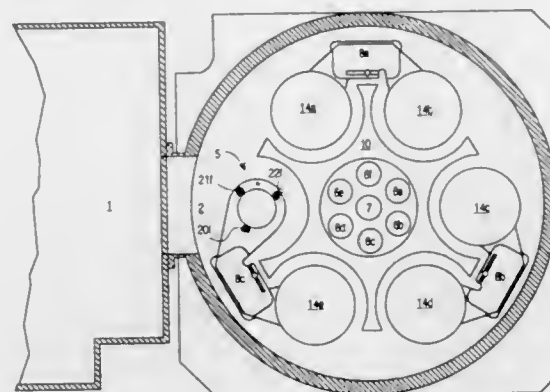
Continuation of Ser. No. 485,191, Jun. 7, 1995, which is a continuation-in-part of Ser. No. 294,514, Aug. 23, 1994, Pat. No. 5,578,532, which is a continuation-in-part of Ser. No. 7,457, Jan. 22, 1993, Pat. No. 5,374,594, which is a division of Ser. No. 554,225, Jul. 16, 1990, Pat. No. 5,230,741. This application Jan. 17, 1996, Ser. No. 591,241

Int. Cl.<sup>6</sup> H01L 21/205

U.S. Cl. 118—725

8 Claims

1. A method for chemical vapor deposition, comprising: providing a platen in a chemical deposition chamber, said platen having a substantially planar upper surface; securing a wafer to said planar upper surface; aligning an exclusion body disposed in the chamber with the platen such that a protecting portion of the exclusion body projects over a frontside peripheral region of the wafer, said protecting portion being uniformly spaced from said frontside peripheral region so as to form a restrictive passage connecting a first volume of the chamber proximate the wafer frontside deposition surface to a second volume proximate the wafer edge, said restrictive passage extending along an entire periphery of the wafer;



providing a process gas to the first volume; and

providing a deposition control gas to the second volume at a pressure equal to or greater than the pressure of the process gas.

5,769,952

#### REDUCED PRESSURE AND NORMAL PRESSURE TREATMENT APPARATUS

Mitsuaki Komino, Nakano-ku, Japan, assignor to Tokyo Electron, Ltd., Tokyo-To, Japan

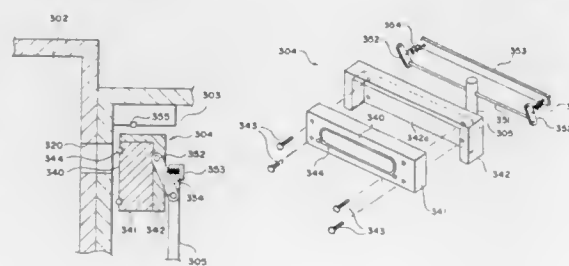
Division of Ser. No. 458,806, Jun. 2, 1995, abandoned. This application Apr. 17, 1997, Ser. No. 842,833

Claims priority, application Japan, Jun. 7, 1994, 6-148485; Aug. 19, 1994, 6-217810

Int. Cl.<sup>6</sup> C23C 16/00

U.S. Cl. 118—733

5 Claims



3. A treatment apparatus comprising a gas-tight treatment chamber and a gate valve opening and closing a treatment object transport opening formed in the treatment chamber, wherein:

a treatment object is treated by a treatment gas or plasma thereof;

the gate valve includes a multi-layer construction having a surface layer portion and a rear base portion; the surface layer portion has a surface and a sealing means on the surface;

when the gate valve is closed, the sealing means defines a region of the surface that is exposed to the atmosphere within the treatment chamber and a second region of the surface that is isolated from the atmosphere within the treatment chamber; and

the surface layer portion is attached to the rear base portion by fasteners that pass through the second region of the surface to the rear base portion, whereby the fasteners are isolated from the atmosphere within the treatment chamber.

5,769,953

#### PLASMA AND HEATING METHOD OF CLEANING VULCANIZING MOLD FOR ASHING RESIDUE

Masato Yoshikawa, Kodaira; Yukihiko Kusano, Kokubunji, and Kazuo Naito, Kawasaki, all of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

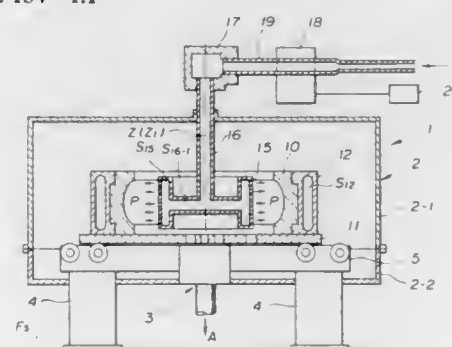
Filed Apr. 25, 1996, Ser. No. 637,376

Claims priority, application Japan, May 1, 1995, 7-107517; May 2, 1995, 7-108439

Int. Cl.<sup>6</sup> B08B 7/00

U.S. Cl. 134—1.1

2 Claims



1. In a method of cleaning a vulcanizing mold comprising the steps of:

positioning a vulcanizing mold in a vacuum processing bath; applying a plasma of a low pressure reactive gas to an elastomer residue formed on an inner surface of said mold resulting from repeated vulcanizing molding of elastomers; and ashing and removing the elastomer residue, the improvement comprising the steps of:

providing a plasma generating furnace for supplying a plasma flow into said vacuum processing bath, and a microwave generating apparatus for converting a reactive gas flowing in said plasma generating furnace into a plasma flow mainly containing neutral active species by a microwave discharge, said reactive gas composed of either a single oxygen gas or a mixed gas of an oxygen gas as a main component and a halogenated gas;

introducing the plasma flow having mainly containing neutral active species which is generated in said plasma generating furnace, into said vacuum processing bath by way of a conduit tube;

uniformly jetting the introduced plasma flow to all of the elastomer residue adhering peripheral surface of said vulcanizing mold; and

ashing the elastomer residue by the neutral active species contained in the jetted plasma flow wherein the ashing processing is carried out in a state that the residue adhering surface of said vulcanizing mold placed in said vacuum processing bath is heated and kept at a temperature in a range of from 100° to 200° C.

5,769,954

#### PROCESS AND DEVICE FOR TREATING THE SURFACE OF LARGE OBJECTS

Martin Wanner, Stuttgart, and Thomas Fred Herkommer, Gerlingen, both of Germany, assignors to Putzmeister Aktiengesellschaft, Aichtal, Germany

PCT No. PCT/EP94/02632, § 371 Date Feb. 12, 1996, § 102(e) Date Feb. 12, 1996, PCT Pub. No. WO95/05309, PCT Pub. Date Feb. 23, 1995

PCT Filed Aug. 9, 1994, Ser. No. 596,231

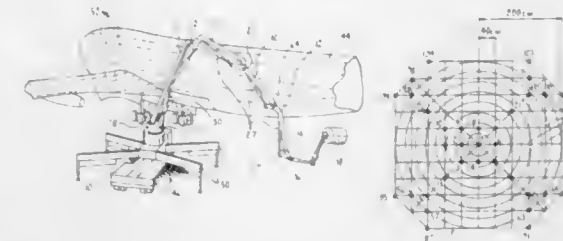
Claims priority, application Germany, Aug. 13, 1993, 43 27 268.1

Int. Cl.<sup>6</sup> B08B 1/00; B60S 3/00

U.S. Cl. 134—6

19 Claims

1. A process for treating a surface of large objects, comprising the steps of moving a large manipulator arranged on an undercarriage into a parking position within reach to the large object, while



in the parking position positioning the undercarriage spaced from the object in a two-dimensional parking field having a specified boundary to define an actual parking position, determining the position and orientation of the large object with respect to the actual parking position of the large manipulator, moving a treatment tool over the surface of the large object along a specified working path associated with the actual parking position of the large manipulator by means of an articulated mast which is arranged on the undercarriage and consists of several arms, pivoting the arms with respect to one another on pivot joints, treating the surface of the object with the treatment tool, and controlling the joints of the articulated mast during the surface treatment in accordance with a series of specified joint-coordinate sets, which series is associated with the actual parking position of the large manipulator within the parking field.

5,769,955

#### PORTABLE SYSTEM FOR LAUNCHING/CATCHING PIPELINE PIGS

Louis C. Kozisek, Anchorage, Ak., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 13, 1996, Ser. No. 748,449

Int. Cl.<sup>6</sup> B08B 9/04; 1/00

U.S. Cl. 134—8

12 Claims



1. A portable launcher/catcher system for launching/receiving a pipeline pig, said system comprising:

a docking station having an inlet section connected into a pipeline,

a portable pig launcher/receiver comprising:

a barrel having a diameter large enough to receive the largest-diameter pig to be handled by said launcher/receiver; and means at one end of said barrel for releasably connecting said barrel to said inlet section of said docking station whereby a pipeline pig can be launched/received through said pipeline, said releasable connecting means comprising:

a turret rotatably mounted on said barrel, and at least two transition spools radially spaced on said turret, each of said spools having a different diameter and each having means at one of its end adapted to connect said spool to said one end of said barrel and having a means at its other end adapted to connect said spool to a respective pipeline having an equal diameter when said turret is rotated to aligned said spool with a respective pipeline; and releasable closure means at the other end of said barrel for opening and closing said other end.



5,769,956

**METHOD FOR CLEANING A SCREEN BY SPRAYING AND MOVING IN A REPEATED CONTINUOUS OSCILLATING MOTION**

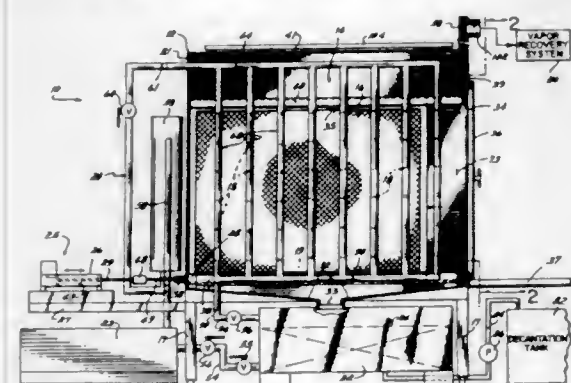
Albert B. Cord; Cameron W. Cord, both of Cincinnati, Ohio; David N. Gehrich, St. Paul, Ind.; Gregory N. Jensen, Westchester, and Ted K. Parr, Cincinnati, both of Ohio, assignors to Intercontinental Chemical Corporation, Cincinnati, Ohio

Continuation of Ser. No. 652,372, May 23, 1996, abandoned, which is a division of Ser. No. 384,737, Feb. 7, 1995, Pat. No. 5,566,697. This application Mar. 27, 1997, Ser. No. 826,287

Int. Cl.<sup>6</sup> B08B 3/02

U.S. Cl. 134—10

12 Claims



1. A method for cleaning a screen with a spray cleaning liquid comprising:

placing a screen within within a chamber proximate a first plurality of spraynozzles positioned within the chamber; positioning the screen on a movable track in a chamber track to an oscillating, the mechanism including a push-pull device which is operable for pushing and pulling the track in the chamber;

repeatedly pushing and pulling the track for moving said screen in a repeated, continuous oscillating motion within said cleaning chamber to thus move the screen repeatedly back and forth in front of the spray nozzles whereby to increase the coverage of the sprayed cleaning liquid over said screen for improved cleaning and removal of undesired contaminants from said screen.

5,769,957

**REGENERATING METHOD AND APPARATUS OF IMAGE HOLDING SUPPORTING MEMBER**

Kakuzi Murakami, Kamakura; Kiyoshi Tanikawa; Tadashi Saito, both of Yokohama; Toshiaki Tokita, Zama; Kiyofumi Nagai, and Shigeru Fujita, both of Machida, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

PCT No. PCT/JP95/00219, § 371 Date Oct. 16, 1995, § 102(e) Date Oct. 16, 1995, PCT Pub. No. WO95/22788, PCT Pub. Date Aug. 24, 1995

PCT Filed Feb. 16, 1995, Ser. No. 532,568

Claims priority, application Japan, Feb. 16, 1994, 6-042050; Jan. 31, 1995, 7-034559

Int. Cl.<sup>6</sup> B08B 3/04;3/00

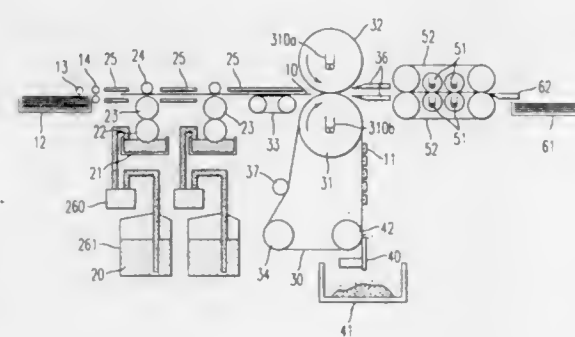
U.S. Cl. 134—15

17 Claims

1. A method for regenerating a fibrous recorded material capable of absorbing a liquid, the fibrous recorded material having an image recorded on a surface thereof by an image forming substance having a thermoplastic or thermally melting property, comprising the steps of:

applying an image removing accelerating liquid so as to wet the recorded material in at least a portion thereof having the image thereon;

repeating said applying step until a joining force between the recorded material and the image forming substance is reduced;



using a separating member to separate the image from the recorded material; and transferring the separated image to the separating member.

5,769,958

**TANK WETTING METHOD**

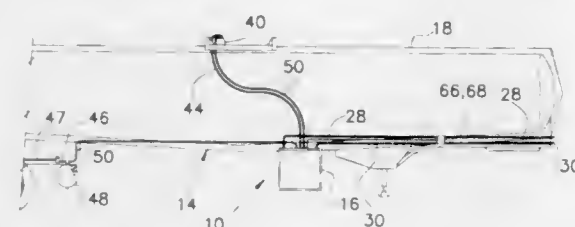
Gary L. Reagan; Ned C. Crawford, and Gregory A. Luther, all of Knox County, Tenn., assignors to Highway Transport, Inc., Knoxville, Tenn.

Continuation-in-part of Ser. No. 242,786, May 16, 1994, abandoned. This application Dec. 11, 1995, Ser. No. 570,668

Int. Cl.<sup>6</sup> B08B 9/093

U.S. Cl. 134—22.1

8 Claims



1. A tank wetting method for use with a vehicle having a tank defining an interior for transporting substances, the interior being defined by interior surfaces, having an air brake system, and having an internal combustion engine for effecting travel of the vehicle, the internal combustion engine including a cooling system for cooling the internal combustion engine, said tank wetting method being for wetting the interior surfaces of the tank of the vehicle such that residue in the tank from a transported substance does not dry on the interior surfaces of the tank prior to cleaning, said method comprising the steps of:

discharging the transported substance from the tank of the vehicle;

sealing the tank of the vehicle such that the tank can be maintained in an air-tight condition;

pressurizing the tank to a selected pressure by injecting an atomized liquid into the tank, the liquid being atomized by simultaneously supplying air from the air brake system of the vehicle and a liquid from a reservoir mounted on the vehicle to an atomizing device having at least one nozzle disposed in the tank whereby the atomized liquid wets the interior surfaces of the tank and the atomizing and pressurizing of the tank to the selected pressure which prohibits residue from the transported substance from drying on the interior surfaces of the tank prior to cleaning; and

maintaining the sealed and pressurized status of the tank until the cleaning of the tank.

5,769,959

**PROCESS FOR REMOVING INSOLUBLE N-VINYL AMIDE POLYMER FROM EQUIPMENT**

Thomas Albert Johnson, Orefield, and Malee Lecaphon, Allentown, both of Pa., assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Apr. 4, 1995, Ser. No. 416,564

Int. Cl.<sup>6</sup> B08B 3/08;9/00;9/08; C23D 17/00

U.S. Cl. 134—22.17

9 Claims

1. In a process for removing N-vinylformamide homopolymer buildup from process equipment wherein the N-vinylformamide homopolymer is contacted with a solvent under conditions sufficient to effect dissolution of such N-vinylformamide homopolymer, the improvement which comprises utilizing an aqueous solution of a weak base as said solvent, wherein the weak base is present in said aqueous solution in an amount from about 1 to 5 molar and the base has a pK<sub>a</sub> of from 3 to 9.5.

5,769,960

**DEVICE AND METHOD FOR MANUALLY REMOVING A CLOG CONTAINING FIBROUS MATTER**

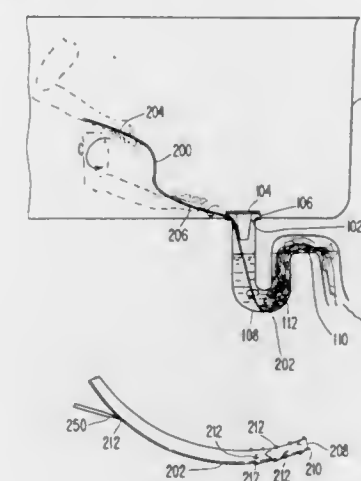
Chittaranjan N. Nirmel, 1108 Portner Rd., Alexandria, Va. 22314

Filed Jul. 5, 1995, Ser. No. 498,469

Int. Cl.<sup>6</sup> B08B 9/02

U.S. Cl. 134—22.11

10 Claims



1. A device for manually removing a clog containing tangled fibrous matter from a water trap, comprising:

a firm and flexibly bendable elongate element having a smooth-surfaced body comprising a plastic material, the body having a clog-snagging end portion and a manually-graspable end portion; and

at least one clog-snagging element having a distal end extending outwardly of the clog-snagging end portion,

said elongate element having a cross-section selected to allow a user to insert the clog-snagging end portion into the water trap and into the clog, manually bend the elongate element to a crank shape, grasp the elongate element loosely in both hands, and manually crank the elongate element to thereby snag, twist and then forcibly draw at least a portion of the clog out of the water trap.

5,769,961

**REMEDIATION OF ARSENIC-CONTAMINATED SOILS AND GROUNDWATERS**

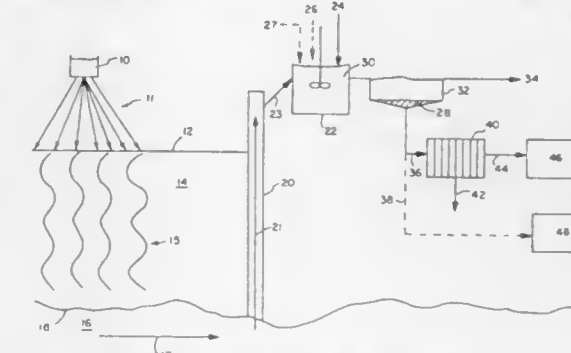
Robert W. Peters, Naperville; James R. Frank, Glen Ellyn, both of Ill., and Xiandong Feng, West Richland, Wash., assignors to The University of Chicago, Chicago, Ill.

Filed May 16, 1995, Ser. No. 442,323

Int. Cl.<sup>6</sup> B08B 3/08; B01D 11/02;11/04

U.S. Cl. 134—25.1

19 Claims



1. A method for remediating an arsenic-contaminated soil medium without excavating the soil, comprising:

contacting the soil medium with an aqueous extractant solution, wherein said extractant is selected from the group consisting of oxalic acid, oxalate anion, phosphoric acid, phosphate anion, citric acid, citrate anion, polyvinylsulfonic acid, polyvinylsulfonate anion and combinations thereof;

directing said extractant solution through the soil medium; extracting at least one arsenic contaminant from the soil medium into said extractant solution; and

collecting said extractant solution and said arsenic contaminant.

5,769,962

**CLEANING METHOD**

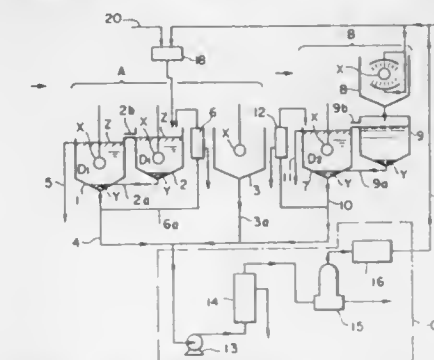
Minoru Inada, Yokohama; Kimiaki Kabuki, Tokyo; Yasutaka Imajo, Hachioji; Noriaki Yagi, Yokohama, and Nobuhiro Saitoh, Ohta, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 177,697, Jan. 4, 1994, Pat. No. 5,503,681, which is a continuation of Ser. No. 768,554, Sep. 27, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 471,242

Claims priority, application Japan, Mar. 16, 1990, 2-065837 Int. Cl.<sup>6</sup> B08B 3/08; C23G 5/02

U.S. Cl. 134—29

16 Claims



1. A cleaning method comprising, a first step of cleaning an object to be cleaned with a mixture of a base cleaning agent and a cleaning power promoting agent, and

a second cleaning step of cleaning the object with a base cleaning agent alone after the first step, wherein said base cleaning agent is the same or different non-water system agent silicon-containing agent, and further comprising vapor drying the object with a vapor drying agent to remove base cleaning agent from the object,

wherein the vapor drying agent has a difference of solubility parameter of 4 or less and an evaporation latent heat of 5 fold or less compared with the cleaning agent used in the second cleaning step.

5,769,963

## PHOTOVOLTAIC DEVICE

Yasushi Fujioka; Shotaro Okabe, both of Nara; Masahiro Kanai; Akira Sakai, both of Soraku-gun; Yuzo Koda, Tsuzuki-gun; Tadashi Hori, Nara; Tomonori Nishimoto, Tsuzuki-gun, and Takahiro Yajima, Soraku-gun, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Aug. 30, 1996, Ser. No. 697,783

Claims priority, application Japan, Aug. 31, 1995, 7-223942; Aug. 31, 1995, 7-223943

Int. Cl.<sup>6</sup> H01L 31/0352

U.S. Cl. 136—258

38 Claims



1. A photovoltaic device comprising in the following order, in its layer configuration, a conductive substrate, a first semiconductor layer having a first conductivity type, a substantially intrinsic second semiconductor layer, a third semiconductor layer having a conductivity type opposite to that of the first conductivity type, and a transparent electrode;

said first to third semiconductor layers each comprising a silicon-containing non-single-crystal semiconductor and light being made to be incident on the side of said transparent electrode;

wherein a dopant impurity determining the conductivity type of said first semiconductor layer is distributed therein so that the density of said impurity is lower on the side of said conductive substrate than on the side of said second semiconductor layer.

5,769,964

## BULK SINGLE CRYSTAL TERNARY SUBSTRATES FOR A THERMOPHOTOVOLTAIC ENERGY CONVERSION SYSTEM

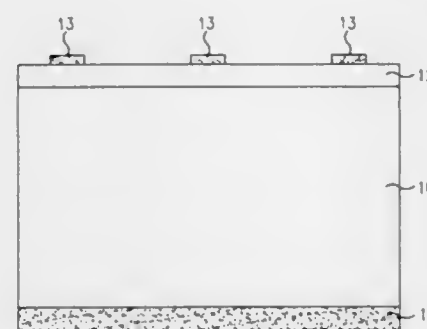
Greg W. Charache; Paul F. Baldasaro, both of Clifton Park, and Greg J. Nichols, Burnt Hills, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 29, 1996, Ser. No. 704,974  
Int. Cl.<sup>6</sup> H01L 31/036

U.S. Cl. 136—262

18 Claims

1. A thermophotovoltaic energy conversion device comprising a substrate formed from a bulk single crystal material having a bandgap ( $E_g$ ) of 0.4 eV <  $E_g$  < 0.7 eV and selected from the group of AlInAs, AlInSb, GaAsSb, GaInAs, GaInSb, and InPAs, and an emitter fabricated on the substrate, wherein the emitter is formed



by adding an n-type or p-type dopant material to the upper portion of the substrate.

5,769,965

## METHOD FOR TREATING AT LEAST ONE PART OF SOFT MAGNETIC MATERIAL TO FORM A HARD WEAR AREA

Dieter Liedtke, Ludwigsburg; Juergen Graner, Sersheim; Norbert Keim, Bietigheim-Bissingen, and Joerg Illing, Radeberg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

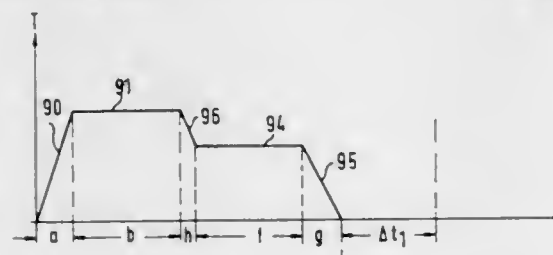
PCT No. PCT/DE95/00772, § 371 Date Apr. 19, 1996, § 102(c) Date Apr. 19, 1996, PCT Pub. No. WO96/00313, PCT Pub. Date Jan. 4, 1996

PCT Filed Jun. 16, 1995, Ser. No. 601,024  
Claims priority, application Germany, Jun. 23, 1994, 44 21 937.7

U.S. Cl. 148—121

Int. Cl.<sup>6</sup> H01F 1/00

20 Claims



1. A method for treating at least one part of a soft magnetic material by annealing and production of a wear guard layer in a sealable reaction chamber, which comprises, placing the at least one part (1, 16, 34, 48) in said sealable reaction chamber (61), annealing and producing a wear guard layer (84) on the at least one part in the reaction chamber (61) under retention of the soft magnetic characteristics by application of temperatures in a range from 750° C. to 950° C.

5,769,966

## INSULATOR COATING FOR HIGH TEMPERATURE ALLOYS METHOD FOR PRODUCING INSULATOR COATING FOR HIGH TEMPERATURE ALLOYS

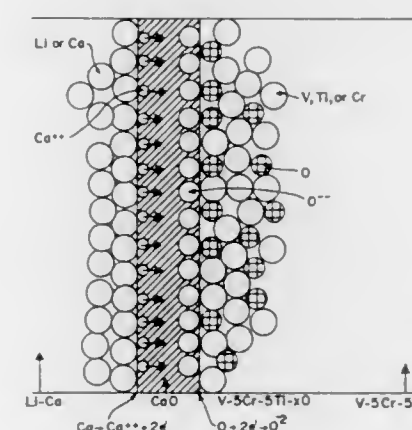
Jong Hee Park, Clarendon Hills, Ill., assignor to The United States of America as represented by the Department of Energy, Washington, D.C.

Continuation of Ser. No. 241,425, May 11, 1994, abandoned.  
This application Jul. 3, 1996, Ser. No. 674,938  
Int. Cl.<sup>6</sup> C23C 10/22; 8/40

U.S. Cl. 148—242

9 Claims

1. An in situ method for producing and maintaining an electrically insulating coating on a surface comprising: selecting a surface from the group consisting of vanadium, vanadium-chromium-titanium alloy, titanium, vanadium-titanium alloy, molybdenum, stainless steel, and combinations thereof;



forming an intermetallic layer on the surface through contacting the surface with a liquid selected from the group consisting of lithium, lithium-lead, sodium, potassium, sodium-potassium, gallium, and combinations thereof, said liquid containing dissolved metals selected from the group consisting of Al, Be, Ca, Cr, Fe, In, Ni, Pd, Pt, Si, Ti, Y—Pt, and combinations thereof; and contacting the intermetallic layer with an alkali liquid containing dissolved molten metal-nonmetal compounds thereby forming an electrically insulating coating on the surface.

5,769,967

## COMPOSITION AND PROCESS FOR TREATING METAL

Shawn E. Dolan, Sterling Heights, Mich., assignor to Henkel Corporation, Plymouth Meeting, Pa.  
Continuation of Ser. No. 429,431, Apr. 21, 1995, Pat. No. 5,534,082, which is a continuation-in-part of Ser. No. 213,138, Mar. 15, 1994, abandoned, which is a continuation-in-part of Ser. No. 131,645, Oct. 5, 1993, Pat. No. 5,356,490, which is a continuation-in-part of Ser. No. 862,012, Apr. 1, 1992, Pat. No. 5,281,282. This application Jul. 2, 1996, Ser. No. 674,558  
Int. Cl.<sup>6</sup> C23C 22/48

U.S. Cl. 148—247

19 Claims

1. A process for making a liquid metal treating composition, said process comprising steps of:

- (I) providing a precursor mixture with a continuous liquid phase, said precursor mixture consisting essentially of water and:
  - (A) a dissolved component selected from the group consisting of  $H_2TiF_6$ ,  $H_2ZrF_6$ ,  $H_2HfF_6$ ,  $H_2SiF_6$ ,  $H_2GeF_6$ ,  $H_2SnF_6$ ,  $HBF_4$ , and mixtures thereof and
  - (B) a dissolved, dispersed, or both dissolved and dispersed component selected from the group consisting of Ti, Zr, Hf, Al, Si, Ge, Sn, and B, the oxides, hydroxides, and carbonates of Ti, Zr, Hf, Al, Si, Ge, Sn, and B, and mixtures of any two or more of these elements, oxides, hydroxides, and carbonates,

said precursor mixture having at least one of the following characteristics: (i) it is not optically transparent in a thickness of 1 cm; (ii) it scatters visible light; or (iii) it undergoes visually detectable settling of a solid phase if maintained for at least 100 hours at a temperature between its freezing point and 20° C.;

- (II) maintaining the precursor liquid mixture provided in step (I) for at least a sufficient time at a sufficient temperature to form a stabilized liquid mixture that is free from any visually observable evidence of phase separation, is transparent when viewed in a thickness of 1 cm, and is sufficiently stable that it would remain free from any visually observable evidence of phase separation during storage at any temperature in the range from 20° to 25° C. for a period of at least 100 hours; and
- (III) mixing with the stabilized liquid mixture from the end of step (II):
  - (C) a component selected from the group consisting of water soluble compounds containing hexavalent chromium; and, optionally, one or more of water and;

- (D) a component selected from the group consisting of water soluble oxides, carbonates, and hydroxides of all of the elements Ti, Zr, Hf, B, Al, Si, Ge, and Sn; and
- (E) a component selected from the group consisting of water soluble oxidizing agents that are not part of any of the previously recited components,

to form said liquid metal treating composition, which is sufficiently stable that it remains free from any visually observable evidence of phase separation during storage at temperature in the range from 20+ to 25° C. for a period of at least 100 hours and which contains: (i) a total concentration of titanium, zirconium, hafnium, boron, aluminum, silicon, germanium, and tin derived from component (A) of the precursor mixture that is from about 1.0 to about 200 mM/L and (ii) an amount of hexavalent chromium that has a molar ratio to all metalloid and metal atoms derived from components (A) and (B) that is in a range from about 0.3:1.0 to about 10:1.0.

5,769,968

## METHOD FOR MANUFACTURING A DEVELOPER SUPPORT

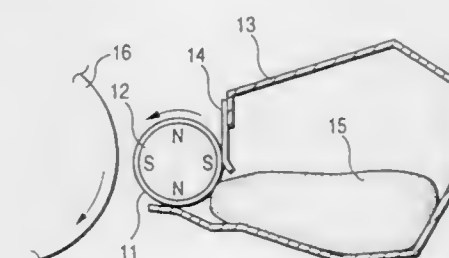
Masaki Sutoh, and Shinichiro Fukunaga, both of Saitama, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan  
Division of Ser. No. 250,486, May 27, 1994, Pat. No. 5,589,916. This application Aug. 26, 1996, Ser. No. 703,126

Claims priority, application Japan, May 28, 1993, 5-126668; Apr. 8, 1994, 6-70590

Int. Cl.<sup>6</sup> C23C 22/24

U.S. Cl. 148—266

5 Claims



1. A method of manufacturing a developer support having an outer surface of chromium, comprising the steps of: providing a hollow cylindrical substrate having an outer surface with a surface roughness (Ra) in the range of from 0.05 to 2.0  $\mu$ m; forming a film consisting essentially of chromium on the outer surface of said cylindrical substrate using a treatment liquid containing a chromic acid; and reducing hexavalent chromium in said film using a treatment liquid to form a treated film, said treated film being the outer surface of said developer support.

5,769,969

## RARE EARTH-IRON-NITROGEN MAGNET ALLOY

Takashi Ishikawa, Ichikawa, and Atsushi Kawamoto, Inzal, both of Japan, assignors to Sumitomo Metal Mining Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1996, Ser. No. 753,530

Claims priority, application Japan, Nov. 28, 1995, 7-308725  
Int. Cl.<sup>6</sup> H01F 1/059

U.S. Cl. 148—301

15 Claims

1. A rare earth-iron-nitrogen magnet alloy comprising mainly a rare earth element (at least one of the lanthanoids including Y), iron and nitrogen, and also containing 0.001 to 0.1% by weight of at least one element selected from the group consisting of Li, K, Rb, Cs, Mg, Ca, Sr and Ba, said element being uniformly present in said alloy.



5,769,970

**STEEL FOR THE MANUFACTURE OF SEPARABLE MECHANICAL COMPONENTS AND SEPARABLE MECHANICAL COMPONENT**

Marc Robelet, Florange, and Jacques Bellus, Scy-Chazelles, both of France, assignors to Ascometal (Societe Anonyme)-Immeuble la Pacific, Puteaux, France

Filed Dec. 16, 1996, Ser. No. 767,430

Claims priority, application France, Dec. 14, 1995, 95 14833  
Int. Cl.<sup>6</sup> C22C 38/02; 38/60

U.S. Cl. 148—320

32 Claims

1. Steel which comprises, by weight based on total weight:

0.25% ≤ C ≤ 0.15%

0.2% ≤ Si ≤ 1.5%

0.1% ≤ Mn ≤ 2%

0% ≤ Ni ≤ 1%

0% ≤ Cr ≤ 1%

0% ≤ Mo ≤ 1%

0% ≤ Cu ≤ 1%

0% ≤ V ≤ 0.2%

0.02% ≤ S ≤ 0.35%

0.04% ≤ P ≤ 0.2%

0% ≤ Al ≤ 0.005%

0.005% ≤ N ≤ 0.02%

optionally at least one element selected from the group consisting of lead, tellurium and selenium each in contents of less than 0.1%, the balance being iron and impurities resulting from smelting, the steel optionally having been treated with calcium, wherein the steel has a ferritic-pearlitic structure.

5,769,971

**MANGANESE-ALUMINUM MAGNET WITH FAR-INFRARED RADIATION EFFECT AND METHOD OF MANUFACTURING THE SAME**

Naoto Kuroda, Atsushi Obkawa, Noriyuki Umano, all of Himeji, and Yutaro Iso, Tokyo, all of Japan, assignors to Creation Renai Co. Ltd., Tokyo, Japan

Filed Aug. 8, 1996, Ser. No. 694,371

Claims priority, application Japan, Aug. 10, 1995, 7-227445  
Int. Cl.<sup>6</sup> C22L 22/00

U.S. Cl. 420—434

5 Claims

1. A manganese-aluminum magnet obtained through mixing, molding and hot-extruding of powder of a manganese-aluminum magnet raw material and powder of a far-infrared radiation material.

5,769,972

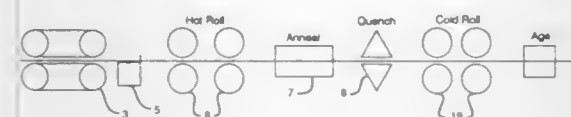
**METHOD FOR MAKING CAN END AND TAB STOCK**  
Tyzh-Chiang Sun, Danville, and William Betts, Pleasanton, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Pleasanton, Calif.

Filed Nov. 1, 1995, Ser. No. 548,337

Int. Cl.<sup>6</sup> C22C 21/06

U.S. Cl. 148—439

13 Claims



1. A can lid or tab stock for aluminum alloy containers formed of aluminum alloy containing less than about 2% by weight magnesium and having an ultimate tensile strength of at least 50,000 psi produced by strip or belt casting an aluminum alloy to form a hot feedstock, rapidly heating the feedstock to anneal the feedstock and effect recrystallization without causing substantial precipitation of alloying elements, quenching the annealed feedstock to avoid substantial precipitation of alloying elements and cold rolling the quenched feedstock to reduce its thickness.

5,769,973

**HIGH PERFORMANCE AUTOMOTIVE CLUTCH WITH MODIFIED PRESSURE PLATE FOR SUSTAINED INCREASED SPRING FORCE**

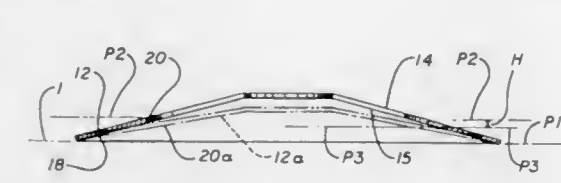
Robert P. Smith, Jr., 10101 Canoga Ave., No. 5, Chatsworth, Calif. 91311

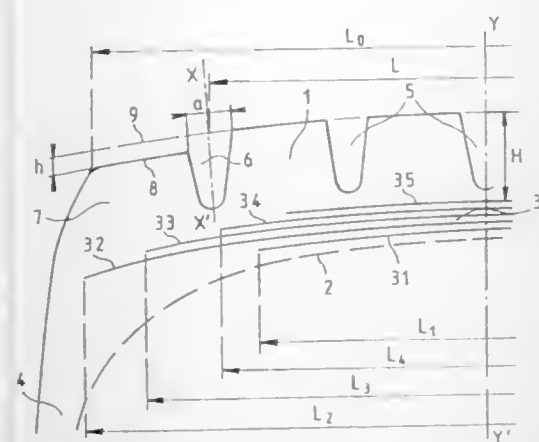
Filed Mar. 7, 1996, Ser. No. 612,135

Int. Cl.<sup>6</sup> C21D 8/02

U.S. Cl. 148—563

6 Claims





non-stretchable cables parallel to each other in each ply and crossed from one ply to the next forming an angle of at most 45° with a circumferential direction, and a tread (1) having in each lateral zone a circumferential groove (6) defining a lateral rib (7) and a circumferential groove (5) defining a rib axially adjacent the lateral rib, the width of the lateral rib being less than the width of the adjacent rib, the meridian profile of the lateral rib being substantially parallel to the meridian profile (9) of the geometrical envelope of the principal median zone and radially recessed with respect to said meridian profile of the geometrical envelope of the median zone, the widths ( $L_1$ ,  $L_2$ ,  $L_3$ ,  $L_4$ ) of at least two working plies having cables crossed from one ply to the other being greater than the axial distance  $L$  between the median axes  $XX'$  of the circumferential grooves (6) in the lateral zones, characterized by the fact that the difference in level  $h$  between the meridian profile of the median zone and the meridian profile of the lateral ribs (7) of the tread (1) is such that the ratio  $h/H$  is from 0.07 to 0.40,  $H$  being the thickness of the tread (1) measured in the equatorial plane  $YY'$ , and by the fact that the difference  $L_0-L$  is greater than 38 mm and less than or equal to 80 mm,  $L_0$  being the axial width of the tread.

5,769,979

**ROTARY AIR CONNECTION FOR TIRE INFLATION SYSTEM**

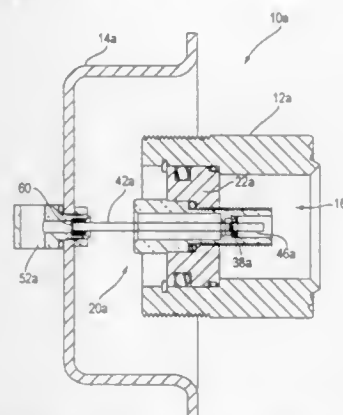
Mark Henry Naedler, San Antonio, Tex., assignor to Equaire Systems, Inc., Corpus Christi, Tex.

Filed Aug. 30, 1996, Ser. No. 706,080

Int. Cl.<sup>6</sup> B60C 23/00

U.S. Cl. 152—417

6 Claims



1. In an air inflation system for a vehicle having at least one axle with at least one wheel having a pneumatic tire at each end of the axle and said vehicle having an air supply supplying air to the inside of the axle and a hub cap at each end of the axle, the improvement in a rotary air connection for supplying air to the rotating tires comprising,

a hollow tubular member able to serve as a conduit for pressurized air having a first and second end,

a circular first resilient seal generally coaxial with the axle, a sealable connection between the second end of the said hollow member and the first seal creating sealed communication between the air supply inside the axle and the interior of the said hollow member,

a circular resilient second seal generally coaxial with the hub cap,

a sealable connection between the first end of the said hollow member and the second seal creating sealed communication between a pressure conduit which rotates with the said hub cap and the interior of the said hollow member,

said hollow member is positioned between the first and second seals so that during rotation of the hub cap in relation to the said axle when the hub cap is not perfectly centered with the axle the ends of the hollow member are free to pivot in the resilient seals and compensate for any misalignment.

5,769,980

**PNEUMATIC TIRE WITH SIDEWALL INSERTS HAVING SPECIFIED EXTENSION UNDERNEATH THE BELT PACKAGE**

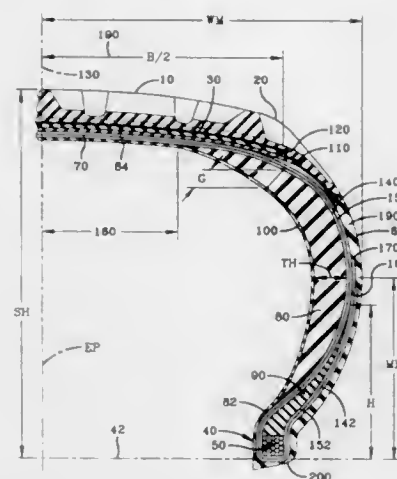
Charles D. Spragg, Hudson; Thomas W. Bell, Mogadore; William L. Hergenrother, and James M. Kirby, both of Akron, all of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Nov. 13, 1996, Ser. No. 748,263

Int. Cl.<sup>6</sup> B60C 15/00; 15/06; 17/00

U.S. Cl. 152—517

21 Claims



1. A pneumatic tire having an aspect ratio of greater than 50% comprising:

a tread portion (10) having a pair of lateral tread edges (20);

a belt package (30) located radially inward of the tread portion;

a pair of bead portions (40) each having a bead core (50) and a bead filler (90) positioned radially outward of the bead core, wherein a height  $H$  of bead portion (40) from a nominal rim diameter (42) is not less than 30% of a tire section height  $SH$  therefrom;

a carcass structure (70) having at least one carcass ply extending between each bead core (50), at least one ply turned-up around the bead cores in an axially outward direction;

a pair of sidewalls (60), each extending radially from the lateral tread edge (20) of the tread portion to the bead portion (40), and

a pair of crescent shaped sidewall inserts (80), one on each side of the belt package, disposed axially inward of the carcass structure, wherein each sidewall insert has a first inner end (82) located from the nominal rim diameter at a position between 15% and 45% of height  $H$  of the bead portions, and a second outer end which extends to an axial position of not less than 40% of a half width  $B/2$  of the outermost belt in the belt package, as measured from the lateral edge of the belt toward an equatorial plane  $EP$  of the tire.

5,769,981

**PNEUMATIC TIRE WITH BEAD REGIONS HAVING CIRCUMFERENTIALLY EXTENDING RIBS**

John Anthony Turley, Sutton Coldfield, and Arthur Roger Williams, Solihull, both of England, assignors to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan

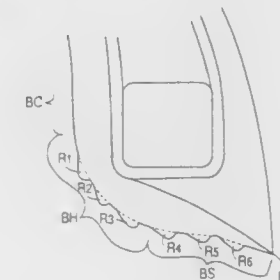
Filed Nov. 8, 1996, Ser. No. 745,621

Claims priority, application United Kingdom, Nov. 14, 1995, 9523275; Sep. 24, 1996, 9619870

Int. Cl.<sup>6</sup> B60C 15/02; 15/024

U.S. Cl. 152—544

15 Claims



1. A radial tire comprising a tire carcass comprising a strip of circumferentially extending material jointed at the ends and including reinforcing cords extending between two bead regions and enclosed therein by wrapping around a circumferentially extending inextensible bead core in each bead region, the axially outer surface of each bead region comprising a bead seat radially inward of the bead core for seating onto the rim seat of a wheelrim, the bead seat terminating at a bead toe at the axially inward end of the bead seat, and a bead clinch extending substantially radially outwardly and located axially outwardly of the bead core and a bead heel extending between the radially inward end of the bead clinch and the axially outward end of the bead seat, the bead regions having a bead base width being the axial distance between the bead toe and the theoretical bead heel point, wherein each bead region has between two and ten circumferentially extending ribs projecting outward of the bead region outer surface, each rib surface lying between the edges of the base of the rib where the rib contacts the outer surface of the bead region being one continuous surface having no edges, the rib surface in cross section comprising an arc and a straight line meeting tangentially.

5,769,982

**TIRE WITH REINFORCED BEADS**

Pierre De Loze de Plaisanc, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin—Michelin & Cie, Clermont-Ferrand Cedex, France

Filed Jul. 12, 1996, Ser. No. 678,202

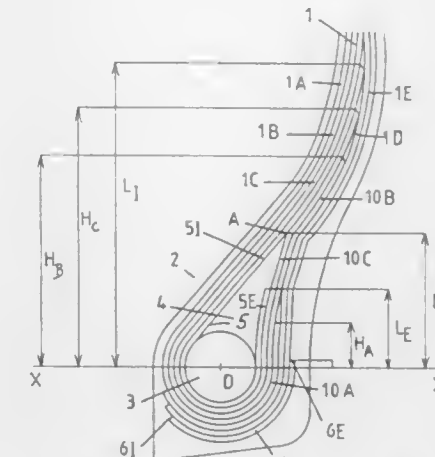
Claims priority, application France, Jul. 31, 1995, 95 09407

Int. Cl.<sup>6</sup> B60C 15/00; 15/06; 9/08

U.S. Cl. 152—546

4 Claims

1. An airplane tire, inflated to elevated pressure, having a tread, a crown reinforcement, and a radial carcass reinforcement, comprising at least two axially inner plies of textile cords, wound around a bead wire in each bead from the inside to the outside, forming outside turn-ups and at least one axially outer ply of textile cords superimposed on the inner plies under the crown reinforcement and separated from said plies in the beads in order to extend along the turn-ups of the inner plies, said bead wire being radially surmounted by a filler of vulcanized rubber mix, of substantially triangular shape, the apex  $A$  of which radially furthest from the axis of rotation is at distance  $D$  from a straight reference line  $XX'$  parallel to said axis and passing through the geometrical center of the circle circumscribed on the cross section of the anchoring bead wire, and comprising also at least one inner flipper wound around the bead wire to form an axially inner leg and an axially outer leg which are axially adjacent to the filler above the bead wire, the tire characterized by the fact that



the end of the axially outer leg of the inner flipper is located at a radial distance  $L_E$  from the reference line  $XX'$  such that  $L_E$  is between 0.40  $D$  and 0.80  $D$ ;

the end of the turn-up of the inner carcass ply arranged axially furthest to the inside is located at a distance  $H_A$  from the reference line  $XX'$ , such that  $H_A$  is between 0.15  $D$  and 0.50  $D$ , and by the fact that

the ends of the axially inner leg of the inner flipper and of the turn-up or turn-ups of the inner carcass ply or plies axially furthest to the outside are located at respective radial distances from the reference line  $XX'$  which are greater than the distance  $D$ .

5,769,983

**PNEUMATIC RADIAL TIRES PROVIDED WITH A SIDE PORTION REINFORCING LAYER**

Hiroshi Nishigata, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

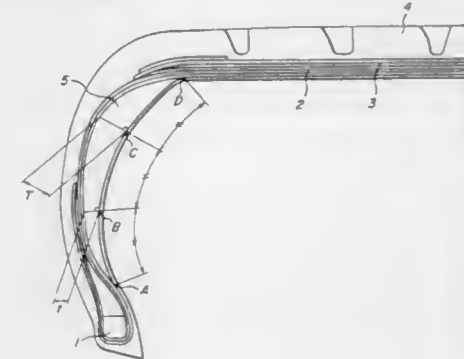
Filed May 23, 1997, Ser. No. 862,368

Claims priority, application Japan, May 29, 1996, 8-135039

Int. Cl.<sup>6</sup> B60C 9/00; 9/08; 17/00; 17/06

U.S. Cl. 152—555

3 Claims



1. A pneumatic radial tire comprising a pair of bead portions each with a bead core embedded therein, a radial carcass of a rubberized cord ply extending between both bead portions through a crown portion and a pair of side portions and wound around each of the bead cores from inside toward outside, a belt superimposed outward on a crown portion of the carcass in a radial direction and comprised of rubberized belt layers containing substantially non-extensible cords therein, a tread disposed outside the belt in the radial direction, and a side portion reinforcing layer extending along an inner surface of the carcass over a full region of each side portion and having a crescent shape at a radial section thereof, in which when a periphery length of the side portion reinforcing layer is divided into three equal parts along an inner surface of the tire, a thickness of the side portion reinforcing layer at a section in a radial direction of the tire is thickest in the vicinity of the 1/3 point located outward in the radial direction.



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5,769,984

## OPTICAL PELLICLE ADHESION SYSTEM

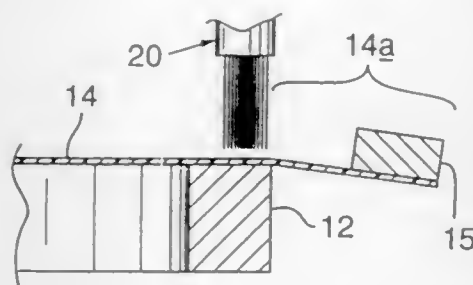
Yung-Tsai Yen, Atherton, and Quang Rung Bih, San Jose, both of Calif., assignors to Micro Lithography, Inc., Sunnyvale, Calif.

Filed Feb. 10, 1997, Ser. No. 797,874

Int. Cl.<sup>6</sup> G03F 1/14; H01L 21/027

U.S. Cl. 156—73.1

26 Claims



1. A method of assembling an optical pellicle including a pellicle frame and a pellicle membrane comprising:  
selecting a pellicle frame corresponding to the shape of the desired pellicle;  
applying adhesive containing a first solvent to the pellicle frame;  
heating the pellicle frame to evaporate the first solvent;  
fabricating a pellicle membrane;  
applying a second solvent to the adhesive on the pellicle frame, wherein the second solvent is a mixture of at least two solvents having boiling points which differ by at least 10° C.; and  
mounting the pellicle membrane to the adhesive on the pellicle frame.

5,769,985

## METHOD OF MANUFACTURING A MONOLITHIC CERAMIC ELECTRONIC DEVICE

Hiroyuki Kawakami, Toyama-ken; Yoshiaki Kohno, Moriyama, and Noriyuki Kubodera, Shiga-ken, all of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

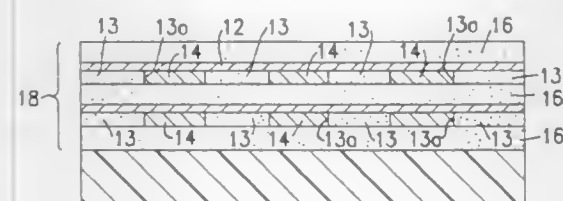
Filed Mar. 18, 1996, Ser. No. 617,177

Claims priority, application Japan, Mar. 16, 1995, 7-057303; Apr. 4, 1995, 7-079120

Int. Cl.<sup>6</sup> B32B 31/26

U.S. Cl. 156—89

11 Claims



1. A method of manufacturing a monolithic ceramic electronic device, comprising the steps of:  
forming a first metal film on a first supporting member by a thin film forming method;  
forming, on said first metal film, a resist layer having pattern holes therein;  
forming, within at least one of said pattern holes, a second metal film;  
forming a monolithic ceramic structure including a plurality of said resist layers and said first and second metal films; and  
firing said monolithic ceramic structure so as to change said first metal films into insulating material and at least partially remove said resist layers.

5,769,986

## STRESS-FREE BONDING OF DISSIMILAR MATERIALS

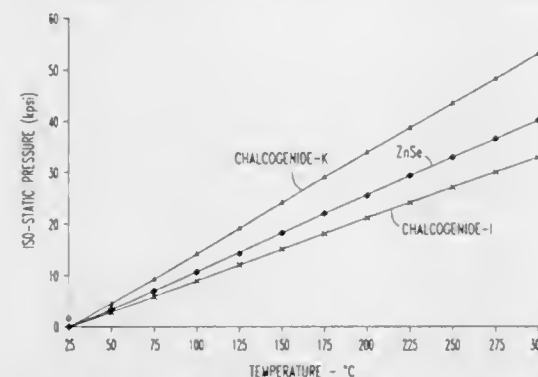
Fred B. Hagedorn, Orlando, and William F. Cashion, Oviedo, both of Fla., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Aug. 13, 1996, Ser. No. 696,218

Int. Cl.<sup>6</sup> B32B 18/00; 31/04

U.S. Cl. 156—89

16 Claims



1. A process for bonding together two layers of dissimilar material, yielding a composite structure which is substantially stress-free at a selectable reference temperature and reference isostatic pressure, comprising the steps of:  
(a) providing a first layer and a second layer;  
(b) determining a critical line for the first layer and second layer in a pressure-temperature plane wherein a location of the critical line depends on the selectable reference temperature and reference isostatic pressure and depends on coefficients of thermal expansion and bulk moduli material constants of the first layer and the second layer, wherein the critical line sets forth a plurality of temperature-pressure pairs at which the composite structure will be substantially stress-free;  
(c) controlling a temperature and an isostatic pressure during bonding such that the temperature and the isostatic pressure represent a point on the critical line;  
(d) bonding the first layer and the second layer at the temperature and the isostatic pressure in said step (c); and  
(e) returning to the selectable reference temperature and reference isostatic pressure after bonding is completed by following a path in the pressure-temperature plane which avoids imposing disruptive stresses on the composite structure.

5,769,987

## POST-FIRING METHOD FOR INTEGRATING PASSIVE DEVICES INTO CERAMIC ELECTRONIC PACKAGES

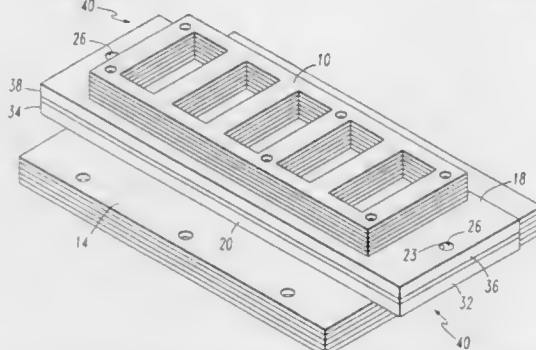
Stephen R. Gurkovich, Pittsburgh; Kenneth C. Radford, North Huntingdon, both of Pa.; Alex E. Bailey, Hampstead, Md.; Deborah P. Partlow, Export, Pa., and Andrew J. Piloto, Columbia, Md., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Nov. 20, 1996, Ser. No. 752,110

Int. Cl.<sup>6</sup> B32B 31/26

U.S. Cl. 156—89

18 Claims



1. A post-firing method for integrating passive components with ceramic electronic packages, comprising the steps of:

- firing a first passive component at a first densification temperature;
- firing a second component constituting said electronic package at a second densification temperature;
- providing at least one electrically insulating bonding layer having a plurality of metallized vias therethrough and positioning said at least one bonding layer between and in contact with the fired first and second components, wherein the at least one bonding layer has a third densification temperature lower than that of the first and second densification temperatures; and
- heating the fired first passive component, the fired second component and the at least one bonding layer at the third densification temperature.

5,769,988

## METHOD OF MANUFACTURING A CERAMIC ELECTRONIC COMPONENT

Hiroshi Kagata; Ichiro Kameyama; Tatsuya Inoue, and Junichi Kato, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

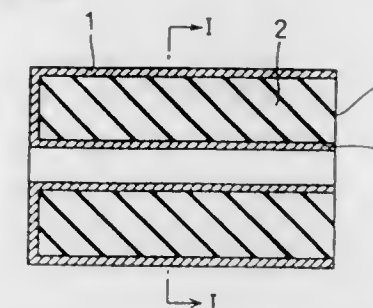
Filed Nov. 20, 1996, Ser. No. 752,837

Claims priority, application Japan, Nov. 28, 1995, 7-309127

Int. Cl.<sup>6</sup> C04B 37/00; B05D 5/12

U.S. Cl. 156—89

8 Claims



1. A method of manufacturing a ceramic electronic component that comprises as main components a dielectric ceramic and a conductor containing silver, the method comprising:  
sintering a dielectric ceramic;  
forming a conductive paste containing silver as a main component in a pattern of electrodes on the sintered dielectric ceramic;  
subjecting the sintered dielectric ceramic with conductive paste formed thereon to heat treatment in an oxidizing atmosphere; and then  
subjecting the sintered dielectric ceramic with the conductive paste formed thereon to a heat treatment at 400° C. or more in an atmosphere containing 10% or less by volume of oxygen.

5,769,989

## METHOD AND SYSTEM FOR REWORKABLE DIRECT CHIP ATTACH (DCA) STRUCTURE WITH THERMAL ENHANCEMENT

Mark Kenneth Hoffmeyer, Rochester, Minn., and David A. Sluzewski, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

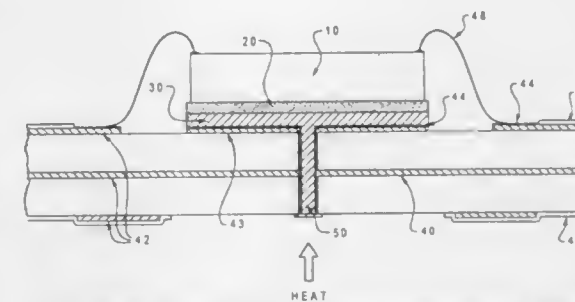
Filed Sep. 19, 1995, Ser. No. 530,452

Int. Cl.<sup>6</sup> B32B 35/00

U.S. Cl. 156—94

7 Claims

6. A method for removably mounting an integrated circuit device to a surface-mounted circuit assembly, wherein said surface mounted circuit assembly includes a carrier board having an upper surface and a lower surface, wherein said carrier board has at least one via therethrough and at least one mounting site on said upper surface of said carrier board, said method comprising the steps of:  
disposing a solder layer on said upper surface of said carrier board at said at least one mounting site, filling and covering a portion of said at least one via, wherein any layers that may



be disposed between said solder layer and said at least one mounting site are metallic; and  
mounting said integrated circuit device to said upper surface of said carrier board utilizing an adhesive layer connecting a lower surface of said integrated device to said solder layer; wherein said integrated circuit device and said adhesive layer can be removed from said upper surface of said carrier board by applying heat to said at least one via at the lower surface of said carrier board.

5,769,990

## METHOD OF MAKING TIRE WITH TIRE TREAD PITCH BANDS

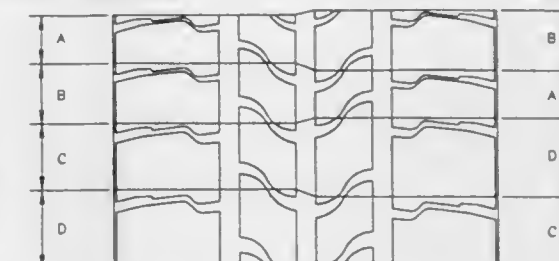
Kurt Matthew Hoffmeister, Ames, Iowa, assignor to Michelin Recherche et Technique S.A., Switzerland

Division of Ser. No. 263,318, Jun. 21, 1994, abandoned. This application May 30, 1995, Ser. No. 453,179

Int. Cl.<sup>6</sup> B29D 30/00; B60C 11/300

U.S. Cl. 156—110.1

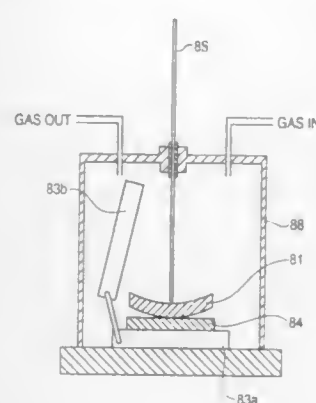
4 Claims



1. A method for making a low noise tire having a tread portion including a plurality of load carrying bands, including the steps of:  
a) selecting a minimum pitch length and a maximum pitch length, the minimum pitch length and the maximum pitch length defining a ratio of minimum pitch length to the maximum pitch length;  
b) providing a first variable pitch length single mold segment for forming a first variable pitch length tread band having the minimum pitch length on one axial side and a second pitch length greater than the minimum pitch length on the other axial side of said first tread band;  
c) providing a second variable pitch length single mold segment for forming a second variable pitch length tread band having a third pitch length smaller than the maximum pitch length on one axial side and said maximum pitch length on the other axial side of said second tread band, said third pitch length being greater than said minimum pitch length but less than said second pitch length and said maximum pitch length being greater than said second pitch length;  
wherein both circumferential edges of both the first and the second single mold segments are profiled the same, such that a trailing circumferential edge of the first single mold segment is capable of meshing with either a leading circumferential edge or a trailing circumferential edge of the second single mold segment and such that a leading circumferential edge of the first single mold segments is capable of meshing with either the leading circumferential edge or the trailing circumferential edge of the second single mold segment;  
d) making a tire having a tread portion wherein said step of making a tire having a tread includes using the first single mold segment and the second single mold segment to form

the first variable pitch length tread band and the second variable pitch length tread band respectively, a profiled circumferential edge of the first variable pitch length tread band meshing with a profiled circumferential edge of the second variable pitch length tread band.

5,769,991  
METHOD AND APPARATUS FOR WAFER BONDING  
Yoshihiro Miyazawa, and Yasunori Ohkubo, both of Kana-  
gawa, Japan, assignors to Sony Corporation, Japan  
Filed Feb. 23, 1994, Ser. No. 200,432  
Claims priority, application Japan, Feb. 28, 1993, 5-062980  
Int. Cl.<sup>6</sup> H01L 21/304  
U.S. Cl. 156—153 20 Claims



1. A method of wafer bonding for forming a bonded wafer by bonding together wafers with sticking forces of surfaces of said wafers, said method being carried out in cooperation with an apparatus having a chamber with a gas inlet and a gas outlet, a first chuck for holding a first wafer, a second chuck for holding a second wafer and moving said second wafer to said first wafer, said chamber including a pressure application bar for contacting at least one of said first and said second wafers, the method including the steps of:

setting a pressure of gas between said first and said second wafers before starting a sticking of said wafers to be below atmospheric pressure;

filling a space between said first and said second wafers before the start of sticking of surfaces of said wafers with a gas having a lower viscosity than air;

moving said second wafer to face said first wafer and releasing said second wafer from said second chuck, and

applying pressure on said second wafer by said pressure application bar.

5,769,992

PROCESS FOR THE PRODUCTION OF FLEXIBLE  
SURFACE FILTER MATERIAL FOR DEALING WITH  
NOXIOUS SUBSTANCES

Klaus Smolik, Grefees, Germany, assignor to Helsa-Werke  
Helmut Sandler GmbH & Co., KG, Grefees, Germany

PCT No. PCT/DE95/00415, § 371 Date Jul. 15, 1996, § 102(e)  
Date Jul. 15, 1996, PCT Pub. No. WO95/26219, PCT Pub.  
Date Oct. 5, 1995

PCT Filed Mar. 23, 1995, Ser. No. 676,136

Claims priority, application Germany, Mar. 29, 1994, 44 10  
920.2

Int. Cl.<sup>6</sup> B32B 31/20;31/12; A62D 5/00  
U.S. Cl. 156—163 18 Claims

1. A process for producing a flexible surface filter material for dealing with harmful gases or liquids and other noxious substances, which comprises

simultaneously joining and compressing a foam layer that contains a dried paste of active particles in a non-crosslinked binding agent to a textile carrier layer, under heat effective to cross-link the paste for a time sufficient to fix the foam layer in its compressed state by means of the paste, wherein the active particles act on the noxious substances, and the binding agent has a cross-linking temperature higher than its drying temperature.

5,769,993

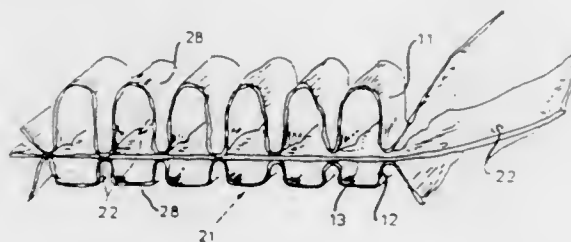
**PROCESS FOR PRODUCING AN ELASTIC  
MULTILAYER WEB OF MATERIAL**

Georg Baldauf, Laer, Germany, assignor to Amoco Corporation, Chicago, Ill.

PCT No. PCT/EP93/03187, § 371 Date Oct. 26, 1994, § 102(e)  
Date Oct. 26, 1994, PCT Pub. No. WO94/11189, PCT Pub.  
Date May 26, 1994

PCT Filed Nov. 13, 1993, Ser. No. 256,564  
Claims priority, application Germany, Nov. 14, 1992, 42 38 541.5

Int. Cl.<sup>6</sup> A61F 13/15; B32B 31/04;31/08;31/20  
U.S. Cl. 156—164 2 Claims



1. Process for producing an elastic multilayer web of material consisting of a flexible elastic backing film made of a thermoplastic elastomer with a web of nonwoven material attached in a crepe-like pattern to both the top and bottom sides of the backing film, whereby the webs of nonwoven material are welded together and the welds or bonded spots are distributed in the form of a grid of spot weld points over the multilayer web of material and at the same time areas of increased air permeability through the multilayer web of material are obtained, with the following process steps:

- a) guiding and stretching the backing film to at least  $(100+a)\%$  of the unstretched length,
- b) separately guiding the two webs of nonwoven material (**11** and **12**) and joining them to form a sandwich arrangement consisting of the backing film in the middle and the webs of nonwoven material on the outside,
- c) welding the webs of nonwoven material to the backing film with the help of a roll having welding spikes as part of a welding station (**10**),
- d) releasing the tension on the backing film with the webs of nonwoven material welded to it after leaving the welding station,

the process characterized by the fact that the two webs of nonwoven material (**11** and **12**) are guided and stretched to certain dimensions  $(100+b)\%$  and  $(100+c)\%$  while maintaining the following condition:

where the difference in the extent of stretching is great enough to produce the crepe-like pattern in the nonwoven webs, and then steps c and d are carried out.

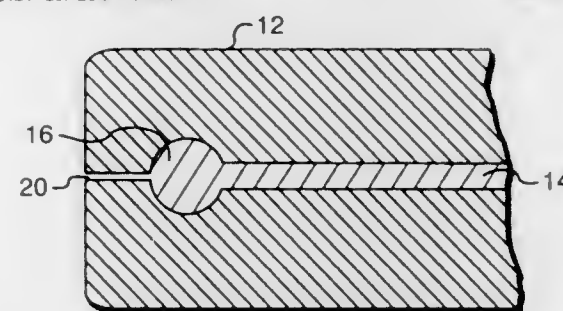
5,769,994

**METHOD OF MANUFACTURING AN ELONGATED,  
LIGHTWEIGHT FORMABLE ARTICLE**

Rustam Booz; Andrew Farrar, both of Cambridge, and Arthur M. Ganson, Somerville, all of Mass., assignors to Hands On Toys, Inc., Woburn, Mass.

Continuation-in-part of Ser. No. 265,809, Jun. 27, 1994, Pat. No. 5,498,190. This application Mar. 8, 1996, Ser. No. 613,054 Int. Cl.<sup>6</sup> B29C 63/18; 65/14; 65/52

U.S. Cl. 156—244.13 10 Claims

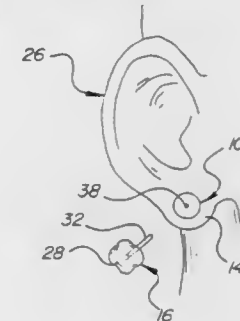


1. A process for manufacturing an elongated, seamless, formable toy, having an elongated foam body, having two ends and a length to width ratio of at least about 36:1, with a flexible wire embedded therein, and capable of interconnecting at virtually any point along the toy's length with another such toy, including the steps of:

- extruding a seamless elongated foam body while simultaneously forming a central, full length, longitudinal aperture in the body open at both ends of the foam body;
- then providing a flexible wire substantially coated with an adhesive;
- inserting the adhesive-coated wire into one end of the elongated foam body through the central longitudinal aperture of the foam body; and
- then activating the adhesive to bond the wire to the foam body and thereby form said toy.

5,769,995  
 DEVICE AND METHOD FOR REINFORCING A PIERCED  
 EARLOBE  
 MaryAnne Greyerbiehl, 11746 Gratiot Rd., Saginaw, Mich.  
 48609

U.S. Cl. 156—250 22 Claims



1. A method of reinforcing an orifice of a pierced earlobe extending between opposing front and back surfaces of the earlobe to provide support to an earring having a post adapted for extension through the passage accommodated within the orifice, said method comprising the steps of:

providing a patch of reinforcement material having an adhesive applied to at least one side of the patch that is releasably adherable to the skin of a person and being of such size to enable the patch to be adhered to one of the earlobe surfaces of the person in position over the passage and with the patch being confined only to the earlobe surface to which it is applied;

extending the post of the earring through the passage of the earlobe and adhering the patch to one of the earlobe surfaces in position over the passage and being confined only to such surface of the earlobe with the mounting portion of the earring projecting through an opening in the patch aligned with the passage, whereby the weight of the earring is borne by the patch and distributed across the contact area of the patch with the earlobe.

5,769,996

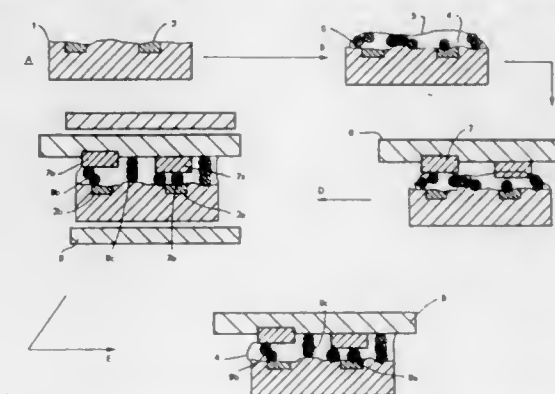
**COMPOSITIONS AND METHODS FOR PROVIDING  
ANISOTROPIC CONDUCTIVE PATHWAYS AND BONDS  
BETWEEN TWO SETS OF CONDUCTORS**

Ciaran Bernard McArdle, and Joseph Burke, both of Dublin,  
Ireland, assignors to Loctite (Ireland) Limited, Dublin, Ire-  
land

PCT No. PCT/IE95/00009, § 371 Date Jun. 29, 1995, § 102(e)  
Date Jun. 29, 1995, PCT Pub. No. WO95/20820, PCT Pub.  
Date Aug. 3, 1995

PCT Filed Jan. 26, 1995, Ser. No. 464,733  
Claims priority, application Ireland, Jan. 27, 1994, 940077;  
Jan. 27, 1994, 940078

Int. Cl.<sup>6</sup> B32B 31/20; H01F 1/44; H01R 4/04  
U.S. Cl. 156—272.4 40 Claims



1. A method of providing anisotropic conductive pathways between two sets of conductors which comprises forming said pathways with a plurality of electrically conductive particles having substantially uniform sizes and shapes, said electrically conductive particles having been arrayed in a regular pattern by application of a substantially uniform magnetic field to a composition comprising (i) a plurality of electrically-conductive particles having substantially uniform sizes and shapes dispersed in either (ii) a ferrofluid comprising a colloidal suspension of ferromagnetic particles in a non-magnetic carrier liquid, or (iii) a mixture of a ferrofluid comprising a colloidal suspension of ferromagnetic particles in a non-magnetic carrier liquid and a curable liquid composition.

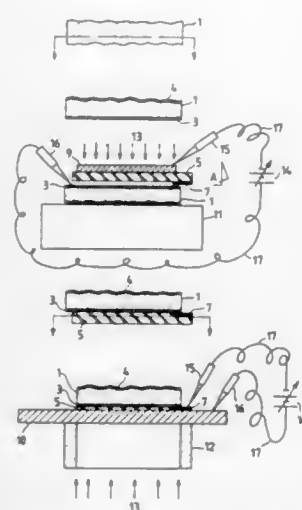
5,769,997  
METHOD FOR BONDING AN INSULATOR AND  
CONDUCTOR  
Masatake Akaike, Atsugi; Takayuki Yagi, Yokohama; Ma-  
sahiro Fushimi, Zama, and Miki Tamura, Isehara, all of  
Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 216,446, Mar. 23, 1994, abandoned.  
This application Apr. 30, 1997, Ser. No. 841,381  
Claims priority, application Japan, Mar. 23, 1993, 5-064294  
Int. Cl.<sup>6</sup> B32B 31/06

U.S. Cl. 156-273.1 16 Claims

1. A method for bonding an insulator formed of a piezoelectric material and a conductor, comprising:

(a) a step of polishing the insulator to impart a flat, smooth surface thereto;





- (b) a step of forming a thin conductive film on the flat, smooth surface of the insulator;  
(c) the steps of providing an insulating substrate containing ions of sufficient mobility to migrate toward an electrode during anodic bonding, said insulating substrate having first and second opposed faces, and forming a thin conductive film on one portion of the first face of the insulating substrate;  
(d) a step of anodically bonding the first face of the insulating substrate to the thin conductive film on the insulator;  
(e) a step of subsequently thinning and polishing the second face of the insulating substrate to impart a flat, smooth surface thereto; and  
(f) a step of anodically bonding the conductor and the flat, smooth polished surface of the second face of the insulating substrate using the thin conductive film formed on said one portion of the first face of the insulating substrate as an electrode.

5,769,998

**METHOD FOR FORMING AGGREGATION BODY BY THERMOCOMPRESSION**

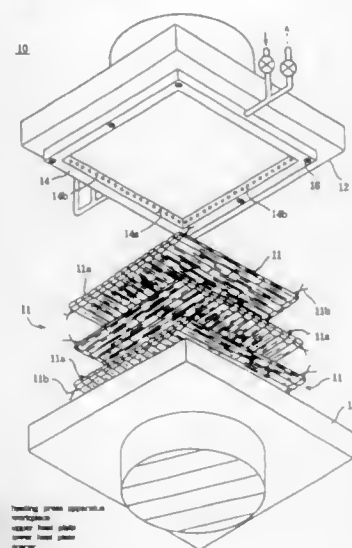
Shinji Tanzawa, Tokyo; Katsutoshi Sasagawa; Mitsumasa Horikawa, both of Aichi; Yasuo Tamura, and Koichi Kimura, both of Kanagawa, all of Japan, assignors to Koyo Sangyo Co., Ltd., Tokyo, Japan

Filed Aug. 17, 1995, Ser. No. 516,295

Claims priority, application Japan, Aug. 19, 1994, 6-195489  
Int. Cl.<sup>6</sup> B29J 5/02

U.S. Cl. 156—285

8 Claims



1. A method for forming an aggregation body by thermocompression, comprising the steps of:

- a) inserting a workpiece comprising a woody material and an adhesive between upper and lower heated plates of a heating press apparatus;  
b) surrounding the workpiece with a spacer having a thickness equal to that of the desired aggregation body;  
c) moving the heated plates together to form an airtight compartment containing the workpiece, the compartment being defined by the upper and lower heated plates and the spacer therebetween;  
d) reducing gas pressure in the airtight compartment by evacuating gas therefrom; and  
e) after step d), supplying steam or heated gas to the interior of the compartment to harden the adhesive.

5,769,999

**CAP SEALING MACHINE**

Ronald C. Anderson, and David A. Myers, both of Mt. Pleasant, Pa., assignors to Stahls', Inc., St. Clair Shores, Mich.

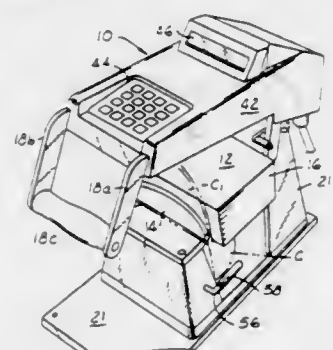
Continuation of Ser. No. 689,024, Sep. 16, 1991, abandoned.

This application May 9, 1994, Ser. No. 240,095

Int. Cl.<sup>6</sup> B32B 31/00; G05G 15/00

U.S. Cl. 156—359

11 Claims



1. In apparatus for thermally bonding heat applied transfer indicia to caps, the apparatus having relatively movable upper and lower platens manually movable between open and closed positions, each platen having a generally complementary pressing surface, the invention characterized by the upper platen pressing surface being of a concave shape and the lower platen pressing surface being of a convex shape with the radius of curvature of the upper platen pressing surface being greater than the radius of curvature of the lower platen pressing surface, whereby equal pressure is applied across the pressing surfaces to a cap and the heat applied transfer indicia disposed between the platen pressing surfaces when the platens are in the closed position, further characterized by a handle pivotal in a vertical plane with linkage connecting the handle to the upper platen and wherein said linkage is constructed and arranged to cause the upper platen to move through a greater arc than the handle as the handle is pivoted while the handle extends downwardly in overhanging relation with respect to the lower platen in the closed position, and in front of the upper platen in both said open and closed positions.

5,770,000

**CLEANING SYSTEM AND METHOD**

Iosef Zinman, Tel-Aviv, and Alex Sergienko, Karmiel, both of Israel, assignors to Sizary Materials Purification Ltd., Migdal Tefen, Israel

Filed May 28, 1996, Ser. No. 654,031

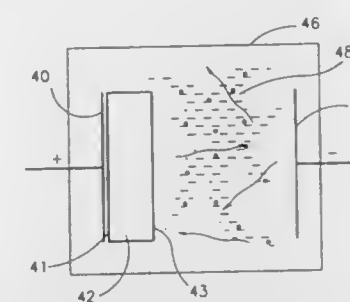
Claims priority, application Israel, Jun. 11, 1995, 114097

Int. Cl.<sup>6</sup> B44C 1/22; H01L 21/00

U.S. Cl. 156—345

34 Claims

1. A cleaning system for removing impurities from a material to be cleaned, the system comprising:  
a. a first electrode placed near to a first surface of said material to be cleaned;



- b. a second electrode placed at a distance from a second surface of said material to be cleaned thereby defining a gap between said second electrode and said material to be cleaned;  
c. a chamber into which said first and second electrodes and said material to be cleaned is placed;  
d. a medium of conductivity produceable at least within said gap, wherein said first and second electrodes are capable of defining an electrical potential therebetween and inducing, thereby, ion emission from said material to be cleaned to the more negatively charged electrode, and wherein, when said electrical potential exists, said medium of conductivity provides at least a flow of negatively charged particles towards the more positive electrode.

5,770,001

**AUTOMATIC ASSEMBLY AND INSPECTION SYSTEM FOR OPTICAL CONNECTOR**

Akira Nagayama, Tokyo; Takashi Yoshizawa, Hidaka; Kunihiko Sasakura, Higashimurayama; Tadao Saitoh, Koganei, and Sigemitsu Oguchi, Tokorozawa, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

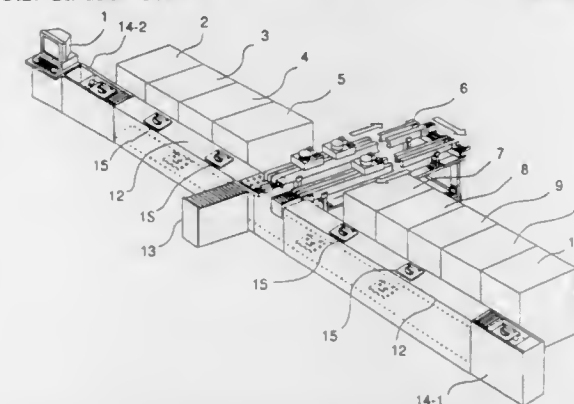
Filed Feb. 23, 1996, Ser. No. 605,933

Claims priority, application Japan, Feb. 24, 1995, 7-036994

Int. Cl.<sup>6</sup> B32B 31/00

U.S. Cl. 156—350

26 Claims



1. An automatic assembly and inspection system for optical connectors, comprising:

- a pallet for installing an optical cord;  
a transfer mechanism for transferring the pallet;  
modules for performing various processes for assembling an optical connector with the optical cord installed on the pallet transferred by the transfer mechanism, said various processes including at least one of the processes of required-length cutting, pre-processing, cleaning, insertion, curing, polishing, polished surface inspection, final assembling, optical performance evaluation, and stamping, and each of the modules having a common combining mechanism and a common communication means with respect to the transfer mechanism; wherein:  
the pallet comprises a grip mechanism for gripping a portion of the optical connector, the shape of the gripped portion differing according to the various processes; and  
the transfer mechanism comprises an installation portion to which each module at any position on a transfer path is fixed

by using the combining mechanism of the module and a connecting means for transmitting and receiving signals to and from the fixed module by using the communication means of the module, and

- a system controller for performing supervised control of the transfer mechanism and the modules using the communication means based on parameters indicating specifications for assembly and inspection of the optical connector.

5,770,002

**APPARATUS FOR ASSEMBLING A DISC-SHAPED RECORDING MEDIUM AND A METHOD FOR ASSEMBLING DISC-SHAPED RECORDING MEDIUM USING THE APPARATUS**

Takatsugu Funawatari; Kenji Takahashi, and Hiroyuki Ishikawa, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

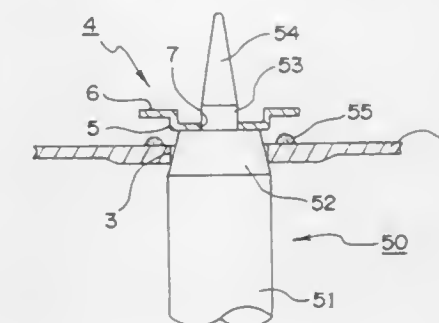
Division of Ser. No. 518,459, Aug. 23, 1995. This application Jan. 31, 1997, Ser. No. 791,865

Claims priority, application Japan, Aug. 24, 1994, P06-199556

Int. Cl.<sup>6</sup> B29C 35/08; B32B 31/28

U.S. Cl. 156—379.6

7 Claims



1. An apparatus for assembling a disc-shaped recording medium by mounting a hub on a disc substrate having an information recording area on at least one major surface and having a center opening, said hub having a fitting portion with a diameter substantially equal to the diameter of the center opening and flange portion extending outwardly from said fitting portion, a spindle shaft opening being formed at the center of said fitting portion so as to be engaged by a spindle provided on a disc driving device, comprising:

- an assembly guide member having a first guide portion movable in a direction perpendicular to the major surface to the disc substrate so as to be engaged in said center opening in the disc substrate, and a second guide portion formed integrally with the first guide member so that a center axis of said second guide portion is aligned with a distal end of said first guide portion, said second guide portion being fitted in said spindle shaft opening in said hub, said assembly guide member having said first guide portion fitted in said center opening for positioning said disc substrate and said second guide portion being so engaged in said spindle shaft opening for centering said disc substrate with respect to said hub, wherein a first taper guide is formed at the distal end of said first guide portion of said assembly guide member and wherein a second taper guide is formed at a distal end of said second guide portion of said assembly guide member.

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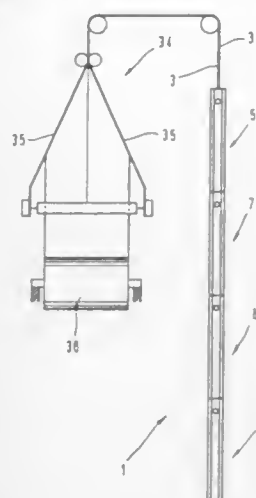
5,770,003

## MOULDING OF CONTAINERS

Roberto Tabaroni, Bologna, and Andrea Bartoli, Emilia, both of Italy, assignors to Unifill S.p.A., Modena, Italy  
Filed Jul. 11, 1995, Ser. No. 500,614

Claims priority, application Italy, Jul. 12, 1994, M094A0106  
Int. Cl.<sup>6</sup> B65B 47/08; B29C 49/00  
U.S. Cl. 156—382

17 Claims



1. Apparatus for moulding containers in thermoformable and heat-weldable sheet material, comprising a heating and welding station, at which first and second parts of said material are heated and welded together, a container-forming and container-shape-stabilizing station, at which said first and second parts are finally shape-stabilized, moulding means of the forming and shape-stabilizing station, mould recess means of said moulding means, at least one welding and forming station which is between said heating and welding station and said forming and shape-stabilizing station and at which said first and second parts are further welded together and a hollow interior is formed between said first and second parts by deformation of said first and second parts, other moulding means of said at least one welding and forming station, other mould recess means of said other moulding means and into which said first and second parts are deformed, and middles of said mould recess means of said moulding means of said forming and shape-stabilizing station and of said other mould recess means.

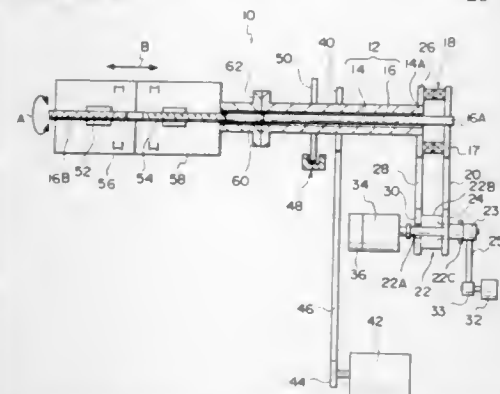
5,770,004

## DRIVING APPARATUS OF TIRE FORMING DRUM

Yuichiro Ogawa, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan  
Filed May 6, 1996, Ser. No. 642,875  
Claims priority, application Japan, May 26, 1995, 7-128480  
Int. Cl.<sup>6</sup> B29D 30/24

U.S. Cl. 156—398

20 Claims



1. A driving apparatus of a tire forming drum, comprising: a shaft section having a main shaft and an inner shaft which is rotatably inserted into an interior of the main shaft;

main shaft rotating means for rotating the main shaft;  
main-shaft rotation stopping means which prevents rotation of the main shaft;  
a clutch for switching a state of the main shaft and the inner shaft between a connected state and a non-connected state;  
inner shaft rotating means for rotating the inner shaft;  
a pair of bead locking mechanisms engaged on the inner shaft in such a manner to be axially movable along an axial line of the inner shaft in directions of approaching and separating from each other and simultaneously rotating in a direction of rotation of said main shaft;  
a differential gear unit connected both to the inner shaft and the main shaft; and  
distance-between-beads detecting means which is connected to said differential gear unit and detects an interval between said pair of bead locking mechanisms from a rotational difference between the inner shaft and the main shaft.

5,770,005

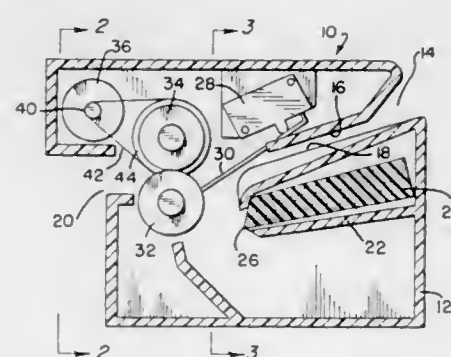
## ENVELOPE FLAP SEALING DEVICE

Tadeusz Staniszewski, Budd Lake, N.J., assignor to Shap, Inc., Budd Lake, N.J.

Filed Nov. 12, 1996, Ser. No. 746,481  
Int. Cl.<sup>6</sup> B43M 5/00; 5/04

U.S. Cl. 156—442.1

7 Claims



1. An envelope flap sealing device, comprising:  
a housing; wherein

said housing has first means, formed in said housing, for admitting an envelope which has a flap and a body into said housing;  
said housing has second means, formed in said housing, for discharging such a housing-admitted envelope from said housing;  
said housing further has third means, confined within said housing, for moistening the flap of such a housing-admitted envelope; and  
said housing also has fourth means, mounted within said housing, and operative in response to an admittance of an envelope into said housing, for (a) forceably moving a flap-moistened envelope through said housing, from said first means to said second means, and (b) sealing said flap against said body; wherein  
said first means comprises a slot opening into said housing; said slot is formed of spaced-apart, confronting surfaces; one of said surfaces comprises a housing-entry slide, having a given plane, for an envelope;  
said fourth means comprises an electrical switch;  
said switch has a switch-operating sensor;  
said sensor is set across an inner termination of said slot and traverses said plane; and  
said sensor comprises means for (a) unyieldingly directing an envelope flap toward said third means, and (b) yieldingly displacing, upon engagement thereof by the body of an envelop, to permit travel of an envelope to said second means.

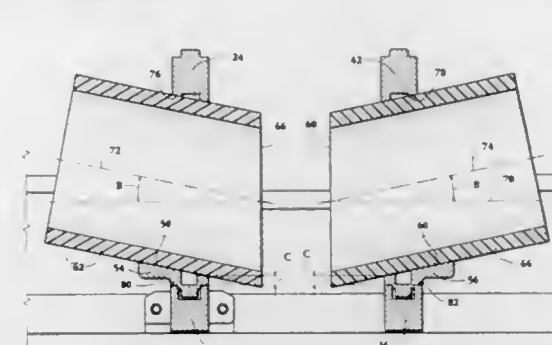
5,770,006

## BUTT FUSION MACHINE FOR MANUFACTURING FULL SIZE SEGMENTED PIPE TURNS

Bill Dean Andrew; Paul Michael Hatch; Richard Leroy Goswick, all of Tulsa, and William Joseph Tefft, Claremont, all of Okla., assignors to TDW Delaware, Inc., Wilmington, Del.  
Filed Jan. 13, 1997, Ser. No. 782,374  
Int. Cl.<sup>6</sup> B32B 31/00

U.S. Cl. 156—499

1 Claim



1. An improved plastic pipe butt fusion machine comprising:  
a frame;  
opposed, paralleled horizontal guide rods supported by said frame;  
a fixed clamp having a lower fixed clamp portion secured to said frame and a first fixed clamp removable upper portion pivotally secured to said lower fixed clamp portion;  
a moveable clamp having a lower moveable clamp portion slidably supported on said guide rods and moveable towards and away from said fixed clamp and a first moveable clamp removable upper portion pivotally secured to said lower moveable clamp portion, said first fixed clamp removable upper portion and said lower fixed clamp portion and said first moveable clamp removable upper portion each having a cylindrical surface adaptable to releasably secure end portions of first and second lengths of thermoplastic pipe in axial alignment, the first and second lengths of pipe having a maximum diameter of "A", said lengths of pipe being supported at a first elevation above said guide rods whereby first and second lengths of pipe can be moved towards and away from each other along a horizontal axis;  
a pair of removable insert jaws, one receivable by said lower fixed clamp portion and one receivable by said lower moveable clamp portion in which each has a semi-cylindrical surface having an axis inclined at an angle "B" relative to said horizontal axis;  
a second fixed clamp removable upper portion and a second moveable clamp removable upper portion each having a semi-cylindrical surface inclined at said angle "B" relative to said horizontal axis whereby two pipe segments may be supported by said fixed clamp and moveable clamp and may be moved towards and away from each other, whereby two segments of pipe can be fused together with their axes intersecting at an angle of 2B, said removable insert jaws, said second fixed clamp removable upper portion and said second moveable clamp removable upper portion being configured to support pipe segments therebetween at a second elevation above said guide rods that is higher than said first elevation to thereby permit pipe segments of diameter "A" to be fused at an angle of 2B relative to each other.

5,770,007

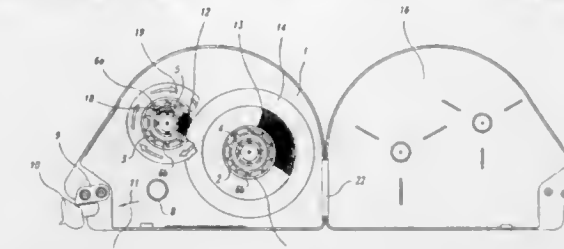
## DEVICE FOR DISPENSING TRANSFER MATERIAL

Manuel Czech, Neutraubling, and Hermann Runge, Kneiting/Pettendorf, both of Germany, assignors to Czewo Plast Kunststofftechnik GmbH, Neutraubling, Germany  
Filed May 2, 1995, Ser. No. 432,977

Claims priority, application Germany, May 2, 1994, 94 07 305 U  
Int. Cl.<sup>6</sup> B44C 7/00

U.S. Cl. 156—540

26 Claims



1. A device for dispensing onto a surface a transfer material, provided on a carrier strip, comprising a supply reel which is rotatably accommodated in a housing and which is used for storing thereon a carrier strip together with a transfer material, a take-up reel which is also rotatably accommodated in the housing such that it is radially displaced relative to the supply reel and which is used for receiving thereon the carrier strip from which the transfer material has been removed at least partially, a rotary drive transmitting mechanism used for rotatively driving the take-up reel when the supply reel rotates in an unwinding movement and including a clutch mechanism for providing a driving transmission ratio of the rotary drive transmitting mechanism which is adapted to respective unwinding and winding-up conditions of the reels, wherein the clutch mechanism comprises a friction wheel element which yields in a radial direction which is arranged coaxially with an axis of said take-up reel or said supply reel, the friction wheel element abutting via a peripheral surface thereof on a peripheral surface section of a counterwheel element so as to provide a friction force-transmitting area of contact, the device including a return stop device which comprises an engagement section which is provided in the housing and which is adapted to engage with a sawtooth section formed on an end face of a shaft section of the take-up reel which faces toward a lateral surface of the housing.

5,770,008

## STICKER DISPENSER

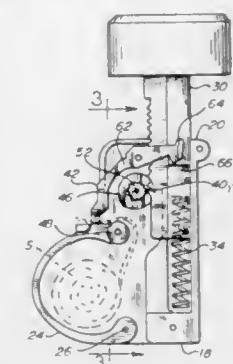
Jeffrey T. Murphy, Chaska, Minn., assignor to The Miner Group, Minneapolis, Minn.

Filed Feb. 26, 1997, Ser. No. 806,313

Int. Cl.<sup>6</sup> B32B 31/00

U.S. Cl. 156—579

16 Claims



1. A sticker dispenser for holding a tape of stickers and dispensing the stickers one at a time, comprising:  
(a) a case;  
(b) a loading door opening in the case and a loading door pivoted to the case adapted to allow insertion of a tape of stickers into the case;



- (c) a movable plunger mounted to the case and movable between an extended position and a retracted position and biased in the extended position by a spring and the plunger having a gear rack thereon;
- (d) sticker moving means engaging the gear rack for forcing the tape of stickers out of the case; and
- (e) sticker guiding means mounted to the case for engaging and guiding the tape of stickers as it leaves the case, wherein the sticker guiding means comprises a movable sticker door mounted on the case and cooperating with the loading door to close the loading door opening with the tape of stickers extending out of the case between the sticker door and the loading door.

5,770,009

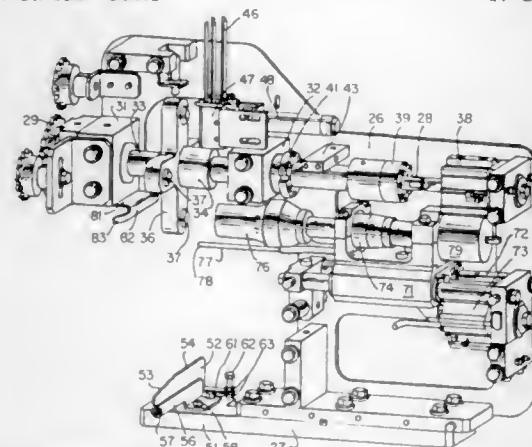
**ALIGNMENT DEVICES FOR FITMENT APPLICATION MACHINE AND METHOD THEREOF**

Gerald M. Blain, Los Gatos, and Reynaldo F. Medel, Milpitas, both of Calif., assignors to Portola Packaging, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 317,561, Oct. 4, 1994, Pat. No. 5,601,669. This application Nov. 1, 1996, Ser. No. 740,760 Int. Cl.<sup>6</sup> B32B 31/16

U.S. Cl. 156—580.1

17 Claims



1. In a fitment applicator for attaching fitments having a peripheral flange at one end and a spout at an opposite end to an open-ended carton having a panel formed with an aperture, said applicator having a conveyor bed along which a carton advances substantially horizontally parallel to a first substantially vertical plane, a substantially horizontal shaft substantially perpendicular to said first plane, an anvil mounted for rotation with said shaft, said anvil having a plurality of radial arms, means for securing fitments to said arms, means for intermittently rotating said shaft to deposit a fitment inside a carton, means for reciprocating said anvil axially to push an opposite end of a fitment out said aperture, a welding horn mounted on a carriage means for reciprocating said carriage horizontally parallel to said shaft in alignment with said aperture, the improvement which comprises a disk mounted for rotation with said anvil formed with holes corresponding to said arms and a stationary pin positioned to fit into a hole as said anvil reciprocates to accurately locate said fitment aligned with said aperture.

5,770,010

**PULPING PROCESS EMPLOYING NASCENT OXYGEN**

James W. Jelks, Sand Springs, Okla., assignor to R-J Holding Company, Dayton, Ohio

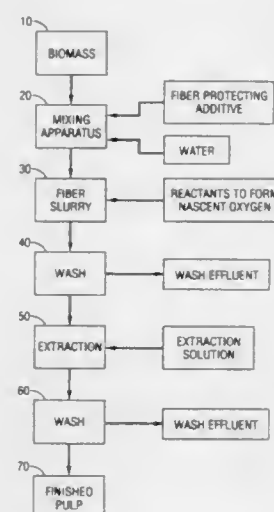
Continuation-in-part of Ser. No. 426,499, Apr. 20, 1995, abandoned. This application Sep. 13, 1996, Ser. No. 712,510

Int. Cl.<sup>6</sup> D21C 5/02

U.S. Cl. 162—6

62 Claims

1. A process for the delignification of a cellulosic biomass comprising the steps of:



- (a) providing a defiberized, lignin-containing biomass of cellulosic material;
- (b) reducing said biomass to a fiber slurry of lignin-containing cellulosic material;
- (c) modifying the lignin in said fiber slurry by a step comprising in situ formation of nascent oxygen, not occurring as a result of hydrogen peroxide decomposition, in said fiber slurry; and
- (d) extracting at least a portion of said lignin from said fiber slurry by washing said fiber slurry with an aqueous solution of an alkaline material.

4. The process of claim 1, wherein nascent oxygen is obtained from the atmosphere.

5,770,011

**NEUTRAL MONOPEROXYSULFATE BLEACHING PROCESS**

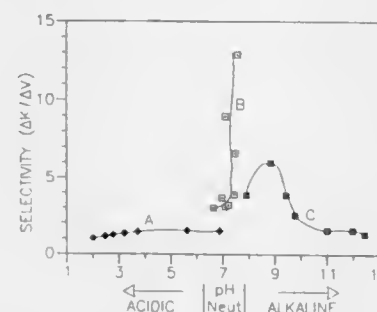
Jamshed N. Lam, Monroe; Vacheslav M. Yasnovsky, Nyack, and Shyam S. Bhattacharjee, Monroe, all of N.Y., assignors to International Paper Company, Purchase, N.Y.

Filed Nov. 17, 1995, Ser. No. 572,147

Int. Cl.<sup>6</sup> D21C 9/14; 9/147; 9/153; 9/16

U.S. Cl. 162—65

28 Claims



1. A process for bleaching and delignifying pulp which comprises reacting a lignocellulosic pulp prior to an alkaline extraction, oxygen delignification or chlorine-free bleaching stage in a monoperoxysulfate treatment stage wherein the pulp is contacted with an aqueous solution containing an alkali or alkaline earth metal salt of a monoperoxysulfuric acid at an initial pH in the range of from about 6.8 to about 8.5 in the presence of a buffering compound sufficient to maintain the pulp within the aforementioned range throughout the treatment stage and to bring the pulp to a final pH in the range of from about 6.8 to about 7.7 at the completion of the stage and wherein the pulp exhibits a selectivity of a least about 3 after an alkaline extraction treatment stage carried out on the pulp following the monoperoxysulfate treatment stage.

5,770,012

**PROCESS FOR TREATING PAPER MACHINE STOCK CONTAINING BLEACHED HARDWOOD PULP WITH AN ENZYME MIXTURE TO REDUCE VESSEL ELEMENT PICKING**

Elwood W. Cooper, III, Dover, Pa., assignor to P. H. Glatfelter Co., Spring Grove, Pa.

Continuation-in-part of Ser. No. 677,276, Jul. 9, 1996, Pat.

No. 5,725,732, which is a continuation-in-part of Ser. No. 344,582, Nov. 18, 1994, abandoned. This application Oct. 22, 1996, Ser. No. 736,062

Int. Cl.<sup>6</sup> D21H 25/02

U.S. Cl. 162—72

17 Claims

1. A process for reducing bleached hardwood vessel element picking in prepared paper machine stock containing bleached hardwood pulp, comprising treating prepared paper machine stock containing bleached hardwood pulp with an enzyme mixture comprised of cellulases and xylanases in an amount of about 0.05 to about 1.0 weight percent, based on the weight of the wood fiber, dry basis, in said prepared paper machine stock, the mixture having a cellulase activity of at least 200 EGU/g, in a pH range of 7 to 8, at a temperature from about 85° to about 145° F. for a reaction time of about 30 to about 240 minutes, at a consistency of about 1 to about 15 percent, whereby the hardwood vessel element in said prepared paper machine stock containing bleached hardwood pulp, which is used in the printing or book publishing industry, is substantially reduced.

5,770,015

**DRYING SECTION OF A PAPER MACHINE**

Udo Grossmann; Albrecht Meinecke, both of Heidenheim, and Hans Loser, Langenau, all of Germany, assignors to Voith Sulzer Papiermaschinen GmbH, Heidenheim, Germany

PCT No. PCT/DE95/00601, § 371 Date Apr. 9, 1996, § 102(e) Date Apr. 9, 1996, PCT Pub. No. WO95/31601, PCT Pub. Date Nov. 23, 1995

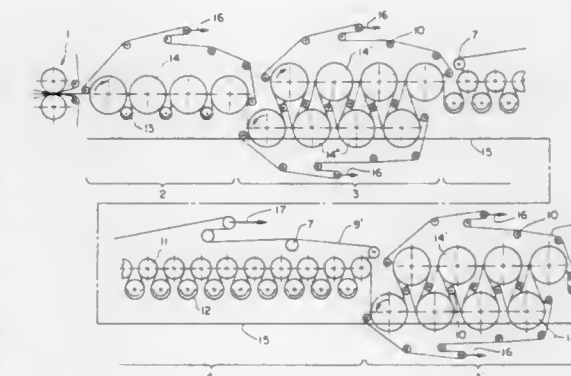
PCT Filed May 10, 1995, Ser. No. 583,047

Claims priority, application Germany, May 11, 1994, 44 16 585.4

Int. Cl.<sup>6</sup> F26B 11/02

U.S. Cl. 162—359.1

14 Claims



5,770,013

**METHOD FOR MANUFACTURING PAPER AND PAPER FABRICATED FROM THE SAME METHOD**

Nicholas R. Chance, Lewiston, Id.; Christopher J. Elskamp, Clarkston, Wash., and Timothy H. Switzer, Lewiston, Id., assignors to Potlatch Corporation, Cloquet, Minn.

Filed Jun. 21, 1996, Ser. No. 668,283

Int. Cl.<sup>6</sup> D21H 23/24

U.S. Cl. 162—127

15 Claims

1. A method for manufacturing a multi-ply paperboard by using a paper machine which has a sizing press and a wet calendar stack, comprising:

rendering the sizing press inoperable;

providing a plurality of paper stock slurries to the paper machine to form a substantially continuous multi-ply sheet of paperboard, and wherein the substantially continuous multi-ply sheet of paperboard includes a pair of outer plies, and an inner ply sandwiched between the outer plies, and wherein the outer plies each have about 5% to about 70% pulp from sawdust, and the inner ply has at least 1% pulp from sawdust;

removing water from the paper stock slurries to form the resulting, substantially continuous multi-ply sheet of paperboard; and

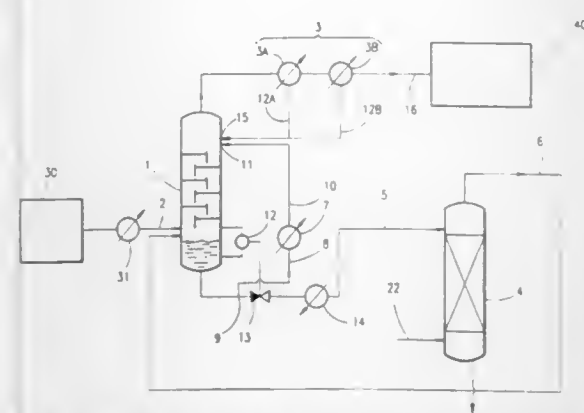
providing and applying an aqueous solution of a substantially amylose free starch to the multi-ply paperboard at the wet calendar stack to provide the resulting multi-ply paperboard with about 30 pounds to about 40 pounds per ton of the substantially amylose free starch, the resulting multi-ply paperboard being manufactured at a production rate which is at least 10% faster than the production rate which can be achieved for substantially identical paperboard having the same physical characteristics but which is manufactured using the sizing press on the same paper machine.

1. A drying section of a paper machine for drying a fiber web, said drying section comprising:

a plurality of consecutively arranged drying groups, each said drying group including a plurality of heatable drying cylinders, a continuous hold-down belt carrying said web and associated with each of said drying cylinders, and means for applying a longitudinal tension to said hold-down belt, said hold-down belt for biasing the fiber web against said drying cylinders, said plurality of drying groups including at least one high-pressure group comprising a single-row drying group having one row of drying cylinders and one row of corresponding deflection rolls, said hold-down belt being positioned to carry said web by partially wrapping alternate respective ones of said drying cylinders and said deflection rolls, said hold-down belt positioned to press the fiber web into direct contact with each of said drying cylinders of said high pressure group, each said deflection roll of said high pressure group having an internal suction device defining a suction zone, said internal suction device being positioned for directly contacting and exerting a suction on the fiber web, said tension applying means of said high-pressure group applying a longitudinal tension of at least 10 kN/m to said hold-down belt of said high-pressure group.







column operating such that the temperature of the liquid stream at the bottom of said cooling column is lower than or equal to the condensation temperature of the feed gas stream, the difference in temperature being less than 20° C., and, in a second stage, condensing the gaseous effluent at a temperature that is lower than 20° C. to give a liquid fraction and a purified gaseous fraction.

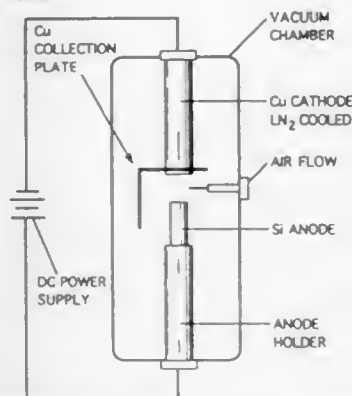
5,770,022

**METHOD OF MAKING SILICA NANOPARTICLES**  
Robert Pang Heng Chang, Glenview; Jeffrey Michael Lauerhaas; Tobin Jay Marks, both of Evanston, all of Ill., and Udo C. Pernisz, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich., and Northwestern University, Evanston, Ill.

Filed Jun. 5, 1997, Ser. No. 870,015  
Int. Cl.<sup>6</sup> C01B 33/113

U.S. Cl. 204—164

9 Claims



1. A method of making silicon oxide nanoparticles comprising generating a direct current electric arc between an anode comprised of silicon and a metal cathode in a chamber containing oxygen, subjecting the silicon of the anode to the plasma generated by the electric arc to vaporize silicon within the chamber, allowing silicon oxide nanoparticles to form in the chamber, quenching the silicon oxide nanoparticles on a surface within the chamber positioned adjacent the silicon anode, and collecting the silicon oxide nanoparticles from the surface.

5,770,023

**ETCH PROCESS EMPLOYING ASYMMETRIC BIPOLAR PULSED DC**

Jeff C. Sellers, Palmyra, N.Y., assignor to ENI A Division of Astec America, Inc., Rochester, N.Y.

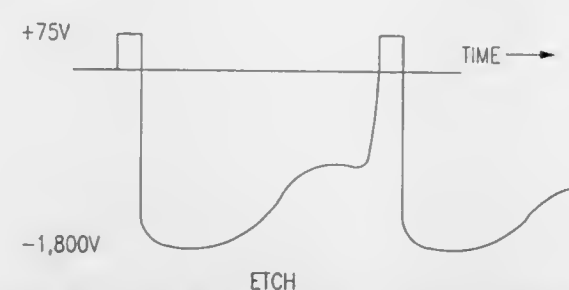
Filed Feb. 12, 1996, Ser. No. 600,194

Int. Cl.<sup>6</sup> C23C 14/34

U.S. Cl. 204—192.3

10 Claims

3. A combined etching and sputtering process in which a workpiece is first subjected to plasma etching in a plasma chamber that contains a sputtering target to remove impurities from the surface



of the article, and then is subjected to reactive sputtering to produce a coating on the article; comprising the steps of

a) etching said article in a plasma chamber by

i) applying a negative dc forward etching current at an applied forward voltage level between said workpiece and an anode in said chamber such that said forward voltage level causes noble gas ions in said chamber to impinge upon said workpiece with sufficient energy to free impurities from the surface of said workpiece; while

ii) applying onto said forward etching current pulses of a positive reverse bias voltage at a suitable pulse width and pulse rate and a suitable reverse bias level relative to said anode, so that the voltage applied between said workpiece and said anode is a train of asymmetric bipolar pulses wherein the positive reverse bias voltage has a pulse duty cycle significantly below fifty percent;

wherein said forward applied voltage is between negative 300 and negative 4,000 volts and said reverse bias voltage is provided at a substantially smaller level between positive 50 volts and positive 300 volts; and with said pulse width being between 0.25 μsec and 3 μsec; and

directly after said workpiece has been etched sufficiently to carry out a sputter coating operation thereon.

b) carrying out a reactive sputtering process in the very same plasma chamber, by

i) introducing into said chamber a reactive gas; and

ii) applying a dc sputtering current between said target and an anode in said chamber at an applied voltage level that causes noble gas ions in the chamber to impinge upon said target with sufficient energy to free atoms of said target material from said target;

iii) wherein the free atoms of said target material react with said reactive gas to form a compound that is then deposited on the etched surface of said workpiece.

5,770,024

**ELECTRODE FOR USE IN MEMBRANE ELECTROLYZERS**

Peter Fabian, Hanau, Germany, and Emilio Zioni, Trezzano, Italy, assignors to De Nora S.p.A., Italy

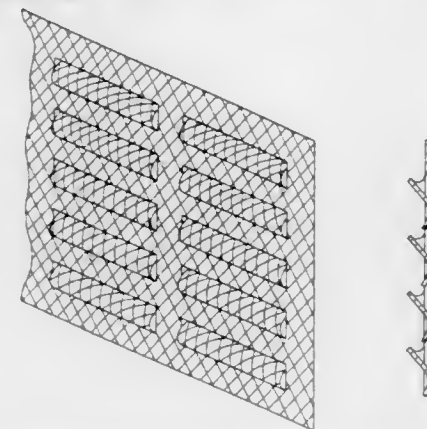
Filed Nov. 4, 1996, Ser. No. 743,108

Claims priority, application Italy, Nov. 22, 1995, MI95A2421

Int. Cl.<sup>6</sup> C25D 1/00

U.S. Cl. 204—281

12 Claims



1. An electrode for electrochemical processes forming gaseous products comprising a metal sheet shaped to produce a louvered

profile comprising bent metal strips and attached thereto a metal mesh provided with an electrocatalytic coating having the same louvered profile as that of the metal sheet wherein the profiles of the mesh and metal sheet are coincident.

5,770,025

**MAGNETRON SPUTTERING APPARATUS**  
Tetsuji Kiyota, Chigasaki, Japan, assignor to Nihon Shinku Gijutsu Kabushiki Kaisha, Kanagawa-ken, Japan

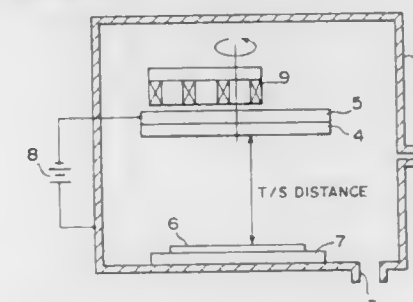
Filed Aug. 1, 1996, Ser. No. 690,789

Claims priority, application Japan, Aug. 3, 1995, 7-198268; Aug. 3, 1995, 7-198273

Int. Cl.<sup>6</sup> C23C 14/34

U.S. Cl. 204—298.2

3 Claims



1. A magnetron sputtering apparatus, comprising:  
a vacuum chamber,  
a sputtering target located in said vacuum chamber, said target having a back side and a front surface,  
a magnet arranged in said vacuum chamber on the back side of the target for generating a closed loop magnetic field in front of the target and for producing a magnetic field distribution having a horizontal magnetic field intensity of not lower than 140 Gauss at a position on the surface of the target where a vertical magnetic field intensity is equal to 0 and a vertical field intensity of not lower than 60 Gauss at a position on the surface of the target where the horizontal magnetic field intensity is equal to 0 so as to ignite electric discharge at a pressure level as low as 10<sup>-2</sup> Pa.

5,770,026

**SEMICONDUCTOR FABRICATION APPARATUS HAVING IMPROVED SPUTTERING COLLIMATOR AND WIRING METHOD FOR A SEMICONDUCTOR DEVICE USING SUCH APPARATUS**

Chang-Jae Lee, Choongcheongbuk-Do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Cheongju, Rep. of Korea

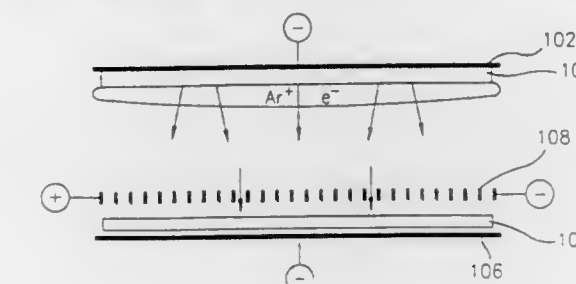
Filed Jan. 17, 1997, Ser. No. 785,694

Claims priority, application Rep. of Korea, Sep. 19, 1996, 40798/1996

Int. Cl.<sup>6</sup> C23C 14/34

U.S. Cl. 204—298.11

2 Claims



1. A sputtering apparatus for fabricating a semiconductor device comprising:  
a negative electrode having a metallic target;

a positive electrode arranged opposite the negative electrode, on which the positive electrode a semiconductor substrate is mountable;

a collimator mounted between the negative electrode and the positive electrode and near the semiconductor substrate; and current applying means that applies an electrical current to the collimator, whereby Joule heating is generated in the collimator,

wherein the collimator is positioned sufficiently close to the semiconductor substrate to heat the semiconductor substrate with radiative heat generated by the collimator.

5,770,027

Patent Not Issued For This Number

5,770,028

**ELECTROCHEMICAL SENSOR PASTE**

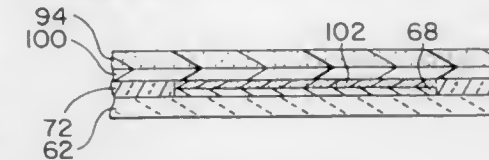
Thomas C. Maley, Medway; Mark W. Boden, Millbury; Paul A. D'Orazio, Mendon, and Peter G. Edelman, Franklin, all of Mass., assignors to Chiron Diagnostics Corporation, E. Walpole, Mass.

Continuation of Ser. No. 508,272, Sep. 15, 1995, abandoned, which is a division of Ser. No. 266,824, Jun. 27, 1994, Pat. No. 5,494,562. This application Dec. 19, 1996, Ser. No. 770,689

Int. Cl.<sup>6</sup> G01N 27/26

U.S. Cl. 204—435

20 Claims



1. A reference electrode, comprising:

a substrate layer;

a cellulose acetate layer, formed from screen printing a paste which comprises:

(a) cellulose acetate; and

(b) an aprotic solvent, said paste having a viscosity of from about 40,000 centipoise to about 350,000 centipoise; and a membrane disposed over said cellulose acetate layer.

5,770,029

**INTEGRATED ELECTROPHORETIC MICRODEVICES**  
Robert J. Nelson, Alameda; Herbert H. Hooper, Belmont, both of Calif., and James Landers, Rochester, Minn., assignors to Soane Biosciences, Hayward, Calif.

Filed Jul. 30, 1996, Ser. No. 690,307

Int. Cl.<sup>6</sup> G01N 27/26; 27/447

U.S. Cl. 204—604

14 Claims

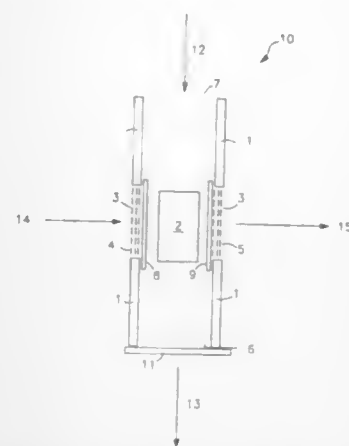
1. A device for use in electrophoretic application, said device comprising a substrate having a generally planar surface on which are formed:

a main electrophoretic microchannel defining a main electrophoretic flowpath, said main electrophoretic microchannel being provided with means for applying an electric field to media contained therein;

an enrichment channel defining an enrichment flowpath in fluid conducting relation with said main electrophoretic flowpath, said enrichment channel containing an enrichment medium for enriching a particular fraction of a sample; and

means for transferring a portion at least of said fraction from said enrichment channel to said main electrophoretic flowpath;

said device further comprising an outlet in fluid conducting relation to said enrichment flowpath for discharging away



from said main electrophoretic flowpath a portion of said sample other than said portion of said fraction.

5,770,030

**PROCESS FOR THE SEPARATION OF CARRIER-FREE RADIO-NUCLIDES FROM TARGET LIQUIDS, THE USE OF THE PROCESS AND AN ARRANGEMENT SUITABLE THEREFOR**

Kurt Hamacher, and Gerrit Blessing, both of Aachen, Germany, assignors to Forschungszentrum Jülich GmbH, Jülich, Germany

PCT No. PCT/DE95/00025, § 371 Date Jul. 9, 1996, § 102(e) Date Jul. 9, 1996, PCT Pub. No. WO95/18668, PCT Pub. Date Jul. 13, 1995

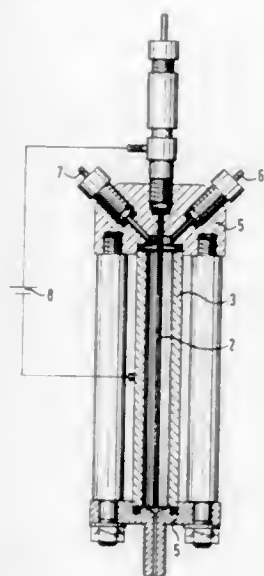
PCT Filed Jan. 10, 1995, Ser. No. 676,135

Claims priority, application Germany, Jan. 11, 1994, 44 00 539.3

Int. Cl.<sup>6</sup> B01D 59/40; G21G 1/10

U.S. Cl. 205—43

11 Claims



1. A process for separating a carrier-free radionuclide from a liquid or liquefiable target material containing a radionuclide and having reduced electrical conductivity which results from a nuclear process, in ionizable or polarizable form, which comprises the steps of:

- providing a permanent electrode arrangement in a flow cell which comprises:
  - a vitreous carbon cylinder as an outer
  - a counter electrode in the form of a platinum capillary within said vitreous carbon cylinder and extending over an entire length of the cylinder which terminates via a flat cone in a capillary spaced from a valve and at its upper end in a cap closing the cylinder and holding the counterelec-

- trode with an inert gas-connecting fitting and a pressure equalization opening;
- feeding the liquid or liquefiable target material containing the radionuclide to the flow cell through the platinum capillary in the counterelectrode;
- applying an electrical field to the liquid or liquefiable target material for electrofixing the radionuclide on one of the electrodes;
- following step (c), separating the liquid or liquefied target material from the radionuclide by removing the liquid or liquefied target material from the flow cell while maintaining a fixing voltage in said flow cell; and
- forming a solution of the carrier-free radionuclide separated according to step (d) with a shut-off field or in a field of opposite poling.

5,770,031

Patent Not Issued For This Number

5,770,032

**METALLIZING PROCESS**

Frank N. Cane, San Jose, Calif., assignor to Fidelity Chemical Products Corporation, Newark, N.J.

Filed Oct. 16, 1996, Ser. No. 734,245

Int. Cl.<sup>6</sup> C25D 5/34; 5/02; 5/54; 5/56

U.S. Cl. 205—210

44 Claims

1. In a process for metallizing a surface of a substrate wherein said surface has been cleaned, the improvement which comprises sensitizing the cleaned surface by contact with an aqueous solution consisting of a stannous salt, a precious metal salt and a source of chloride ions consisting of a salt selected from the group consisting of sodium chloride, potassium chloride and mixtures thereof.

5,770,033

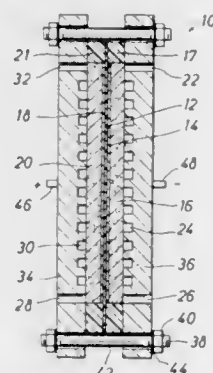
**METHODS AND APPARATUS FOR USING GAS AND LIQUID PHASE CATHODIC DEPOLARIZERS**

Oliver J. Murphy, and G. Duncan Hitchens, both of Bryan, Tex., assignors to Lynntech, Inc., College Station  
Continuation of Ser. No. 472,183, Jun. 7, 1995, abandoned, which is a continuation-in-part of Ser. No. 91,752, Jul. 13, 1993, Pat. No. 5,460,705. This application Jun. 26, 1997, Ser. No. 883,262

Int. Cl.<sup>6</sup> C25B 1/00; 1/30; 1/02

U.S. Cl. 205—464

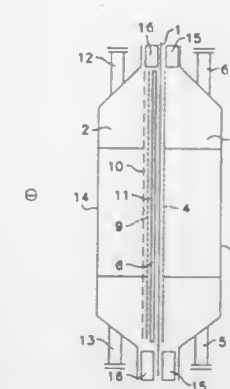
51 Claims



1. A method for electrochemical synthesis of ozone comprising the steps of:

- supplying a source of oxygen gas through a gas diffusion layer to a catalyst disposed within a cathodic catalyst layer, wherein the cathodic catalyst layer comprises a proton exchange polymer, polytetrafluoroethylene polymer and a metal selected from platinum, palladium, gold, iridium, nickel

- and mixtures thereof, and wherein the cathodic catalyst layer has a first surface of an ionically conducting membrane bonded thereto;
- supplying a liquid consisting essentially of water and a compound selected from sulfuric acid, phosphoric acid, tetrafluoroboric acid,  $C_6F_5CH_2PO(OH)_2$ ,  $(CF_3)_2CFP(O)(OH)_2$ ,  $CF_3CH_2N(H)P(O)(OH)_2$ ,  $CF_2CFHCF_2SO_3H$ ,  $(CFPO_3H_2)CF_2SO_3H$ , sulfonic acids, perfluoro bis-sulfonimides, carbanion acids thereof, and mixtures thereof to an anode disposed in intimate contact with a second surface of the membrane; and
  - passing an electric current through the anode, the cathode and the ionically conducting membrane to form ozone at the anode and hydrogen peroxide at the catalyst within the cathodic catalyst layer.



5,770,034

**PROCESS AND APPARATUS FOR DESILVERING A SILVER-CONTAINING SOLUTION**

Benedictus Jansen, Geel; Fernand Ketels, Kontich; Paul Smet, Wilrijk; Werner Van de Wynckel, Mortsel, and Michiels Frank, Arendonk, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

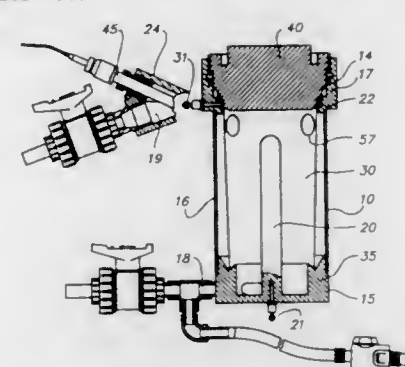
Filed Jul. 8, 1996, Ser. No. 676,442

Claims priority, application European Pat. Off., Jul. 15, 1995, 95201954

Int. Cl.<sup>6</sup> C25C 1/20; 7/06

U.S. Cl. 205—571

19 Claims



1. A process for desilvering a silver-containing solution in an electrolytic cell having an anode, a cathode and a reference electrode, said process comprising the steps of:  
supplying a sufficient quantity of said silver-containing solution to said electrolytic cell to immerse said anode, said cathode and said reference electrode in said silver-containing solution; applying an electrical potential between said cathode and said reference electrode at a first potential level within a first potential range and corresponding to a cell current value, said first potential level being effective to cause silver to be deposited on said cathode; and  
reducing the absolute magnitude of said electrical potential from said first level to enhance said desilvering process.

5,770,035

**METHOD FOR THE ELECTROLYSIS OF AQUEOUS SOLUTIONS OF HYDROCHLORIC ACID**

Giuseppe Fatta, Novara, Italy, assignor to De Nora S.p.A., Italy  
Filed Dec. 18, 1996, Ser. No. 769,483

Claims priority, application Italy, Jan. 19, 1996, MI96A0086  
Int. Cl.<sup>6</sup> C25B 1/26

U.S. Cl. 205—624

21 Claims

1. Process for the electrolysis of aqueous solutions of hydrochloric acid for producing chlorine, carried out in electrolyzers consisting of at least one electrochemical cell comprising a cathode compartment and an anode compartment separated by a corrosion-resistant, cationic ion exchange membrane, the cathode and anode

compartments being equipped with a gas diffusion cathode and an anode made of an inert substrate provided with an electrocatalytic coating for chlorine evolution, at least the gas diffusion cathode and the membrane being in intimate contact with each other, the cathode compartment being further provided with an inlet for feeding an oxygen-containing gas and an outlet for the discharge of the reaction water, the anode compartment comprising an inlet for the aqueous solution of hydrochloric acid to be electrolyzed and outlets for the removal of the exhausted hydrochloric acid solution and of the produced chlorine, characterized in that the process is carried out in a cell wherein the anode and cathode compartments are made of the same construction material, which is selected from the group consisting of titanium and titanium alloys and by adding to the aqueous solution of hydrochloric acid to be electrolyzed an oxidizing compound having a redox potential at least equal 0 Volt NHE and that must be always kept in the oxidized condition by chlorine and must be significantly reduced when it comes in contact with the cathode.

5,770,036

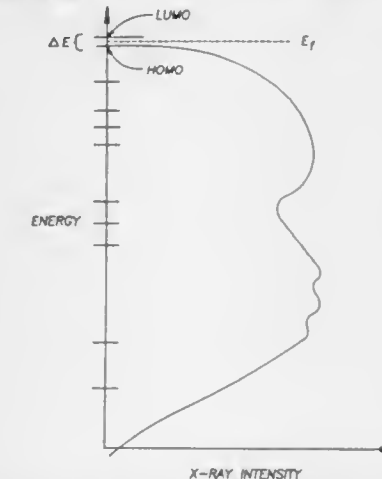
**METHOD OF MAXIMIZING ANHARMONIC OSCILLATIONS IN DEUTERATED ALLOYS**

Brian S. Ahern, Boxboro; Keith H. Johnson, Cambridge, and Harry R. Clark, Jr., Townsend, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.  
Continuation of Ser. No. 331,007, Oct. 28, 1994, abandoned, which is a division of Ser. No. 86,821, Jul. 2, 1993, Pat. No. 5,411,654. This application May 2, 1996, Ser. No. 642,127

Int. Cl.<sup>6</sup> C25F 1/02; C23F 1/00; B05D 3/00

U.S. Cl. 205—640

45 Claims



1. A method for producing dynamic anharmonic oscillations of a condensed matter guest species dissolved in a condensed matter host lattice, the method comprising treating host lattice surfaces to provide surface features on at least a portion of the host lattice surfaces, the surface features having a radius of curvature less than 0.5 microns, such that upon dissolution of said guest species in said host lattice in a ratio of at least 0.5, the guest species undergoes said dynamic anharmonic oscillations.





a body having a front face; .  
means for securing the container to the front face;  
means for expressing a first portion of the blood from the  
interior of the first chamber of the container to the interior of  
the second chamber of the container through the first frangible  
access port wherein the means for expressing is associated  
with the body; and  
means for sealing the frangible access port after expressing the  
first portion of the blood wherein the means for sealing is  
connected to the front face and the container extends between



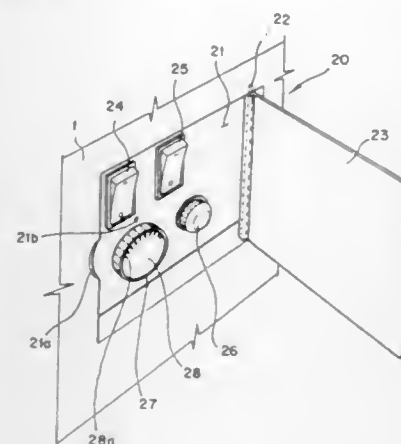
the front face and the means for sealing with the means for sealing arranged to separate the first chamber from the second chamber.

**5,770,052**  
**DEVICE FOR CONTROLLING THE RATIO OF PURE WATER TO CONCENTRATED WATER IN WATER PURIFIERS**

Deok-Joong Yoon, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea  
Filed Jul. 30, 1996, Ser. No. 681,915

Claims priority, application Rep. of Korea, Jul. 31, 1995, 95-23548

Int. Cl.<sup>6</sup> B01D 61/12  
U.S. Cl. 210—94 5 Claims



1. In a water purifier including a casing, filters disposed in the casing for receiving unpurified water and producing therefrom purified water and waste water, and a control knob for regulating a ratio of pure water to waste water; the improvement wherein the casing includes a control box disposed on a wall thereof and accessible from outside of the casing, the control knob being mounted for rotation within the control box; a setting point marked in the control box; the control knob carrying a plurality of regularly-spaced indicator marks selectively alignable with the setting point to enable a setting of the control knob to be visually determined.

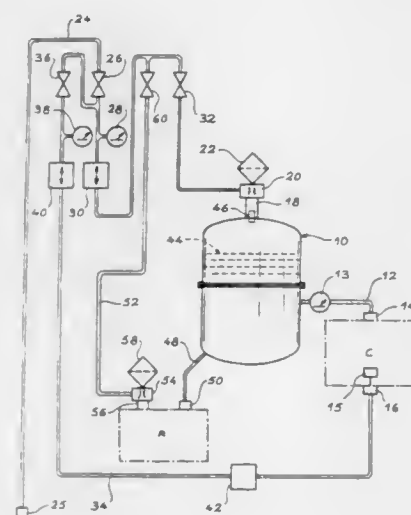
**5,770,053**  
**HYDRAULIC EQUIPMENT DRAINING MEANS**  
Henri Chotel, St. Fory; Max Roger, and Alexis Albin, both of Toulouse, all of France, assignors to Societe Nationale Industrielle et Aerospatiale, Paris, France  
Filed Oct. 10, 1995, Ser. No. 541,615

Claims priority, application France, Oct. 11, 1994, 94 12107  
Int. Cl.<sup>6</sup> B01D 21/24

U.S. Cl. 210—97 7 Claims

1. Draining means for draining at least one hydraulic equipment containing a liquid and having at least one outlet coupling and at least one calibrated closing member imposing a flow direction of the liquid in said equipment, said draining means comprising:

- a reception reservoir for said liquid;
- at least one suction line tightly connecting the reception reservoir to said at least one outlet coupling;
- a first venturi connecting a top of the reception reservoir to an outside;
- a compressed air line connecting a control orifice of the first venturi to an external compressed air source; and
- at least one opening line connecting the compressed air line to said at least one inlet coupling, for injecting compressed air into the equipment at a pressure that is above an opening pressure of said at least one calibrated closing member, but

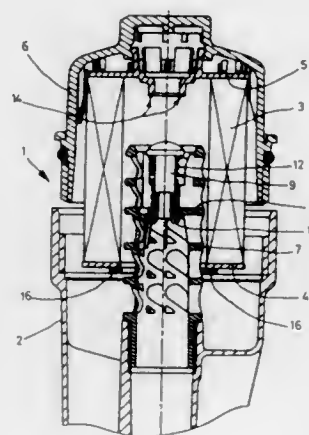


inadequate to produce a pressure above atmospheric pressure in the at least one outlet coupling of the hydraulic equipment.

**5,770,054**  
**FLUID FILTER WITH FILTER BYPASS VALVE AND SEALING SURFACE ON FILTER ELEMENT SIDE**  
Wilhelm Ardes, Ascheberg, Germany, assignor to Firma Ing. Walter Hengst GmbH & Co. KG, Münster, Germany  
Filed Mar. 15, 1996, Ser. No. 617,472

Claims priority, application Germany, Mar. 16, 1995, 195 09 566.9; Feb. 14, 1996, 196 05 425.7

Int. Cl.<sup>6</sup> B01D 35/147  
U.S. Cl. 210—130 23 Claims



- 1. A fluid filter, comprising
- a housing,
- a replaceable filter element positioned within said housing, said filter element including first and second ends and a filtering surface positioned therebetween, and
- a filter bypass valve including a valve body, mounting means for integrally mounting said valve body within said housing so as to remain mounted within said housing when the replaceable filter is replaced, said valve body being movable between a closed position, in which said valve body sealingly engages a sealing surface, and an open position in which said valve body permits fluid flow to bypass said filter element, wherein said first end of said filter element forms said sealing surface for said valve body.

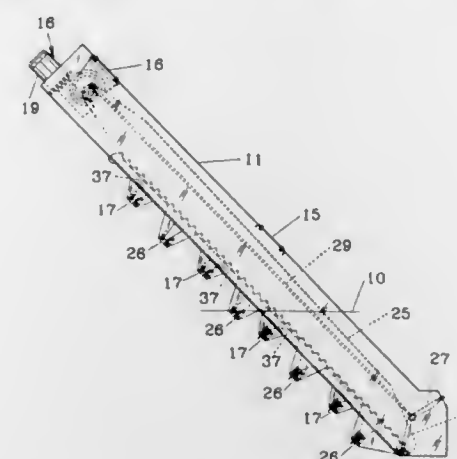
**5,770,055**  
**STRAINER FOR REMOVING PARTICLES FROM EFFLUENT**

Carl-Otto Wallander, Vaglångsgatan, and Lars Hedman, Taillepied, both of Sweden, assignors to Erich Hochstrasser, Rothenburg, Switzerland

PCT No. PCT/SE94/00062, § 371 Date Sep. 22, 1995, § 102(e)  
Date Sep. 22, 1995, PCT Pub. No. WO94/24373, PCT Pub. Date Oct. 27, 1994

PCT Filed Jan. 28, 1994, Ser. No. 500,957  
Claims priority, application Sweden, Feb. 8, 1993, 9300396

Int. Cl.<sup>6</sup> E02B 5/08; B01D 29/70; 33/52  
U.S. Cl. 210—154 12 Claims



1. A strainer for removing particles from horizontal flow of effluent, comprising:

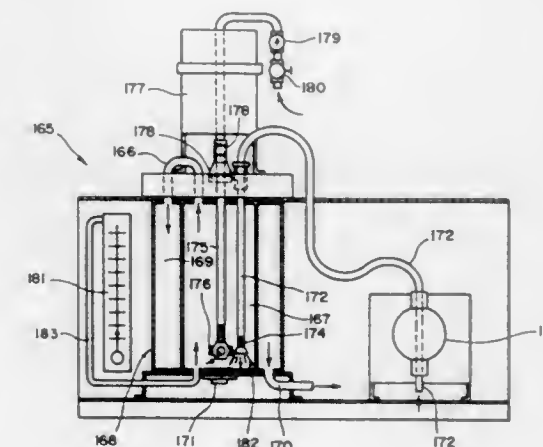
- a screen having a plurality of parallel fixed bars and a plurality of parallel displaceable bars, the fixed and displaceable bars being adapted to be inclined downwards into the flow of effluent and having edges for facing the flow of effluent that have step portions, the displaceable bars being interconnected to form a displaceable bar package with a lower end and an upper end;
- a drive mechanism operably connected to the upper end of the displaceable bar package for driving the upper end of the displaceable bar package in a constrained first circuitous path, and said drive mechanism is operably connected to the lower end of the displaceable bar package by a flexible link mechanism means for driving said lower end in a second circuitous path which is unconstrained, said flexible link mechanism means allowing said second unconstrained circuitous path of said lower end of the displaceable bar package to flexibly vary to minimize stress on the strainer should debris become lodged beneath the lower end of the displaceable bar package.

**5,770,056**  
**SEWAGE DEWATERING EQUIPMENT**  
Franklin David Deskins, 23 Fairway Dr., Alexandria, Ind. 46001

Division of Ser. No. 419,289, Apr. 10, 1995, Pat. No. 5,660,733.  
This application Apr. 23, 1996, Ser. No. 636,673

Int. Cl.<sup>6</sup> B01D 21/24  
U.S. Cl. 210—136 18 Claims

1. Mixing-introducing apparatus for mixing two components, at least one of which is a liquid, comprising a mixing chamber, aspirator means having an end rotating at high speed for providing air or other gas in a rotating manner in said mixing chamber, means for providing a flow of a liquid composition of a liquid and a solid in particle form under pressure into the mixing chamber in the vicinity of the rotating end of the aspirator means, means for providing a flow of a second liquid under pressure into the mixing chamber in the vicinity of the rotating end of the aspirator means, and a second chamber for temporary retention of the mixed liquid composition and second liquid, the aspirator means mixing the

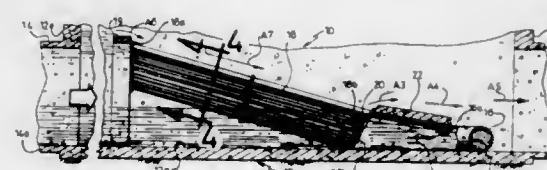


liquid composition and the second liquid by the action of the revolving air or other gas flow.

**5,770,057**  
**OVERFLOW WATER SCREENING APPARATUS**  
Gilles Fillion, Kirkland, Canada, assignor to John Meunier Inc., Montreal, Canada

Filed Aug. 12, 1996, Ser. No. 689,590  
Int. Cl.<sup>6</sup> B01D 35/02; 35/22; E03F 5/14

U.S. Cl. 210—162 13 Claims



- 1. An overflow water screening apparatus comprising:
- a) an elongated conduit defining a bottom wall portion, two lateral side portions, an upstream end section and a downstream end section, said conduit being destined to convey a water flow from said upstream to said downstream end sections;
- b) a refuse discharge pipe fixedly installed in said conduit and having an inlet opening inside said conduit proximate said downstream end section, said inlet opening having a smaller cross-section than said conduit, said inlet section facing said upstream end section and being located adjacent said conduit bottom wall portion;
- c) a bar screen fixedly and transversely attached in said conduit and defining a first end mounted to said upstream end section and a second end mounted to said conduit adjacent said inlet opening, said bar screen being inclined so as to slope downwards from said upstream end portion to said refuse discharge pipe inlet opening but clearing said inlet opening, said bar screen straddling said lateral side portions of the conduit from said upstream end section to said inlet opening except at said inlet opening, said bar screen having a plurality of longitudinally arranged bars which are spaced from one another in successive pairs, said bars anchored to one another at selected intervals by transverse arcuate arms; said bar screen having a substantially semi-cylindrical shape being downwardly concave, said inlet opening having a peripheral shape registering in a complementary fashion with said bar screen downstream end; said conduit being continuously free of any structural elements between said upstream end section and said downstream end section so as to allow a continuous water flow therethrough.

5,770,058

## CENTRIFUGAL SEPARATOR

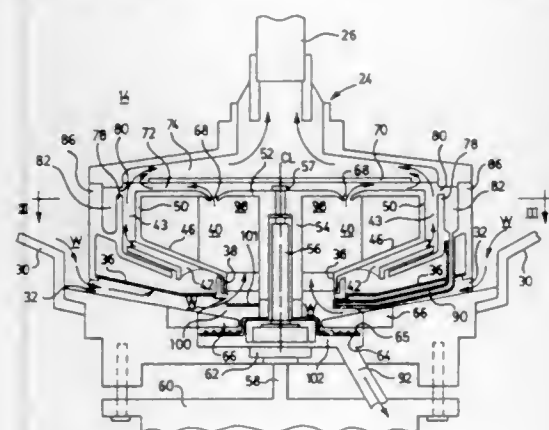
Todd M. Jozwiak, Benton Harbor, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 13, 1996, Ser. No. 713,488

Int. Cl.<sup>6</sup> B01D 21/26

U.S. Cl. 210—167

15 Claims



12. A soil separator for removing soil from recycled wash water in a dishwashing apparatus, the separator comprising:

- a soil laden water inlet;
- a recycled water outlet;
- a soil outlet;

a means for spinning said soil laden water received from said soil laden water inlet, for separating soil from recycled water, the means for spinning comprising a centrifuge having a rotatable hollow body having at least one hole through the top of the hollow body;

- a first means for directing soil from said means for spinning to said soil outlet; and
- a second means for directing recycled water to said recycled water outlet.

5,770,059

## WASTE WATER TREATMENT APPARATUS

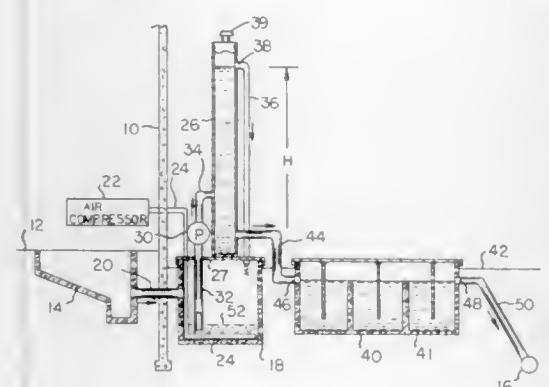
Choong H. Rhee, P.O. Box 1041, Huntington Beach, Calif. 92647

Filed Oct. 3, 1996, Ser. No. 724,902

Int. Cl.<sup>6</sup> B01D 21/34

U.S. Cl. 210—170

4 Claims



1. A waste water treatment apparatus comprising:
- an equalization basin receiving waste water from an industrial plant;
  - a waste water clarifier means receiving waste water discharged from said equalization basin; said clarifier means having a water outlet connectable to a municipal sewer; and
  - flow control means interposed between said equalization basin and said clarifier means for maintaining a relatively constant

flow rate into said clarifier means in spite of waste water volume variations in the equalization basin;

said flow control means comprising a liquid column means elevated above said equalization basin, and a motor-operated pump for pumping liquid from said basin into said liquid column means;

said liquid column means comprising an upstanding tube having a lower end and an upper end; said pump having a liquid connection to said tube located at an intermediate point between the tube upper and lower ends; said tube having a liquid outlet near its lower end connected to said clarifier means, and an overflow pipe extending from a point proximate to the tube upper end back to said basin.

5,770,060

## DEVICE FOR PACKING CHROMATOGRAPHIC STATIONARY PHASES

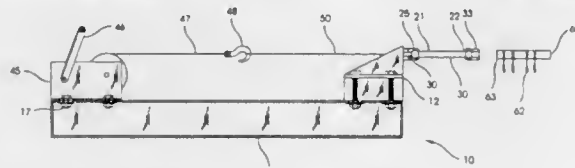
Michael Ladisch; Kent Hamaker; Richard Hendrickson, and Mark Brewer, all of West Lafayette, Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Division of Ser. No. 553,749, Oct. 23, 1995, Pat. No. 5,624,553, which is a division of Ser. No. 260,021, Jun. 15, 1994, abandoned. This application Nov. 22, 1996, Ser. No. 755,135

Int. Cl.<sup>6</sup> B01D 15/08

U.S. Cl. 210—198.2

4 Claims



1. A chromatography column, comprising:

a column;

a stationary phase packed in said column, said stationary phase including rolled cellulosic fabric radially compressed within said column and exhibiting a packing density of at least about 0.5 g/cc;

said chromatography column being characterized by its preparation by a process including passing the rolled cellulosic fabric through a funnel member having converging walls so as to radially compress the rolled cellulosic fabric as it enters said column;

said chromatography column further having a void fraction of less than about 0.4 as measured by bovine serum albumin.

5,770,061

## CHROMATOGRAPHIC SEPARATION COLUMN, INNER STRUCTURES THEREOF, AND CHROMATOGRAPHIC SEPARATION

Heikki Heikkilä, Espoo; Göran Hyöky, and Jarmo Kuisma, both of Kantvik, all of Finland, assignors to Suomen Sokeri Oy, Helsinki, Finland

Continuation of Ser. No. 583,202, Jan. 4, 1996, abandoned, which is a continuation of Ser. No. 184,615, Jan. 21, 1994, abandoned. This application Aug. 12, 1997, Ser. No. 909,516

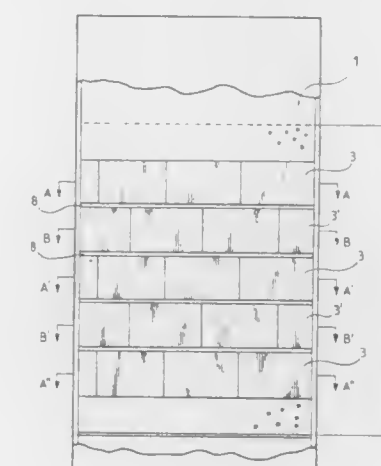
Claims priority, application Finland, Jan. 25, 1993, 930297

Int. Cl.<sup>6</sup> B01D 15/08

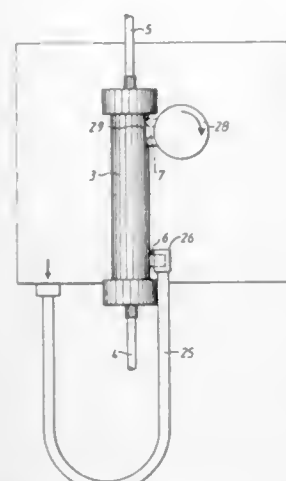
U.S. Cl. 210—198.2

14 Claims

1. A chromatographic separation system comprising: an outer chromatographic separation column and an inner structure for chromatographic use arranged within the chromatographic separation column, the structure comprising at least two zones, which, during operation of the column, are substantially uniformly filled with a column filling material, the zones being located within the filling material space of the column in the vertical direction, between which zones no means that would hinder vertical flow exist and which are divided by means of substantially vertical walls into separate sections, the zones being so dimensioned that







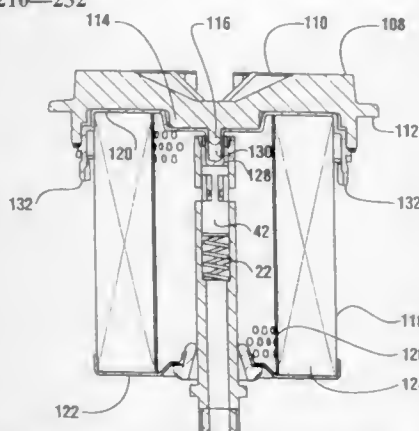
member being transverse to said pivot axis of said holding member whereby upon connection of said connecting member with said fluid coupling member of said dialyser, said dialyser can be pivoted together with said holding member without any relative movement between said connecting member and said fluid coupling member of said dialyser.

#### 5,770,065 FUEL FILTER ASSEMBLY WITH REPLACEABLE ELEMENT

Peter Popoff; David H. Hodgkins, both of Modesto; Michael D. Clausen, Turlock, and Victor R. Oelschlaegel, Modesto, all of Calif., assignors to Parker Hannifin Corporation, Cleveland, Ohio

Continuation of Ser. No. 441,584, May 15, 1995, abandoned, which is a continuation of Ser. No. 121,803, Sep. 15, 1993, abandoned. This application Oct. 9, 1996, Ser. No. 731,114 Int. Cl.<sup>6</sup> B01D 35/02

U.S. Cl. 210—232 55 Claims



1. A replaceable filter element removably positionable within a housing composed of mating parts forming an interior enclosure for the filter element, said filter element comprising:

- a first imperforate end cap, said first end cap having a major cap portion, a first longitudinally extending projection extending longitudinally from said major cap portion, and attachment structure directly fixedly joining said first longitudinally extending projection to said major cap portion independently of the mating part of the housing that would be adjacent to said first imperforate end cap;
- a continuous ring of filter media, said ring having an interior surface bounding an interior area, said ring being adhesively bonded in fluid tight relation to said major cap portion of said first end cap, and said interior area being closed at an end thereof by said first end cap;
- a second end cap longitudinally disposed from said first end cap and attached in fluid tight relation to said media ring, said second end cap having a standpipe opening therethrough

axially aligned with said first longitudinally extending projection and through which a standpipe can be inserted longitudinally into said interior area;

wherein said first longitudinally extending projection extends in said interior area and is radially disposed inwardly from said interior surface, is smaller in transverse cross-section than said opening in said second end cap and is longer than it is wide, such that said first longitudinally extending projection can fit within an actuator opening in the end of the standpipe when inserted longitudinally through said opening in the second end cap for actuating a valve flow element mounted to the standpipe; and

said major cap portion including an annular portion to which the filter media ring is bonded and a well area radially inwardly of said annular portion, said well area extending longitudinally into said interior area and including a radially extending bottom wall and an annular side wall extending between said bottom wall and annular portion, said bottom wall having a planar extent extending substantially perpendicularly to a longitudinal axis of said filter element, said longitudinally extending projection having a base end supported by said bottom wall radially inwardly of said annular wall, said longitudinally extending projection including a tubular wall forming a portion of a recess that opens away from said interior area to an axially outer side of said bottom wall, and said longitudinally extending projection terminating at a point closer to said first end cap than said second end cap.

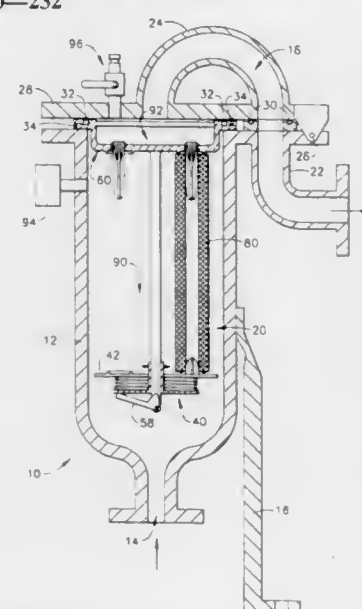
#### 5,770,066 CONVERTIBLE PRESSURE VESSEL HAVING A TIE ROD CONNECTING A SEPARATOR PLATE ASSEMBLY AND COMPRESSION SEAL ASSEMBLY

Daniel L. Coates, Fairfield, Ohio, assignor to Northeast Filter and Equipment Company, Chardon, Ohio

Filed Nov. 4, 1996, Ser. No. 740,880

Int. Cl.<sup>6</sup> B01D 29/17

U.S. Cl. 210—232 20 Claims



1. A filter assembly, comprising:

- a pressure vessel having an inlet at a first end of said vessel and an outlet at a second end of said vessel and means for permanently connecting processing piping to said inlet and said outlet;
- a separator plate assembly having at least one first positioning guide and a sealing surface per first positioning guide;
- a compression seal assembly having at least one second positioning guide and a sealing surface per second positioning guide;
- a tie rod that connects the separator plate assembly to the compression seal assembly;

a filter cartridge located between each of said at least one first and second positioning guides;

said separator plate assembly and said compression seal assembly being placed under compression with respect to one another via said tie rod; and

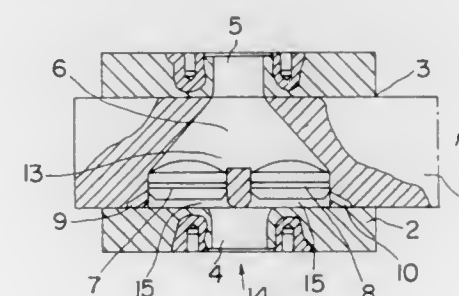
an ambient seal, which also acts as a separator seal between a contaminated chamber and a purified chamber of said filter assembly, said ambient seal being placed along the edges of the separator assembly, a pivotable or removable cover which, when opened, does not interrupt the process piping, mounted on said vessel in contact with said ambient seal, and said cover and separator assembly creating a purified chamber along the inside of the vessel therebetween.

#### 5,770,067

DEVICE FOR FILTERING A FLUID  
Manfred Hangmann, Greven, Germany, assignor to Wil-Man Polymer Filtration GmbH, Wettingen, Germany  
Filed Dec. 11, 1996, Ser. No. 763,204

Claims priority, application Germany, Mar. 29, 1996, 196 12 790.4

Int. Cl.<sup>6</sup> B01D 29/06; 29/52; 29/68; B29C 47/68  
U.S. Cl. 210—236 11 Claims



1. A device for filtering a fluid, comprising  
a housing,

a single fluid supplying canal and a fluid draining canal in said housing,

a single connecting canal which connects said fluid supplying canal to said fluid draining canal so that said fluid to be filtered flows in a flow direction from said fluid supplying canal to said fluid draining canal through said connecting canal,

at least first and second substantially flat filters movably arranged in and across said flow direction,

said connecting canal comprising a funnel-shaped extension which receives said first and second filters,

said first and second filters being simultaneously movable between a first position in which said single connecting channel communicates with said fluid draining channel and said fluid is filtered by said first and second filters, and a second position in which said single connecting channel still communicates with said fluid draining channel and said fluid is filtered by one of said filters while the other of said filters is superfused with said fluid in an opposite flow direction,

wherein in said second position, the portion of said fluid which passes through the other of said filters in said opposite flow direction is drained from said device through a drain channel,

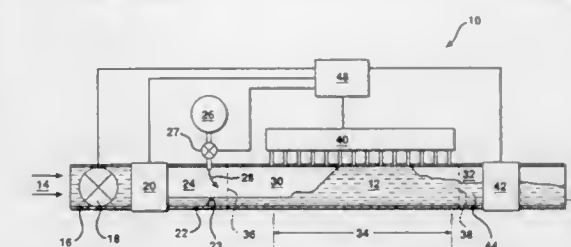
wherein said connecting canal is arranged in a cylindrical bolt, said cylindrical bolt is disposed fluid-tight in a housing bore which extends vertically to said flow direction of said fluid, said connecting canal extends through the entire diameter of said bolt, said filters are movably supported and located on said bolt, and said bolt is movable across said flow direction of said fluid so that said filters can be moved between said first and second positions by shifting of said bolt.

5,770,068  
MULTI-PHASE MIXING IN A HYDRAULIC JUMP  
W. Paul Jepson, Athens, Ohio, assignor to Ohio University, Athens, Ohio

Filed Feb. 20, 1996, Ser. No. 603,130

Int. Cl.<sup>6</sup> B01D 53/00; 17/12

U.S. Cl. 210—741 35 Claims



1. A method of mixing materials comprising the steps of:  
providing a first inlet flow of a first fluid in a first pipe section;  
providing a second inlet flow of a non-atmospheric second fluid in said first pipe section;

creating at least one stationary hydraulic jump in a second pipe section in communication with said first pipe section;  
mixing said first fluid and said second fluid in said at least one stationary hydraulic jump; and

providing a mixed fluid flow in a third pipe section.

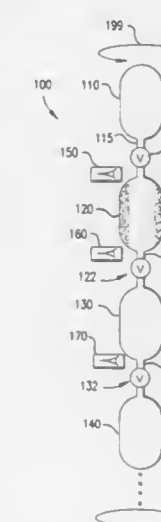
29. An apparatus for mixing materials comprising:  
a first pipe section including a first fluid inlet, a second non-atmospheric fluid inlet, and a first fluid film height controller;  
a second stationary hydraulic jump pipe section in communication with said first pipe section; and  
a third pipe section in communication with said second pipe section and including a back pressure regulator.

5,770,069  
COLLAPSIBLE CONTAINER FOR HOLDING A FLUID DURING A CENTRIFUGATION OPERATION

Harold T. Meryman, Ashton, Md., assignor to Organ, Inc., Chicago, Ill.

Division of Ser. No. 483,265, Jun. 7, 1995, Pat. No. 5,656,154. This application Feb. 21, 1997, Ser. No. 803,880

Int. Cl.<sup>6</sup> B01D 21/26 13 Claims



1. An elongated collapsible container for holding a fluid during a centrifugation operation, comprising at least one flexible container wall that forms at least two chambers that are in fluid communication through at least one neck, wherein the at least two chambers are arranged longitudinally along the container, and wherein the at least two chambers and the at least one neck share said wall and have longitudinal central axes that coincide with a longitudinal central axis of the container.

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5,770,070

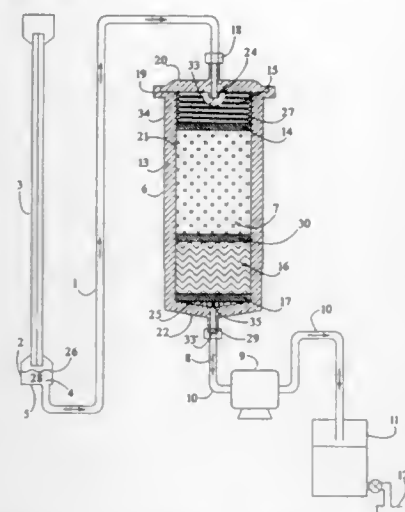
**RADIOACTIVE WASTE DISPOSAL CARTRIDGE**  
Thomas E. Davis, Moss Beach, and Henry L. Schwartz, San Francisco, both of Calif., assignors to Genomx Corporation, Foster City, Calif.

Filed Oct. 3, 1994, Ser. No. 316,733

Int. Cl.<sup>6</sup> B01D 27/02

U.S. Cl. 210—266

15 Claims



1. A radioactive waste treatment cartridge comprising: an elongated chamber having an entry port and an exit port which define an axis through the elongated chamber, an anion exchange resin within the elongated chamber and maintained between a porous upper frit and a porous lower frit, the exchange resin having the property of binding radioactive waste particles, the exchange resin also defining a cross section perpendicular to the axis defined by the entry port and the exit port, the entry port having a tip that points down inside the chamber and through which entering radioactive liquid is deposited on top and center of the porous upper frit, the porous upper frit having sufficient thickness and porosity to create a liquid head on top of the porous upper frit and in which the liquid head has a cross section parallel to and substantially coextensive with the cross section of the exchange resin, and
- a means within the elongated chamber for retaining pressure between the porous upper frit and the porous lower frit, wherein radioactive waste particles are retained within the elongated chamber by the exchange resin when radioactive liquid is passed from the entry port to the exit port and through the exchange resin and wherein the elongated chamber is made of material which shields the emission of radiation from radioactive waste particles retained by the exchange resin.

5,770,071

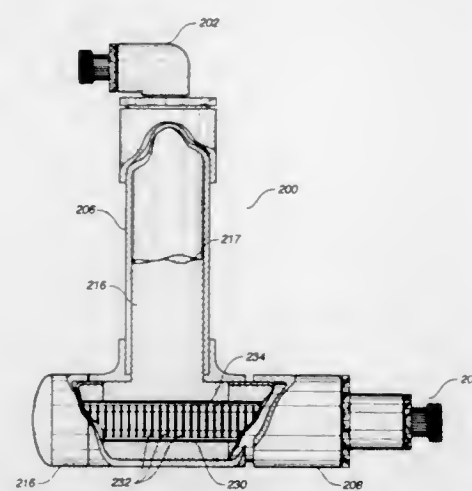
**SAND FILTER FOR A WASTEWATER EFFLUENT MANAGEMENT SYSTEM**

T. Gig Drewery, P.O. Box 426, Kountze, Tex. 77625-0426  
Continuation-in-part of Ser. No. 133,645, Oct. 8, 1993, Pat. No. 5,536,404. This application Jul. 15, 1996, Ser. No. 680,498  
Int. Cl.<sup>6</sup> B01D 24/42

U.S. Cl. 210—289

24 Claims

1. A wastewater filter comprising:
- a fluid inlet;
  - a fluid outlet;
  - a first body portion connected to said fluid inlet;
  - a second body portion connected to said first body portion;
  - a filter support disposed in said second body portion between said first body portion and said fluid outlet, said filter support having a plurality of openings formed therein; and
  - a particulate filter means filling an area between said second body portion and said filter support and extending into said first body portion, said particulate filter means for filtering wastewater passing therethrough, said plurality of openings



having a total area greater than a cross-sectional area of said particulate filter means in said first body portion.

5,770,072

**MULTIPLE INLET VALVE WITH MEANS TO ISOLATE EACH INLET INDIVIDUALLY AND DIRECT A REVERSE FLOW THERETHROUGH**

Christen Grönvold-Hansen, Karlstad, and Stig Eriksson, Skoghall, both of Sweden, assignors to Kvaerner Pulp AB, Sweden

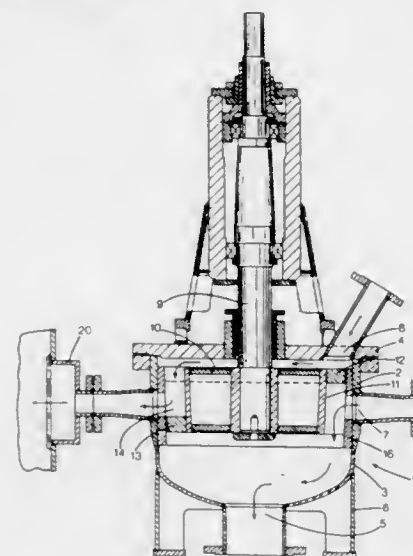
PCT No. PCT/SE95/00062, § 371 Date Aug. 14, 1996, § 102(e) Date Aug. 14, 1996, PCT Pub. No. WO95/22708, PCT Pub. Date Aug. 24, 1995

PCT Filed Jan. 24, 1995, Ser. No. 693,162

Claims priority, application Sweden, Feb. 18, 1994, 9400550  
Int. Cl.<sup>6</sup> B01D 29/00

U.S. Cl. 210—333.01

14 Claims



1. A valve arrangement for use in a removal system for removal of digesting liquid from a cellulose digester, comprising:
- a housing having at least three first inlet openings defined therein for removing liquid flowing therethrough;
  - a plurality of screens in fluid communication with the first inlet openings;
  - an elongate rotatable rotor disposed in the housing, the rotatable rotor being substantially perpendicular to the first inlet openings;
  - the housing defining an outlet opening for removing liquid from the screens;
  - the housing defining a second inlet opening adapted to back flush the screens with a back flushing liquid; and
  - the rotor being adapted to intermittently shut off the first inlet openings from the outlet opening and opening a fluid commu-

nication between the first inlet openings and the second inlet opening to permit back flushing of the screens, the first inlet openings being disposed between the second inlet opening and the screens so that the back flushing liquid is permitted to pass through the first inlet openings before the back flushing liquid is permitted to pass through the screens.

5,770,073

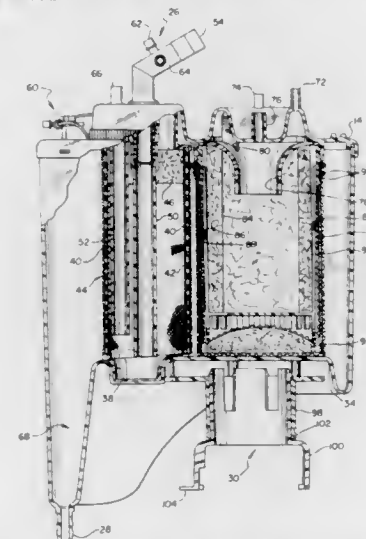
**COMBINED CARDIOTOMY AND VENOUS RESERVOIR**  
Ulf-Eiel F. Bach, Minnetonka, and James Strom, Arden Hills, both of Minn., assignors to Minntech Corporation, Minneapolis, Minn.

Filed Mar. 15, 1996, Ser. No. 616,719

Int. Cl.<sup>6</sup> A61M 1/14; B01D 27/00; 29/00

U.S. Cl. 210—472

11 Claims



8. A device for defoaming and filtering venous blood for separating foam, macroscopic and microscopic air bubbles from venous blood, comprising:

- a housing defining a reservoir for containing blood;
- blood inflow and outflow ports in communication with said reservoir;
- a first filter structure mounted within said housing and including a perforated cage, a first microscreen disposed within an interior of said cage, a second microscreen structure disposed exteriorly of said cage and a defoaming component of limited vertical height mounted to an upper portion of said cage structure, an inlet tube extending through said defoaming component from said inflow port to a bottom portion of said cage, whereby the upper portion of the first filter structure receives the foam, and macroscopic and microscopic bubbles separated from blood as it flows through the cage and microscreen structures and whereby contact of blood with said defoaming component is substantially avoided.

5,770,074

**FILTER APPARATUS**

Jeffrey R. Pugh, Potters Bar, England, assignor to Brasilia (UK) Limited, London, England

PCT No. PCT/GB95/01255, § 371 Date Dec. 5, 1996, § 102(e) Date Dec. 5, 1996, PCT Pub. No. WO95/33399, PCT Pub. Date Dec. 14, 1995

PCT Filed Jun. 1, 1995, Ser. No. 750,514

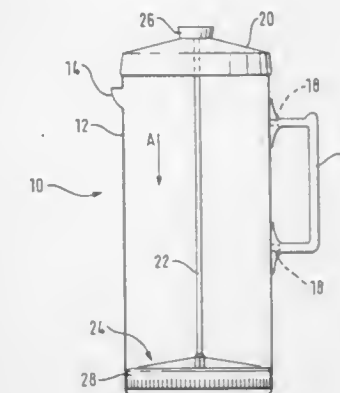
Claims priority, application United Kingdom, Jun. 6, 1994, 9411268

Int. Cl.<sup>6</sup> B01D 33/01

U.S. Cl. 210—474

13 Claims

1. Filter apparatus comprising a receptacle for liquid to be filtered, the receptacle having an outlet from which filtered liquid can be dispensed, and a plunger movable downwardly within said receptacle and through the liquid, the plunger having filter means



arranged to filter said liquid during the downward, filtering movement of the plunger, said plunger having a cylindrical skirt portion in contact with the inner surface of said receptacle, wherein said skirt portion depends downwardly from said filter means in the direction of the filtering movement of said plunger, said skirt portion being arranged to be biased towards the inner surface of said receptacle by the pressure of the liquid being filtered during said filtering movement, and wherein said skirt portion of said plunger has thermally activated memory characteristics enabling the skirt portion to be returned to its original diameter.

5,770,075

**BEVERAGE FILTER**

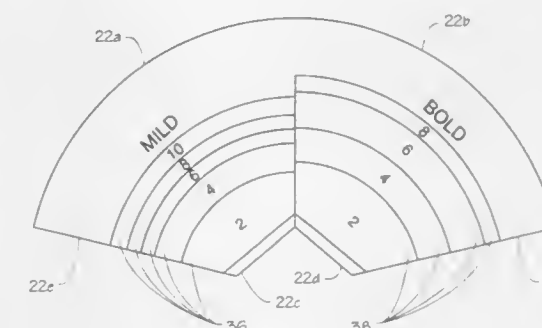
David P. Geoffroy, 1412 Serenade Ter., Corona del Mar, Calif. 92625

Filed Feb. 24, 1997, Ser. No. 806,534

Int. Cl.<sup>6</sup> B01D 29/085

U.S. Cl. 210—474

10 Claims



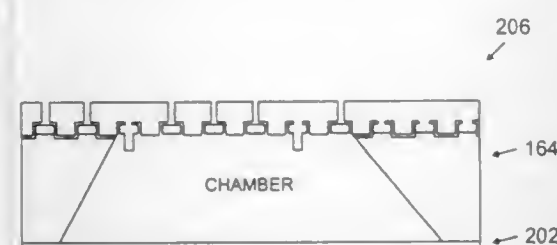
1. A filter for use with a beverage brewing apparatus having a container for retaining the filter which receives the ground beverage through which hot water passes from a pot or reservoir through the filter and through aperture means in the container into a beverage receptacle, said filter comprising:

- a generally porous, generally flexible filtration material configured with an open top for being received within the container; and
- indicia on the interior sides of said material arranged in at least first and second sets, said first set including indicia of volume of ground beverage to be placed within the filter for brewing the beverage at a first strength for a given volume of brewed beverage, and said second set including indicia of volume of ground beverage to be placed within the filter for brewing the beverage at a second strength for the same given volume of brewed beverage.



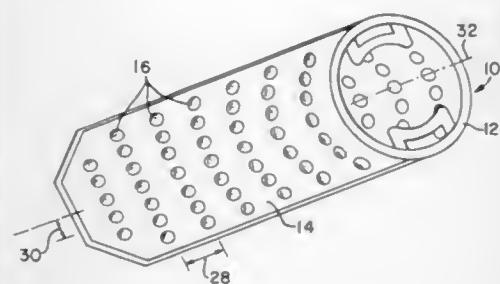
5,770,076  
MICROMACHINED CAPSULES HAVING POROUS MEMBRANES AND BULK SUPPORTS  
Wen-Hwa Chu, Albany, and Mauro Ferrari, Lafayette, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 254,330, Jun. 6, 1994, which is a continuation-in-part of Ser. No. 207,457, Mar. 7, 1994, Pat. No. 5,651,900, and Ser. No. 207,459, Mar. 7, 1994, Pat. No. 5,660,680. This application Jun. 7, 1995, Ser. No. 482,237  
Int. Cl.<sup>6</sup> B01D 69/10; A61K 9/50; 9/52  
U.S. Cl. 210—490 1 Claim



1. A microfabricated containment capsule, comprising:  
at least one bulk substrate, said at least one bulk substrate delimiting a cavity having a boundary, a first portion of said boundary constituting an inner wall of a solid portion of said at least one bulk substrate; and  
at a second portion of said boundary, a membrane having at least one porous area with controlled pores and rib members to provide additional structural support to said at least one porous area, providing a selective molecular barrier between an interior and an exterior of said containment capsule.

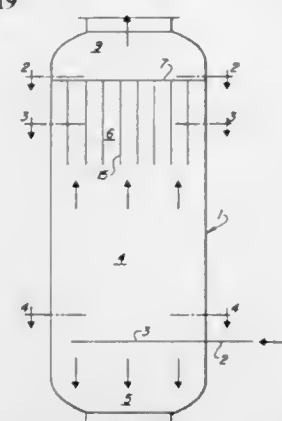
5,770,077  
LAMINATED FILTER MATERIAL  
Sidney Goldman, Boca Raton, Fla., assignor to Mechanical Manufacturing Corp., Sunrise, Fla.  
Continuation of Ser. No. 331,267, Oct. 24, 1994, abandoned.  
This application May 6, 1996, Ser. No. 642,922  
Int. Cl.<sup>6</sup> B01D 39/16  
U.S. Cl. 210—490 23 Claims



1. A multi-layer laminated filter material comprising:  
a) an outer layer of non-woven filter material;  
b) an inner layer of non-woven filter material;  
c) a central layer of at least one layer of melt blown filter material devoid of any material having layers of longitudinal continuous filaments; and  
d) non-piercing means utilized throughout and spaced at intervals across the surface of said filter material for binding said outer layer of filter material and said inner layer of filter material together.

5,770,078  
PHASE SEPARATOR APPARATUS TO SEPARATE A MIXTURE OF LIQUIDS AND FINELY DIVIDED SUSPENDED PARTICLES  
Brian W. Hedrick, Rolling Meadows, Ill., assignor to UOP, Des Plaines, Ill.

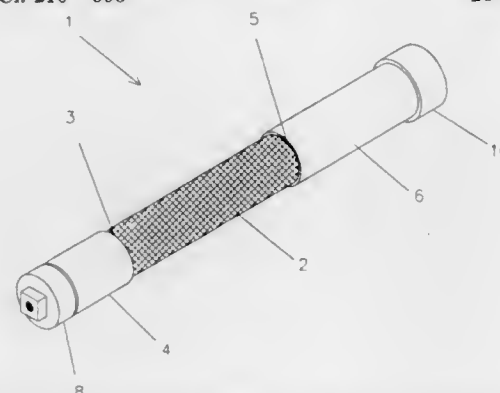
Filed Oct. 4, 1996, Ser. No. 726,876  
Int. Cl.<sup>6</sup> B01D 21/00  
U.S. Cl. 210—519 8 Claims



1. An improved separation apparatus for the separation of mixtures of liquids and finely divided suspended particles which comprises a separator vessel having at least one inlet for the introduction of the liquid containing the mixture being separated, upper and lower outlets for the separated components of the liquid wherein the apparatus comprises:  
(a) a generally vertical separator vessel having an upper locus and a lower locus;  
(b) a feed inlet distributor located in the lower locus of said vessel which directs at least a majority of a feed mixture in a generally upwardly direction;  
(c) a multiplicity of generally vertical baffles located in the upper locus of said generally vertical separator vessel and arranged in an intersecting pattern defining generally vertical passages for the flow of at least a portion of a feed mixture; and  
(d) a generally horizontal baffle located adjacent and above said multiplicity of generally vertical and intersecting baffles and defining a multiplicity of holes to allow the passage of an upwardly flowing liquid therethrough.

5,770,079  
BIOLOGICAL INJECTOR AND METHOD OF APPLICATION THEREOF  
Richard Alan Haase, Suite 422 Lexington Blvd., Sugarland, Tex. 77479

Filed Jun. 25, 1997, Ser. No. 882,568  
Int. Cl.<sup>6</sup> C02F 3/34; 1/58  
U.S. Cl. 210—606 20 Claims



1. A biological injector, suitable for seeding bacterial cultures to a fluid flowing through or contained in a collection or treatment system, that comprises:

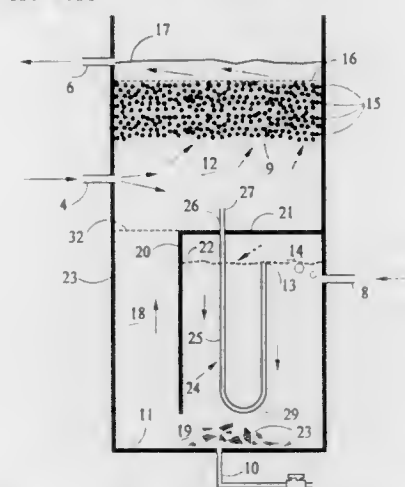
- (a) at least one porous section for containing bacterial cultures;  
(b) at least one non-porous solid section, with each porous section being attached to at least one non-porous solid section and with at least one non-porous solid section being used as a base to which some components of the biological injector can be attached; and  
(c) at least one removable piece that is attached to one non-porous solid section and that is removed to allow placement of bacterial cultures in the biological injector;  
such that, upon attachment of each removable piece to the corresponding non-porous solid section, all porous sections, non-porous solid sections and removable pieces of the biological injector form an enclosed container for storage of bacterial cultures and for wetting and release to the fluid of bacterial cultures when the biological injector is placed in the fluid.

14. A method for biodegrading a fluid, flowing through or contained in a collection or treatment system, by seeding bacterial cultures to the fluid, said method comprising:

- (a) providing a biological injector that comprises at least one porous section for containing bacterial cultures, at least one non-porous solid section, with each porous section being attached to at least one non-porous solid section and with at least one non-porous solid section being used as a base to which some components of the biological injector can be attached, and at least one removable piece that is attached to one non-porous solid section;  
(b) removing a removable piece from the non-porous solid section and placing bacterial cultures in the biological injector;  
(c) attaching any removable piece to the corresponding solid section, such that all porous sections, non-porous solid sections and removable pieces of the biological injector form an enclosed container for storage of bacterial cultures; and  
(d) placing the biological injector within the fluid to be treated; such that the bacterial cultures, that have been placed in the biological injector, are wetted by and released to an amount of the fluid which enters and exits the biological injector via openings in the porous section.

5,770,080  
AIR CHARGED BACKWASHING BIOCLARIFIER  
Ronald F. Malone, 3218 Riverwalk Dr., Baton Rouge, La. 70820

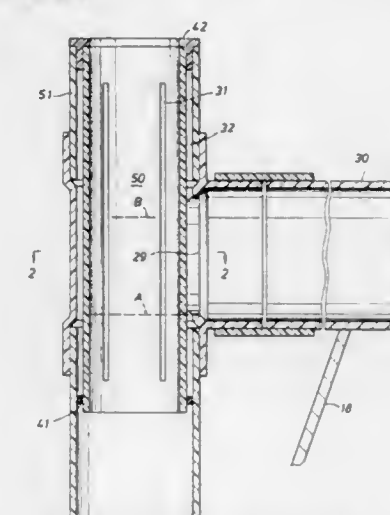
Filed Apr. 23, 1997, Ser. No. 842,241  
Int. Cl.<sup>6</sup> C02F 3/06  
U.S. Cl. 210—618 26 Claims



1. A tank for a floating media biofilter comprising:  
a. a filter chamber;  
b. a charge chamber for intermittently storing air, said charge chamber being fluidly connected to said filter chamber and having:  
i. an air outlet for admitting air into said filter chamber;

- ii. an air inlet; and  
c. a trigger for selectively allowing the passage of air through said air outlet.  
23. A method of backwashing the filter media in a floating media biofilter having a filter chamber with waste water flowing there-through, a charge chamber, and a trigger for selectively allowing the transfer of air between said filter chamber and said charge chamber, said method comprising the steps of:  
a. introducing air into said charge chamber while said trigger does not allow any substantial transfer of air between said filter chamber and said charge chamber;  
b. activating said trigger to allow air to flow from said charge chamber to said filter chamber at a rate sufficient to agitate said floating media; and  
c. deactivating said trigger to prevent any substantial transfer of air between said charge chamber and said filter chamber.

5,770,081  
APPARATUS FOR AND METHOD OF REDUCING SOLIDS AND CONTROLLING SURGES IN THE FLOW OF EFFLUENT FROM A WASTEWATER TREATMENT PLANT  
Jerry McKinney, P.O. Box 9337, Beaumont, Tex. 77709  
Filed Mar. 13, 1997, Ser. No. 815,627  
Int. Cl.<sup>6</sup> C02F 3/12  
U.S. Cl. 210—620 12 Claims



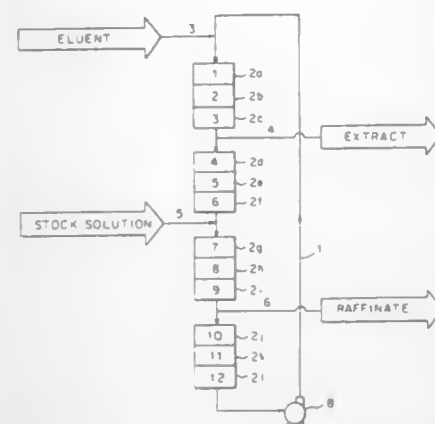
1. In a wastewater treatment plant including an aeration chamber into which wastewater flows to be exposed to aerobic bacteria to convert organic solids in the wastewater to water and CO<sub>2</sub> and a clarifier chamber in which effluent from the aeration chamber flows upwardly toward an outlet pipe through which the effluent flows from the plant, the improvement comprising a surge control weir assembly mounted in the clarifier upstream of the outlet pipe to control the rate wastewater flows out of the plant as a function of the volume entering the aerator, the assembly comprising a vertical tubular housing located in the clarifier chamber upstream of the outlet pipe and extending above and below the outlet pipe, said housing having a lateral opening connected to the outlet pipe, a surge control weir comprising a tubular member of smaller diameter than the housing mounted concentrically within the housing to provide an annular space between the surge control weir and the tubular housing, a seal between the surge control weir and the housing closing the lower end of the annular space, the surge control weir having a plurality of narrow slots through which wastewater can flow into the annular space and through the outlet pipe, and said surge control weir being positioned so that the level of effluent in the annular space, when conditions are static and no effluent is entering or leaving, is about even with the bottom of the lateral opening in the tubular housing and the width and length of the slots being such that as effluent enters the clarifier chamber, the level of effluent in the weir and the clarifier chamber will increase temporarily to accommodate the increased volume and then fall as

U.S. Cl. 210—659 13 Claims

1. A simulated moving bed chromatographic process for separating a mixture of substances, comprising:

forming a circulation circuit comprising a plurality of columns, each provided with an inlet port and an outlet port and packed with a solid adsorbent, said columns being serially and endlessly connected so as to achieve serial and unidirectional fluid flow through said columns at a constant circulation flow rate, and means for pumping a fluid through said columns; introducing a stock solutions containing a plurality of substances to be separated, into one of the columns via the inlet port thereof in order to make strongly adsorbable substances adsorbed on the adsorbent in the column and several columns that follow;





drawing out a portion of a solution rich in other substances weakly adsorbable on the adsorbent via the outlet port of another one of the columns;  
introducing a supercritical fluid as an eluent into still another one of the columns via the inlet port thereof to desorb strongly adsorbable substances from the adsorbent;  
passing the remaining solution and the supercritical fluid through the circuit and recirculating them,  
drawing out a solution rich in the strongly adsorbable substances via the outlet port of further another one of the columns, wherein the position for introducing the supercritical fluid, the position for drawing out the solution containing the strongly adsorbable substances, the position for introducing the stock solution, and the position for drawing out the solution containing the weakly adsorbable substances are arranged in the circulation in this order along the direction of the fluid flow, and the positions are successively moved in the direction of the fluid flow in the circuit by intermittently changing over the position for introducing the supercritical fluid, the position for drawing out the solution containing the strongly adsorbable substances, the position for introducing the stock solution, and the position for drawing out the solution containing the weakly adsorbable substances without changing the order of the positions, wherein, in said changing over step, the circulation flow rate is kept constant without a stepwise increase or decrease in flow as the positions for introducing and for drawing out are successively shifted in the direction of fluid flow.

5,770,089

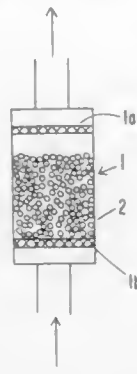
**WATER TREATMENT METHOD USING TOURMALINE**  
Tetsujiro Kubo, 5-12-408, Shibuya 2-chome, Shibuya-ku, Tokyo, Japan, 150

Continuation of Ser. No. 968,142, Oct. 29, 1992, abandoned, which is a continuation-in-part of Ser. No. 874,230, Apr. 27, 1992, abandoned, which is a continuation of Ser. No. 586,973, Sep. 24, 1990, abandoned. This application May 2, 1994, Ser. No. 236,154

Claims priority, application Japan, Oct. 3, 1989, 1-257130  
Int. Cl.<sup>6</sup> C02F 1/28

U.S. Cl. 210—661

7 Claims



1. A water treatment method using tourmaline, which comprises: passing water through a housing containing a plurality of free bodies, the free bodies comprising a mixture of fine tourmaline crystals which possess polarity and an electrically insulating material which electrically insulates the fine tourmaline crystals from one another, wherein the free bodies contain tourmaline crystals which are about 3 microns in size, wherein the free bodies have a spherical shape and a diameter in a range of 3 to 5 millimeters, wherein the free bodies contain 5 to 10% fine tourmaline crystals, 40% of Al<sub>2</sub>O<sub>3</sub> powder more minute than 3 microns, 40% of boric silicic acid group glass powder more minute than 2 microns, and 10% of a clay group molding assistant powder more minute than 3 microns and wherein the housing includes means for passing water through the housing while preventing the passage of free bodies out of the housing, so that the free bodies are brought into contact and collision with one another and so that matters adhered to the surfaces of the free bodies are dislodged therefrom.

5,770,090

**METHOD FOR RECOVERY OF HEAVY METAL FROM WASTE WATER**

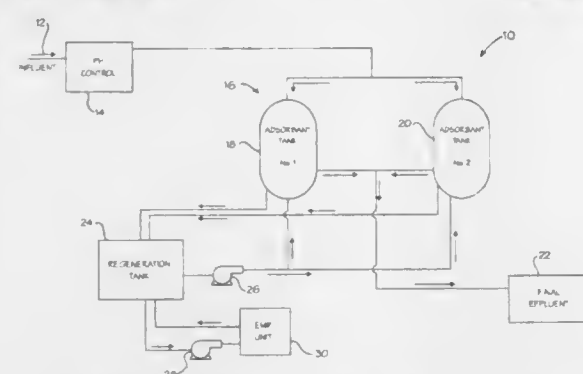
Tom Lewis, III, R.D. #3, Box 135, New Alexandria, Pa. 15670

Continuation of Ser. No. 317,200, Oct. 3, 1994, abandoned, which is a continuation-in-part of Ser. No. 20,206, Feb. 19, 1993, abandoned, which is a continuation-in-part of Ser. No. 387,165, Jul. 28, 1989, abandoned. This application May 21, 1996, Ser. No. 650,959

Int. Cl.<sup>6</sup> C02F 1/28

U.S. Cl. 210—662

14 Claims



1. A method for reclaiming heavy metal from waste water comprising the steps of:  
adjusting the pH of waste water to a range between about 2 to 9, pretreating the surface of a bed of adsorption material by a chemical solution having a pH in the range between about 2 to 9,  
passing the waste water in a stream through a bed of pretreated adsorption material,  
adsorbing the heavy metal present in the waste water onto the surface of the adsorption material,  
directing the waste water free of the heavy metal as an effluent stream away from the bed of adsorption material for discharge,  
monitoring the pH of the effluent stream exiting the bed of adsorption material to evaluate the capacity of the bed to adsorb the heavy metal while the bed remains on line, detecting an increase in pH of the effluent stream to a preselected control point,  
supplying an acid solution of a preselected pH to reactivate the bed of adsorption material while on line when the pH of the effluent stream reaches the control point to restore the adsorptive capacity of the bed,  
maintaining the acid solution in contact with the bed of adsorption material for a preselected period of time until the pH of the surface of the bed of adsorption material is restored to a preselected pH level.

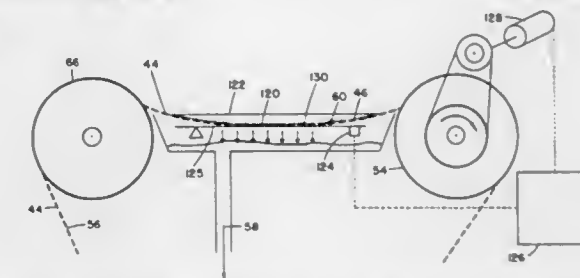
5,770,092

**APPARATUS AND METHOD FOR PURIFYING WATER**  
Eitan Sharir, Ashdod, Israel, assignor to Solar Dynamics Ltd., Ashdod, Israel

Continuation-in-part of Ser. No. 459,544, Jun. 2, 1995, abandoned. This application Mar. 12, 1997, Ser. No. 815,830  
Claims priority, application Israel, Jun. 15, 1994, 110020  
Int. Cl.<sup>6</sup> B01D 33/04;36/04

U.S. Cl. 210—738

16 Claims



16. A method for continuous waste water filtration, comprising the following steps:  
(a) feeding waste water containing suspended solids into a first tank;  
(b) adding a coagulant to said waste water;  
(c) mixing the coagulant into said waste water in said first tank;  
(d) feeding the resultant mixture into a sloped-bottom second tank;  
(e) periodically discharging accumulated solids from said second tank by opening a lower door therein;  
(f) arranging the partially-cleared water to overflow an upper weir of said second tank, so as to fall onto a perforated continuously-driven, non-taut perforated belt, having a surface positioned to receive, at a first location, a stream of said discharged, partially-cleared water, the belt perforations being sized to enable the passage of clear water therethrough while retaining fine and coagulated solids on said surface for subsequent discharge at a second location, and said belt being non-taut to form a trough for retaining a body of water above the surface thereof;  
(g) providing a load sensor in contact with said belt to determine the combined weight of said belt and the water retained thereon and to control a motor of said belt and the speed thereof as a function of said weight, whereby a microcake of less than 1 mm thickness of fine and coagulated solids is formed and retained on the surface of said belt thereby improving the filtering capacity of said belt;  
(h) collecting water which has been filtered by said moving belt; and  
(i) removing solid particles from the surface and perforations of said moving belt.

5,770,093

**CATALYST FOR TREATMENT OF WASTE WATER, METHOD FOR PRODUCTION THEREOF AND METHOD FOR TREATMENT OF WASTE WATER THEREWITH**  
Yusuke Shiota, Tohru Ishii, and Kiichiro Mitsui, all of Hyogo, Japan, assignors to Nippon Shokubai Co., Ltd., Osaka-fu, Japan

Continuation of Ser. No. 364,741, Dec. 27, 1994, abandoned. This application May 2, 1996, Ser. No. 641,839

Claims priority, application Japan, Dec. 28, 1993, 5-335957; Oct. 7, 1994, 6-243593

Int. Cl.<sup>6</sup> C02F 1/72

U.S. Cl. 210—762

20 Claims

1. A method for the treatment of waste water, which comprises subjecting said waste water to wet oxidation treatment with an oxygen-containing gas in the presence of a catalyst under pressure such that said waste water retains the liquid phase thereof at temperatures of not less than 140° C. and less than 370° C., said catalyst consisting essentially of an oxide of manganese obtained by heat-treating a precursor of an oxide of manganese in an oxidiz-

passing an acid stripping solution through the bed of adsorption material to strip the heavy metal from the surface of the adsorption material,  
passing the stripping solution containing the heavy metal to an electrolytic recovery unit,  
electrolytically depositing the heavy metal from the stripping solution onto a cathode terminal in the electrolytic unit,  
recovering the heavy metal deposited onto the cathode terminal, and  
reusing the retained stripping solution in subsequent cycles of stripping heavy metal from the surface of the adsorption material.

5,770,091

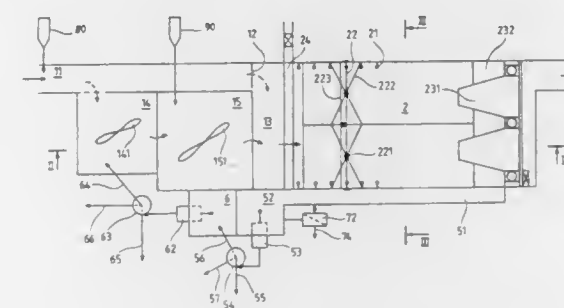
**METHOD OF PLAIN SEDIMENTATION AND PHYSICAL-CHEMICAL SEDIMENTATION OF DOMESTIC OR INDUSTRIAL WASTE WATER**

Patrick Binot, Bussy Saint Martin; Valéry Ursel, Saint Maurice, and Michel Badard, Clamart, all of France, assignors to Omium de Traitement et de Valorisation, France  
Filed Aug. 27, 1996, Ser. No. 703,548

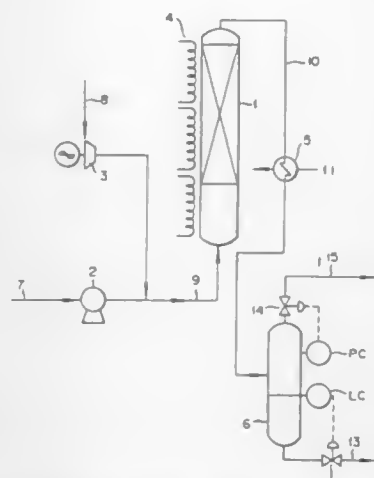
Claims priority, application France, Sep. 21, 1995, 95 11100  
Int. Cl.<sup>6</sup> C02F 1/56

U.S. Cl. 210—711

23 Claims



1. A method of treating a flow of untreated waste water containing particles, said method being capable of handling said flow during periods of a first predetermined flow and further being capable of handling a second predetermined flow in excess of said first predetermined flow, said method comprising the steps of:  
introducing said flow of untreated waste water during periods of said first predetermined flow from an inlet channel having an open valve directly into a sedimentation unit;  
treating said flow by means of sedimentation;  
evacuating said treated flow through a first outlet channel;  
closing said valve and introducing said flow of untreated waste water during periods of said second predetermined flow from said inlet channel into a coagulation area;  
mixing a coagulating agent with said second predetermined flow, said coagulating agent being introduced in predetermined proportions;  
maintaining turbulence within said coagulation area;  
transferring said second predetermined flow into an intermediate area having at least one injection area;  
injecting sand and flocculating agent into said intermediate area; producing turbulence in said at least one injection area wherein said sand is suspended while said particles collect around said sand;  
transferring said second predetermined flow into said sedimentation unit;  
treating said second predetermined flow by means of sedimentation wherein a separation of an effluent and a sludge results; evacuating said effluent through a second outlet channel;  
collecting said sludge;  
separating said sand from said sludge wherein said sand is recycled into said at least one injection area; and  
evacuating said sludge.

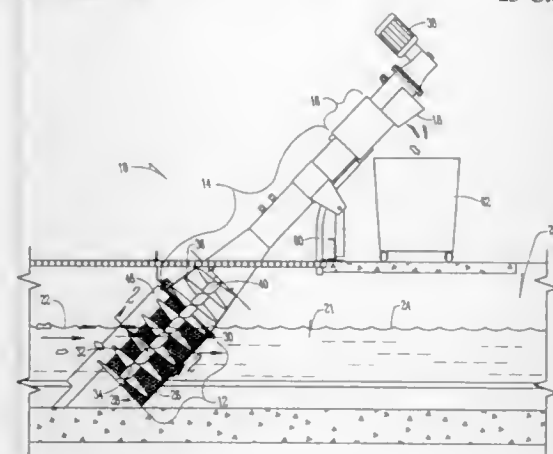


ing atmosphere at a temperature of 300° to 550°, and the oxide of at least one metal selected from the group consisting of iron, titanium, and zirconium, the oxidation level of said oxide of manganese being in the range of  $x=1.7$  to 2.0 as  $MnO_x$ , the BET surface area being in the range of from 5 to 200  $m^2/g$ .

**5,770,094**  
**SCREW CONVEYOR SCREENING APPARATUS FOR REMOVING SOLIDS FROM WASTEWATER**  
M. Shawn Garton, Lucas County, and Michael D. Feehan, Monroe County, both of Iowa, assignors to Johnson Machine Works, Inc., Chariton, Iowa  
Filed Oct. 1, 1996, Ser. No. 723,062  
Int. Cl.<sup>6</sup> B01D 29/48; 37/00

U.S. Cl. 210—791

23 Claims



1. An apparatus for screening solids in waste water treatment comprising:  
a screen trough;  
a plurality of spiral flights extending along a longitudinal axis, the spiral flights having an interior edge and any outer edge; the spiral flights attached at the interior edge to an axle drive shaft positioned along the longitudinal axis and extending to the outer edge;  
the outer edge of the spiral flights nesting within the screen trough which receives and matingly matches a portion of the spiral flights so that when rotated, solids which collect on the screen trough are moved in the direction of the longitudinal axis of the flights, off the screen trough, and to a collection section; and  
a replaceable edge mounted on the outer edge of the spiral flights, the replaceable edge comprising a band having a body which is removable mounted to the outer edge of the spiral flight and a distal surface extending beyond the outer edge, but still allowing the spiral flights to rotate within the screen trough.

23. A method of improving the operation of an apparatus of the type to screen solids from waste water, including a housing defining a water pathway, an inlet to the housing through which unscreening waste water passes into the housing, a straining screen placed across the water pathway in the housing, a rotatable spiral fighting positioned adjacent the screen and having free, unattached inner and outer edges, the straining screen having a shape which closely conforms to the outer edge of the spiral fighting, the method comprising:  
supporting the spiral fighting along its rotational axis;  
utilizing a replaceable outer edge on the spiral fighting; and  
spraying fluid on one or more of the spiral fighting and straining screen during operation.

**5,770,095**  
**POLISHING AGENT AND POLISHING METHOD USING THE SAME**

Yasutaka Sasaki, Kawasaki; Nobuo Hayasaka, Yokosuka; Hisashi Kaneko, Fujisawa; Hideaki Hirabayashi, Tokyo, and Masatoshi Higuchi, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan  
Filed Jul. 11, 1995, Ser. No. 500,753

Claims priority, application Japan, Jul. 12, 1994, 6-159898; Mar. 15, 1995, 7-055290

Int. Cl.<sup>6</sup> H01L 21/00; C23F 1/00; B44C 1/22

U.S. Cl. 216—38

15 Claims

1. A polishing method comprising the steps of:  
forming a film made of material containing a metal as a main component over a substrate having depressed portions on a surface thereof so as to fill said depressed portions with said film; and  
polishing said film by a chemical mechanical polishing method using a polishing agent containing a chemical agent and an etching agent, said chemical agent being responsible for forming a protection film on the surface of said film by reacting with said material containing a metal as a main component, and said etching agent being for etching said material containing a metal as a main component, thereby forming a conductive film in said depressed portions, wherein said metal is Cu or a Cu alloy and said etching agent includes either aminoacetic acid or amidosulfuric acid, and an oxidizing agent and water.

**5,770,096**  
**PATTERN FORMATION METHOD**  
Sang-kyun Lee, Kyungki-do, Rep. of Korea, assignor to Samsung Aerospace Industries, Ltd., Kyongsangnam-do, Rep. of Korea  
Filed Jul. 17, 1996, Ser. No. 682,075

Claims priority, application Rep. of Korea, Jul. 18, 1995, 95-21105

Int. Cl.<sup>6</sup> G03C 5/00

U.S. Cl. 216—41

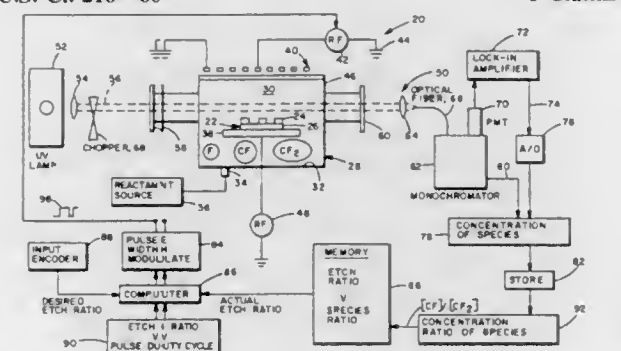
11 Claims

1. A pattern formation method comprising the steps of:  
forming a plating film of a metal insoluble in an etching solution on a substrate;  
forming a photo-sensitive film on said plating film;  
forming a resist pattern by exposing said photo-sensitive film to radiation using a predetermined pattern of a photo mask and then developing;  
forming a plating film pattern by using said resist pattern as a mask;  
etching said substrate by using said plating film pattern as an etching mask.

**5,770,097**  
**CONTROL OF ETCH SELECTIVITY**  
James Anthony O'Neill, New City, and Jyothi Singh, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.  
Division of Ser. No. 363,674, Dec. 23, 1994, Pat. No. 5,683,538. This application Jun. 11, 1997, Ser. No. 873,055  
Int. Cl.<sup>6</sup> H01L 21/302

U.S. Cl. 216—60

5 Claims





5,770,100

## METHOD OF TREATING SAMPLES

Ryooji Fukuyama, 236-14, Nishitoyoi; Makoto Nawata, 1598-35, Nishitoyoi, both of Kudamatsu-Shi, Yamaguchi-Ken; Yutaka Kakehi, 7-13-11, Nijigaoka, Hikari-Shi, Yamaguchi-Ken; Hironobu Kawahara, 68-31, Wakamiya, Kochi; Yoshiaki Sato, 1611-10, Nishitoyoi, both of Kudamatsu-Shi, Yamaguchi-Ken; Yoshimi Torii, 1-3-17, Wakabo-Cho, Tachikawa-Shi, Tokyo; Akira Kawaraya, 1507-2, Higashitoyoi, and Yoshie Sato, 1611-10, Nishitoyoi, both of Kudamatsu-Shi, Yamaguchi-Ken, all of Japan

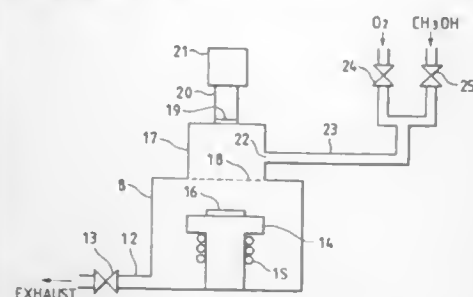
Continuation of Ser. No. 315,260, Sep. 29, 1994, Pat. No. 5,556,714, which is a division of Ser. No. 966,849, Oct. 27, 1992, Pat. No. 5,380,397, which is a continuation of Ser. No. 569,021, Aug. 17, 1990, abandoned. This application Jun. 12, 1996, Ser. No. 662,142

Claims priority, application Japan, Aug. 28, 1989, 1-218523; Nov. 2, 1989, 1-284711; May 9, 1990, 2-117596

Int. Cl.<sup>6</sup> H01L 21/00

U.S. Cl. 216—69

8 Claims



1. A method of treating a sample comprising: a step for etching said sample, said sample having an aluminum-containing wiring material coated with a resist using an etching gas thereby forming residual adhered matter; and a step for removing said residual adhered matter from at least a surface of said sample using a water vapor.

5,770,101

## MAGNETOSTATIC-WAVE DEVICE

Takashi Fujii, Otokuni-gun, and Hiroshi Takagi, Ohtsu, both of Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Continuation-in-part of Ser. No. 179,932, Jan. 11, 1994, abandoned. This application Oct. 5, 1995, Ser. No. 539,597

Claims priority, application Japan, Jan. 11, 1993, 5-019538

Int. Cl.<sup>6</sup> H03H 2/00; H01F 10/04; 10/28

U.S. Cl. 252—62.57

6 Claims



1. A magnetostatic wave device comprising a thin magnetic garnet single-crystal film consisting essentially of yttrium-iron-garnet containing at least one halogen therein in which the molar amount of halogen ranges from 0.0004 to 0.04, wherein the composition of said yttrium-iron-garnet is expressed by the formula  $(Y^{3+}_{3-m}M_m)(Fe^{2+}_yFe^{3+}_{5-y}M'_n)O^{2-}_{12-x/2}X^{1-}_x$  in which X is at least one halogen, M is at least one trivalent element, and M' is at least one divalent or tetravalent metal, m is greater than 0 to less than 3, n is greater than 0 to less than 0.5, x is the molar fraction of divalent iron and y is the molar fraction of halogen.

5,770,102

## ICE NUCLEATING-ACTIVE MATERIALS AND ICE BANK SYSTEM

Kazuo Torii, Miyagi; Hideo Yamamoto, Ibaragi; Katuhiro Miyaji, Chiba, and Norio Murase, Saitama, all of Japan, assignors to Japan as represented by Director General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Feb. 7, 1997, Ser. No. 796,283

Int. Cl.<sup>6</sup> C09K 5/06

U.S. Cl. 252—70

8 Claims

1. In a method for preparing an ice bank system, the improvement for obtaining an energy-saving effect comprising adding a trioctahedral smectite dispersible in water to a liquid in said ice bank system at a concentration of at least 30 ppm to result in dissolving an over-cooling state of said liquid, and freezing the resulting liquid.

5,770,103

## COMPOSITION AND METHOD FOR POLISHING A COMPOSITE COMPRISING TITANIUM

Huey-Ming Wang, Hockessin; Guangwei Wu, Wilmington, both of Del., and Lee Melbourne Cook, Steelville, Pa., assignors to Rodell, Inc., Newark, Del.

Filed Jul. 8, 1997, Ser. No. 889,338

Int. Cl.<sup>6</sup> C09K 13/00; 13/02

U.S. Cl. 252—79.1

17 Claims

1. A composition, which is an aqueous slurry useful for the chemical-mechanical polishing of substrates which comprise titanium, comprising: water, submicron abrasive particles, an oxidizing agent, and a mono-, di-, or tri-substituted phenol wherein at least one of the substituted functional groups is polar.

5,770,104

## DETERGENT COMPOSITIONS CONTAINING SUBSTANTIALLY PURE EG III CELLULASE

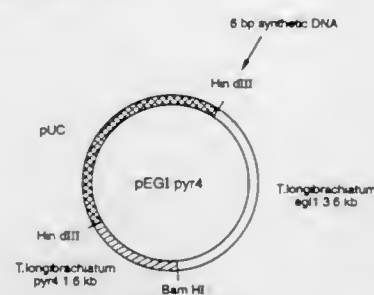
Kathleen A. Clarkson, San Francisco; Edward Larenas, San Carlos, and Geoffrey L. Weiss, San Francisco, all of Calif., assignors to Genencor International, Inc., Rochester, N.Y.

Continuation of Ser. No. 79,546, Jun. 22, 1993, Pat. No. 5,419,778, which is a division of Ser. No. 707,647, May 30, 1991, Pat. No. 5,290,474, which is a continuation-in-part of Ser. No. 668,640, Mar. 13, 1991, abandoned, which is a continuation-in-part of Ser. No. 593,919, Oct. 5, 1990, abandoned. This application Feb. 17, 1995, Ser. No. 390,767

Int. Cl.<sup>6</sup> C11D 3/386

U.S. Cl. 252—174.12

7 Claims



1. A detergent composition suitable for use with cotton-containing fabrics which comprises: a cleaning effective amount of a surfactant or a mixture of surfactants suitable for preparing an alkaline wash medium having a pH of from above 7 to about 10 and from about 0.01 to about 5 weight percent of a cellulase composition comprising at least 40 weight percent of endoglucanase III based on the total weight of exo-cellobiohydrolase, endoglucanase and  $\beta$ -glucosidase proteins in the cellulase composition wherein said endoglucanase III is an endoglucanase component derived from any strain of *Trichoderma* spp. which produces endoglucanase III and having a pH optimum of about 5.5 to

6.0, an isoelectric point of from about 7.2 to 8.0, and a molecular weight of about 23 to 28 Kdaltons.

5,770,105

## METHODS FOR MANUFACTURING STICKY BLEACHING COMPOSITIONS

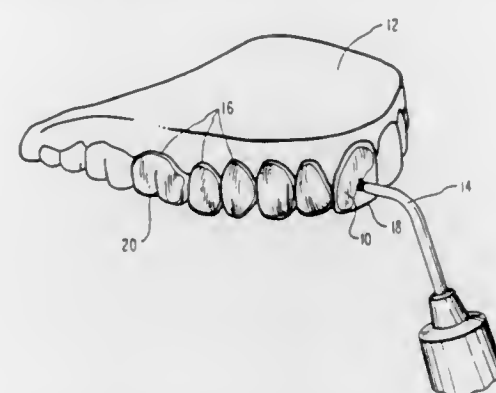
Dan E. Fischer, Sandy, Utah, assignor to Ultradent Products, Inc., South Jordan, Utah

Division of Ser. No. 378,315, Jan. 25, 1995, which is a continuation of Ser. No. 99,247, Jul. 28, 1993, abandoned, which is a continuation of Ser. No. 985,700, Dec. 2, 1992, abandoned, which is a continuation of Ser. No. 718,210, Jun. 20, 1991, abandoned, which is a division of Ser. No. 497,934, Mar. 22, 1990, abandoned. This application Sep. 30, 1996, Ser. No. 722,397

Int. Cl.<sup>6</sup> C01B 15/00; A61K 7/20; A61C 5/00

U.S. Cl. 252—186.25

17 Claims



1. A method for manufacturing a sticky dental bleaching composition adapted to be loaded into a dental tray when used to treat a patient's teeth, the method comprising the steps of:

- (a) mixing together carboxypolyethylene, one or more polyols, and optionally water in sufficient quantities to form a matrix material into which a dental bleaching agent can be dispersed and so that the resulting dental bleaching composition will be sufficiently sticky and resistant to dilution by saliva such that the dental bleaching composition is capable of retaining the dental tray against the patient's teeth for at least about two hours without significant pressure being exerted by the dental tray;
- (b) adding a base in order to adjust the pH of the matrix material to a desired pH;
- (c) dispersing the dental bleaching agent within the matrix material.

5,770,106

## COPOLYMERS FROM POLYALKYLENE OXIDES CONTAINING AN ALLYLGLYCIDYL ETHER REACTIVE DOUBLE BOND AND VINYL ACETATE

Pauls Davis, Gibraltar; Steven D. Gagnon, Detroit, and Eric Lind, Canton, all of Mich., assignors to BASF Corporation, Mt. Olive, N.J.

Continuation of Ser. No. 455,540, Dec. 22, 1989, abandoned.

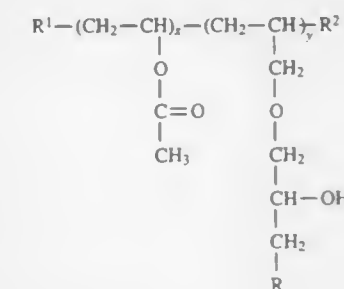
This application Aug. 18, 1992, Ser. No. 931,628

Int. Cl.<sup>6</sup> C09K 3/00

U.S. Cl. 252—182.27

22 Claims

1. A random copolymer having the general formula:



wherein R is a polyalkylene oxide,

R<sup>1</sup> and R<sup>2</sup> are end groups, and

x is equal to or greater than y, and wherein the random copolymer has a number average molecular weight ranging from about 500 to about 5000.

5,770,107

## REACTIVE LIQUID CRYSTALLINE COMPOUND

Ian Hassall; Simon Greenfield, and David Coates, all of Dorset, Great Britain, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Germany

Filed Oct. 4, 1996, Ser. No. 725,511

Claims priority, application European Pat. Off., Oct. 5, 1995, 95115697

Int. Cl.<sup>6</sup> C09K 19/12; 19/20; 19/06

U.S. Cl. 252—299.6

11 Claims

1. A reactive liquid crystalline compound of formula I



wherein

R<sup>1</sup> is CH<sub>2</sub>=CW—COO—,



HWN—, CH<sub>2</sub>=CH<sub>2</sub>— or HS—CH<sub>2</sub>—(CH<sub>2</sub>)<sub>m</sub>—COO— with W being H, Cl or alkyl with 1–5 C atoms and m being 1–7.

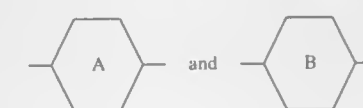
P is alkylene with 1 to 12 C atoms, one or more non-adjacent

CH<sub>2</sub> groups optionally being replaced by —O—,

X is —O—, —S—, —CO—, —COO—, —OCO—, —C=C— or a single bond.

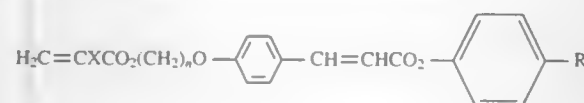
R<sup>2</sup> is an optionally fluorinated alkyl radical with 1 to 15 C atoms, one or more CH<sub>2</sub> groups optionally being replaced by —O—, —S—, —CO—, —COO—, —OCO— or —O—CO—O— in such a manner that oxygen atoms are not linked directly to one another, or alternatively R<sup>2</sup> is halogen, cyano or has independently one of the meanings given for R<sup>1</sup>—P—X—,

Z is —CH<sub>2</sub>—CH<sub>2</sub>—, —COO—, —O—CO—, —CH=CH—COO—, —O—CO—CH=CH— or a single bond.



are each independently 1,4-phenylene or trans-1,4-cyclohexylene, the rings optionally being substituted by one or more alkyl, alkoxy or alkanoyl radicals with 1 to 7 C atoms, —CN, nitro or halogen atoms, and n is 0 or 1.

excluding compounds of the following formula



wherein X is H, Cl or CH<sub>3</sub>, n is 2-12 and R is cyano or alkoxy.

5,770,108

# PYRIMIDINE COMPOUND; AND LIQUID CRYSTAL COMPOSITION AND LIQUID CRYSTAL ELEMENT USING THE SAME

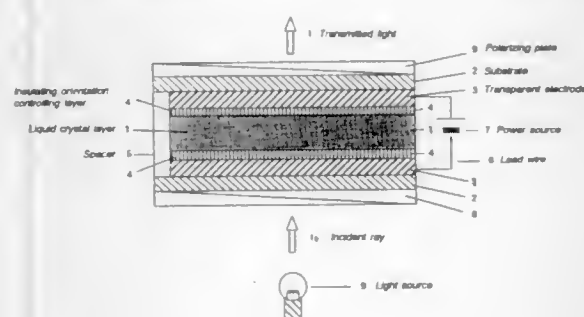
Yoshiyuki Totani, Yokohama; Motokazu Hirao, Hokkaido; Atsuo Otsuji, Yokohama; Tsutomu Ishida, Yokohama; Hiroe Kayashima, Yokohama, and Masakatsu Nakatsuka, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Jun. 21, 1996, Ser. No. 668,157

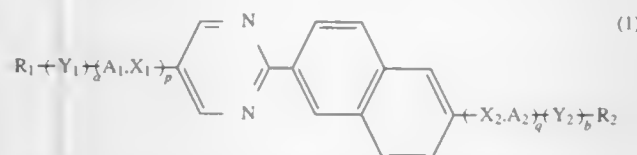
Claims priority, application Japan, Jun. 28, 1995, 7-162099; Aug. 15, 1995, 7-207960

Int. Cl.<sup>6</sup> C09K 19/34; 19/32; C07D 69/76; 239/02  
U.S. Cl. 252-299.61

16 Claims



1. A pyrimidine compound represented by the following Formula (1):



wherein R<sub>1</sub> and R<sub>2</sub> each represent a linear or branched alkyl group or alkoxy group having 1 to 24 carbon atoms or a linear or branched alkenyl group alkenyloxy group having 2 to 24 carbon atoms and each group may be substituted with halogen atoms; the —CH<sub>2</sub>— groups which are present in said alkyl group, alkoxy group, alkenyl group and alkenyloxy group, provided that the adjacent —CH<sub>2</sub>— groups and the —CH<sub>2</sub>— groups bonded to Y<sub>1</sub>, Y<sub>2</sub> or an aromatic ring are excluded, may be substituted with an oxygen atom, a sulfur atom, a —CO— group, a —COO— group, or a —OCO— group; R<sub>1</sub> and R<sub>2</sub> may have asymmetric carbon atoms, and said asymmetric carbon atoms may be optically active; A<sub>1</sub> and A<sub>2</sub> each represent a substituted or unsubstituted 1,4-phenylene group, a pyridine-2,5-diyl group or a trans-1,4-cyclohexylene group; X<sub>1</sub> and X<sub>2</sub> each represent a connecting group selected from a single bond, a —COO— group, a —OCO— group, a —OCH<sub>2</sub>— group and a —CH<sub>2</sub>O— group; Y<sub>1</sub> and Y<sub>2</sub> each represent a —COO— group or a —OCO— group, provided that when Y<sub>1</sub> is a —OCO— group, R<sub>1</sub> is not a linear or branched alkoxy group or alkenyloxy group, and when Y<sub>2</sub> is a —COO— group, R<sub>2</sub> is not a linear or branched alkoxy group or alkenyloxy group; and a, b, p and q each represent 0 or 1, provided that a+b+p and q is not 0 and that when a, p and q each are 0, R<sub>2</sub> is an alkyl group having no optically active asymmetric carbon atoms, or an alkoxy group, alkenyl group or alkenyloxy group each of which may have optically active asymmetric carbons.

5,770,109

# FERROELECTRIC LIQUID CRYSTAL CELL

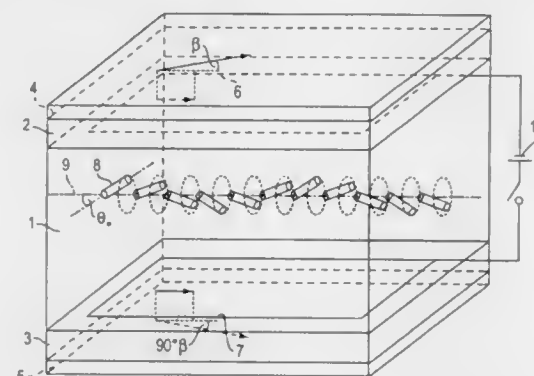
Leonid A. Beresnev; Nina I. Chernova; Vladimir G. Chigrinov; Dmitry I. Dergachev, all of Moscow; Alexander V. Ivashchenko, Dolgoprudny; Marina V. Loseva, Moscow; Boris I. Ostrovskiy, Moscow; Arnold Z. Rabinovich, Moscow; Evgeniy P. Pozhidaev, Moscow, all of Russian Federation; Martin Schadt, Seltisberg, Switzerland, and Victor V. Titov, Moscow, Russian Federation, assignors to Rolic AG, Zug, Switzerland

Division of Ser. No. 486,610, Jun. 7, 1995, Pat. No. 5,676,880, which is a continuation of Ser. No. 340,816, Nov. 17, 1994, which is a continuation of Ser. No. 200,939, Feb. 23, 1994, abandoned, which is a continuation of Ser. No. 76,487, Jun. 14, 1993, abandoned, which is a continuation of Ser. No. 964,482, Oct. 21, 1992, abandoned, which is a continuation of Ser. No. 771,824, Oct. 7, 1991, abandoned, which is a continuation of Ser. No. 641,953, Jan. 16, 1991, abandoned, which is a continuation of Ser. No. 243,756, Sep. 13, 1988, abandoned.

This application May 23, 1997, Ser. No. 862,858  
Claims priority, application Switzerland, Sep. 18, 1987, 3607/87; Sep. 21, 1987, 3640/87; Sep. 25, 1987, 3722/87; Apr. 26, 1988, 1555/88

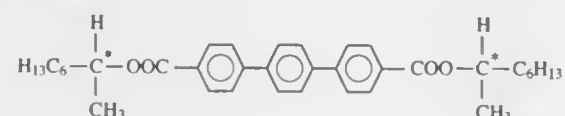
Int. Cl.<sup>6</sup> C09K 19/12; G06F 1/1333  
U.S. Cl. 252-299.65

1 Claim



1. An electro-optical cell comprising:
  - a) front and rear transparent plate means;
  - b) means for applying an electric potential to the plate means;
  - c) a chiral ferroelectric smectic liquid crystal disposed between the plate means and having a helical structure which is influenced by the action of the electrical potential means so as to alter its optical anisotropy; and
  - d) surface orientation means disposed on each surface of the plate means adjacent the liquid crystal so as to align the molecules of the liquid crystal in a predetermined manner; and
  - e) front and rear polarisers disposed respectively on the surface of the front and rear plate means opposite to the surface of orientation means;

such that the ratio of d/p of the thickness d of the liquid crystal to the pitch height p of the helical twisting is greater than about 5, the smectic tilt angle θ, is between about 22.5° and about 50° and the product of the thickness d, the square of the tilt angle θ, and the value of the birefringence Δn and the reciprocal of the wavelength λ of light (phase factor) is greater than about 0.45 μm, and wherein the liquid crystal comprises the following mixture 26.1 wt. % 5-octyl-2-[p-(octyloxy) phenyl] pyrimidine, 17.1 wt. % 5-octyl-2-[p-(nonyloxy) phenyl] pyrimidine, 24.5 wt. % 5-octyl-2-[p-(decyloxy) phenyl] pyrimidine, 32.3 wt. % of the chiral additive of the formula:



5,770,110

# UV-ACTIVE REGENERATED CELLULOSE FIBER

Andreas Schrell, and Stefan Meier, both of Frankfurt, Germany, assignors to Hoechst Aktiengesellschaft, Germany  
Filed Oct. 23, 1996, Ser. No. 736,358

Claims priority, application Germany, Oct. 23, 1995, 195 39 315.5

Int. Cl.<sup>6</sup> D01F 10/10; C09K 11/02; 11/08

U.S. Cl. 252-301.36

10 Claims

1. Luminescent regenerated cellulose fiber comprising one or more inorganic luminophors selected from the group consisting of the phosphates, tungstates, oxides, silicates and aluminates of the alkaline earth metals, of the subgroup elements or of the rare earths and the halides of the alkali and alkaline earth metals doped with one or more activators selected from the group consisting of Mn<sup>2+</sup>, Mn<sup>4+</sup>, Sb<sup>2+</sup>, Pb<sup>2+</sup>, Cu<sup>+</sup>, Ag<sup>+</sup> and the rare earths, and wherein the inorganic luminophors have an average particle size of less than 1 μm.

5,770,111

# PHOSPHOR WITH AFTERGLOW CHARACTERISTIC

Hirofumi Moriyama; Tomofumi Moriyama, and Teruo Goto, all of Kanagawa, Japan, assignors to Kabushiki Kaisha Tokyo Kagaku Kenkyusho, Kanagawa, Japan  
PCT No. PCT/JP96/01014, § 371 Date Nov. 26, 1996, § 102(e)  
Date Nov. 26, 1996, PCT Pub. No. WO96/32457, PCT Pub. Date Oct. 17, 1996

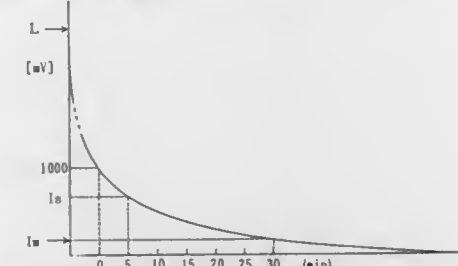
PCT Filed Apr. 12, 1996, Ser. No. 737,906

Claims priority, application Japan, Apr. 14, 1995, 7-112574

Int. Cl.<sup>6</sup> C09K 11/80; 11/64

U.S. Cl. 252-301.4 R

17 Claims



1. A phosphor having afterglow characteristics, which comprises a matrix containing an Eu<sup>2+</sup> activated strontium aluminate phosphor substance, wherein said phosphor has a chemical composition expressed by:



where Sr+Eu+Pb=1, Al+Bi=2y, said phosphor having a chemical composition of (Sr<sub>0.955</sub>, Eu<sub>0.03</sub>, Pb<sub>0.015</sub>)Al<sub>2.991</sub>Bi<sub>0.009</sub>O<sub>5.5</sub>.

5,770,112

# OIL-IN-ALCOHOL EMULSIFIED COMPOSITION

Takayuki Omura; Teruhiko Hineno; Tomiyuki Nanba; Haruo Ogawa, and Kazuaki Suzuki, all of Yokohama, Japan, assignors to Shiseido Co. Ltd., Tokyo, Japan  
PCT No. PCT/JP96/01939, § 371 Date Mar. 11, 1997, § 102(e)  
Date Mar. 11, 1997, PCT Pub. No. WO97/02888, PCT Pub. Date Jan. 30, 1997

PCT Filed Jul. 12, 1996, Ser. No. 793,865

Claims priority, application Japan, Jul. 12, 1995, 7-199102

Int. Cl.<sup>6</sup> B01J 13/00; A61K 7/075; 7/08; 7/11

U.S. Cl. 252-308

4 Claims

1. An oil-in-alcohol emulsified composition comprising:  
(a) an oily component,  
(b) a lower alcohol,  
(c) water, and  
(d) an emulsifier which comprising one or more of polyether-modified silicones represented by the following general for-

mula (1):



wherein A is a polyalkylene group shown as the general formula: —C<sub>3</sub>H<sub>6</sub>O(C<sub>2</sub>H<sub>4</sub>O)<sub>a</sub>(C<sub>3</sub>H<sub>6</sub>O)<sub>b</sub>R' (wherein R' is selected from the group consisting of a hydrogen atom, an acyl group, and an alkyl group having a carbon number of 1 to 4, a is an integer of 5 to 50, and b is an integer of 5-50); R is a methyl group or a phenyl group; m is an integer of 150 to 1,000; and n is an integer of 1 to 40.

5,770,113

# ZINC OXIDE CERAMICS AND METHOD FOR PRODUCING THE SAME

Atsushi Iga; Hideyuki Okinaka, and Masahiro Ito, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

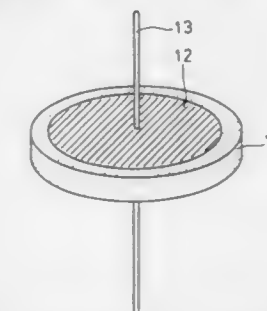
Filed Mar. 5, 1996, Ser. No. 610,837

Claims priority, application Japan, Mar. 6, 1995, 7-045980; Jul. 13, 1995, 7-177634

Int. Cl.<sup>6</sup> H01B 1/08; C01G 9/02

U.S. Cl. 252-519.51

20 Claims



1. A method for producing a zinc oxide ceramic, comprising: preparing a composition comprising:  
100 parts by weight of zinc oxide as a first component;  
0.1 to 5.0 parts by weight of at least one of cobalt oxide and manganese oxide as a second component; and  
0.2 to 20 parts by weight of a powder mixture of oxides of bismuth, titanium and antimony as a third component; and  
sintering the composition,  
wherein the powder mixture is heated at temperature of 450° to 800° C. before the composition is formed.

5,770,114

# UV STABILIZED COMPOSITIONS WITH IMPROVED SOLUBILITY

Harlan J. Byker, and Ramanujan Srinivasa, both of Holland, Mich., assignors to Gentex Corporation, Zeeland, Mich.

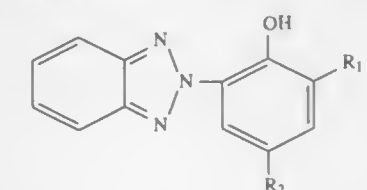
Filed Aug. 6, 1997, Ser. No. 906,750

Int. Cl.<sup>6</sup> G02F 1/00; 1/15; F21V 9/04

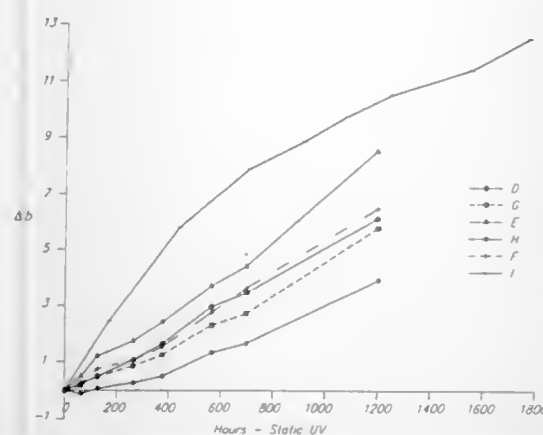
U.S. Cl. 252-583

30 Claims

1. A UV-stabilized composition which comprises (a) an aprotic polar solvent, (b) at least one electrochromic compound, and (c) a compound of the formula I







wherein  $R_1$  is H, a straight or branched alkyl group containing 1 to 18 carbons, or  $R_3-COO-R_4$ , where  $R_3$  is a single bond, or is a straight or branched alkylene group containing 1-6 carbons and  $R_4$  is a straight or branched alkyl group containing 1-18 carbons, and if  $R_1$  is H or a straight or branched alkyl group containing 1 to 18 carbons, then  $R_2$  is  $R_3-COO-R_4$ , and if  $R_1$  is  $R_3-COO-R_4$ , then  $R_2$  is H, a straight or branched alkyl group containing 1 to 18 carbons, or  $R_5-COO-R_6$ , where  $R_5$  is a single bond, or is a straight or branched alkylene group containing 1 to 6 carbons, and  $R_6$  is a straight or branched alkyl group containing 1-18 carbons.

**5,770,115**  
**PHOTOCHROMIC NAPHTHOPYRAN COMPOSITIONS OF IMPROVED FATIGUE RESISTANCE**  
Michael S. Misura, Clinton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 19, 1996, Ser. No. 639,855  
Int. Cl.<sup>6</sup> G02B 5/23

U.S. Cl. 252-586 23 Claims

1. A composition comprising, in combination, a carrier, a photochromic amount of organic photochromic naphthopyran material, and an amount of a stabilizer system comprising, in combination,
- (a) 5 to 50 weight percent of at least one polyphenolic antioxidant,
  - (b) 5 to 50 weight percent of organic ultraviolet light absorber, and
  - (c) 10 to 90 weight percent of at least one hindered amine light stabilizer,

said stabilizer system being sufficient to provide a reduction of at least 30% in the % Photopic Fatigue of said naphthopyran material, the weight ratio of the photochromic naphthopyran material to the stabilizer system being from 2.5:1 to 1.5:1.

**5,770,116**  
**GAME HUNTER'S SYSTEM AND KIT FOR TRACKING A WOUNDED ANIMAL AT NIGHT**  
Albert E. Byrne, Jr., 1323 Polo Run Dr., Yardley, Pa. 19067

Filed Aug. 5, 1996, Ser. No. 692,268  
Int. Cl.<sup>6</sup> C09K 3/00; F21K 2/00

U.S. Cl. 252-700 12 Claims

1. A kit comprising:
- (i) a first container for and containing a pre-measured amount of a chemiluminescent chemical capable of emitting visible light on contact with animal blood,
  - (ii) a second container for and containing a pre-measured amount of a peroxy oxidizing agent,
  - (iii) an amount of aqueous solvent for said pre-measured amounts of (i) and (ii) which is free from contaminants that would inhibit the functioning of component (i),
  - (iv) a vessel suitable for mixing components (i), (ii) and (iii), and
  - (v) a device suitable for delivering the resulting mixture or solution as a spray from said vessel to an area of terrain

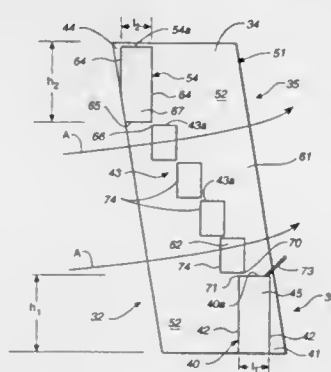
suspected of having blood deposits thereon, whereby said spray upon contact with said blood will luminesce and emit visible light enabling recognition by a hunter of the presence of said blood and to assist in tracking and locating a wounded game animal.

**5,770,117**  
**UPPER AND LOWER CROSSFLOW FILM FILL STACK FOR A COOLING TOWER**  
Peter M. Phelps, 15 Buckeye Way, Kentfield, Calif. 94904

Continuation of Ser. No. 425,450, Apr. 20, 1996, abandoned, which is a division of Ser. No. 199,513, Feb. 22, 1994, Pat. No. 5,427,718. This application Oct. 15, 1996, Ser. No. 729,939  
Int. Cl.<sup>6</sup> B01D 45/00

U.S. Cl. 261-23.1

10 Claims



1. A crossflow cooling tower for contacting liquid and gas comprising:

- at least one upright sidewall having a gas inlet opening;
- a liquid supply device for supplying gravitating liquid to an upper portion of the tower;
- a gas outlet opening;
- a liquid collecting basin;
- a fill apparatus having a crossflow film fill assembly positioned vertically adjacent to and below said liquid supply device, and including:
  - a lower crossflow film fill section disposed in the lower inboard corner of the tower proximal to said gas outlet opening and said liquid collecting basin, said lower crossflow film fill section being defined by opposing top and bottom surfaces, and generally upright sides;
  - an upper crossflow film fill section disposed in the upper outboard corner of the tower proximal to said gas inlet opening and liquid supply device, said upper crossflow film fill section being defined by generally upright sides and opposing top and bottom surfaces; and
  - a stair-stepped series of intermediate crossflow film fill sections extending from a location proximal a lower portion of said upper crossflow film fill section to a location proximal to an upper portion of the lower crossflow film fill section, each of said intermediate crossflow film fill sections being defined by generally upright sides and opposing top and bottom surfaces, and substantially all of the gas flowing from said gas inlet opening to said gas outlet opening flows through at least one of said upper, lower, and intermediate crossflow film fill sections;

said lower crossflow film fill section having a height at least twice the average height of the stair-stepped intermediate crossflow film fill sections from the respective bottom surface to the top surface, and the lower crossflow film fill section top surface being positioned at a vertical inboard location, relative to the liquid supply device, at least about 20% to 60% of the vertical height of said fill apparatus to increase impingement of the gravitating liquid, distributed from an inboard portion of said liquid supply device, with the lower film fill section top surface; and

said upper, lower and intermediate crossflow film fill sections comprising a plurality of sheets cooperating to form said sections in integral units with adjacent sheets defining passages for gas and liquid, said sheets being substantially aligned to define a gas path extending generally from said gas inlet opening toward said gas outlet opening and being substantially vertically disposed to provide an essentially vertical path to liquid gravitating from said liquid supply device.

**5,770,118**  
**BUBBLE GENERATOR FOR A WASHING MACHINE**  
Jea-Yoll Lee, Kyunggi-Do, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

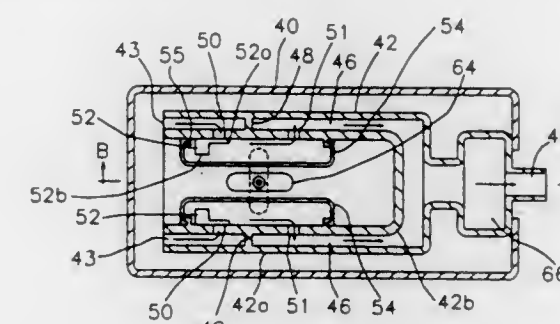
Filed Nov. 21, 1996, Ser. No. 752,744

Claims priority, application Rep. of Korea, Nov. 22, 1995, 1995-34729

Int. Cl.<sup>6</sup> B01F 3/04

U.S. Cl. 261-30

8 Claims



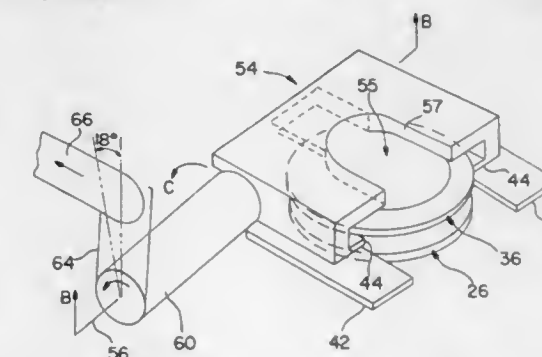
1. A bubble generator for a washing machine comprising:

- a housing;
  - a body including an inner wall and an outer wall, having inlets for inflow of air at one side thereof and outlets for outflow of air at the other side thereof, having passages for communicating said inlets with said outlets, said passages being defined by said inner and outer walls, having partitions for closing said passages, said partitions being formed adjacent to said inlets on the way of said passages, having spaces for expanding compressed air, said spaces being formed adjacent to said outlets, and having opposite pairs of holes formed at said inner wall, each pair of holes thereof being positioned so that portion of said inner wall at which one of said partitions is provided intervenes therebetween, said body being installed within said housing to expose said outlets out of said housing;
  - a pair of bellows provided opposite to each other on said inner wall of said body;
  - an actuating cam for vibrating the pair of bellows by rotation provided between the pair of bellows, said actuating cam having a width shorter than a distance between the pair of bellows and a length longer than the distance therebetween;
  - driving means for rotating said actuating cam;
  - elastic blocking means for intermittently closing a hole of each pair of holes provided adjacent to said inlets in response to pressure change within said passages,
- wherein said elastic blocking means is deformed to open said hole closed by said elastic blocking means if the pair of bellows are inflated, while said elastic blocking means is restored to their original shape to close said hole if the pair of bellows are contracted; and
- each of the pair of bellows is airtightly attached on said inner wall to surround each pair of holes and said blocking means.

**5,770,119**  
**LASER DEMOLDING METHOD**  
Craig William Walker, and Henri Armand Dagobert, both of Jacksonville, Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.  
Continuation of Ser. No. 464,244, Jun. 5, 1995, abandoned, which is a division of Ser. No. 257,801, Jun. 10, 1994, abandoned, which is a continuation of Ser. No. 207,443, Mar. 7, 1994, Pat. No. 5,417,557, which is a division of Ser. No. 947,218, Sep. 18, 1992, Pat. No. 5,294,379. This application Apr. 10, 1996, Ser. No. 631,725  
Int. Cl.<sup>6</sup> B29D 11/00

U.S. Cl. 264-1.37

12 Claims



1. A method for demolding a mold assembly, comprising a first front mold portion which has a central mold section with a surrounding flange, and a corresponding second back mold portion which has a central mold section with a surrounding flange, and having a molded ophthalmic lens formed between the front and back mold portions, and wherein the flanges of the front and back mold portions are spaced apart relative to each other, comprising:

- a restraining the first mold portion of the mold assembly by restraining fingers which are positioned between and on opposite sides of the spaced flanges of the first and second mold portions and against the flange of the first mold portion;
- positioning separating fingers between and on opposite sides of the spaced flanges of the first and second mold portions and against the flange of the second mold portion; and
- rotating the separating fingers about a fixed axis relative to the restrained first mold portion to progressively separate and peel the second mold portion from the molded ophthalmic lens in the first mold portion.

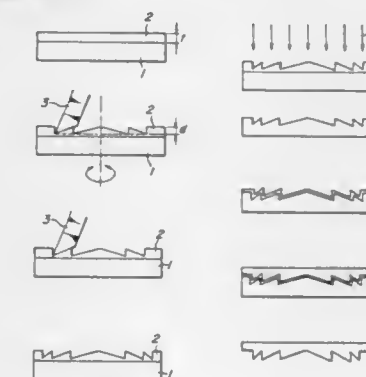
**5,770,120**  
**METHOD OF MANUFACTURING DIE AND OPTICAL ELEMENT PERFORMED BY USING THE DIE**  
Yasuhiro Kamihara, and Hitoshi Ohashi, both of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan  
Filed Dec. 11, 1995, Ser. No. 570,508

Claims priority, application Japan, Dec. 9, 1994, 6-306321; Dec. 9, 1994, 6-306322

Int. Cl.<sup>6</sup> B44C 1/22

U.S. Cl. 264-1.27

20 Claims



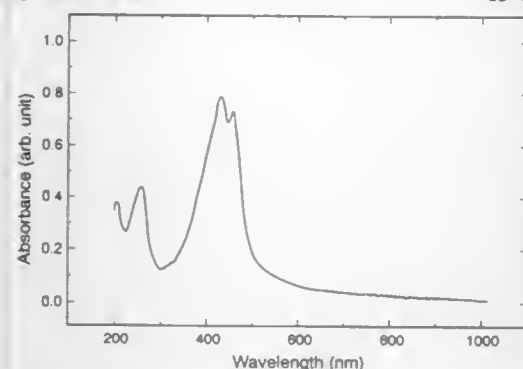
1. A method of manufacturing a die for optical elements, said method comprising:

- (a) forming a workpiece film on a substrate;  
(b) mechanically machining the workpiece film in a required configuration;  
(c) subjecting the workpiece film mechanically machined in the required configuration and the substrate to etching to transfer the required configuration of the workpiece film onto the substrate analogously in a depth direction; and  
(d) forming a die by using the substrate etched in step (c) as a master matrix.

5,770,121  
**SOLID STATE COAGULATION OF OPTICAL QUALITY POLYMER THIN FILMS**  
Chyi-Shan Wang, Beavercreek; Jar-Wha Lee, Dublin, both of Ohio, and D. Mark Husband, APO AE, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 18, 1996, Ser. No. 759,819  
Int. Cl.<sup>6</sup> B29D 7/00

U.S. Cl. 264—2.6 15 Claims

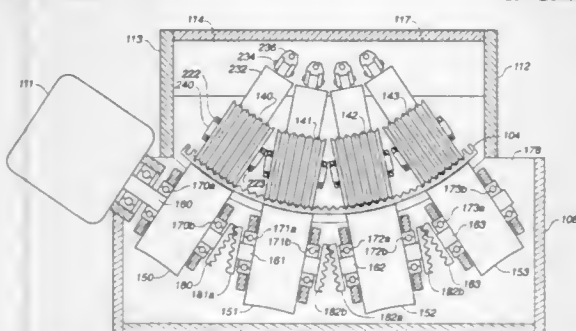


1. A method for preparing optical quality, thin films of polymers and co-polymers, which comprises:  
(a) preparing a 0.1 to about 5.0 weight percent solution of the polymer or co-polymer in a suitable solvent;  
(b) forming a film from the solution;  
(c) rapidly cooling the thus-formed film to a temperature below the freezing point of the solvent;  
(d) dissolving the solvent out of said film at a temperature below the melting point of the solvent; and  
(e) drying the film.

5,770,122  
**ROLL FORMER FOR AN EXTRUDED FRESNEL LENS**  
Donald B. Curchod, 1023 Los Trancos Rd., Portola Valley, Calif. 94028

Filed Apr. 11, 1997, Ser. No. 834,650  
Int. Cl.<sup>6</sup> B29D 11/00

U.S. Cl. 264—2.7 19 Claims



1. Roll-forming apparatus for shaping an extruded plastic Fresnel lens, comprising:  
means for providing a moving, extruded arcuate, elongated linear Fresnel lens formed from thermoplastic material mov-

ing in a longitudinal direction, the outer surface of which is smooth and on the inner surface of which are formed a series of elongated grooves which serve as lens sections, which are spaced side-by-side across the width of the lens;

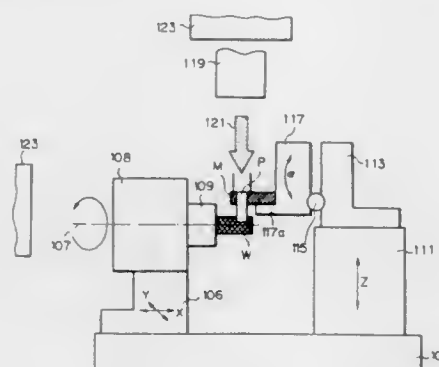
- a support frame;  
a drive/support roller, which is rotatably mounted to the support frame and the surface of which engages and rotates to support the smooth outer surface of the extruded arcuate, elongated linear Fresnel lens as the Fresnel lens moves in the longitudinal direction;  
a tooth-forming roller, which is rotatably mounted to the support frame and which has an external profile with tooth-forming projections formed thereon for engagement with the grooves on the inner surface of the extruded sheet, said tooth-forming roller being positioned on the inner surface of the Fresnel lens opposite the drive/support roller and being loosely mounted on the support frame to forceably track the grooves formed in the Fresnel lens to improve the profile of the lens section by sharpening the root radius and flattening the optical face of each lens section.

5,770,123  
**METHOD AND APPARATUS FOR ENERGY BEAM MACHINING**

Masahiro Hatakeyama; Katsunori Ichiki, both of Kanagawa-ken; Tadasuke Kobata, Tokyo; Masayuki Nakao, Chiba-ken, and Yotaro Hatamura, 2-12-11, Kohinata, Bunkyo-ku, Tokyo, all of Japan, assignors to Ebara Corporation, and Yotaro Hatamura, both of Tokyo, Japan

Filed Sep. 21, 1995, Ser. No. 531,698  
Claims priority, application Japan, Sep. 22, 1994, 6-228235; Dec. 9, 1994, 6-306496

Int. Cl.<sup>6</sup> B29C 59/16 34 Claims  
U.S. Cl. 264—1.21



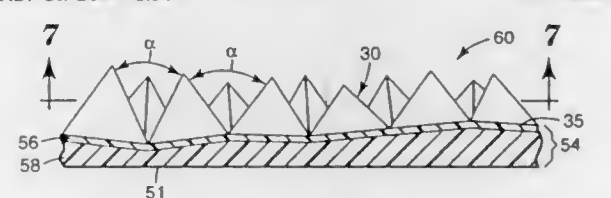
1. A method of machining a pattern in a workpiece, said method comprising:  
emitting an energy beam from an energy beam source;  
passing a portion of said energy beam through a beam transmission hole of a predetermined shape defined in a mask, to thereby form a shaped energy beam having a shape corresponding to said predetermined shape;  
irradiating said shaped energy beam onto said workpiece and thereby machining said workpiece; and  
changing at least one of a relative positional relationship between said energy beam source and said mask and a relative positional relationship between said mask and said workpiece, and thereby machining said pattern into said workpiece while changing an amount of irradiation of said shaped energy beam onto different portions of said workpiece and thus controlling the depth of machining thereof.

5,770,124  
**METHOD OF MAKING GLITTERING CUBE-CORNER RETROREFLECTIVE SHEETING**

Paul E. Marecki, May Township; Jeanine M. Shusta, Mahomed; Matthew R. Atkinson, Cottage Grove; Cheryl M. Frey, White Bear Lake, and Olester Benson, Jr., Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 30, 1996, Ser. No. 641,129  
Int. Cl.<sup>6</sup> B29D 11/00

U.S. Cl. 264—1.36 28 Claims



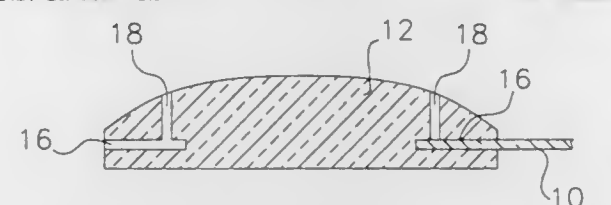
1. A method of making a glittering retroreflective sheeting, which method comprises:  
(a) providing a first retroreflective sheeting that includes an array of cube-corner elements arranged in a repeating pattern; and  
(b) exposing the first retroreflective sheeting to heat, pressure, or a combination thereof to produce a second glittering retroreflective sheeting that comprises an array of cube-corner elements that are randomly tilted, the cube-corner elements becoming randomly tilted from the heat, pressure, or the combination thereof other than through securing a seal film to the first retroreflective sheeting.

5,770,125  
**HAPTIC ATTACHMENT SYSTEM FOR INTRAOCULAR LENSES USING DIODE LASER**

John J. O'Connor, Rowland Heights, and Lawrence Y. Wissman, Anaheim Hills, both of Calif., assignors to Mentor Corporation, Santa Barbara, Calif.

Filed Nov. 27, 1995, Ser. No. 562,658  
Int. Cl.<sup>6</sup> B29D 11/00

U.S. Cl. 264—1.37 10 Claims



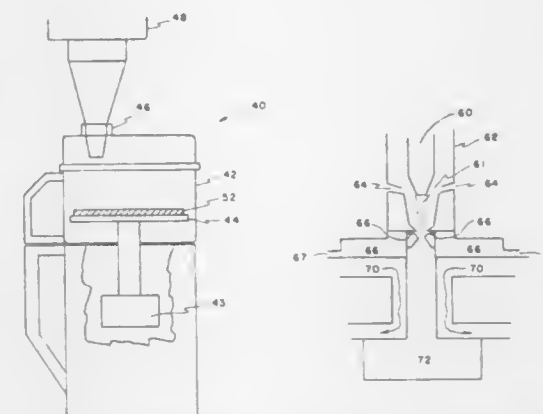
1. A method for staking a haptic having a first end to an optic having an upper surface comprising the steps of:  
inserting the haptic first end into the optic;  
melting a portion of the inserted haptic first end using a diode laser beam having a wavelength in the range from about 800 to about 840 nm; and  
cooling the melted haptic to coalesce into a bead, anchoring the haptic to the optic.

5,770,126  
**HIGH PRODUCING RATE OF NANO PARTICLES BY LASER LIQUID INTERACTION**

Jogender Singh; Eric Whitney, and Paul E. Denney, all of State College, Pa., assignors to The Penn State Research Foundation, University Park, Pa.

Filed Sep. 5, 1996, Ser. No. 708,425  
Int. Cl.<sup>6</sup> B29B 9/00; B05B 17/04

U.S. Cl. 264—8 8 Claims  
1. A process for producing nano-scale particles comprising the steps of:



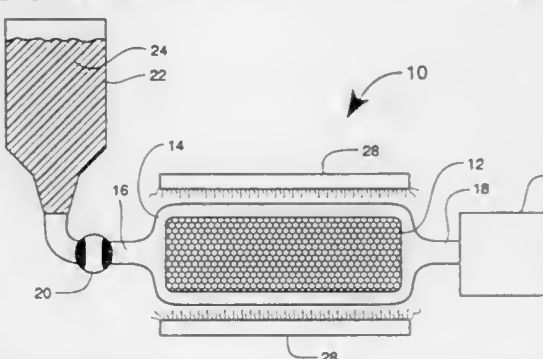
- a. placing a substrate on a rotatable specimen holder that is inside a reactive chamber, where said specimen holder is rotatable by a drive source;  
b. filling said reactive chamber with a liquid precursor solution to a level above said substrate;  
c. rotating said specimen holder and therefore said substrate by engaging said drive source;  
d. irradiating said rotating substrate and said liquid precursor solution with a laser beam;  
e. removing irradiated liquid precursor solution from said reactive chamber; and  
f. separating nano-scale particles from the irradiated liquid precursor solution by use of a centrifugal separator.
5. A process for producing nano-scale particles comprising the steps of:  
a. mixing a liquid precursor solution with a carrier gas creating a mixture for injection into a plasma nozzle;  
b. irradiating said mixture with a laser beam while said mixture is flowing through said plasma nozzle;  
c. allowing nano-scale particles to settle from said irradiated mixture into a collection chamber;  
d. allowing remaining gases to vent from said collection chamber; and  
e. collecting said nano-scale particles from said collection chamber.

5,770,127  
**CARBON OR GRAPHITE FOAM REINFORCED COMPOSITES**

Frances L. Abrams, New Carlisle; Joseph W. Hager, and Richard B. Hall, both of Dayton, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 15, 1996, Ser. No. 692,902  
Int. Cl.<sup>6</sup> C01B 31/00

U.S. Cl. 264—29.1 4 Claims



1. A method for making a carbon or graphite reinforced composite structure comprising the steps of:  
(a) providing a flexible bag for holding a rigid porous carbon preform, the flexible bag having a first end and a second end with openings at each end;



- (b) providing a matrix resin inlet valve, attached to the opening at the first end of the bag, for enabling and disabling a flow of matrix resin to the bag;
- (c) providing a matrix resin source, containing a quantity of matrix resin, attached to the matrix resin inlet valve;
- (d) providing a vacuum port, connected to the opening at the second end of the bag, for coupling the bag to a vacuum source;
- (e) providing a vacuum source connected to the vacuum port;
- (f) providing a heat source for providing heat to the preform held inside the bag;
- (g) placing the preform inside the flexible bag;
- (h) next, activating the vacuum source to create a vacuum inside the bag;
- (i) next, heating the bag and the preform;
- (j) next, opening the matrix resin inlet valve to allow the matrix resin to flow into the bag and amply impregnate the preform;
- (k) after the matrix resin is amply impregnated into the foam preform, closing the matrix resin inlet valve; and,
- (l) next, heating the bag and impregnated foam preform to cure the preform to result in the reinforced composite structure.

5,770,128

## METHOD OF TRANSFER MOLDING AND A TRANSFER MOLDING MACHINE

Kazuhiko Kobayashi; Ryoichi Arai; Yasuhiko Miyashita, and Kazumi Sawazaki, all of Togura-machi, Japan, assignors to Apic Yamada Corporation, Nagano, Japan

PCT No. PCT/JP93/00468, § 371 Date Dec. 8, 1993, § 102(e) Date Dec. 8, 1993, PCT Pub. No. WO93/20996, PCT Pub. Date Oct. 25, 1993

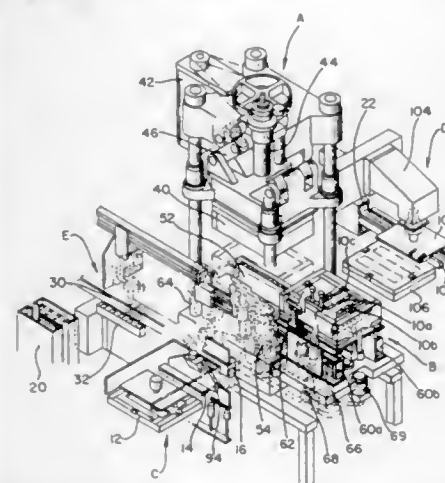
PCT Filed Apr. 12, 1993, Ser. No. 157,114

Claims priority, application Japan, Apr. 13, 1992, 4-119697; Aug. 27, 1992, 4-252114; Nov. 2, 1992, 4-317810; Dec. 1, 1992, 4-349916; Dec. 1, 1992, 4-349917

Int. Cl.<sup>6</sup> B29C 45/02; 45/14

U.S. Cl. 264—39

15 Claims



1. A method for transfer molding, in a transfer molding machine comprising:

- a mold having an upper die and a lower die;
- a plurality of pots being provided in said lower die; and
- a plurality of plungers being provided, respectively, in each said pot in said lower die, said plungers being capable of moving in said pots and a plunger holder operatively connected to said plurality of plungers for imparting mutual movement to said plurality of plungers from beneath said lower die, said plunger holder being detachably connected to a platen for imparting movement to said plunger holder and said plurality of plungers, said method comprising the steps of:
- setting insert-parts into said mold;
- supplying resin tablets into said pots;
- clamping said insert-parts by said upper die and said lower die; and

exerting pressure on resin melt by imparting movement to said platen and said plunger holder for imparting mutual movement to said plurality of plungers disposed in said lower die, so as to fill cavities in said mold with said resin, wherein said insert-parts are clamped and molded at a molding position at which said upper die and said lower die are faced relative to each other;

opening said mold after molding, wherein said lower die and said plurality of plungers are simultaneously moved to a first position, adjacent to a side of the molding position; and removing molded products from said lower die at the first position for inserting parts for next molding operation and supplying resin tablets for next molding operation, then returning said lower die to the molding position for the next molding, wherein said transfer molding machine further comprises:

an unloading mechanism for taking out said molded products and cleaning said lower die, said unloading mechanism being capable of moving between the position above the first position and a first switching position, which is on one side of the first position; and

a parts-loading mechanism for setting said insert-parts into said lower die, said parts-loading mechanism being capable of moving between the position above the first position and a second switching position, which is on the other side of the first position, and

wherein said method further includes the following steps: moving said unloading mechanism to the position above the first position before said lower die is moved to the first position; removing the molded products by said unloading mechanism upon said lower die reaching the first position, and cleaning a parting face of said lower die during the movement toward the first switching position; and moving said parts-loading mechanism from the second switching position to the position above the first position for setting next insert-parts into said lower die while said unloading mechanism moves to the first switching position.

5,770,129

## APPARATUS AND METHOD FOR CONTROLLING MASS FLOW IN AN EXTRUSION DIE

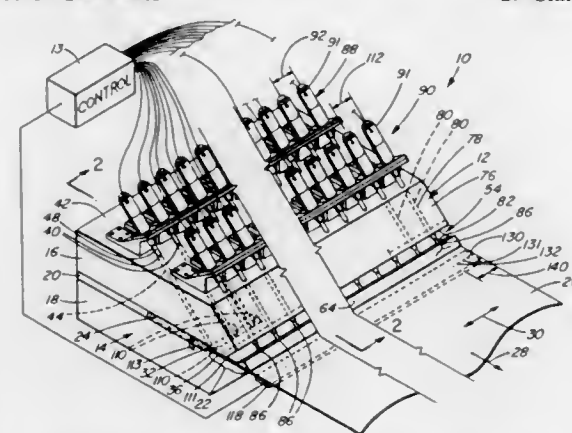
Brian James Monti, Alpharetta, Ga., assignor to Honeywell Measurex Devron, Inc., Canada

Filed Dec. 22, 1995, Ser. No. 576,950

Int. Cl.<sup>6</sup> B29C 47/92

U.S. Cl. 264—40.1

29 Claims



1. An apparatus for controlling the mass flow of a mass in an extrusion die, the apparatus comprising:

- a) measurement means for providing cross-directional measurements of at least one property of an extrusion produced by said extrusion die, such measurements being made at a plurality of cross-directional locations that successively span the extrusion;
- b) means for assembling the measurements to provide cross-directional profiles of the extrusion;

- c) spatial-frequency splitting means for operating upon the cross directional profiles to separate selected spatial frequency component profiles from each cross-directional profile into measured high frequency component profiles and measured low frequency component profiles;
- d) reference profile means for providing reference profiles representing desired high frequency component profiles and low frequency component profiles;
- e) error signal generating means for generating error signals representing the difference between said measured high frequency component profiles and measured low frequency component profiles and said desired high frequency component profiles and low frequency component profiles to produce high and low frequency error profiles;
- f) first set of actuators disposed generally linearly in a first cross directional line parallel to said extrusion die connected to a flexible restrictor bar extending in said first cross-directional line for controlling mass flow in the extrusion die, said flexible restrictor bar having a plurality of cross-directional portions with said first set of actuators being connected to respective cross-directional portions of said flexible restrictor bar such that each of said first set of actuators is operable to move a corresponding cross-directional portion of said restrictor bar, the first set of actuators being controlled by the error signals representing the low frequency error profiles; and
- g) second set of actuators disposed generally linearly in a second cross-directional line, downstream and parallel to the first cross-directional line, connected to a flexible die lip extending in said second cross-directional line for controlling mass flow in the extrusion die, said flexible die lip having a plurality of cross-directional portions with said second set of actuators being connected to respective cross-directional portions of said flexible die lip such that each of said second set of actuators is operable to move a corresponding cross-directional portion of said flexible die lip, the second set of actuators being controlled by error signals representing the high frequency error profiles.

5,770,130

## METHOD AND APPARATUS FOR COMPRESSION MOLDING PLASTIC ARTICLES

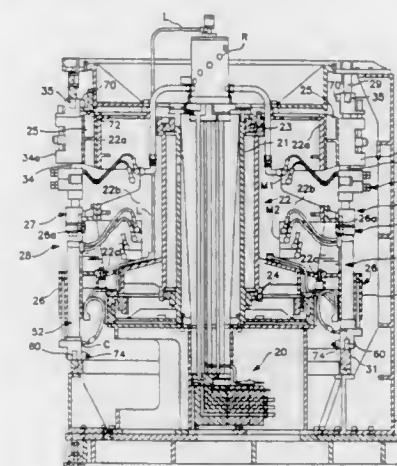
Keith W. Ingram, Holland, Ohio, and David C. Thompson, Ft. Wayne, Ind., assignors to Owens-Illinois Closure Inc., Toledo, Ohio

Continuation of Ser. No. 135,829, Oct. 14, 1993, Pat. No. 5,554,327. This application Sep. 5, 1996, Ser. No. 708,519

Int. Cl.<sup>6</sup> B29C 43/08; 43/18; 43/58

U.S. Cl. 264—40.5

75 Claims



1. A method for compression molding a plastic article comprising providing a first tool assembly having a male mold associated therewith,

providing a second tool assembly having a cavity mold associated therewith,

providing a first fixed cam for moving the first tool assembly relative to said second assembly and a second fixed cam for moving said second tool assembly relative to said first assembly,

interposing a fluid cylinder comprising a fluid filled chamber and a piston on one of said tool assemblies interposed between one of said fixed cams and the associated tool assembly for urging said one tool assembly toward said other tool assembly to provide a constant limited molding force during the full movement of the associated tooling under the actuation of said cams,

providing said fluid in said fluid cylinder at a predetermined pressure to provide said constant limited molding force during the forming of the plastic article of the associated tooling under the actuation of said cams,

providing a charge of extrudate to the cavity of the cavity mold, moving the first and second assemblies under the action of said fixed cams to move the first assembly and second mold assembly toward one another to close the mold and provide a constant limited molding force on the charge to compress the charge to form an article.

5,770,131

## METHOD AND APPARATUS FOR APPLYING AN OSCILLATING FORCE ON A MOLTEN MATERIAL

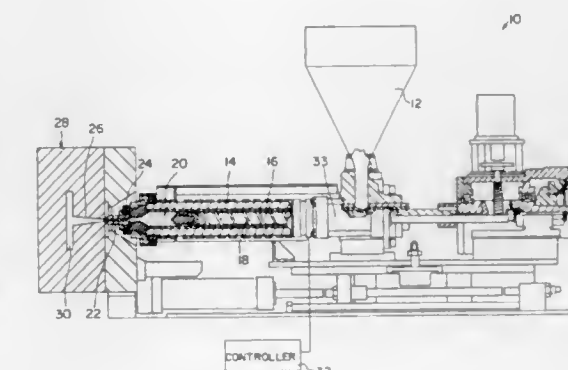
Alexander Bubel, Stamford; Robert Callahan, Hamden, and Akihisa Kikuchi, Stamford, all of Conn., assignors to Thermold Partners, L.P., Stamford, Conn.

Filed Jan. 2, 1996, Ser. No. 581,976

Int. Cl.<sup>6</sup> B29C 45/77

U.S. Cl. 264—69

33 Claims



1. A method for applying an oscillating force on a molten material within a mold cavity comprising the steps of: dispensing a moldable material into an barrel, rotating a screw conveyor about its longitudinal axis for conveying the moldable material to an accumulation chamber; accumulating a predetermined amount of material within the accumulation chamber; translating the screw conveyor along its longitudinal axis and toward a mold a first predetermined distance to a first location so as to force a portion of the accumulated material to flow along a conduit and into a mold cavity; translating the screw conveyor along its longitudinal axis away from the mold; and translating the screw conveyor along its longitudinal axis and toward the mold a second predetermined distance to a second location forcing accumulated material to flow along the conduit and into the mold cavity, the second location being closer to the mold than the first location.

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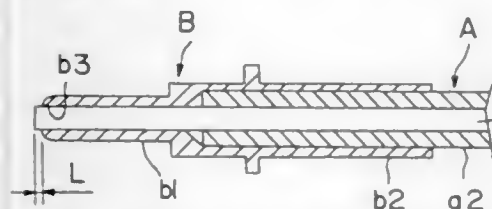
**TERMINAL TREATMENT DEVICE FOR A PLASTIC FIBER**

Takehiko Yamamura, and Hayato Yuuki, both of Yokkaichi, Japan, assignors to Sumitomo Wiring Systems, Ltd., Japan  
Filed Jun. 23, 1995, Ser. No. 494,267

Claims priority, application Japan, Jun. 24, 1994, 6-143514  
Int. Cl.<sup>6</sup> B29D 11/00

U.S. Cl. 264—1.25

17 Claims



1. A device for fixing a ferrule to a fiber terminal which comprises a thermoplastic clad core, a leading end of said core being inserted through said ferrule, a tip of said core protruding from said ferrule, and said ferrule having a melt zone adjacent said tip, said device comprising:

- a chamber;
- a heated element mounted on said chamber so as to form a portion of a wall of said chamber, said heated element including a central area having a blind hole therein, said hole having a base and a side wall, said side wall having a height corresponding to said melt zone, and said blind hole adapted to receive said melt zone whereby, when said tip is inserted into said hole, said melt zone is in contact with said side wall and said tip is in contact with said base; and
- a heater positioned within said chamber for heating said central area.

5,770,133

**METHOD FOR FABRICATING A VIBRATION ISOLATING DATA STORAGE SYSTEM HOUSING**

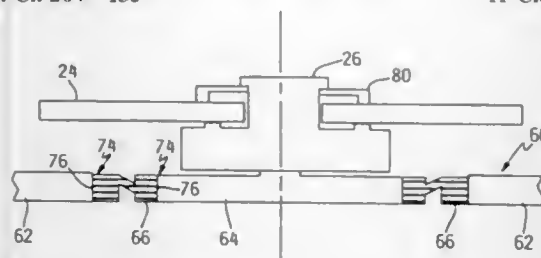
Zine-Eddine Boutaghou, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 334,200, Nov. 4, 1994, Pat. No. 5,483,398.  
This application Jun. 7, 1995, Ser. No. 472,136

Int. Cl.<sup>6</sup> B29C 45/14; 70/84

U.S. Cl. 264—135

11 Claims



1. A method of manufacturing a composite housing base of a data storage system, the data storage system having a data storage disk, a spindle motor adapted for rotating the data storage disk, and an actuator assembly having a transducer for transferring data to and from the data storage disk, the method of manufacturing the data storage system comprising the steps of:

- providing an injection molding apparatus including a mold;
- providing a primary base and a secondary base;
- mounting at least a portion of the spindle motor to the secondary base;
- placing the primary base and the secondary base into the mold so that a first gap is defined between the primary base and secondary base, the secondary base placed within the mold in a coplanar relationship with respect to the primary base; and
- flowing polymeric material into the first gap to form a compliant element between the primary base and the secondary base wherein the compliant element attenuates internally or externally induced vibrations transmitted between the primary base and the secondary base.

5,770,134

**MANUFACTURING METHOD FOR MULTI-LAYER MOLDED-PRODUCT CONSISTING OF A BASE HAVING HOLES THROUGH AND A COVERING MATERIAL**

Takahisa Hara, Hyogo, and Masahito Matsumoto, Osaka, both of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

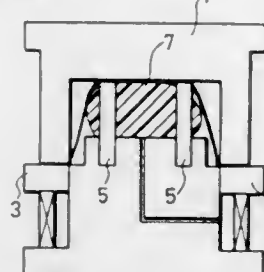
Filed Jun. 25, 1993, Ser. No. 81,158

Claims priority, application Japan, Jul. 1, 1992, 4-174177;  
Jul. 1, 1992, 4-174180

Int. Cl.<sup>6</sup> B29C 45/16

U.S. Cl. 264—154

12 Claims



1. A manufacturing method for a molded-product comprising a base plate having at least one through hole and a covering material for covering a surface of the base plate, comprising the steps of:

- pushing a covering material against a recessed section formed in a molding face of a mold by the use of a protrusion formed on a molding face of an opposing mold so as to fit the protrusion to the recessed section in such a manner as to make a hole in the covering material;
- supplying molten thermoplastic resin to a cavity formed between said molds, said step of supplying following said step of pushing; and
- executing a forming process by closing said molds and thereby molding the thermoplastic resin so as to obtain a base plate having a through hole at a portion that is occupied by the protrusion and entangledly fusing the remaining covering material to a surface of the base plate.

5,770,135

**PROCESS FOR PRODUCING PERMEATION RESISTANT CONTAINERS**

John Peter Hobbs, Landsdale; James Francis Dei Tos, Emmaus, and Madhu Anand, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jul. 1, 1996, Ser. No. 673,989

Int. Cl.<sup>6</sup> B29C 49/46

U.S. Cl. 264—83

17 Claims

1. In a process for the production of a permeation resistant thermoplastic container wherein a thermoplastic material is formed into a container and at least the interior of the container fluorinated by contacting the surface with a fluorine containing gas under conditions sufficient to effect surface fluorination and thereby reduce the permeability of said container to organic fluids, and the container recovered, the improvement which resides in quenching the fluorination of said container by contacting the fluorine contained within the container with a fluorine reactive gas under conditions effective for converting the fluorine to a less reactive or less toxic by-product.

5,770,136

**METHOD FOR CONSOLIDATING POWDERED MATERIALS TO NEAR NET SHAPE AND FULL DENSITY**

Xiaodi Huang, 406 2nd St., Houghton, Mich. 49931

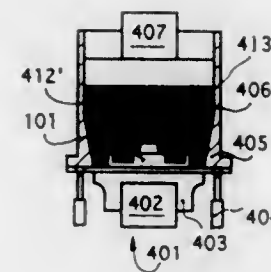
Filed Aug. 7, 1995, Ser. No. 512,221

Int. Cl.<sup>6</sup> C04B 35/64

U.S. Cl. 264—101

25 Claims

1. A method for consolidating powdered material to near net shape and full density, comprising the steps of:



mixing a particulate material with a binder to form a mold material;

shaping said mold material into the shape of a mold having an external surface and an internal cavity and being of sufficient solidity to maintain a shape yet being compressible under pressure;

filling said interior cavity with a powdered material to be consolidated;

heating said mold with said powdered material therein to form a heated mold;

applying pressure to the external surface of said mold by placing said mold into a mechanical die having relatively movable portions and moving said movable portions relative to one another to mechanically apply pressure from said die portions to said mold material sufficient to compress said mold material and transfer a pressurizing force to said powdered material within the mold cavity so as to consolidate the powdered material in the mold cavity and form an article; and removing the article from said mold.

14. A method for consolidating powdered material to near net shape and full density, comprising the steps of:

- shaping a mold material comprising a particulate material into a mold having a shape by using a generated force to hold said particulate material in the shape of said mold, said mold having an external surface and an interior cavity and being of sufficient solidity under said generated force to substantially maintain said shape yet being compressible under pressure;
- filling said interior cavity with a powdered material to be consolidated;
- heating said mold with said powdered material therein to form a heated filled mold;
- applying pressure to the external surface of said mold sufficient to compress said mold material and transfer a pressurizing force to said powdered material within the mold cavity so as to consolidate the powdered material in the mold cavity and form an article; and
- removing the article from said mold.

5,770,137

**METHOD FOR PREPARING COMPOSITE MATERIALS FROM RENEWABLE RAW MATERIALS**

Jürgen Lörcks, Rees; Winfried Pommeranz, Enger; Kurt Klenke, Kleve; Harald Schmidt, Emmerich, and Joachim Heuer, Kranenburg, all of Germany, assignors to Biotec Biologische Naturverpackungen GmbH & Co., Emmerich, Germany

PCT No. PCT/EP94/01737, § 371 Date Feb. 5, 1996, § 102(e)  
Date Feb. 5, 1996, PCT Pub. No. WO94/27796, PCT Pub. Date Dec. 8, 1994

PCT Filed May 27, 1994, Ser. No. 553,574

Claims priority, application Germany, May 27, 1993, 43 17 692.5

Int. Cl.<sup>6</sup> B27N 3/00; C09J 5/00

U.S. Cl. 264—109

17 Claims

1. A method for preparing a composite article of fibers of renewable raw material physically bound by a starch-based biodegradable binder, said method comprising:

- adding and mixing in a mixer fibers of renewable raw material, water and swellable starch to produce a mixture while converting the starch into a colloid;
- placing the mixture resulting from step (a) into a heatable mold comprising pressing surfaces with a variable side open-

ing and heating the mixture under compression pressure until a compressed cake of the mixture is obtained, and  
c) drying the compressed cake while reducing the compression pressure;  
whereby the starch colloid is physically cured to produce the binder and form the composite article.

5,770,138

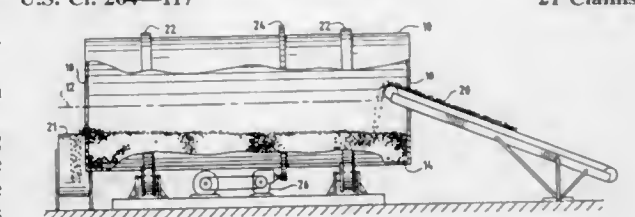
**METHOD OF MAKING ENHANCED NON-CLAY GRANULES MADE FROM PULP OR PAPER SLUDGE**  
Rick L. Yoder, Green Bay, Wis., assignor to Thermo FiberGen, Inc., Waltham, Mass.

Filed Mar. 24, 1995, Ser. No. 410,150

Int. Cl.<sup>6</sup> B29C 67/02

U.S. Cl. 264—117

21 Claims



1. A method of producing improved cellulosic granules comprising the steps of:

- providing raw pulp or paper sludge;
- adjusting the moisture content of the raw sludge to allow fiber size reduction;
- reducing the fiber size of the sludge;
- agglomerating the sludge in an agitating device to cause cellulosic fibers to interlock and bond to form granules;
- tumbling the granules in a rolling device which is separate from the agitating device while increasing the moisture level of the granules; and
- drying the granules.

5,770,139

**METHOD AND APPARATUS FOR CONNECTING TUBING TO BARBED CONNECTORS**

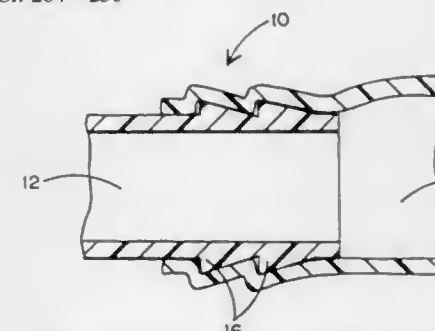
Curtis D. Kinghorn, Minneapolis, Minn., and Roger J. Elgas, Anaheim Hills, Calif., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 27, 1996, Ser. No. 622,778

Int. Cl.<sup>6</sup> B29C 61/02

U.S. Cl. 264—230

2 Claims



1. A method of assuring secured, sterile connections between rigid barbed connectors on heat-sterilizable medical equipment and sterilizable tubing which heat-shrinks at a temperature higher than the temperature at which said heat sterilization is performed, but cold-flows at said sterilization temperature, comprising the steps of:

- assembling said connectors and said tubing prior to sterilization;
- deforming said tubing into a shape providing mechanical engagement with said barbs of said connectors by heat-shrinking said tubing onto said connectors to produce a tight, non-releasable connection;



- c) sterilizing said connection;  
 d) said deforming step involving heat shrinking said tubing sufficiently to shrink said tubing onto said connectors with a shrinking pressure in excess of that needed for use; and  
 e) said sterilizing step involving relaxing said shrinking pressure sufficiently to reduce said shrinking pressure to the level needed for use of said tubing and connectors as a secure sterile fluid-tight connection at room temperature.

5,770,140

## CURABLE COMPOSITIONS

Heinz Muller, Mainz, Germany, assignor to Dow Corning GmbH, Wiesbaden, Germany

Filed Sep. 27, 1996, Ser. No. 723,211

Claims priority, application United Kingdom, Oct. 4, 1995, 9520280

Int. Cl.<sup>6</sup> B29C 71/00; C08J 5/00; C08G 77/06

U.S. Cl. 264—236 12 Claims

11. A method of providing a molding from a curable composition, which curable composition comprises a siloxane polymer, wherein the siloxane polymer is a diorganopolysiloxane having silicon-bonded organic substituents selected from the group consisting of methyl groups, fluoroalkyl groups, phenyl groups and vinyl groups, filler, and a curing agent which is capable of effecting cure of the composition when heated, wherein the curing agent consists essentially of a 1,1, di(tertiary butylperoxy) 3,3,5-trimethylcyclohexane in combination with a peroxide selected from a group consisting of dicumyl peroxide and 2,5-di(tertiary butylperoxy) hexane, which method comprises introducing the curable composition to a mold having a closed molding cavity, heating the mold to a temperature in the range of 150° C. to 170° C. for about 10 minutes to cure the composition, stripping the cured composition from the mold, and post-curing the molding for 0 to about 4 hours and about 200° C.

5,770,141

## PROCESS FOR THE PRODUCTION OF A FILLED REACTION MIXTURE

Klaus Schulte, Bergisch Gladbach; Heinrich Ersfeld; Karl Dieter Kreuer, both of Leverkusen, and Christian Wolfrum, Köln, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

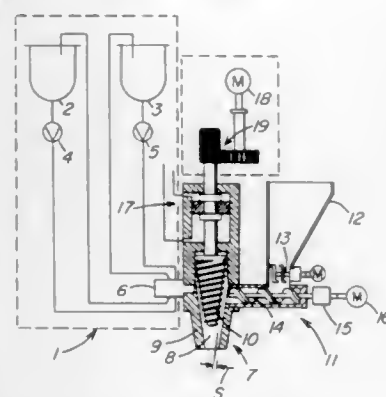
Filed May 22, 1995, Ser. No. 447,304

Claims priority, application Germany, May 27, 1994, 44 18 505.7

Int. Cl.<sup>6</sup> B28B 1/20

U.S. Cl. 264—311

1 Claim



1. A process for the production of a curable multi-component reaction mixture containing fillers comprising:  
 a) premixing the reaction components in a high pressure injection mixer;  
 b) introducing the pre-mixed reaction components and dry filler into a friction mixer, said friction mixer having a conically shaped screw having a multiplicity of screw windings, said

- screw being rotatable in a conical mixing chamber with a gap formed between the wall of said chamber and the screw and operating under a fractional load, with said screw rotating at a speed of from 500 to 5,000 rpm, and wherein the ratio of the volume between the screw windings to the volume of said gap is from about 1:1 to about 5:1;  
 c) introducing the mixture of step b) into a mold;  
 d) stopping the supply of reaction components and filler once said mold is filled, and  
 e) increasing the speed of said screw to 12,000 rpm or higher and bringing said screw into contact with the wall of said mixing chamber in order to clean said chamber.

5,770,142

## PROCESS FOR MANUFACTURING SINTERED POLYBENZIMIDAZOLE ARTICLE

Yoshisato Sasaki, and Minoru Kurisaki, both of Tokyo, Japan, assignors to Hoechst Japan Limited, Tokyo, Japan

Filed Jun. 13, 1997, Ser. No. 874,860

Claims priority, application Japan, Nov. 29, 1996, 8-335002

Int. Cl.<sup>6</sup> C08G 33/02; B27J 5/00; C08J 5/00

U.S. Cl. 264—331.12 5 Claims

1. A process for manufacturing sintered polybenzimidazole articles by sintering a polybenzimidazole resin, which comprises the following steps in that order:

- (1) a step of putting a polybenzimidazole resin into a mold having a predetermined shape;
- (2) a step of closing the mold to thereby compact the polybenzimidazole resin therein, followed by heating the mold up to a predetermined temperature of from 350° C. to 600° C. in the absence of any external pressure to the mold;
- (3) a step of sintering the resin, after having reached the predetermined temperature, in such a manner that said elevated temperature is kept as it is for from 0 to 100 minutes, then the pressure to the mold is increased up to a predetermined pressure of from 140 to 1400 kg/cm<sup>2</sup>, and thereafter said elevated temperature and said increased pressure are kept as they are for from 60 to 250 minutes;
- (4) a step of cooling the mold down to a temperature of from 50° to 400° C.; and
- (5) a step of taking out the sintered polybenzimidazole article from the mold.

5,770,143

## METHOD FOR LIQUID THERMOSETTING RESIN MOLDING USING RADIOFREQUENCY WAVE HEATING

Martin C. Hawley, East Lansing; Jes Asmussen, Jr., Okemos, both of Mich.; Jianghua Wei, Raleigh, N.C., and Trent A. Shidaker, Brighton, Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Filed Jul. 3, 1996, Ser. No. 675,608

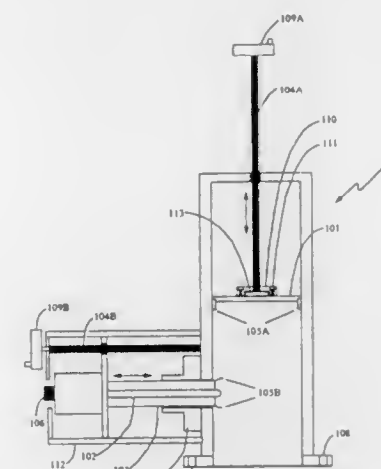
Int. Cl.<sup>6</sup> H05B 6/64; B29C 67/00

U.S. Cl. 264—404

11 Claims

1. A method for forming an article of a cured thermoset polymer which comprises:

- (a) providing a metal mold with metal walls defining a cavity, with an injection port for introducing a curable liquid polymer composition into the cavity, with multiple ports with dielectric covers which provide apertures into the cavity and which allow transmission of electromagnetic waves selected from the group consisting of radiofrequency waves and microwaves into the cavity and with means for removing gas from the cavity before or during injection;
- (b) removing gas from the cavity;
- (c) introducing the liquid polymer composition through the injection port into the cavity;
- (d) heating to induce curing of the liquid polymer composition by introducing the electromagnetic waves through selected said multiple ports and dielectric covers so as to provide



uniform heating in the cavity and to cure the liquid polymer composition and form the article; and  
 (c) removing the article from the mold.

5,770,144

## METHOD OF FORMING IMPROVED APERTURED FILMS BY USING FLUID PERFORATION

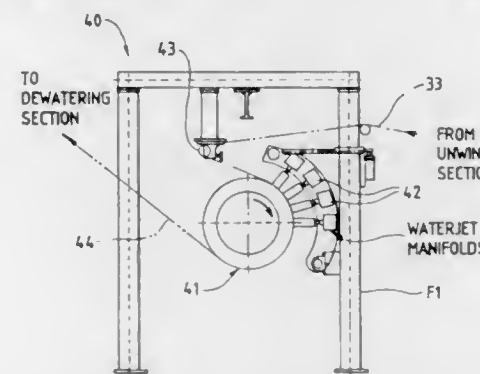
William A. James, Pennington; William G. F. Kelly, Middlesex, and Charles James Shimalla, Plainsboro, all of N.J., assignors to McNeil-PPC, Inc., New Brunswick, N.J.

Filed Sep. 1, 1995, Ser. No. 523,112

Int. Cl.<sup>6</sup> B29C 59/06

U.S. Cl. 264—504

24 Claims



1. A method for forming an aperture film from a stretchable thermoplastic polymeric material comprising:

- a) providing a starting film comprising said stretchable thermoplastic polymeric material having an upper surface and a lower surface;
- b) providing a backing member comprising localized support regions for supporting said starting film, recessed zones into which the film may be deformed by the application thereto of fluid forces; and means for allowing said applied fluid to be transported away from said backing member;
- c) supporting said starting film on said backing member with portions of the lower surface of said film being in contact with the support regions of said backing member and with the upper surface of said film facing away from said backing member;
- d) forming irregular size micro-holes and large sized holes in said starting film by directing a fluid in the form of substantially non-diverging, columnar streams from at least two sets of orifices against the upper surface of said starting film in a zone of contact to cause said starting film to stretch between said backing member localized support regions over said recessed zones, the orifices of the first set having a diameter greater than ten mils and the fluid supplied thereto having a pressure less than 500 psig. to cause said starting film to rupture into a multiplicity of said large sized holes in said

starting film between said localized support regions, the orifices of the second set having a diameter less than or equal to ten mils and the fluid supplied thereto having a pressure of at least 500 psig., to cause said starting film to rupture into a multiplicity of said micro-holes in said starting film between said localized support regions;

- e) moving said film from said contact zone; and  
 f) removing said now-apertured film from said backing member.

5,770,145

## SUPERIOR HIGH ALKALI METAL AND CALCIUM SOL GEL ABRASIVE AND PROCESSES FOR ITS PRODUCTION

Alvin P. Gerk, Newark, Del., and Robert J. Seider, Ransomville, N.Y., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 668,360, Mar. 12, 1991, abandoned, which is a continuation-in-part of Ser. No. 445,946, Dec. 8, 1989, abandoned, which is a continuation of Ser. No. 830,478, Feb. 13, 1986, abandoned, which is a continuation-in-part of Ser. No. 666,133, Oct. 30, 1984, abandoned, which is a continuation of Ser. No. 602,272, Apr. 23, 1984, abandoned, which is a continuation of Ser. No. 377,782, May 13, 1982, abandoned, which is a continuation-in-part of Ser. No. 330,123, Dec. 14, 1981, abandoned, which is a continuation-in-part of Ser. No. 267,495, May 27, 1981, abandoned. This application May 19, 1995, Ser. No. 446,112

Int. Cl.<sup>6</sup> C04B 35/10; 35/64

U.S. Cl. 264—621

22 Claims

1. A process for forming alumina-based ceramic abrasive grains which comprises:

- a) preparing a dispersion comprising from about 2 to about 60 weight percent aluminum oxide monohydrate; a dissolved metal containing sintering aid in an atomic ratio of metal in the sintering aid to aluminum in the aluminum oxide monohydrate of from 1:2 to 1:35, and added sodium plus calcium compound sufficient to provide in the ceramic a sodium plus calcium content greater than about 0.1 to about 1.8 weight percent of solids, provided the weight percent calcium is from 0 to about 1.8 and the weight percent sodium is from 0 to about 0.4 and from 2 to 40 weight percent aluminum oxide monohydrate is in the dispersion;
- b) gelling said dispersion;
- c) drying the gelled dispersion at a temperature below the frothing temperature of the gel to vaporize free water;
- d) crushing the dried solid to form grains;
- e) rapidly heating the grains to above about 1200° C. in less than 10 minutes; and
- f) continuing to heat the grains at a sintering temperature between about 1200° C. and about 1650° C. for a sufficient sintering time to sinter the grains to a density above about 85% of theoretical density.

5,770,146

## SYSTEM FOR THE HEAT TREATMENT OF METALLIC ANNEALING MATERIAL

Peter Helmut Ebner, Bergham 168, A-4060 Leonding, Austria

Filed Oct. 16, 1996, Ser. No. 733,022

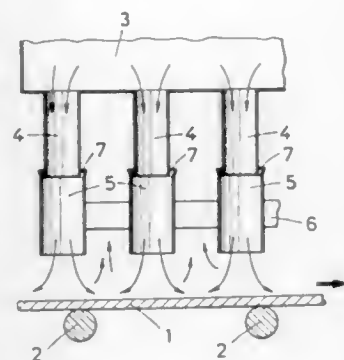
Claims priority, application Austria, Oct. 19, 1995, 1741/95

Int. Cl.<sup>6</sup> C21D 1/06

U.S. Cl. 266—252

3 Claims

1. A system for the heat treatment of a metallic annealing material, which comprises a distributor for a gaseous heat treating medium, the distributor comprising tubular nozzles directing an oblique blast of the heat treating medium against the annealing material through orifices of the nozzles, the nozzles comprising telescopically retractable extensions for adjusting the distance between the nozzle orifices and the annealing material, a frame



interconnecting the retractable extensions for common adjustment of the distance between the nozzle orifices and the annealing material.

5,770,147

# APPARATUS FOR THE IRRADIATION OF BODY FLUIDS BY ULTRAVIOLET LIGHT

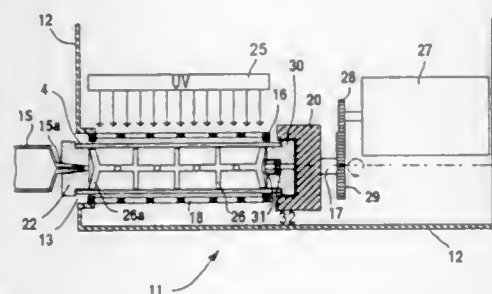
Hans Müller, Reichenhaller Str. 49, 81547 München, Germany  
Filed Nov. 15, 1996, Ser. No. 751,056

Claims priority, application Germany, May 17, 1995, 195 18 117.4; Aug. 29, 1995, 195 31 751.3

Int. Cl.<sup>6</sup> A61L 2/00

U.S. Cl. 422—24

9 Claims



I. An apparatus for the irradiation of body fluids by ultraviolet light, particularly of blood and other tissue extracts, said apparatus comprising a removable tubular containment for receiving the body fluids and an ultraviolet light source having a radiation range in which said containment can be placed, said containment including baffle means arranged so as to subject body fluids circulated therethrough to turbulence, said baffle means having a multitude of integral baffle structures including a longitudinal rod extending axially in said containment and transverse bars branching off said longitudinal rod, past which said body fluids flow and which convert laminar flow to a turbulent flow such that the body fluid in said containment is uniformly exposed to the UV radiation emitted by said light source.

5,770,148

# METHOD AND APPARATUS FOR THE DEACIDIFICATION OF LIBRARY MATERIALS

Lee H. Leiner, New Kensington, and James E. Burd, Saxonburg, both of Pa., assignors to Preservation Technologies, L.P., Cranberry Township, Pa.

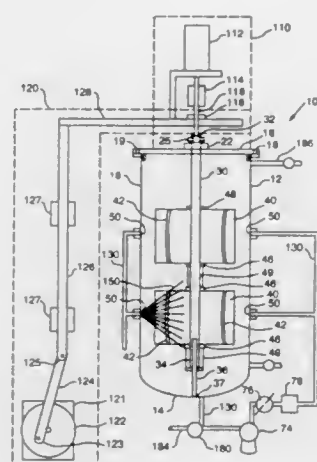
Filed Jan. 16, 1996, Ser. No. 586,252

Int. Cl.<sup>6</sup> B01J 19/00

U.S. Cl. 422—40

14 Claims

I. A method for contacting sheetlike material having opposing surfaces and defining a spine with a treating medium comprising placing the material in a treating medium; producing relative movement at a predetermined velocity between the materials and the treating medium in a direction



generally parallel to the spine of the materials for a period of time effective for the treating medium to contact substantially all of the material;

directing the treating medium toward the materials generally perpendicular to the spine of the materials sufficient to expose substantially the entirety of the spine of the materials to the treating medium for a period of time effective for the treating medium to contact substantially all of the material; and, removing excess treating medium from the material.

5,770,149

# EXTRACORPOREAL BLOOD OXYGENATION SYSTEM HAVING INTEGRATED BLOOD PUMP, HEAT EXCHANGER AND MEMBRANE OXYGENATOR

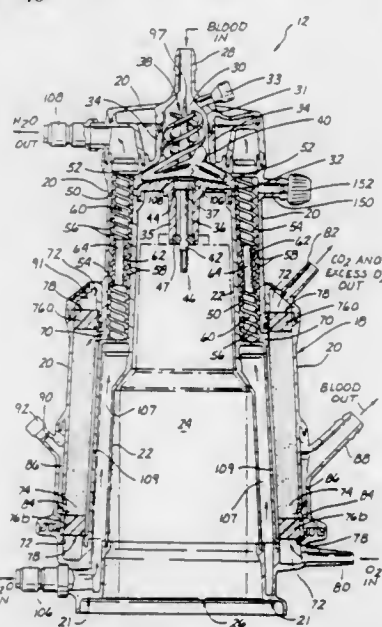
Donald A. Raible, Santa Ana, Calif., assignor to Baxter International, Deerfield, Ill.

Filed Oct. 31, 1995, Ser. No. 551,256

Int. Cl.<sup>6</sup> A61M 1/14

U.S. Cl. 422—46

28 Claims



I. An extracorporeal blood oxygenation system comprising:

(a) an integrated blood pump/heat exchanger/membrane oxygenator component comprising:

- a blood pump;
- a heat exchanger positioned below said blood pump;
- a membrane oxygenator positioned below said heat exchanger;

said blood pump, heat exchanger, and membrane oxygenator being joined to one another as a unitary integrated assembly having a bottom end and a top end, said integrated assembly having an opening formed in the bottom end thereof and a

hollow inner cavity formed within, said hollow inner cavity extending upwardly from said opening,

said integrated assembly further having a blood inlet port formed therein for passing blood into said pump, a blood outlet port formed therein for allowing blood to pass out of said membrane oxygenator, and a blood flow path formed within said assembly, between said inlet port and said outlet port, wherein blood entering said blood inlet port passes initially downward through said pump, then downward through said heat exchanger, then downward through said membrane oxygenator, and out of said blood outlet port,

said blood pump comprising:

- a pump housing having said blood inlet port formed at the top end thereof and a pump housing outlet at the bottom end thereof, said pump housing outlet forming a radially outwardly directed passageway from said pump housing into said heat exchanger;
- a blood pump impeller positioned within said pump housing, said impeller comprising:
- a plurality of centrifugal propulsion legs which extend outwardly from a vertical rotational axis, each of said centrifugal propulsion legs having a leading surface and a trailing surface; and
- a plurality of helical strut members which extend from said centrifugal propulsion legs, said strut members being helically disposed about said vertical rotational axis; and
- a central member which is coaxial with said rotational axis, said central member extending and upwardly from said centrifugal propulsion legs, said helical strut members being helically twined about and spaced apart from said central member;

said impeller being thereby configured such that, when said impeller is rotated in a first direction about said axis, said helical strut members axially draw blood from said blood inlet, in a downward direction, such that blood deposits in front of the leading surfaces of said centrifugal propulsion legs, the rotational movement of said centrifugal propulsion legs being thereby operative to radially propel the blood out of said pumping housing outlet and into said heat exchanger,

(b) a motor/drive component comprising:

- a base housing having an electric motor located therewithin;
- a support projection which extends upwardly from said base housing, said support projection being insertable through said opening and into the hollow inner cavity of said blood pump/heat exchanger/membrane oxygenator component;
- a rotatable drive member which extends upwardly through said support projection, said drive member being rotatably driven by said motor;

said blood pump/heat exchanger/membrane oxygenator component being positionable upon the motor/drive component such that the support projection of said motor/drive component extends into and is received within the hollow inner cavity of the blood pump/heat exchanger/membrane oxygenator component, and further such that the drive member rotatably engages said blood pump.

5,770,150

# TEST KIT FOR THE QUALITATIVE DETERMINATION OF PEROXIDES IN FAT

Gregory Lee Thornton, West Des Moines; Lawrence Keith Schlatter, Ankeny, and Douglas Howard Catron, Des Moines, all of Iowa, assignors to Kemin Industries, Inc., Des Moines, Iowa

Division of Ser. No. 542,937, Oct. 13, 1995, Pat. No. 5,670,374. This application Jun. 12, 1997, Ser. No. 873,359

Int. Cl.<sup>6</sup> G01N 33/06

U.S. Cl. 422—61

5 Claims

I. A test kit for determining whether a fat sample contains peroxides in an amount above a predetermined fat peroxides amount that comprises:

- a first container having a first reagent comprising a 3:2 volume:volume solution of acetic acid:isooctane and a dis-



persing amount of a surfactant, said first reagent being sufficient to dissolve a predetermined weight of fat in said fat sample;

- a second container containing a predetermined volume of a saturated aqueous solution of potassium iodide, said solution volume being sufficient to provide an amount of iodide ions needed to react with fat peroxides present in the fat in excess of a predetermined fat peroxides amount to form iodine; and
- a third container containing an aqueous composition of starch indicator dispersed in a predetermined amount of iodine reductant solution, the amount iodine reductant being sufficient to reduce only an amount of iodine formed from a predetermined amount of fat peroxides present in the fat in said fat sample.

5,770,151

# HIGH-SPEED LIQUID DEPOSITION DEVICE FOR BIOLOGICAL MOLECULE ARRAY FORMATION

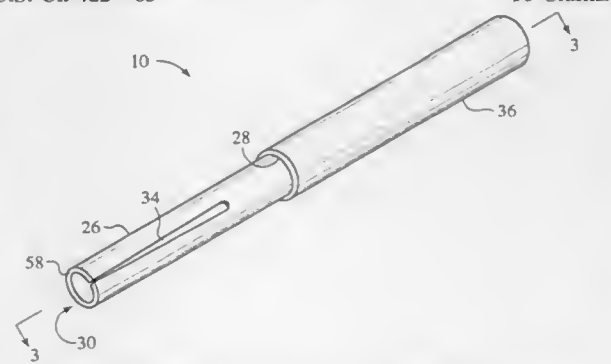
David J. Roach, Los Gatos, and Richard F. Johnston, Murphys, both of Calif., assignors to Molecular Dynamics, Inc., Sunnyvale, Calif.

Filed Jun. 5, 1996, Ser. No. 658,527

Int. Cl.<sup>6</sup> G01N 35/10

U.S. Cl. 422—63

16 Claims



I. A collection and deposition device, comprising:

- a hollow tube including an open end and a closed end disposed opposite to said open end, defining a lumen therebetween having a longitudinal axis, said tube including an elongated slit extending from said open end toward said closed end, parallel to said axis, with said lumen and said slit adapted to permit liquid flow into said tube by capillary action, the slit tapering from a wider dimension distal to the open end to a smaller dimension proximate to the open end;
- a cross-member extending along a first direction;
- an arm extending along a second direction, transverse to said first direction, with said arm movably attached to said cross-member to traverse parallel to said first direction; and
- a pod movably attached to said arm to traverse along said second direction and along a third direction, transverse to both said first and second directions, said hollow tube being mounted to said pod with said longitudinal axis extending parallel to said third direction allowing collection and deposition of liquids by providing three-dimensional movement of said hollow tube.



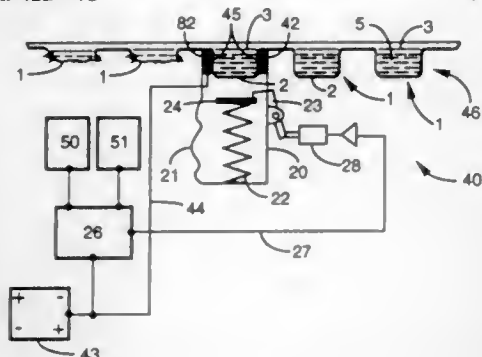
5,770,152

**COLLAPSIBLE CONTAINER FOR MEASURING PARTICLES IN A SAMPLE FLUID**

Jeffrey A. Schuster; Peter M. Lloyd, both of Oakland; Igor Gonda, San Francisco, and David Cipolla, Belmont, all of Calif., assignors to Aradigm Corporation, Hayward, Calif.  
Filed Nov. 18, 1996, Ser. No. 749,610  
Int. Cl.<sup>6</sup> G01N 7/00

U.S. Cl. 422—73

4 Claims



1. A device for measuring a size or number of particles in a sample fluid, comprising:

- a container for holding the sample fluid to be tested, the container having an opening therein and a wall collapsible by an application of force;
- a porous membrane having a plurality of pores therein, wherein the pores have a diameter in a range of 0.1 to 100 microns;
- a fluid connection between the container opening and the porous membrane;
- a means for forcing the sample of fluid through the porous membrane by applying force to the collapsible wall of the container;
- a measurement component which measures a quantity selected from a group consisting of: (a) time needed to extrude the sample of fluid through the porous membrane wherein the time is measured by a timing means; (b) pressure needed to extrude the sample of fluid through the porous membrane wherein the pressure is measured by a pressure detection means; and (c) force needed to extrude the sample of fluid through the porous membrane wherein force is measured by a force measurement means; and a detection means for relating the measured quantity to the size and number of particles in the sample fluid.

5,770,153

**INTEGRATED ANALYTICAL DEVICE FOR DETERMINING THE GAS CONSUMPTION OF MATTER**

Ingeborg Wagner, Gmund, Germany, assignor to WTW Wissenschaftlich-Technische Werkstätten GmbH, Weilheim, Germany

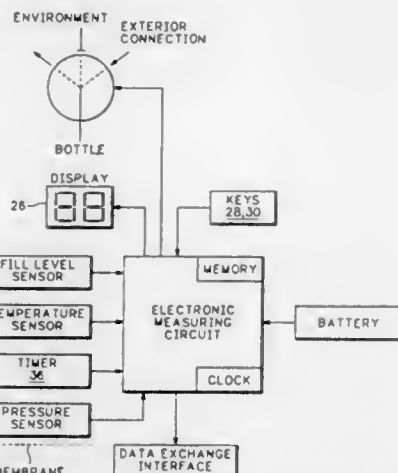
Filed Jul. 21, 1995, Ser. No. 505,034  
Int. Cl.<sup>6</sup> G01N 7/00

U.S. Cl. 422—79

18 Claims

1. An analytical device for determining biological oxygen demand of waste water, comprising a container bounding an interior space to hold a sample of the waste water and a cap to seal the container in a gas-tight manner, wherein the cap contains:

- an electrical pressure sensor in communication with the interior space of the container and operative to generate a pressure sensor output signal representative of pressure in said interior space;
- electronic measuring circuitry connected to receive the pressure sensor output signal and operative to calculate biological oxygen demand of the waste water in the container, the electronic measuring circuitry including a memory for storing reference and measured values;
- a user interface including keys to operate the electronic measuring circuitry and a display to display measured, calculated, or stored values, and



a source of operating power for the electronic measuring circuitry.

5,770,154

**DEVICE FOR TESTING AND FOR ANALYZING A PETROCHEMICAL PROCESS**

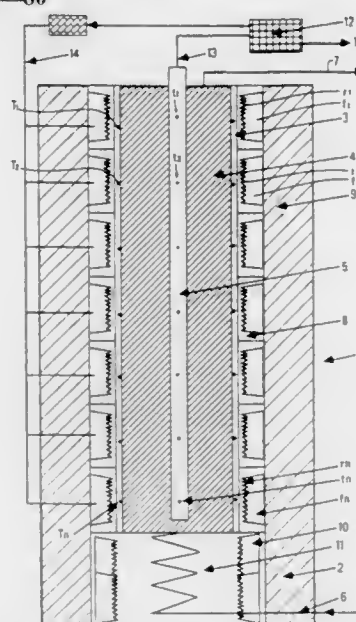
Pierre Bigeard, Vienne; Stephane Kressmann, Serezin du Rhone; Christophe Gueret, Vienne; Pierre Galtier, Vienne, and Julia Magne-Drisch, Vienne, all of France, assignors to Institut Francais du Petrole, France

Filed Dec. 26, 1995, Ser. No. 578,223

Claims priority, application France, Dec. 26, 1994, 94 15741  
Int. Cl.<sup>6</sup> G01N 35/00

U.S. Cl. 422—80

16 Claims



1. A device for testing and for analyzing a chemical reaction employing a load placed in contact with at least one catalyst, said device comprising at least one reactor for containing at least one catalyst, said reactor being of cylindrical shape having an outside diameter, a length L and an inside diameter D, means for heating said reactor to a temperature, means for controlling the temperature of said reactor, means for preheating a load prior to entry thereof in the reactor, thermal insulation means disposed at least exteriorly of the outside diameter of said reactor, wherein the inside diameter D ranges between 10 and 40 mm, said reactor has an L/D ratio of 50<L/D<150, said temperature control means comprises at least one sheathed thermometer arranged substantially along the axis of the reactor, and said reactor, arranged substantially vertically, comprises receiving means for the load through a lower or upper end of said reactor.

5,770,155

**COMPOSITE STRUCTURE RESIN CURE MONITORING APPARATUS USING AN OPTICAL FIBER GRATING SENSOR**

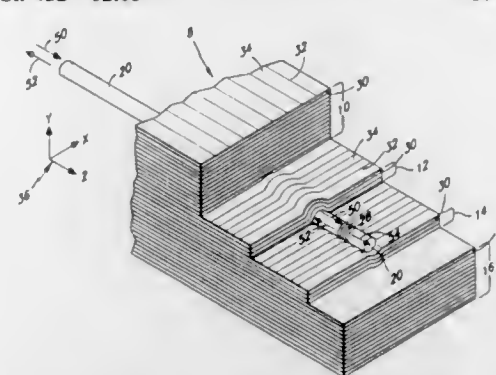
James R. Dunphy, South Glastonbury; Robert M. Rukus, South Windsor, both of Conn., and Jong-Min Ha, Seoul, Rep. of Korea, assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 21, 1995, Ser. No. 560,268

Int. Cl.<sup>6</sup> G01N 21/17

U.S. Cl. 422—82.05

10 Claims



1. A composite structure resin cure monitoring apparatus, comprising:

- an optical fiber having a grating sensor embedded therein;
- buffer means disposed adjacent to said sensor;
- a composite structure disposed adjacent to said buffer means; and
- said buffer means for enabling said sensor to detect a minimum resin viscosity and a gelation point of the resin and for isolating said sensor from interfering stresses from said composite structure.

5,770,156

**GAS DETECTION AND MEASUREMENT SYSTEM**

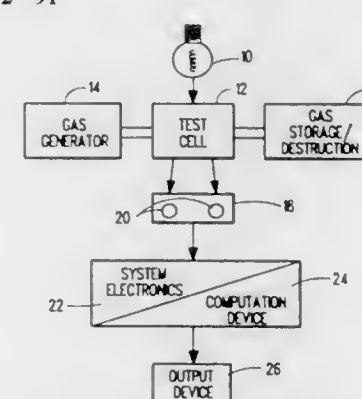
Victor J. Dosoretz, Newton Center; Daniel Behr, Needham, and Scott Keller, Lincoln, all of Mass., assignors to IN USA, Inc., Needham, Mass.

Filed Jun. 4, 1996, Ser. No. 658,020

Int. Cl.<sup>6</sup> G01N 21/59

U.S. Cl. 422—91

15 Claims



1. A gas detection and measurement system comprising:

- a light source;
- a light sensor;
- a test cell having a first port and a second port;
- a first optical path defined by a first pair of spaced-apart optical elements from said light source to said light sensor through said test cell, said first optical path defining a first path length;
- a second optical path defined by a second pair of spaced-apart optical elements from said light source to said light sensor through said test cell, said second optical path defining a second path length, wherein said first path length is different than said second path length, and

system electronics for determining the light intensity through a fluid to be measured along said first optical path and the light intensity of said fluid along said second optical path, and for comparing said light intensities along said first and second optical paths against the light intensities along said first and second optical paths of a reference fluid so as to determine the concentration of a component of said fluid to be measured.

5,770,157

**METHODS AND APPARATUS FOR THE GENERATION OF CHEMICAL LIBRARIES**

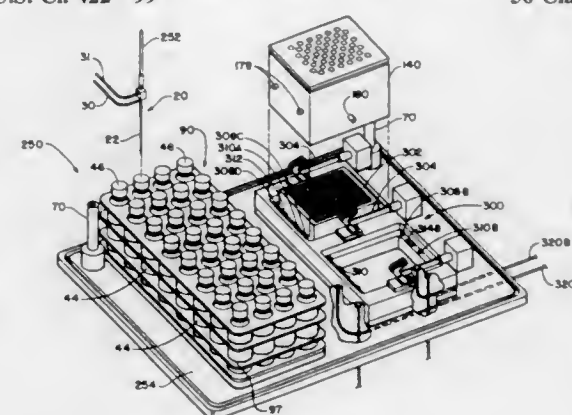
John Cargill, San Diego, and Romaine R. Malefski, Oceanside, both of Calif., assignors to Ontogen Corporation, Carlsbad, Calif.

Division of Ser. No. 422,869, Apr. 17, 1995, Pat. No. 5,609,826.  
This application Sep. 18, 1996, Ser. No. 718,105

Int. Cl.<sup>6</sup> B01L 3/00

U.S. Cl. 422—99

36 Claims



1. A reaction chamber comprising:

- a generally cylindrical upper body having a top opening with a rounded edge, an inner surface, an outer surface, an inside diameter, and a gas inlet port connecting the inner surface of the upper body to the outer surface of the upper body;
- a generally cylindrical lower body coaxial with the upper body; the lower body having an inner surface, an outer surface, and an inside diameter smaller than the inside diameter of the upper body;
- a tapered section connecting the upper body to the lower body;
- a drain tube having an inside surface and connected to the lower body with a funnel-shaped section; and
- an s-shaped trap tube having an inlet opening and an outlet opening, the inlet opening of the trap tube connected to the drain tube.

5,770,158

**CAPILLARY SYRINGE**

Kathleen A. Eischen, St. Paul, Minn., and James W. Kenney, Broomall, Pa., assignors to Diametrics Medical, Inc., Roseville, Minn.

Filed Jun. 13, 1996, Ser. No. 661,310

Int. Cl.<sup>6</sup> B01L 3/02

U.S. Cl. 422—100

18 Claims

- 1. A disposable capillary syringe device comprising:
  - (a) capillary tube having a tube wall and a hollow interior for withdrawing liquid by capillary draw;
  - (b) generally cylindrical plunger means reciprocally operable in said capillary tube for operating with a resilient pressurizable sealing means and discharging said liquid from said capillary tube under pressure;
  - (c) handle means connected to said plunger means for operating said plunger means in said capillary tube means; and
  - (d) resilient pressurizable sealing means in said capillary tube sealable against said tube wall and having a central opening

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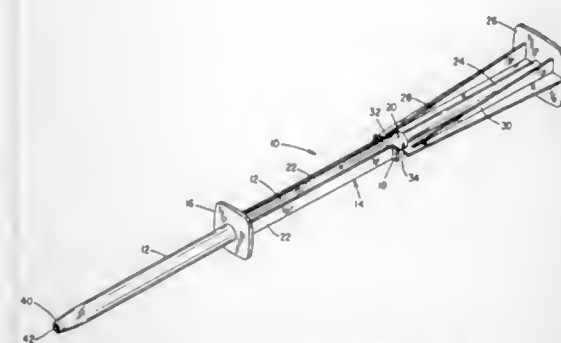
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for enabling said capillary tube means to fill by capillary draw, said central opening in said resilient sealing means being resiliently sealed by advancing said plunger means into said opening in said sealing means.

5,770,159

**PIPETTE FOR DISPENSING SUCCESSIVE VOLUMES OF LIQUID**

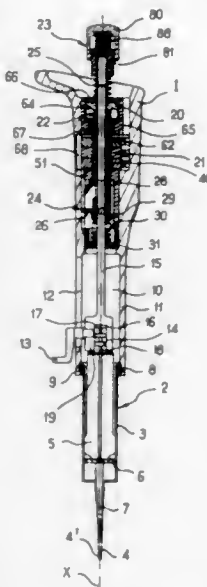
Eric Marteau D'Autry, 1 rue Boutarel, 75004 Paris, France  
PCT No. PCT/FR95/01084, § 371 Date Feb. 11, 1997, § 102(e)  
Date Feb. 11, 1997, PCT Pub. No. WO96/04991, PCT Pub.  
Date Feb. 22, 1996

PCT Filed Aug. 16, 1995, Ser. No. 793,161

Claims priority, application France, Aug. 16, 1994, 94 10035  
Int. Cl.<sup>6</sup> B01L 3/02

U.S. Cl. 422—100

7 Claims



1. A pipette for dispensing successive volumes of liquid by repeated action on a pushbutton (22), the pipette comprising:  
a housing (1) of oblong shape, incorporating an adjustment mechanism for adjusting the volume of liquid to be dispensed;  
a syringe (2) for mounting removably to one end of the housing (1), comprising a syringe body (3) provided with a fluid-passing orifice (4') and a piston rod (5) mounted to move inside said syringe body (3);  
a thrust rod (15) mounted to slide longitudinally in the housing, and to be removably connected at one end to said piston rod (5);  
a drive lever (26) for driving the thrust rod (15) and the piston rod (5) solely towards said liquid-passing orifice (4'), the lever (26) extending transversely to a longitudinal axis (X) of the thrust rod (15) and being provided with a hole (27) through which the thrust rod (15) passes with an amount of clearance, the lever (26) also being mounted with the ability to move inside the housing over a stroke that is adjustable in a direction along the longitudinal axis (X) of the thrust rod (15) between a rest position defined by an adjustable abutment of

the adjustment mechanism and an end-of-stroke position defined by a fixed abutment (31), and being returned towards said rest position by resilient return means (30); and  
a pusher (22) being mounted to slide longitudinally inside the housing, being provided at one end extending outside the housing with a pushbutton (23) and being capable of acting via its other end on the lever (26) to tilt it obliquely relative to the thrust rod (15) and then by wedging the thrust rod (15) to drive the thrust rod (15) towards the fluid-passing orifice (4') together with the piston rod (5) so as to expel a predetermined volume of liquid as defined by the stroke of the lever (26) between said rest position and said end-of-stroke position, return movement of the lever (26) towards its rest position after each action on the pusher (22) taking place under drive from said resilient return means (30) while the piston rod (5) retains its position within the body (3) of the syringe (2), the pipette being characterized in that the lever (26), mounted to rotate about a tilt axis (Y) that intersects the axis of said hole (27) perpendicularly and substantially halfway along the hole, is disposed on the thrust rod (15) between a bottom sleeve (29) and a top sleeve (28) slidably mounted on the thrust rod (15), and wherein said lever has two surfaces of revolution centered on said tilt axis (Y), said surfaces being disposed on either side of said hole (27) and being in contact with the top and bottom sleeves (28, 29), the bottom sleeve (29) coming into abutment against said fixed abutment (31) when the lever (26) reaches its end-of-stroke position.

5,770,160

**POSITIVE DISPLACEMENT LIQUID DRAWING AND DISPENSING APPARATUS**

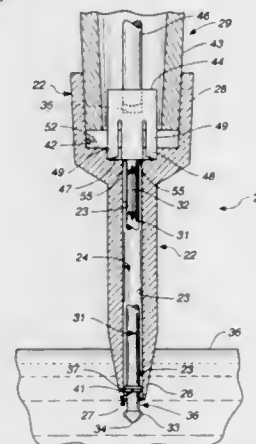
James C. Smith, Hayward, and Donald H. DeVaughn, San Francisco, both of Calif., assignors to Bio-Plas, Inc., San Francisco, Calif.

Continuation of Ser. No. 528,780, Sep. 15, 1995, abandoned.  
This application Jul. 25, 1997, Ser. No. 906,137

Int. Cl.<sup>6</sup> B01L 3/02; G01N 1/14

U.S. Cl. 422—100

20 Claims



1. A liquid drawing and dispensing apparatus comprising:  
a tubular member having an interior surface defining an axially extending lumen having a length dimension and terminating in a draw opening enabling drawing of a liquid into said lumen and dispensing of liquid therefrom; and  
a plunger mounted for axial displacement in said lumen in a first direction to draw liquid into said lumen and a second opposite direction to dispense liquid from said lumen, said plunger having a length dimension extending over substantially the entire length dimension of said lumen, said plunger having a first seal positioned proximate a draw end of said plunger closest to said draw opening and a second seal positioned axially spaced from said first seal in a direction away from said draw end, said first seal and said second seal each slidably and sealingly engaging said interior surface as said plunger is displaced axially in said lumen, and said plunger being recessed intermediate said first seal and said second seal

for receipt of gas trapped during drawing in of said liquid, and said plunger having a length dimension sufficient for displacement of said first seal to a position outwardly of said draw opening while said plunger is coupled to a pipetter, and said first seal is dimensioned to be drawn back into said lumen through said draw opening during drawing of liquid.

5,770,161

**FLUE GAS TREATING SYSTEM**

Eiji Ochi, Tokyo; Toru Takashina, and Takao Sodeshita, both of Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

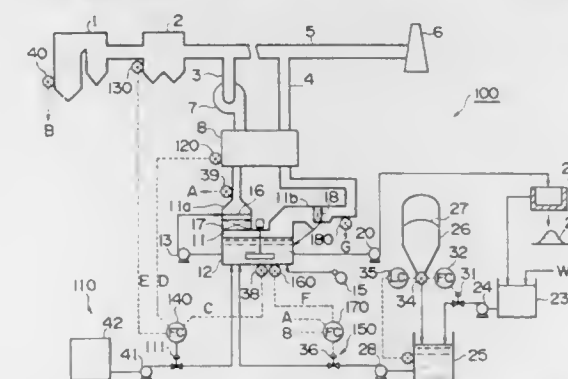
Filed Nov. 29, 1995, Ser. No. 564,409

Claims priority, application Japan, Apr. 21, 1995, 7-096773

Int. Cl.<sup>6</sup> B01D 47/00; G05D 7/00

U.S. Cl. 422—111

5 Claims



1. A flue gas treating system comprising a gas-gas heater for heating the treated flue gas by use of the heat of untreated flue gas containing sulfur dioxide; and a wet flue gas desulfurization apparatus in which the flue gas leaving said gas-gas heater is introduced into an absorption tower and brought into contact with a calcium compound-containing slurry to remove the sulfur dioxide by absorption and form gypsum, said flue gas system further comprising:

addition means for adding an alkaline agent to the slurry;  
a pH detector for detecting the pH of the slurry within said absorption tower;  
gas-gas heater operational state detection means for detecting the operational state of said gas-gas heater; and  
alkaline agent addition control means for controlling the amount of alkaline agent added in response to signals from said pH detector and said gas-gas heater operational state detection means;  
said alkaline agent addition control means configured so that when detection of the pH of the slurry within said absorption tower and of the operational state of said gas-gas heater reveals that the pH of the slurry has fallen below a preset target value or the operational state of said gas-gas heater has become an unsteady operational state causing an increase in the amount of impurities present in the untreated flue gas, at least a predetermined constant flow rate of the alkaline agent can be added to the slurry until the pH of the slurry rises to the target value and the unsteady operational state ceases.

5,770,162

**HORIZONTAL REGENERATIVE THERMAL OXIDIZER UNIT**

Hassan S. Niknafs, Stow, Ohio, assignor to Norton Chemical Process Products Corporation, Stowe, Ohio

Filed Jul. 8, 1996, Ser. No. 676,607

Int. Cl.<sup>6</sup> F23B 5/00; B01D 50/00; F01N 3/10; F27D 17/00

U.S. Cl. 422—169

4 Claims

1. A horizontal thermal regenerative oxidizer unit comprising a combustion chamber connected to two heat regenerator units hous-

ing heat sink media wherein each unit comprises at least first and second compartments in vertically stacked relationship with connecting passageways such that gases passing therethrough pass horizontally in a first direction through the first compartment and then subsequently in the reverse direction through the second compartment.

5,770,163

**SYSTEM FOR THE RECOVERY OF AMMONIA ESCAPING FROM AN AMMONIA REDUCTION DENITRATOR**

Tadashi Gengo; Norihisa Kobayashi, and Koichi Sakamoto, all of Tokyo, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

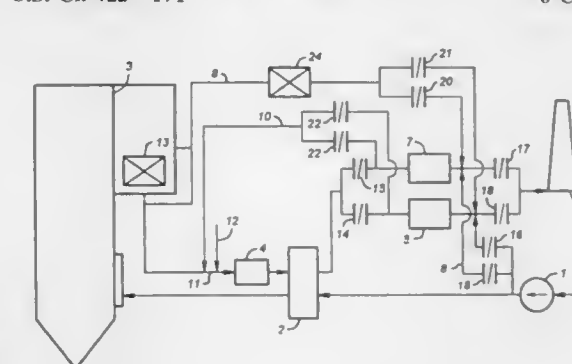
Continuation of Ser. No. 360,585, Dec. 21, 1994, abandoned.

This application Apr. 26, 1996, Ser. No. 638,468

Int. Cl.<sup>6</sup> B01D 53/34

U.S. Cl. 422—171

6 Claims



1. A denitration system comprising a source of gas comprising nitrogen oxide, an ammonia injection line for injecting ammonia, an ammonia reduction denitrator, communicable with said ammonia injection line, for denitrating said nitrogen oxide-containing gas, at least two leak ammonia recovery units, communicable with said denitrator, which adsorb and remove ammonia escaping from said ammonia reduction denitrator, a first gas line connecting said source of nitrogen oxide-containing gas to said leak ammonia recovery units for supplying said nitrogen oxide-containing gas to said leak ammonia recovery units for desorption of absorbed ammonia, an air supply line with a fan for supplying air to said leak ammonia recovery units, said air supply line connected to an end of each of said leak ammonia recovery units to which end said first gas line is connected so as to cool said leak ammonia recovery units after ammonia is desorbed from said units, a desorption gas line connecting said leak ammonia recovery units to a line connecting said source of nitrogen oxide-containing gas with said ammonia reduction denitrator so that a desorption gas containing ammonia desorbed from said leak ammonia recovery units is supplied to the ammonia reduction denitrator, means being provided so that operation of said leak ammonia recovery units is switched over in such a way that during operation at least one of the leak ammonia recovery units removes leak ammonia from said nitrogen oxide-containing gas outputted from said ammonia reduction denitrator as a result of denitration of said nitrogen oxide containing gas while absorbed ammonia is desorbed from another leak ammonia recovery unit or said another leak ammonia recovery unit is cooled, and a second line connected to said first gas line for introducing air from said air supply line to said first gas line so as to adjust the temperature of the gas in said first gas line to be supplied to said ammonia recovery units for desorption of adsorbed ammonia therefrom.



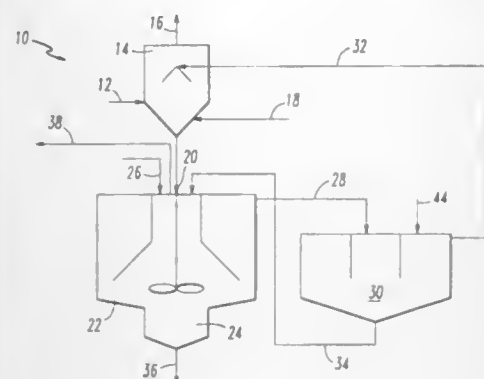
5,770,164

## CLEAR LIQUOR ORGANIC ACID FLUE GAS DESULFURIZATION SYSTEM

Robert E. Moser, Palo Alto; David R. Owens, Mountain View, both of Calif.; James H. Wilhelm, Sandy, Utah; James D. Colley, Anchorage, Ky., and Oliver W. Hargrove, Jr., Austin, Tex., assignors to Electric Power Research Institute, Palo Alto, Calif.

Division of Ser. No. 453,897, May 30, 1995, Pat. No. 5,558,848, which is a continuation-in-part of Ser. No. 109,487, Aug. 20, 1993, abandoned. This application May 9, 1996, Ser. No. 647,053

Int. Cl.<sup>6</sup> B01D 50/00; B01J 8/04; C10B 17/20  
U.S. Cl. 422-171 16 Claims



1. A wet flue gas desulfurization system for conducting a flue gas desulfurization process wherein sulfur dioxide is removed from sulfur dioxide-containing flue gas with a substantially solids-free clear scrubbing liquor and organic acid to produce gas that is substantially free of sulfur dioxide and sulfur oxide-containing waste solids, wherein said system comprises:

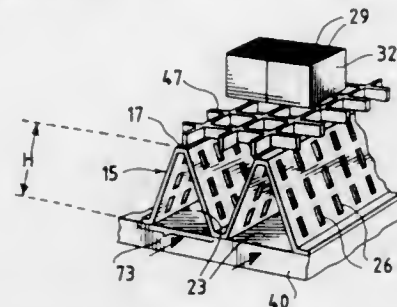
- a) a scrubber fluidically connected to a source of sulfur dioxide-containing flue gas for scrubbing the sulfur dioxide from the flue gas with the organic acid-containing clear scrubbing liquor, wherein said scrubber includes a gas discharge line for discharging substantially sulfur dioxide-free gas into the environment and a gravity discharge line for directing substantially all of the sulfur dioxide-containing scrubber effluent from the scrubber;
- b) a reactor system fluidically connected to the gravity discharge line to receive substantially all of the scrubber effluent, wherein said reactor system includes a single unitary reaction tank that combines reactor and thickener functions positioned proximate to the gravity discharge line and a sludge bed reactor formed integrally with the reaction tank and positioned distant from the gravity discharge line;
- c) an acid addition line fluidically connected between a source of organic acid and the scrubber for adding an organic acid to the flue gas desulfurization system;
- d) a reactor liquor discharge line fluidically connected between the reaction tank and the scrubber whereby substantially solids-free reactor liquor is directed from the reaction tank to the scrubber;
- e) a conduit fluidically connected between a source of lime or limestone and the reactor system for directing lime or limestone into the reactor system; and
- f) a sludge discharge line fluidically connected to said sludge bed reactor to direct sulfur oxide-containing waste solids to a dewatering system for removing water from said waste solids.

5.770.165

## REGENERATIVE THERMAL OXIDIZER WITH FLOOR-MOUNTED MEDIA SUPPORT

Thomas James Truppi, Corona; Erwin Hendricks, LaVerne; Gary Lee Martin, Upland, and Melanlus D'Souza, San Dimas, all of Calif., assignors to Smith Engineering Company, Ontario, Calif.

U.S. Cl. 422-171 17 Claims



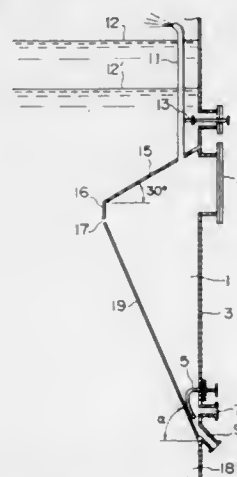
1. Support structure in combination with a thermal oxidizer, comprising:
  - a regenerative thermal oxidizer with a regenerator, the regenerator resting on a base surface and containing heat exchange materials;
  - a perforated, corrugated beam made of a rigid material, the beam having a configuration defining, together with the base surface, a plurality of air distribution plenums located under the beam; and
  - wherein the beam rests on the base surface and supports the heat exchange materials.

5,770,166

**SLURRY THICKENING TANK AND ABSORPTION  
TOWER FOR USE IN WET FLUE GAS  
DESULFURIZATION SYSTEMS**

Taku Shimizu; Koichiro Iwashita; Yoshikazu Endo, all of Tokyo; Masakazu Onizuka, and Toru Takashina, both of Hiroshima-ken, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 12, 1996, Ser. No. 630,687  
Claims priority, application Japan, May 26, 1995, 7-128312  
Int. Cl.<sup>6</sup> B01D 50/00; B01J 8/08

U.S. Cl. 422—172 6 Claims

1. A slurry thickening tank comprising a tank body disposed below a surface of a slurry within a slurry tank, a slurry inlet provided in an upper part of said tank body, a thickened slurry outlet provided in a lower part of said tank body, and supernatant liquid withdrawal means provided in an upper part of said tank body, whereby the slurry introduced into said tank body through said slurry inlet is thickened by sedimentation in said tank body

JUNE 23, 1998

and a resulting thickened slurry is discharged from said tank body through said slurry outlet, wherein a surface of the structural member of said tank body extending from said slurry inlet to said thickened slurry outlet has an angle of inclination greater than an angle of repose for the thickened slurry.

5.770.167

WASTE GAS TREATING APPARATUS  
Chin-Ching Yen, 2 F, No. 499, Ying-Tsai Road, Taichung, Taiwan, and Chih-Ming Lee, 3 F, No. 92, Min-Chuan First Road, Kaohsiung, Taiwan

U.S. Cl. 422—172 2 Claims



1. A waste gas treating apparatus for treating a waste gas containing at least one gas selected from the group consisting of carbon dioxide or sulfur dioxide, comprising:

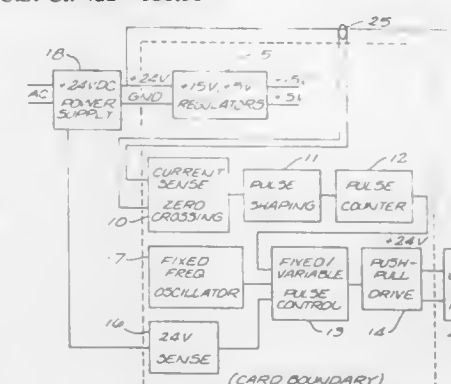
- carbon dioxide or sulfur dioxide, comprising:
- a first washing tower having a draining opening disposed in a base portion thereof;
  - a precipitation pool coupled in fluid communication with said draining opening;
  - a plurality of angularly arranged fluid inlets disposed at equal intervals on an inner wall of said washing tower, each of said plurality of fluid inlets being inclined downwardly at an angle within the approximating range of 10 to 30 degrees and inclined inwardly at an angle within the approximating range of 45 to 85 degrees with respect to a line extending normal to said inner wall of said washing tower for introducing a clockwise flow of a fluid passing therefrom;
  - means for supplying the fluid to said plurality of fluid inlets at a substantially equal and constant flow rate, said substantially constant flow rate of said plurality of fluid inlets being equal to a flow rate of the fluid through said draining opening for maintaining the fluid at a predetermined height above said plurality of fluid inlets, said fluid supply means including means for recirculating the fluid from said precipitation pool and means for forming a dispersion of lime in the fluid;
  - compressor means coupled in fluid communication with said washing tower and a source of the waste gas for supplying the waste gas to said washing tower at a predetermined pressure;
  - means for removing ashes from the waste gas disposed intermediate the source of the waste gas and said compressor means; and
  - a plurality of angularly arranged gas inlets disposed at equal intervals on an inner wall of said washing tower at a height below said plurality of fluid inlets and coupled in fluid communication with said compressor means for injecting the waste gas into the fluid, the gas being injected at a substantially equal flow rate from each of said plurality of gas inlets, each of said plurality of gas inlets being inclined upwardly at an angle within the approximating range of 10 to 30 degrees and inclined inwardly at an angle within the approximating range of 45 to 85 degrees with respect to a line extending normal to said inner wall of said washing tower for introducing a counterclockwise flow of the waste gas passing therefrom.

5.770.168

### OZONE-GENERATOR SELF ADJUSTING PUSH-PULL CIRCUIT

**Ronald J. Carlsen, and Victor J. Hamel, both of Tucson, Ariz., assignors to Val Priotte, Tucson, Ariz.**

U.S. Cl. 422—186.16 10 Claims



1. An electronic circuit comprising a self-adjusting circuit that senses a self-resonant current in an ozone generator having a natural frequency and drives the ozone generator at substantially two thirds of the natural frequency.

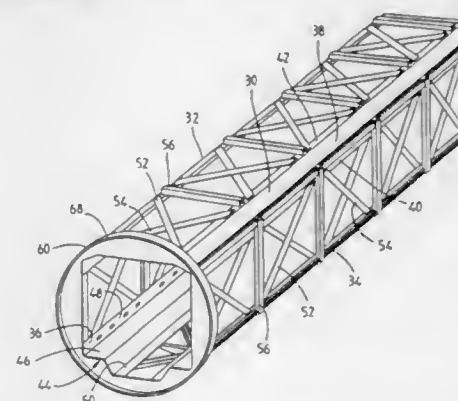
5,770,169

## ROTARY DRUM STRUCTURE FOR A STERILIZING APPARATUS

Jean-Patrick Roumagnac, Le Coteau, France, assignor to Barriquand Steriflow, Roanne, France  
PCT No. PCT/FR94/00778, 371 Date Dec. 28, 1995, § 102(c)  
Date Dec. 28, 1995, PCT Pub. No. WO95/01107, PCT Pub.  
Date Jan. 12, 1995

PCT Filed Jun. 28, 1994, Ser. No. 569,222  
Claims priority, application France, Jun. 29, 1993, 93 07891  
Int. Cl.<sup>6</sup> A61L 9/00

U.S. Cl. 422-297 6 Claims



1. A rotary drum structure for a sterilizer including an outer case having a longitudinal axis about which the drum is mounted to rotate, the structure comprising:

- four beam-forming elements disposed parallel to said axis and defining a rectangular parallelepiped volume for receiving objects to be sterilized;
- a plurality of spacer elements disposed in the four faces defining said parallelepiped volume, each spacer element having a first end welded to one beam element and a second end welded to another beam element lying in the same face, the spacer elements and the beams forming triangulated structures;
- a first end part fixed to a first end of the beam elements to define a central rotary bearing disposed on said axis for rotation, the central rotary bearing disposed in the center of said first end part;

a rotary drive shaft adapted to co-operate with said central rotary bearing;  
a second end part fixed to a second end of the beam elements to define an inlet opening into said drum; and  
means forming a circular running path secured to said second end part, said running path having axis for rotation at its axis of revolution, said running path being adapted to co-operate with rotary guide means secured to an inside face of the outer case of said sterilizer.

5,770,170  
RECOVERY OF ZINC FROM SULPHIDIC CONCENTRATES

Michael J. Collins, and Donald K. Kofluk, both of Fort Saskatchewan, Canada, assignors to 698638 Alberta Ltd., Fort Saskatchewan, Canada

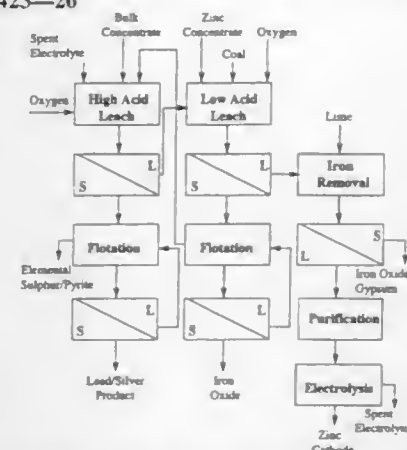
Division of Ser. No. 553,175, Nov. 7, 1995, Pat. No. 5,651,947.

This application Aug. 20, 1996, Ser. No. 700,143

Int. Cl.<sup>6</sup> B03D 1/00; C22B 19/00; 3/00

U.S. Cl. 423—26

6 Claims



1. A two stage cocurrent pressure leaching process for recovering zinc, lead and/or silver from zinc bearing sulphidic materials which comprises: dispersing finely divided zinc bearing sulphidic material containing lead and/or silver in an aqueous sulphuric acid solution to form a first slurry; feeding the said first slurry to a first pressure leach stage; dispersing finely divided zinc bearing sulphidic material in an aqueous sulphuric acid solution to form a second slurry; feeding said second slurry to a second pressure leach stage; providing an effective amount of finely divided coal to said second pressure leach stage which is functional to inhibit molten sulphur from occluding unleached sulphide particles; leaching said zinc bearing sulphidic materials in said second pressure leach stage under a positive partial pressure of oxygen at a temperature above the melting point of sulphur, adjusting and correlating the quantity of zinc bearing sulphidic material fed to said second pressure leach stage relative to the quantity of acid, and any acid equivalent such as iron sulphates in said second pressure leach stage, such that at least about 1.3 mole of zinc in sulphide form enters said second pressure leach stage for each mole of acid and acid equivalent as iron sulphate, to extract zinc values with concurrent conversion of sulphide sulphur to elemental sulphur to thereby produce a second pressure leach stage residue containing unreacted sulphides, elemental sulphur gangue minerals and precipitated iron, and a second pressure leach stage solution having a pH above 1 and containing about 160 g/L dissolved zinc, less than about 10 g/L free sulphuric acid and less than about 2 g/L dissolved iron; separating the second pressure leach stage solution from the second pressure leach stage residue; precipitating iron from the second pressure leach stage solution and purifying the solution from which the iron has been precipitated, recovering zinc from the purified solution by subjecting the purified solution to electrolysis; subjecting said second pressure leach stage residue to froth flotation to separate a flotation concentrate containing unleached sulphides, elemental sulphur and coal from a flotation tailings containing the precipitated iron and gangue minerals; passing said

second pressure leach flotation concentrate and spent electrolyte from said electrolysis step together with said zinc bearing sulphidic material containing lead and/or silver fed to said first pressure leach stage; conducting said first pressure leach stage under a positive partial pressure of oxygen at a temperature above the melting point of sulphur to extract substantially all of the zinc from said second pressure leach flotation concentrate and said zinc bearing sulphidic material containing lead and/or silver in a first pressure leach stage solution, said first pressure leach stage solution having a stoichiometric excess of sulphuric acid relative to the zinc content of the feed materials to said first pressure leach stage of from about 50 to 100% to thereby produce a residue containing a major proportion of the lead and/or silver and a leach solution containing a major portion of the zinc and iron; passing said leach solution from the first pressure leach stage to the second pressure leach stage; and subjecting said first pressure leach stage residue to froth flotation to recover the lead and/or silver as flotation tailings.

5,770,171

PROCESS FOR PRODUCTION OF CHLORINE DIOXIDE  
Birgitta Sundblad, Sundsvall; Anders Oscar Johan Dahl, Saltsjö-Boo, both of Sweden, and John R. Winters, Marietta, Ga., assignors to Eka Nobel Inc., Marietta, Ga.

Filed Mar. 5, 1990, Ser. No. 486,122

Int. Cl.<sup>6</sup> C01B 11/02

U.S. Cl. 423—479

11 Claims

1. A process for producing chlorine dioxide by reducing alkali metal chlorate with methanol, ethanol or isopropanol as organic reducing agent in an aqueous reaction medium containing sulfuric acid, said reaction medium maintained in a single-chambered generator-evaporator-crystallizer apparatus under a subatmospheric pressure, the process including the steps of maintaining said reaction medium at its boiling point at a temperature below that above which substantial decomposition of chlorine dioxide occurs to evaporate water from said reaction medium and provide a gaseous mixture containing steam and chlorine dioxide;

removing said gaseous mixture from said single-chambered apparatus, recovering an aqueous solution of chlorine dioxide from said removed mixture;  
maintaining the liquid level in said single-chambered apparatus substantially constant by balancing water fed to the single-chambered apparatus with water removed therefrom;  
continuously depositing alkali metal sulfate salt from said reaction medium after the reaction medium becomes saturated thereby after the initial start up of the process, and removing said deposited alkali metal salt from said single-chambered apparatus, wherein substantially steady state conditions are maintained in said reaction medium by continuously feeding said alkali metal chlorate, organic reducing agent and sulfuric acid in the substantial absence of added chloride ions into said reaction medium to make up chemicals consumed in said reducing step and to maintain a total acid normality in said reaction medium of less than 9 normal and at least 5.5 normal, and a chlorate concentration of between 1.6 molar and saturation.

5,770,172

PROCESS OF FORMING COMPOUNDS USING REVERSE MICELLE OR REVERSE MICROEMULSION SYSTEMS

John C. Linehan; John L. Fulton, and Roger M. Bean, all of Richland, Wash., assignors to Battelle Memorial Institute, Richland, Wash.

Continuation of Ser. No. 310,882, Sep. 22, 1994, abandoned, which is a continuation of Ser. No. 821,765, Jan. 15, 1992, abandoned. This application Oct. 4, 1996, Ser. No. 725,840

Int. Cl.<sup>6</sup> C01G 49/02; 49/06; 49/08

U.S. Cl. 423—561.1

42 Claims

1. A process of producing nanometer-sized particles of a metal oxide compound, comprising the steps of:

forming a reverse micelle system or a bi-continuous system, or a reverse microemulsion system each comprising a polar fluid, a surfactant and a co-surfactant that is water soluble in a non-polar or low-polarity fluid;

introducing a first reactant comprising a multi-component, water soluble metal compound into the polar fluid during the formation of said reverse micelle system or said bi-continuous system subsequent to its formation;

reacting said multi-component, water soluble metal compound in said reverse micelle system or said bi-continuous system to form said nanometer sized particles of said nanometer-sized metal oxide compound, said nanometer sized particles having an average size not more than about 20 nm; and  
separating said nanometer-sized particles from said reverse micelle system or said bi-continuous system.

5,770,173

METHOD OF PRODUCING CATHODE ACTIVE MATERIAL FOR NON-AQUEOUS ELECTROLYTE SECONDARY BATTERY

Yoshiaki Nitta, Hirakata; Masatoshi Nagayama, and Tomoaki Seo, both of Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

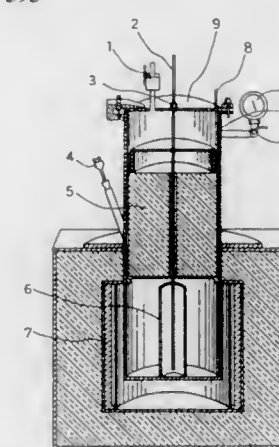
Filed Feb. 27, 1996, Ser. No. 607,544

Claims priority, application Japan, Mar. 3, 1995, 7-044052

Int. Cl.<sup>6</sup> C01G 45/12; 51/00; 53/00

U.S. Cl. 423—593

8 Claims



1. A method of producing a cathode active material for a non-aqueous electrolyte secondary battery, comprising the step of exposing a hydroxide or an oxyhydroxide of a 3d transition metal to an atmosphere of saturated water vapor including dispersed water mist containing lithium metal ions to substitute said lithium ions for protons contained in said hydroxide or said oxyhydroxide.

5,770,174

METHOD FOR CONTROLLING REACTION TEMPERATURE

James M. Eller; Roy N. McBrayer, both of Austin, and Jimmy G. Swan, Alvin, all of Tex., assignors to RPC Waste Management Services, Inc., Austin, Tex.

Continuation of Ser. No. 868,954, Apr. 16, 1992, abandoned.

This application Jun. 7, 1994, Ser. No. 254,956

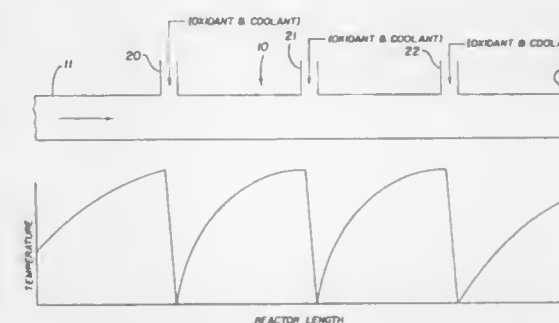
Int. Cl.<sup>6</sup> C07B 31/00; 33/00

U.S. Cl. 423—659

103 Claims

1. A method of controlling reactions in a process stream in which an exothermic reaction of at least two reactants occurs comprising:

(a) causing a process stream containing water and a first reactant to flow from an inlet toward an outlet in an elongated reaction chamber under a pressure greater than 218 bar and a temperature sufficient to achieve at least supercritical water conditions;  
(b) sensing a temperature of the process stream;



(c) injecting a sufficient amount of water into said elongated reaction chamber a first location downstream from said inlet to reduce the temperature of the process stream downstream from said inlet, wherein the water is injected into the reaction chamber as a function of the sensed temperature; and  
(d) injecting a second reactant into said reaction chamber.

5,770,175

METHOD OF PREPARING ZEOLITE SSZ-42

Stacey I. Zones, San Francisco, Calif., assignor to Chevron U.S.A. Inc., San Francisco, Calif.

Division of Ser. No. 574,559, Dec. 14, 1995, Pat. No.

5,653,956, which is a continuation of Ser. No. 199,040, Feb.

18, 1994, abandoned. This application Apr. 8, 1997, Ser. No.

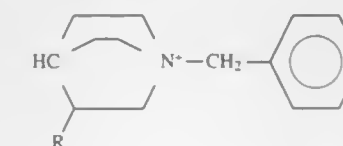
841,968

Int. Cl.<sup>6</sup> C01B 39/02; 39/04; 39/12

U.S. Cl. 423—706

7 Claims

1. A method of preparing a crystalline material having a mole ratio of a first oxide selected from silicon oxide, germanium oxide and mixtures thereof to a second oxide selected from aluminum oxide, gallium oxide, iron oxide, titanium oxide, boron oxide and mixtures thereof greater than about 10 and wherein at least 50% of the second oxide is boron oxide, said method comprising contacting under crystallization conditions sources of said oxides and a templating agent comprising cations selected from the group consisting of N-benzyl-1-azabicyclo[2.2.2]octane cations having the structure



where R is —OH or —NH<sub>2</sub>, and N-benzyl-1,4-diazabicyclo[2.2.2]octane cations.

5,770,176

ASSAYS FOR FUNCTIONAL NUCLEAR RECEPTORS

Ruhangiz Dokhi Nargessi, Alameda, Calif., assignor to Chiron Diagnostics Corporation, East Walpole, Mass.

Filed Dec. 8, 1995, Ser. No. 569,977

Int. Cl.<sup>6</sup> A61K 5/00

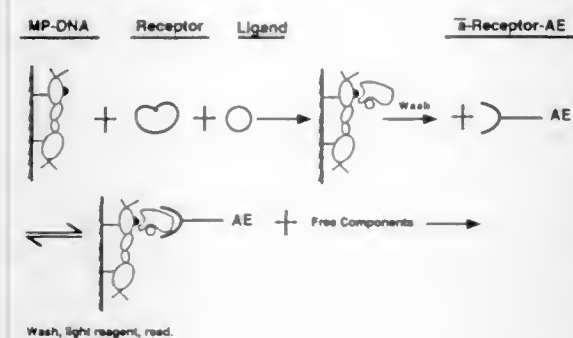
U.S. Cl. 424—1.49

64 Claims

1. A method of detecting the presence or absence of functional nuclear receptors in a cell or tissue sample, or of detecting and quantitating functional nuclear receptors in a cell or tissue sample comprising:

(a) contacting said sample with the following: (1) ligand to which the nuclear receptor under assay binds; (2) antibody that is capable of specifically binding to the nuclear receptor under assay when said receptor is bound both to its associated ligand and response element; and (3) a nucleic acid reagent containing one or more response element segments to which the nuclear receptor under assay binds; wherein either said antibody or said nucleic acid reagent is attached to a solid phase, and wherein the sample may be contacted with the





ligand, the nucleic acid reagent and the antibody components simultaneously, with two of said components simultaneously, or sequentially with said three components in any order; and (b) correlating the specific binding of said nucleic acid reagent, said ligand and said antibody to a substance in said sample with the presence of functional nuclear receptors in said sample, or correlating the amount of complexes formed by the specific binding of said nucleic acid reagent, said ligand, said antibody and a substance in said sample with the amount of functional nuclear receptors in said sample.

5,770,177

Patent Not Issued For This Number

5,770,178

## METAL CHELATE FORMING PEPTIDES AND USE THEREOF

Yoshitoshi Itaya, Sodegaura; Ikuya Seki, Ichihara; Koichi Hanaoka, Sodegaura, and Yoshifumi Shirakami, Ichihara, all of Japan, assignors to Nihon Medi-Physics Co., Ltd., Hyogo-Ken, Japan

Filed Dec. 20, 1995, Ser. No. 575,863

Claims priority, application Japan, Dec. 27, 1994, 6-338024

Int. Cl.<sup>6</sup> A61K 51/00; A61M 36/14

U.S. Cl. 424—1.69

14 Claims

1. A metal chelate forming peptide having an amino acid sequence represented by:

X1-X2-Cys

wherein X1 represents an Asp residue, a Tyr residue or a Lys residue; X2 represents an amino acid residue other than a Cys residue and a Pro residue, provided that X2 does not represent a Gly residue when X1 represents an Asp residue; wherein functional groups at the N-terminus, C-terminus and side chain are optionally substituted with protecting groups; and wherein each of the amino acid residues are either D-form or L-form.

5,770,179

## RADIOLABELED GLUCANS

Richard T. Dean, Bedford, N.H., assignor to Diatide, Inc., Londonderry, N.H.

Division of Ser. No. 98,206, Jul. 28, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 476,687

Int. Cl.<sup>6</sup> A61K 51/00; A61M 36/14

U.S. Cl. 424—1.73

2 Claims

1. A composition of matter comprising a water-soluble  $\beta$ -glucan that specifically binds to leukocytes in vivo, and a stannous ion.

5,770,180  
BRIDGE-SUBSTITUTED TROPANES FOR METHODS OF IMAGING AND THERAPY

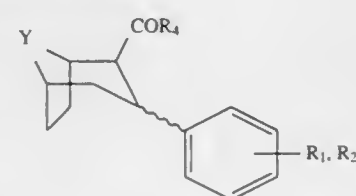
Bertha K. Madras, Newton, and Peter Meltzer, Lexington, both of Mass., assignors to Organix, Inc., Woburn, and President and Fellows of Harvard College, Cambridge, both of Mass. Continuation-in-part of Ser. No. 548,271, Oct. 25, 1995, abandoned, which is a division of Ser. No. 111,141, Aug. 24, 1993, Pat. No. 5,506,359, which is a continuation-in-part of Ser. No. 934,362, Aug. 24, 1992, abandoned. This application Apr. 26, 1996, Ser. No. 649,258

Int. Cl.<sup>6</sup> A61K 51/04; C07D 313/00; 451/02

U.S. Cl. 424—1.81

15 Claims

1. A compound of formula:



wherein the linkage at each of the 2- and 3-positions independently may be  $\alpha$  or  $\beta$ ; wherein Y is C, O, S, SO; or SO<sub>2</sub>; wherein R<sub>1</sub> and R<sub>2</sub> are each chosen independently from OH, Br, Cl, F, I, OCH<sub>3</sub>, CF<sub>3</sub>, NO<sub>2</sub>, NH<sub>2</sub>, CN, NCS, OAc, H, or N<sub>3</sub>; and wherein R<sub>4</sub> is CH<sub>3</sub>, CH<sub>3</sub>CH<sub>2</sub>, (CH<sub>2</sub>)<sub>2</sub>CH, CH<sub>3</sub>(CH<sub>2</sub>)<sub>n</sub>, (CH<sub>2</sub>)<sub>n</sub>C<sub>6</sub>H<sub>4</sub>X, C<sub>6</sub>H<sub>4</sub>X, C<sub>6</sub>H<sub>5</sub>, OCH<sub>3</sub>, OCH(CH<sub>3</sub>)<sub>2</sub>, OC<sub>6</sub>H<sub>5</sub>, OC<sub>6</sub>H<sub>4</sub>X, O(CH<sub>2</sub>)<sub>n</sub>C<sub>6</sub>H<sub>4</sub>X, O(CH<sub>2</sub>)<sub>n</sub>CH<sub>3</sub>, or OCH<sub>2</sub>CH<sub>2</sub>, wherein X is Br, Cl, I, F, OH, OCH<sub>3</sub>, CF<sub>3</sub>, NO<sub>2</sub>, NH<sub>2</sub>, CN, NHC(O)CH<sub>3</sub>, N(CH<sub>3</sub>)<sub>2</sub>, (CH<sub>2</sub>)<sub>n</sub>CH<sub>3</sub>, COCH<sub>3</sub>, or C(CH<sub>3</sub>)<sub>3</sub>, wherein n is between 0 and 6 inclusive.

5,770,181

## COMPOSITION AND METHOD FOR DELIVERING ACTIVE AGENTS

W. Dean Kirkland, El Cajon, Calif., assignor to Alliance Pharmaceutical Corp., San Diego, Calif.

Continuation of Ser. No. 685,211, Apr. 12, 1991, Pat. No. 5,496,535. This application Jun. 7, 1995, Ser. No. 481,057

Int. Cl.<sup>6</sup> A61K 49/04

U.S. Cl. 424—9.37

33 Claims

1. A composition for delivering an active material to a patient, comprising:

a fluorocarbon liquid; and  
an effective amount of a solid, fluorocarbon-insoluble particulate material, selected from the group consisting of a gas-generating agent, a palatability-enhancing agent, a pharmacological agent, and a bioactive agent, in direct admixture with said liquid.

5,770,182

## METHODS FOR TREATING TEETH WITH ANTICARIOGENIC AND ANTIMICROBIAL DENTAL COMPOSITIONS

Dan E. Fischer, Salt Lake City, Utah, assignor to Ultradent Products, Inc., South Jordan, Utah

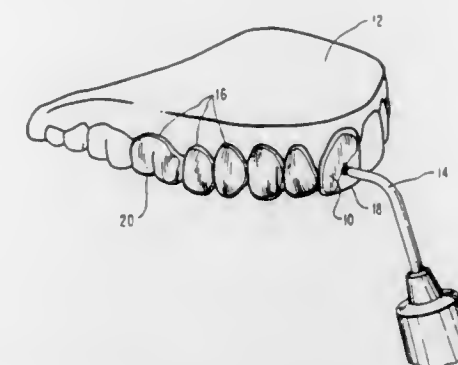
Continuation of Ser. No. 99,247, Jul. 28, 1993, abandoned, which is a continuation of Ser. No. 985,700, Dec. 2, 1992, abandoned, which is a continuation of Ser. No. 718,210, Jun. 20, 1991, abandoned, which is a division of Ser. No. 497,934, Mar. 22, 1990, abandoned. This application Jan. 25, 1995, Ser. No. 378,315

Int. Cl.<sup>6</sup> A61K 7/16; A61C 5/00

U.S. Cl. 424—49

18 Claims

1. A method for providing anticariogenic treatment of a patient's teeth consisting essentially of the following steps:



- obtaining a dental tray configured to cover a patient's teeth to be treated and configured to hold an anticariogenic dental composition therewithin;
- placing within said dental tray an anticariogenic dental composition having sufficient stickiness to retain said dental tray over the patient's teeth, the dental composition consisting essentially of:
  - an anticariogenic agent for treating teeth in contact with the anticariogenic agent, the anticariogenic agent selected from the group consisting of fluoride salts, complexes, and mixtures thereof;
  - a matrix into which the anticariogenic agent is dispersed, the matrix containing therein dispersed carboxypolyethylene that has been neutralized with a base in a range from about 3.5% to about 12% by weight of the anticariogenic dental composition;
  - water in a range from about 10% to about 60% by weight of the dental composition; and
  - a base to adjust the pH of the dental composition to within a range from about 5 to about 7;
- positioning the dental tray over the patient's teeth so that the anticariogenic dental composition is in contact with the patient's teeth;
- allowing the dental tray to remain positioned over the patient's teeth for at least about two hours; and
- removing the dental tray from the patient's teeth.

5,770,183

## HIGH SPF (30 AND OVER) WATERPROOF SUNBLOCK COMPOSITIONS

Francisco J. Linares, 16363 NW, 49th Ave., Miami Lakes, Fla. 33014

Filed Aug. 1, 1996, Ser. No. 690,898

Int. Cl.<sup>6</sup> A61K 7/42; 7/00; B01J 13/00

U.S. Cl. 424—59

2 Claims

1. An emulsion having an aqueous phase and an oil phase, said oil phase having ingredients comprising at least three components, said components selected from a group consisting of: oxybensone, sulisobensone, dioxibensone, menthyl anthranilate, aminobenzoic acid, amyl dimethyl PABA, 2-ethoxyethyl p-methoxy cinnamate, diethanolamine p-methoxy cinnamate, digalloyl trioleate, ethyl 4-bis (hydroxypropyl) aminobenzoate, 2-ethylhexyl-2-cyano-3-diphenylacrylate, Ethylhexyl p-methoxy cinnamate, 2-ethylhexyl salicylate, Glyceryl Aminobenzoate, Homomenthyl Salicylate, law-some with dihydroxyacetone, octyldimethyl PABA, 2-phenylbenzimidazole-5-sulfonic acid, triethanolamine salicylate, red petrolatum, and titanium dioxide, wherein said aqueous phase constitutes between 35% to 95% of said emulsion by weight.

5,770,184

## ARTIFICIAL FINGERNAIL METHOD AND COMPOSITION

Alexander M. L. Keller, 130 Oxford St., Brooklyn, N.Y. 11235 Continuation-in-part of Ser. No. 710,491, Sep. 18, 1996, which is a continuation-in-part of Ser. No. 530,886, Sep. 19, 1995, Pat. No. 5,632,973. This application May 19, 1997, Ser. No. 858,913

Int. Cl.<sup>6</sup> A61K 7/04; 31/74

U.S. Cl. 424—61

22 Claims

- A method of applying a prefabricated artificial fingernail on a natural fingernail, comprising the steps of:
  - adhering a rigid polyvinyl chloride fingernail extension to a top surface of a free end of the natural fingernail;
  - applying a coating of adhesive to the top surface of the natural fingernail and a layer of powder having acrylic ester polymers to the top surface of the natural fingernail;
  - applying a coating of adhesive to the top surface of the natural fingernail and to the top surface of the polyvinyl chloride fingernail extension and applying a layer of powder having acrylic ester polymers to the top surface of the natural fingernail and to the top surface of the polyvinyl chloride fingernail extension on the adhesive coating while said adhesive coating is still wet;
  - repeating step c. between one and four times after brushing off excess powder before each repetition; and
  - shaping and filing a resulting fingernail surface.

5,770,185

## DEODORIZING PREPARATIONS

Rolf Wachter, Duesseldorf; Karl-Heinz Maurer, Erkrath, and Holger Tesmann, Juechen, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP94/04084, § 371 Date Jun. 17, 1996, § 102(e) Date Jun. 17, 1996, PCT Pub. No. WO95/16429, PCT Pub. Date Jun. 22, 1995

PCT Filed Dec. 8, 1994, Ser. No. 663,130

Claims priority, application Germany, Dec. 17, 1993, 43 43 264.6

Int. Cl.<sup>6</sup> A61K 7/32; 7/00; 31/19; 31/20

U.S. Cl. 424—65

4 Claims

- The process of suppressing body odor comprising applying to the skin a topical composition containing fat-soluble hydroxycarboxylic acid esters obtained by esterification of polybasic, optionally acetylated hydroxycarboxylic acids containing 3 to 6 carbon atoms by reaction with fatty acids containing 12 to 30 carbon atoms, fatty acid esters of C<sub>12-22</sub> fatty acids and C<sub>1-4</sub> alcohols or with hydroxyl compounds selected from the group consisting of:
  - fatty alcohols containing 12 to 30 carbon atoms,
  - fatty acid esters of C<sub>12-22</sub> fatty acids and polyols containing 2 to 6 carbon atoms and 2 to 6 hydroxyl groups,
  - epoxyalkanes containing 12 to 30 carbon atoms,
  - alkyl glycosides corresponding to the formula R<sup>1</sup>O(C<sub>6</sub>H<sub>10</sub>O)<sub>x</sub>—H, in which R<sup>1</sup> is an alkyl group containing 8 to 16 carbon atoms and x representing the average degree of oligomerization of the glycoside unit (C<sub>6</sub>H<sub>10</sub>O), has a value of 1 to 4, and
- adducts of 1 to 8 moles of ethylene oxide with the hydroxyl compounds (a) to (d).

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5,770,186

## ANTIPERSPIRANT COMPOSITION

David T. Callaghan, Quincy; Alan M. Phipps, Framingham, both of Mass., and Stephen J. Provancal, Addison, Ill., assignors to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 252,376, Jun. 1, 1994, Pat. No. 5,589,196, which is a continuation of Ser. No. 846,016, Mar. 4, 1992, abandoned, which is a division of Ser. No. 287,096, Dec. 20, 1988, Pat. No. 5,114,705, which is a continuation of Ser. No. 713,470, Mar. 19, 1985, abandoned, which is a continuation-in-part of Ser. No. 523,785, Aug. 16, 1983, abandoned. This application Dec. 16, 1996, Ser. No. 771,364

Int. Cl.<sup>6</sup> A61K 7/32; 33/24; C01G 25/00; C01F 7/00  
U.S. Cl. 424—65 8 Claims

1. A high efficacy antiperspirant salt which comprises a solid composition of zirconyl hydroxy chloride and aluminum chlorohydroxide with a GPC peak 4 to peak 3 height ratio of at least 1.5:1.

5,770,187

## POROUS PARTICULATE AND COSMETIC

Yoshihiro Hasebe; Michitaka Sawada, both of Wakayama; Makoto Furukawa, Sumida-ku; Takako Nakayama, Wakayama; Kenji Kodama, Sumida-ku; Yasushi Ito, Wakayama; Genichi Nakamura, Wakayama, and Yasuhisa Fukumoto, Wakayama, all of Japan, assignors to Kao Corporation, Tokyo, Japan

PCT No. PCT/JP95/00489, § 371 Date Sep. 13, 1996, § 102(e) Date Sep. 13, 1996, PCT Pub. No. WO95/25752, PCT Pub. Date Sep. 28, 1995

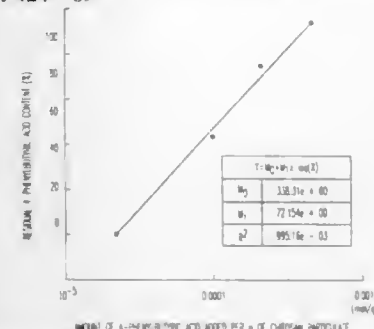
PCT Filed Jun. 17, 1995, Ser. No. 702,699

Claims priority, application Japan, Mar. 18, 1994, 6-048792; Mar. 31, 1994, 6-062401

Int. Cl.<sup>6</sup> A61K 7/035

U.S. Cl. 424—69

26 Claims



1. An amphoteric porous particulate comprising a basic polysaccharide and a polymer of an organic acid containing a reactive vinyl group or a salt thereof and having an average particle size of 50  $\mu$ m or less, wherein said amphoteric porous particulate comprises spherical particles.

5,770,188

## GLUCOXIDE DERIVATIVES FOR ENZYME MODIFICATION, LIPID-COATED ENZYMES, METHOD OF PRODUCING SUCH ENZYMES AND ANTIFOULING PAINT COMPOSITION

Ryoji Hamade, Kadoma; Naoki Yamamori, Tuzuki-gun, and Yoshio Okahata, Kawasaki, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Oct. 28, 1996, Ser. No. 742,597

Claims priority, application Japan, Oct. 26, 1995, 7-278709; Oct. 26, 1995, 7-278718; Oct. 26, 1995, 7-278722

Int. Cl.<sup>6</sup> A61K 31/74

U.S. Cl. 424—78.09

12 Claims

1. An antifouling paint composition which comprises a lipid-coated enzyme being stable in organic solvents as a result of coating with a lipid having 6 to 30 carbon atoms, and a paint resin.

5,770,189

## USE OF DIBUTYL MALATE AS INSECT ATTRACTANT

Michael John Airey, Lancashire; Angela Janousek, Canterbury, both of Great Britain; Erich Klein, Graz, Austria, and Stephen David Watkins, Ashford, Great Britain, assignors to Quest International B.V., Naarden, Netherlands

PCT No. PCT/EP95/02614, § 371 Date Mar. 27, 1997, § 102(e) Date Mar. 27, 1997, PCT Pub. No. WO96/01052, PCT Pub. Date Jan. 18, 1996

PCT Filed Jul. 5, 1995, Ser. No. 765,068

Claims priority, application European Pat. Off., Jul. 6, 1994, 94304965

Int. Cl.<sup>6</sup> A01N 37/06; A01M 1/14; 1/20; 1/22

U.S. Cl. 424—84

8 Claims

3. A method for catching domestically occurring flies which comprises exposing said flies to dibutyl malate vapors emanating from an insect trap thereby causing a concentration gradient of dibutyl malate in the atmosphere surrounding the flies which will lure the flies into or onto the trap.

5,770,190

## METHOD OF TREATMENT OF ACUTE LEUKEMIA WITH INTELEUKIN-10

Oystein Bruserud, Eidsvåg, Norway, and Mary Ellen M. Rybak, Warren, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Jun. 27, 1996, Ser. No. 670,298

Int. Cl.<sup>6</sup> A61K 45/05

U.S. Cl. 424—85.2

16 Claims

1. A method for treating an acute leukemia in a mammal, comprising administering a therapeutically effective amount of interleukin-10 to said mammal.

5,770,191

## ACTIVE C-TERMINAL PEPTIDES OF INTERFERON—GAMMA AND THEIR USE

Howard M. Johnson, and Brian E. Szente, both of Gainesville, Fla., assignors to University of Florida, Gainesville, Fla.

Filed May 24, 1995, Ser. No. 449,639

Int. Cl.<sup>6</sup> A61K 38/21; C07K 14/57

U.S. Cl. 424—85.5

19 Claims

1. A peptide having an amino acid sequence consisting of the following components:

optionally, an N-terminal amino acid residue or sequence of residues of from 2 to about 15 amino acids; the sequence of a fragment of a mammalian interferon-gamma protein other than murine interferon-gamma, the fragment having about 39 or 40 amino acid residues and corresponding to the C-terminal of the interferon protein, or a sequence which differs therefrom by the deletion of up to 15 amino acid residues from the N-terminus, the C-terminus, or both; and optionally, a C-terminal amino acid residue or sequence of residues of from 2 to about 15 amino acids,

wherein the peptide binds to the cytoplasmic domain of the interferon-gamma receptor, induces antiviral activity, or induces MHC class II antigen expression on a target cell, and wherein a peptide having only the amino acid sequence of said fragment binds to the cytoplasmic domain of the interferon-gamma receptor, induces antiviral activity, or induces MHC class II antigen expression on a target cell.

3. A method for modulating an immune response in a subject, comprising the step of administering to the subject an amount of a peptide according to claim 1 effective to induce antiviral activity or to induce MHC class II antigen expression on a target cell.

5,770,192

## BIOLOGICAL CONTROL AGENTS

Patricia Jane Cayley, Berkhamsted; Lorna Mary Dyet Stewart, London; Robert David Possee, and Miguel Lopez Ferber, both of Oxford, all of United Kingdom, assignors to Roussel-Uclaf, Paris, France, and Natural Environment Research Council, Swindon, United Kingdom

Continuation of Ser. No. 117,125, Nov. 24, 1993, abandoned. This application May 26, 1995, Ser. No. 451,472

Claims priority, application United Kingdom, Mar. 22, 1991, 9106185

Int. Cl.<sup>6</sup> A01N 63/00; C12N 15/86

U.S. Cl. 424—93.2

24 Claims

1. A stable, occluded recombinant nuclear polyhedrosis virus which has a functional polyhedrin gene and which, in insect cells infected therewith, expresses a foreign protein comprising an insecticidal toxin which is secreted by the cells which normally produce the toxin; the toxin being provided with a signal peptide such that the toxin is secreted from the insect cells.

5,770,193

## PREPARATION OF THREE-DIMENSIONAL FIBROUS SCAFFOLD FOR ATTACHING CELLS TO PRODUCE VASCULARIZED TISSUE IN VIVO

Joseph P. Vacanti, Winchester, and Robert S. Langer, Somerville, both of Mass., assignors to Massachusetts Institute of Technology Children's Medical Center Corporation, Cambridge, Mass.

Continuation of Ser. No. 401,640, Aug. 30, 1989, abandoned, which is a continuation of Ser. No. 933,018, Nov. 20, 1986, abandoned. This application Feb. 28, 1994, Ser. No. 203,521

Int. Cl.<sup>6</sup> C12N 11/08; 5/00; A61F 2/28; 2/18

U.S. Cl. 424—93.7

17 Claims

1. A method for preparing a scaffold for preparing a cell-scaffold composition for growing cells in vitro to produce functional vascularized organ tissue in vivo comprising:

providing fibers made of a biocompatible, biodegradable, synthetic polymer, and forming the fibers into a fibrous three-dimensional scaffold composed of the fibers.

wherein the fibers of the scaffold provide sufficient surface area to permit attachment in vitro of an amount of the cells effective to produce the functional vascularized organ tissue in vivo;

wherein the fibers of the scaffold are spaced apart such that the maximum distance over which diffusion of nutrients and gases must occur through a mass of cells attached to the fibers is between 200 and 300 microns; and

wherein the diffusion provides free exchange of nutrients, gases and waste to and from the cells uniformly attached to the fibers of the scaffold and proliferating throughout the scaffold in an amount effective to maintain cell viability throughout the scaffold in the absence of vascularization.

5,770,194

## FIBRIN SEALANT COMPOSITIONS AND METHODS FOR UTILIZING SAME

Peter A. D. Edwardson, Chester; John E. Fairbrother; Ronald S. Gardner, both of Clwyd; Derek A. Hollingsbee, South Wirral, and Stewart A. Cederholm-Williams, Oxford, all of United Kingdom, assignors to Bristol-Myers Squibb Company, Skillman, N.J.

Division of Ser. No. 138,674, Oct. 18, 1993, which is a continuation-in-part of Ser. No. 958,212, Oct. 8, 1992, abandoned. This application May 25, 1995, Ser. No. 450,829

Int. Cl.<sup>6</sup> A61K 38/48

U.S. Cl. 424—94.64

2 Claims

1. A method of applying a fibrin sealant comprising a fibrin polymer to a mammal in need thereof, which method comprises

a) preparing a fibrin polymer by subjecting autologous fibrinogen to an enzyme which catalyzes the cleavage of fibrinopeptide A and/or B from fibrinogen, removing substantially all of the enzyme and

b) applying the resulting fibrin sealant to said mammal.

5,770,195

## MONOCLONAL ANTIBODIES DIRECTED TO THE HER2 RECEPTOR

Robert M. Hudziak, Corvallis, Oreg.; H. Michael Shepard, Rancho Santa Fe, Calif.; Axel Ullrich, Portola Valley, Calif., and Brian M. Fendly, Half Moon Bay, Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 286,303, Aug. 5, 1994, Pat. No. 5,677,171, which is a continuation of Ser. No. 977,453, Nov. 18, 1992, abandoned, which is a continuation of Ser. No. 147,461, Jan. 25, 1988, abandoned, which is a continuation-in-part of Ser. No. 143,912, Jan. 12, 1988, abandoned. This application May 23, 1995, Ser. No. 447,517

Int. Cl.<sup>6</sup> A61K 39/395; C07K 16/30; 16/46; C12P 21/08  
U.S. Cl. 424—130.1

36 Claims

1. A method of inhibiting the growth of tumor cells that overexpress HER2 receptor comprising administering to a patient an antibody which binds specifically to the extracellular domain of the HER2 receptor in an amount effective to inhibit growth of the tumor cells in the patient.

14. A method of inhibiting the growth of tumor cells that overexpress a growth factor receptor selected from the group consisting of HER2 receptor and EGF receptor comprising administering to a patient an antibody which binds specifically to said growth factor receptor and a cytotoxic factor, wherein said antibody and said cytotoxic factor are each administered in amounts effective to inhibit growth of tumor cells in the patient and said antibody sensitizes the tumor cells to said cytotoxic factor.

5,770,196

## MODIFIED ANTIBODY VARIABLE DOMAINS AND THERAPEUTIC USES THEREOF

Gary M. Studnicka, Santa Monica, Calif., assignor to XOMA Corporation, Berkeley, Calif.

Continuation of Ser. No. 82,842, Jun. 23, 1993, which is a continuation-in-part of Ser. No. 808,464, Dec. 13, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 472,788

Int. Cl.<sup>6</sup> C07K 16/28; 14/725; 14/705; A61K 39/395

U.S. Cl. 424—133.1

18 Claims

1. A method of depleting CD5<sup>+</sup> cells in an animal comprising the step of administering, to said animal, an effective amount of a cytotoxic protein that comprises a modified immunoglobulin variable domain, wherein said protein is selected from the group consisting of an anti-CD5 immunoglobulin molecule, an immunoglobulin conjugate comprising said molecule, and a fusion protein comprising said molecule, and wherein said modified immunoglobulin variable domain comprises at least one member selected from the group consisting of:

- a modified light chain variable region that has the amino acid sequence of SEQ ID No. 27;
- a modified light chain variable region that has the amino acid sequence of SEQ ID No. 73;
- a modified heavy chain variable region that has the amino acid sequence of SEQ ID No. 29; and
- a modified heavy chain variable region that has the amino acid sequence of SEQ ID No. 74.



5,770,197

**METHODS FOR REGULATING THE IMMUNE RESPONSE USING B7 BINDING MOLECULES AND IL-4 BINDING MOLECULES**

Peter S. Linsley; Jeffrey A. Ledbetter, both of Seattle; Nitin K. Damle, Renton; William Brady, Bothell, and Philip M. Wallace, Seattle, all of Wash., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

Continuation-in-part of Ser. No. 723,617, Jul. 27, 1991, abandoned. This application Jan. 22, 1993, Ser. No. 8,898

Int. Cl.<sup>6</sup> A61K 39/395; C07K 14/705; 16/46

U.S. Cl. 424—134.1

11 Claims

1. A method for suppressing an immune response comprising contacting B7-positive lymphocytes with a B7-binding molecule and an IL-4-binding molecule, wherein an immune response is thereby suppressed.

5,770,198

**PLATELET-SPECIFIC CHIMERIC 7E3 IMMUNOGLOBULIN**

Barry S. Collier, Dix Hills, N.Y., and David M. Knight, Paoli, Pa., assignors to The Research Foundation of the State of New York, Stonybrook, N.Y., and Centocor, Inc., Malvern, Pa.

Continuation of Ser. No. 771,656, Oct. 4, 1991, abandoned, which is a continuation-in-part of Ser. No. 195,720, May 18, 1988, abandoned. This application Jan. 17, 1995, Ser. No. 375,074

Int. Cl.<sup>6</sup> A61K 39/395; C07K 16/28

U.S. Cl. 424—153.1

21 Claims

1. A pharmaceutical composition comprising a chimeric immunoglobulin or chimeric immunoglobulin fragment having specificity for glycoprotein IIb/IIIa receptor and a pharmaceutically acceptable vehicle, said immunoglobulin or immunoglobulin fragment comprising an antigen binding region or a functional portion of said antigen binding region having specificity for glycoprotein IIb/IIIa receptor of the 7E3 monoclonal antibody produced by the hybridoma having ATCC accession number HB 8832 and at least a portion of a constant region of human origin.

5,770,199

**METHOD FOR VIRUS INACTIVATION IN THE PRESENCE OF POLYALKYLENE GLYCOL AS WELL AS THE PHARMACEUTICAL PREPARATION OBTAINED THEREWITH**

Johann Eibl; Friedrich Dörner, both of Vienna, and Noel Barrett, Klosterneuburg/Weidling, all of Austria, assignors to Immuno Aktiengesellschaft, Vienna, Austria

PCT No. PCT/IB95/00019, § 371 Date Jun. 28, 1996, § 102(e) Date Jun. 28, 1996, PCT Pub. No. WO95/09657, PCT Pub. Date Apr. 13, 1995

PCT Filed Jan. 10, 1995, Ser. No. 624,516

Claims priority, application Germany, Oct. 6, 1993, 43 34 087.3; Sep. 27, 1994, 44 34 538.0

Int. Cl.<sup>6</sup> A61K 39/395; 35/16

U.S. Cl. 424—176.1

23 Claims

1. A method for the production of a biological preparation, comprising  
(a) contacting a solution comprising a plasma protein with a polyether and a chaotropic agent to inactivate contaminating infectious agents by a physico-chemical or chemical treatment without the use of a detergent, and  
(b) removing the polyether and chaotropic agent to obtain the pharmaceutical preparation that is substantially free of infectious agents and denaturation products.

5,770,200

**Patent Not Issued For This Number**

5,770,201

**HA-2 ANTIGENIC PEPTIDE**

Els A. J. M. Goulmy, Oegstgeest, Netherlands; Donald F. Hunt, and Victor H. Engelhard, both of Charlottesville, Va., assignors to Rijksuniversiteit Te Leliden, Av Leiden, Netherlands

Filed Dec. 23, 1994, Ser. No. 363,691

Int. Cl.<sup>6</sup> A61K 39/00; C07K 14/78

U.S. Cl. 424—185.1

11 Claims

1. A purified or isolated HA-2 minor histocompatibility antigen polypeptide comprising the amino acid sequence YXGEVXVS (SEQ ID NO: 1) wherein "X" represents a leucine or isoleucine residue and wherein said polypeptide comprises a T cell epitope.

6. A vaccine capable of inducing a Class I MHC-mediated immune response to an HA-2 antigen in an HA-2 negative subject comprising a polypeptide of any one of claims 1, 2, 3 or 4 and a pharmaceutically acceptable carrier or excipient.

7. A method for the elimination of hematopoietic cells presenting an HA-2 minor histocompatibility antigen peptide or polypeptide in a subject comprising administering the vaccine of claim 6 to said subject, wherein said HA-2 peptide or polypeptide comprises the amino acid sequence YXGEVXVS (SEQ ID NO: 1) and wherein "X" represents a leucine or isoleucine residue.

5,770,202

**CLONING AND SEQUENCING OF ALLERGENS OF DERMATOPHAGOIDES (HOUSE DUST MITE)**

Wayne R. Thomas, Nedlands, and Kaw-Yan Chua, Nollamara, both of Australia, assignors to The Institute for Child Health Research, West Perth, Australia, and Immulogic Pharmaceutical Corporation, Waltham, Mass.

Continuation of Ser. No. 945,288, Sep. 10, 1992, Pat. No. 5,433,948, which is a continuation-in-part of Ser. No. 580,655, Sep. 11, 1990, abandoned, which is a continuation-in-part of Ser. No. 458,642, Feb. 13, 1990, abandoned. This application Jun. 5, 1995, Ser. No. 461,809

Int. Cl.<sup>6</sup> A61K 39/35

U.S. Cl. 424—185.1

2 Claims

1. An isolated peptide comprising a portion of a *Der p 1* protein allergen having the following amino acid sequence (SEQ ID NO: 11), wherein said portion comprises at least one T cell epitope and at least one amino acid sequence polymorphism selected from the group consisting of Xaa<sub>1</sub>, Xaa<sub>2</sub>, Xaa<sub>3</sub>, Xaa<sub>4</sub>, Xaa<sub>5</sub>:

Thr Asn Ala Cys Ser Ile Asn Gly Asn Ala Pro Ala Glu Ile Asp Leu Arg Gln Met Arg Thr Val Thr Pro Ile Arg Met Gln Gly Gly Cys Gly Ser Cys Trp Ala Phe Ser Gly Val Ala Ala Thr Glu Ser Ala Tyr Leu Ala Xaa<sub>1</sub> Arg Asn Gln Ser Leu Asp Leu Ala Glu Gln Glu Leu Val Asp Cys Ala Ser Gln His Gly Cys His Gly Asp Thr Ile Pro Arg Gly Ile Xaa<sub>2</sub> Tyr Ile Gln His Asn Gly Val Val Gln Glu Ser Tyr Tyr Arg Tyr Val Ala Arg Glu Gln Ser Cys Arg Arg Pro Asn Ala Gln Arg Phe Gly Ile Ser Asn Tyr Cys Gln Ile Tyr Pro Pro Asn Xaa<sub>3</sub> Asn Lys Ile Arg Glu Ala Leu Ala Gln Thr His Xaa<sub>4</sub> Ala Ile Ala Val Ile Ile Gly Ile Lys Asp Leu Asp Ala Phe Arg His Tyr Asp Gly Arg Thr Ile Ile Gln Arg Asp Asn Gly Tyr Gln Pro Asn Tyr His Ala Val Asn Ile Val Gly Tyr Ser Asn Ala Gln Gly Val Asp Tyr Trp Ile Val Arg Asn Ser Trp Asp Thr Asn Trp Gly Asp Asn Gly Tyr Gly Tyr Phe Ala Ala Asn Ile Asp Leu Met Met Ile Glu Xaa<sub>5</sub> Tyr Pro Tyr Val Val Ile Leu

where Xaa<sub>1</sub> is selected from the group consisting of His and Tyr; where Xaa<sub>2</sub> is selected from the group consisting of Glu and Lys;

where Xaa<sub>3</sub> is selected from the group consisting of Ala and Val; where Xaa<sub>4</sub> is selected from the group consisting of Ser and Thr; and

where Xaa<sub>5</sub> is selected from the group consisting of Glu and Gln.

except for the amino acid sequence where Xaa<sub>1</sub> is His, Xaa<sub>2</sub> is Glu, Xaa<sub>3</sub> is Ala, Xaa<sub>4</sub> is Ser and Xaa<sub>5</sub> is Glu (SEQ ID NO: 11).

5,770,203

**MODIFIED CHOLERA TOXIN BASED ON MUTAGENIZED SUBUNIT A**

W. Neal Burnette, Thousand Oaks, and Harvey R. Kaslow, Los Angeles, both of Calif., assignors to Amgen Inc., Thousand Oaks, and University of Southern California, Los Angeles, both of Calif.

Division of Ser. No. 271,222, Jul. 6, 1994, abandoned, which is a continuation of Ser. No. 694,733, May 2, 1991, abandoned. This application May 24, 1995, Ser. No. 449,045

Int. Cl.<sup>6</sup> A61K 39/106; C12N 9/10; C07K 14/28

U.S. Cl. 424—190.1

8 Claims

1. A modified cholera toxin having reduced or essentially no catalytic activity associated with cholera toxin reactivity, in which the modification comprises the substitution of a different amino acid in one or more of the sites in the native sequence for mature catalytic subunit A, aa 19-258 of SEQ ID NO: 2 selected from among arginine-7, aspartic acid-9, histidine-44, histidine-70 and glutamic acid-112 or a truncation of the carboxyl-terminal portion of said sequence beginning at the amino acid immediately following tryptophan-179.

5,770,204

**COMPOSITION FOR MUCOSA TREATMENT WITH SAPONIN**

Jack G. Wiersma, Jupiter, Fla., assignor to Nouveau Technologies, Inc., Tequesta, Fla.

Filed Jun. 6, 1996, Ser. No. 659,278

Int. Cl.<sup>6</sup> A61K 35/78

U.S. Cl. 424—195.1

7 Claims

1. A mucosa treatment mixture for treating mucosa throughout a digestive tract comprising: a composition of 1 part colloidal non-steroidal saponin admixed to 20,000 parts water; whereby said composition is taken orally for purposes of reducing the ability of bacteria to colonize by reducing the fluid surface tension.

5,770,205

**TISSUE FRACTIONS OF SEA CUCUMBER FOR THE TREATMENT OF INFLAMMATION**

Peter Donald Collin, Sunset, Me., assignor to Coastside Bio Resources, Stonington, Me.

Filed Aug. 5, 1996, Ser. No. 692,174

Int. Cl.<sup>6</sup> A01N 65/00; C07G 3/00

U.S. Cl. 424—195.1

32 Claims

1. A method for the treatment of inflammatory diseases in a mammal comprising administering an effective dose of a composition comprising an active ingredient selected from the group consisting of isolated sea cucumber body wall, isolated sea cucumber epithelial layer, isolated sea cucumber flower, combinations thereof, active derivatives thereof or combinations of active derivatives thereof.

5,770,206

**BODY OILS AND METHOD FOR MAKING THE SAME**  
Carlo Nicolichchia, Egg Harbor, N.J., assignor to C&D Master Enterprises Ltd, Egg Harbor, N.J.

Filed Dec. 19, 1996, Ser. No. 770,002

Int. Cl.<sup>6</sup> A61K 35/78; 39/385; 47/00

U.S. Cl. 424—195.1

28 Claims

1. A method of providing a sensory stimulating safely ingestible body oil comprising the steps:

combining water with a quantity of cinnamon sticks to form a combination;  
boiling the combination;  
draining the water remaining following boiling from the combination and adding the water drained to virgin olive oil to form a mixture;  
simmering the mixture until substantially all the water evaporates leaving a flavored oil;  
adding cayenne pepper to the flavored oil;  
adding paprika to the flavored oil;  
filtering the flavored oil; and  
cooling the flavored oil.

5,770,207

**DIETARY SUPPLEMENTS CONTAINING KAVA ROOT EXTRACT, PASSION FLOWER, CHAMOMILE FLOWERS, HOPS, AND SCHIZANDRA FRUIT**

Calverly M. Bewicke, San Anselmo, Calif., assignor to Natrol, Incorporated, Chatsworth, Calif.

Filed Mar. 17, 1997, Ser. No. 818,931

Int. Cl.<sup>6</sup> A61K 35/78; 9/48

U.S. Cl. 424—195.1

6 Claims

1. A dietary supplement comprising, in capsule form, the following components:  
a. about 150 to 250 mg pharmaceutical grade Kava root extract;  
b. about 25 to 100 mg Passion Flower power;  
c. about 25 to 100 mg Chamomile Flowers power;  
d. about 25 to 100 mg Hops power; and  
e. about 25 to 100 mg Schizandra Fruit power.

5,770,208

**STAPHYLOCOCCUS AUREUS B-LINKED HEXOSAMINE ANTIGEN**

Ali Ibrahim Fattom, Rockville, and Atulkumar Induprasad Patel, Germantown, both of Md., assignors to NABI, Rockville, Md.

Filed Sep. 11, 1996, Ser. No. 712,438

Int. Cl.<sup>6</sup> A61K 39/085; 39/40; C07K 16/12

U.S. Cl. 424—197.11

23 Claims

7. A composition comprising:  
an isolated *S. aureus* antigen that comprises  $\beta$ -linked hexosamine, wherein said antigen contains no O-acetyl groups detectable by nuclear magnetic resonance spectroscopy and specifically binds with antibodies to *Staphylococcus aureus* Type 336 deposited under ATCC 55804;  
*S. aureus* Type 5 polysaccharide antigen or *S. aureus* Type 8 polysaccharide antigen;  
and a sterile pharmaceutically acceptable carrier therefor.

5,770,209

**ACCELERATION OF WOUND HEALING USING CONNECTIVE TISSUE GROWTH FACTOR**

Gary R. Grotendorst, Miami, Fla., and Douglass M. Bradham, Jr., Baltimore, Md., assignors to University of South Florida, Tampa, Fla.

Continuation-in-part of Ser. No. 386,680, Feb. 10, 1995, Pat. No. 5,585,270, which is a division of Ser. No. 167,628, Dec. 14, 1993, Pat. No. 5,408,040, which is a continuation of Ser. No. 752,427, Aug. 30, 1991, abandoned. This application Jun. 2, 1995, Ser. No. 459,717

Int. Cl.<sup>6</sup> A61K 38/18

U.S. Cl. 424—198.1

2 Claims

1. A method for accelerating wound healing in a subject in need of such treatment comprising contacting the site of the wound with a therapeutically effective amount of a composition containing CTGF polypeptide.

2. The method of claim 1, wherein the composition further contains transforming growth factor beta (TGF- $\beta$ ).

5,770,210

**RECOMBINANT VACCINIA VIRUS EXPRESSING HUMAN RETROVIRUS GENE**

Bernard Moss, Bethesda, Md., and Sekhar Chakrabarti, Nabagram, India, assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 377,750, Jul. 7, 1989, abandoned, which is a continuation of Ser. No. 849,298, Apr. 8, 1986, abandoned. This application Jul. 29, 1992, Ser. No. 919,384

Int. Cl.<sup>6</sup> A61K 39/21;39/295; C12N 15/86; C12P 21/02

U.S. Cl. 424—199.1

5 Claims

1. An infectious recombinant vaccinia virus, comprising an HTLV-III envelope gene under the transcriptional control of a vaccinia virus promoter, wherein said gene is inserted into a non-essential site of a vaccinia virus genome and said promoter is derived from a region other than said non-essential site, such that an infectable host cell infected by said virus expresses HTLV III envelope proteins comprising gp41, gp120 and gp160 and transports one or more of said proteins to the plasma membrane of said host cell.

5,770,211

**RECOMBINANT RACCOON POX VIRUSES AND THEIR USE AS AN EFFECTIVE VACCINE AGAINST FELINE INFECTIOUS PERITONITIS VIRUS DISEASE**

Terri Wasmoe; Lloyd Chavez, and Hsien-Jue Chu, all of Fort Dodge, Iowa, assignors to American Home Products Corporation, Madison, N.J.

Division of Ser. No. 125,516, Sep. 22, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 480,210

Int. Cl.<sup>6</sup> A61K 39/215;39/275;39/295; C12N 7/01

U.S. Cl. 424—199.1

13 Claims

1. A recombinant raccoon poxvirus having at least one internal gene comprising a DNA sequence encoding the transmembrane (M/E1) protein of Feline Infectious Peritonitis Virus (FIPV).

5,770,212

**RECOMBINANT POXVIRUSES WITH FOREIGN DNA IN ESSENTIAL REGIONS**

Falko-Günter Falkner; Georg Holzer, and Friedrich Dorner, all of Vienna, Austria, assignors to Immuno Aktiengesellschaft, Vienna, Austria

Division of Ser. No. 616,133, Mar. 14, 1996, which is a continuation-in-part of Ser. No. 235,392, Apr. 29, 1994, abandoned. This application Feb. 21, 1997, Ser. No. 802,985

Int. Cl.<sup>6</sup> A61K 39/285;39/275;39/002;39/02;39/12

U.S. Cl. 424—199.1

19 Claims

1. A vaccine comprising (a) a defective poxvirus that lacks a function imparted by an essential region of its parental poxvirus, wherein (i) said defective poxvirus comprises a DNA polynucleotide encoding an antigen and said DNA polynucleotide is under transcriptional control of a promoter, and (ii) the function can be complemented by a complementing source; and (b) a pharmaceutically acceptable carrier.

5,770,213

**PURIFIED NONTYPABLE HAEMOPHILUS INFLUENZAE P5 PROTEIN AS A VACCINE FOR NONTYPABLE HAEMOPHILUS INFLUENZAE INFECTION**

Gary W. Zlotnick, Penfield, N.Y., assignor to American Cyanamid Company, Wayne, N.J.

Filed May 5, 1994, Ser. No. 210,394

Int. Cl.<sup>6</sup> A61K 39/102;39/00; C07K 1/36;14/285

U.S. Cl. 424—256.1

24 Claims

1. P5 outer membrane protein of nontypable *Haemophilus influenzae* bacterial strains which is substantially free of bacterial endotoxin, which is purified without the use of denaturing detergents or reducing agents and which elicits bactericidal antibodies.

5,770,214

**VACCINES CONTAINING SALMONELLA BACTERIA ATTENUATED BY MUTATIONS IN TWO GENES OF THE AROMATIC AMINO ACID BIOSYNTHETIC PATHWAY**

Gordon Dougan; Steven Neville Chatfield, both of Beckenham, and Carlos Estenio Hormaeche, Cambridge, all of United Kingdom, assignors to Glaxo Wellcome, Inc., Research Triangle Park, N.C.

Continuation of Ser. No. 135,436, Oct. 13, 1993, abandoned, which is a continuation of Ser. No. 979,460, Nov. 20, 1992, abandoned, which is a continuation of Ser. No. 857,092, Mar. 20, 1992, abandoned, which is a continuation of Ser. No. 642,138, Jan. 15, 1991, abandoned, which is a continuation of Ser. No. 399,539, Aug. 22, 1989, abandoned. This application

Jun. 7, 1995, Ser. No. 484,314

Claims priority, application United Kingdom, Dec. 23, 1987, 8730037

Int. Cl.<sup>6</sup> A61K 39/02;39/112; C12N 15/00;1/00

U.S. Cl. 424—258.1

12 Claims

1. A vaccine comprising a pharmaceutically acceptable excipient and a *Salmonella* bacterium which is sufficiently attenuated such that it fails to cause a disease caused by the unattenuated bacterium, but which induces immunity in a mammal inoculated with the bacterium and provides protection against subsequent challenge with a virulent bacterium, wherein attenuation is attributable to a defined, non-reverting mutation in each of two discrete *aro* genes of the aromatic amino acid biosynthetic pathway selected from the group consisting of *aroA*, *aroC*, *aroD* and *aroE*.

5,770,215

**MULTIVITAMIN/VASCULAR OCCLUSION INHIBITING COMPOSITION**

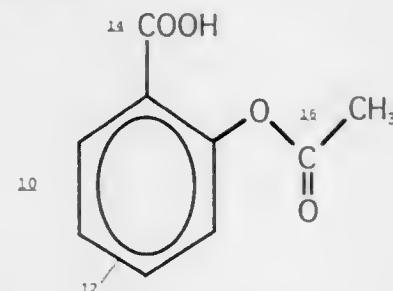
Emil Payman Moshedy, 49 Rutland Rd., West Babylon, N.Y. 11704

Filed Jan. 6, 1997, Ser. No. 778,758

Int. Cl.<sup>6</sup> A61K 31/00

U.S. Cl. 424—440

5 Claims



Acetylsalicylic Acid 18  
(Aspirin) 20

1. A vitamin supplement for the treatment of a cardiac care patient comprising a single composition of:

- a) from about 5% to about 1000% of the RDA of vitamins A, D, E, K, C, thiamin, riboflavin, niacin, niacinamide, B<sub>6</sub>, folate, B<sub>12</sub>, biotin, pantothenic acid and mixtures thereof;
- b) from about 10 to 1000 mg acetylsalicylic acid; and
- c) from about 5% to 500% of the RDA of minerals selected from selenium, zinc, magnesium, calcium, iron, manganese, copper, chromium, cobalt, phosphorous, iodine, potassium, molybdenum, vanadium fluoride, chloride, nickel, tin and silicon.

5,770,216

**CONDUCTIVE POLYMERS CONTAINING ZINC OXIDE PARTICLES AS ADDITIVES**

Mark Mitchnick, P.O. Box 1451, Wainscott, N.Y. 11975, and Mamoun Muhammed, Eketorpsvägen 25, S-18261 Djursholm-(Stockholm), Belgium

Continuation of Ser. No. 54,848, Apr. 28, 1993, abandoned.

This application May 17, 1995, Ser. No. 442,643

Int. Cl.<sup>6</sup> B32B 27/18

U.S. Cl. 428—402

19 Claims



1. A conductive polymer comprising an organic polymer and zinc oxide particles having a substantially rod shape, said rod shape comprising an elongated spherical shape, having an aspect ratio of at least 2, said particles have a length of less than about 10,500 nanometers and a diameter of less than about 3,500 nanometers.

5,770,217

**DIETARY SUPPLEMENT FOR HEMATOLOGICAL, IMMUNE AND APPETITE ENHANCEMENT**

Frank J. Kutilek, III, Cheney, and J. R. Duell Gates, Haysville, both of Kans., assignors to ATLANT, Inc., Guthrie, Okla.

Filed Jul. 2, 1997, Ser. No. 887,103

Int. Cl.<sup>6</sup> A61K 9/20

U.S. Cl. 424—442

22 Claims

1. A dietary supplement for enhancing the immune system, improving the condition of the blood and for enhancing appetite and decreasing weight loss, comprising on a percentage of dry weight basis:

a crucifer extract, 5–15%; *Vigna sinensis*, 5–15%; *Eleutherococcus senticosus*, 2–10%; *Schizandra chinensis*, 1–10%; *Panax quinquefolium*, 1–10%; *Ligustrum lucidum*, 0.5–5%; *Echinacea angustifolium*, 0.5–5%; *Artemisia annua*, 0.5–5%; *Astragalus membranaceus*, 0.25–5%; *Glycyrrhiza glabra*, 0.25–5%; *Mallotia dielsiana*, 0.25–5%; *Ophiopogon japonicus*, 0.25–5%; selenium, 0.05–1%; glutathione (reduced), 1–10%; L-cysteine, 1–10%; L-methionine, 0.001–0.1%; and excipients, from about 15% to about 85%.

5,770,218

Patent Not Issued For This Number

5,770,219

**SOLID MATRIX SYSTEM FOR TRANSDERMAL DRUG DELIVERY**

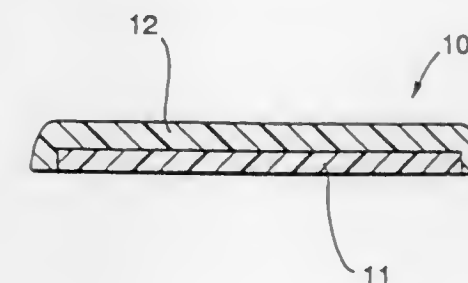
Chia-Ming Chiang, Foster City, and Renee Ann Tenzel, Mountain View, both of Calif., assignors to Cygnus Inc., Redwood City, Calif.

Continuation of Ser. No. 88,793, Aug. 8, 1993, abandoned, which is a division of Ser. No. 857,094, Mar. 20, 1992, Pat. No. 5,252,334, which is a continuation of Ser. No. 405,630, Sep. 8, 1989, abandoned. This application Sep. 26, 1994, Ser. No. 311,914

Int. Cl.<sup>6</sup> A61F 13/02

U.S. Cl. 424—448

20 Claims



1. A drug-containing matrix for use in a transdermal drug delivery device for administering at least one estrogen to an area of skin or mucosa comprising the estrogen dispersed in a body of a pressure sensitive adhesive, said pressure-sensitive adhesive comprising an acetate acrylate copolymer and polyvinylpyrrolidone, said matrix being essentially free of a skin permeation enhancer.

5,770,220

**ACTIVE SUBSTANCE-CONTAINING PATCH**

Reinhold Meconi, Neuwied, and Frank Seibert, Bad Hönningen/Ariendorf, both of Germany, assignors to LTS Lohmann Therapie Systeme GmbH, Neuwied, Germany

PCT No. PCT/EP94/03866, § 371 Date Aug. 5, 1996, § 102(e) Date Aug. 5, 1996, PCT Pub. No. WO95/15158, PCT Pub. Date Jun. 8, 1995

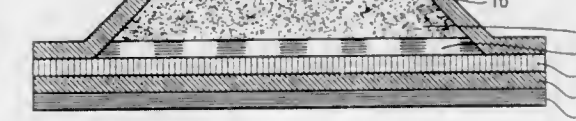
PCT Filed Nov. 23, 1994, Ser. No. 640,791

Claims priority, application Germany, Dec. 4, 1993, 43 41 444.3

Int. Cl.<sup>6</sup> A61F 13/02

U.S. Cl. 424—448

11 Claims



1. In an active substance-containing patch for the controlled release of an active substance, said patch comprising a backing layer, an adjoining active substance-containing reservoir layer which softens at body temperature, a membrane controlling the active substance release, a pressure-sensitive adhesive device permitting fixation of the patch to the skin, and a removable protective layer, the improvement wherein the reservoir layer which softens at body temperature is spaced away from the controlling membrane by means of a device made of a material impermeable to the active substance which device extends over all the mutually facing surfaces of the reservoir and the membrane and which device has at least one passage for the reservoir layer which softens at body temperature.



5,770,221

**FORMULATION FOR PERCUTANEOUS ADMINISTRATION FOR TREATING DISTURBANCE IN MICTURITION**

Katsuhiko Nakamura, and Nobuyuki Koga, both of Tsukuba, Japan, assignors to Hisamitsu Pharmaceutical Co., Inc., Saga, Japan

PCT No. PCT/JP95/00946, § 371 Date Nov. 15, 1996, § 102(e) Date Nov. 15, 1996, PCT Pub. No. WO95/31190, PCT Pub. Date Nov. 23, 1995

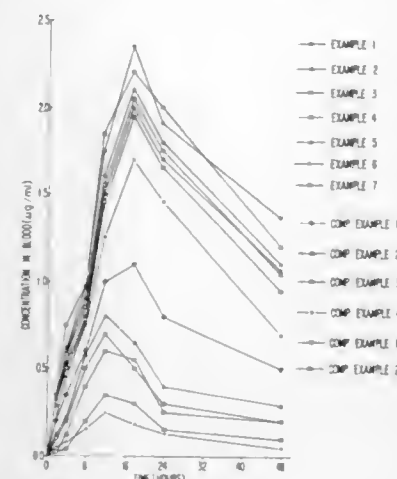
PCT Filed May 18, 1995, Ser. No. 737,160

Claims priority, application Japan, May 18, 1994, 6-128162

Int. Cl.<sup>6</sup> A61K 9/70; 47/32; A61M 37/00

U.S. Cl. 424—449

8 Claims



1. A formulation without scopolamine for percutaneous administration for treating disturbance in micturition, which comprises a medicine for treating disturbance in micturition in an adhesive, said adhesive containing a low-molecular weight polyisobutylene having a viscosity-average molecular weight of from about 10,000 to 100,000, a high-molecular weight polyisobutylene having a viscosity-average molecular weight of from 500,000 to 2,500,000 and an oil as main bases.

5,770,222

**THERAPEUTIC DRUG DELIVERY SYSTEMS**

Evan C. Unger; Thomas A. Fritz; Terry Matsunaga; VaradaRajan Ramaswami; David Yellowhair, and Guanli Wu, all of Tucson, Ariz., assignors to ImaRx Pharmaceutical Corp., Tucson, Ariz.

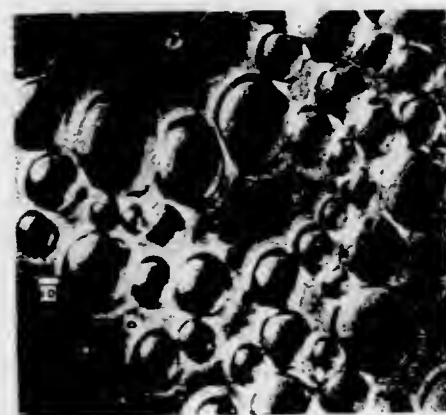
Division of Ser. No. 76,250, Jun. 11, 1993, Pat. No. 5,580,575, which is a continuation-in-part of Ser. No. 716,899, Jun. 18, 1991, abandoned, and a continuation-in-part of Ser. No. 717,084, Jun. 18, 1991, abandoned, which is a continuation-in-part of Ser. No. 569,828, Aug. 20, 1990, Pat. No. 5,088,499, said Ser. No. 716,899 is a continuation-in-part of Ser. No. 569,828, Aug. 20, 1990, Pat. No. 5,088,499, which is a continuation-in-part of Ser. No. 455,707, Dec. 22, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 472,305

Int. Cl.<sup>6</sup> A61K 9/127

U.S. Cl. 424—450

75 Claims

1. A targeted therapeutic delivery system comprising a gas-filled lipid-containing microsphere wherein said gas-filled microsphere has an interior volume of at least about 50% gas, and comprises a therapeutic compound wherein said therapeutic compound is selected from the group consisting of antineoplastic agents; blood products; biological response modifiers; anti-fungal agents; hormones; vitamins; peptides; anti-tuberculars; enzymes; anti-allergic agents; anti-coagulation agents; circulatory drugs; metabolic potentiators; antivirals; antianginals; antibiotics; antiinflammatories; antiprotazoans; antirheumatics; narcotics; opiates; cardiac glycosides; neuromuscular blockers; sedatives; local anesthetics; general



anesthetics; radioactive compounds; monoclonal antibody; genetic material; prodrugs; and combinations thereof.

5,770,223

**METHOD OF TREATMENT FOR COMBATTING THE EFFECTS OF AGING ON THE CONDITION OF SKIN AND HAIR**

Fredéric Bonte; Alain Meybeck, both of Courbevoie, and Georges Massiot, Reims, all of France, assignors to LVMH Recherche, Colombes, Cedex, France

Division of Ser. No. 596,699, Feb. 5, 1996, which is a continuation of Ser. No. 326,048, Oct. 19, 1994, abandoned, which is a continuation of Ser. No. 64,126, May 21, 1993, abandoned.

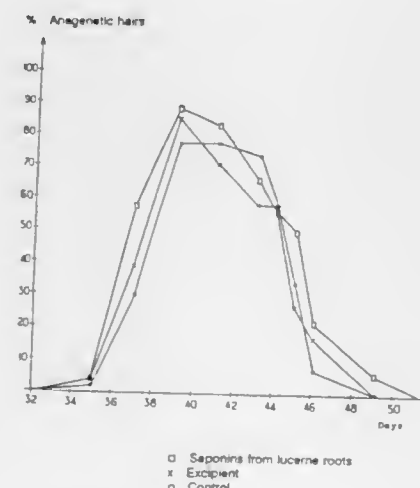
This application Nov. 13, 1996, Ser. No. 748,639

Claims priority, application France, Nov. 21, 1990, 90 14542

Int. Cl.<sup>6</sup> A61K 9/127; 7/00

U.S. Cl. 424—450

19 Claims



1. A method for the topical treatment of skin selected from the group consisting of a method for promoting skin collagen synthesis and a method for treating skin aging, comprising topical delivery to said skin of an effective amount for achieving said topical treatment of an active ingredient consisting essentially of at least one Medicago component selected from the group consisting of Medicago triterpene saponins, Medicago triterpene sapogenins, a Medicago plant extract containing at least one of said triterpene saponins, a Medicago plant extract containing at least one of said sapogenins, and any mixture thereof.

5,770,224

**CAPSULE CONSTRUCTION**

Abdul Rashid, Glasgow; Howard Norman Ernest Stevens, Drymen; Massoud Bakhshaei, Glasgow; James Robertson Miller Kelso, Dalry; Mark Hegarty, East Kilbride, all of United Kingdom, and James Leonard Mackie, Windsor, Canada, assignors to R. P. Scherer Corporation, Troy, Mich. PCT No. PCT/GB93/02270, § 371 Date Jun. 26, 1995, § 102(e) Date Jun. 26, 1995, PCT Pub. No. WO94/09745, PCT Pub. Date May 11, 1994

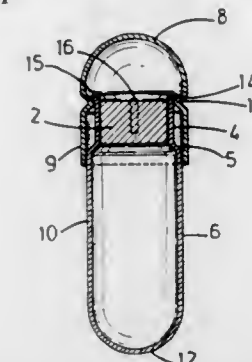
PCT Filed Nov. 4, 1993, Ser. No. 433,334

Claims priority, application United Kingdom, Nov. 4, 1992, 223172

Int. Cl.<sup>6</sup> A61K 9/48

U.S. Cl. 424—451

8 Claims



1. A controlled release capsule which comprises a male member (2) engaged within a neck portion (4) of a water-impermeable female body (6); the capsule including a water swellable material which swells so as to disengage the female body upon exposure of the capsule to an aqueous medium; the female body comprising a flared mouth portion (14) adjacent to the neck portion, the mouth portion having an entrance (15) which is wider than the neck portion and wider than the male member so as to facilitate insertion of the male member into the neck portion; and the neck portion of the female body being narrower than the remainder of the body; and the male member comprising a plug, and the plug being formed of said water swellable material.

5,770,225

**PROCESS OF PREPARING A SUBCOATED SIMULATED CAPSULE-LIKE MEDICAMENT**

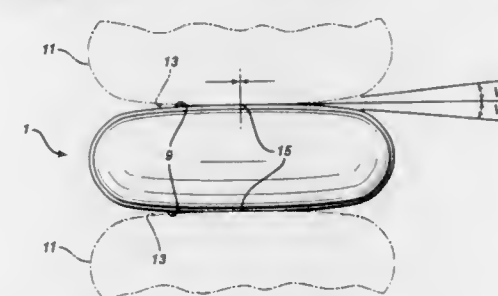
Kishor B. Parekh, Horsham; Dennis C. Wiedand, Coopersburg, and Jean B. Leasure, Penlynn, all of Pa., assignors to McNeil-PPC, Inc., Skillman, N.J.

Division of Ser. No. 784,623, Oct. 31, 1991, Pat. No. 5,658,589, which is a continuation-in-part of Ser. No. 345,599, Apr. 28, 1989, abandoned. This application Jun. 5, 1995, Ser. No. 463,436

Int. Cl.<sup>6</sup> A61K 9/48

U.S. Cl. 424—456

8 Claims



1. A process for preparing an oral gelatin coated medicament comprising the steps of: compressing a mixture of a medicament and excipients to form a solid core; applying a subcoating composition consisting essentially of hydroxypropylmethyl cellulose and castor oil to said core; and applying an outer gelatinous coating to

the subcoated solid core by dipping said subcoated solid core into one or more gelatin solutions having a temperature of about 35° to about 55° C., a viscosity of about 800 to about 1000 cps and comprising about 20 to about 40 weight percent gelatin.

5,770,226

**COMBINED PHARMACEUTICAL ESTROGEN-ANDROGEN-PROGESTIN ORAL CONTRACEPTIVE**

Claude L. Hughes, Jr., Mebane, and Manuel J. Jayo, Winston-Salem, both of N.C., assignors to Wake Forest University, Winston-Salem, N.C.

Filed Jul. 10, 1996, Ser. No. 679,764

Int. Cl.<sup>6</sup> A61K 9/20

U.S. Cl. 424—464

22 Claims

1. A contraceptive preparation comprising a hormonal fraction consisting of an estrogen, a progestin and an androgen in an amount effective to enhance bone accrual in a user of said contraceptive.

5,770,227

**PROGESTERONE REPLACEMENT THERAPY**

Liang C. Dong, Mountain View; Patrick S. L. Wong, Palo Alto, and Steven Espinal, Sunnyvale, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 286,125, Aug. 4, 1994, Pat. No. 5,633,011.

This application Jul. 17, 1996, Ser. No. 682,200

Int. Cl.<sup>6</sup> A61K 9/36; 31/56

U.S. Cl. 424—480

8 Claims

1. A therapeutic composition for hormone replacement therapy, comprising 10 ng to 1200 mg of a progestin, 1 mg to 30 mg of a surfactant, 5 mg to 225 mg of an alkali carboxymethylcellulose, 0.05 mg to 20 mg of a disintegrant, and 0.5 mg to 75 mg of an osmagent.

5,770,228

**PLATELET DERIVED GROWTH FACTOR GEL FORMULATION**

Martin W. Edwards, Woodinville, Wash., and Niels Christian Larsen, Hvidebækvaenge, Denmark, assignors to ZymoGenetics, Inc., Seattle, Wash., and Novo Nordisk A/S, Bagsvaerd, Denmark

Continuation of Ser. No. 786,806, Nov. 4, 1991, abandoned.

This application Jan. 14, 1994, Ser. No. 183,115

Int. Cl.<sup>6</sup> A61K 9/06; 38/17

U.S. Cl. 424—488

22 Claims

1. A composition comprising at least 90% pure platelet derived growth factor (PDGF) formulated in a carrier consisting essentially of hydroxyethyl cellulose (HEC) gel having a viscosity of about 200–30,000 cps, said composition having a concentration of PDGF between about 5 μg–5 mg PDGF per gram HEC gel.

5,770,229

**MEDICAL POLYMER GEL**

Masao Tanihara, Kurashiki, and Hisao Kinoshita, Ikoma, both of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Division of Ser. No. 571,976, Jan. 16, 1996, Pat. No. 5,658,592.

This application Mar. 24, 1997, Ser. No. 826,097

Claims priority, application Japan, May 13, 1994, 6-124158

Int. Cl.<sup>6</sup> A61K 9/10

U.S. Cl. 424—488

9 Claims

1. A medical polymer gel produced by immobilizing a drug D onto a water swelling polymer gel A, via a side chain comprising a cleavable group C having a main chain to be cleaved via an enzymatic reaction, and a spacer B, in a sequence represented by the following general formula (I):

A-B-C-D

5,770,230

METHOD FOR PREPARING STABILIZED  
PROSTAGLANDIN E1

Dirk L. Teagarden; William J. Petre, both of Kalamazoo, and Paul M. Gold, Vicksburg, all of Mich., assignors to Pharmacia &amp; Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 619,690, Mar. 28, 1996, which is a continuation-in-part of Ser. No. 143,695, Oct. 27, 1993, abandoned. This application Dec. 30, 1996, Ser. No. 777,132  
Int. Cl.<sup>6</sup> A61K 31/557; 9/14

U.S. Cl. 424—489 3 Claims

1. A method for preparing a stabilized, lyophilized formulation of PGE-1 comprising the steps of:

- adding PGE-1 to lactose and tertiary butyl alcohol wherein said tertiary butyl alcohol is present in an amount of from about 15% to about 33% volume/volume and the ratio of said lactose to PGE-1 is from about 40,000 to 1 to about 10,000 to 1 weight/weight whereby a formulation of PGE-1 dispersed in lactose is formed;
- adjusting the pH of said formulation from about 4 to about 5 with an organic acid buffer selected from the group consisting of citrate and acetate;
- freezing said formulation to about -50° C., warming to about -25° C. for about two hours and then refreezing to about -50° C.; and
- drying said formulation to obtain a moisture content of less than 1% by dry weight and a tertiary butyl alcohol content of less than 3% by dry weight.

5,770,231

MICROENCAPSULATED 3-PIPERIDINYL-SUBSTITUTED  
1,2-BENZISOXAZOLES 1,2-BENZISOTHAZOLES

Jean Mesens, Wechelderzande, Belgium; Michael E. Rickey, Loveland, and Thomas J. Atkins, Cincinnati, both of Ohio, assignors to Alkermes Controlled Therapeutics, Inc. II, Cambridge, Mass., and Janssen Pharmaceutica, Belgium

Continuation of Ser. No. 154,403, Nov. 19, 1993. This application Feb. 28, 1997, Ser. No. 808,261  
Int. Cl.<sup>6</sup> A61K 9/14; 31/505

U.S. Cl. 424—497 22 Claims

1. A sustained-release microparticle produced by dissolving in a solvent an active agent and a biodegradable and biocompatible polymer to form an organic phase, wherein the active agent is selected from the group consisting of risperidone, 9-hydroxy-risperidone, and pharmaceutically acceptable acid addition salts of the foregoing, and extracting the solvent to form microparticles.

5,770,232

METHOD OF DISINFECTING THE FOOD CONTACT  
SURFACES OF FOOD PACKAGING MACHINES AND  
DISINFECTING SOLUTION THEREFOR

Charles S. Sizer, Hawthorne Woods, and Ronald W. Swank, Crystal Lake, both of Ill., assignors to Tetra Laval Holdings &amp; Finance, SA, Pully, Switzerland

Continuation of Ser. No. 687,791, Jul. 19, 1996, abandoned, which is a continuation of Ser. No. 317,385, Oct. 4, 1994, abandoned. This application Mar. 3, 1997, Ser. No. 811,136  
Int. Cl.<sup>6</sup> A01N 39/02

U.S. Cl. 424—616 8 Claims

1. A method of disinfecting the food contact surfaces of a food packaging machine, the method comprising:

- introducing to the machine an aqueous solution comprising from about 0.1% to about 1% by weight of hydrogen peroxide and from about 0.01% to about 0.1% by weight of sodium acid pyrophosphate;

- contacting the food contact surfaces with said solution at a temperature of at least about 70° C. for a time period of at least about 15 minutes; and
- removing substantially all of said solution from the machine.

5,770,233

CONTAINER FILLED WITH INFUSION LIQUIDS AND  
INFUSION PREPARATION

Takae Kido; Shigeo Ii; Shun-ichi Abe, and Kazumasa Yokoyama, all of Osaka, Japan, assignors to The Green Cross Corporation, Osaka, Japan

Filed Apr. 21, 1995, Ser. No. 437,330

Claims priority, application Japan, Oct. 22, 1992, 4-309249

Int. Cl.<sup>6</sup> A61K 9/00; 9/08; 33/00; 31/70; 31/59; 31/595; 31/34; A61J 1/00

U.S. Cl. 424—641 3 Claims

1. A container, filled with infusion liquids, comprising two compartments which are separated from each other by a separation means and containing an infusion liquid comprising a fat emulsion, sugar, vitamin C, vitamin B<sub>1</sub>, vitamin B<sub>2</sub>, vitamin A, vitamin D, vitamin E, vitamin K in a first compartment and an infusion liquid comprising amino acid, electrolyte, vitamin B<sub>6</sub>, vitamin B<sub>12</sub> and folic acid in a second compartment.

5,770,234

PARTICLE INDUCED AMPLIFICATION OF IMMUNE  
RESPONSE

Anthony G. Gristina, Reston, and Girish Giridhar, Manassas Park, both of Va., assignors to Medical Sciences Research Institute, Herndon, Va.

Continuation of Ser. No. 482,809, Jun. 7, 1995, Pat. No. 5,585,106, which is a continuation-in-part of Ser. No. 197,340, Feb. 16, 1994, Pat. No. 5,591,441, which is a division of Ser. No. 885,301, May 18, 1992, Pat. No. 5,292,513. This application Dec. 13, 1996, Ser. No. 764,585  
Int. Cl.<sup>6</sup> A61K 9/14; A61F 2/02; A61L 9/04

U.S. Cl. 424—501 4 Claims

1. A method of preventing microbial infections via non-specific immunity, comprising the steps of:

- administering to a patient in need thereof a sufficient quantity of phagocytosable particles of a size ranging from 0.01 to 10 μm to prime macrophages in said patient for enhanced macrophage activity during a one week interval, said step of administering being performed during a time period ranging from approximately one day prior to said one week interval to approximately 6–12 hours after a beginning time for said one week interval; and
- allowing said phagocytosable particles to prime said macrophages from an enhanced oxidative burst during said one week interval.

5,770,235

DROP FORMING DRUM FOR THE MANUFACTURE OF  
PASTILLES

Warrfried Baumann, Beinstein, and Reinhard Froeschke, Weinstadt, both of Germany, assignors to Santrade Ltd., Lucerne, Switzerland

PCT No. PCT/EP95/03831, § 371 Date Aug. 30, 1996, § 102(e) Date Aug. 30, 1996, PCT Pub. No. WO96/14929, PCT Pub. Date May 23, 1996

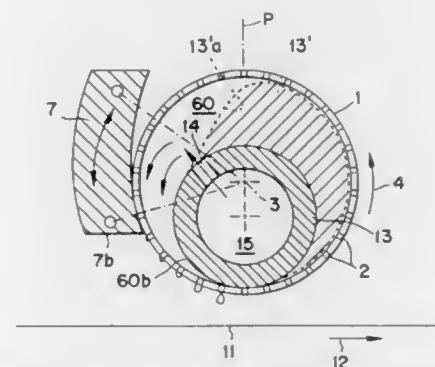
PCT Filed Sep. 28, 1995, Ser. No. 669,537

Claims priority, application Germany, Nov. 16, 1994, 44 40 875.7

Int. Cl.<sup>6</sup> B30B 11/20

U.S. Cl. 425—8 7 Claims

1. Apparatus for making pastilles from a free-flowing substance, comprising:



a hollow drum rotatable about a horizontal axis, the drum including openings disposed around its entire circumference, the openings traveling to a drop-forming zone disposed at a lower portion of the drum, for discharging drops of a free-flowing substance supplied to the drum by a supply passage, the drum including a front side traveling toward the drop-forming zone, and a back side traveling away from the drop-forming zone;

- a stationary interior body disposed within the drum in spaced relationship with an interior surface of the front side of the drum to form, together with such interior surface, a generally sickle-shaped gap extending downwardly to the drop-forming zone;
- a channeling device resting against an outer surface of the front side of the drum and forming, together with that outer surface, an upwardly open inlet channel communicating with the drum openings and defining the supply passage for the free-flowing substance; and
- an extender strip bearing against the outer surface of the drum at a location spaced from the channeling member in a direction toward the back side of the drum, the extender strip, together with an upper open end of the channeling member, forming an inlet to the channel.

5,770,236

## POST-CURE INFLATOR

Kashiro Ureshino; Hisaaki Onishi, and Hisashi Mitamura, all of Takasago, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

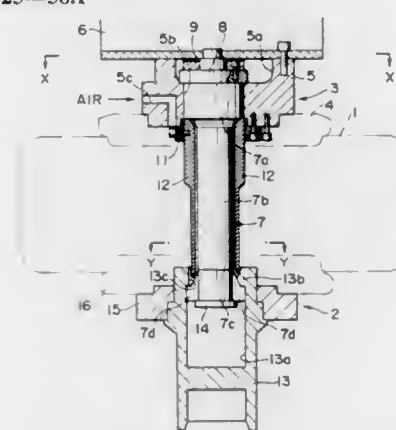
Filed Oct. 11, 1996, Ser. No. 729,528

Claims priority, application Japan, Oct. 11, 1997, 7-29027

Int. Cl.<sup>6</sup> B29C 35/16

U.S. Cl. 425—58.1

5 Claims



1. A post-cure inflator for inflating and curing a vulcanized tire, comprising:

- a first rim mechanism comprising a first rim and a fitting portion having at least two first projections defining an insertion groove therebetween;
- a second rim mechanism comprising a second rim and a locking shaft extending towards said first rim mechanism, said locking shaft being fittable in said fitting portion and having at

least one second projection, wherein at least one of the first and second rim mechanisms is relatively movable in the direction of elongation of said locking shaft such that said locking shaft may be inserted into and removed from said fitting portion, and wherein said locking shaft is relatively rotatable with respect to said fitting portion such that said first and second projections may overlap one another to lock said locking shaft in said fitting portion when said locking shaft is fitted into said fitting portion; and

at least one guide plate mounted to said second rim mechanism, wherein each said at least one guide plate extends toward said first rim mechanism such that said guide plate is positioned in said insertion groove when said first and second projections overlap one another to lock said locking shaft in said fitting portion.

5,770,237

METHOD AND APPARATUS FOR PRODUCING AN  
INJECTION MOULDING OF PLASTICS MATERIAL  
USING GAS ASSISTANCE AND A VALVE TO CONTROL  
THE GAS SUPPLY PASSAGE

Matthew Emmett Sayer, Marlow, and Kenneth Richard Crow, Northfield, both of United Kingdom, assignors to Clnpres Limited, Staffordshire, United Kingdom

Continuation of Ser. No. 331,579, Nov. 1, 1994, abandoned.

This application Nov. 25, 1996, Ser. No. 755,624

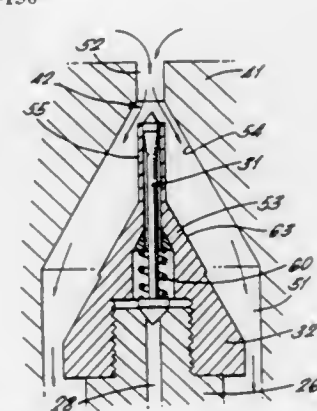
Claims priority, application United Kingdom, May 18, 1992,

9210607

Int. Cl.<sup>6</sup> B29C 45/03

U.S. Cl. 425—130

12 Claims



1. An apparatus for producing injection mouldings, comprising: a mould having an interior surface which defines a mould space that includes an article of manufacture mould section, and said mould having a fluid plastic introduction opening that opens out at the interior surface into said mould space, and said mould also having a gas exhaust passageway which includes a nozzle reception opening that opens out at the interior surface into said mould space at a location spaced from said plastic introduction opening;

- a plastic material injection assembly which injects plastic material through said plastic introduction opening such that injected plastic material flows away from the plastic introduction opening along said interior surface;
- a gas supply nozzle positioned within said gas exhaust passageway, said gas supply nozzle having a first end dimensioned for sealing receipt by the nozzle reception opening of said gas exhaust passageway;

- a gas supply nozzle retraction assembly connected with said gas supply nozzle for shifting said gas supply nozzle between a plastic injection mode wherein the first end of said gas supply nozzle is received by said nozzle reception opening and extends into said mould space such that the injected plastic material passes around said first end while being prevented from entering said gas exhaust passageway and a gas escape mode wherein said first end is retracted into a gas exhaust position with respect to said nozzle reception opening, and



said gas supply nozzle having an internal gas supply conduit which opens out at the first end of said gas supply nozzle; a valve member which is positioned in the gas supply conduit of said gas supply nozzle and has a head member that is dimensioned for sealing off an outlet end of said gas supply conduit when said valve member is placed in a valve closed state, and said valve member being dimensioned so as to extend further into the plastic material within said mould space when in an open state;

a gas supply assembly which includes a gas line in communication with the internal gas supply conduit of said gas supply nozzle such that gas fed through said internal gas conduit and into contact with said valve member shifts said valve member from said valve closed state into the valve open state wherein the supplied gas penetrates the injected plastic and forms a gas cavity in the plastic material that facilitates the filling of the mould space as said nozzle reception opening is positioned at an intermediate location with respect to plastic travel along the interior surface in the mould space from the plastic introduction opening to a remote location of said article of manufacture mould section downstream, with respect to plastic travel, from both said plastic introduction opening and said nozzle reception opening, and said nozzle reception opening being positioned such that, upon a discontinuing of the gas supply, a return of said valve member to the valve closed state, and the retraction of the gas supply nozzle, the gas in the gas cavity escapes through said nozzle reception opening, past said first end of the gas supply nozzle and closed valve member and out said gas exhaust passageway,

and wherein the first end of said gas supply nozzle is comprised of a frustoconical base section and a cylindrical tip, and said gas exhaust opening is defined by a corresponding frustoconical interior wall section and cylindrical wall section with the cylindrical wall section having an outlet end defining the nozzle reception opening and an axial length which is shorter than the axial length of said cylindrical tip such that said cylindrical tip extends away from the interior surface of said mould space and further into the mould space.

5,770,238

## MASTER DISK FOR MAKING DIES FOR PRESSING IN PARTICULAR OPTICAL DISKS

Jean Ledieu, Crespières, and Jean-François Dufresne, Caen, both of France, assignors to Digipress, Caen, France

Continuation of Ser. No. 190,772, Feb. 1, 1994, abandoned.  
This application Apr. 2, 1996, Ser. No. 626,387

Claims priority, application France, Feb. 3, 1993, 93 01177

Int. Cl.<sup>6</sup> B29C 33/42

U.S. Cl. 425—175

17 Claims



1. A master disk for making a die for pressing optical discs, consisting of

a support made from a material selected from the group consisting of aluminum and glass and having an outer planar surface, and

a layer of hard, conductive and reflecting in the near infrared range material coated directly onto said outer planar surface of said support and adhering thereto,

said layer of hard, conductive and reflecting in the near infrared range material having a succession of microcups representative of information to be duplicated etched therein to thereby form the master disk, the master disk being structured and arranged to produce a plurality of identical dies including the

information to be duplicated, each of the dies being capable of pressing a plurality of optical disks.

5,770,239

## MACHINE FOR DOMESTIC USE FOR MAKING, CUTTING AND SHAPING PASTA

Enrico Ancona, Turin, Italy, assignor to Imperia Trading s.r.l., Rome, Italy

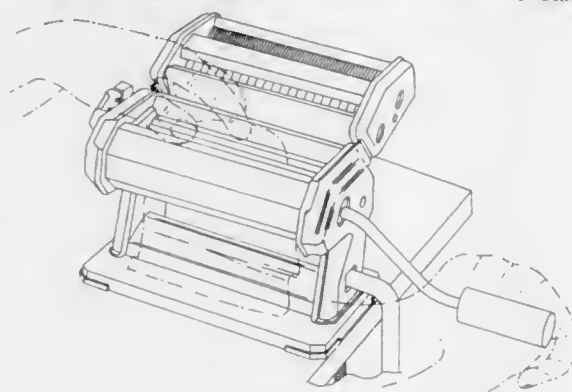
Filed Jan. 24, 1997, Ser. No. 788,264

Claims priority, application Italy, Jul. 26, 1996, TO96U0163

Int. Cl.<sup>6</sup> A21C 3/04; 11/16; B29B 1/06; B01F 7/18

U.S. Cl. 425—190

5 Claims



1. A machine for domestic use for making, cutting or shaping pasta comprising:

at least one unit head for making, cutting or shaping pasta, said unit head having at least one pair of rollers having horizontal and parallel axes, said rollers being disposed adjacent to each other and rotatable around said horizontal and parallel axes, thereby forming an area for processing dough to form a sheet; said unit head further comprising a hopper to feed the dough or pasta between said rollers, whereby the dough may be processed without manual intervention of the operator after introduction of the dough or sheet between said rollers.

5,770,240

## EXTRUSION DIE FOR RIGID FOAM SHEET

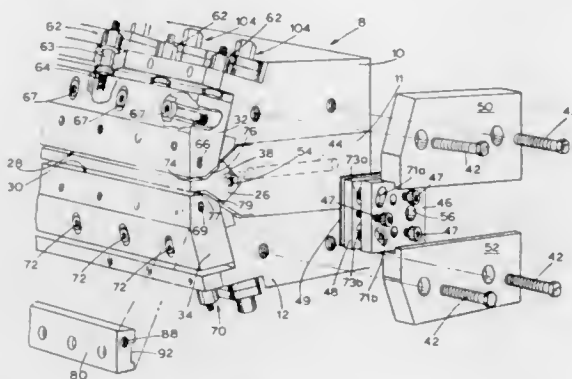
Vernon Krupa, Chippewa, Wis., assignor to Extrusion Dies, Inc., Chippewa Falls, Wis.

Filed Apr. 12, 1996, Ser. No. 631,549

Int. Cl.<sup>6</sup> B29C 47/22

U.S. Cl. 425—192 R

23 Claims



1. An extrusion die for foam sheet, comprising:

die body means defining a manifold comprising separate distribution channels for conducting a split stream of heated and pressurized foamable thermoplastic melt;

a pair of mating die lips defining a straight-line die exit and arranged on opposed sides of the distribution channels, the lips at least in part forming an outer wall of said channels, the

lips being constructed to adjustably slide toward and away from each other to vary the flow of a melt in the channels; and a mandrel disposed between the die lips and between the separate distribution channels, the mandrel being slidably insertable and removable through a passageway extending through the die transverse to the direction of the melt flow through the distribution channels to enable quick withdrawal and replacement of the mandrel.

5,770,241

## APPARATUS FOR PREVENTING ACCUMULATION OF MATERIAL ON A CUTTING MECHANISM

Paul V. Tuzzio, North Canton, Ohio, and Rick Ruegg, Coppell, Tex., assignors to Recot, Inc., Pleasanton, Calif.

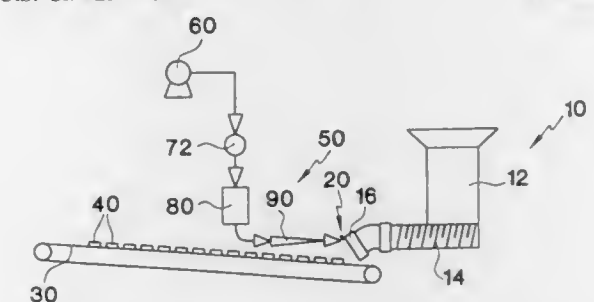
Division of Ser. No. 572,237, Dec. 13, 1995, Pat. No.

5,676,992. This application Apr. 4, 1997, Ser. No. 831,851

Int. Cl.<sup>6</sup> A21D 6/00

U.S. Cl. 425—232

6 Claims



1. An apparatus for extruding material and cutting the extruded material to form a plurality of portions, the apparatus comprising: an extruder including an inlet for receiving a supply of material and an outlet, the outlet including a die face having a die opening through which the material is extruded into a desired shape; a movable cutter blade disposed adjacent the die opening which is reciprocated along the die face to cut the extruded material exiting the outlet of the extruder; a hot air blower device positioned adjacent the cutter blade, the hot air blower device including a heater which heats pressurized air and a nozzle which outputs the hot pressurized air; and wherein the nozzle is positioned adjacent the cutter and the extruder and the nozzle is located opposite the cutter blade and directs air against the cutter blade to reduce accumulation of the material on the cutter blade.

5,770,242

## DOUGH FORMING APPARATUS

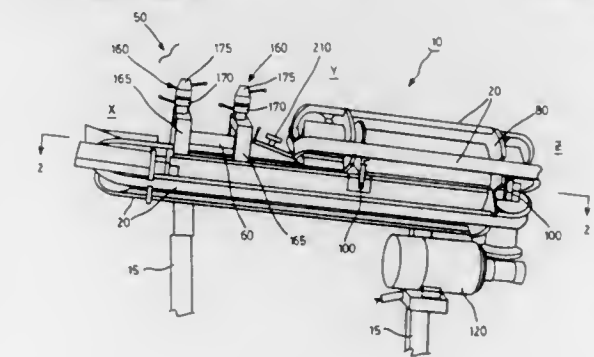
Alex Kuperman, 141 Homewood Avenue, Willowdale, Ontario, Canada, M2M 1K4

Filed Sep. 13, 1996, Ser. No. 715,387

Int. Cl.<sup>6</sup> A21C 11/00

U.S. Cl. 425—364 B

19 Claims



1. A dough forming apparatus comprising a frame having attached thereto:

- a plurality of endless longitudinally aligned forming belts adapted to receive and convey a piece of dough, each forming belt having an arcuate forming surface contacting the dough, the plurality of belts configured such that the arcuate forming surfaces of the plurality of belts combine to form a substantially cylindrical passageway;
- a mandrel, extending coaxially within the substantially cylindrical passageway; and
- a drive means for synchronously moving the plurality of forming belts.

5,770,243

## VACUUM BAGGING APPARATUS

Peter Butterworth, Rochdale, England, assignor to Launchform Ltd., Kelghley, United Kingdom

PCT No. PCT/GB93/00774, § 371 Date Jan. 16, 1995, § 102(e) Date Jan. 16, 1995, PCT Pub. No. WO93/20907, PCT Pub. Date Oct. 28, 1993

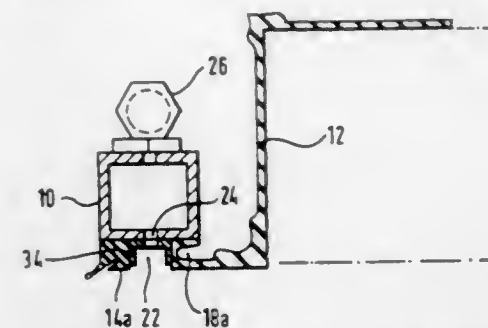
PCT Filed Apr. 14, 1993, Ser. No. 335,888

Claims priority, application United Kingdom, May 15, 1992, 9210461

Int. Cl.<sup>6</sup> B29C 70/44

U.S. Cl. 425—389

6 Claims



1. An apparatus for forming composite articles which comprises a stretchable or pre-shaped membrane (12) adapted to be placed on a mould and a rigid framework (10) carrying an outer seal (14a), there being an inner seal (18a) attached to the membrane and located between the membrane and the inner side of the rigid framework (10) defining a vacuum activity (22), the membrane being attached to the inner seal on a lower part, thereof characterised in that the seals are substantially square in section and have cut-out sections (36, 40) to enhance resilience, and in that the outer seal has an outwardly directed downwardly extending curtain portion (38) to form an initial loose seal with a mould base.

5,770,244

## MOLD FOR THE PRODUCTION OF SHAPED BRICKS

Rudolf Braungardt, Legenfeld, and Erwin Schmucker, Schelklingen, both of Germany, assignors to Kobra Formen- und Anlagenbau GmbH, Lengenfeld, Germany

Filed Jul. 9, 1996, Ser. No. 677,418

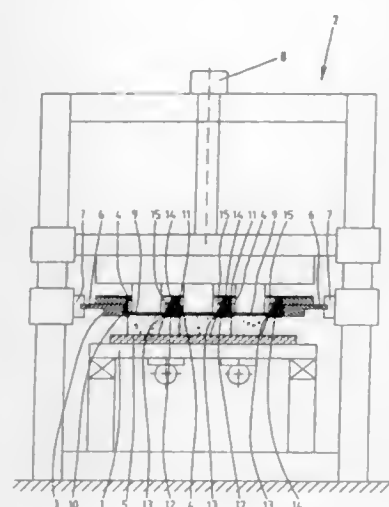
Claims priority, application Germany, Aug. 30, 1995, 195 31 800.5

Int. Cl.<sup>6</sup> B28B 1/14; 13/06

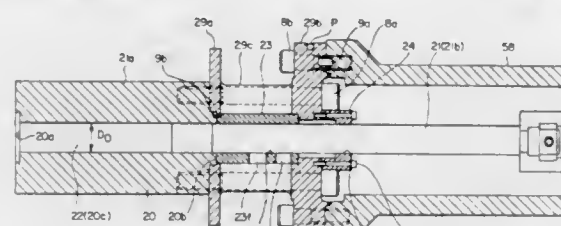
U.S. Cl. 425—443

9 Claims

1. A mold for the production of shaped brick comprising means (4) in said mold (3) for defining one or more mold cavities, said means comprising a longitudinal vertical side wall (11), opposed end vertical side walls and an inclined longitudinal side wall (12) opposed from said longitudinal vertical side wall (11) for each said mold cavity, said inclined longitudinal side wall diverging upwardly with respect to the opposed longitudinal side wall of a said mold cavity to define an upwardly opening angle therewith,

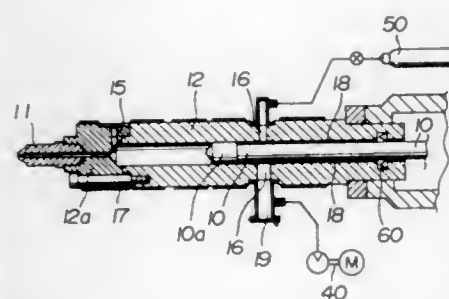


5,770,246  
INJECTION MOLDING MACHINE  
Misao Fujikawa, Kaga, Japan, assignor to Sodick Co., Ltd., Japan  
PCT No. PCT/JP95/02521, § 371 Date Aug. 8, 1996, § 102(e)  
Date Aug. 8, 1996, PCT Pub. No. WO96/17717, PCT Pub.  
Date Jun. 13, 1996  
PCT Filed Dec. 8, 1995, Ser. No. 687,425  
Claims priority, application Japan, Aug. 12, 1994, 6-335204  
Int. Cl.<sup>6</sup> B29C 45/48  
U.S. Cl. 425—557 10 Claims



and means for moving a said inclined side wall upwardly in the direction in which it is inclined to open the mold so that the shaped brick can be removed.

5,770,245  
PREPLASTICIZING INJECTION MACHINE  
Kiyoto Takizawa, and Toshimi Kato, both of Hanishina-gun, Japan, assignors to Nissei Plastic Industrial Co., Ltd., Nagano-ken, Japan  
Filed Sep. 17, 1996, Ser. No. 718,627  
Claims priority, application Japan, Sep. 18, 1995, 7-262033  
Int. Cl.<sup>6</sup> B29C 45/54  
U.S. Cl. 425—549 6 Claims



I. A preplasticizing injection machine comprising:  
an injection cylinder having a plunger passed therethrough;  
a plasticizing cylinder having a valve seat at an end thereof provided in parallel with said injection cylinder;  
a resin passage connected to said injection cylinder at one end and said plasticizing cylinder at the other end to allow selective resin communication between said injection cylinder and said plasticizing cylinder, the resin passage being extended between an inflow port and an outflow port, the inflow port being formed in said injection cylinder at a portion corresponding to the advance limit of the plunger and the outflow port being formed in said plasticizing cylinder through said valve seat; and  
a resin vent formed in said injection cylinder at a portion behind a plunger stroke of the plunger;  
said resin vent disposed on a lower portion of said injection cylinder and in liquid and gaseous communication with said injection cylinder wherein a liquid flows naturally through said resin vent and wherein said resin vent is connected to a pressure reducing device for use in sucking a gas generated in said injection cylinder to exhaust the gas out of said injection cylinder.

1. An injection molding machine having an injection chamber into which a molding resin may be introduced, said injection chamber having an inside wall, an injection plunger capable of reciprocal movement within said injection chamber whereby molding resin is ejected from said injection chamber; said injection plunger including a shank portion and a head portion having an edge, said head portion having a diameter larger than that of the shank portion wherein said edge is operable to scrape any molding resin adhering to the inside wall of said injection chamber, and a scraper ring having a passageway aligned with the injection chamber and adapted to be penetrated by said injection plunger; said scraper ring having a protuberance formed on an inside wall thereof, said protuberance extending substantially to a surface of said injection plunger and having a diameter which is smaller than the head portion of said injection plunger but slightly larger than the shank portion thereof; and a window located in said scraper ring through which molding material may pass.

5,770,247  
METHOD OF INCREASING THE CLA CONTENT OF COW'S MILK  
Larry D. Satter, Tilak R. Dhiman, and Michael W. Pariza, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.  
Filed Oct. 3, 1996, Ser. No. 725,389  
Int. Cl.<sup>6</sup> A23K 1/16  
U.S. Cl. 426—2 5 Claims

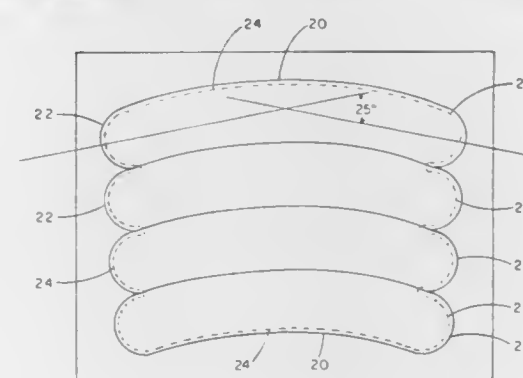
1. A method of increasing the conjugated linoleic acid (CLA) content in a cow's milk, said method comprising feeding to a lactating cow for about 7 days a feed to which has been added about 1% to about 5% by weight of a vegetable oil which contains at least 30% linoleic acid or 30% linolenic acid, and then collecting the milk.

5,770,248  
REDUCED FAT SHREDDED WAFERS AND PROCESS  
Kevin J. Leibfred, Towaco, N.J.; Diane L. Hnat, Danbury, Conn.; Angel D. Ferrer, Patterson, and Henry M. Andreski, Whippany, both of N.J., assignors to Nabisco Technology Company, Wilmington, Del.  
Continuation of Ser. No. 355,582, Dec. 14, 1994, Pat. No. 5,595,774. This application Dec. 17, 1996, Ser. No. 767,907  
Int. Cl.<sup>6</sup> A23L 1/168  
U.S. Cl. 426—93 16 Claims

1. A reduced-fat wafer consisting essentially of a plurality of laminated net-like sheets of shredded whole wheat, a reduced amount of shortening or fat, and at least one hydrocolloid gum to

provide a smooth or slippery mouthfeel to the wafer, said at least one hydrocolloid gum being incorporated into and onto each of said net-like sheets by coating whole wheat berries or grain with the at least one hydrocolloid gum prior to shredding of the whole wheat berries or grain, and wherein at least substantially all of the strands or shreds of the wafers contain the at least one hydrocolloid gum.

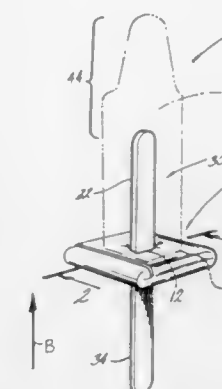
5,770,249  
MEAT PRODUCT PACKAGE AND METHOD OF FORMING SAME  
Frank C. Mello, Columbus, Miss.; Jeffrey A. Williams, Calhoun, Ga., and Roger S. Williams, New Richmond, Ohio, assignors to Sara Lee Corporation, Winston-Salem, N.C.  
Continuation of Ser. No. 489,390, Jun. 12, 1995, abandoned.  
This application Sep. 5, 1996, Ser. No. 707,630  
Int. Cl.<sup>6</sup> B65D 85/08; B65B 25/06  
U.S. Cl. 426—119 17 Claims



1. A meat product package for displaying in an arcuate arrangement a plurality of elongated, free ended, sausage shaped meat products which have been processed prior to packaging such that the meat products normally maintain a substantially straight shape said package comprising: a tray and a plurality of said elongated, free ended, sausage-shaped, processed meat products, each meat product having a longitudinal axis, the tray having a plurality of elongated recesses with each recess containing one of said products, each recess having a longitudinal arcuate configuration and each recess being suitably sized to receive the normally substantially straight meat product therein after it has been bent and to hold the normally substantially straight meat product in the arcuate configuration of the recess under tension, each recess having a bottom portion, side portions and end portions, the bottom and side portions extending substantially parallel to the product longitudinal axis, and the side and end portions having overformed edges, said overformed edges extending along the arcuate configuration of the recess to maintain the sausage-shaped meat product in the arcuate configuration under tension within the recess for storage and display.

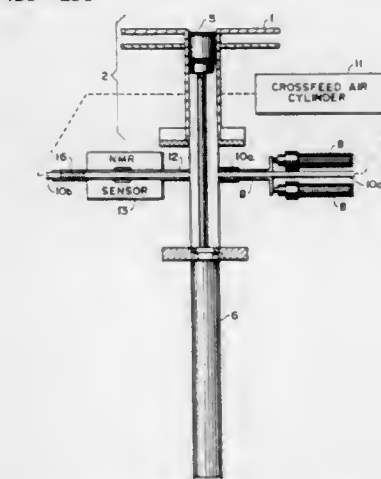
5,770,250  
CONFECTION ON A STICK AND ASSOCIATED DRIP ABSORBER  
Wanda K. Smith, P.O. Box 562, Stanton, Mich. 48888  
Filed Jan. 29, 1997, Ser. No. 791,036  
Int. Cl.<sup>6</sup> A23G 9/00  
U.S. Cl. 426—134 9 Claims

1. In a preformed frozen treat comprising a frozen confection mounted on a stick, the stick having a first end being embedded in the frozen confection and a second end being intended to be held by a user, the improvement comprising:  
a first absorbent member having opposed top and bottom surfaces defining a pocket therebetween;  
a second absorbent member being disposed in the pocket; and



a slit, dimensioned to receive the stick, said slit extending through the top surface of the first absorbent member, the second absorbent member, and the bottom surface of the first absorbent member;  
the drip-absorbing article receiving the second end of the stick through said slit so that the drip-absorbing article is located adjacent the frozen confection to absorb liquid melting from the frozen confection.

5,770,251  
PROCESS FOR ACCURATELY CONTROLLING MOISTURE OR SOLIDS LEVELS OF COMPOSITIONS WITH SMALL AMOUNTS OF OR NO SURFACTANT  
Kevin Michael Finucane, Saddle Brook, and Laurie Coyle, Park Ridge, both of N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.  
Filed Aug. 20, 1997, Ser. No. 915,098  
Int. Cl.<sup>6</sup> G01N 33/00  
U.S. Cl. 426—231 1 Claim



I. A process for preparing an edible composition or slurry having edible surfactants or no surfactants comprising:  
(i) mixing components comprising:  
(a) 0 to 30% edible surfactant;  
(b) 1% to 90% of non-surfactant ingredients other than water forming remainder of composition; and  
(c) balance water;  
(ii) heating and/or mixing the component mixture;  
(iii) removing a sample amount of the component mixture from a mixer pipeline or container while holding or processing the mixture, which sample amount is to be sampled by a device containing a nuclear magnetic resonance (NMR) sensor;  
(iv) submitting the sample to an NMR sensor and measuring on-line NMR parameters of the sample and comparing the parameters to a preset calibration curve to obtain desired moisture or solids levels; and repeating the NMR evaluation until the desired moisture or solids level is obtained;  
(v) releasing the mixture for further processing upon reaching desired moisture or solids level.



5,770,252

## PROCESS FOR PREPARING A BREADED FOOD

Laurel McEwen, Barrington, N.H.; Michael G. Yurchesyn, Alpharetta, Ga., and Krystyne Wypior, Nova Scotia, Canada, assignors to National Sea Products, Inc., Greenland, N.H.

Continuation of Ser. No. 778,464, Oct. 16, 1991, abandoned.

This application Apr. 12, 1994, Ser. No. 226,415

Int. Cl.<sup>6</sup> A23L 1/01; A21D 10/04; A23B 4/10

U.S. Cl. 426—292

7 Claims

1. A method for producing a cooked low-fat breaded food product ready for eating comprising:

providing an uncooked food;

making a frozen, uncooked, breaded food product by prewashing the uncooked food;

predusting the prewashed food with fine breading crumbs, said emulsion comprising proportions of oil such that the low-fat uncooked breaded food product comprises at least 3% and no more than 8% by weight of fat,

applying to the coated food a first breadening layer comprising coarse crumbs,

applying to the once breaded food a second breadening layer comprising fine crumbs,

spraying the twice breaded food with a dextrin-based solution, and

freezing the sprayed food; and

cooking the frozen, uncooked, breaded food product in an oven converting such uncooked product into a comestible.

5,770,253

## FODDER AND METHOD FOR PRODUCTION OF FODDER CONTAINING LIPIDS OF LOW MELTING TEMPERATURE, IN PARTICULAR FODDER FOR AQUATIC ORGANISMS

Kirsti Ladstein, Stavanger, and Fred Thorsen, Hundvåg, both of Norway, assignors to Nutreco Aquaculture Research Centre AS, Forus, Norway

PCT No. PCT/NO94/00146, § 371 Date Mar. 5, 1996, § 102(e) Date Mar. 5, 1996, PCT Pub. No. WO95/07028, PCT Pub. Date Mar. 16, 1995

PCT Filed Sep. 2, 1994, Ser. No. 596,363

Claims priority, application Norway, Sep. 6, 1993, 933160

Int. Cl.<sup>6</sup> A23K 1/18; 1/20

U.S. Cl. 426—604

6 Claims

1. A fodder for aquatic organisms, comprising pellets having a crystalline structure formed by a first mixture of lipides and emulsifiers having a high melting point, and further comprising lipides having a lower melting point than said first mixture carried within the crystalline structure.

5,770,254

## REDUCED-FAT COMPOSITIONS AND METHODS FOR PREPARING AND USING SAME

Henry J. Izzo, Bridgewater, and Robert E. Lieberman, Morris Township, both of N.J., assignors to Healthy Foods Solutions, Inc., Morris Township, N.J.

Continuation-in-part of Ser. No. 327,486, Oct. 21, 1994, Pat. No. 5,560,955. This application Dec. 5, 1995, Ser. No. 567,488

Int. Cl.<sup>6</sup> A23L 1/38

U.S. Cl. 426—633

24 Claims

1. A reduced-fat composition in the form of an emulsion which comprises in percentages by weight of the total composition:

(A) an oil phase comprising an edible fat or oil present in an amount from about 1% to about 99%; and

(B) an aqueous phase present in an amount from about 1% to about 99%, wherein the aqueous phase comprises a protein complexing agent present in an amount from about 0.6% to about 13%.

5,770,255

## ANTI-MICROBIAL COATING FOR MEDICAL DEVICES

Robert E. Burrell, Sherwood Park, and Larry Roy Morris, Edmonton, both of Canada, assignors to Westaim Technologies, Inc., Alberta, Canada

Continuation of Ser. No. 885,758, May 19, 1992, abandoned.

This application Sep. 29, 1993, Ser. No. 128,027

Int. Cl.<sup>6</sup> B05D 7/00; A61L 29/00; 27/00

U.S. Cl. 427—2.1

21 Claims

1. A method for forming an anti-microbial coating on a medical device intended for use in contact with an alcohol or water based electrolyte, comprising:

depositing a coating containing one or more of the metals selected from the group consisting of Ag, Au, Pt, Pd, Hg, Sn, Cu, Sb, Bi and Zn or alloys of two or more of these metals on a surface of the medical device by physical vapor deposition to provide a thin film of the metal, in a crystalline form, having atomic disorder formed throughout the thickness of the film such that the coating, in contact with an alcohol or a water based electrolyte, provides a release of the metal ions at a concentration sufficient to provide a localized anti-microbial effect which is sufficient to generate a zone of inhibition of at least 6.3 mm s determined by incubating a coating on a bacterial lawn on a nutrient-containing agar medium and measuring the zone of clearing.

5,770,256

## METHOD OF MAKING AN IONICALLY PERMEABLE SEPARATOR FOR A LECLANCHE CELL

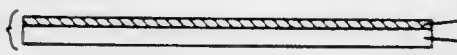
Ronald J. Ekern, Verona; Janna L. Rose, and Miguel E. Armacanqui, both of Madison, all of Wis., assignors to Rayovar Corporation, Madison, Wis.

Division of Ser. No. 526,762, Sep. 11, 1995, which is a continuation-in-part of Ser. No. 275,019, Jul. 13, 1994. This application May 13, 1996, Ser. No. 645,495

Int. Cl.<sup>6</sup> B05D 5/12; H01M 2/16

U.S. Cl. 427—58

14 Claims

70 {  73  
71

1. A method of making an ionically permeable separator configured for use in a Heavy Duty Leclanche cell, the method comprising the steps of:

(a) selecting a Kraft paper substrate;

(b) depositing onto the Kraft paper substrate a coating selected for an ability to inhibit corrosion of a zinc anode, the coating comprising an organic inhibitor, an inorganic inhibitor, a binding agent, and a starch.

5,770,257

## METHOD FOR ALTERING CABLE SEMICONDUCTIVE LAYER

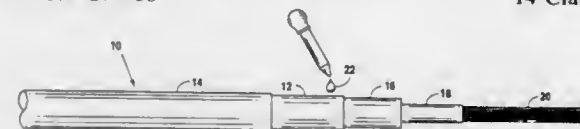
Gary A. Shreve; Nanayakkara Liyanage Don Somasiri; Justine Anne Mooney; Alan George Hulme-Lowe, and Curtis Roy Guilbert, all of Austin, Tex., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Aug. 1, 1996, Ser. No. 690,958

Int. Cl.<sup>6</sup> B05D 5/12

U.S. Cl. 427—58

14 Claims



1. A method of altering the electrical conductivity of a portion of a semiconductive layer of an electrical cable, the semiconductive layer being formed of a polymer loaded with a conductive material, comprising the steps of:

applying an intercalant to the portion of the semiconductive layer for a sufficient time to allow the semiconductive layer to

absorb some of the intercalant such that the portion of the semiconductive layer swells; and  
then curing the intercalant with the portion of the semiconductive layer in a state of increased volume such that the effective loading of the conductive material in the semiconductive layer is decreased.

(c) applying a liquid, curable coating containing the same or different tinting agent over said primer;  
(d) curing to harden said coating.

5,770,260

## PROCESS FOR FORMING SILICON DIOXIDE FILM

Shun-ichi Fukuyama; Daitel Shin, both of Kawasaki; Yuki Komatsu, Tokyo; Hideki Harada, Satsuma-gun; Yoshihiro Nakata, Kawasaki; Michiko Kobayashi, Kawasaki, and Yoshiyuki Okura, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, and Kyushu Fujitsu Electronics Limited, Kagoshima, both of Japan

Continuation of Ser. No. 582,024, Jan. 2, 1996, abandoned, which is a continuation of Ser. No. 281,077, Jul. 27, 1994, abandoned. This application Jun. 30, 1997, Ser. No. 886,018

Claims priority, application Japan, Jul. 29, 1993, 5-188156

Int. Cl.<sup>6</sup> B05D 3/02; 3/06

U.S. Cl. 427—226

7 Claims

1. A process for forming a silicon dioxide film comprising applying a mixture of polysilazane and a compound containing a phenolic hydroxyl group on a base to form a coated film, and converting the resulting coated film to said silicon dioxide film.

5,770,261

## METHOD OF MANUFACTURING COATED CUTTING TOOL AND COATED CUTTING TOOL MADE FROM

Elji Nakamura, Saitama; Toshiaki Ueda; Takashi Yamada, both of Ibaragi-ken, and Takatoshi Oshika, Saitama, all of Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Jan. 10, 1997, Ser. No. 781,236

Claims priority, application Japan, Jan. 10, 1996, 8-002292; Mar. 25, 1996, 8-068114; Apr. 12, 1996, 8-091025; Apr. 15, 1996, 8-092423; Apr. 16, 1996, 8-093966; Nov. 15, 1996, 8-304335; Nov. 15, 1996, 8-304336

Int. Cl.<sup>6</sup> C23C 16/40

U.S. Cl. 427—255

17 Claims

1. A method for preparing a coated cutting tool comprising: coating a surface of a substrate with a coating layer comprising an aluminum oxide wherein the aluminum oxide layer is formed from a reaction gas comprising aluminum trichloride and nitrogen oxides selected from the group consisting of NO, NO<sub>2</sub> and N<sub>2</sub>O, and mixtures thereof in an inert gas as carrier gas wherein the aluminum oxide layer contains components other than aluminum and oxygen from the reaction gas in a total amount of 15% or less.

5,770,262

## METHOD FOR CONTINUOUS MANUFACTURE OF REACTION BONDED SILICON CARBIDE

Sang-Wan Park; Huesup Song; Sang-Dong Kim, and Jo-Woong Ha, all of Seoul, Rep. of Korea, assignors to Korea Institute of Science and Technology, Seoul, Rep. of Korea

Filed May 22, 1996, Ser. No. 652,324

Claims priority, application Rep. of Korea, May 22, 1995, 1995/12784

Int. Cl.<sup>6</sup> B05D 3/00

U.S. Cl. 427—294

5 Claims

1. A method for continuously manufacturing a reaction bonded silicon carbide comprising continuously supplying a molten metal containing silicon to a preform disposed on a carbon woven fabric, said preform selected from the group consisting of silicon carbide/carbon and carbon, through a capillary path from a molten metal

5,770,258

## CATHODE-RAY TUBE AND METHOD OF PRODUCING THE SAME

Tomoki Takizawa, and Hiroshi Okuda, both of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 170,765, Dec. 21, 1993, Pat. No.

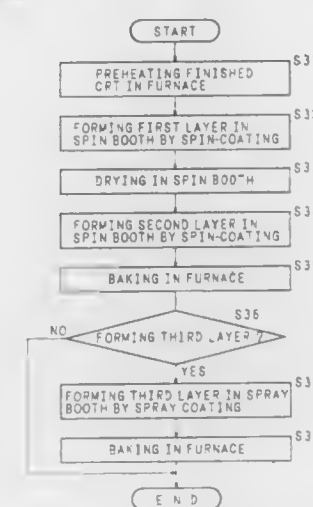
5,519,282. This application May 4, 1995, Ser. No. 434,586

Claims priority, application Japan, Dec. 25, 1992, 4-346458; Nov. 17, 1993, 5-288173

Int. Cl.<sup>6</sup> B05D 5/12

U.S. Cl. 427—64

11 Claims



1. A method of producing a cathode-ray tube provided with a face plate on whose outer surface a coat layer is formed, comprising the steps of:

forming a high-refractive transparent conductive layer on the surface of said face plate by spin coating;

forming a low-refractive smooth transparent layer on the surface of said high-refractive transparent conductive layer by spin coating; and

forming a low-refractive rough transparent layer on the surface of said low-refractive smooth transparent layer by spray coating;

wherein said high-refractive transparent conductive layer has a high-refractive index relative to said low-refractive smooth transparent layer and said low-refractive rough transparent layer, and said low-refractive smooth transparent layer and said low-refractive rough transparent layer have low-refractive indices relative to said high-refractive transparent conductive layer.

5,770,259

## QUANTITATIVE TINTING

Theodore L. Parker, Danville, and David S. Soane, Piedmont, both of Calif., assignors to 2C Optics, Inc., Hayward, Calif.

Filed Nov. 10, 1994, Ser. No. 337,645

Int. Cl.<sup>6</sup> B05D 5/06

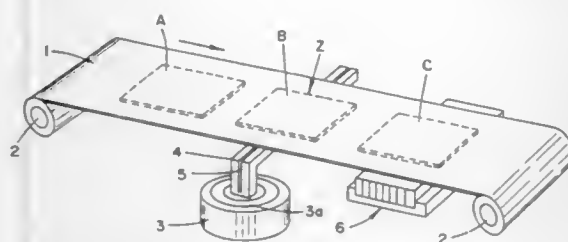
U.S. Cl. 427—164

25 Claims

1. A method of tinting a plastic lens comprising the steps of:

(a) applying a curable primer containing a tinting agent onto a surface of said lens;

(b) curing said primer;



pool, said supplying step occurring at an infiltration zone through which said preform is passed at constant speed.

5,770,263

# METHOD FOR IN SITU REMOVAL OF PARTICULATE RESIDUES RESULTING FROM HYDROFLUORIC ACID CLEANING TREATMENTS

Richard C. Hawthorne, Nampa, and Whonchee Lee, Boise, both of Id., assignors to Micron Technology, Inc., Boise, Id. Filed Nov. 8, 1995, Ser. No. 555,488

Int. Cl.<sup>6</sup> B05D 3/00

U.S. Cl. 427—309

27 Claims

1. A process for depositing a metal on an exposed silicon containing surface, the process comprising:
  - subjecting the exposed silicon containing surface to a fluorine containing cleaning material, whereby a residue of fluorine ions forms nucleation points for the formation of particulate matter haze;
  - heating the exposed silicon containing surface to a temperature greater than about 100° C. in a chamber having a non-oxidizing ambient so as to render the exposed silicon containing surface substantially free from native oxide and said particulate matter haze; and
  - depositing a metal on the exposed silicon containing surface that is substantially free from native oxide in the chamber having a non-oxidizing ambient.

5,770,264

# ANIONICALLY MODIFIED POLYURETHANE UREAS HAVING REDUCED TACKINESS FOR THE COATING OF LEATHER

Thomas Münzmay, Dormagen, and Tillmann Hassel, Köln, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 463,601, Jun. 5, 1995, abandoned, which is a division of Ser. No. 96,802, Jul. 23, 1993, abandoned. This application Sep. 5, 1996, Ser. No. 711,423

Claims priority, application Germany, Jul. 31, 1992, 42 25 290.3

U.S. Cl. 427—323

11 Claims

1. A method for finishing leather comprising coating leather with an anionic polyurethane urea prepared by
    - (1) reacting
      - (A) an aromatic diisocyanate with an isocyanate-reactive component consisting essentially of
      - (B) a polyether polyol having an isocyanate-reactive functionality of 2 and a number average molecular weight greater than 1500,
      - (C) (i) a compound containing one isocyanate-reactive group and at least one anionic group, (ii) a compound containing two isocyanate-reactive groups and at least one anionic group selected from dimethylol-propionic acid and anionic forms thereof, or (iii) mixtures thereof, and
      - (D) a polyamine having a number average molecular weight of at least 32,
- wherein the average total isocyanate-reactive functionality of the isocyanate-reactive compounds (B), (C), and (D) is from 1.85 to 2.2 and the molar ratio between the isocyanate groups of

- component (A) and the isocyanate-reactive groups of components (B), (C), and (D) is greater than 1, thereby forming an intermediate having residual isocyanate groups, and
- (2) mixing said intermediate with water (optionally mixed with all or a portion of polyamine (D)) to form, as an aqueous dispersion, an anionic polyurethane urea having from 800 to 1500 mmol of urethane groups and from about 800 to about 1800 mmol of urethane plus urea groups per kilogram of the anionic polyurethane urea.

5,770,265

# ENVIRONMENTALLY FRIENDLY TREATMENTS TO EXTEND THE FUNCTIONAL LIFE OF WOOD STRUCTURES AND NOVEL TREATED WOOD STRUCTURES

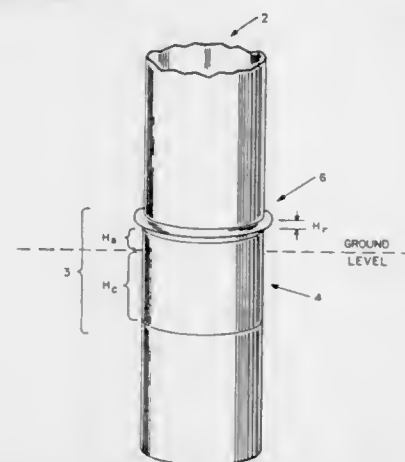
Frederic K. Pfander, Chapel Hill, N.C., and Cloide C. Branning, Hilton Head, S.C., assignors to Triangle Laboratories, Inc., Durham, and University of North Carolina, Chapel Hill, Chapel Hill, both of N.C.

Continuation of Ser. No. 534,224, Sep. 26, 1995, abandoned. This application Jul. 17, 1997, Ser. No. 896,117

Int. Cl.<sup>6</sup> B05D 7/06

U.S. Cl. 427—325

30 Claims



1. A method for treating a wood structure comprising:
  - applying a microbial treating solution to a portion of the wood structure subject to decay from microbial organisms, wherein said microbial treating solution comprises a solution which creates an altered environment in soil for microbial organisms and bacteria which degrade wood to thereby reduce the degradation of the wood structure caused by said organisms and bacteria and
  - covering a portion of the wood structure subject to decay from insects with a substantially insect impenetrable material to form a physical substantially insect impenetrable barrier and assist in maintaining the altered environment; wherein the covered portion comprises at least a portion of the treated portion.

5,770,266

# FUNCTIONAL LAMINATED CHEMICALLY ABSORBED FILMS AND METHODS OF MANUFACTURING THE SAME

Kazufumi Ogawa, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

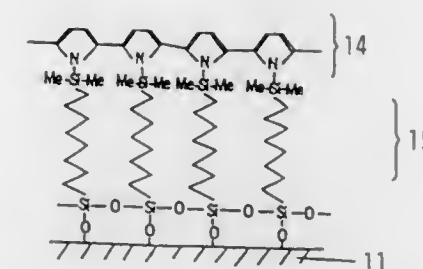
Division of Ser. No. 217,029, Mar. 24, 1994, Pat. No. 5,468,551, which is a continuation of Ser. No. 872,166, Apr. 22, 1992, abandoned. This application Aug. 16, 1995, Ser. No. 515,594

Claims priority, application Japan, Apr. 30, 1991, 3-098917

U.S. Cl. 427—333

6 Claims

1. A method of manufacturing a film having a specific function by a chemical adsorption process comprising the steps of:



- (a) contacting a surface of a hydrophilic substrate with an adsorption solution prepared by dissolving a surface active material in a non-aqueous solution to bring about a chemical adsorption reaction, said surface active material having a first functional group which can react on a surface of the hydrophilic substrate at least at one end and a second functional group which can react on a molecule having the specific function at least at another end;

where said first functional group of said surface active material is a group selected from the group consisting of a halosilyl group, an alkoxysilyl group, a silylidine group, a halotitanium group, and an alkoxyl titanium group, said second functional group is a group selected from the group consisting of a halosilyl group, an alkoxysilyl group, a silylidine group, a halotitanium group, and an alkoxyl titanium group, and said surface active material is selected from the group consisting of the materials represented by the formula:



where p and q independently represent integers ranging from 0 to 2, r represents an integer ranging from 1 to 30, A represents a lower-alkyl group with a carbon number of 1 to 6, lower-alkoxy group with a carbon number of 1 to 6 or an aryl group, and B represents a functional group selected from the group consisting of an oxygen-containing chain segment, a nitrogen-containing chain segment, a silicon-containing chain segment, an aromatic segment, a substituted aromatic segment, a heterocyclic segment and a substituted heterocyclic segment;

- (b) washing non-reacted surface active material away from the substrate surface using a non-aqueous solution; and
- (c) contacting the washed substrate surface with a solution containing the molecules having the specific function to cause a reaction between the second functional groups on the substrate surface and the molecules having the specific function.

5,770,267

# METHOD AND APPARATUS FOR SMOOTHING SUBSTRATE SURFACES

Ralph S. Bullock, Jr., Agoura, Calif., assignor to J. M. Huber Corporation, Edison, N.J.

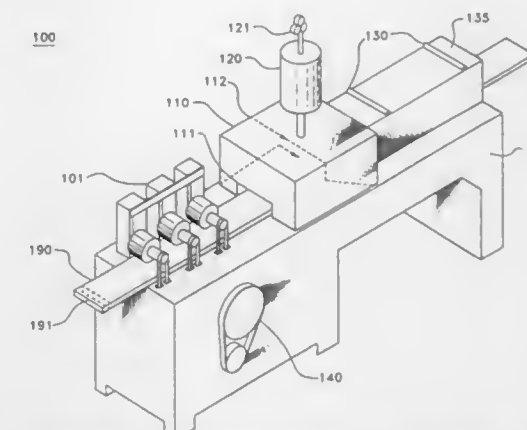
Filed Apr. 5, 1996, Ser. No. 628,503

Int. Cl.<sup>6</sup> B05D 3/12; B05C 11/04

U.S. Cl. 427—356

33 Claims

1. A method for smoothing surfaces of a substrate having a profile and irregular surfaces, the method comprising:
  - (a) applying fill material to at least one surface of the substrate, wherein the fill material fills irregularities in the at least one surface, wherein the substrate is composed of engineered wood;
  - (b) removing some of the fill material from the at least one surface to leave a working excess layer of fill material on the at least one surface; and



- (c) scraping the working excess layer of fill material from the at least one surface to provide a relatively smooth at least one surface.

5,770,268

# CORROSION-RESISTANT COATING COMPOSITION HAVING HIGH SOLIDS CONTENT

Ming C. Kuo, Fox Point, Wis.; Staer S. Kirsten, Copenhagen, Denmark, and Gary W. Marshall, Advance, N.C., assignors to R.J. Tower Corporation, Grand Rapids, Mich.

Continuation-in-part of Ser. No. 375,030, Jan. 19, 1995, Pat. No. 5,576,371. This application Jan. 4, 1996, Ser. No. 582,683

Int. Cl.<sup>6</sup> B05D 1/18

U.S. Cl. 427—386

33 Claims

1. A method for producing a coated member including a substrate of corrodable material and a hard, moisture resistant coating on the substrate, comprising the steps of:
  - (a) preparing a supply of a liquid composition comprising a polyester in a concentration of about 5% to about 40% by weight of the composition, the polyester having hydroxy functional groups, a functional polyol compound in a concentration of about 5% to about 40% by weight of the composition, a cycloaliphatic epoxy compound in a concentration of about 35% to about 80% by weight of the composition, and a thermal curing catalyst in a concentration of about 0.1% to about 2% by weight of the composition, which catalyst is effective to cure the epoxy compound, polyester and functional polyol compound to form the coating;
  - (b) dipping the substrate into a liquid composition;
  - (c) withdrawing the substrate from the liquid composition so that a continuous coating of the liquid remains on the substrate; and
  - (d) thermally curing the coating to form on the substrate a hard, moisture resistant coating of the cured composition, the cured coating comprising a reaction product of the cycloaliphatic epoxy compound, the functional polyol, and the polyester.

5,770,269

# THERMAL CONTROL COATING

Lynn E. Long, Manhattan Beach, and Joan L. Lum, Redondo Beach, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Division of Ser. No. 242,201, May 13, 1994, Pat. No. 5,589,274. This application Sep. 20, 1996, Ser. No. 717,443

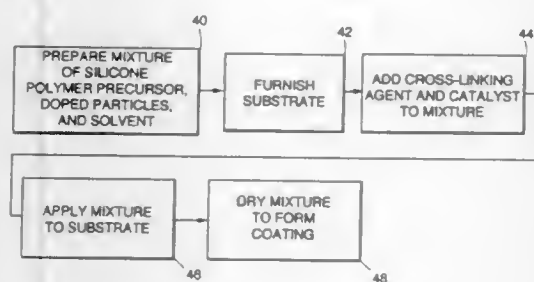
Int. Cl.<sup>6</sup> B05D 3/02; 5/12

U.S. Cl. 427—387

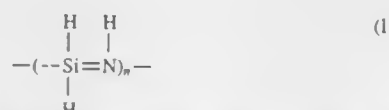
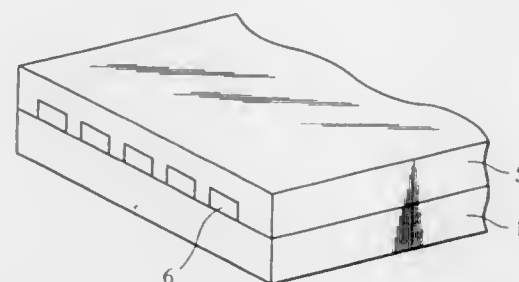
14 Claims

1. A method for preparing a coated article, comprising the steps of:
  - preparing a precursor mixture of a silicone polymeric precursor, doped zinc oxide pigment particles, the zinc oxide pigment particles being doped with an element that forms shallow donorlike states in the zinc oxide, and





a solvent;  
providing a substrate having a surface;  
adding to the precursor mixture a cross-linking agent and a catalyst for the silicone polymeric precursor to form a final mixture; immediately after the step of adding,  
applying the final mixture to the surface of the substrate; and  
drying the final mixture to form a coating on the surface of the substrate to form a coated article, the coating being both white in color and electrically conductive.



forming a thin film surface modification layer by drying and curing the coating solution at a temperature which does not damage the plastic base; and  
forming an ink-repellent layer on the surface modification layer.

#### 5,770,270 PROTECTIVE AND/OR REFLECTIVITY ENHANCEMENT OF NOBLE METAL

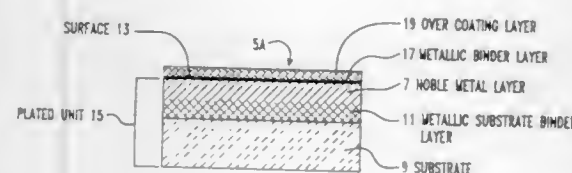
Ramin Lalezari, Boulder, and Dale E. Long, Lafayette, both of Colo., assignors to Research Electro-Optics, Inc., Boulder, Colo.

Filed Apr. 3, 1997, Ser. No. 832,234

Int. Cl.<sup>6</sup> B05D 1/36

U.S. Cl. 427—404

18 Claims



1. A method for forming over coating on a noble metal, said method comprising:  
providing a noble metal having a surface;  
depositing a thin metallic binder layer on said surface of said noble metal with said metallic binder layer having a thickness such that said metallic binder layer is substantially transparent; and  
depositing at least one coating layer on said thin metallic binder layer.

#### 5,770,271 METHOD FOR TREATING THE SURFACE OF A BASE AND PRODUCTION OF AN INK-JET RECORDING HEAD USING THE METHOD

Isao Imamura, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 4, 1996, Ser. No. 707,764

Claims priority, application Japan, Sep. 4, 1995, 7-248274; Aug. 6, 1996, 8-221882

Int. Cl.<sup>6</sup> B05D 1/38; B02; B01; B05

U.S. Cl. 427—412.1

8 Claims

1. A method for treating a surface of a plastic base comprising the steps of:  
applying a coating solution containing a material selected from the group consisting of alumina sol, silanol sol, and perhydro-poly-silazane represented by the following general formula (1), on the surface of the plastic base;

#### 5,770,272 MATRIX-BEARING TARGETS FOR MALDI MASS SPECTROMETRY AND METHODS OF PRODUCTION THEREOF

Klaus Biemann, Alton Bay, N.H., and Heinrich Köchling, Alton, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 28, 1995, Ser. No. 431,064

Int. Cl.<sup>6</sup> B05D 1/02

U.S. Cl. 427—421

5 Claims



1. A method of forming a continuous matrix-bearing target having a matrix aver with an average thickness in excess of 0.7 μm and being substantially free of matrix crystals having any dimension in excess of 10 μm for matrix-assisted laser desorption/ionization mass spectrometry comprising:  
directing at a deposition surface a spray of a solution of a matrix-assisted laser desorption/ionization matrix material dissolved in a solvent;  
simultaneously directing at said surface a stream of non-reactive gas forming a substantially coaxial sheath enveloping said spray; and  
causing said surface and said spray to move relative to one another forming a continuous matrix layer of said matrix material having an average thickness in excess of 0.7 μm and being substantially free of matrix crystals having any dimension in excess of 10 μm the matrix layer being deposited on said surface.

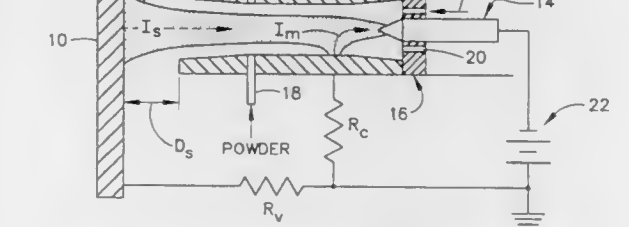
#### 5,770,273 PLASMA COATING PROCESS FOR IMPROVED BONDING OF COATINGS ON SUBSTRATES

Henry Peter Offer, Los Gatos, Calif.; Yuk-Chiu Lau, Ballston Lake; Young Jin Kim, Clifton Park, both of N.Y., and Alfred Stanley Nelson, III, San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Continuation of Ser. No. 388,081, Feb. 14, 1995, abandoned.

This application Oct. 7, 1996, Ser. No. 726,908

Int. Cl.<sup>6</sup> C23C 4/08



1. A plasma spray process for applying a coating on a substrate using a plasma gun, comprising the steps of:  
connecting the substrate and a plasma gun power supply to a common ground such that a potential difference exists between the substrate and a cathode of the plasma gun;  
arranging the plasma gun such that the plasma gun is directed at a surface of the substrate separated by a distance sufficiently short that a plasma stream exiting the plasma gun during plasma gun operation will impinge directly on the substrate surface;  
ion etching the substrate surface by heating the substrate surface with a plasma stream exiting a spray nozzle of the plasma gun to transform oxide-forming atoms on the substrate surface into positive ions, the distance separating said plasma gun and said substrate being such that said positive ions leave the substrate surface under the influence of said potential difference between the substrate and the cathode; and  
splattering the substrate surface with molten droplets of coating material injected into the plasma gun,  
wherein said ion etching and said splattering steps are performed concurrently while maintaining said potential difference between the substrate and the cathode.

#### 5,770,274 METHOD FOR PRODUCING EXTRUSION-COATED LAMINATES

Andreas Christel, Schaffhausen, Switzerland, assignor to Alusuisse Technology & Management Ltd., Neuhausen am Rheinfall, Switzerland, and Softal Electronic GmbH, Hamburg, Germany

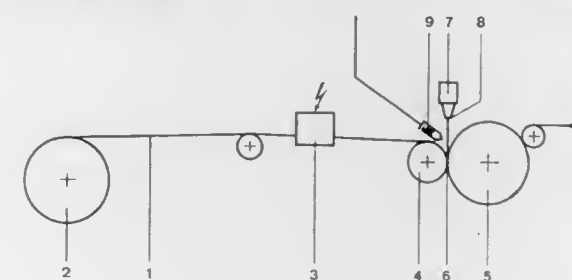
Division of Ser. No. 974,559, Nov. 12, 1992, abandoned. This application May 6, 1994, Ser. No. 239,384

Claims priority, application Switzerland, Dec. 11, 1991, 3645/91

Int. Cl.<sup>6</sup> B05D 3/06

U.S. Cl. 427—535

8 Claims



1. A process for forming extrusion-coated laminates, which comprises the steps of:  
passing a substrate film between a roller gap formed by a cooling roller and a contact roller, wherein the roller gap has a narrowest point;  
forming a thermoplastic coating film having a surface part from a nozzle lip of an extruder nozzle and directing the lip toward the roller gap for causing the coating film to enter the roller gap;  
joining the coating film to the substrate film in the roller gap;  
providing a corona treatment station including two pin electrodes wherein between the electrodes a corona discharge burns, wherein the electrodes are comprised of a discharge electrode and a counter-electrode both located on one side of the coating film to provide a corona treatment on the coating film for promoting adhesion of the coating film to the substrate;  
disposing the corona treatment station in a region between the extruder nozzle lip and the narrowest point of the roller gap at a slight distance from the coating film, wherein the station is positioned closer to the narrowest point than to the nozzle lip; and  
subjecting the surface part of the extruded coating film to a corona discharge treatment from the corona treatment station while the coating film is at least partly in a molten state.

#### 5,770,275 MOLECULAR SIEVING SILICA MEMBRANE FABRICATION PROCESS

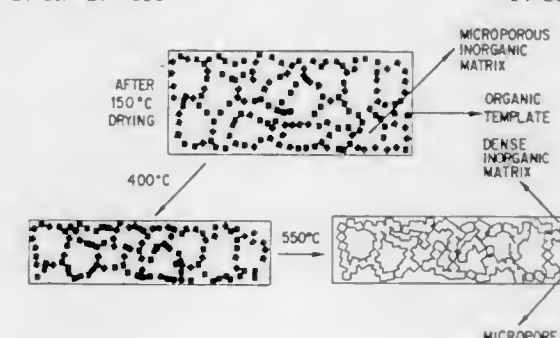
Narayan K. Raman, 400 Maple St. SE., Apartment 112, Albuquerque, N. Mex. 87106, and Charles Jeffrey Brinker, 14 Eagle Nest Dr., NE., Albuquerque, N. Mex. 87122

Filed Aug. 23, 1996, Ser. No. 702,745

Int. Cl.<sup>6</sup> H05H 1/00

U.S. Cl. 427—535

14 Claims



1. A process for producing a molecular sieve silica membrane comprising:  
depositing a hybrid organic-inorganic polymer comprising at least one organic constituent and at least one inorganic constituent on a porous substrate material; and  
removing at least a portion of said at least one organic constituent of said hybrid organic-inorganic polymer, forming a porous film.

#### 5,770,276 COMPOSITE FILLED HOLLOW STRUCTURE

Robert H. Greene, 131 Stable Dr., Lancaster, Pa. 17603

Continuation of Ser. No. 915,315, Jul. 20, 1992, abandoned.

This application Aug. 9, 1996, Ser. No. 694,750

Int. Cl.<sup>6</sup> B29D 22/00

U.S. Cl. 428—36.91

9 Claims

1. Filled structure characterized by the combination of high compressive strength and tensile strength to allow a high bending load, the filled structure comprises:  
a glass fiber reinforced resinous hollow structure having glass fiber rovings throughout an entire thickness thereof and

VOL

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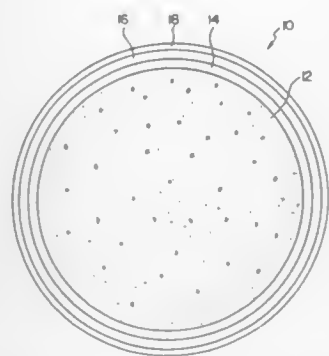
4

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angled with respect to a longitudinal axis thereof so as to have a tensile strength of at least 30,000 psi and having an inside surface forming a boundary which enclose a space, a hard core within said space enclosed by the hollow structure, the hard core having a density of at least 35 pounds per cubic foot and a compressive strength of at least 1500 psi, the hard core being formed from a mixture of particulate cementitious material and liquid, the mixture expanding its volume as it hardens, expansion of the mixture being restrained by the hollow structure and the hard core exerting a force against the inside surface of the hollow structure such that the hard core is force-fit against the surface.

5,770,277

Patent Not Issued For This Number

5,770,278

Patent Not Issued For This Number

5,770,279

Patent Not Issued For This Number

5,770,280

Patent Not Issued For This Number

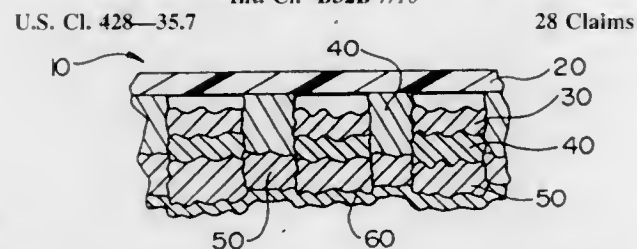
5,770,281

Patent Not Issued For This Number

5,770,282

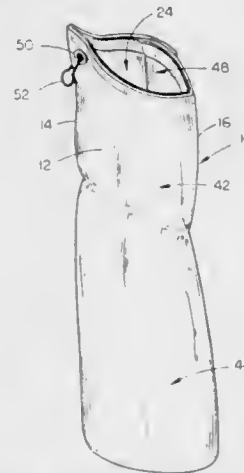
Patent Not Issued For This Number

5,770,283  
TAMPER-INDICATING LABEL  
Raymond R. Gosselin, Stillwater, and John A. Spevacek, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.  
Continuation of Ser. No. 146,615, Nov. 2, 1993, abandoned.  
This application Aug. 29, 1996, Ser. No. 705,038  
Int. Cl.<sup>6</sup> B32B 7/10



1. A tamper-indicating label for application to a substrate, the label having an assembly cohesive strength and comprising sequential layers of:  
(a) a light-transmissive facestock;  
(b) an imaged release coating providing indicia on the label, said indicia being substantially invisible to the unaided eye until becoming permanently visible to the unaided eye when the release coating is separated from at least one of the other layers of the label; and  
(c) adhesive means for bonding the label to the substrate with an adhesive strength, said adhesive strength being less than the assembly cohesive strength of the label, to permit the label to be removed from the substrate without residual label fragments remaining on the substrate, and to keep the label together as a single unit after activation of the label.

5,770,284  
TOWEL WITH INTEGRATED POCKET  
Coe Leta Logemann, 10760 N. 156th St., Box 1, Bennington, Nebr. 68007  
Filed Feb. 7, 1997, Ser. No. 796,286  
Int. Cl.<sup>6</sup> B32B 3/04;3/06  
U.S. Cl. 428—36.1



1. A towel having an integrated pocket, said towel comprising: a sheet of fabric material having front and rear faces, a longitudinal axis and a transverse axis extending generally perpendicular to said longitudinal axis; two spaced-apart folds being formed in said sheet, each of said folds extending generally parallel with said longitudinal axis such that said sheet includes first and second folded sections and an unfolded section between said first and second folded sections, said first and second folded sections extending generally parallel with and overlaying at least part of said unfolded section on said rear face of said sheet; said first and second folded sections each having a top edge, a fold edge and an outer side edge, said first folded section

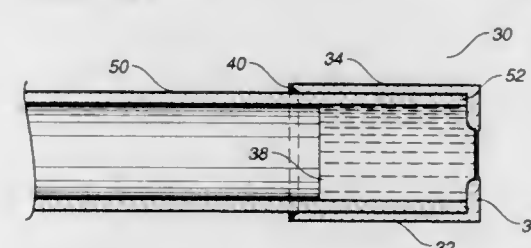
connected to said second folded section generally adjacent said outer side edges of said first and second folded sections along at least part of said first and second folded sections, said connection having a lower end below which said first and second folded sections are free of connection to one another; said first and second folded sections connected to said unfolded section along a line extending generally parallel with said transverse axis of said sheet and generally contacting said lower end of said connection of said first and second folded sections such that said first and second folded sections and said unfolded section cooperate to form an integrated pocket having an interior volume, a top opening and walls defined by said first and second folded sections and said unfolded section, said sheet being divided into an upper pocket section and a lower towel section; and closure means mounted on said sheet adjacent said top opening of said pocket, said closure means operative to releasably close said top opening of said pocket whereby release of items held within said pocket is prevented.

5,770,285  
FUEL HOSE AND METHOD OF PRODUCING THEREOF  
Koyo Murakami, Nagoya; Hiroaki Ito, and Tetsuji Narasaki, both of Komaki, all of Japan, assignors to Tokai Rubber Industries, Ltd., Komaki, Japan  
Filed Feb. 16, 1996, Ser. No. 603,592  
Claims priority, application Japan, Feb. 16, 1995, 7-028379  
Int. Cl.<sup>6</sup> B05D 7/22; B29D 23/00  
U.S. Cl. 428—36.8



1. A fuel hose comprising (1) an outer rubber layer having a crosslinking density of polysulfide bonding set at not less than  $4 \times 10^{-5}$  mol/cm<sup>3</sup> by vulcanization, and (2) a continuous inner polyamide resin layer which is laminated on the inside face of the outer rubber layer and integrated therewith by heat-bonding so that polysulfide bonds of the outer rubber layer decompose during the heat-bonding and the resultant residue after decomposition combines with polyamide molecules of the inner polyamide resin layer so as to form a strong bond between the outer rubber layer and the inner polyamide resin layer.

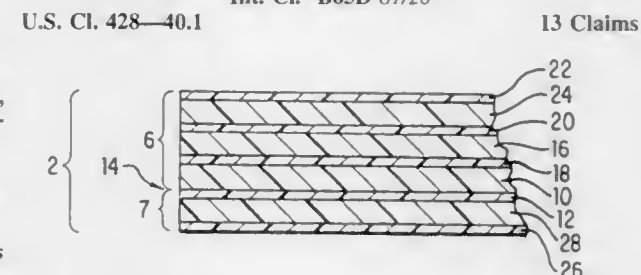
5,770,286  
CORROSION INHIBITOR RETAINING SEAL  
Felix L. Sorkin, P.O. Box 1503, Stafford, Tex. 77477  
Filed Apr. 10, 1996, Ser. No. 630,444  
Int. Cl.<sup>6</sup> E04C 5/08  
U.S. Cl. 428—36.9



1. A transition member for use on an anchorage of a post-tension construction system comprising:

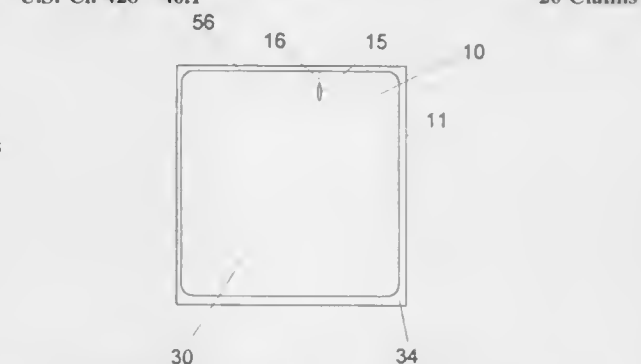
a tubular member having a first end and a second end, said first end for attachment to the anchorage;  
a cap affixed to said second end of said tubular member, said cap having a closed frangible surface extending across said second end of said tubular member; and  
a corrosion-resistant material positioned within said cap adjacent said closed frangible surface.

5,770,287  
VACUUM SKIN PACKAGE AND COMPOSITE FILM THEREFOR  
Nathanael R. Miranda, Gastonia, N.C.; Robin H. Logan, Spartanburg, and Gregory M. Wilson, Greer, both of S.C., assignors to W. R. Grace & Co.-Conn., Duncan, S.C.  
Continuation of Ser. No. 369,846, Jan. 6, 1995, abandoned, which is a continuation-in-part of Ser. No. 343,299, Nov. 22, 1994, abandoned. This application Sep. 17, 1996, Ser. No. 715,112  
Int. Cl.<sup>6</sup> B65D 81/20  
U.S. Cl. 428—40.1



1. A vacuum skin packaging composite film comprising a permeable film and an impermeable film which is peelably removable from said permeable film, said permeable film comprising a single semi-adherent layer that is peelably adhered to said impermeable film at a peel force ranging from about 0.02 to 0.05 pounds/inch, a sealant outer layer and a core layer positioned between said sealant outer layer and said semi-adherent layer, wherein the core and the sealant layers are different from the semi-adherent layer, wherein said semi-adherent layer comprises an adhesive blended with a polymer selected from the group consisting of polypropylene and ethylene propylene copolymer and further said semi-adherent layer contains less than 0.45 weight percent migratable waxes.

5,770,288  
LABEL WITH REMOVAL SLIT  
Robert S. Carney, Jr., 4232 Colfax Ave. South, Minneapolis, Minn. 55409  
Filed Oct. 18, 1996, Ser. No. 733,249  
Int. Cl.<sup>6</sup> B32B 3/10;3/06;7/06  
U.S. Cl. 428—40.1



1. A label for labeling to an object, comprising:  
a) a first label layer having a first side and a second side; and  
b) said first side of said first label layer having no adhesive coating, and forming a front side of said label, and providing a surface for receiving and retaining indicia; and



- c) said second side of said first label layer having the border of the label peripheral edge coated with a removable primary adhesive material, said peripheral edge border of primary adhesive material being either continuous or having one or more gaps, and said removable primary adhesive material having a peel force of less than three pounds; and
- d) said first label layer having one or more slits or holes, such that at least one said slit or hole is enclosed within the area bounded by the said peripheral edge border of primary adhesive material, and such that part or all of the peripheral edge of the said at least one slit or hole enclosed within the peripheral edge border of primary adhesive material borders an area on the second side of said first label layer having no adhesive coating or a weaker adhesive coating.

5,770,289

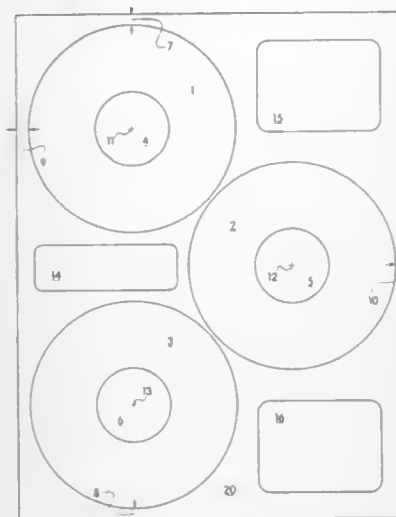
**DIE CUT SELF-ADHESIVE LABEL SHEET FOR LABELING CD-ROMS**

Peter Tracy, 170 Barkder Hill Rd., Guilford, Conn. 06437  
Filed Nov. 13, 1996, Ser. No. 748,430

Int. Cl.<sup>6</sup> B32B 3/02

U.S. Cl. 428—40.1

11 Claims



1. A die cut self adhesive CD-ROM label sheet, comprising at least three circular labels arranged on a sheet having dimensions of between about 210–216 mm by about 297–279.4 mm, said labels each being adapted for adhering to a CD-ROM, wherein said label sheet is formed of a stock having a first color and having a pigment of a second color applied over a portion of said sheet encompassing said at least three circular labels, wherein said first color and said second color are different.

5,770,290

**EASY OPEN END OF A METAL-PLASTIC CONSTRUCTION**

Robert J. McHenry, 2819 Royal Ashdown Ct., St. Charles, Ill. 60174, and Dominique Petit, Les Cotes F-38340, Pommiers-la-Placette, France

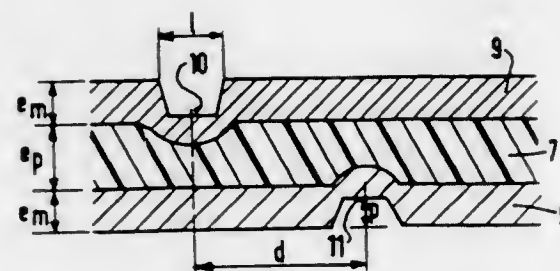
PCT No. PCT/US94/13919, § 371 Date Sep. 3, 1996, § 102(e) Date Sep. 3, 1996, PCT Pub. No. WO95/15228, PCT Pub. Date Jun. 8, 1995

PCT Filed Nov. 30, 1994, Ser. No. 656,344  
Claims priority, application France, Dec. 1, 1993, 93 14616  
Int. Cl.<sup>6</sup> B65D 17/28; 75/62; B32B 3/30

U.S. Cl. 428—43

22 Claims

1. An easy open can end comprising:  
a drawn end body having a generally circular configuration including a first major surface adapted to be inwardly facing and an opposed second major surface adapted to be outwardly facing when the can end is joined to a can body, said end body



having an M<sub>1</sub>-P-M<sub>2</sub> type laminar construction wherein M<sub>1</sub> and M<sub>2</sub> are inner and outer metal foil layers, respectively, each metal foil layer having a thickness of from about 25 to about 100 microns, and P is a central polymer layer, having a thickness of from about 80 to about 300 microns, said end body further including an opening panel defined by a first score line disposed in said first major surface, and a second score line disposed in said second major surface, wherein the first score line defines an area of reduced thickness for the metal layer M<sub>1</sub> and polymer layer P and the second score line defines an area of reduced thickness for the metal layer M<sub>2</sub> and the polymer layer P, and wherein the centerline spacing, d, between the first score line and the second score line is greater than about 100 μm, said opening panel being movable to define an opening in said end body by perforating the end body at a point along said first and second score lines and, thereafter, tearing the end body along the first and second score lines by displacing at least a portion of the opening panel from a remainder of said end body to define said opening.

5,770,291

**BLANK FOR A LIGHTWEIGHT CASKET**

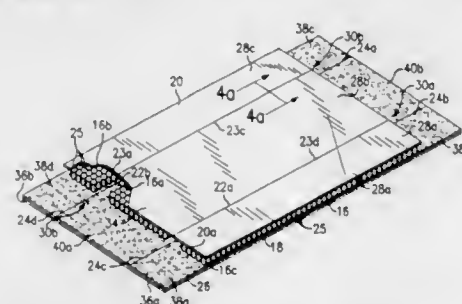
William C. Tambussi, Cherry Hill, N.J., assignor to Batesville Casket Company, Inc., Batesville, Ind.

Continuation-in-part of Ser. No. 495,323, Jun. 27, 1995, Pat. No. 5,685,935, which is a continuation of Ser. No. 124,638, Sep. 22, 1993, abandoned. This application Jan. 22, 1996, Ser. No. 589,822

Int. Cl.<sup>6</sup> A61G 17/013

U.S. Cl. 428—55

32 Claims



1. A blank for folding into a body containment section of a casket, the blank comprising:  
a first stabilizing surface element, the first stabilizing surface element being a unitary element,  
a second stabilizing surface element positioned to lie above the first stabilizing surface element and spaced-apart therefrom, the second stabilizing surface element being a unitary element, and  
a core having a top surface and a bottom surface, the core being sandwiched between the first and second stabilizing surface elements, the bottom surface of the core being attached to the first stabilizing surface element and the top surface of the core being attached to the second stabilizing surface element, the core including a first section and a second section spaced-apart from the first section to form an elongated gap therebetween, the first and second sections of the core being arranged so that the blank can be bent along the gap, each of the first

and second sections of the core being attached to both the first and second unitary stabilizing surface elements.

5,770,292

**JOINT ASSEMBLY OF A LEADER AND A FILM AND SPLICER FOR MAKING THE SAME**

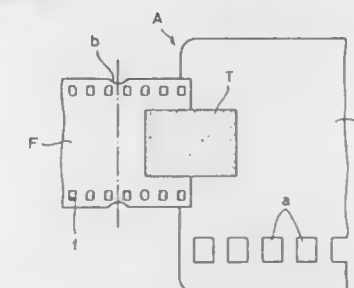
Yasunobu Shimamura, Masayuki Kobayashi, and Takuya Yamamoto, all of Wakayama, Japan, assignors to Noritsu Koki Co., Ltd., Wakayama, Japan

Division of Ser. No. 399,214, Mar. 6, 1995, Pat. No. 5,651,854. This application Mar. 14, 1997, Ser. No. 818,677

Claims priority, application Japan, Mar. 4, 1994, 6-34800  
Int. Cl.<sup>6</sup> B32B 3/02

U.S. Cl. 428—57

1 Claim



1. A joint assembly of a leader and a film fabricated by joining a leading end of the film to a trailing end of the leader made of a flexible material, characterized in that the film has a pair of notches provided at both sides of a leading portion thereof for ease of separation after development process of the film.

5,770,293

**METHOD OF FORMING RECORDABLE OPTICAL ELEMENT USING LOW ABSORPTION MATERIALS**

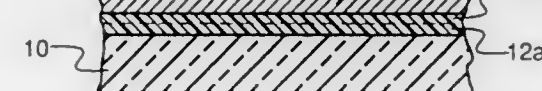
Pranab K. Raychaudhuri, Rochester, and Fridrich Vazan, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 12, 1996, Ser. No. 631,754

Int. Cl.<sup>6</sup> B32B 3/00; C23C 16/00

U.S. Cl. 428—64.1

6 Claims



1. A method of forming a recordable element including a substrate and having on its surface, in order, an optical recording layer and a light reflecting layer, the optical recording layer having at least two sublayers of different compositions, comprising the steps of:

- a) forming in a sputtering chamber on the substrate surface a first sublayer of a predetermined thickness by sputtering at least two metal elements having Ge and Te, or alloys thereof, in a flowing environment of a hydrocarbon gas and an inert gas wherein the flow rate of the hydrocarbon gas is selected relative to the flow rate of the inert gas to provide the first sublayer with an elemental R<sub>min</sub> reflectivity is in the range of 40–60%;  
b) forming in the sputtering chamber on the first sublayer a second sublayer of a predetermined thickness by sputtering at least two elements having Ge and Te, or alloys thereof, in a flowing environment of hydrocarbon gas and the inert gas, with the flow rates of the hydrocarbon gas and the inert gas being substantially the same as when the first sublayer was formed and reducing the sputtering rate of the metal elements in comparison to that used when forming the first sublayer so

that the elemental R<sub>min</sub> reflectivity of the second sublayer is in the range of about 70–85%;

- c) forming a reflecting layer on the second sublayer; and  
d) selecting the thicknesses of the first and second sublayers, and the reflecting layer such that the reflectivity of the recording element is about or greater than 70% for a laser wavelength of about 780 nm.

5,770,294

**MOLDED GLASS PLATES PRODUCED BY MOLD WITH MODIFIED SURFACE**

Yasuaki Sakamoto, 23-43 Harinokimata, Amarubecho, Kameoka-shi, Kyoto-hu, Japan

Division of Ser. No. 520,585, Aug. 29, 1995, abandoned, and a continuation-in-part of Ser. No. 441,411, May 15, 1995, abandoned. This application Jun. 25, 1996, Ser. No. 669,998

Int. Cl.<sup>6</sup> B23B 3/00

U.S. Cl. 428—64.1

1 Claim



1. Molded glass plate for optical disks formed by a process comprising the steps of:

- modifying a surface of a metallic mold made of super-hard material by ion injection,  
providing said metallic mold with required flatness by carbon coating on said surface after modifying said surface by ion injections,  
heating a glass plate to a softening temperature,  
pressing the glass plate in said metallic mold, and cooling the glass plate.

5,770,295

**PHASE CHANGE THERMAL INSULATION STRUCTURE**

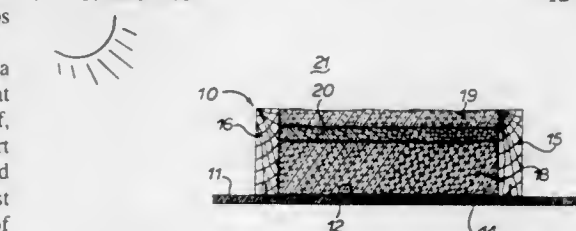
Robert J. Alderman, Canyon Lake, Tex., assignor to Energy Pillow, Inc., Sequin, Tex.

Continuation-in-part of Ser. No. 118,567, Sep. 9, 1993, Pat. No. 5,626,936. This application Jun. 7, 1995, Ser. No. 475,876

Int. Cl.<sup>6</sup> B32B 3/06

U.S. Cl. 428—68

12 Claims



1. A thermal insulation structure for a building structure for placement in heat exchange relationship between a substantially constant temperature space normally maintained at a generally constant predetermined temperature and a variable temperature space normally of a variable temperature within a range of temperatures extending higher than and lower than the temperature of the generally constant temperature space during a time cycle, comprising:

a first layer of heat insulation material having first and second opposed surfaces, said first surface to be arranged to face the constant temperature space of the building structure,  
a second layer of heat insulation material having first and second opposed surfaces, said first surface of said second layer of insulation material overlying said second surface of said first layer of insulation material and said second surface of said second layer to be arranged to face the variable temperature space of the building structure,  
an intermediate layer of phase change material generally uniformly coated in a liquid form on at least one of said facing surfaces only of said first and second layers of insulation material, wherein interior portions of said first and second layers are substantially free of said phase change material, said phase change material comprising a material that changes between a solid state and a liquid state at a predetermined phase change temperature, said phase change temperature falling within said range of temperatures of the variable temperature space during a time cycle,  
said first layer of insulation material having greater heat insulation value than said second layer of insulation material and said phase change material being arranged to more readily exchange heat with said variable temperature space than the constant temperature space when the thermal insulation structure is placed in a building structure and the temperature of the variable temperature space becomes higher than or lower than the phase change temperature.

5,770,296

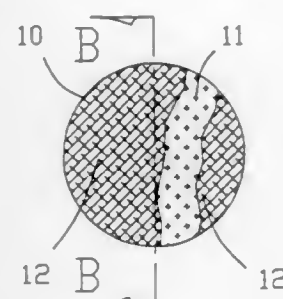
## ADHESIVE DEVICE

David L. Remerowski; Duane C. Shomler; Anthony T. Racca; David J. Lococo, all of Cincinnati, Ohio, and Vladimir Pilic, Smithtown, N.Y., assignors to Senco Products, Inc., Cincinnati, Ohio

Filed Aug. 5, 1996, Ser. No. 689,180  
Int. Cl.<sup>6</sup> B32B 3/02

U.S. Cl. 428—80

7 Claims



1. An adhesive device for the adhesive assembly of associated components which comprises:  
a target element having an upper surface and a lower surface, composed of metal foil having a continuous surface which has a mathematically smooth perimeter essentially defining a closed curve, and a heat-activatable adhesive material which completely covers both surfaces of said foil, said target element being absorbent of electromagnetic waves, which are convertible to heat energy to activate said adhesive material.

5,770,297

## GRIPPING DEVICE

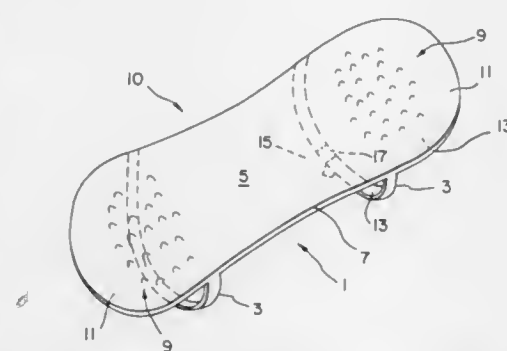
Ivan J. Grubich, 3330 Longfellow Avenue, Windsor, Ontario, Canada, N9E 2L6

Filed Oct. 1, 1996, Ser. No. 725,348  
Int. Cl.<sup>6</sup> B25B 13/50

U.S. Cl. 428—99

8 Claims

1. A gripping device comprising:



a) a thin flexible strip of generally rectangular shape and having a gripping surface and an opposing back surface, the thin flexible strip defining a width approximating a width of a user's index finger or thumb and being made of an elastic material;  
b) a pair of elastic attachment bands, each elastic attachment band integrally formed as part of the thin flexible strip and continuously extending between opposing edges of the thin flexible strip, each elastic attachment band mounted to the thin flexible strip in a spaced apart relationship and sized to form an opening with a portion of the opposing back surface, the opening formed by one elastic attachment band sized to receive only an index finger of a user, the opening formed by the other elastic attachment band sized to receive only a thumb of a user;  
c) wherein the thin flexible strip is sized in length to extend along a portion of a user's thumb, along and adjacent the juncture between a user's thumb and a user's index finger and to a portion of a user's thumb, the width of the thin flexible strip being sized so that at least an inner surface of a middle finger, a ring finger and a little finger of a user are exposed so that the thin flexible strip does not interfere with manipulation or movement of the exposed fingers.

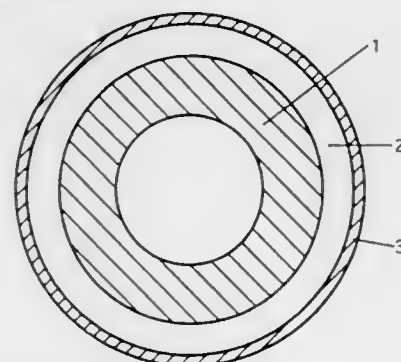
5,770,298

FIXING ROLL AND SILICONE GEL FOR USE THEREIN  
Akito Nakamura, and Yoshito Ushio, both of Chiba Prefecture, Japan, assignors to Dow Corning Toray Silicone Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1996, Ser. No. 734,644  
Claims priority, application Japan, Nov. 10, 1995, 7-317214  
Int. Cl.<sup>6</sup> B32B 3/00

U.S. Cl. 428—195

15 Claims



1. A fixing roll comprising  
A) a roller shaft;  
B) a peelable organic resin layer established on the external circumferential surface of the roller shaft; and  
C) a layer of cured silicone gel interposed between the roller shaft and the peelable organic resin layer;  
wherein the cured silicone gel has a penetration value, as measured according to JIS K 2207, of 30 to 200.

5,770,299

## MARKING FOR OBJECTS PAINTED WITH AN EFFECT PAINT AND PROCESS FOR PRODUCING THE MARKING

Fritz Dannenhauer, Hasel, and Karl Holdik, Ulm, both of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

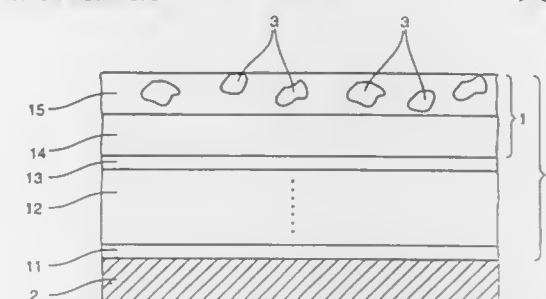
Filed Nov. 5, 1996, Ser. No. 743,223

Claims priority, application Germany, Nov. 5, 1995, 195 41 028.9

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—195

9 Claims



1. A pigment-containing effect paint for painting an object, said pigment imparting a color effect to the paint which depends on the viewing angle and comprising pigment particles formed by fracturing a wiped and cross-linked polymer film, said pigment particles comprising marked pigment particles which carry a recognizable marking which enables the object painted with the pigment-containing effect paint to be identified.

5,770,300

## MULTILAYERED METALLIC PRINTED BOARD AND MOLDED MODULE

Kenji Okamoto; Yukio Nakajima; Kazuhiko Imamura, and Takao Ichihara, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

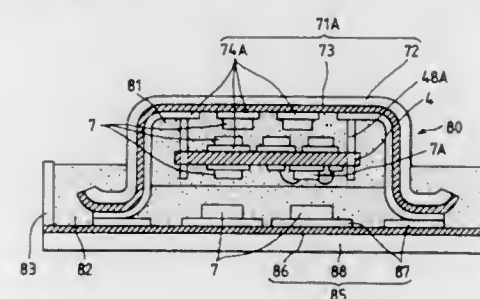
Continuation of Ser. No. 459,000, Jun. 6, 1995, abandoned, which is a division of Ser. No. 263,332, Jun. 21, 1994, abandoned. This application Dec. 3, 1996, Ser. No. 763,707

Claims priority, application Japan, Jun. 25, 1993, 5-180836; Mar. 18, 1994, 6-74402; May 10, 1994, 6-95985

Int. Cl.<sup>6</sup> B32B 3/00; H05K 1/00; 1/03; 1/11

U.S. Cl. 428—209

14 Claims



1. A molded module comprising:  
a mother board comprised of an insulating layer laminated on a metallic plate base layer and a conductive layer on said insulating layer, and having first electronic parts mounted thereon;  
a first printed board joined to said mother board at a joining area and having a layer of insulating material laminated on a metallic base layer and a conductive pattern formed on a surface of said insulating material, said conductive pattern being electrically connected to said mother board;  
said first printed board being folded upward to form an interior space between said conductive pattern and said mother board, second electronic parts being mounted on said first printed board within said interior space; and

a second printed board laminated on said first printed board within said interior space, third electronic parts being mounted on said second printed board within said interior space.

5,770,301

## BARRIER COMPOSITE FILMS AND A METHOD FOR PRODUCING THE SAME

Takaaki Mural, Hiroshima, and Ryuta Miyake, Amagasaki, both of Japan, assignors to Dalc Chemical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP96/00614, § 371 Date Oct. 25, 1996, § 102(e) Date Oct. 25, 1996, PCT Pub. No. WO96/28299, PCT Pub. Date Sep. 19, 1996

PCT Filed Mar. 13, 1996, Ser. No. 732,226

Claims priority, application Japan, Mar. 14, 1995, 7/83308  
Int. Cl.<sup>6</sup> B32B 27/32; 27/34; 27/36

U.S. Cl. 428—213

24 Claims

1. A barrier composite film which comprises a base film layer, an inorganic thin layer having a thickness of 100 to 5,000 Å formed on at least one side of said base film layer, and a gas barrier resin coating layer containing a silane coupling agent formed on said inorganic thin layer.

23. A process for producing a barrier composite film which comprises depositing an inorganic thin layer having a thickness of 100 to 5,000 Å on at least one side of a base film and coating the deposited side of said base film with a coating composition containing a silane coupling agent and a gas barrier resin.

5,770,302

## MAGNETIC RECORDING MEDIUM

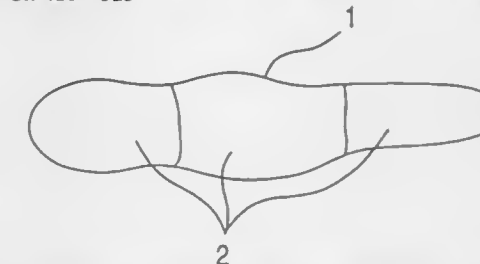
Kouichi Masaki, and Toshihiko Miura, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 4, 1996, Ser. No. 725,244

Claims priority, application Japan, Oct. 13, 1995, 7-265673  
Int. Cl.<sup>6</sup> G11B 5/706

U.S. Cl. 428—323

4 Claims



1. A magnetic recording medium comprising a nonmagnetic support having thereon a magnetic layer containing at least ferromagnetic particles, wherein said ferromagnetic particles have a coercive force of from 1,700 to 3,000 Oe, an average long axis length of from 30 to 80 nm, an average acicular ratio of from 2.0 to less than 5.0, and a crystallinity of from 30 to 100%.

5,770,303

## OCCLUDED COMPOSITE-PARTICLE LATEX

Raymond J. Weinert, Macedonla; Satish C. Sharma, Stow; John P. Kovalchin; David M. Lee, both of Akron; Nick G. Triantafilopoulos, Stow, and Ira John Westerman, Wadsworth, all of Ohio, assignors to GenCorp Inc., Fairlawn, Ohio

Continuation-in-part of Ser. No. 271,402, Jul. 6, 1994, abandoned. This application Jan. 5, 1996, Ser. No. 583,260

Int. Cl.<sup>6</sup> B32B 5/16

U.S. Cl. 428—326

13 Claims

1. A latex composition, comprising:



occluded composite particles containing at least a first polymer and at least a second polymer, said occluded particles comprising a morphology of a plurality of lobes of said second polymer, said second polymer being phase separated from said first polymer,

said first polymer being formed from monomers comprising at least one vinyl ester having from 4 to 12 carbon atoms, optionally ethylene, and optionally one or more alkyl acrylates or alkyl methacrylates wherein the alkyl group has from 1 to 10 carbon atoms, and

said second polymer being formed in the presence of said first polymer from monomers comprising at least one vinyl substituted aromatic having from 8 to 12 carbon atoms, or at least one conjugated diene having from 4 to 12 carbon atoms, or combinations thereof, and at least one unsaturated carboxylic acid having a total of from 3 to 12 carbon atoms.

5,770,304

**WIDE BANDWIDTH ELECTROMAGNETIC WAVE ABSORBING MATERIAL**

Koji Nakamura, Amagasaki; Hideki Komori, Takatsuki; Mitsuyuki Oda, Kyoto, and Kazunori Kanda, Yao, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka-fu, Japan

Filed Jul. 11, 1995, Ser. No. 500,836

Claims priority, application Japan, Jul. 11, 1994, 6-158398

Int. Cl.<sup>6</sup> B32B 5/16

U.S. Cl. 428—328 10 Claims

1. An electromagnetic wave absorbing material which can absorb about 75 to 94% of electromagnetic waves over a frequency range of 1.9 to 60 GHz comprising:

a first layer composed of a conductive material having a shielding capacity of not less than 20 dB;

a second layer applied on the first layer, comprising particles of a metal oxide magnetic material and a matrix of a binder, the second layer having a thickness of from 1.8 to 3.6 mm, and the particles of the metal oxide magnetic material having a mean particle size of from 2 to 50  $\mu$ m; and

a third layer applied on the second layer, comprising particles of a metal magnetic material and a matrix of a binder, the third layer having a thickness of from 0.2 to 1.1 mm, and the particles of the metal magnetic material having a mean particle size of from 1 to 30  $\mu$ m, wherein the metal magnetic material comprises 80 to 90% by weight of the third layer.

5,770,305

**ANISOTROPIC CONDUCTIVE FILM**

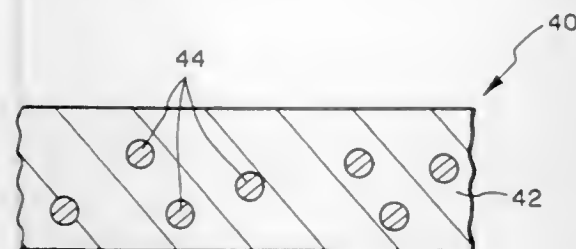
Shinji Terasaka, Tokyo, Japan, assignor to NEC Corporation, Japan

Filed Sep. 27, 1995, Ser. No. 534,445

Claims priority, application Japan, Sep. 30, 1994, 6-236547

Int. Cl.<sup>6</sup> B32B 5/16; H01B 1/22

U.S. Cl. 428—328 6 Claims



1. An anisotropic conductive film having conductivity only in a thicknesswise direction comprising an adhesive insulating resin comprising a dispersed mixture of insulating resin and conductive particles for linking, when compressed, electronic parts to each other to thereby electrically connect said electronic parts, said conductive particles comprising elastically deformable alloy par-

ticles which expand or contract in response to a change in stress, wherein said elastically deformable alloy particles comprise Ti—Ni alloy particles.

5,770,306

**ANTIREFLECTION FILM CONTAINING ULTRAFINE PARTICLES, POLARIZING PLATE AND LIQUID CRYSTAL DISPLAY DEVICE**

Hiroko Suzuki; Kiyotaka Takematsu; Mitsuru Tsuchiya, and Hiroomi Katagiri, all of Tokyo-To, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan

Filed Mar. 6, 1996, Ser. No. 611,661

Claims priority, application Japan, Mar. 9, 1995, 7-078240

Int. Cl.<sup>6</sup> B32B 5/16

U.S. Cl. 428—328 7 Claims

1. An antireflection film comprising:

a transparent substrate film; and

at least one resin layer provided on said transparent substrate film directly or through (an)other layer(s), said at least one resin layer having a controlled refractive index and formed of a resin composition containing ultrafine particles, the outermost layer having a lower refractive index than the underlying layer in direct contact therewith and disposed on either the transparent substrate film or the transparent substrate film side.

the resin composition containing as at least part of a binder resin component a carboxyl-containing (meth)acrylate prepared by reacting a compound having at least one acid anhydride in its molecule with an hydroxyl-containing polyfunctional acrylate having an hydroxyl group and at least three acryloyl groups in its molecule.

5,770,307

**COEXTRUDED MONOFILAMENTS**

Robert Lee Rackley, and Charles Fletcher Nelson, both of Parkersburg, W. Va., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 27, 1996, Ser. No. 721,855

Int. Cl.<sup>6</sup> D02G 3/00; A46B 00/00; B29C 47/88

U.S. Cl. 428—373 12 Claims



1. A coextruded monofilament comprising:

a core material of a first resin,

a sheath material of a second resin, said second resin being different from said first resin, and

a pocket formed in the end of the monofilament.

5,770,308

**HIGH WATER-REPELLENT FIBER AND NONWOVEN**  
Masayasu Suzuki, Yasu-gun; Masaru Nishijima, and Hirokazu Terada, both of Moriyama, all of Japan, assignors to Chisso Corporation, Tokyo, Japan

Filed Mar. 24, 1997, Ser. No. 822,689

Claims priority, application Japan, Mar. 26, 1996, 8-096055; May 27, 1996, 8-156095; Jul. 15, 1996, 8-205187

Int. Cl.<sup>6</sup> D02G 3/00

U.S. Cl. 428—375 6 Claims

1. A high water-repellent fiber comprising a thermoplastic resin, wherein the following components (A) 75–90% by weight, (B) 5–20% by weight and (C) 1–5% by weight are adhered on the fiber 0.1–1.0% by weight per fiber:

(A) a mixture comprising less than 55% by weight of at least one metal alkyl phosphate of 14–18 carbons, and 45% or more by weight of at least one metal alkyl phosphate of 20–24 carbons;

(B) a compound containing a perfluoroalkyl group; and

(C) a metal alkyl phosphate of 2–6 carbons.

5,770,309

**HOLLOW MULTI-COMPONENT INSULATION FIBERS AND THE MANUFACTURING OF SAME**

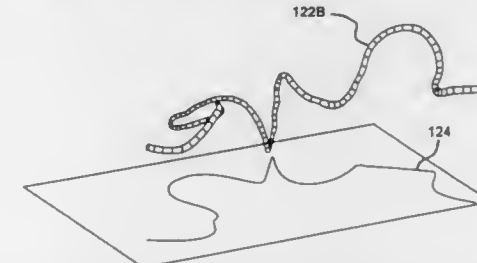
Ronald A. Houpt, Newark; Larry J. Huey, Granville, and David C. K. Lin, Worthington, all of Ohio, assignors to Owens Corning Fiberglas Technology Inc., Summit, Ill.

Continuation of Ser. No. 309,706, Sep. 21, 1994, abandoned.

This application Aug. 12, 1996, Ser. No. 695,531

Int. Cl.<sup>6</sup> D02G 3/00

U.S. Cl. 428—398 16 Claims



1. A glass fiber insulation product comprising irregularly-shaped hollow glass fibers having a rotation which varies irregularly both in direction and in magnitude along a length of said irregularly-shaped hollow glass fibers, said fibers having a substantially uniform volume filling nature.

5,770,310

**COMPOSITE FINE PARTICLES OF METAL OXIDES AND PRODUCTION THEREOF**

Tamio Noguchi, and Yukitaka Watanabe, both of Iwaki, Japan, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Germany

Filed Apr. 1, 1997, Ser. No. 831,302

Claims priority, application Japan, Apr. 2, 1996, 8-102046

Int. Cl.<sup>6</sup> B32B 5/16; B05D 7/00

U.S. Cl. 428—403 14 Claims

1. A composite fine particle of metal oxides having a particle diameter equal to or less than 0.5  $\mu$ m, comprising a core and a surface layer, said core comprising a nucleus and outer layer wherein the nucleus comprises (A) titanium dioxide (B) iron oxide or (C) a mixture of titanium dioxide and iron oxide, and the outer layer comprises titanium dioxide, said surface layer comprising metal oxides of magnesium and calcium accounting for 2–20 wt % of the total particle weight in terms of metal oxide and, when the nucleus comprises iron oxide, the amount of iron oxide on Fe<sub>2</sub>O<sub>3</sub> basis is 2–20% wt of the total particle weight.

5,770,311

Patent Not Issued For This Number

5,770,312

**POLYMERIC FILM**

Julian Neal Robinson, Middlesbrough, England, assignor to Imperial Chemical Industries PLC, London, England

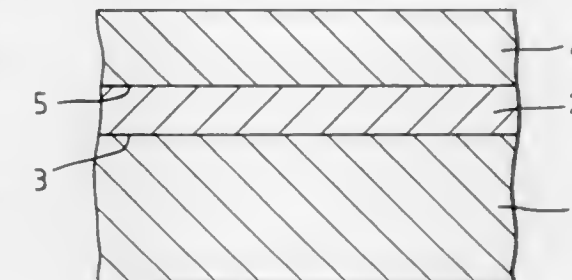
Continuation of Ser. No. 18,059, Feb. 17, 1993, abandoned.

This application Jun. 9, 1994, Ser. No. 257,460

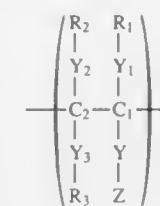
Claims priority, application United Kingdom, Feb. 17, 1992, 9203350

Int. Cl.<sup>6</sup> B32B 27/06

U.S. Cl. 428—411.1 10 Claims



1. A light-sensitive coated film comprising a polymeric film substrate having on at least one surface thereof a subbing layer comprising an organic acid having a molecular weight from 70 to 800 and a polymer comprising greater than 60 mole % of at least one or more repeating units comprising at least one or more pendant nitrogen atoms, the ratio of organic acid to polymer in the subbing layer being in the range from 1:0.1 to 20 by weight, and a light-sensitive emulsion layer on said subbing layer, said subbing layer functioning to improve adhesion between the substrate and the light-sensitive emulsion layer thereon said repeating unit having the structure



wherein

Z represents amine, amide, quaternary ammonium, and/or wherein Z is protonated and associated with a negatively charged counter ion wherein the counter ion is selected from the group consisting of halide, phosphate and carboxylate, R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are the same or different and represent hydrogen, halogen, alkyl, nitrile, amine, amide, quaternary ammonium, ketone, ether, vinyl, and/or halide, phosphate or carboxylate salts thereof, and Y, Y<sub>1</sub>, Y<sub>2</sub> and Y<sub>3</sub> are optional alkylene groups having up to 10 carbon atoms, which may be the same or different.

5,770,313

**PREPREG, COMPOSITE MOLDED BODY AND METHOD OF MANUFACTURE OF THE COMPOSITE MOLDED BODY**

Goro Furumoto, Moriyama; Takashi Fujiwara, Nobeoka, and Tsuneo Igarashi, Moriyama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan  
Division of Ser. No. 34,171, Feb. 12, 1993, Pat. No. 5,597,651, which is a continuation of Ser. No. 582,183, Nov. 14, 1990, abandoned. This application Sep. 6, 1996, Ser. No. 709,188  
Claims priority, application Japan, Apr. 19, 1989, 1-97595; Apr. 19, 1989, 1-97596; Apr. 27, 1989, 1-105756; Nov. 21, 1989, 1-300803; Nov. 24, 1989, 1-303250; Jan. 25, 1990, 1-14124  
Int. Cl.<sup>6</sup> B32B 27/00

U.S. Cl. 428—411.1

29 Claims



1. A prepeg comprising at least one layer of a film comprising an organic polymer having substantially no melting point and having a tensile modulus of 700 kg/mm<sup>2</sup> or more and a tensile strength of 35 kg/mm<sup>2</sup> or more and at least one layer of a resin, said film and said resin layer being bonded to each other.

5,770,314

**TRANSPARENT ELECTRICALLY CONDUCTIVE PLATE**  
Masanobu Suga; Tsuyoshi Asano, and Nobuyuki Kuroda, all of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

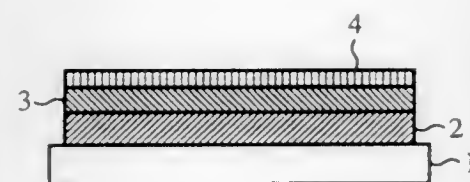
Filed Mar. 29, 1996, Ser. No. 625,173

Claims priority, application Japan, Apr. 4, 1995, 7-078554

Int. Cl.<sup>6</sup> B32B 27/36

U.S. Cl. 428—412

17 Claims



1. A transparent electrically conductive plate comprising a transparent substrate of glass material, a transparent electrically conductive layer, an ultraviolet absorbing layer including an organic ultraviolet absorber and a basic material with the ultraviolet absorber being chemically bonded to the basic material disposed between the transparent substrate and the transparent electrically conductive layer, and an overcoating layer disposed between the transparent electrically conductive layer and said ultraviolet absorbing layer for protecting the ultraviolet absorbing layer.

5,770,315

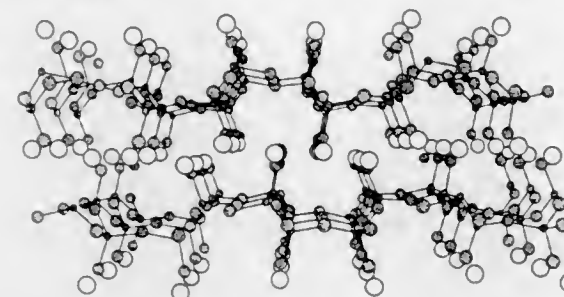
**PROCESS FOR THE AFTERTREATMENT OF ALUMINUM MATERIALS, SUBSTRATES OF SUCH MATERIALS, AND THEIR USE FOR OFFSET PRINTING PLATES**

Wolfgang Wiedemann, Geisenheim, Germany, assignor to Agfa-Gevaert AG, Leverkusen, Germany  
Division of Ser. No. 435,162, May 5, 1995, Pat. No. 5,556,531. This application Mar. 4, 1996, Ser. No. 610,392  
Claims priority, application Germany, May 21, 1994, P 44 17 907.3

Int. Cl.<sup>6</sup> B32B 15/00

U.S. Cl. 428—446

15 Claims



1. A substrate comprising an aluminum or aluminum alloy material having an aluminum oxide layer coated with an alkali metal silicate layer, wherein the alkali metal silicate layer comprises an anhydrous and crystalline alkali metal silicate, wherein the alkali metal silicate comprises a sheet sodium silicate having a polymeric wavy sheet structure of the silicate framework.

5,770,316

**HEAT-STABLE POLARIZERS**

Karl-Heinz Aleksander Ostojka Starzewski, Bad Vilbel, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 26, 1996, Ser. No. 753,549

Claims priority, application Germany, Dec. 14, 1995, 195 46 747.7

Int. Cl.<sup>6</sup> G02B 1/08

U.S. Cl. 428—451

10 Claims

1. A heat-stable, flexible polarizer with a polarizing core layer of a polymer with conjugated double bonds, with the exception of exclusively polyacetylene-containing polymer matrixes, wherein the polarizing core layer has surfaces sealed with soda water-glass or potash water-glass.

5,770,317

**ORIENTED POLYESTER FILM**

Katsuhiko Takaya, and Tetsuo Ueno, both of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP95/00724, § 371 Date Jan. 15, 1997, § 102(e) Date Jan. 15, 1997, PCT Pub. No. WO95/28438, PCT Pub. Date Oct. 26, 1995

PCT Filed Apr. 13, 1995, Ser. No. 727,423

Claims priority, application Japan, Apr. 14, 1994, 6-075874  
Int. Cl.<sup>6</sup> B32B 27/06

U.S. Cl. 428—480

6 Claims

1. A copolyester film having a planar orientation of from 0.04 to 0.15, wherein said copolyester has a reduced viscosity of from 0.8 dl/g to 1.6 dl/g and comprises dicarboxylic acid components including terephthalic acid as a main component, 1,4-butanediol, and diol components including at least one kind of diol represented by following formula (I), wherein when the content of the diol of

5,770,320

**ASSEMBLING SHEET METAL MEMBERS**

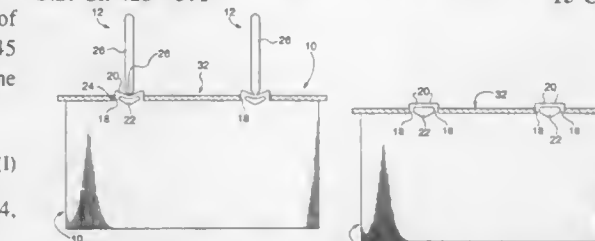
Richard P. Hughes, and Patrick T. Lawless, both of Kanata, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Sep. 26, 1996, Ser. No. 720,276

Int. Cl.<sup>6</sup> B65D 6/28; F16B 17/00

U.S. Cl. 428—571

15 Claims



the formula (I) in which m is 2 is less than 0.2 mole % based on all the acid components, the content of 1,4-butanediol is from 55 mole % to 85 mole % and the content of the diol of the formula (I) in which m is 1 is from 15 mole % to 45 mole % in 100 mole % of the total diol components excluding the diol of the formula (I) in which m is 2; and when the content of the diol of the formula (I) in which m is 2 is from 0.2 moles % to 3 moles %, the content of 1,4-butanediol is from 55 mole % to 90 mole % and the content of the diol of the formula (I) in which m is 1 is from 10 mole % to 45 mole % in 100 mole % of the total diol components excluding the diol of the formula (I) in which m is 2;



(I)

wherein m is 1 or 2, when m is 1, n is an integer of from 2 to 4, and when m is 2, n is a real number of from 6 to 55; provided that when m is 2 the content of the diol of formula (I) is 0 to 3 mole %, based on all the acid components.

5,770,318

**THERMOPLASTIC SEAL AND WRAPPING FILM**

Michael Friedman, Wayne, N.J., assignor to Norton Performance Plastics Corporation, Wayne, N.J.

Filed Jan. 13, 1995, Ser. No. 373,574

Int. Cl.<sup>6</sup> B32B 27/00; C08L 29/00

U.S. Cl. 428—500

15 Claims

1. A method of producing a film for seal and wrapping applications comprising the steps of:

- selecting a metallocene catalyzed polyethylene plastomer having a density of at least 0.900 g/ccm;
- selecting a metallocene catalyzed polyethylene elastomer having a density lower than 0.900 g/ccm;
- blending said plastomer and said elastomer to form a blend consisting of about 70% to 97% by weight plastomer and 3% to 30% by weight elastomer; and
- forming said film by way of conventional film manufacturing methods selected from the group consisting of casting extrusion, blown extrusion and screw extrusion, whereby the film has sufficient tensile strength, elongation at break and mechanical recovery properties to simultaneously seal and wrap articles without the application of heat.

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**DENSIFICATION OF LIGNOCELLULOSIC MATERIAL**

Robert Franich, and Kathryn Anderson, both of Rotorua, New Zealand, assignors to Her Majesty the Queen in Right of New Zealand, New Zealand

Continuation of Ser. No. 222,003, Apr. 4, 1994, abandoned, which is a continuation of Ser. No. 839,815, Feb. 21, 1992, abandoned. This application Dec. 19, 1994, Ser. No. 359,344

Claims priority, application New Zealand, Aug. 23, 1990, 235036

Int. Cl.<sup>6</sup> B27K 3/00; C08L 3/02; 1/02

U.S. Cl. 428—528

28 Claims

1. A method of densifying lignocellulosic material, comprising impregnating the lignocellulosic material with a non-acidic impregnant, said non-acidic impregnant comprising a cross-linking agent and a maltodextrin having a dextrose equivalent of about 10 to about 30 and cross-linking or curing the maltodextrin to form a cross-linked product within the lignocellulosic material, thereby forming a densified lignocellulosic material.

**NEUTRAL, HIGH VISIBLE, DURABLE LOW-E GLASS COATING SYSTEM AND INSULATING GLASS UNITS MADE THEREFROM**

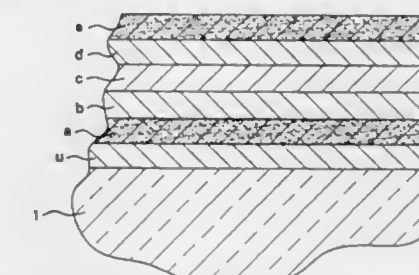
Klaus W. Hartig, Brighton; Steve L. Larson, Monroe, and Philip J. Lingle, Temperance, all of Mich., assignors to Guardian Industries Corp., Auburn Hills, Mich.

Continuation-in-part of Ser. No. 552,366, Nov. 2, 1995, abandoned. This application Mar. 22, 1996, Ser. No. 611,457

Int. Cl.<sup>6</sup> B32B 15/04; 17/06

U.S. Cl. 428—622

28 Claims



1. A sputter-coated glass article comprised of a glass substrate having on a surface thereof, from the glass outwardly, a layer system including:

- a layer of a transparent dielectric material having an index of refraction (n) of about 2.5–2.6 as measured at a wavelength of 550 nanometers;
- a layer of Si<sub>3</sub>N<sub>4</sub>;
- a layer of nichrome;
- a layer of silver;
- a layer of nichrome; and
- a layer of Si<sub>3</sub>N<sub>4</sub>, and wherein when said glass substrate has a thickness of about 2 mm–6 mm, and wherein said layers are of sufficient thicknesses such that said coated glass substrate has a normal emissivity (E<sub>n</sub>) of about 0.06 or less, a hemispherical emissivity (E<sub>h</sub>) of about 0.07 or less, a sheet resistance (R<sub>s</sub>) of about 5.0 ohms/sq. or



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less and having a substantially neutral visible reflected color when viewed from the glass side.

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## CERAMIC SLIDING COMPONENT

Takao Nishioka; Masamichi Yamagiwa; Takeshi Satoh; Hisao Takeuchi, and Akira Yamakawa, all of Hyogo, Japan, assignors to Sumitomo Electric Industries, Ltd., Japan

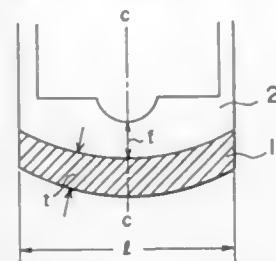
PCT No. PCT/JP95/02311, § 371 Date Apr. 15, 1996, § 102(e) Date Apr. 15, 1996, PCT Pub. No. WO96/15359, PCT Pub. Date May 23, 1996

PCT Filed Nov. 13, 1995, Ser. No. 633,767

Claims priority, application Japan, Nov. 14, 1994, 6-279009; Nov. 14, 1994, 6-279014; Nov. 14, 1994, 6-279017

Int. Cl.<sup>6</sup> B32B 15/04; C04B 37/02; F01L 1/14; 1/18

U.S. Cl. 428—627 24 Claims



1. A silicon-nitride ceramic sliding component comprising a sliding face member joined to a base metal having a coefficient of thermal expansion greater than that of the sliding face member, the sliding face of the sliding face member having a crowning profile whose maximum height is 0.1 to 0.4% of the maximum sliding face length and wherein the silicon nitride material has a four-point flexural strength of at least 100 kg/mm<sup>2</sup> as measured in accordance with JTS R 1601-1981 of the Japanese Industrial Standards, a Charpy impact value of at least 15 kJ/m<sup>2</sup>, a heat shock resistance to a temperature difference of at least 800° C. and an area ratio of pores opening at the sliding face of 0.5% or less relative to the area of the sliding face and the sliding face member has a thickness ratio ranging from 0.01 to 0.05 relative to the maximum length of the joined face corresponding to the sliding face.

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## BEARINGS

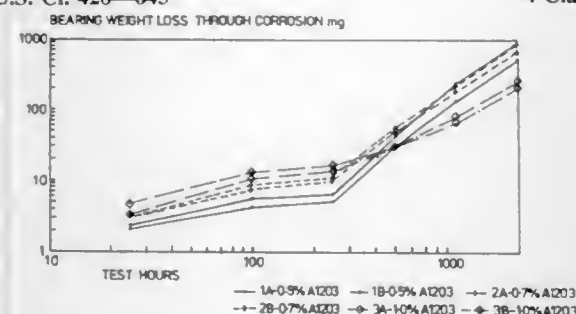
Charan P. S. Johal, Birstall; David R. Eastham, Hemel Hempstead, and Alan D. Pope, Rugby, all of England, assignors to T & N Technology Limited, England

Continuation-in-part of Ser. No. 436,985, May 8, 1995, abandoned, which is a continuation of Ser. No. 87,716, Jul. 12, 1993, abandoned. This application Feb. 23, 1996, Ser. No. 606,275

Claims priority, application United Kingdom, Feb. 20, 1991, 9103481

Int. Cl.<sup>6</sup> B32B 15/01; F16C 33/12

U.S. Cl. 428—643 4 Claims



1. A bearing comprising a steel backing, a bearing alloy layer, and on top of the bearing alloy layer a composite overlay deposited

by electro co-deposition to have a thickness in the range 10–60 micrometers and comprising a soft metal matrix selected from the group consisting of tin-based, lead-based and cadmium-based metals, and which has dispersed therein from 0.05 up to 2 wt % of a second phase of  $\alpha$ -alumina having a Vickers hardness (Hv) of at least 300, wherein said overlay coating contains sufficient soft metal matrix to embed dirt particles.

5,770,324

## METHOD OF USING A HOT PRESSED SILICON CARBIDE DUMMY WAFER

Thomas M. Holmes, Grafton, and John A. Tomanovich, Paxton, both of Mass., assignors to Saint-Gobain Industrial Ceramics, Inc., Worcester, Mass.

Filed Mar. 3, 1997, Ser. No. 805,843

Int. Cl.<sup>6</sup> B32B 9/00; 19/00

U.S. Cl. 428—688 49 Claims

29. A sintered ceramic wafer having less than 5 wt % free silicon, a thickness of between about 0.5 mm and about 1.0 mm, a diameter of at least 125 mm, a density of at least about 90% of theoretical density, and closed porosity, the wafer comprising at least about 90 wt % silicon carbide grains, a Weibull modulus of at least 8, and a D<sub>50</sub> SiC grain size of at least 5  $\mu$ m, wherein at least 80 wt % of the SiC grains having a diameter of between 0.5 and 5  $\mu$ m.

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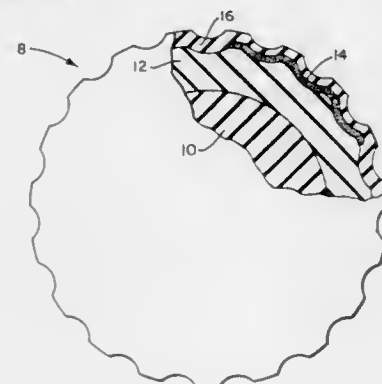
## UV CURABLE INK FOR GAME BALL AND METHOD OF PRINTING

Viktor Keller, Colchester, Conn., and Thomas J. Kennedy, Wilbraham, Mass., assignors to Lisco, Inc., Tampa, Fla.

Filed Sep. 18, 1995, Ser. No. 529,361

Int. Cl.<sup>6</sup> B41M 3/12 19 Claims

U.S. Cl. 428—914



1. A game ball having a surface and an indicia comprising a UV curable ink adhered to the surface, the UV curable ink being formed from a composition comprising a UV curable resin and a photoinitiator, the impact resistance of the ink UV cured and the adhesion between the indicia and the surface after UV curing being sufficient to render the ball suitable for use in competitive play.

5,770,326

## MONOLITHIC MASS AND ENERGY TRANSFER CELL

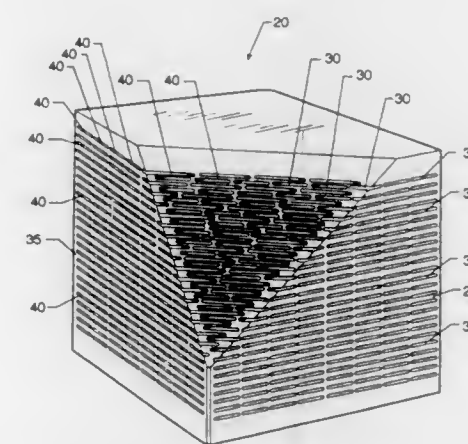
Santosh Y. Limaye, 3009 E. Alvera Cir., Salt Lake City, Utah 84117

Filed Dec. 23, 1996, Ser. No. 771,513

Int. Cl.<sup>6</sup> H01M 8/10; 8/12; C25B 11/20; 13/02

U.S. Cl. 429—30 20 Claims

1. A monolithic mass and energy transfer cell comprising: a monolithic ionically conductive core having an outer surface including a first entrance surface and a first exit surface



spaced apart from the first entrance surface, a first set of passages therebetween; and a second entrance surface and a second exit surface spaced apart from the second entrance surface, a second set of passages therebetween wherein the first set of passages are in a non-parallel relationship with the second set of passages and wherein the monolithic ionically conductive core is a single unit that does not require bonding between the first set of passages and the second set of passages;

a first porous, electrically conductive coating disposed within the first set of passages;

a second porous, electrically conductive coating disposed within the second set of passages; and

an external electric circuit in electrical contact with the monolithic ionically conductive core.

5,770,327

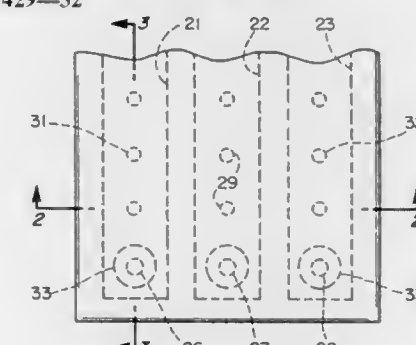
## SOLID OXIDE FUEL CELL STACK

Scott Alexander Barnett, Evanston, Ill., and Tsepin Tsai, Peekskill, N.Y., assignors to Northwestern University, Evanston, Ill.

Filed Aug. 15, 1997, Ser. No. 911,854

Int. Cl.<sup>6</sup> H01M 8/04

U.S. Cl. 429—32 5 Claims



1. A solid oxide fuel cell stack comprising:

a plurality of rectangular, metallic interconnects each having three parallel elongated internal cavities, with the center elongated cavity having a plurality of holes extending to one major surface of the interconnect and the outer cavities each having a plurality of holes extending to the other major surface of the interconnect;

a plurality of rectangular fuel cells, each including an anode, a solid electrolyte and a cathode interposed between adjacent interconnects with the anode opposite the holes in the outer cavities of one interconnect and the cathode opposite the holes in the center cavities of the adjacent interconnect;

a fuel manifold for introducing fuel gas into one of the outer cavities so that the fuel gas flows out of the holes in the cavity and across the anode to the holes in the other cavity which collects the spent fuel;

a second fuel manifold is associated with the other outer cavity to remove the spent fuel; and  
an oxidant manifold for introducing oxidant gas into the center cavity so that the oxidant gas flows through the holes in the center cavity across the cathode to the sides of the stack.

5,770,328

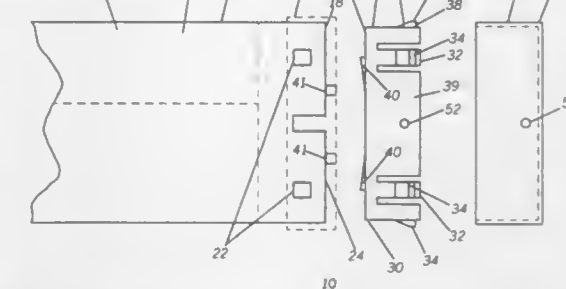
## BATTERY PACKAGING SYSTEM AND CLIP FOR SAME

Charles W. Friedli, Duluth, and Kevin D. Page, Dacula, both of Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1996, Ser. No. 676,012

Int. Cl.<sup>6</sup> H01M 2/04 17 Claims

U.S. Cl. 429—96



1. A battery packaging system for packaging at least one battery cell, comprising:

a housing member for housing said at least one battery cell and having an interior surface and a rim having a plurality of openings formed therethrough and defining a mouth; and

a clip, disposed in said mouth of said housing member, having a retaining surface disposed adjacent said at least one battery cell and having a periphery, a plurality of cantilevered clip fingers extending from said periphery, each said cantilevered clip finger having a retaining protrusion corresponding to, and partially extending through one of said openings, thereby retaining said clip within said mouth of said housing member.

5,770,329

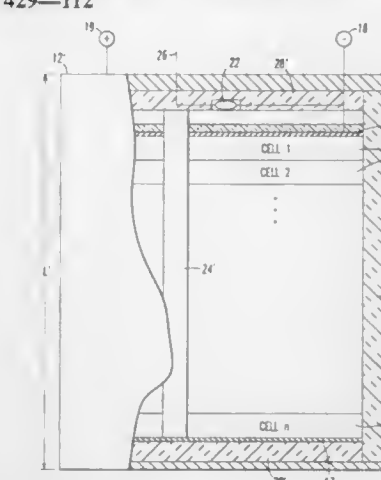
## THERMAL BATTERY AND IMPROVED CELL THEREFOR

David Ellison Harney, Twinsburg, Ohio, assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Jan. 21, 1997, Ser. No. 786,580

Int. Cl.<sup>6</sup> H01M 10/39 10 Claims

U.S. Cl. 429—112



1. A thermal battery comprising:

(A) a thermally insulated battery case;  
(B) a stack of similar battery cells contained within said case;

- (C) a plurality of current collectors positioned within said case and contacting selected ones of said battery cells;
- (D) a plurality of electric terminals respectively connected to said current collectors;
- (E) each said battery cell including
- (i) an anode wafer,
  - (ii) a cathode precursor wafer, and
  - (iii) an electrolyte wafer disposed between said wafers and being of the type which is solid at room temperature and which when heated to a predetermined temperature will become molten to activate the battery,
  - (iv) said cathode precursor being of a chemical formulation which is ignitable and when ignited, will generate sufficient heat to cause said electrolyte wafer to become molten, and after generation of said heat, to functionally operate as a cathode of said battery cell; and
- (F) means for igniting said cathode precursor wafer.

5,770,330

**BATTERY PACKAGE WITH MULTIPLE SURFACE CHARGING CONTACTS**

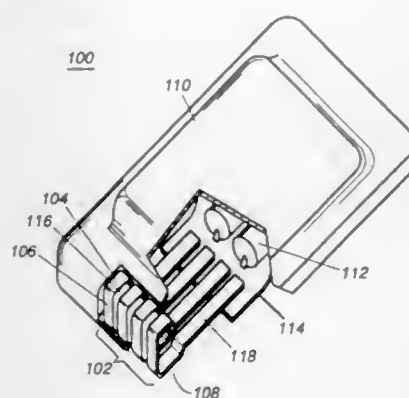
Julio C. Castaneda, Coral Springs; Tyler D. Jensen, Sunrise, both of Fla., and Barbara A. Ruth, Cumming, Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 24, 1996, Ser. No. 736,633

Int. Cl.<sup>6</sup> H01M 2/30

U.S. Cl. 429—123

9 Claims



1. A battery package for use with a communication device, comprising:
- a battery housing having a first major surface for interfacing with the communication device and at least two additional surfaces;
- at least one battery cell located within the battery housing for providing the communication device with operational energy;
- a plurality of charging contacts coupled to the at least one battery cell, the plurality of charging contacts comprising:
- a first plane extending out of the first major surface for providing electrical connection between the at least one battery cell and the communication device;
  - second and third planes extending out of the additional surfaces for providing charging contacts between the at least one battery cell and at least two different styles of battery chargers.

5,770,331  
**RADIATION CURABLE FRAME FOR STACKED CELL CONSTRUCTION AND FOR EDGE SEALING OF ELECTROLYTIC CELLS TO RETARD DENDRITIC SHORT-CIRCUITS**

Ib I. Olsen; Russell D. Moulton, both of San Jose; Benjamin Chaloner-Gill, Santa Clara; James Buckley, Cupertino, all of Calif.; Neal Golovin, Owings Mills, Md., and Douglas J. Payne, San Jose, Calif., assignors to Valence Technology, Inc., Henderson, Nev.

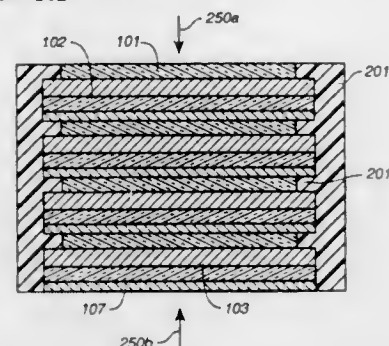
Continuation of Ser. No. 230,181, Apr. 20, 1994, abandoned.

This application Sep. 20, 1996, Ser. No. 727,176

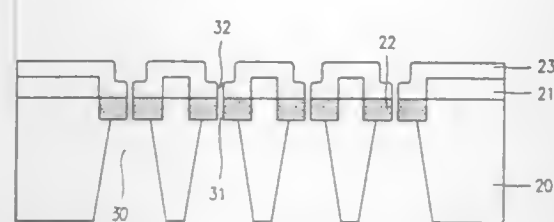
Int. Cl.<sup>6</sup> H01M 10/36

U.S. Cl. 429—162

28 Claims







forming a conductive layer on the doped regions and the film patterns; and  
forming a plurality of passages through the semiconductor substrate.

5,770,337

**METHOD OF INSPECTION TO DETERMINE RETICLE PITCH**

Yung-Shu Chiang, Hsin Chu, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chu, Taiwan

Filed Mar. 22, 1996, Ser. No. 620,199  
Int. Cl.<sup>6</sup> G03F 9/00

U.S. Cl. 430—22

19 Claims

10. In the manufacture of integrated circuits on a semiconductor workpiece a method of inspecting to determine the degree to which a rectangular reticle with four corners and a center is level by determining the degree of resolution at a plurality of sites on said semiconductor workpiece including the steps comprising:

providing at least nine sets of alignment marks on said workpiece, said nine sets of alignment marks including three horizontal rows of sets of alignment marks, said rows including a top row, a middle row and a bottom row,

said top row including three sets of alignment marks comprising a first set of alignment marks proximate to the upper left corner of said reticle, a second set of alignment marks proximate to said center of said reticle along the top edge thereof and a third set of alignment marks proximate to the upper right corner of said reticle,

said middle row including three sets of alignment marks comprising a first set of alignment marks proximate to the left edge of said reticle, a second set of alignment marks proximate to said center of said reticle and a third set of alignment marks proximate to the right edge of said reticle, and

said bottom row including three sets of alignment marks comprising a first set of alignment marks proximate to the lower left corner of said reticle, a second set of alignment marks proximate to said center of said reticle along the bottom edge thereof and a third set of alignment marks proximate to the lower right corner of said reticle,

measuring the focus at each of said sets of alignment marks, determining the pitch of said reticle at each position of the workpiece by obtaining measurements of the focal lengths at each of said alignment marks, and  
checking leveling repeatedly to obtain information for producing optimum focus of the reticle image upon the region of the workpiece being exposed.

5,770,338

**PHASE SHIFTING OVERLAY MARK THAT MEASURES EXPOSURE ENERGY AND FOCUS**

Chang-Moon Lim, Seoul, and Chang-Nam Ahn, Incheon, both of Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyongki-do, Rep. of Korea

Filed Dec. 27, 1996, Ser. No. 774,845

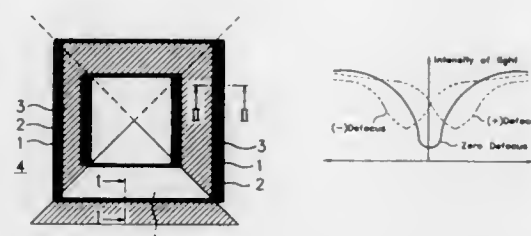
Claims priority, application Rep. of Korea, Dec. 29, 1995, 95-66052

Int. Cl.<sup>6</sup> G03F 9/00

U.S. Cl. 430—22

9 Claims

1. An overlay mark comprising an inner box and an outer box to concurrently measure exposure energy and focus, wherein the



changes of exposure energy and focus are respectively represented by phase shift between said inner and outer boxes in X-axis and Y-axis, and the X-axis and the Y-axis representing phase shift respectively indicate the exposure energy and the focus.

5,770,339

**ELECTROPHOTOGRAPHIC PHOTORECEPTOR USING CHARGE TRANSPORTING COPOLYESTER**

Katsumi Nukada; Akira Imai, and Masahiro Iwasaki, all of Minami Ashigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

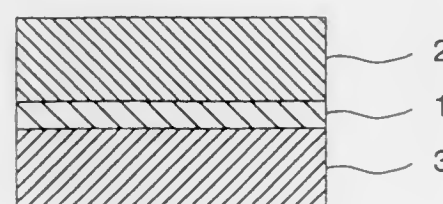
Filed Oct. 13, 1995, Ser. No. 542,831

Claims priority, application Japan, Oct. 18, 1994, 6-277233; Dec. 6, 1994, 6-329854; Jul. 11, 1995, 7-197159

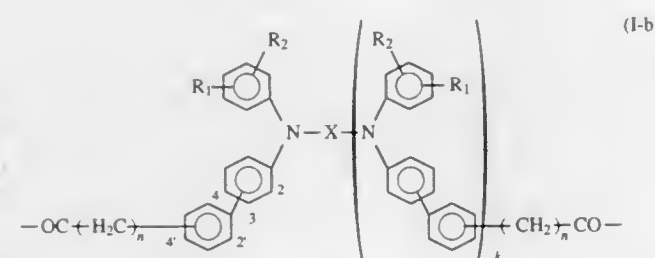
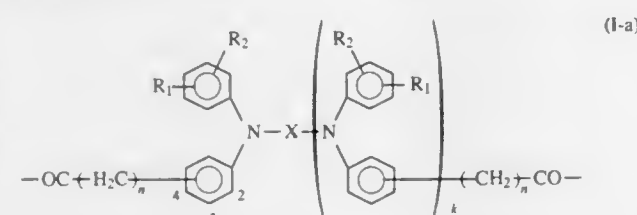
Int. Cl.<sup>6</sup> G03G 5/047

U.S. Cl. 430—59

7 Claims



1. An electrophotographic photoreceptor comprising an electroconductive substrate having provided thereon a photosensitive layer, which has a layer containing a charge transporting copolyester containing at least two repeating structural units selected from the group consisting of the structures represented by formulae (I-a) and (I-b):



wherein R<sub>1</sub> and R<sub>2</sub> each independently represents a hydrogen atom, an alkyl group, an alkoxy group, a substituted amino group, a halogen atom, or a substituted or unsubstituted aryl group; X represents a substituted or unsubstituted divalent aromatic residue; n is an integer of from 1 to 5; and k is an integer of 0 or 1.

5,770,340

**IMAGE FORMATION METHOD USING SCANNING EXPOSURE**

Takao Nakayama; Eiichi Kato, and Kazuo Ishii, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 27, 1995, Ser. No. 578,952

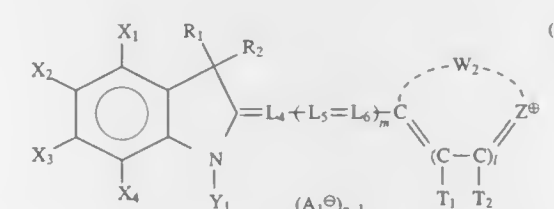
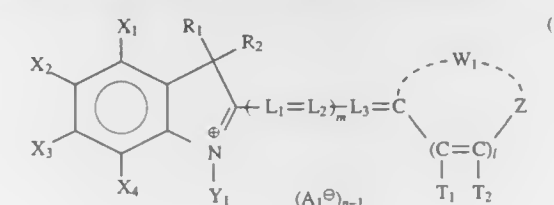
Claims priority, application Japan, Dec. 27, 1994, 6-325900; Apr. 3, 1995, 7-077797

Int. Cl.<sup>6</sup> G06C 13/04

U.S. Cl. 430—95

2 Claims

1. A method for forming an image using scanning exposure of an electrophotographic lithographic printing plate comprising an electrically conductive support having thereon a photoconductive layer containing an inorganic photoconductor, a chemical sensitizer, a sensitizing dye and a binder resin, and a back layer on the opposite side of said photoconductive layer, wherein said back layer has a surface resistivity of  $1 \times 10^{10} \Omega$  or less and the sensitizing dye in said photoconductive layer is at least one selected from the compounds represented by the following formulae (I) and (II):



wherein R<sub>1</sub> and R<sub>2</sub> which may be the same or different, each represents an alkyl group, an alkenyl group or an aralkyl group or R<sub>1</sub> and R<sub>2</sub> each may be a hydrocarbon group forming an alicyclic ring;

X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub> and X<sub>4</sub>, which may be the same or different, each represents a hydrogen atom or a group selected from respective substituent groups defined by the Hammett's substituent constant, or X<sub>1</sub> or X<sub>2</sub> or X<sub>3</sub> and X<sub>4</sub> each may be a hydrocarbon group forming a benzene ring;

Y<sub>1</sub> represents an alkyl, alkenyl or aralkyl group which may be substituted;

Z represents an oxygen atom, a sulfur atom, a selenium atom, a tellurium atom or a nitrogen atom substituted by a substituent Y<sub>2</sub> (wherein Y<sub>2</sub> has the same meaning as Y<sub>1</sub> above and Y<sub>1</sub>, and Y<sub>2</sub> in each formula may be the same or different);

W<sub>1</sub> represents an atomic group necessary for forming an indolenine, naphthoindolenine, pyran, benzopyran, naphthopyran, thiopyran, benzothiopyran, naphthothiopyran, selenapyran, benzoselenapyran, naphthoselenapyran, tellurapyran, benzotellurapyran, naphthotellurapyran, benzothiazole or naphthothiazole ring which may be substituted or an atomic group necessary for forming a nitrogen-containing heterocyclic ring which may be substituted;

W<sub>2</sub> represents an onium salt of a heterocyclic group as formed in the manner defined for W<sub>1</sub>;

T<sub>1</sub> and T<sub>2</sub>, which may be the same or different, each represents a hydrogen atom, an aliphatic group or an aromatic group;

L<sub>1</sub>, L<sub>2</sub>, L<sub>3</sub>, L<sub>4</sub>, L<sub>5</sub> and L<sub>6</sub>, which may be the same or different, each represents a methine group which may be substituted; l represents 0 or 1;

m represents 2 or 3;

A<sub>1</sub><sup>−</sup> represents an anion; and

n represents 1 or 2, provided that when the dye molecule contains a sulfo group or a phospho group, an inner salt is formed and n is 1.

5,770,341

**FRICTION CHARGE-PROVIDING MEMBER FOR POSITIVELY-CHARGEABLE TONER**

Osamu Mukudai; Yuji Matsuura, and Hiroyoshi Yamaga, all of c/o Hodogaya Chemical Co., Ltd., Tsukuba Laboratory, 45, Miyukigaoka, Tsukuba-shi, Ibaraki, Japan

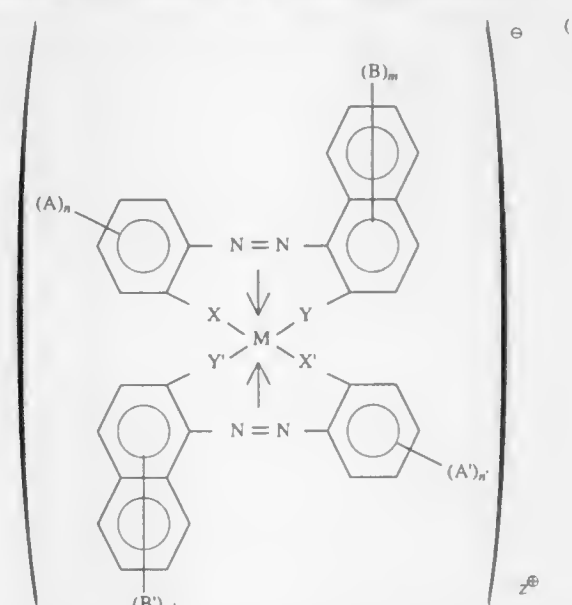
Filed Dec. 22, 1994, Ser. No. 361,589

Claims priority, application Japan, Dec. 22, 1993, 5-345471  
Int. Cl.<sup>6</sup> G03G 9/097

U.S. Cl. 430—110

1 Claim

1. A friction charge-providing member for positively-chargeable toner, comprising a parent material selected from the group consisting of carriers and conveyor members, wherein the parent material has provided at least on the surface thereon a compound represented by formula (I) as a charge-controlling agent:



wherein A and A' are the same or different and each independently represents a hydrogen atom, a halogen atom, a nitro group, an alkyl group having 1 to 18 carbon atoms which may contain a substituent(s), an alkenyl group, an acyl group, a sulfonic acid group, a sulfamoyl group, a N-substituted sulfamoyl group, an alkylsulfonyl group having 1 to 5 carbon atoms, a carboxyl group, an alkylester group having 1 to 5 carbon atoms, a hydroxyl group, an alkoxy group having 1 to 18 carbon atoms, an amino group, or a N-substituted amino group; B and B' may be the same or different and each independently represents a hydrogen atom, a halogen atom, an alkyl group having 1 to 18 carbon atoms which may contain a substituent(s), an alkenyl group, an amino group, a N-substituted amino group, an acyl group, a benzoylamino group which may contain a substituent(s), a sulfamoyl group, an alkylester group having 1 to 5 carbon atoms, a hydroxyl group, an alkoxy group having 1 to 18 carbon atoms or a N-substituted carbamoyl group; X, X', Y and Y' are the same or different and each independently represents —O—, —COO—, —NH— or —S— and is present at ortho-position of an azo group; n, n', m and m' are the same or different and each independently represents an integer of 1 to 4; Z represents a hydrogen atom, sodium, potassium, ammonium, aliphatic ammonium, alicyclic ammonium or heterocyclic ammonium; M represents iron.

5,770,342  
ELECTROPHOTOGRAPHIC TONER AND METHOD OF  
PRODUCING THE TONER

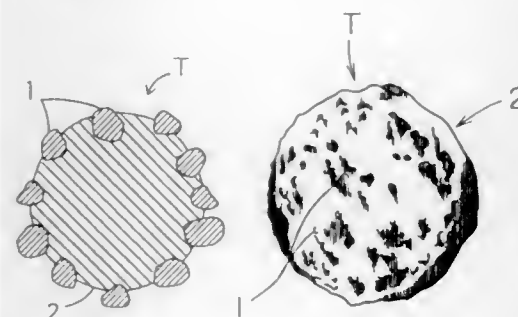
Toshiro Okae, and Masami Tsujihiro, both of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan  
Continuation of Ser. No. 325,929, Oct. 18, 1994, abandoned.

This application Oct. 24, 1996, Ser. No. 740,077  
Claims priority, application Japan, Oct. 20, 1993, 5-262594;  
Oct. 29, 1993, 5-272597

Int. Cl.<sup>6</sup> G03G 9/087

U.S. Cl. 430—111

12 Claims



1. An electrophotographic toner produced by a process comprising:

polymerizing a monomer-phase mixture while suspended in the form of drops in a dispersion medium, wherein said monomer-phase mixture contains:

- (i) a polymerizable monomer serving as a raw material of a fixing resin of said toner and
- (ii) fine particles selected from the group consisting of fine particles of a crosslinking resin having a primary particle size of 1% to 30% of a particle size of said toner, and water insoluble inorganic fine particles which have said primary particle size and which have been treated to increase their affinity with said monomer,

wherein a mixing ratio of said fine particles to said monomer is in a range of 0.1% to 100% by weight,

said monomer being insoluble in said dispersion medium,

wherein said fine particles are dispersed in said monomer phase mixture and move to the surface of said monomer phase drops but do not move further into said dispersion medium,

wherein said toner is provided on a surface thereof with numerous projections made of said fine particles securely formed, when polymerized, on said toner, and

wherein said projections are integral with said toner.

5,770,343  
POSITIVE-WORKING PHOTORESIST COMPOSITION

Kazufumi Sato, Sagami-hara; Kazuyuki Nitta, Kanagawa-ken; Akiyoshi Yamazaki, Yokohama; Yoshika Sakai, Atsugi, and Toshimasa Nakayama, Chigasaki, all of Japan, assignors to Tokyo Ohka Kogyo Co., Ltd., Japan

Filed May 29, 1996, Ser. No. 654,522

Claims priority, application Japan, Jun. 15, 1995, 7-149285

Int. Cl.<sup>6</sup> G03F 7/004; 7/30

U.S. Cl. 430—170

9 Claims

1. A positive-working photoresist composition which comprises, in the form of a uniform solution:

- (a) a compound capable of generating an acid by the irradiation with actinic rays;
- (b) a resinous compound capable of being imparted with an increased solubility in an aqueous solution in the presence of an acid;
- (c) an organic solvent selected from the group consisting of ketone compounds, ether compounds and ester compounds; and
- (d) N,N-dimethyl formamide or N,N-dimethyl acetamide in an amount in the range from 0.1 to 5% by weight based on the amount of the component (b).

5,770,344  
SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE  
MATERIAL

Kohzaburo Yamada; Hiroyuki Suzuki, and Toshihide Ezoe, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 27, 1996, Ser. No. 774,227

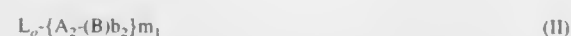
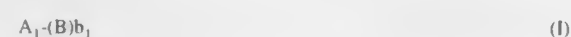
Claims priority, application Japan, Dec. 27, 1995, 7-351279;  
Dec. 27, 1995, 7-351287; Oct. 25, 1996, 8-299877

Int. Cl.<sup>6</sup> G03C 1/73

U.S. Cl. 430—264

3 Claims

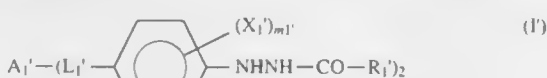
1. A silver halide photographic light-sensitive material containing a hydrazide compound represented by the following formula (I), (II), (I'), or (I''):



wherein  $A_1$  represents a substituted or unsubstituted benzene ring,  $A_2$  represents an arylene group,  $B$  represents a group represented by the following formula (III),  $b_1$  represents an integer of from 3 to 6,  $L_n$  represents a di-, tri-, tetra-, penta- or hexavalent linking group,  $b_2$  represents an integer of from 1 to 5, and  $m_1$  represents an integer of from 2 to 6, provided that when  $b_2$  is 1,  $m_1$  represents an integer of from 3 to 6:



wherein  $G_1$  represents a carbonyl group, an oxalyl group, a sulfonyl group or a phosphonyl group,  $R_1$  represents a hydrogen atom or a block group,  $Ar_1$  represents an aromatic group and  $L_1$  represents a linking group:



wherein  $A_1'$  represents a substituted or unsubstituted benzene ring,  $L_1'$ ,  $L_2'$  and  $L_3'$  each represents a divalent linking group,  $X_1'$ ,  $X_2'$  and  $Y_2'$  each represents a substituent,  $m_1'$ ,  $m_2'$  and  $m_3'$  each represents an integer of from 0 to 4,  $R_1'$  and  $R_2'$  each represents a hydrogen atom or a block group, provided that at least one of two  $R_1'$  groups in formula (I') and at least one of two  $R_2'$  groups in formula (II') each represents a substituted alkyl group substituted by one or more fluorine atoms; and wherein  $L_3'$  does not contain a cationic group.

5,770,345  
PHOTORESIST HAVING INCREASED SENSITIVITY AND  
USE THEREOF

Edward Darko Bahich, Chappaqua; Karen Elizabeth Petrillo, Mahopac; John Patrick Simons, Cold Spring, and David Earle Seeger, Congers, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 389,864, Feb. 17, 1995, Pat. No. 5,593,812. This application Jul. 16, 1996, Ser. No. 680,668

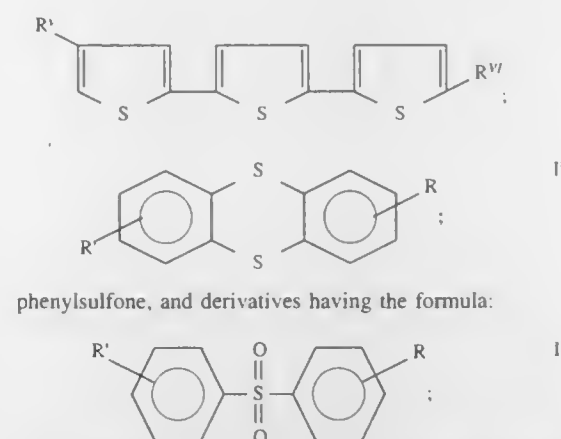
Int. Cl.<sup>6</sup> G03F 7/039

U.S. Cl. 430—270.1

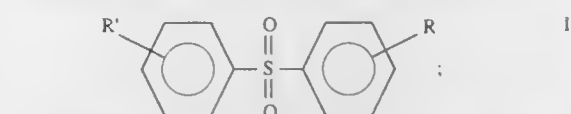
15 Claims

1. A positive photoresist having increased sensitivity comprising:

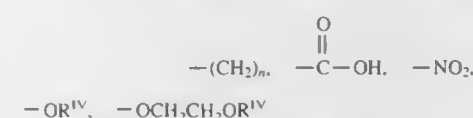
- a polymer matrix,
- a photosensitive acid generator, and
- at least one compound selected from the group consisting of 2,2',5',1'-terthiophene and its derivatives having the formula:



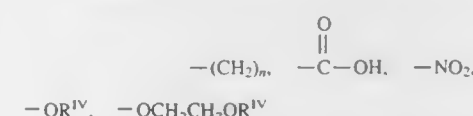
phenylsulfone, and derivatives having the formula:



4,5-diphenyl-1,3-dioxol-2-one and mixtures thereof; and wherein  $R$  and  $R'$  in the above formulae II and III are individually selected from the group of H, alkyl having 1 to 12 carbon atoms, aryl having 6 to 18 carbon atoms,



wherein  $R^{IV}$  is H or alkyl having 1 to 12 carbon atoms; and wherein  $R'$  and  $R''$  in the above formula I are individually selected from the group of H, alkyl having 1 to 12 carbon atoms,



wherein  $R^{IV}$  is H or alkyl having 1 to 12 carbon atoms.

5,770,346  
PHOTORESIST AND COMPOUNDS FOR COMPOSING  
THE PHOTORESIST

Shigeyuki Iwasa; Kaichiro Nakano; Katsumi Maeda; Takeshi Ohfuji, and Etsuo Hasegawa, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

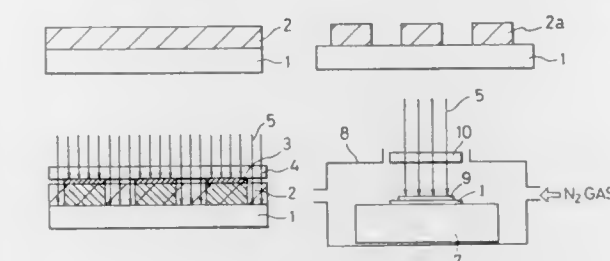
Filed Dec. 10, 1996, Ser. No. 763,055

Claims priority, application Japan, Dec. 11, 1995, 7-322039;  
Sep. 4, 1996, 8-234228

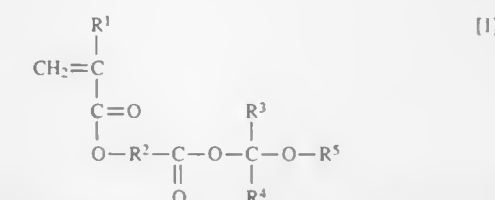
Int. Cl.<sup>6</sup> G03F 7/039

U.S. Cl. 430—270.1

11 Claims



1. A photoresist comprising: a resin composed of a polymer including a compound represented with the following general formula [1] within a structural unit thereof; and a photo acid generator:



wherein  $R^1$  represents one of a hydrogen atom and a methyl group,  $R^2$  represents a divalent hydrocarbon group including a bridged cyclic hydrocarbon group and having a carbon number in the range of 7 to 13 both inclusive,  $R^3$  represents one of a hydrogen atom and a hydrocarbon group having a carbon number of 1 or 2,  $R^4$  represents a hydrocarbon group having a carbon number of 1 or 2, and  $R^5$  represents one of (a) a hydrocarbon group having a carbon number in the range of 1 to 12 both inclusive, (b) a hydrocarbon group having a carbon number in the range of 1 to 12 both inclusive and replaced with an alkoxy group having a carbon number in the range of 1 to 12 both inclusive, and (c) a hydrocarbon group having a carbon number in the range of 1 to 12 both inclusive and replaced with an acyl group having a carbon number in the range of 1 to 13 both inclusive.

5,770,347  
PHOTOCURABLE AND THERMOSETTING COATING  
COMPOSITION AND METHOD FOR FORMATION OF  
SOLDER MASK FOR PRINTED CIRCUIT BOARD

Teruo Saitoh, Iwatsuki; Kazunobu Fukushima, Hatoyama-machi, and Kyo Ichikawa, Niiza, all of Japan, assignors to Taiyo Ink Manufacturing Co., Ltd., Japan

Filed Nov. 9, 1995, Ser. No. 555,785

Claims priority, application Japan, Nov. 11, 1994, 6-301700;  
Dec. 28, 1994, 6-337585; May 26, 1995, 7-151204

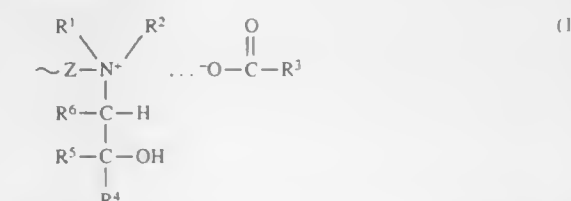
Int. Cl.<sup>6</sup> G03F 7/032; 7/038

U.S. Cl. 430—280.1

17 Claims

1. A photocurable and thermosetting coating composition capable of being diluted with water, comprising:

- (a) a photopolymerizable resin having a number-average molecular weight in the range of from 500 to 50,000 and containing an aprotic ammonium salt-containing moiety represented by the following general formula (I) in a proportion of from 0.2 to 4.0 mols per kilogram of the resin,
- (b) a photopolymerization initiator,
- (c) at least one thermosetting compound selected from the group consisting of amino resins, cyclocarbonate compounds, blocked isocyanate compounds, and epoxy resins, and
- (d) a diluent.



wherein  $Z$  represents a hydrocarbon or a hydrocarbon possessing an ester bond or an amide bond, each having 1 to 5 carbon atoms,  $R^1$  and  $R^2$  are identical with or different from each other and respectively represent a substituted or unsubstituted hydrocarbon of 1 to 8 carbon atoms, wherein the substituent is a hydroxyl group, an ester group, an alkoxy group, or a halogen atom, or a heterocyclic ring jointly formed by hydrocarbons of said  $R^1$  and  $R^2$  in conjunction with a nitrogen atom with which they are coupled,  $R^3$  and  $R^4$  are identical with or different from each other and respectively represent a hydrogen atom or a substituted or unsubstituted hydrocarbon having 1 to 18 carbon atoms, wherein the substituent is a hydroxyl group, an ester group, an alkoxy group, or a halogen atom and either or both of  $R^3$  and  $R^4$  possess at least one polymerizable unsaturated group, and  $R^5$



and R<sup>6</sup> are identical with or different from each other and respectively represent a hydrogen atom, a substituted or unsubstituted hydrocarbon of 1 to 18 carbon atoms, wherein the substituent is a hydroxyl group, an ester group, an alkoxy group, or a halogen atom, or a ring jointly formed by hydrocarbons of said R<sup>5</sup> and R<sup>6</sup>.

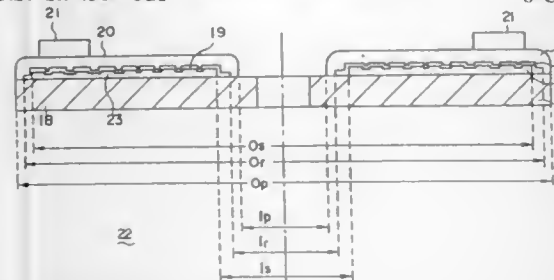
5,770,348  
OPTICAL DISK AND METHOD FOR ITS  
MANUFACTURE

Tetsuya Kondo, Kanagawa-ken, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan  
Filed Mar. 27, 1996, Ser. No. 622,392  
Claims priority, application Japan, Mar. 29, 1995, 7-097813; Jul. 14, 1995, 7-201446

Int. Cl.<sup>6</sup> G11B 7/24; 7/26

U.S. Cl. 430—321

8 Claims



1. An optical disk comprising:

a transparent substrate;

a ring-shaped signal layer, on top of said transparent substrate, which is made of radiation curable resin and has a peel strength against said transparent substrate in the range of about 20/100 to about 80/100 in the test method JIS-K5400;

a reflective layer that is formed on top of said signal layer; and a protective layer that is formed on top of said reflective layer; wherein the outer and inner diameters of said signal layer are represented by Os and Is respectively, the outer and inner diameters of said reflective layer are represented by Or and Ir respectively, and the outer and inner diameters of said protective layer are represented by Op and Ip respectively, these diameters satisfy the relationships,

$$Os < Or < Op$$

and

$$Ip < Ir < Is.$$

5,770,349  
MANUFACTURING METHOD OF MULTICOLOR LIQUID  
CRYSTAL DISPLAY

Mitsuru Suginoia; Shunichi Motte; Takakazu Fukuchi; Hito-shi Kamamori, all of Chiba; Yoshikatsu Okada, and Akiko Sakurai, both of Hyogo, all of Japan, assignors to Seiko Instruments Inc., Chiba, and Sumitomo Chemical Co., Ltd., Osaka, both of Japan

Continuation of Ser. No. 580,019, Dec. 20, 1995, abandoned.

This application Mar. 20, 1997, Ser. No. 821,028

Claims priority, application Japan, Dec. 22, 1994, 6-320989  
Int. Cl.<sup>6</sup> G02B 5/20; G02F 1/1335

U.S. Cl. 430—321

1 Claim

1. A method for manufacturing a multicolor liquid crystal display which contains color filters comprising the steps of:

forming and patterning a plurality of electrodes on each of two substrates;

forming and patterning an insulating resist on a first part of one of the substrates;



forming and electro-depositing color filters on electrodes which are on a second part of the one of the substrates and are not covered with insulating resist, by selectively energizing them such that the thickness of the color filters is substantially greater than the thickness of the insulating resist;

covering over the color filters and the insulating resist with a light shielding substance;

exposing the light shielding substance from the side of the substrate opposite to the side carrying the color filters by using the color filters as photo-masks for patterning the light shielding substance so as to be left on the parts where the color filters are not formed; and

placing liquid crystal material between the substrates.

5,770,350  
METHOD FOR FORMING PATTERN USING  
MULTILAYER RESIST

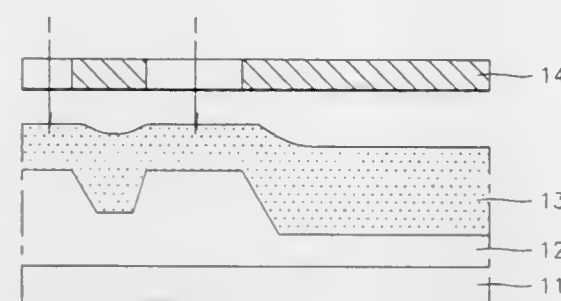
Jun Seok Lee, Seoul, Rep. of Korea, assignor to LG Semicon Co. Ltd., Chungcheongbuk-Do, Rep. of Korea

Continuation of Ser. No. 395,166, Feb. 27, 1995, abandoned, which is a continuation of Ser. No. 149,640, Nov. 9, 1993, abandoned. This application Mar. 13, 1996, Ser. No. 615,634

Int. Cl.<sup>6</sup> G03C 5/00

U.S. Cl. 430—325

18 Claims



1. A method for forming a pattern using a multilayer resist, comprising the steps of:

(a) coating a first lower resist layer on a substrate having a lower level region and an upper level region;

(b) leveling the substrate by selectively subjecting the upper level region of the first lower resist layer to an over-exposure using a mask and subjecting the first lower resist layer to a development process;

(c) coating a second lower resist layer on the first lower resist layer and the upper level region, wherein the second lower resist layer is made of a novolak-based photoresist material;

(d) forming an intermediate layer on the second lower resist layer;

(e) coating an upper resist layer on the intermediate layer;

(f) subjecting the upper resist layer to a photolithography process to form an upper resist pattern;

(g) transferring the upper resist pattern to the intermediate layer to form an intermediate pattern; and

(h) transferring the intermediate pattern to the first and second lower resist layers.

5,770,351  
PROCESSING OF MONOCHROME PHOTOGRAPHIC  
SILVER HALIDE PRINT MATERIAL

William Edward Long, Wilmslow, and Michael John Parker, Saffron Walden, both of England, assignors to Ilford Limited, Switzerland

PCT No. PCT/GB95/02796, § 371 Date Aug. 15, 1997, § 102(e) Date Aug. 15, 1997, PCT Pub. No. WO96/21886, PCT Pub. Date Jul. 18, 1996

PCT Filed Nov. 30, 1995, Ser. No. 860,737

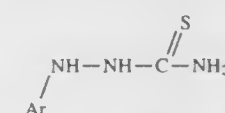
Claims priority, application United Kingdom, Jan. 12, 1995, 9500624

Int. Cl.<sup>6</sup> G03C 5/29

U.S. Cl. 430—438

15 Claims

1. A method of processing silver halide photographic material in a processing machine using a developing solution which comprises either a hydroquinone type developing agent or a reductone type developing agent, together with an electron transfer agent as an auxiliary developing agent, and with at least one basic compound the anion of which is carbonate, sulphite or hydroxide, and with a compound of formula 1:



where Ar is an aromatic ring or heterocyclic aromatic ring which is optionally substituted.

5,770,352  
HIGH ACTIVITY PHOTOGRAPHIC DISPERSIONS WITH  
ULTRA LOW LEVELS OF PERMANENT SOLVENT

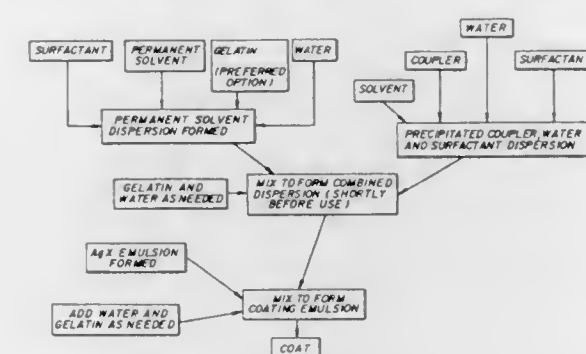
Krishnan Chari, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 18, 1996, Ser. No. 634,491

Int. Cl.<sup>6</sup> G03C 7/25

U.S. Cl. 430—546

20 Claims



1. A method of forming a photographic dispersion comprising:

providing an aqueous dispersion of photographic coupler having a logP of greater than or equal to about 10 by precipitation from an auxiliary solvent solution by pH or solvent shift;

providing an aqueous dispersion of activating permanent solvent having a logP of greater than or equal to about 8 and a glass transition temperature of less than or equal to about -80° C.; and

combining said dispersion of photographic coupler and said dispersion of activating permanent solvent to form a combined dispersion with a weight ratio of permanent solvent to coupler within the range of from 0.01:1 to 0.3:1.

5,770,353  
PHOTOGRAPHIC ELEMENT HAVING IMPROVED  
FERROTYPING RESISTANCE AND SURFACE  
APPEARANCE

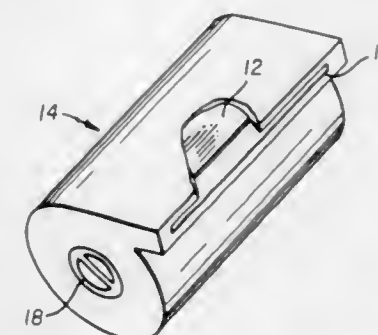
Yongcai Wang, Penfield; Alfred Bruce Fant, Rochester; Dennis Edward Smith, Rochester; Kurt Michael Schroeder, Rochester, and Melvin Michael Kestner, Hilton, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 28, 1996, Ser. No. 673,433

Int. Cl.<sup>6</sup> G03C 11/06; 1/32; 3/00

U.S. Cl. 430—501

24 Claims



1. A silver halide photographic element comprising a support having a front and a back side, at least one light-sensitive silver halide emulsion layer and a light-insensitive protective overcoat on the front side of the support, and a magnetic recording layer on the back side of the support, the light-insensitive protective overcoat comprising an outermost protective layer, wherein:

the outermost protective layer comprises a hydrophilic binder and dispersed particles having a mean size of less than 0.4 μm of a polymer having a glass transition temperature of at least 70° C. comprising units derived from monomers A and B at a weight ratio of A:B of from 97:3 to 80:20 and less than 3 wt % ionic monomers, where A represents ethylenically unsaturated monomers which form substantially water insoluble homopolymers and B represents ethylenically unsaturated non-ionic monomers capable of forming water soluble homopolymers.

5,770,354  
SILVER HALIDE PHOTOGRAPHIC ELEMENTS HAVING  
IMPROVED SENSITIVITY

Sergio Massirio, Finale Ligure; Raffaella Biavasco, and Flavio Costa, both of Savona, all of Italy, assignors to Imation Corp., Oakdale, Minn.

Filed Apr. 25, 1996, Ser. No. 635,180

Claims priority, application European Pat. Off., Jun. 6, 1995, 95108591

Int. Cl.<sup>6</sup> G03C 1/46

U.S. Cl. 430—506

9 Claims

1. A multilayer color photographic element comprising a support having coated thereon red-, green- and blue-sensitive silver halide emulsion layers comprising, respectively, cyan, magenta and yellow dye-forming couplers, wherein the blue-sensitive emulsion layer comprises at least two blue-sensitive emulsions layers, the uppermost of which, located furthest from the support, has the highest sensitivity and the lowermost of which, located closest to the support, has the lowest sensitivity, characterized in that the uppermost highest sensitivity blue-sensitive silver halide emulsion layer comprises a yellow dye-forming coupler and a cyan dye-forming coupler, the cyan dye-forming coupler being represented by the formula

VOL

1  
2  
1  
1

ISS

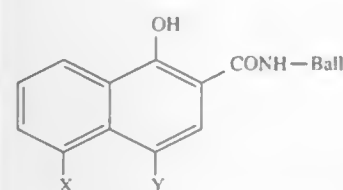
4

JE

23

1998

UMI



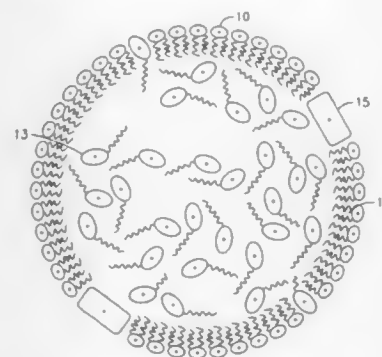
wherein Ball is a ballasting group which renders the coupler non-diffusible in photographic coatings, Y represents a halogen atom, and X represents a hydrogen atom.

5,770,355

**HEART DISEASE TEST KIT AND METHOD OF DETERMINING A HEART DISEASE RISK FACTOR AND EFFICACY OF A TREATMENT FOR HEART DISEASE**  
Robert W. Brocia, 15 Moore Rd., Bronxville, N.Y. 10708  
Continuation-in-part of Ser. No. 148,731, Oct. 29, 1993, Pat. No. 5,585,235. This application Jun. 15, 1995, Ser. No. 490,610

Int. Cl.<sup>6</sup> C12Q 1/48; 1/37; 1/00; G01N 33/48  
U.S. Cl. 435—4

36 Claims



1. A non-radioactive method of simplifying the determination of a coronary heart disease risk factor comprising the steps of:

- obtaining a sample of plasma from a mammal having a source of lipid transfer protein;
- incubating for an effective time period the sample in a non-radioactive lipid transfer protein assay to obtain an incubated sample;
- measuring fluorescent emission of the lipid transfer protein activity of the incubated sample to determine a lipid transfer protein activity value; and
- comparing the sample's lipid transfer protein activity value to a predetermined standard value.

5,770,356

**PHAGEMIDS COEXPRESSING A SURFACE RECEPTOR AND A SURFACE HETEROLOGOUS PROTEIN**  
James Paul Light, II, San Diego, and Richard A. Lerner, La Jolla, both of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

PCT No. PCT/US93/08364, § 371 Date Feb. 22, 1995, § 102(e) Date Feb. 22, 1995, PCT Pub. No. WO94/05781, PCT Pub. Date Mar. 17, 1994

Continuation-in-part of Ser. No. 941,369, Sep. 4, 1992, abandoned. This PCT application Sep. 3, 1993, Ser. No. 387,874

Int. Cl.<sup>6</sup> C12Q 1/68; 1/70; C12N 1/21; 15/64

U.S. Cl. 435—5

45 Claims

26. A method for producing a filamentous phage particle containing a surface-exposed heterodimeric receptor having a preselected binding specificity, which method comprises the steps of:

- providing a library of filamentous phage particles wherein each filamentous phage particle comprises:

- an indicator polypeptide fused to a first filamentous phage coat protein membrane anchor; and
  - a heterodimeric receptor comprised of first and second receptor polypeptides wherein one of said receptor polypeptides is fused to a second filamentous phage coat protein membrane anchor, said heterodimeric receptor able to bind to a preselected ligand;
- adsorbing members of said provided library onto a plurality of preselected ligand molecules in the solid phase to form a plurality of solid-phase adsorbed phage particles;
  - assaying said solid phase for the presence of said indicator polypeptide, and thereby the presence of a solid-phase adsorbed phage particle containing said surface-exposed heterodimeric receptor having a preselected binding specificity; and
  - recovering said solid-phase adsorbed phage particle that contains said heterodimeric receptor, wherein said first and second coat protein membrane anchors are selected from the group consisting of cpIII and cpVIII.

5,770,357

**METHOD OF DIAGNOSING CAPRINE ARTHRITIS-ENCEPHALITIS VIRUS INFECTION**

Angeline Douvas, 345 S. Grand Oaks Ave., Pasadena, Calif. 91107, and Glenn Ehresmann, 1941 Meadowbrook Rd., Altadena, Calif. 91101

Filed Mar. 15, 1996, Ser. No. 616,855

Int. Cl.<sup>6</sup> C12Q 1/70; G01N 33/53; 33/544; 33/536

U.S. Cl. 435—5

6 Claims

1. An immunologic method of diagnosing a CAEV infection in a human suspected of being infected with CAEV, comprising the steps of:

- obtaining a human sample;
- contacting said human sample with a CAEV antigen under suitable conditions; and
- detecting specific binding of an anti-CAEV antibody present in said sample to said CAEV antigen, wherein the detection of said specific binding is diagnostic of the human being infected with CAEV infection.

5,770,358

**TAGGED SYNTHETIC OLIGOMER LIBRARIES**

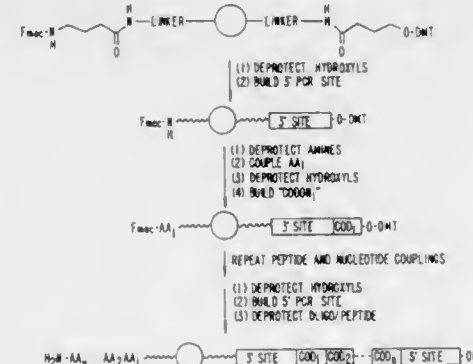
William J. Dower, Menlo Park; Ronald W. Barrett, Sunnyvale; Mark A. Gallop, East Palo Alto, and Michael C. Needels, Oakland, all of Calif., assignors to Affymax Technologies N.V., Greenford, United Kingdom

Continuation-in-part of Ser. No. 762,522, Sep. 18, 1991, abandoned. This application Sep. 16, 1992, Ser. No. 946,239

Int. Cl.<sup>6</sup> C12Q 1/68; G01N 33/53; A61K 38/00; C07H 21/00

U.S. Cl. 435—6

18 Claims



1. An encoded library of compounds comprising:

- a solid support;
- a plurality of copies of a compound directly bound to said support, said compound having a first reactive group selected

from the group consisting of amino groups, carboxyl, hydroxyl, and phosphate groups and wherein any additional reactive groups of said compound that are capable of interfering with compound synthesis or identifier tag addition have been suitably protected;

one or more first identifier tags, each tag being directly bound to said support, said tag having a second reactive group selected from the group consisting of amino groups, carboxyl, hydroxyl, and phosphate groups and wherein any additional reactive groups of said tag that are capable of interfering with compound synthesis or identifier tag addition have been suitably protected, wherein said identifier tag is different than said compound, and

wherein said tag identifies the compound bound to said support or records a step in a synthesis of said compound; and a substance in contact with said support selected from the group consisting of a building block having a third reactive group, a second identifier tag having a fourth reactive group, an activator group, and a solvent, wherein said third reactive group of said building block and said fourth reactive group of said second identifier tag are independently selected from the group consisting of amino groups, carboxyl, hydroxyl, and phosphate groups and wherein any additional reactive groups of said building block or said second identifier tag that are capable of interfering with compound synthesis or identifier tag addition have been suitably protected.

5,770,359

**RECOMBINANT DNA SEQUENCES, VECTORS CONTAINING THEM AND METHOD FOR THE USE THEREOF**

Richard Harris Wilson, Glasgow, Scotland, and Christopher Robert Bebbington, Windsor, England, assignors to Celltech Therapeutics Limited, Berkshire, and The University Court of the University of Glasgow, Glasgow, both of England  
Continuation of Ser. No. 165,533, Dec. 13, 1993, abandoned, which is a continuation of Ser. No. 852,390, Mar. 16, 1992, abandoned, which is a continuation of Ser. No. 595,733, Oct. 10, 1990, Pat. No. 5,122,464, which is a continuation of Ser. No. 117,071, Oct. 23, 1987, abandoned. This application Sep. 8, 1994, Ser. No. 302,241

Claims priority, application United Kingdom, Jan. 23, 1986, 8601597

Int. Cl.<sup>6</sup> C12Q 1/68; C12N 15/85; 5/10; C07H 21/04

U.S. Cl. 435—6

12 Claims

1. A recombinant DNA expression vector which is amplifiable in a transformed host cell and which encodes the complete amino acid sequence of a mammalian glutamine synthetase (GS).

5,770,360

**ELIMINATION OF FALSE NEGATIVES IN NUCLEIC ACID DETECTION**

Tim Kievits, Yught, and Peter Franklin Lens, Den Bosch, both of Netherlands, assignors to Akzo Nobel N.V., Arnhem, Netherlands

PCT No. PCT/EP93/02248, § 371 Date Feb. 24, 1995, § 102(e) Date Feb. 24, 1995, PCT Pub. No. WO94/04706, PCT Pub. Date Mar. 3, 1994

PCT Filed Aug. 20, 1993, Ser. No. 392,932

Claims priority, application European Pat. Off., Aug. 24, 1992, 92202563

Int. Cl.<sup>6</sup> C12Q 1/68; 1/00; C12N 15/00

U.S. Cl. 435—6

9 Claims

1. A method for the elimination of false negative results in an isothermal transcription-based amplification reaction, comprising:

- performing an isothermal transcription-based amplification of an analyte nucleic acid in a sample to which an internal control nucleic acid has been added, wherein the internal control nucleic acid is amplified less efficiently than the analyte nucleic acid such that the analyte nucleic acid will be

5,770,361

**PROTEIN CONFERRING AN INDUCIBLE RESISTANCE TO GLYCOPEPTIDES, PARTICULARLY IN GRAM-POSITIVE BACTERIA**

Michel Arthur, Paris; Sylvie Dutka-Malen, Fresnes; Stefan Evers, Paris, and Patrice Courvalin, Paris, all of France; assignors to Institut Pasteur, Paris Cedex, France  
PCT No. PCT/FR93/01264, § 371 Date Sep. 7, 1995, § 102(e) Date Sep. 7, 1995, PCT Pub. No. WO94/14961, PCT Pub. Date Jul. 7, 1994

PCT Filed Dec. 17, 1993, Ser. No. 454,196

Claims priority, application France, Dec. 18, 1992, 92 15671; Jul. 7, 1993, 93 08356

Int. Cl.<sup>6</sup> C12Q 1/68; C07H 21/04; 21/02; C07K 15/28

U.S. Cl. 435—6

32 Claims

1. A purified protein comprising the amino acid sequence of SEQ ID NO:2.

5,770,362

**GENOMIC DNA FRAGMENT OF STREPTOCOCCUS PNEUMONIAE, HYBRIDIZATION PROBE, AMPLIFICATION PRIMER, REAGENT AND METHOD FOR THE DETECTION OF STREPTOCOCCUS PNEUMONIAE**

Jean-Pierre Claverys, Toulouse, and Claude Mabilat, Villeurbanne, both of France, assignors to Bio Merieux, Marcy L'Etoile, France  
Division of Ser. No. 419,765, Apr. 10, 1995, which is a continuation of Ser. No. 15,850, Feb. 10, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 485,180

Claims priority, application France, Feb. 10, 1992, 92 01655  
Int. Cl.<sup>6</sup> C12Q 1/68

U.S. Cl. 435—6

26 Claims

1. A probe for *Streptococcus pneumoniae*, comprising a nucleotide sequence of at least 12 contiguous nucleotides of at least one sequence selected from the group consisting of sequences SEQ ID NO: 2, SEQ ID NO: 4, variants thereof that are naturally occurring in *Streptococcus pneumoniae*, and their respective complementary sequences, wherein said probe specifically hybridizes with genomic DNA of *Streptococcus pneumoniae*.

5,770,363

**METHODS FOR DIAGNOSING HUMAN MALE INFERTILITY**

David B. Brown, 1216 Pin Oak Dr., Dickinson, Tex. 77539  
Continuation-in-part of Ser. No. 781,357, Oct. 24, 1991, Pat. No. 5,358,847, and Ser. No. 269,340, Jun. 30, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 472,668

Int. Cl.<sup>6</sup> C12Q 1/68; 1/00; A01N 1/02; C12N 5/00

U.S. Cl. 435—6

32 Claims

1. An in vitro method for screening for abnormal human sperm as part of a regimen for assessing human sperm fertilizing capacity comprising:

- obtaining a human sperm sample and isolating a number of sperm therefrom to provide a test sample;



incubating the test sample in a non-mammalian egg extract capable of supporting human sperm decondensation, DNA synthesis or sperm recondensation; monitoring the test sample for sperm decondensation; and comparing test sperm decondensation of the sample to sperm decondensation of a sperm sample from a proven fertile male in the non-mammalian egg extract, wherein a test sample demonstrating less than 80% decondensed sperm relative to the control sample identifies abnormal human sperm.

21. A frozen *Xenopus laevis* frog egg extract, said extract prepared by a process of:
- collecting mature *Xenopus laevis* frog eggs,
  - treating the collected eggs to provide dejellied eggs,
  - lysing the dejellied eggs,
  - collecting the middle layer of the lysed dejellied eggs to provide an extract,
  - selecting the extract which support the human sperm activation events of DNA synthesis, chromatin decondensation or chromatin recondensation,
  - adding the selected extract dropwise to a volume of liquid nitrogen to provide a frozen *Xenopus laevis* frog egg extract.

5,770,364

Patent Not Issued For This Number

5,770,365

## NUCLEIC ACID CAPTURE MOIETIES

Michael J. Lane, Baldwinsville, N.Y.; Albert S. Benight, Schaumburg, Ill., and Brian D. Faldasz, Maynard, Mass., assignors to Tm Technologies, Inc., Woburn, Mass.

Filed Aug. 25, 1995; Ser. No. 519,197

Int. Cl.<sup>6</sup> C12Q 1/68; C07H 21/04; 21/02

U.S. Cl. 435—6

24 Claims



1. A method of promoting the hybridization of a target single-stranded nucleic acid and a nucleic acid capture moiety comprising:

- a) providing a unimolecular nucleic acid capture moiety having a double-stranded region with a terminal base and an adjacent single-stranded region, the terminal base of the double-stranded region being all or part of a duplex-binding-ligand binding site, and said single-stranded region being capable of hybridizing to said target nucleic acid, wherein said unimolecular nucleic acid capture moiety is bound to a solid support;
  - b) forming a reaction mixture comprising said target single-stranded nucleic acid, said nucleic acid capture moiety, and a duplex-binding ligand, under conditions such that the target single-stranded nucleic acid and the nucleic acid capture moiety can hybridize; and
  - c) allowing said target single-stranded nucleic acid to hybridize to said nucleic acid capture moiety such that said duplex-binding ligand binds to the intermolecular duplex thereby formed,
- such that the hybridization of the target single-stranded nucleic acid and the nucleic acid capture moiety is promoted.

5,770,366

## MELANOMA-INHIBITING PROTEIN

Ulrich Bogdahn, Würzburg; Reinhard Burrner, Bach, and Brigitte Kaluza, Bad Heilbrunn, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany

PCT No. PCT/EP94/02369, § 371 Date Jan. 19, 1996, § 102(e) Date Jan. 19, 1996, PCT Pub. No. WO95/03328, PCT Pub. Date Feb. 2, 1995

PCT Filed Jul. 19, 1994, Ser. No. 578,649

Claims priority, application Germany, Jul. 20, 1993, 43 24 247.2

Int. Cl.<sup>6</sup> C12Q 1/68; C12N 15/12; 5/08:5/10; 1/21; 1/00; A61K 38/17; C07K 14/425; 16/18

U.S. Cl. 435—6

27 Claims

1. An isolated nucleic acid molecule, the complementary sequence of which hybridizes to SEQ ID NO: 1 or SEQ ID NO: 3, at 55°–66° C., 6×SSC, 5×Denhardt's solution, 100 ug/ml salmon sperm DNA or 68° C., 5×SSC, 5×Denhardt's solution, 0.5% SDS, 10% dextran sulfate and 100 ug/ml salmon sperm DNA.

5,770,367

## TAG REAGENT AND ASSAY METHOD

Edwin Southern, Oxford, and William Jonathan Cummins, Tring, both of United Kingdom, assignors to Oxford Gene Technology Limited, United Kingdom

PCT No. PCT/GB94/01675, § 371 Date Feb. 5, 1996, § 102(e) Date Feb. 5, 1996, PCT Pub. No. WO95/04160, PCT Pub. Date Feb. 9, 1995

PCT Filed Aug. 1, 1994, Ser. No. 586,875

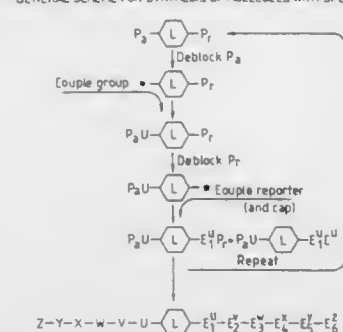
Claims priority, application United Kingdom, Jul. 30, 1993, 9315847

Int. Cl.<sup>6</sup> C12Q 1/68; C07H 19/00; 21/02; 21/04

U.S. Cl. 435—6

10 Claims

GENERAL SCHEME FOR SYNTHESIS OF MOLECULES WITH SPECIFIC TAGS



1. A method of sequencing a target nucleic acid, which method comprises the steps of:

- a) providing an oligonucleotide immobilized on a support,
  - b) hybridizing the target nucleic acid with the immobilized oligonucleotide,
  - c) incubating the hybrid from b) with a library comprising a solution of reagents, each of said reagents comprising:
    - 1) an analyte moiety comprising at least two analyte residues, and linked to
    - 2) a tag moiety comprising one or more reporter groups suitable for detection by mass spectrometry, excluding oligonucleotides.
- wherein a reporter group designates an analyte residue, and the reporter group at each position of the tag moiety is chosen to designate an analyte residue at a defined position of the analyte moiety
- and wherein the library consists of 4<sup>n</sup> reagents, each of said reagents comprising a different analyte moiety which is a different oligonucleotide chain of n nucleotides,
- so that an oligonucleotide chain of a first reagent of the library becomes hybridized to the target nucleic acid adjacent the immobilized oligonucleotide,
- d) ligating the adjacent oligonucleotides, thus forming a ligated first reagent,
  - e) removing other non-ligated reagents, and

- f) recovering and analyzing the tag moiety of the ligated first reagent as an indication of the sequence of a first part of the target nucleic acid wherein the said target nucleic acid and ligated first reagent remain hybridized.

5,770,368

## CRYPTOSPORIDIUM DETECTION METHOD

Ricardo De Leon, Irvine, and Paul A. Rochelle, Manhattan Beach, both of Calif., assignors to Metropolitan Water District of Southern California, Los Angeles, Calif.

Filed May 9, 1996, Ser. No. 647,351

Int. Cl.<sup>6</sup> C12Q 1/68

U.S. Cl. 435—6

26 Claims

1. A method of selectively detecting viable, infectious *Cryptosporidium parvum* organisms in a sample potentially containing viable, infectious *Cryptosporidium parvum* organisms and other *Cryptosporidium* organisms, the method comprising the steps of:

- (a) exposing the sample potentially containing viable, infectious *Cryptosporidium parvum* organisms to conditions suitable to induce RNA transcription of *Cryptosporidium parvum* heat shock protein 70 (HSP 70) DNA;
  - (b) selectively producing *Cryptosporidium parvum* HSP 70 polynucleotide from the *Cryptosporidium parvum* HSP 70 RNA utilizing a primer which produces polynucleotide from a portion of *Cryptosporidium parvum* HSP 70 RNA but which does not produce polynucleotide from a portion of HSP 70 of other *Cryptosporidium* species;
  - (c) exposing any polynucleotide produced in step (b) to conditions suitable to produce double-stranded polynucleotide of *Cryptosporidium parvum* but not suitable to produce double-stranded polynucleotide of a portion of HSP 70 of other *Cryptosporidium* species;
  - (d) exposing any double-stranded polynucleotide produced in step (c) to conditions suitable to amplify any double-stranded polynucleotide formed in step (c); and
  - (e) detecting the presence of any amplified polynucleotide formed in step (d);
- wherein the presence of amplified polynucleotide detected in step (e) indicates the presence of viable, infectious *Cryptosporidium parvum* organisms in the sample.

5,770,369

## NUCLEIC ACID MEDIATED ELECTRON TRANSFER

Thomas J. Meade, Altadena; Jon Faiz Kayyem, Pasadena, and Scott E. Fraser, Newport Beach, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Continuation of Ser. No. 475,051, Jun. 7, 1995, which is a continuation of Ser. No. 166,036, Dec. 10, 1993, Pat. No. 5,591,578. This application Jun. 7, 1996, Ser. No. 660,534

Int. Cl.<sup>6</sup> C12Q 1/68; 1/70; C12P 19/34; C07H 21/04

U.S. Cl. 435—6

27 Claims

1. A composition comprising a single-stranded nucleic acid containing at least one electron donor moiety and at least one electron acceptor moiety, wherein said electron donor moiety and said electron acceptor moiety are covalently attached to said nucleic acid, and wherein said electron donor moiety and said electron acceptor moiety are not redox proteins.

5,770,370

## NUCLEASE PROTECTION ASSAYS

Rajan Kumar, Robbinsville, N.J., assignor to David Sarnoff Research Center, Inc., Princeton, N.J.

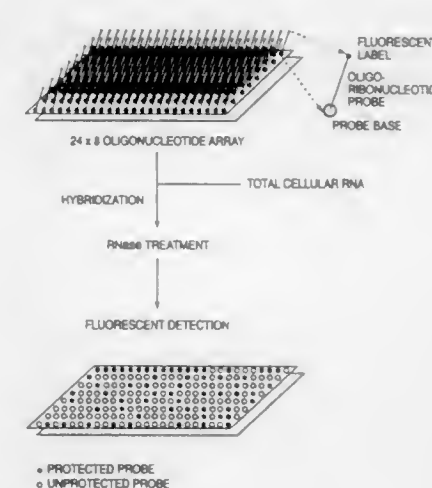
Filed Jun. 14, 1996, Ser. No. 665,104

Int. Cl.<sup>6</sup> C12Q 1/68; C12P 19/34; C07H 21/02; 21/04

U.S. Cl. 435—6

19 Claims

1. A nuclease protection assay comprising:



- (A) attaching a nucleic acid probe comprising a first nucleotide sequence to a solid surface area;
- (B) contacting the nucleic acid probe with a nucleic acid template under conditions that promote hybridization between complementary polynucleotides, forming a probe-template complex if the template includes a segment that is complementary to the probe;
- (C) contacting the probe-template complex with a nuclease effective to selectively cleave the nucleotide bonds of (1) the first nucleotide sequence when the first nucleotide sequence is single stranded or (2) mismatched regions of the first nucleotide sequence when the first nucleotide sequence is in duplex nucleic acid; and
- (D) detecting the presence of duplex nucleic acids formed by the probe and template nucleic acids by detecting the presence of the first nucleotide sequence.

5,770,371

## MODIFICATION OF CRYPTIC SPLICE SITES IN HETEROLOGOUS GENES EXPRESSED IN FUNGI

Sheryl Thompson, Davis, Calif., assignor to Novo Nordisk Biotech, Inc., Davis, Calif.

Filed Jun. 27, 1996, Ser. No. 672,158

Int. Cl.<sup>6</sup> C12Q 1/68; C12P 19/34; C12N 1/15; C07H 21/04

U.S. Cl. 435—6

25 Claims

1. A method for obtaining a recombinant fungal host cell, which produces a biologically active heterologous polypeptide comprising introducing into a fungal host cell a nucleic acid sequence encoding said heterologous polypeptide, wherein at least one cryptic splice site is modified in the nucleic acid sequence by replacing at least one cryptic consensus sequence of at least one cryptic splice site with a non-consensus sequence or by replacing a first region of a cryptic intron with a second region which has a percent G+C content in the range of about 40% to about 70%, wherein a recombinant fungal host cell which produces a biologically active heterologous polypeptide is obtained.

5,770,372

## DETECTION OF MUTATIONS IN THE HUMAN ATM GENE

Patrick Concannon, Bainbridge Island, Wash., assignor to Virginia Mason Research Center, Seattle, Wash.

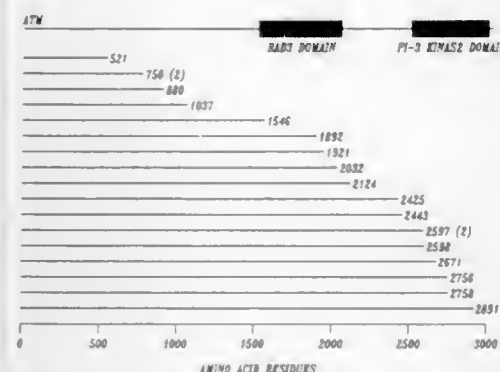
Filed Nov. 20, 1996, Ser. No. 753,147

Int. Cl.<sup>6</sup> C12Q 1/68; C07H 21/02; 21/04

U.S. Cl. 435—6

6 Claims

1. A method of detecting mutations in the ATM gene comprising the steps of:
- (a) conducting a first and a second PCR reaction to obtain a first and a second amplified DNA product, using as template for the first PCR reaction a first sample of DNA from an indi-



vidual suspected of carrying a mutation in the ATM gene, and using as template for the second PCR reaction a second sample of DNA from an individual who does not carry a mutation in the ATM gene, and using as primers for the first and second PCR reactions a pair of primers selected from the group consisting of SEQ ID NOS:1 and 2; SEQ ID NOS:3 and 4; SEQ ID NOS:5 and 6; SEQ ID NOS:7 and 8; SEQ ID NOS:9 and 10; SEQ ID NOS:11 and 12; SEQ ID NOS:13 and 14; SEQ ID NOS:15 and 16; SEQ ID NOS:17 and 18; SEQ ID NOS:19 and 20; SEQ ID NOS:21 and 22; SEQ ID NOS:23 and 24; SEQ ID NOS:25 and 26; SEQ ID NOS:27 and 28; SEQ ID NOS:29 and 30; SEQ ID NOS:31 and 32; SEQ ID NOS:33 and 34; SEQ ID NOS:35 and 36; SEQ ID NOS:37 and 38; SEQ ID NOS:39 and 40; SEQ ID NOS:41 and 42; SEQ ID NOS:43 and 44; SEQ ID NOS:45 and 46; SEQ ID NOS:47 and 48; SEQ ID NOS:49 and 50; SEQ ID NOS:51 and 52; SEQ ID NOS:53 and 54; SEQ ID NOS:55 and 56; SEQ ID NOS:57 and 58; SEQ ID NOS:59 and 60; SEQ ID NOS:61 and 62; SEQ ID NOS:63 and 64; SEQ ID NOS:65 and 66; SEQ ID NOS:67 and 68; SEQ ID NOS:69 and 70; SEQ ID NOS:71 and 72; SEQ ID NOS:73 and 74; SEQ ID NOS:75 and 76; SEQ ID NOS:77 and 78; SEQ ID NOS:79 and 80; SEQ ID NOS:81 and 82; SEQ ID NOS:83 and 84; SEQ ID NOS:85 and 86; SEQ ID NOS:87 and 88; SEQ ID NOS:89 and 90; SEQ ID NOS:91 and 92; SEQ ID NOS:93 and 94; SEQ ID NOS:95 and 96; SEQ ID NOS:97 and 98; SEQ ID NOS:99 and 100; SEQ ID NOS:101 and 102; SEQ ID NOS:103 and 104; SEQ ID NOS:105 and 106; SEQ ID NOS:107 and 108; SEQ ID NOS:109 and 110; SEQ ID NOS:111 and 112; SEQ ID NOS:113 and 114; SEQ ID NOS:115 and 116; SEQ ID NOS:117 and 118; SEQ ID NOS:119 and 120; SEQ ID NOS:121 and 122; and SEQ ID NOS:123 and 124; and

(b) determining that the ATM gene in the first sample of DNA contains a mutation if the first amplified DNA product is different from the second amplified DNA product.

5,770,373

#### RAPID AND SENSITIVE DETECTION OF ANTIBIOTIC-RESISTANT MYCOBACTERIA USING OLIGONUCLEOTIDE PROBE SPECIFIC FOR RIBOSOMAL RNA PRECURSORS

Theresa B. Britschgi, and Gerard A. Cangelosi, both of Seattle, Wash., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Division of Ser. No. 485,602, Jun. 7, 1995, which is a continuation-in-part of Ser. No. 261,068, Jun. 16, 1994, abandoned. This application Nov. 8, 1996, Ser. No. 745,638

Int. Cl.<sup>6</sup> C12Q 1/68

U.S. Cl. 435—6

6 Claims

1. A method for determining whether cells of a mycobacterial sample are sensitive to an antimicrobial agent, the method comprising the steps of:

- (a) culturing the mycobacterial cells in the presence of the antimicrobial agent;
- (b) treating the cells by enzymatic or mechanical means to expose the cell membrane to lysis reagents, and contacting the

cells with a lysis reagent under conditions that release but do not degrade pre-rRNA from the mycobacterial cells; and

(c) detecting the pre-rRNA using an oligonucleotide probe which is capable of selectively hybridizing, under hybridizing conditions, to a region of the pre-rRNA that is not present in a mature mycobacterial rRNA molecule;

wherein sensitivity to the antimicrobial agent is indicated by an increase or a decrease in pre-rRNA levels for mycobacterial cells exposed to the antimicrobial agent compared to mycobacterial cells not exposed to the antimicrobial agent.

5,770,374

#### METHODS FOR IDENTIFYING ONCOGENES AND ANTI-ONCOGENES

Mark J. Cooper, Solon, Ohio, assignor to Case Western Reserve University, Cleveland, Ohio

Continuation of Ser. No. 479,204, Jun. 7, 1995, and a continuation of Ser. No. 594,299, Jan. 30, 1996, which is a continuation of Ser. No. 151,387, Nov. 12, 1993, abandoned, said Ser. No. 479,204 is a continuation of Ser. No. 151,387. This application Oct. 10, 1996, Ser. No. 728,608

Int. Cl.<sup>6</sup> C12Q 1/68

U.S. Cl. 435—6

2 Claims

1. A method for identifying a candidate oncogene, comprising the steps of:

introducing episomes into non-tumorigenic cells, each of said episomes comprising:

- (a) a replication competent, transformation negative vector comprising at least one papovavirus origin of replication and a first DNA sequence encoding a papovavirus large T antigen which contains a replication competent binding site for said origin of replication and which is negative for binding to both wild-type p53 tumor suppressor and retinoblastoma tumor suppressor, said first DNA sequence being operatively linked to a first promoter which is functional in said non-tumorigenic cells; and
- (b) a second DNA sequence operatively linked to a second promoter which is functional in the non-tumorigenic cells, wherein the second DNA sequence is a cDNA which is complementary to mRNA obtained from tumorigenic cells; and

screening the resulting cells for a tumorigenic phenotype, wherein the resulting cells which display said tumorigenic phenotype contain a CDNA comprising said candidate oncogene.

5,770,375

#### PROBE FOR DIAGNOSING STAPHYLOCOCCUS EPIDERMIDIS

Tsuneya Ohno, 15-16, Kita-Aoyama 3 chome, Minato-ku, Tokyo 107; Akio Matsuhisa, Nara; Hirotsugu Uehara, Higashinada-ku, and Soji Eda, Osaka, all of Japan, assignors to Tsuneya Ohno, Tokyo, and Fuso Pharmaceutical Industries, Ltd., Osaka, both of Japan

Division of Ser. No. 362,577, Mar. 27, 1995. This application Aug. 29, 1997, Ser. No. 920,827

Claims priority, application Japan, Jul. 7, 1992, 4-179719

Int. Cl.<sup>6</sup> C12Q 1/68; C07H 21/04

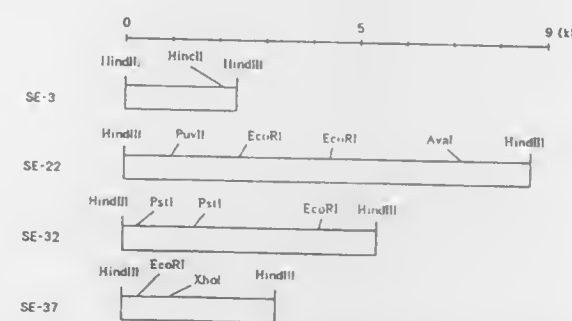
U.S. Cl. 435—6

2 Claims

1. A probe composition for detecting *Staphylococcus epidermidis*, wherein the probe composition consists essentially of

- (a) the DNA of any one of SEQ ID NOS:5 through 8, or
- (b) the complement of (a).

2. A method for detecting the presence of *Staphylococcus epidermidis* in a sample comprising the steps of contacting nucleic acid from said sample with the probe composition of claim 1 and detecting hybridization of the nucleic acid from said sample with



DNA in said probe composition as an indication of the presence of *Staphylococcus epidermidis*.

5,770,376

#### METHOD OF DIAGNOSING AND TREATING MYOCARDIAL INFARCTION AND HYPERTENSION

Alexei Y. Bagrov, St. Petersburg, Russian Federation, assignor to Biomedical Sciences Research Laboratories, Inc., Millersville, Md.

Continuation-in-part of Ser. No. 181,918, Jan. 18, 1994, abandoned, which is a continuation-in-part of Ser. No. 984,480, Dec. 2, 1992, abandoned. This application Mar. 2, 1995, Ser. No. 396,487

Int. Cl.<sup>6</sup> G01N 33/53; 33/536; 33/74; 37/00

U.S. Cl. 435—7.1

4 Claims

1. A method for determining whether a human is suffering from myocardial infarction, comprising the steps of

- (a) obtaining plasma from a human suspected of having a myocardial infarction;
- (b) measuring, by immunoassay with antibodies specific for marinobufagin, the level of immunoreactivity with said antibodies in the plasma obtained in step (a);
- (c) comparing the level of immunoreactivity with antibodies specific for marinobufagin obtained in step (b) with a standard level of immunoreactivity with antibodies specific for marinobufagin, wherein an elevated level of immunoreactivity in said human compared to the standard is an indication that the human is experiencing a myocardial infarction.

5,770,377

#### INTERRUPTION OF BINDING OF MDM2 AND P53 PROTEIN AND THERAPEUTIC APPLICATION THEREOF

Steven Michael Pickles, Angus, and David Philip Lane, Fife, both of Scotland, assignors to University of Dundee, Dundee, United Kingdom

Continuation-in-part of Ser. No. 277,660, Jul. 20, 1994. This application Apr. 19, 1995, Ser. No. 424,957

Int. Cl.<sup>6</sup> G01N 33/53; 33/574; 33/542; 33/543

U.S. Cl. 435—7.1

11 Claims

1. A method of identifying a compound which interferes with the binding of oncogene protein to p53, said method comprising the steps of:

- forming a first mixture by combining (a) a fragment not exceeding 28 amino acids of p53 protein which includes at least the sequence FxxLW (SEQ ID NO:4), wherein x is any amino acid, or a peptide analogue thereof which includes the sequence FxxLW (SEQ ID NO:4), or an organic compound which is modelled to resemble the three-dimensional structure of the amino acid residues FxxLW (SEQ ID NO:4) as they appear at amino acid residues 19-23 in human p53 and which binds to human MDM2, (b) the oncogene protein or a fragment thereof which binds to p53 protein and (c) a test compound;

forming a second mixture by combining (a) a fragment not exceeding 28 amino acids of p53 protein which includes at

least the sequence FxxLW (SEQ ID NO:4), wherein x is any amino acid, or a peptide analogue thereof which includes the sequence FxxLW (SEQ ID NO:4), or an organic compound which is modelled to resemble the three-dimensional structure of the amino acid residues FxxLW (SEQ ID NO:4) as they appear at amino acid residues 19-23 in human p53 and which binds to human MDM2 and (b) the oncogene protein or a fragment thereof which binds to p53 protein; and

determining the quantity of (a) which is bound to (b) in the presence of (c) in said first mixture, wherein a decrease in the quantity of (a) which is bound to (b) in the presence of (c) in said first mixture as compared to the amount of (a) which is bound to (b) in the absence of (c) in said second mixture indicates that the test compound is a compound which interferes with the binding of oncogene protein to p53.

5,770,378

#### TRICYCLIC RETINOIDS, METHODS FOR THEIR PRODUCTION AND USE

Chan Kou Hwang, Boulder, Colo.; Steven K. White, San Diego, Calif.; Youssef L. Bennani, La Jolla, Calif.; Stacie S. Canan Koch; Beth Ann Badea, both of San Diego, Calif.; Jonathan J. Hebert, Mission Viejo, Calif., and Alex M. Nadzan, San Diego, Calif., assignors to Ligand Pharmaceuticals, Inc., San Diego, Calif.

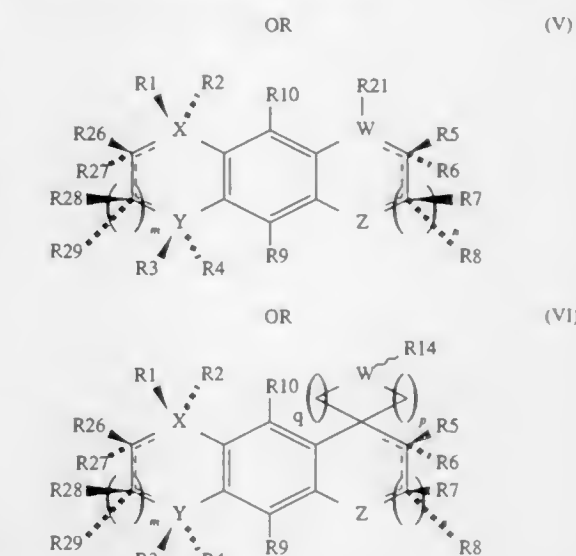
Continuation-in-part of Ser. No. 366,630, Nov. 9, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 472,127

Int. Cl.<sup>6</sup> G01N 33/53; C07D 221/06; A61K 31/33; C07K 1/14

U.S. Cl. 435—7.1

39 Claims

1. A tricyclic compound of the formula:



wherein,

- R<sub>1</sub> through R<sub>4</sub> each independently are hydrogen, a C<sub>1</sub>—C<sub>6</sub> alkyl, or a C<sub>7</sub>—C<sub>15</sub> arylalkyl;
- R<sub>5</sub> through R<sub>8</sub> each independently are hydrogen, a C<sub>1</sub>—C<sub>6</sub> alkyl, or at least two of R<sub>5</sub> through R<sub>8</sub> taken together are a C<sub>3</sub>—C<sub>6</sub> cycloalkyl;
- R<sub>9</sub> and R<sub>10</sub> each independently are hydrogen, a C<sub>1</sub>—C<sub>6</sub> alkyl, F, Cl, Br, NR<sub>11</sub>R<sub>12</sub>, NO<sub>2</sub>, or OR<sub>13</sub>, where R<sub>11</sub> and R<sub>12</sub> each independently are hydrogen, a C<sub>1</sub>—C<sub>8</sub> alkyl, a C<sub>7</sub>—C<sub>15</sub> arylalkyl, a C<sub>1</sub>—C<sub>8</sub> acyl, provided that only one of R<sub>11</sub> or R<sub>12</sub> can be acyl, or R<sub>11</sub> and R<sub>12</sub> taken together are a C<sub>3</sub>—C<sub>6</sub> cycloalkyl, and where R<sub>13</sub> is hydrogen or a C<sub>1</sub>—C<sub>8</sub> alkyl or a C<sub>7</sub>—C<sub>15</sub> arylalkyl;
- R<sub>14</sub> represents:





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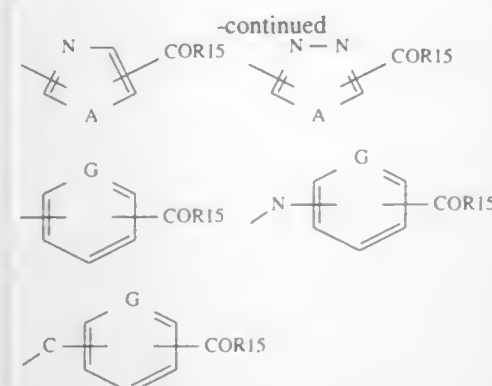
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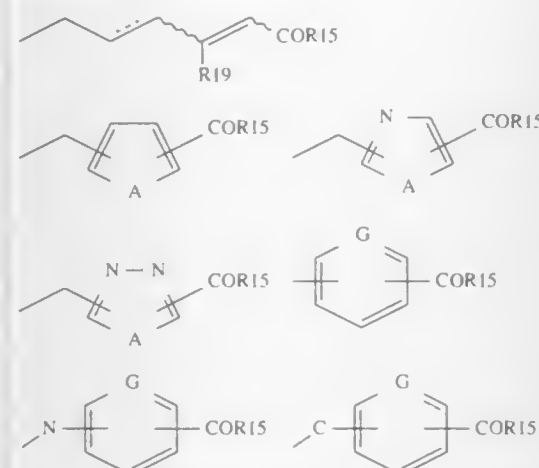
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where  $R_{15}$  is  $OR_{16}$  or  $NR_{17}R_{18}$ , with  $R_{16}$  being hydrogen, a  $C_1-C_6$  alkyl or a  $C_7-C_{15}$  arylalkyl, and with  $R_{17}$  and  $R_{18}$  each independently being hydrogen, a  $C_1-C_6$  alkyl, a  $C_7-C_{15}$  arylalkyl, aryl, ortho-, meta-, or para-substituted hydroxyaryl, or taken together are a  $C_3-C_6$  cycloalkyl, provided that  $R_{18}$  must be hydrogen when  $R_{17}$  is aryl or hydroxyaryl,  $R_{19}$  is a  $C_1-C_5$  alkyl, and A is O, S or  $NR_{20}$ , where  $R_{20}$  is a hydrogen,  $C_1-C_6$  alkyl or a  $C_7-C_{15}$  arylalkyl.

$R_{21}$  represents:



where  $R_{15}$ ,  $R_{19}$ , and A have the same definitions given above;  $R_{26}$  through  $R_{29}$  each independently are hydrogen or a  $C_1-C_6$  alkyl, or taken together then one each of  $R_{26}$  and  $R_{27}$  or  $R_{29}$  respectively, form a carbonyl group;

X and Y each independently represent C, O, S, N, SO, or SO<sub>2</sub>, provided, however, that when X or Y are O, S, SO or SO<sub>2</sub>, then either  $R_1$  and  $R_2$  or  $R_3$  and  $R_4$  respectively do not exist, and further provided, that when X or Y is N, then one each of  $R_1$  and  $R_2$  or  $R_3$  and  $R_4$  respectively, do not exist;

Z is O, S, CR, CR<sub>22</sub>R<sub>23</sub> or NR<sub>24</sub>, where  $R_{22}$  through  $R_{24}$  each independently are hydrogen or a  $C_1-C_6$  alkyl or  $R_{22}$  and  $R_{23}$  taken together are a  $C_3-C_6$  cycloalkyl;

W is N or CR<sub>25</sub>, where  $R_{25}$  is hydrogen or a  $C_1-C_6$  alkyl; G is C or N, provided G cannot be C when W is C;

m is 0 or 1 carbon atoms;

n is 0, 1 or 2 carbon atoms;

q is 1 or 2 carbon atoms;

p is 0, 1 or 2 carbon atoms;

the dashed lines in the structures represent optional double bonds, provided, however, that the double bonds cannot be contiguous, and further provided that when such optional double bonds exist then one each of  $R_5$  and  $R_6$  or  $R_7$  and  $R_8$  respectively do not exist; and

the wavy lines represent olefin bonds that are either in the cis (Z) or trans (E) configuration.

5,770,379

Patent Not Issued For This Number

5,770,380

#### SYNTHETIC ANTIBODY MIMICS—MULTIPLE PEPTIDE LOOPS ATTACHED TO A MOLECULAR SCAFFOLD

Andrew D. Hamilton, and Yoshitomo Hamuro, both of Pittsburgh, Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed Sep. 13, 1996, Ser. No. 712,521

Int. Cl.<sup>6</sup> G01N 33/53; C07K 5/02

U.S. Cl. 435—7.1

15 Claims

1. An antibody mimic comprising a calixarene organic scaffold to which a plurality of peptide loops are covalently linked.

5,770,381

#### METHODS FOR THE DIAGNOSIS OF DIABETES AND PREDIABETIC CONDITIONS

Ian Reay MacKay, Malvern; Merrill Joy Rowley, Camberwell, and Paul Zev Zimet, Toorak, all of Australia, assignors to Monash University, Clayton, Australia

PCT No. PCT/AU94/00056, § 371 Date Oct. 10, 1995, § 102(e) Date Oct. 10, 1995, PCT Pub. No. WO94/18568, PCT Pub. Date Aug. 18, 1994

PCT Filed Feb. 9, 1994, Ser. No. 495,584

Claims priority, application Australia, Feb. 9, 1993, PL7168 Int. Cl.<sup>6</sup> G01N 33/53

U.S. Cl. 435—7.1

21 Claims

1. A method for detecting autoantibodies to glutamic acid decarboxylase (GAD) in the serum of a patient, comprising the steps of: contacting a serum sample from the patient with a GAD preparation, and detecting the binding of GAD autoantibodies in said sample by said GAD preparation,

wherein said GAD preparation comprises an enhanced amount of dimers or oligomers of the 65 kD isoform of GAD, the 67 kD isoform of GAD, or both, relative to preparations of naturally occurring GAD.

5,770,382

#### TRICYCLIC RETINOIDS, METHODS FOR THEIR PRODUCTION AND USE

Chan Kou Hwang, Boulder, Colo.; Steven K. White, San Diego, Calif.; Beth Ann Badea, San Diego, Calif., and Alex M. Nadzan, San Diego, Calif., assignors to Ligand Pharmaceuticals, Inc., San Diego, Calif.

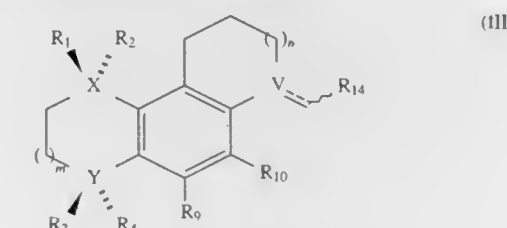
Continuation-in-part of Ser. No. 366,630, Dec. 30, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 475,514

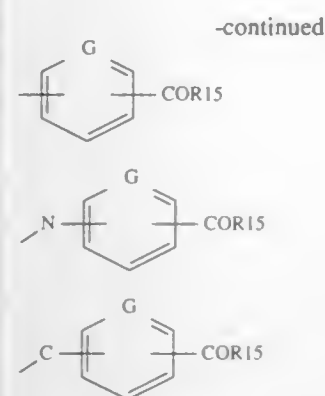
Int. Cl.<sup>6</sup> G01N 33/53; C07D 221/06; A61K 31/33; C07K 1/14

U.S. Cl. 435—7.1

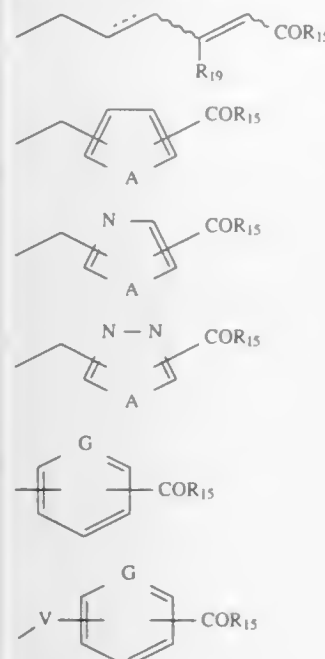
39 Claims

1. A tricyclic compound of the formula:





where  $R_{15}$  is  $OR_{16}$  or  $NR_{17}R_{18}$ , with  $R_{16}$  being hydrogen, a  $C_1-C_6$  alkyl or a  $C_7-C_{15}$  arylalkyl, and with  $R_{17}$  and  $R_{18}$  each independently being hydrogen, a  $C_1-C_6$  alkyl, a  $C_7-C_{15}$  arylalkyl, aryl, ortho-, meta-, or para-substituted hydroxyaryl, or taken together are a  $C_3-C_6$  cycloalkyl, provided that  $R_{18}$  must be hydrogen when  $R_{17}$  is aryl or hydroxyaryl,  $R_{19}$  is a  $C_1-C_5$  alkyl, and A is O, S or  $NR_{20}$ , where  $R_{20}$  is a hydrogen,  $C_1-C_6$  alkyl or a  $C_7-C_{15}$  arylalkyl;



$R_{26}$  through  $R_{29}$  each independently are hydrogen or a  $C_1-C_6$  alkyl, or taken together then one each of  $R_{26}$  and  $R_{27}$  or  $R_{28}$  and  $R_{29}$  respectively, form a carbonyl group;

X and Y each independently represent C, O, S, N, SO, or  $SO_2$ , provided, however, that when X or Y are O, S, SO or  $SO_2$ , then either  $R_1$  and  $R_2$  or  $R_3$  and  $R_4$  respectively do not exist, and further provided, that when X or Y is N, then one each of  $R_1$  and  $R_2$  or  $R_3$  and  $R_4$  respectively, do not exist;

Z is O, S, CR,  $CR_{23}R_{24}$  or  $NR_{24}$ , where  $R_{23}$  through  $R_{24}$  each independently are hydrogen or a  $C_1-C_6$  alkyl or  $R_{22}$  and  $R_{23}$  taken together are a  $C_3-C_6$  cycloalkyl;

W is N or  $CR_{25}$ , where  $R_{25}$  is hydrogen or a  $C_1-C_6$  alkyl;

G is C or N, provided G cannot be C when W is C;

m is 0 or 1 carbon atoms;

n is 0, 1 or 2 carbon atoms;

the dashed lines in the structures represent optional double bonds, provided, however, that the double bonds cannot be contiguous, and further provided that when such optional double bonds exist then one each of  $R_5$  and  $R_6$  or  $R_7$  and  $R_8$  respectively do not exist; and

the wavy lines represent olefin bonds that are either in the cis (Z) or trans (E) configuration.

## 5,770,384

## METHOD FOR DETERMINING COMPOUND INTERACTION WITH E2 BINDING PROTEINS

Elliot J. Androphy, Natick, and David E. Breiding, Somerville, both of Mass., assignors to New England Medical Center Hospitals, Inc. Boston, Mass.

Division of Ser. No. 361,806, Dec. 22, 1994. This application Mar. 6, 1996, Ser. No. 612,986

Int. Cl.<sup>6</sup> C12Q 1/00; C12P 21/06; C07K 14/025

U.S. Cl. 435—7.8 42 Claims

1. A method for evaluating the ability of a test compound to interact with an E2-binding protein (E2-BP), or fragment thereof which binds to a papillomavirus E2 protein said E2-BP selected from the group consisting of E2-BP<sup>42A</sup> (SEQ ID NO:5), E2-BP<sup>5D2-7</sup> (SEQ ID:6), E2-BP<sup>5D-23</sup> (SEQ ID NO:7), and E2-BP<sup>5D-24</sup> (SEQ ID NO:8) comprising: contacting said E2-BP with said test compound and determining whether said test compound interacts with said E2-BP.

## 5,770,385

## ANTIBODIES TO HUMAN GASTRIN-RELEASING PEPTIDE PRECURSOR AND USE THEREOF

Ken Yamaguchi, and Yoshio Miyake, both of Tokyo, Japan, assignors to Tonen Corporation, and Terumo Corporation, both of Tokyo, Japan

Division of Ser. No. 15,180, Feb. 11, 1993, Pat. No. 5,550,026.

This application May 17, 1996, Ser. No. 649,196

Claims priority, application Japan, Jun. 12, 1992, 4-153643

Int. Cl.<sup>6</sup> G01N 33/53; 33/542; 33/537; 33/543

U.S. Cl. 435—7.9 2 Claims

1. A method for diagnosing lung cancer comprising detecting or measuring human gastrin-releasing peptide (GRP) precursor in a blood sample by an immunoassay using an antibody generated against an antigen peptide having the amino acid sequence shown in SEQ ID NO: 2, and reactive to GRP precursor, wherein the antibody has an association constant  $K_d$  of  $3 \times 10^9$ – $2 \times 10^{10}$ /M and is obtained from a hybridoma cell line selected from the group consisting of proGRP-2B10 (FERM BP-4110), proGRP-3G2 (FERM BP-4109), and proGRP-2OD2 (FERM BP-4184).

## 5,770,386

## METHODS AND COMPOSITIONS FOR INCREASING THE SENSITIVITY OF A CELL TO A DNA DAMAGING AGENT

Patricia S. Steeg, Ellicott City; Lance A. Liotta, Potomac, and Ursula Flatow, Bethesda, all of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed May 20, 1992, Ser. No. 886,368

Int. Cl.<sup>6</sup> G01N 33/574; 33/573; C12Q 1/00

U.S. Cl. 435—7.23 17 Claims

13. A method of predicting a patient's response to a DNA damaging therapy made more effective by an increased amount of NM23 in a cell, to a tumor cell from the patient, comprising obtaining a tumor cell from the patient, determining the amount of NM23 in the cell, correlating the amount of NM23 in the cell to an amount in cells susceptible to the therapy, the presence of NM23 in an amount about equal to or greater than a susceptible cell indicating responsiveness to the therapy.

## 5,770,387

## ANTIBODIES TO MAMMALIAN NK ANTIGENS AND USES

Virginia M. Litwin, Palo Alto; Jennifer E. Gumperz, Oakland; Peter R. Parham, Stanford; Joseph H. Phillips, Jr., San Carlos, and Lewis L. Lanier, Los Altos, all of Calif., assignors to Schering Corporation, Kenilworth, N.J., and The Board of Trustees of The Leland Stanford Junior University, Palo Alto, Calif.

Continuation of Ser. No. 188,278, Jan. 28, 1994, abandoned.

This application Jun. 28, 1996, Ser. No. 670,987

Int. Cl.<sup>6</sup> C07K 16/28; G01N 33/577

U.S. Cl. 435—7.24 28 Claims

1. A binding composition, wherein said composition is an antibody or binding fragment thereof which binds specifically to a natural primate NKB1 characterized by:

- a) specific binding by DX9 (ATCC HB11775);
- b) natural core protein by PAGE of about 50 kD; and
- c) is a receptor for an HLA-B allele.

## 5,770,388

## METHOD OF SEPARATION EMPLOYING MAGNETIC PARTICLES AND SECOND MEDIUM

John Vorpahl, Livermore, Calif., assignor to Dade Behring Marburg GmbH, Deerfield, Ill.

Continuation of Ser. No. 455,550, Dec. 22, 1989, Pat. No. 5,279,936. This application Dec. 13, 1993, Ser. No. 168,263

The portion of the term of this patent subsequent to Jan. 18, 2011, has been disclaimed.

Int. Cl.<sup>6</sup> G01N 33/53

U.S. Cl. 435—7.25 19 Claims

1. A method for the separation of a particulate biologic material (PBM) from a mixture containing said PBM and other components, which method comprises:

combining in a first liquid medium said PBM and said other components, and magnetic particles having immobilized thereon a member of a specific binding pair (sbp) that specifically binds to said PBM to form a complex of said PBM and said magnetic particles (PBMMP),

layering said first liquid medium with a second liquid medium that is of different density and/or viscosity than said first liquid medium such that said first medium is layered above said second medium,

subjecting said first liquid medium and said second liquid medium to a magnetic field gradient whereby said PBMMP migrates into said second liquid medium and is washed thereby, and

separating said PBMMP from said second medium.

## 5,770,389

## APPARATUS AND METHOD FOR DETERMINING THE QUANTITY OF AN ANALYTE IN A BIOLOGICAL SAMPLE BY MEANS OF TRANSMISSION PHOTOMETRY

Shan-Fun Ching, Libertyville; Joanell Veronica Hoijer, Arlington Heights; Donald Irvine Stimpson, Gurnee, and Julian Gordon, Lake Bluff, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 127,387, Sep. 27, 1993, abandoned.

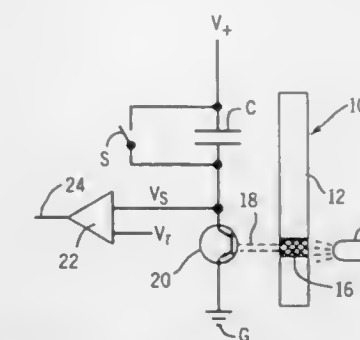
This application Feb. 14, 1996, Ser. No. 601,514

Int. Cl.<sup>6</sup> G01N 33/543; 33/558

U.S. Cl. 435—7.92 38 Claims

1. An apparatus for making a quantitative determination of the amount of an analyte in a biological sample comprising:

- a support medium for receiving a biological sample and retaining a labeled reaction product thereon, the medium including a read window capable of receiving a source light signal and transmitting therethrough a response light signal that has been altered from the source light signal by the presence of a labeled reaction product, wherein said medium is highly light-scattering, the amount of said alteration of said



response light signal by said labeled reaction product being an indication of the amount of said analyte in said biological sample;

b. a source of light positioned to transmit a source light signal to the read window of the medium and to the labeled reaction product at the read window, whereby the response light signal is produced;

c. a collector positioned to receive the response light signal transmitted from the read window of the medium, said collector capable of developing a variable output signal in direct correspondence to the intensity of the response light signal, said collector being a photosensitive element; and

d. means for measuring the variable output signal and correlating the measured signal to the amount of analyte in the sample, said means for measuring the variable output signal comprising:

- (1) a capacitor network connected in series with the photosensitive element, said capacitor network comprising a capacitor, said capacitor network having a discharge cycle over a time cycled duration;
- (2) a power source coupled to the capacitor network and the photosensitive element and capable of charging the capacitor network; and
- (3) means for measuring the duration of the discharge cycle of the capacitor network through the resistance developed by the photosensitive element in response to the intensity of the response light signal, wherein the light intensity of the response light signal is related to the duration of the discharge cycle.

## 5,770,390

## LIPOHAPTENS COMPRISING A MULTIFUNCTIONAL SUBSTITUTED LIPOHILIC CARRIER LINKED TO AN ANTIGEN AND THEIR USE

Wilhelm Stoffel, Köln, Germany, assignor to Dade International Inc., Deerfield, Ill.

Continuation of Ser. No. 382,837, Feb. 3, 1995, abandoned, which is a continuation of Ser. No. 117,750, Sep. 7, 1993, abandoned, which is a continuation of Ser. No. 879,073, Aug. 1, 1992, abandoned, which is a continuation of Ser. No. 452,098, Dec. 14, 1989, abandoned. This application Mar. 22, 1996, Ser. No. 621,050

Claims priority, application European Pat. Off., Dec. 22, 1988, 88121536

Int. Cl.<sup>6</sup> G01N 33/545

U.S. Cl. 435—7.95 7 Claims

1. A method of detection of antibodies in a biological liquid comprising:

- (a) coating a substrate with a lipohapten of the formula  $(X)_m$ — $R$ — $Y$ — $(S)_n$ — $P$  wherein R is a saturated or unsaturated aliphatic or alicyclic hydrocarbyl backbone having from 2 to 30 carbon atoms; X is a saturated or unsaturated aliphatic, aromatic or alicyclic hydrocarbyl radical having from 6 to 30 carbon atoms, which is linked to R via a bonding group consisting of an ester, an ether, an amide, a urethane or a thiourethane; m is an integer from 1 to 5; P is a polypeptide or polysaccharide residue having from 2 to 100 amino acid or glycosyl units; Y is the reacted form of a carboxyl, amino, hydroxy, cyanate or isothiocyanate functional group where, if  $n=0$ , Y has bound to a free amino group of the polypeptide P



or a carboxyl, hemiacetal or hydroxy group of polysaccharide P or where if n=1 Y has bound to S; S is a difunctional spacer group, the functional groups thereof being capable of binding with the functional group Y on the one hand and a free amino, carboxyl or hydroxy group of the polypeptide or polysaccharide P on the other hand, wherein P is antigenic to said antibodies;

- (b) adding body fluid of a patient to be diagnosed, resulting in the formation of a detectable immunological conjugate; and  
(c) detecting the immunological conjugate formed.

5,770,391

**REAGENTS AND METHODS FOR USE IN BIOLUMINESCENCE**

Nicholas Peter Martin Foote, Cambridge, and Peter Leonard Grant, Cambs., both of United Kingdom, assignors to Celsis International PLC, Cambridge, United Kingdom

PCT No. PCT/GB94/01163, § 371 Date Nov. 30, 1995, § 102(e) Date Nov. 30, 1995, PCT Pub. No. WO94/28169, PCT Pub. Date Dec. 8, 1994

PCT Filed May 27, 1994, Ser. No. 564,083

Claims priority, application United Kingdom, Jun. 1, 1993, 9311241

Int. Cl.<sup>6</sup> C12Q 1/66

U.S. Cl. 435—8

13 Claims

1. A purified composition comprising an apyrase enzyme and one or more enzymes capable of degrading substances, other than ATP, wherein said substances are, or can undergo conversion to become, substrates utilized in the light-emitting forward reaction of firefly luciferase, wherein said one or more enzymes capable of degrading substance other than ATP do not include luciferase and wherein each of said one or more enzymes capable of degrading substances other than ATP reduce the light emission produced from said light-emitting reaction of firefly luciferase.

5,770,392

**METHOD AND COMPOSITION FOR IDENTIFYING INHIBITORS OF EUKARYOTIC CELL PROCESSES**

Julian E. Davies, Vancouver, and Barbara Waters, Delta, both of Canada, assignors to TerraGen Diversity Inc., Vancouver, Canada

Filed Oct. 17, 1996, Ser. No. 733,686

Int. Cl.<sup>6</sup> C12Q 1/48; 1/34; 1/37; C12N 1/00

U.S. Cl. 435—15

15 Claims

1. A method for testing a material to determine if the material possesses activity as an inhibitor of eukaryotic post-translational protein modification, calcium signal modulation, cell-cycle development or apoptosis comprising

adding the material to a growing culture of a *prokaryotic* organism which possesses enzyme activity effective to phosphorylate tyrosine, serine or threonine residues within a protein; allowing the culture to grow for a period of time sufficient for visually detectable growth to occur in the presence of the material; and

observing the culture for altered development relative to development of the *prokaryotic* organism grown in the absence of the material, wherein altered development is indicative that the material has activity as an inhibitor of post-translational protein phosphorylation, calcium signal modulation, cell-cycle development or apoptosis.

5,770,393

**BIOLOGICAL INDICATOR FOR DETECTION OF EARLY METABOLIC ACTIVITY**

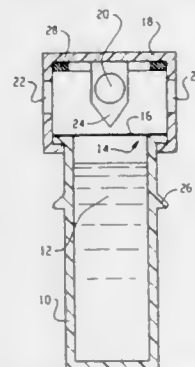
Joseph P. Dalmasso, Apex, and David A. Freeman, Raleigh, both of N.C., assignors to Steris Corporation, Mentor, Ohio

Filed Apr. 1, 1997, Ser. No. 831,318

Int. Cl.<sup>6</sup> C12Q 1/22; 1/40; C12N 3/00; 1/00

U.S. Cl. 435—31

25 Claims



1. A self-contained biological indicator for determining the effectiveness of a sterilization process, the biological indicator comprising:

- (a) a bacteria impermeable container containing a liquid growth medium and including a bacteria impermeable frangible barrier portion;  
(b) a carrier which supports microorganisms exhibiting a high resistance to said sterilization process;  
(c) a cover member within which the carrier is disposed, the cover member being moveable between a first position in which the carrier is separated from the liquid growth medium, the barrier portion, and a second position in which the barrier portion is broken and the carrier becomes immersed in the liquid growth medium, permitting said liquid growth medium to provide nutrients for the growth of said microorganisms remaining viable after the sterilization process and for the generation of enzymes by said viable microorganisms;  
(d) a detection system, specific for said enzymes, including a combined substrate and indicator which are modified and/or cleaved by said enzyme into the substrate and the indicator, resulting in a measurable change in at least one property of said indicator.

5,770,394

**METHOD AND APPARATUS FOR DETECTING BACTERIA USING A BLOOD CULTURE FROTH**

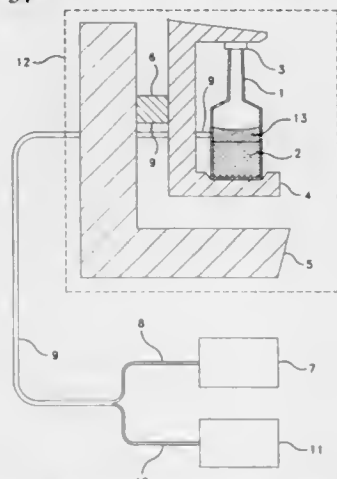
Klaus W. Berndt, Stewartstown, Pa., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed May 22, 1996, Ser. No. 651,313

Int. Cl.<sup>6</sup> C12Q 1/04; C12M 1/34

U.S. Cl. 435—34

6 Claims



1. A method of detecting bacteria in a blood culture bottle comprising the steps of:

providing a sealable blood culture bottle;  
introducing a blood specimen and a growth medium into the sealable blood culture bottle to form a liquid mixture therein; agitating the sealable blood culture bottle vigorously so that a froth is generated above the liquid mixture; and  
monitoring the froth to determine whether bacteria is present in the blood culture bottle by:  
illuminating the froth with a light;  
measuring a back-scattering intensity spectrum of the froth having a plurality of maxima; and  
determining whether bacteria is present in the blood culture bottle based upon a predetermined increase in said plurality of maxima.

5,770,395

**BIOLOGICAL ASSAY FOR MICROBIAL CONTAMINATION**

Jenefir D. Isbister, Potomac, Md., assignor to Center for Innovative Technology, Herndon, Va.

Continuation of Ser. No. 250,383, May 27, 1994, Pat. No. 5,550,032. This application Jun. 18, 1996, Ser. No. 665,537

Int. Cl.<sup>6</sup> C12Q 1/06

U.S. Cl. 435—39

20 Claims

1. A method for detecting the presence or absence of a predetermined minimum level of viable microorganisms in a liquid sample within thirty minutes, comprising the steps of:

- introducing a liquid sample through a polysulfone filter capable of trapping microorganisms on said filter;  
applying an indicator solution including an indicator compound, said indicator compound including a triphenyltetrazolium indicator which undergoes a visible color change upon reduction on said polysulfone filter after said introducing step; and  
determining the presence or absence of a clearly visible color change on said filter within approximately thirty minutes.

5,770,396

**ISOLATION CHARACTERIZATION, AND USE OF THE HUMAN BETA SUBUNIT OF THE HIGH AFFINITY RECEPTOR FOR IMMUNOGLOBULIN E**

Jean Pierre Kinet, Bethesda, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Apr. 16, 1992, Ser. No. 869,933

Int. Cl.<sup>6</sup> C12N 5/10; 15/12

U.S. Cl. 435—69.1

20 Claims

1. An isolated nucleic acid molecule encoding a human beta subunit of Fc $\epsilon$ R1, said beta subunit having an amino acid sequence as shown in Seq. I.D. No. 32

5,770,397

**METHOD OF USING EUKARYOTIC EXPRESSION VECTORS COMPRISING THE BK VIRUS ENHANCER**

Brian W. Grinnell, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 208,930, Mar. 9, 1994, Pat. No. 5,550,036, which is a continuation of Ser. No. 368,700, Jun. 20, 1989, abandoned, which is a continuation-in-part of Ser. No. 250,001, Sep. 27, 1988, abandoned, which is a continuation-in-part of Ser. No. 129,028, Dec. 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 849,999, Apr. 9, 1986, abandoned. This application Jun. 2, 1995, Ser. No. 459,916

Int. Cl.<sup>6</sup> C12P 21/02

U.S. Cl. 435—69.1

52 Claims

1. A method for increasing the activity of a BK enhancer with respect to a eukaryotic promoter that comprises placing said enhancer within 0 to 300 nucleotides upstream of the 5' end of the CAAT region of said eukaryotic promoter, subject to the limitation that said promoter is not the SV40 early promoter.

5,770,398

**VECTOR FOR INTEGRATION SITE INDEPENDENT GENE EXPRESSION IN MAMMALIAN HOST CELLS**

Franklin Grosveld, and Dimitris Kioussis, both of London, United Kingdom, assignors to Medical Research Council, London, United Kingdom

Division of Ser. No. 312,498, Sep. 26, 1994, Pat. No. 5,532,143, which is a continuation of Ser. No. 920,536, Jul. 28, 1992, abandoned, which is a continuation of Ser. No. 346,996, May 11, 1989, abandoned. This application Jun. 7, 1995, Ser. No. 483,998

Claims priority, application United Kingdom, Aug. 7, 1987, 8718779

Int. Cl.<sup>6</sup> C12N 15/85; 15/63; 15/67; 5/10

U.S. Cl. 435—69.1

16 Claims

1. An isolated DNA molecule, comprising:

- (i) a dominant activator sequence that is specific for a particular mammalian cell-type, and  
(ii) a structural gene, wherein

the region in said DNA consisting of (i) and (ii) and DNA therebetween has a nucleotide sequence different from that of naturally occurring DNA, and  
said dominant activator sequence being characterized in that, in naturally occurring DNA:

- (I) it is associated with a naturally occurring gene that is expressed in a tissue-specific manner; and  
(II) it is locatable in naturally occurring DNA by association with a DNase I super hypersensitive site;

wherein said dominant activator sequence is characterized in that it stimulates expression of said structural gene when said DNA molecule is integrated into a genome of a host cell of said mammalian cell-type, such that said expression:

- (a) is dependent on the number of copies of said gene that are integrated into said genome in that said expression increases as said number of copies of said gene increases; and  
(b) is independent of the integration site of said DNA molecule in said genome.

5,770,399

Patent Not Issued For This Number

5,770,400

**EXOGENOUS GENE EXPRESSION VECTOR CONTAINING CHICK  $\beta$ -ACTIN GENE PROMOTER**

Junichi Miyazaki, Ken-ichi Yamamura, Masatake Araki, Hiroshi Yonemura, and Chikateru Nozaki, all of Kumamoto, Japan, assignors to Juridical Foundation The Chemo-Sero-Therapeutic Research Institute, Kumamoto, Japan

Continuation of Ser. No. 373,143, Jun. 23, 1989. This application Mar. 10, 1997, Ser. No. 814,468

Claims priority, application Japan, Jun. 24, 1988, 63-157569; Dec. 9, 1988, 63-312444

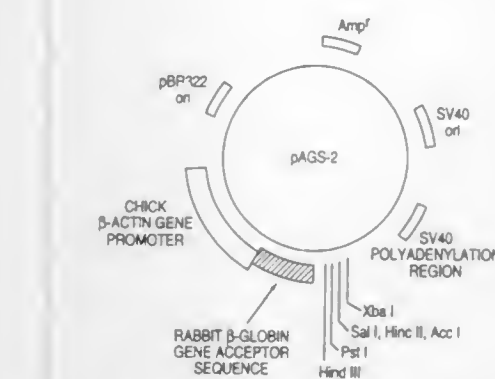
Int. Cl.<sup>6</sup> C12N 15/70; 15/85; C12P 21/02

U.S. Cl. 435—69.1

11 Claims

1. An expression vector for the expression of an exogenous gene in an animal cell, wherein said vector comprises a modified chick  $\beta$ -actin gene promoter and a restriction enzyme site for incorporating an exogenous gene downstream of said chick  $\beta$ -actin gene promoter, wherein said modified chick  $\beta$ -actin promoter is a hybrid promoter formed by:

- deleting a DNA fragment from the 3' end of said promoter, wherein said fragment (A) ranges from the middle of the intron of said promoter to a location downstream thereof and (B) comprises a splicing acceptor sequence, and



linking to the 3' end of said promoter a DNA fragment containing an alternate splicing acceptor sequence.

5,770,401

**METHODS AND COMPOSITIONS FOR TREATING ALLERGIC REACTIONS**

Michael F. Mullarkey, 1422 Eight Ave. West, Seattle, Wash. 98119

PCT No. PCT/US92/08775, § 371 Date Apr. 14, 1994, § 102(e) Date Apr. 14, 1994

Continuation of Ser. No. 776,624, Oct. 15, 1991, abandoned.

This PCT application Oct. 14, 1992, Ser. No. 211,667

Int. Cl.<sup>6</sup> C12P 21/02; C12N 15/00; C07H 19/00

U.S. Cl. 435—69.2

10 Claims

1. A method for treating tissue subject to reactions characterized as having late phase inflammatory responses comprising contacting the inflamed tissue with a preparation comprising at least one member selected from the group consisting of IL-1 receptors, TNF receptors, and receptor analogues thereof which are capable of binding either IL-1 or TNF.

5,770,402

**DNA ENCODING MACROPHAGE INFLAMMATORY PROTEIN-1 $\gamma$** 

Bruce A. Beutler, and Alexander N. Poltorak, both of Dallas, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Apr. 5, 1995, Ser. No. 418,032

Int. Cl.<sup>6</sup> C12N 15/19; C07K 14/52

U.S. Cl. 435—69.5

30 Claims

1. An isolated DNA segment that encodes a polypeptide having the sequence of SEQ ID NO:2 or the complement of said DNA segment.

5,770,403

**CLONING AND EXPRESSION OF HUMANIZED MONOCLONAL ANTIBODIES AGAINST HUMAN INTERLEUKIN-4**

Barbara Dalie, Maywood; Hung V. Le, Rockaway; Kenneth Miller, Edison; Nicholas J. Murgolo, Millington, all of N.J.; Hanh Nguyen, Brookline, Mass.; Stephen Tindall, Madison, and Paul J. Zavodny, Mountaintop, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Division of Ser. No. 290,793, Aug. 16, 1994, which is a continuation of Ser. No. 841,659, Feb. 19, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 469,557

Int. Cl.<sup>6</sup> C12P 21/04; C12N 15/00; C07H 21/04

U.S. Cl. 435—69.6

4 Claims

1. A nucleic acid which encodes a humanized antibody which comprises a variable region having the amino acid sequence of an antibody, selected from the group consisting of h25D2L-1, h25D2hH-1, h25D2H-2, h25D2H-3, h25D2H-4, and h25D2H-5.

5,770,404

**PREPARATION OF HEMOPROTEINS FROM APOPROTEINS AND HEME-LIKE PORPHYRINS DERIVED FROM CHLOROPHYLL**

Gerald W. Camiener, P.O. Box 39370, Solon, Ohio 44139

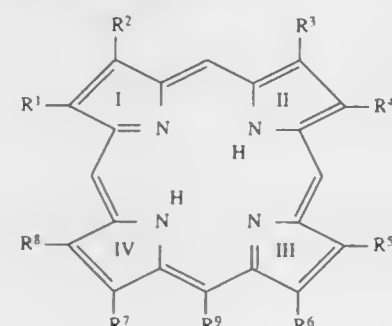
Filed Jun. 6, 1996, Ser. No. 659,416

Int. Cl.<sup>6</sup> C12P 21/04; A61K 38/16; C07B 47/00

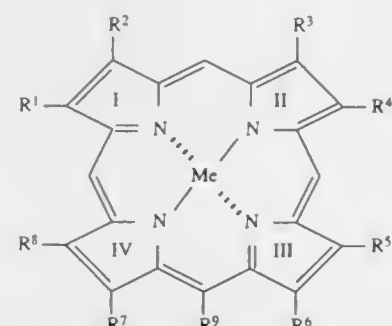
U.S. Cl. 435—70.1

30 Claims

1. A method of producing a hemoprotein comprising an apoprotein and a heme-like porphyrin wherein said heme porphyrin is represented by structure II or III:



(II)



(III)

wherein R<sup>1</sup> through R<sup>9</sup> independently represent hydrogen, methyl, ethyl, vinyl, propyl, hydroxymethyl, hydroxyethyl, hydroxypropyl, formyl, ethanoyl or propionyl and Me is a metal atom; wherein said heme-like porphyrin is obtained from chlorophyll; comprising the steps of

- a) contacting a composition comprising said heme-like porphyrin and a carrier with a fermentation or incubation medium containing naturally-occurring cells, genetically modified cells, organelles, organisms or combinations thereof, which produce an apoprotein; and
- b) collecting the hemoprotein produced in step a).

5,770,405

**ISOLATION AND COMPOSITION OF NOVEL GLYCOSIDASES**

Sharon T. Wong-Madden, Newburyport; Ellen P. Guthrie, Andover, both of Mass.; Christopher H. Taron, Champaign, Ill.; David Landry, Essex, Mass.; Chudi Guan, Wenham, Mass., and Phillips W. Robbins, Beverly, Mass., assignors to New England Biolabs, Inc.

PCT No. PCT/US94/10758, § 371 Date Jun. 5, 1996, § 102(e) Date Jun. 5, 1996, PCT Pub. No. WO95/08645, PCT Pub. Date Mar. 30, 1995

Continuation-in-part of Ser. No. 126,174, Sep. 23, 1993, abandoned. This PCT application Sep. 22, 1994, Ser. No. 596,250

Int. Cl.<sup>6</sup> C12P 19/44; C12N 9/24; C07H 1/00

U.S. Cl. 435—74

19 Claims

1. A composition comprising a purified glycosidase endogenous to Xanthomonas having a substrate specificity for GlcNAc $\beta$ 1-x, wherein the specificity of the glycosidase for GlcNAc $\beta$ 1-x is at least 100 fold greater than for GalNAc $\beta$ 1-x and wherein "GlcNAc" is N-acetylglucosamine, "GalNAc" is N-acetylgalactosamine and

"I-x" comprises a linkage between the carbon 1 of a specified monosaccharide and an unspecified carbon on an adjacent unspecified monosaccharide.

5,770,406

**ENZYME WITH  $\beta$ -(1-6)-ENDOGLUCANASE ACTIVITY**

Lene Venke Kofod, Brorfeldvej 8, DK-4350 Uggerløse; Lene Nonboe Andersen, Lindehøjvej 9, DK-3460 Birkerød; Markus Sakari Kauppinen, Egegade 10, 5, DK-2200 Copenhagen N; Stephan Christgau, Ræveskovvej 10A, DK-2820 Gentofte; Henrik Dalbøge, Parkvej 28, DK-2830 Virum, and Hans Sejr Olsen, Højbjerg Vang 7, DK-2840 Holte, all of Denmark

Filed Nov. 8, 1996, Ser. No. 745,977

Claims priority, application Denmark, May 11, 1994, 0547/94

Int. Cl.<sup>6</sup> C12P 19/44; D21C 1/00; C12N 9/24; 1/00

U.S. Cl. 435—74

13 Claims

1. A purified enzyme exhibiting endo-(1-6)- $\beta$ -glucanase activity, having the following characteristics:

- (a) derived from *Trichoderma harzianum*;
- (b) a pH optimum of about pH 5.0; and
- (c) a temperature optimum of between 30°–40° C.

5,770,407

**PROCESS FOR PREPARING NUCLEOTIDE INHIBITORS OF GLYCOSYLTRANSFERASES**

Chi-Huey Wong, Rancho Santa Fe, Calif., and Takashi Hayashi, Fushimi-ku, Japan, assignors to The Scripps Research Institute, La Jolla, Calif.

Filed Dec. 10, 1996, Ser. No. 763,227

Int. Cl.<sup>6</sup> C12Q 1/48; C12P 19/30; C07H 1/00

U.S. Cl. 435—89

27 Claims

1. A process for preparing a 2-deoxy-2-fluoro-glycosyl-pyranosyl phosphate comprising the following steps:

- Step A: fluorohydrinating a glycol with a fluoridating agent and a hydroxylating agent for producing a 2-deoxy-2-fluoro-glycoside; and then
- Step B: phosphorylating the 2-deoxy-2-fluoro-glycoside with a phosphorylating agent for producing a 2-deoxy-2-fluoro-glycosyl-pyranosyl phosphate.

5,770,408

**METHOD FOR THE AMPLIFICATION OF A BASE SEQUENCE**

Yoshihiro Sato, Toyota, Japan, assignor to Laboratory of Molecular Biophotonics, Shizuoka, Japan

Filed Jul. 10, 1996, Ser. No. 677,944

Claims priority, application Japan, Jul. 13, 1995, 7-177768

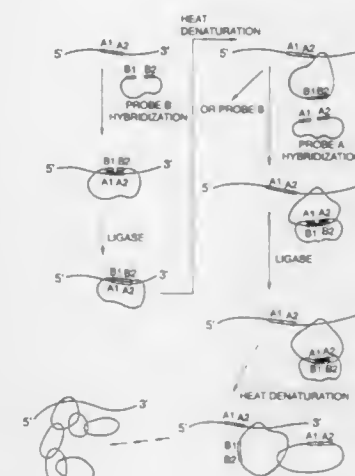
Int. Cl.<sup>6</sup> C12P 19/34; C12Q 1/68; C07H 21/04; 21/00

U.S. Cl. 435—91.2

8 Claims

1. A method for the amplification of a target base sequence A1A2 consisting of two successive base sequences, A1 and A2, in a single strand polynucleotide, which method comprises:

- (i) forming a first complex comprising said single strand polynucleotide interlocked with a ligated first probe B looped around said single strand polynucleotide by:
  - (i) hybridizing, with the target base sequence A1A2 of the single strand polynucleotide, the probe B consisting of a polynucleotide comprising the base sequence B1 complementary to said base sequence A1, a polynucleotide comprising a base sequence B2 complementary to said base sequence A2, and a linkage portion linking the two B1 and B2 polynucleotides.
  - (ii) ligating the 5'-end of the base sequence B1 in said probe B to the 3'-end of the base sequence B2 in said probe B, and
  - (iii) heat denaturing;



(2) forming a second complex comprising said first complex and a first probe A interlocked with said first probe B in said first complex by:

- (i) hybridizing, with the base sequence B1B2 of said looped first probe B, the probe A consisting of a polynucleotide comprising the base sequence A1 complementary to said base sequence B1, a polynucleotide comprising the base sequence A2 complementary to said base sequence B2, and a linkage portion linking the two A1 and A2 polynucleotides.
  - (ii) ligating the 5'-end of the base sequence A1 in said probe A to the 3'-end of the base sequence A2 in said probe A, and
  - (iii) heat denaturing.
- (3) interlocking another probe A with the base sequence B1B2 of said looped probe B in said second complex by steps (2)(i)–(iii), or interlocking another probe B with the base sequence A1A2 of said looped probe A in said second complex by steps (1)(i)–(iii) with the proviso that the base sequence A1A2 is of said looped probe A, and
- (4) repeating step (3) to form a structure with concatenate strands, thus amplifying the base sequence A1A2 of the single strand polynucleotide by amplifying the number of looped probes A and B fixed to said single strand polynucleotide.

5,770,409

**FERMENTATIVE PREPARATION OF LYSINE WITH A STRAIN OF *C. GLUTAMICUM***

Walter Pfefferle, Halle; Hermann Lotter, Hainburg; Heinz Friedrich, Hanau, and Wolfgang Degener, Bielefeld, all of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 198,374, Feb. 18, 1994, abandoned, which is a continuation of Ser. No. 942,804, Sep. 10, 1992, abandoned. This application Jul. 10, 1996, Ser. No. 677,911

Claims priority, application Germany, Sep. 17, 1991, 41 30 867.0

Int. Cl.<sup>6</sup> C12P 13/08; 13/04

U.S. Cl. 435—115

6 Claims

1. A process for the fermentative preparation of L-lysine, said process comprising:

- (a) cultivating the bacterial strain *Corynebacterium glutamicum* DSM 5715, in a nutrient medium in order to produce L-lysine,
- (b) continuously feeding said strain with an amount of sugar sufficient to maintain the sugar concentration in the nutrient medium at a concentration of less than 3 g/l for a time sufficient to accumulate L-lysine in the nutrient medium, and
- (c) isolating said L-lysine; wherein said sugar is sucrose or glucose.



5,770,410

## CHIRAL SYNTHESIS WITH MODIFIED ENZYMES

Helen Margaret Wilks, Charlottesville, Va.; Joseph John Holbrook, Timsbury, United Kingdom; Keith William Hart, Horefield, United Kingdom, and Ayman Elhawrani, Bristol, United Kingdom, assignors to Genzyme Corporation, Framingham, Mass.

Continuation of Ser. No. 256,959, Oct. 5, 1994, abandoned.

This application Nov. 12, 1996, Ser. No. 748,068

Claims priority, application United Kingdom, Jan. 30, 1992, 92 02033; Mar. 4, 1992, 92 04702

Int. Cl.<sup>6</sup> C12P 7/40; C12N 15/00; 9/04

U.S. Cl. 435—136

9 Claims

1. A method for enhancing the substrate specificity of an  $\alpha$ -hydroxy acid dehydrogenase enzyme, while retaining its catalytic activity, characterized in that it comprises: selecting an  $\alpha$ -hydroxy acid dehydrogenase enzyme containing a loop region, the tertiary structure of said enzyme being substantially known or deduced; identifying the location of the loop region of said enzyme; identifying or constructing unique restriction sites bounding the loop region in the DNA coding therefore; generating a DNA sequence which corresponds to at least a portion of the loop region, except that the nucleotides of at least one codon are randomized, and at least one codon is added to or deleted from the sequence; using the generated DNA sequence to replace the original such sequence; expressing the DNA including the generated DNA sequence; and selecting for an enzyme having enhanced substrate specificity so that the DNA coding therefor may be isolated; the randomized DNA being generated by means of a PCR assembly method.

5,770,411

## MICROBIAL PROCESS FOR THE PREPARATION OF DIHYDROXYACETONE WITH RECYCLING OF BIOMASS

Hans Leonard Ohrem, Weiterstadt, and Frank Westmeier, Munster, both of Germany, assignors to Merck Patent Gesellschaft Mit Beschränkter Haftung, Darmstadt, Germany

Filed Dec. 13, 1995, Ser. No. 571,671

Claims priority, application Germany, Dec. 14, 1994, 44 44 404.4

Int. Cl.<sup>6</sup> C12P 7/26; 7/28; 7/02

U.S. Cl. 435—148

26 Claims

1. In a process for the preparation of dihydroxyacetone by dehydrogenation of glycerol by means of microorganisms having sufficient dehydrogenase activity to dehydrogenate glycerol, in a plurality of production cycles, the improvement wherein:

said microorganisms are cultured in a culture medium containing monosaccharides or sugar alcohols to form preliminary culture, and wherein the amount of glycerol, if present in said culture medium, does not lead to an accumulation of dihydroxyacetone greater than 10 g/l,

after each production cycle is completed, biomass which is no longer capable of growth is reused in whole or in part for the next production cycle, and

preliminary culture capable of growth is added to at least one subsequent production cycle in such a manner that the yield of dihydroxyacetone does not fall below 4 g/l h.

5,770,412

## AZIDO-CAPROLACTAM AS INHIBITOR FOR SELECTING MICROORGANISMS WITH HIGH LYSINE PRODUCTIVITY

Wolfgang Ladner, Fussgoenheim; Uwe Pressler, Altrip, and Wolfgang Siegel, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation of Ser. No. 280,586, Jul. 25, 1994, abandoned, which is a continuation-in-part of Ser. No. 181,973, Jan. 18, 1994, abandoned, which is a continuation of Ser. No. 927,680, Sep. 3, 1992, abandoned. This application Mar. 12, 1996, Ser. No. 614,264

Claims priority, application Germany, Jul. 25, 1990, 40 23 576.9

Int. Cl.<sup>6</sup> C12N 15/00; C12P 13/08

U.S. Cl. 435—172.1

3 Claims

1. A process for stably increasing L-lysine in L-lysine-producing bacteria by mutation and selection steps which process comprises

a) mutating bacteria selected from the group consisting of *Brevibacterium ammoniagenes*, *Brevibacterium divaricatum*, *Brevibacterium flavum*, *Brevibacterium ketoglutamicum*, *Brevibacterium linens*, *Corynebacterium acetacidophilum*, *Corynebacterium acetoglutamicum*, *Corynebacterium glutamicum*, and *Corynebacterium lilium* with one or more mutagens, and

b) selecting strains that produce increased yields of L-lysine by culturing strains that survive said mutation step in a minimal medium having a concentration of 40 mM 2-azido- $\epsilon$ -caprolactam to select for mutants resistant to said compound, wherein said resistant strains produce increased yields of L-lysine.

5,770,413

## EXPRESSION OF PHYTASE IN PLANTS

Albert J. J. Van Ooijen, Voorburg; Krijn Rietveld, Vlaardingen; Andreas Hoekema, Oegstgeest; Jan Pen, Leiden; Peter Christian Sijmons, Amsterdam, and Teunis Cornelis Verwoerd, Leiden, all of Netherlands, assignors to Gist-brocades, B.V., Delft, and Mogen International, Leiden, both of Netherlands

Division of Ser. No. 146,424, Nov. 2, 1993, Pat. No. 5,593,963, which is a continuation-in-part of Ser. No. 756,864, Sep. 11, 1991, abandoned, which is a continuation-in-part of Ser. No. 586,765, Sep. 21, 1990, abandoned. This application Aug. 7, 1996, Ser. No. 693,709

Claims priority, application European Pat. Off., Mar. 25, 1991, 91200687

Int. Cl.<sup>6</sup> C12N 15/00; 15/82; A01N 5/00

U.S. Cl. 435—172.1

30 Claims

1. A method to produce a microbial phytase composition from plant cells, plant parts or plants, comprising the steps of:

preparing an expression construct which contains a DNA sequence encoding a phytase operably linked to regulatory sequences which direct the expression of the DNA sequence encoding phytase in a plant cell;

stably transforming a plant cell, plant part or plant with said expression construct;

culturing said plant cell, plant part or plant under conditions wherein said phytase-encoding DNA is expressed; and processing said plant cell, plant part or plant under conditions appropriate for the intended use of the composition.

5,770,414

## REGULATABLE RETROVIRUS SYSTEM FOR GENETIC MODIFICATION OF CELLS

Fred H. Gage, La Jolla; Jasodhara Ray, San Diego, both of Calif., and Minoru Hoshimaru, Shiga-ken, Japan, assignors to The Regents of the University of California, Oakland, Calif.

Filed Feb. 20, 1996, Ser. No. 602,203

Int. Cl.<sup>6</sup> C12N 15/00

U.S. Cl. 435—172.3

19 Claims

1. A retroviral vector comprising nucleic acid encoding: a regulatable tetracycline controlled transactivator (tTA) element and a selectable marker separated by an internal ribosome entry site (IRES), wherein a viral long terminal repeat (LTR) transcribes both the tTA element and the selectable marker, a heterologous gene; and a regulatory element containing tet operator (tet O) sequences, wherein the regulatory element is in operable linkage with the heterologous gene.

5,770,415

PEPTIDOGLYCAN BIOSYNTHETIC GENE MUR A FROM *STREPTOCOCCUS PNEUMONIAE*

Paul L. Skatrud, Indianapolis, and Robert B. Peery, Brownsburg, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 691,129, Aug. 1, 1996, Pat. No. 5,691,161. This application Mar. 17, 1997, Ser. No. 818,984

Int. Cl.<sup>6</sup> C12N 15/00; 9/10; 5/00; C07H 21/04

U.S. Cl. 435—172.3

10 Claims

1. An isolated nucleic acid which has the amino acid sequence which is SEQ ID NO 2.

5,770,416

## PERMEABLE HOLLOW PARTICLES HAVING AN OUTER SHELL OF MECHANICALLY RIGID POROUS MATERIAL

Allan Otto Fog Lihme, Birkerød; Thorkild Christian Bøgh-Hansen, Hellerup, and Claus Schäfer Nielsen, Humlebæk, all of Denmark, assignors to UpFront Chromatography A/S, Copenhagen, Denmark

Continuation of Ser. No. 784,394, Dec. 30, 1991, abandoned. This application Jun. 3, 1993, Ser. No. 70,847

Claims priority, application Denmark, May 26, 1989, 2597/89

Int. Cl.<sup>6</sup> C12N 11/14; 5/00; G01N 33/552; B01J 20/10

U.S. Cl. 435—176

21 Claims

1. A method for the preparation of permeable hollow particles having an outer shell of a mechanically rigid porous material, the size of the particles being within the range from 1  $\mu$ m to 5000  $\mu$ m, the method comprising:

(a) taking impermeable, substantially spherical, hollow, particles having an outer shell of a mechanically rigid material, the outer shell comprising a member selected from the group consisting of anhydrous forms of silicon dioxide, metal silicates, metal borosilicates, metal oxides, and boric oxide, the size of the particles being within the range from 1  $\mu$ m to 5000  $\mu$ m, and

(b) treating said hollow particles with one or more reagents selected from the group consisting of acids and bases capable of rendering said hollow particles permeable by the formation of through-going pores in the outer shell by chemical reaction or solvent/solute dissolution so as to form substantially spherical permeable hollow particles having a cavity defined by the inner surface of the outer shell, said cavity being connected with the surroundings by the through-going pores, the permeability of said particles being such as to permit chemical species to traverse their outer shell via said through-going pores, wherein step (b) is carried out at a temperature of about 20° C. to the boiling point of said acid or base obtained under reflux conditions open to the atmosphere;

with a first proviso that, if step (b) includes treatment with hydrochloric acid, then said treatment is not employed as the only

treatment or as an initial treatment when said particles of step (a) are soda-lime borosilicate glass,

and with a second proviso that, if step (b) includes treatment with orthophosphoric acid, then said treatment is not employed as the only treatment or as an initial treatment when said particles of step (a) are siliceous particles obtained as a component of the fly-ash formed upon combustion in a combustion plant, and with a third proviso that said mechanically rigid material is not a material selected from metal and alloys thereof.

5,770,417

## THREE-DIMENSIONAL FIBROUS SCAFFOLD CONTAINING ATTACHED CELLS FOR PRODUCING VASCULARIZED TISSUE IN VIVO

Joseph P. Vacanti, Winchester, and Robert S. Langer, Somerville, both of Mass., assignors to Massachusetts Institute of Technology Children's Medical Center Corporation, Cambridge, Mass.

Continuation of Ser. No. 482,028, Feb. 15, 1990, abandoned, which is a continuation of Ser. No. 401,640, Aug. 30, 1989, abandoned, which is a continuation of Ser. No. 933,018, Nov. 20, 1986, abandoned. This application Feb. 28, 1994, Ser. No. 203,705

Int. Cl.<sup>6</sup> C12N 11/08; 5/00; A61F 2/28; 2/18

U.S. Cl. 435—180

23 Claims

1. A cell-scaffold composition prepared in vitro for growing cells to produce functional vascularized organ tissue in vivo, comprising:

a fibrous three-dimensional scaffold composed of fibers of a biocompatible, non-biodegradable, synthetic polymer; and cells derived from a vascularized tissue attached in vitro to the surface of the fibers of the scaffold uniformly throughout the scaffold;

wherein the fibers of the scaffold provide sufficient surface area to permit attachment in vitro of an amount of the cells effective to produce the functional vascularized organ tissue in vivo;

wherein the fibers of the scaffold are spaced apart such that the maximum distance over which diffusion of nutrients and gases must occur through a mass of cells attached to the fibers is between 200 and 300 microns; and

wherein the diffusion provides free exchange of nutrients, gases and waste to and from the cells uniformly attached to the fibers of the scaffold and proliferating throughout the scaffold in an amount effective to maintain cell viability throughout the scaffold in the absence of vascularization.

5,770,418

## PURIFIED POLYPORUS LACCASES AND NUCLEIC ACIDS ENCODING SAME

Debbie Sue Yaver, Davis; Feng Xu, Woodland, both of Calif.; Henrik Dalbøge, Virum, Denmark; Palle Schneider, Bellerup, Denmark, and Dorrit A. Aelyng, Værløse, Denmark, assignors to Novo Nordisk A/S, Bagsvaerd, Denmark, and Novo Nordisk Biotech, Inc., Davis, Calif.

Continuation-in-part of Ser. No. 265,534, Jun. 24, 1994, abandoned. This application May 15, 1995, Ser. No. 441,147

Int. Cl.<sup>6</sup> C12N 15/53; 9/02; 15/63; 1/15

U.S. Cl. 435—189

28 Claims

1. A DNA construct comprising a nucleic acid sequence encoding a Polyporus laccase selected from the group consisting of:

(a) a nucleic acid sequence which encodes the amino acid sequence of SEQ ID NO:2, SEQ ID NO:4, SEQ ID NO:6, SEQ ID NO:8, or SEQ ID NO:10; and

(b) a nucleic acid sequence endogenous to a Polyporus strain, which is capable of hybridizing to (i) the nucleic acid sequence of SEQ ID NO:1, SEQ ID NO:3, SEQ ID NO:5, SEQ ID NO:7, or SEQ ID NO:9; or (ii) any of their complementary strands, at 65° C. in 1. 5 $\times$ SSPE, 1% SDS, 0. 5% non-fat dried milk, and 200  $\mu$ g/ml salmon sperm DNA.

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5,770,419

**MUTANTS OF MYCELIOPHTHORA LACCASE WITH ENHANCED ACTIVITY**

Xu Feng, Woodland; Randy M. Berka, and Jill Angela Wahleithner, both of Davis, all of Calif., assignors to Novo Nordisk Biotech, Inc., Davis, Calif.

Filed Aug. 30, 1996, Ser. No. 706,037

Int. Cl.<sup>6</sup> C12N 9/02

U.S. Cl. 435—189

18 Claims

1. A mutant of a Myceliophthora laccase which comprises a substitution of one or more amino acid residues in one or more regions which correspond to the regions 222GRRHRLRLN231 (SEQ ID NO:27), 308AIFHYAGAPG317 (SEQ ID NO:27), 361VTLDTTGTPLFVWKN376 (SEQ ID NO:27), 421ENDPGAPFTLPHPM433 (SEQ ID NO:27), and 497GAWLFHCHIAWHVSGGLGV515 (SEQ ID NO:27) of the amino acid sequence of the *Myceliophthora thermophila* laccase of SEQ ID NO:27 and the mutant has laccase activity.

5,770,420

**METHODS AND PRODUCTS FOR THE SYNTHESIS OF OLIGOSACCHARIDE STRUCTURES ON GLYCOPROTEINS, GLYCOLIPIDS, OR AS FREE MOLECULES, AND FOR THE ISOLATION OF CLONED GENETIC SEQUENCES THAT DETERMINE THESE STRUCTURES**

John B. Lowe, and Daniel J. Legault, both of Ann Arbor, Mich., assignors to The Regents of the University of Michigan, Ann Arbor, Mich.

Filed Sep. 8, 1995, Ser. No. 525,058

Int. Cl.<sup>6</sup> C12N 9/10; 1/20; 15/00; 5/00

U.S. Cl. 435—193

26 Claims

1. A polypeptide having an amino acid sequence selected from the group consisting of:

- (a) a first subsequence corresponding to amino acid positions 1 to 301 of SEQ ID NO: 2 connected to the amino terminus of a second subsequence corresponding to amino acid positions 301 to 359 of SEQ ID NO: 14;
- (b) a first subsequence corresponding to amino acid positions 1 to 160 of SEQ ID NO: 2 connected to the amino terminus of a second subsequence corresponding to amino acid positions 160 to 359 of SEQ ID NO: 14;
- (c) a first subsequence corresponding to amino acid positions 1 to 300 of SEQ ID NO: 14 connected to the amino terminus of a second subsequence corresponding to amino acid positions 302 to 361 of SEQ ID NO: 2;
- (d) a first subsequence corresponding to amino acid positions 1 to 159 of SEQ ID NO: 14 connected to the amino terminus of a second subsequence corresponding to amino acid positions 161 to 361 of SEQ ID NO: 2;
- (e) a first subsequence corresponding to amino acid positions 1 to 33 of SEQ ID NO: 2 connected to the amino terminus of a second subsequence corresponding to positions 34 to 69 of SEQ ID NO: 14 connected to the amino terminus of a third subsequence corresponding to amino acid positions 71 to 361 of SEQ ID NO: 2;
- (f) a first subsequence corresponding to amino acid positions 1 to 70 of SEQ ID NO: 2 connected to the amino terminus of a second subsequence corresponding to positions 70 to 85 of SEQ ID NO: 14 connected to the amino terminus of a third subsequence corresponding to amino acid positions 87 to 361 of SEQ ID NO: 2;
- (g) a first subsequence corresponding to amino acid positions 1 to 86 of SEQ ID NO: 2 connected to the amino terminus of a second subsequence corresponding to positions 86 to 98 of SEQ ID NO: 14 connected to the amino terminus of a third subsequence corresponding to amino acid positions 100 to 361 of SEQ ID NO: 2;
- (h) a first subsequence corresponding to amino acid positions 1 to 99 of SEQ ID NO: 2 connected to the amino terminus of a second subsequence corresponding to positions 99 to 129 of SEQ ID NO: 14 connected to the amino terminus of a third subsequence corresponding to amino acid positions 131 to 361 of SEQ ID NO: 2;

- (i) a first subsequence corresponding to amino acid positions 1 to 130 of SEQ ID NO: 2 connected to the amino terminus of a second subsequence corresponding to positions 130 to 159 of SEQ ID NO: 14 connected to the amino terminus of a third subsequence corresponding to amino acid positions 161 to 361 of SEQ ID NO: 2;
- (j) a first subsequence corresponding to amino acid positions 1 to 33 of SEQ ID NO: 14 connected to the amino terminus of a second subsequence corresponding to positions 34 to 70 of SEQ ID NO: 2 connected to the amino terminus of a third subsequence corresponding to amino acid positions 70 to 359 of SEQ ID NO: 14;
- (k) a first subsequence corresponding to amino acid positions 1 to 69 of SEQ ID NO: 14 connected to the amino terminus of a second subsequence corresponding to positions 71 to 86 of SEQ ID NO: 2 connected to the amino terminus of a third subsequence corresponding to amino acid positions 86 to 359 of SEQ ID NO: 14;
- (l) a first subsequence corresponding to amino acid positions 1 to 85 of SEQ ID NO: 14 connected to the amino terminus of a second subsequence corresponding to positions 87 to 99 of SEQ ID NO: 2 connected to the amino terminus of a third subsequence corresponding to amino acid positions 99 to 359 of SEQ ID NO: 14;
- (m) a first subsequence corresponding to amino acid positions 1 to 98 of SEQ ID NO: 14 connected to the amino terminus of a second subsequence corresponding to positions 100 to 130 of SEQ ID NO: 2 connected to the amino terminus of a third subsequence corresponding to amino acid positions 130 to 359 of SEQ ID NO: 14;
- (n) a first subsequence corresponding to amino acid positions 1 to 129 of SEQ ID NO: 14 connected to the amino terminus of a second subsequence corresponding to positions 131 to 160 of SEQ ID NO: 2 connected to the amino terminus of a third subsequence corresponding to amino acid positions 160 to 359 of SEQ ID NO: 14;
- (o) a first subsequence corresponding to amino acid positions 1 to 33 of SEQ ID NO: 2 connected to the amino terminus of a second subsequence corresponding to positions 34 to 98 of SEQ ID NO: 14 connected to the amino terminus of a third subsequence corresponding to amino acid positions 100 to 361 of SEQ ID NO: 2;
- (p) a first subsequence corresponding to amino acid positions 1 to 86 of SEQ ID NO: 2 connected to the amino terminus of a second subsequence corresponding to positions 86 to 159 of SEQ ID NO: 14 connected to the amino terminus of a third subsequence corresponding to amino acid positions 161 to 361 of SEQ ID NO: 2;
- (q) a first subsequence corresponding to amino acid positions 1 to 33 of SEQ ID NO: 14 connected to the amino terminus of a second subsequence corresponding to positions 34 to 99 of SEQ ID NO: 2 connected to the amino terminus of a third subsequence corresponding to amino acid positions 99 to 359 of SEQ ID NO: 14;
- (r) a first subsequence corresponding to amino acid positions 1 to 85 of SEQ ID NO: 14 connected to the amino terminus of a second subsequence corresponding to positions 87 to 160 of SEQ ID NO: 2 connected to the amino terminus of a third subsequence corresponding to amino acid positions 160 to 359 of SEQ ID NO: 14;
- (s) a first subsequence corresponding to amino acid positions 1 to 99 of SEQ ID NO: 2 connected to the amino terminus of a second subsequence corresponding to positions 99 to 159 of SEQ ID NO: 14 connected to the amino terminus of a third subsequence corresponding to amino acid positions 161 to 361 of SEQ ID NO: 2;
- (t) a first subsequence corresponding to amino acid positions 1 to 98 of SEQ ID NO: 14 connected to the amino terminus of a second subsequence corresponding to positions 100 to 160 of SEQ ID NO: 2 connected to the amino terminus of a third subsequence corresponding to amino acid positions 160 to 359 of SEQ ID NO: 14; and
- (u) a first subsequence corresponding to amino acid positions 1 to 99 of SEQ ID NO: 2 connected to the amino terminus of a second subsequence corresponding to positions 116 to 166 of SEQ ID NO: 11 connected to the amino terminus of a third subsequence corresponding to amino acid positions 161 to 361 of SEQ ID NO: 2.

5,770,421

**HUMAN ALK PROTEIN TYROSINE KINASE**

Stephan W. Morris, and A. Thomas Look, both of Memphis, Tenn., assignors to St. Jude Children's Research Hospital, Memphis, Tenn.

Continuation-in-part of Ser. No. 160,861, Dec. 3, 1993, Pat. No. 5,529,925. This application Oct. 12, 1995, Ser. No. 542,363

Int. Cl.<sup>6</sup> C12N 9/12; A61K 38/16

U.S. Cl. 435—194

12 Claims

1. An isolated human anaplastic lymphoma kinase (ALK) polypeptide, wherein said isolated ALK polypeptide  
(a) has tyrosine kinase activity; and  
(b) renders an interleukin-3-dependent lymphoid cell line factor independent.

5,770,422

**HUMAN TELOMERASE**

Kathleen Collins, Berkeley, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Jul. 8, 1996, Ser. No. 676,974

Int. Cl.<sup>6</sup> C12N 9/12; 1/20; 15/00; C07H 21/04

U.S. Cl. 435—194

3 Claims

1. An isolated protein comprising the amino acid of SEQ ID NO:1 or a functionally active fragment thereof.

5,770,423

**NUCLEIC ACIDS ENCODING CDC25 A AND CDC25 B PROTEINS AND METHOD OF MAKING CDC25 A AND CDC25 B PROTEINS**

David H. Beach, Huntington Bay, and Konstantin Galaktionov, Cold Spring Harbor, both of N.Y., assignors to Cold Spring Harbor Laboratory, Cold Spring Harbor, N.Y.  
Continuation-in-part of Ser. No. 124,569, Sep. 20, 1993, Pat. No. 5,441,880, which is a continuation of Ser. No. 793,601, Nov. 18, 1991, abandoned, and a continuation-in-part of Ser. No. 189,206, Jan. 31, 1994, Pat. No. 5,672,483, which is a continuation of Ser. No. 878,640, May 5, 1992, Pat. No. 5,294,538, which is a continuation-in-part of Ser. No. 793,601, Nov. 18, 1991, abandoned. This application Jan. 26, 1995, Ser. No. 379,685

Int. Cl.<sup>6</sup> C12P 19/56; C12N 5/00; 9/18; C07H 17/00

U.S. Cl. 435—197

36 Claims

1. An isolated nucleic acid encoding mammalian CDC25A protein, or the complementary sequence thereof.

5,770,424

**DNA CONSTRUCTS AND METHODS OF PRODUCING XYLANOLYTIC ENZYMES**

Helle Outtrup, Bellerup; Claus Dambmann, Søborg; Arne Agerlin Olsen, Virum; Henrik Bisgård-Frantzen, Lyngby; Martin Schülein, and Per Linaa Jørgensen, both of Copenhagen, all of Denmark, assignors to NovoNordisk A/S, Bagsvaerd, Denmark

Continuation-in-part of Ser. No. 470,398, Jun. 6, 1996, which is a continuation of Ser. No. 343,600, Nov. 30, 1994, abandoned. This application Aug. 16, 1996, Ser. No. 698,978

Int. Cl.<sup>6</sup> C12N 9/24; 1/20; 15/00; C07H 21/04

U.S. Cl. 435—200

12 Claims

1. A DNA construct comprising a DNA sequence encoding a xylanolytic enzyme, wherein the DNA sequence comprises  
a) the sequence of SEQ ID NO: 1; or  
b) a DNA sequence which  
(i) hybridizes with the DNA sequence of SEQ ID NO: 1 under conditions of high stringency;  
(ii) has at least 95% homology to the sequence of SEQ ID NO:1.

5,770,425

**HUMAN TISSUE PLASMINOGEN ACTIVATOR VARIANTS**

Stephen P. Anderson; Deborah L. Higgins, both of San Mateo; Adair J. Hotchkiss, Half Moon Bay, and Cara B. Marks, San Francisco, all of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 16,815, Feb. 11, 1993, Pat. No. 5,366,886, which is a continuation of Ser. No. 846,245, Feb. 19, 1992, Pat. No. 5,314,818, which is a continuation of Ser. No. 170,510, Mar. 21, 1988, Pat. No. 5,094,953. This application Jul. 18, 1994, Ser. No. 276,862

Int. Cl.<sup>6</sup> C12N 9/64; 9/48; 9/72

U.S. Cl. 435—226

4 Claims

1. A tissue plasminogen activator which has the identifiable characteristics of des 1-44E253E275 tPA.

5,770,426

**TISSUE PLASMINOGEN ACTIVATOR HAVING ZYMOGENIC OR FIBRIN SPECIFIC PROPERTIES**

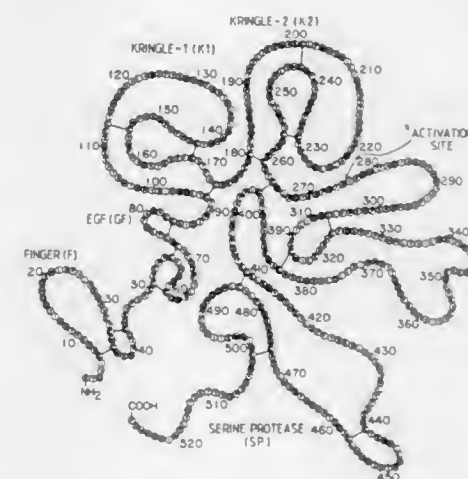
Stephen Anderson, Princeton, N.J.; William F. Bennett, San Mateo, Calif.; David Botstein, Belmont, Calif.; Deborah L. Higgins, San Mateo, Calif.; Nicholas F. Paoni, Moraga, Calif., and Mark J. Zoller, San Francisco, Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 422,736, Apr. 14, 1995, Pat. No. 5,616,486, which is a division of Ser. No. 179,059, Jan. 7, 1994, Pat. No. 5,411,871, which is a continuation of Ser. No. 88,451, Jul. 6, 1993, Pat. No. 5,520,913, which is a division of Ser. No. 770,510, Oct. 3, 1991, Pat. No. 5,262,170, which is a continuation of Ser. No. 384,608, Jul. 24, 1989, Pat. No. 5,108,901, which is a continuation-in-part of Ser. No. 240,856, Sep. 2, 1988, abandoned. This application Jun. 12, 1996, Ser. No. 660,986

Int. Cl.<sup>6</sup> A61K 38/48; C12N 9/64; 15/63

U.S. Cl. 435—226

11 Claims



1. A human tissue plasminogen activator (t-PA) variant substituted at each of amino acid positions 296-299, and devoid of at least a portion of the finger domain, the growth factor domain or the kringle I domain of wild-type human t-PA, capable of fibrin binding and converting plasminogen to plasmin.



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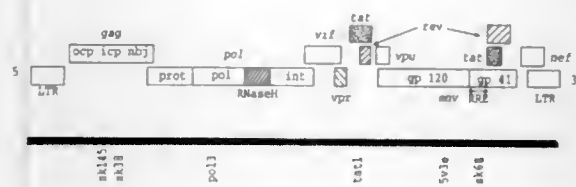
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5,770,427

RETROVIRUS FROM THE HIV GROUP AND ITS USE  
Lutz G. Guertler, Munich; Josef Eberle, Freising; Albrecht V. Brunn, Augsburg; Stefan Knapp, Marburg-Wehrshausen, and Hans-Peter Hauser, Marburg, all of Germany, assignors to Behring Diagnostics GmbH, Marburg, Germany  
Division of Ser. No. 132,653, Oct. 5, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 471,770

Claims priority, application Germany, Oct. 6, 1992, 42 33 646.5; Oct. 22, 1992, 42 35 718.7; Dec. 30, 1992, 42 44 541.8; Jun. 1, 1993, 43 18 186.4

Int. Cl.<sup>6</sup> C12N 7/00; 7/04; C12Q 1/70; A61K 39/21  
U.S. Cl. 435—235.1 2 Claims



1. A cDNA which is complementary to the RNA, or parts of said RNA which encode at least 15 amino acids, of an immunodeficiency virus having all the morphological and immunological properties of retrovirus MVP-5180/91 (SEQ ID NO:56) which has been deposited with the European Collection of Animal Cell Culture (ECACC) under No. V 920 92 318, and having a sequence homology of more than 70% to the env gene of the retrovirus MVP-5180/91.

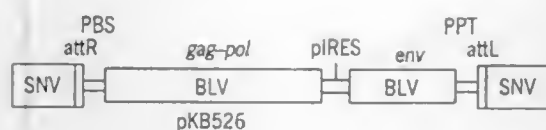
5,770,428

CHIMERIC RETROVIRAL EXPRESSION VECTORS AND PARTICLES CONTAINING A SIMPLE RETROVIRAL LONG TERMINAL REPEAT, BLV OR HIV CODING REGIONS AND CIS-ACTING REGULATORY SEQUENCES, AND AN RNA TRANSLATIONAL ENHANCER WITH INTERNAL RIBOSOME ENTRY SITE

Kathleen A. Boris-Lawrie, Columbus, Ohio, assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 264,115, Jun. 22, 1994, Pat. No. 5,554,524, which is a continuation of Ser. No. 21,622, Feb. 17, 1993, abandoned. This application Apr. 3, 1996, Ser. No. 627,845

Int. Cl.<sup>6</sup> C12N 7/00; 7/01; 15/00; 15/09  
U.S. Cl. 435—235.1 8 Claims



3. A replication competent retrovirus particle containing a single hybrid retroviral genome comprising the following elements:

- a simple retrovirus (S-type) long terminal repeat (LTR);
- the bovine leukemia virus (BLV) gag, pol, and env genes;
- the bovine leukemia virus (BLV) encapsidation signal (E), primer binding site (PBS), polypurine tract (PPT), and att site; and
- a nucleic acid encoding for an RNA translational enhancer containing an internal ribosome entry site (IRES) and positioned on the vector 3' to the gag and pol genes and 5' to the env gene;

wherein said retroviral genome is capable of being expressed in at least one of a tax- or rex-independent manner.

5,770,429

TRANSGENIC NON-HUMAN ANIMALS CAPABLE OF PRODUCING HETEROLOGOUS ANTIBODIES

Nils Lonberg, Redwood City, and Robert M. Kay, San Francisco, both of Calif., assignors to GenPharm International, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 352,322, Dec. 7, 1994, Pat. No. 5,625,126, which is a continuation-in-part of Ser. No. 209,741, Mar. 9, 1994, abandoned, which is a continuation-in-part of Ser. No. 165,699, Dec. 10, 1993, abandoned, which is a continuation-in-part of Ser. No. 161,739, Dec. 3, 1993, abandoned, which is a continuation-in-part of Ser. No. 155,301, Nov. 15, 1993, abandoned, which is a continuation-in-part of Ser. No. 96,762, Jul. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 53,131, Apr. 26, 1993, Pat. No. 5,661,016, which is a continuation-in-part of Ser. No. 990,860, Dec. 16, 1992, Pat. No. 5,545,806, which is a continuation-in-part of Ser. No. 904,068, Jun. 23, 1992, which is a continuation-in-part of Ser. No. 853,408, Mar. 18, 1992, which is a continuation-in-part of Ser. No. 810,279, Dec. 17, 1991, Pat. No. 5,569,825, which is a continuation-in-part of Ser. No. 575,962, Aug. 31, 1990, abandoned, which is a continuation-in-part of Ser. No. 574,748, Aug. 29, 1990, abandoned. This application Oct. 10, 1995, Ser. No. 544,404

Int. Cl.<sup>6</sup> A61K 39/00; C12N 5/00; 15/00; C12P 21/06; C07K 16/00

U.S. Cl. 435—240.2 16 Claims

1. A monoclonal human immunoglobulin composition free of other human proteins, comprising a human sequence IgG having a binding constant of at least  $2 \times 10^9 \text{ M}^{-1}$  for binding to a predetermined human antigen, wherein said immunoglobulin consists of:

- a somatically mutated human sequence light chain composed of (1) a light chain variable region having a polypeptide sequence which is substantially identical to a polypeptide sequence encoded by a human  $V_L$  gene segment and a human  $J_L$  segment, and (2) a light chain constant region having a polypeptide sequence which is substantially identical to a polypeptide sequence encoded by a human  $C_L$  gene segment; and

a somatically mutated human sequence heavy chain composed of (1) a heavy chain variable region having a polypeptide sequence which is substantially identical to a polypeptide sequence encoded by a human  $V_H$  gene segment, a D region, and a human  $J_H$  segment, and (2) a constant region having a polypeptide sequence which is substantially identical to a polypeptide sequence encoded by a human  $C_H$  gene segment wherein the human sequence heavy chain and human sequence light chain are separately encoded by a human heavy chain transgene and a human light chain transgene integrated into a mouse cell genome.

5,770,430

CELLULAR INJURY RESPONSE ELEMENT AND USES THEREOF

Stephen B. Howell, Del Mar, Calif., and Dennis P. Gately, Philadelphia, Pa., assignors to Research Development Foundation, Carson City, Nebr.

Filed Jun. 11, 1996, Ser. No. 661,649

Int. Cl.<sup>6</sup> C12N 5/00; 15/63; C07H 21/04

U.S. Cl. 435—240.2 16 Claims

1. A vector comprising a DNA sequence coding for a cellular injury response element promoter, said promoter having nucleotides -74 to -35 of the GADD153 promoter, relative to the start of transcription, in operable linkage:

- an origin of replication;
- a promoter; and
- a DNA sequence coding for said promoter.

5,770,431

BACILLUS THURINGIENSIS STRAINS ACTIVE AGAINST LEPIDOPTERAN AND COLEOPTERAN PESTS

Chi-Li Liu; Lee Fremont Adams; Patricia A. Lufburrow, and Michael David Thomas, all of Davis, Calif., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 337,358, Nov. 10, 1994, which is a continuation-in-part of Ser. No. 264,100, Jun. 22, 1994, abandoned, which is a continuation-in-part of Ser. No. 194,651, Feb. 9, 1994, abandoned, which is a continuation-in-part of Ser. No. 166,391, Dec. 13, 1993, abandoned, which is a continuation-in-part of Ser. No. 991,073, Dec. 15, 1992, abandoned. This application May 3, 1995, Ser. No. 433,783

Int. Cl.<sup>6</sup> C12N 15/32; 15/63; 1/21

U.S. Cl. 435—252.3 28 Claims

1. A nucleic acid fragment containing a nucleic acid sequence as depicted in Seq. ID. No.37 and encoding a delta-endotoxin or a portion of said delta-endotoxin having insecticidal activity against an insect pest of the order of Lepidoptera.

5,770,432

OBESITY ASSOCIATED GENES

Patsy Nishina; Konrad Noben-Trauth; Juergen Naggert, all of Bar Harbor, Me., and Michael North, La Jolla, Calif., assignors to Sequana Therapeutics, La Jolla, Calif., and Jackson Laboratory, Bar Harbor, Me.

Filed Apr. 10, 1996, Ser. No. 630,592

Int. Cl.<sup>6</sup> C07H 21/04; C12Q 1/68; C12N 15/74; 15/85

U.S. Cl. 435—252.3 6 Claims

1. An isolated nucleic acid molecule comprising a continuous open reading frame that encodes a tubby polypeptide consisting of the amino acid sequence as set forth in SEQ ID NO:2, or SEQ ID NO:7.

4. An isolated cell transfected with a nucleic acid molecule comprising a continuous open reading frame that encodes a human tubby polypeptide consisting of the amino acid sequence as set forth in SEQ ID NO:7.

6. An isolated cell transfected with a nucleic acid molecule comprising a continuous open reading frame that encodes a mouse tubby polypeptide consisting of the amino acid sequence as set forth in SEQ ID NO:2.

5,770,433

RECOMBINANT 47 AND 31KD COCOA PROTEINS AND PRECURSOR

Margaret Elizabeth Spencer, Sheffield; Rachel Hodge, Leicester; Edward Alfred Deakin, and Sean Ashton, both of Sheffield, all of England, assignors to Mars U.K. Limited, Berkshire, England

PCT No. PCT/GB91/00914, § 371 Date Jan. 21, 1993, § 102(e) Date Jan. 21, 1993, PCT Pub. No. WO91/19801, PCT Pub. Date Dec. 26, 1991

PCT Filed Jun. 7, 1991, Ser. No. 955,905

Claims priority, application United Kingdom, Jun. 11, 1990, 9013016

Int. Cl.<sup>6</sup> C12N 5/00; A23J 3/14; C07K 14/415

U.S. Cl. 435—252.33 14 Claims

1. An isolated and purified 67 kD protein of *Theobroma cacao*, having the amino acid sequence shown in FIG. 3 (SEQ ID NO:22).

5,770,434

SOLUBLE PEPTIDES HAVING CONSTRAINED, SECONDARY CONFORMATION IN SOLUTION AND METHOD OF MAKING SAME

William D. Huse, Del Mar, Calif., assignor to IXSYS Incorporated, San Diego, Calif.

Continuation of Ser. No. 978,893, Nov. 10, 1992, abandoned, which is a continuation-in-part of Ser. No. 767,436, Sep. 27, 1991, abandoned, which is a continuation-in-part of Ser. No. 590,664, Sep. 28, 1990, abandoned. This application May 15, 1995, Ser. No. 440,787

Int. Cl.<sup>6</sup> C12N 1/21; 15/63; 15/70

U.S. Cl. 435—252.33 37 Claims

1. A composition of matter comprising a plurality of *E. coli* cells containing a diverse population of expressible oligonucleotides, each of said oligonucleotides encoding a peptide having a desirable bias of predetermined covalent constraints, wherein each of said oligonucleotides is operationally linked to (i) expression elements, (ii) a suppressible stop codon and (iii) a nucleic acid encoding a coat protein contained within an *E. coli* filamentous bacteriophage vector so as to be expressed as a fusion protein with said coat protein of said *E. coli* filamentous bacteriophage in a suppressor host or as a secreted peptide in a non-suppressor host, said expressible oligonucleotides having a desirable bias of random codon sequences and wherein said plurality of *E. coli* cells comprise at least one of said expressible oligonucleotides which encodes a peptide with constrained secondary structure.

5,770,435

MUTANT *E. COLI* STRAIN WITH INCREASED SUCCINIC ACID PRODUCTION

Mark Donnelly, Warrenville; Cynthia S. Millard, Plainfield, and Lucy Stols, Woodridge, all of Ill., assignors to University of Chicago, Chicago, Ill.

Filed Nov. 2, 1995, Ser. No. 556,805

Int. Cl.<sup>6</sup> C12N 1/20; C12P 7/54; 7/46

U.S. Cl. 435—252.33 10 Claims

1. A method for isolating succinic acid producing bacteria comprising:

- isolating a facultative organism lacking the capacity to catabolize pyruvate;
- increasing the biomass of the organism in an aerobic process;
- subjecting the biomass to glucose-rich medium in an anaerobic environment to enable pyruvate-catabolizing mutants to grow; and
- isolating a mutant characterized in that it produces a mixture of succinic acid, acetic acid and ethanol as fermentation products, which as been derived from a parent which lacked the genes for pyruvate formate lyase and lactate dehydrogenase which belongs to the *E. coli* Group of Bacteria.

5,770,436

TREATMENT FOR CONTAMINATED MATERIAL

Thomas B. Mayfield, Cedar Park, Tex., assignor to ERC, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 247,002, May 20, 1994, Pat. No. 5,501,973, which is a continuation-in-part of Ser. No. 927,147, Aug. 7, 1992, abandoned. This application Mar. 25, 1996, Ser. No. 621,358

Int. Cl.<sup>6</sup> C02F 3/00; C12N 1/00; 1/38

U.S. Cl. 435—262.5 9 Claims

1. A method for treating contaminated material, the method comprising applying a treatment composition to the contaminated material, the treatment composition comprising water, powdered soft coal, an alkali metal carbonate, and algin extract solution, the ratio by weight of water to coal to alkali metal carbonate is about 18:6:1.

5,770,437

**ENZYME COMPOSITION FOR THE TREATMENT OF STICKY COTTON FIBER AND METHOD FOR THE TREATMENT OF STICKY COTTON FIBER WITH SUCH ENZYME COMPOSITION**

Oreste J. Lantero, Jr., Goshen, and Jayarama K. Shetty, Elkhart, both of Ind., assignors to Genencor International Indiana, Inc., Elkhart, Ind.

Division of Ser. No. 54,226, Apr. 30, 1993, Pat. No. 5,516,689.

This application Jun. 7, 1995, Ser. No. 487,391

Int. Cl.<sup>6</sup> D21C 1/00; D06M 16/00; C07G 17/00

U.S. Cl. 435—277

12 Claims

1. A method for the treatment of cotton fiber having honeydew thereon, said method comprising contacting said cotton fiber with an enzymatic composition including a pectinase, whereby the honeydew is at least partially hydrolyzed.

5,770,438

**PROCESS FOR ENANTIOSELECTIVE HYDROLYSIS OF  $\alpha$ -(2-AMINO)-PHENYL-BENZENEMETHANOL ESTER TYPE COMPOUNDS USING BACILLUS, PSEUDOMONAS OR STREPTOMYCES**

Kazuo Nakahama, Kyoto; Motowo Izawa, Hyogo; Yoichi Nagano, Osaka; Naoki Tarui, Osaka; Kiyoharu Matsumoto, Osaka; Masakuni Kori, Hyogo; Tsuneo Kanamaru, and Toshiaki Nagata, both of Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 31, 1995, Ser. No. 550,643

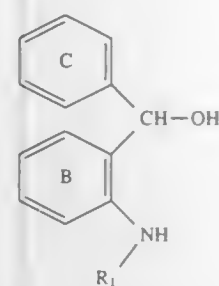
Claims priority, application Japan, Nov. 1, 1994, 6-269056; Mar. 7, 1995, 7-047156

Int. Cl.<sup>6</sup> C12P 41/00

U.S. Cl. 435—280

9 Claims

1. A process for producing an optically active form of a compound of the formula (IV), which comprises subjecting the O-acyl derivative of a racemic compound of the formula (IV):



wherein R<sub>1</sub> represents hydrogen or an alkanyl group; ring B represents a benzene ring that may be substituted; and ring C represents a benzene ring that may be substituted, and is dissimilar to ring B, or a salt thereof, to enzymatic enantioselective hydrolysis, wherein the hydrolysis is conducted using a microorganism selected from the group of genera consisting of Bacillus, Streptomyces or Pseudomonas, or a culture medium or preparation thereof capable of catalyzing said hydrolysis, or Lipase AP6 to provide an optically active form of said compound of formula (IV) or a salt thereof and the corresponding O-acyl derivative of its antipode.

5,770,439

**THICK-FILM CONDUCTIVITY ENZYME ELECTRODES IN A VERTICAL STACK AS BIOSENSOR**

Ursula Bilitewski; Wiebke Drewes, both of Braunschweig, and Franz Bechtold, Cadolzburg, all of Germany, assignors to Gesellschaft für Biotechnologische Forschung mbH (GBF), Braunschweig, Germany

Filed Sep. 28, 1992, Ser. No. 952,044

Claims priority, application Germany, Sep. 28, 1991, 41 32 441.2

Int. Cl.<sup>6</sup> C12M 1/40; G01N 27/327; 11/00; 11/14

U.S. Cl. 435—287.1

14 Claims

8. A conductivity biosensor, which comprises:  
A. a plurality of substrate layers pressed together in a vertical stack;  
B. each substrate layer bearing a conductive electrode formed thereon by screen printing a thick film paste; and  
C. each electrode having immobilized thereon an enzyme for sensing an analyte.

5,770,440

**APPARATUS FOR THE EARLY DETECTION OF MICROORGANISMS**

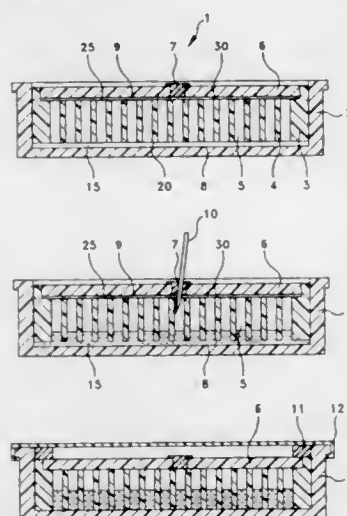
Klaus W. Berndt, Stewartstown, Pa., assignor to Becton Dickinson and Company, Franklin Lakes, N.J.

Continuation of Ser. No. 495,157, Jun. 27, 1995. This application May 2, 1997, Ser. No. 850,590

Int. Cl.<sup>6</sup> C12M 3/00

U.S. Cl. 435—288.4

10 Claims



1. An apparatus for detecting microorganisms comprising:  
a container for containing a specimen from a single patient and a culture medium, said container having an inner bottom surface;  
a block movably mounted inside said container and having a plurality of through holes separated by a plurality of inner walls and arranged in a pattern, said block being movable inside said container from a first position to a second position, wherein when said block is in said first position a first gap remains between the bottom of said block and the inner bottom surface of said container; and  
a movable cover plate having a rubber-like septum pressed into said container to prevent gas exchange between the inside of said container and the exterior of said container, said cover plate being movable from a first position to a second position, wherein when said cover plate is in said first position a second gap remains between said cover plate and the top of said block and the specimen from the single patient is injected into said container, and  
further wherein movement of said cover plate to said second position causes said block to move from said first position to said second position and presses the specimen from the single

patient into each of said plurality of through holes to form a plurality of separated partial specimens from the single patient.

5,770,441

**METHODS, APPARATUSES AND KITS FOR THE GROWTH AND/OR IDENTIFICATION OF MICROORGANISMS**

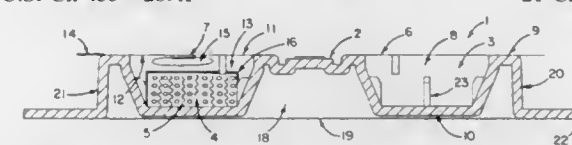
Stewart Lipton, 712 Clearview Dr., Glenview, Ill. 60025

Filed Sep. 30, 1996, Ser. No. 723,916

Int. Cl.<sup>6</sup> C12M 3/00

U.S. Cl. 435—289.1

21 Claims



1. A slide system apparatus for the growth and/or identification of microorganisms comprising:  
(1) a unitary member containing one or more compartments in which microorganisms may grow, and containing one or more openings through which air may flow from the outside environment into each of said compartments;  
(2) one or more porous support matrices present in each of the compartments present in the unitary member;  
(3) dehydrated media present within, or on one or more surfaces of, each of the solid support matrices; and  
(4) a cover sheet lying over the open end of each compartment and secured to the upper surfaces of the unitary member which surround the open end of each compartment, and having a pull tab.

5,770,442

**CHIMERIC ADENOVIRAL FIBER PROTEIN AND METHODS OF USING SAME**

Thomas J. Wickham, Bethesda, Md.; Erik Falck-Pedersen, Dobbs Ferry, N.Y.; Petrus W. Roelvink, Gaithersburg; Joseph T. Bruder, New Market, both of Md.; Jason Gall, New York, N.Y., and Imre Kovacs, Rockville, Md., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y., and GenVec, Inc., Rockville, Md.

Filed Feb. 21, 1995, Ser. No. 395,381

Int. Cl.<sup>6</sup> C12N 15/67; 15/86; C07H 21/04; C12P 21/02

U.S. Cl. 435—320.1

89 Claims

1. A chimeric adenovirus fiber protein which comprises a non-native amino acid sequence in addition to a native fiber amino acid sequence, wherein said nonnative amino acid sequence is a protease recognition sequence or a protein binding sequence selected from the group consisting of a protein binding sequence from a serotype of adenovirus that differs from the serotype of the native fiber amino acid sequence, a bispecific protein binding sequence, and a multispecific protein binding sequence.

5,770,443

**APOPTOSIS-MODULATING PROTEINS, DNA ENCODING THE PROTEINS AND METHODS OF USE THEREOF**

Michael C. Kiefer, Clayton, and Philip J. Barr, Berkeley, both of Calif., assignors to LXR Biotechnology Inc., Richmond, Calif.

Division of Ser. No. 320,157, Oct. 7, 1994, which is a continuation-in-part of Ser. No. 160,067, Nov. 30, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 471,058

Int. Cl.<sup>6</sup> C12N 15/09; 15/63

U.S. Cl. 435—325

30 Claims

1. An isolated nucleic acid molecule comprising a nucleotide sequence encoding the amino acid sequence of SEQ ID NO: 7 or the complement of said nucleotide sequence.

5,770,444

**GROWTH DIFFERENTIATION FACTOR-6**

Se-Jin Lee, and Thanh Huynh, both of Baltimore, Md., assignors to The Johns Hopkins University School of Medicine, Baltimore, Md.

PCT No. PCT/US94/07762, § 371 Date Apr. 15, 1996, § 102(e) Date Apr. 15, 1996, PCT Pub. No. WO95/01601, PCT Pub. Date Jan. 19, 1995

Continuation of Ser. No. 89,300, Jul. 9, 1993, abandoned. This PCT application Jul. 8, 1994, Ser. No. 581,529

Int. Cl.<sup>6</sup> C07K 14/475; C12N 1/19; 5/10; 15/12

U.S. Cl. 435—325

11 Claims

1. Substantially pure growth differentiation factor-6 (GDF-6) having the amino acid sequence as set forth in SEQ ID NO:6.

5,770,445

**GLUCAGON RECEPTOR PROTEINS, PEPTIDES, AND ANTIBODIES**

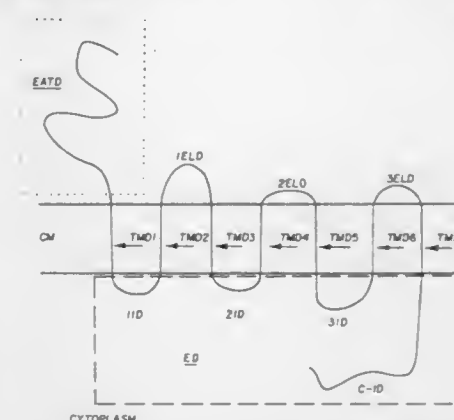
Wayne R. Kindsvogel; Laura J. Jelinek, both of Seattle; Paul O. Sheppard, Redmond; Francis J. Grant, Seattle; Joseph L. Kuijper, Bothell; Donald C. Foster, Seattle; Si Lok, Seattle, and Patrick J. O'Hara, Seattle, all of Wash., assignors to ZymoGenetics, Inc., Seattle, Wash.

Division of Ser. No. 86,631, Jul. 1, 1993, which is a continuation-in-part of Ser. No. 938,331, Aug. 28, 1992, abandoned. This application May 30, 1995, Ser. No. 453,956

Int. Cl.<sup>6</sup> C07K 14/72; 16/28; C12N 15/12

U.S. Cl. 435—334

18 Claims



1. An isolated and purified polypeptide comprising the amino acid sequence of a glucagon receptor having seven transmembrane domains, an N-terminal extracellular domain, a C-terminal intracellular domain, three extracellular loop domains, and three intracellular loop domains, wherein the receptor is capable of binding glucagon with a K<sub>D</sub> no greater than 100 nM and is capable of transducing signal in a suitable host cell in response to such binding, and wherein the receptor is encoded by DNA which hybridizes under conditions of high stringency to a probe having the nucleotide sequence of the complement of nucleotides 145–1599 of SEQ ID NO: 14 or nucleotides 53–1483 of SEQ ID NO: 24.

3. An isolated and purified polypeptide comprising the amino acid sequence of a glucagon receptor native to a mammal, the receptor having seven transmembrane domains, an N-terminal extracellular domain, a C-terminal intracellular domain, three extracellular loop domains, and three intracellular loop domains, wherein the receptor is encoded by DNA which hybridizes under conditions of high stringency to a probe having the nucleotide



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sequence of the complement of nucleotides 145-1599 of SEQ ID NO: 14 or nucleotides 53-1483 of SEQ ID NO: 24.

5,770,446

Patent Not Issued For This Number

5,770,447

#### CELL LINE FOR THE RAPID EXPRESSION OF FUNCTIONAL CALCIUM CHANNELS

James David Offord, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 467,203, Jun. 6, 1995, Pat. No. 5,712,158.

This application Sep. 4, 1997, Ser. No. 923,489

Int. Cl.<sup>6</sup> C12N 5/00; 15/00

U.S. Cl. 435—369

1 Claim

1. A method for determining the binding ability of a sample containing gabapentin comprising:

providing a vessel containing calcium channel subunits of 34893 2L cell line deposited under the Budapest Treaty as ATCC No. CRL-12108;

introducing into the vessel the sample containing gabapentin; and

determining the binding ability of gabapentin to the cells.

5,770,448

#### HUMAN EPITHELIAL CELL MATRIX AND USES THEREFOR

Jonathan C. R. Jones; Stephanie Stahl, both of Chicago, and Sigmund A. Weitzman, Winnetka, Ill., assignors to Northwestern University, Evanston, Ill.

Filed Mar. 29, 1996, Ser. No. 626,168

Int. Cl.<sup>6</sup> C12N 5/00; C07K 1/00

U.S. Cl. 435—325

23 Claims

1. A method of stimulating hemidesmosome formation in epithelial cells, comprising:

contacting epithelial cells other than MCF-10A cells with the matrix protein obtainable from MCF-10A human epithelial cells, the protein having the following characteristics:

it is capable of stimulating hemidesmosome formation; and it comprises polypeptides having molecular weights of about 100 kDa, 135 kDa and 150 kDa as determined by polyacrylamide gel electrophoresis under reducing conditions;

whereby the epithelial cells are stimulated to attach to a substrate and produce hemidesmosomes.

5,770,449

#### VECTOR FOR INTEGRATION SITE INDEPENDENT GENE EXPRESSION IN MAMMALIAN HOST CELLS WHICH PERMIT IMMUNOGLOBULIN GENE EXPRESSION

Sarah Jane Eccles, and Franklin Gerardus Grosveld, both of London, United Kingdom, assignors to Medical Research Council Ltd., London, United Kingdom

Division of Ser. No. 402,880, Mar. 1, 1995, abandoned, which is a continuation of Ser. No. 173,954, Dec. 28, 1993, abandoned, which is a continuation of Ser. No. 953,772, Sep. 30, 1992, abandoned, which is a continuation of Ser. No. 768,942, Oct. 22, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 483,999

Claims priority, application United Kingdom, Feb. 22, 1989, 8904009

Int. Cl.<sup>6</sup> C12N 5/10; 15/13; 15/67; 15/85

U.S. Cl. 435—375

11 Claims

1. In a method of obtaining production of a gene product in a mammalian host cell which permits immunoglobulin gene expression, the improvement comprising

introducing into said host cell a recombinant DNA comprising

(I) a dominant control region that is functional in a mammalian cell-type which permits immunoglobulin gene expression,

(ii) a promoter that is functional in said mammalian cell-type, and

(iii) a gene encoding said gene product operatively linked to said promoter, wherein the region in said DNA consisting of (I), (ii) and (iii) and DNA therebetween as a nucleotide sequence different from that of naturally occurring DNA, and said dominant control region being characterized in that it naturally occurring DNA:

(I) it is associated with a naturally occurring immunoglobulin gene locus; and

(II) it is locatable in naturally occurring DNA by association with a DNase I super hypersensitive site;

wherein said dominant control region is characterised in that it stimulates expression of said gene when said DNA molecule is integrated into a genome of a host cell which permits expression of said naturally occurring immunoglobulin gene locus, such that said expression:

(a) is independent on the number of copies of said gene that are integrated into said genome in that said expression increases as said number of copies of said gene increases; and

(b) is independent of the integration site of said DNA molecule in said genome.

5,770,450

#### ZEA MAYS PLANTS REGENERATED FROM PROTOPLASTS OR PROTOPLAST-DERIVED CELLS

Ray Shillito, Chapel Hill; Gleta Carswell, Cary; Christian Harms, Chapel Hill, all of N.C., and Yin-Fu Chang, Hayward, Calif., assignors to Novartis Finance Corporation

Continuation of Ser. No. 24,875, Mar. 1, 1993, Pat. No.

5,350,689, which is a continuation of Ser. No. 276,210, Nov. 23, 1988, abandoned, which is a continuation-in-part of Ser.

No. 178,170, Apr. 6, 1988, abandoned, which is a continuation-in-part of Ser. No. 56,552, May 29, 1987, abandoned, and Ser. No. 56,506, May 29, 1987, abandoned, which is a continuation-in-part of Ser. No. 53,241, May 22, 1987,

abandoned, which is a continuation-in-part of Ser. No. 52,440, May 20, 1987, abandoned. This application Jul. 1, 1994, Ser. No. 269,677

Int. Cl.<sup>6</sup> A01H 4/00; C12N 5/04

U.S. Cl. 435—424

24 Claims

15. A method for producing *Zea mays* protoplasts capable of regenerating fertile plants, which method comprises the steps of:

(a) obtaining embryogenic *Zea mays* callus that is relatively nonmucilaginous, and is granular and friable, said callus being obtained by culturing an immature *Zea mays* embryo on a callus-inducing medium comprising an auxin followed by the culture of said callus on a callus-maintaining medium comprising an auxin.

- (b) transferring the callus to a liquid medium to form a suspension of cells or cell aggregates,
- (c) subculturing the suspension under conditions sufficient to maintain the cells and cell aggregates in a viable state,
- (d) selecting and retaining those cultures from the subcultured suspension of step (c) that contain aggregates of dense, cytoplasmic, dividing cells, sufficient to obtain, in a viable, dividing stage, *Zea mays* protoplasts capable of being regenerated into fertile plants, and
- (e) removing the cell walls with suitable enzymes, and isolating *Zea mays* protoplasts.

5,770,451

#### LIQUID LIPOPROTEIN CONTROL

Wayne L. Ryan, and Bradford A. Hunsley, both of Omaha, Nebr., assignors to Streck Laboratories, Inc., Omaha, Nebr.

Continuation-in-part of Ser. No. 413,477, Mar. 30, 1995, Pat. No. 5,614,414. This application Mar. 24, 1997, Ser. No.

823,364

Int. Cl.<sup>6</sup> G01N 31/00

U.S. Cl. 436—13

22 Claims

1. A liquid lipoprotein control composition comprising:

- a) a lipoprotein;
- b) a surfactant present in an amount directly proportional to the amount of lipoprotein;
- c) a divalent cation present in an amount inversely proportional to the amount of lipoprotein; and
- d) an anti-oxidant.

5,770,452

#### QUANTITATIVE DETERMINATION OF LIPID, AND OF CO-EXISTING TWO COMPOUNDS

Nobuko Yamamoto, Isehara; Yasuko Tomida, Atsugi; Junji Ohyama, Yamato; Tsuyoshi Nomoto, and Masahiro Kawaguchi, both of Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

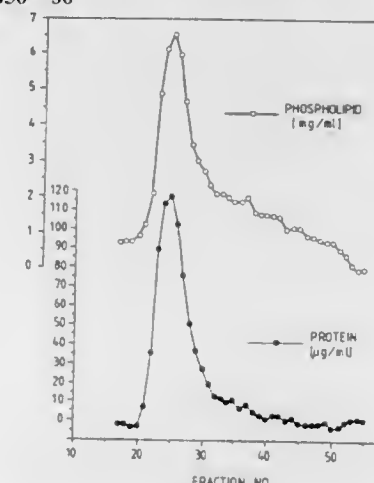
Division of Ser. No. 942,417, Sep. 9, 1992, Pat. No. 5,491,093. This application Jun. 2, 1995, Ser. No. 458,258

Claims priority, application Japan, Sep. 9, 1991, 3-228960; Sep. 9, 1991, 3-228961; Sep. 11, 1991, 3-231914

Int. Cl.<sup>6</sup> G01N 21/00

U.S. Cl. 436—86

8 Claims



1. A method of quantitative determination of lipid and protein, both of which coexist in a liquid sample, without separating either the lipid or the protein from the liquid sample, the lipid and the protein being capable of reacting with a color developing reagent to produce a reaction product which develops a color, comprising the steps of:

- providing first standard liquid samples of the lipid, all of which have known concentrations, and using a first known process (a) to measure absorbances of the first standard liquid samples

to obtain a relationship between the absorbances and the concentrations of the first standard liquid samples of the lipid, to calculate a first concentration constant (a1) of the lipid, providing first standard liquid samples of the protein, all of which have known concentrations, and using the process (a) to measure absorbances of the first standard liquid samples of the protein, to obtain a relationship between the absorbances and the concentrations of the first standard liquid samples of the protein, to calculate a first concentration constant (a2) of the protein, wherein said first known process (a) is capable of quantifying only said lipid or only said protein in said standard liquid samples;

providing second standard liquid samples of the lipid, all of which have known concentrations, and using a second known process (b) to measure absorbances of the second standard liquid samples, to obtain a relationship between the absorbances and the concentrations of the second standard liquid samples of the lipid to calculate a second concentration constant (b1) of the lipid;

providing second standard liquid samples of the protein, all of which have known concentrations, and using the process (b) to measure absorbances of the second standard liquid samples of the protein, to obtain a relationship between the absorbances and the concentrations of the second standard liquid samples of the protein to calculate a second concentration constant (b2) of the protein wherein said second known process (b) is capable of quantifying only said lipid or only said protein in said standard liquid samples;

providing the liquid sample containing the lipid and the protein whose concentrations are unknown, and using the processes (a) and (b) to measure absorbances (Va) and (Vb) of the liquid sample; and

deriving actual concentrations of the lipid (x) and the protein (y) from the calculation of simultaneous equations (I) and (II)

$$Va = x \cdot a1 + y \cdot a2 \quad (I)$$

$$Vb = x \cdot b1 + y \cdot b2 \quad (II)$$

wherein the first known process (a) is different from the second known process (b), and process (b) is a Lowry method of a BCA (bicinchoninic acid) method and at least one of the processes (a) and (b) comprises the steps of reacting at least one of the lipid and protein in a sample with said color developing reagent to cause the sample containing the lipid and protein, to develop a color, and measuring the absorbances (Va) and (Vb) of said color-developed sample wherein each of the processes (a) and (b) is capable of quantifying the lipid and protein in said liquid sample.

5,770,453

#### SENSORS FOR NEUTRAL MOLECULES

Paul Beer; Matthew Shade, and Zheng Chen, all of Oxford, Great Britain, assignors to The Secretary of State for Defence in her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland

PCT No. PCT/GB94/02276, § 371 Date Apr. 23, 1996, § 102(e) Date Apr. 23, 1996, PCT Pub. No. WO95/11449, PCT Pub. Date Apr. 27, 1995

PCT Filed Oct. 18, 1994, Ser. No. 633,775

Claims priority, application United Kingdom, Oct. 19, 1993, 9321545

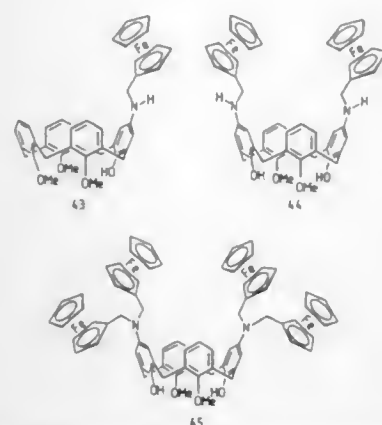
Int. Cl.<sup>6</sup> G01N 27/333; 33/00; C08K 5/15

U.S. Cl. 436—149

26 Claims

1. A method for the detection of an uncharged chemical agent present in a sample comprising the steps of

- (1) exposing a calixarene, having a cyclic array of phenolic methylene monomers and having one or more redox active substituents on its upper rim, to a solution or suspension of the sample,
- (2) measuring any change in electrical properties of the calixarene during or after exposure to the solution or suspension as compared to a reference condition, and



(3) relating such change in electrical properties to the presence of said chemical agent.

5,770,454

**METHOD AND APPARATUS FOR DETERMINING AN ANALYTE IN A BIOLOGICAL SAMPLE**

Matthias Essenpreis, Gauting; Dirk Boecker, Heidelberg; Heinz-Michael Hein, Seeheim-Jugenheim, and Hans-Peter Haar, Wiesloch, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany  
PCT No. PCT/DE95/00593, § 371 Date Nov. 7, 1996, § 102(e) Date Nov. 7, 1996, PCT Pub. No. WO95/32416, PCT Pub. Date Nov. 30, 1995

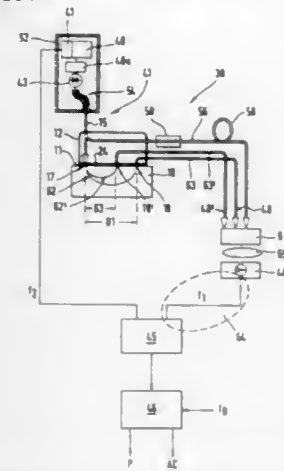
PCT Filed May 3, 1995, Ser. No. 737,135

Claims priority, application Germany, May 19, 1994, 44 17 639.2

Int. Cl.<sup>6</sup> G01N 21/00

U.S. Cl. 436—164

51 Claims



1. A method for the analytical determination of a concentration of an analyte in a biological sample, said method comprising the steps of:

performing at least two detection measurements, each detection measurement comprising the step of irradiating light at an irradiation site as primary light into the biological sample through a boundary surface thereof, said light being propagated along a light path within the biological sample, and detecting light as the light emerges from the biological sample as secondary light through a detection site at the boundary surface, said irradiation site and said detection site being separated by a predetermined measuring distance; wherein said at least two detection measurements are carried out with at least two different measurement light paths between the irradiation site and the detection site, said at least two different measurement light paths being provided by a plurality of detection sites with a plurality of detection means, each of said plurality of detection sites having different measuring distances from the irradiation site, each of said at least two detection measurements is a frequency-domain spectroscopic

measurement being performed at at least two different wavelengths of light, and wherein each frequency-domain spectroscopic measurement includes a comparison of a phase shift of the secondary light with the primary light as a first measurement variable and an intensity of the secondary light as a second measurement variable, said method further comprising a step of

determining an analyte concentration in the biological sample based upon the first and second measurement variables.

5,770,455

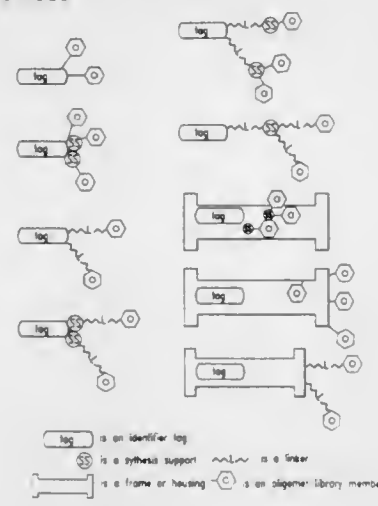
**METHODS AND APPARATUS FOR SYNTHESIZING LABELED COMBINATORIAL CHEMISTRY LIBRARIES**

John Cargill, San Diego, and Robert W. Armstrong, Los Angeles, both of Calif., assignors to Ontogen Corporation, Carlsbad, Calif.

Division of Ser. No. 383,766, Feb. 2, 1995, which is a continuation-in-part of Ser. No. 180,863, Jan. 13, 1994, abandoned, which is a continuation-in-part of Ser. No. 92,863, Jul. 19, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 480,438

Int. Cl.<sup>6</sup> G01N 33/543; 33/544  
U.S. Cl. 436—518

6 Claims



1. A pre-encoded substrate useful for being linked to a single oligomer structure whereby said pre-encoded substrate bears a unique identifier, said tag being a pre-encoded microchip identifying said oligomer structure.

2. An encodable substrate useful for being linked to a single oligomer structure whereby said encodable substrate has a unique identifier, said tag being an encodable microchip identifying said oligomer structure.

5,770,456

**CYCLOC NUCLEIC ACID AND POLYPEPTIDE ARRAYS**

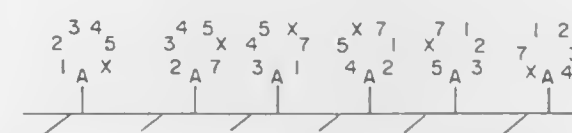
Christopher P. Holmes, Saratoga, Calif., assignor to Affymetrix, Inc., Santa Clara, Calif.

Continuation of Ser. No. 972,007, Nov. 5, 1992, Pat. No. 5,527,681, which is a continuation-in-part of Ser. No. 796,727, Nov. 22, 1991, Pat. No. 5,242,974, and Ser. No. 805,727, Dec. 6, 1991, Pat. No. 5,424,186, which is a continuation-in-part of Ser. No. 624,120, Dec. 6, 1990, abandoned, which is a continuation-in-part of Ser. No. 492,462, Mar. 7, 1990, Pat. No. 5,143,854, which is a continuation-in-part of Ser. No. 362,901, Jun. 7, 1989, abandoned. This application May 13, 1996, Ser. No. 647,618

Int. Cl.<sup>6</sup> G01N 33/534; C07H 19/06  
U.S. Cl. 436—518

10 Claims

1. An array of cyclic nucleic acids on a substrate, said nucleic acids having N nucleotide positions, said substrate comprising N different sites, said substrate sites comprising said cyclic nucleic



acids coupled thereto, said cyclic nucleic acids comprising common nucleotide sequences but coupled to said substrate at a different one of said nucleotide positions via a tether molecule in each of said different substrate sites.

5. An array of cyclic polypeptides on a substrate, said polypeptides having N amino acid positions, said substrate comprising N different sites, said substrate sites comprising said cyclic polypeptides coupled thereto, said cyclic polypeptides comprising common amino acid sequences but coupled to said substrate at a different one of said amino acid positions via a tether molecule in each of said different substrate sites.

5,770,457

**RAPID ONESIDE SINGLE TARGETING (ROST) IMMUNOASSAY METHOD**

Ronald Helmut Stöcker, Monheim, and Margit Doth, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

PCT No. PCT/EP95/01829, § 371 Date Nov. 20, 1996, § 102(e) Date Nov. 20, 1996, PCT Pub. No. WO95/33204, PCT Pub. Date Dec. 7, 1995

PCT Filed May 15, 1995, Ser. No. 737,901

Claims priority, application Germany, May 27, 1994, 44 18 513.8

Int. Cl.<sup>6</sup> G01N 33/53

U.S. Cl. 436—518

5 Claims

1. A method for the determination of the amount of an antigen, comprising:

- incubating said antigen and a first antibody in the presence of an immobilized second antibody, wherein said first antibody is specifically reactive with said antigen, and said second antibody is immobilized on a matrix and binds said first antibody if said first antibody is not bound to said antigen, but does not bind said first antibody if said first antibody is bound to said antigen;
- separating first antibody in a supernatant from first antibody bound to said second antibody immobilized on said matrix; and
- determining the amount of said first antibody in said supernatant or the amount of said first antibody bound to said second antibody immobilized on said matrix to give an indication of the amount of said antigen.

5,770,458

**APPARATUS AND METHOD FOR CONDUCTING A BINDING ASSAY ON AN ABSORBANT CARRIER MATERIAL**

Alexei Dmitri Klimov, Princeton, and Shioh-Chuan Jane Tsai, Flemington, both of N.J., assignors to Roche Diagnostics Systems, Inc., Branchburg, N.J.

Continuation of Ser. No. 385,300, Feb. 10, 1995, abandoned.

This application Jun. 17, 1997, Ser. No. 877,189

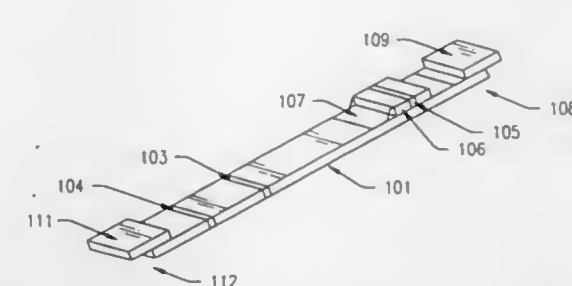
Int. Cl.<sup>6</sup> G01N 33/543

U.S. Cl. 436—518

19 Claims

1. An apparatus for conducting a binding assay, which comprises:

- a main membrane formed from an absorbant material and having a first reagent immobilized thereon at a first predetermined location, the first reagent having an affinity to find with an analyte or a second labeled reagent, the main membrane having a beginning end located at the most rearward position on the main membrane and a terminal end located at the most forward position on the main membrane with the first prede-



terminated location being located between the beginning end and the terminal end; and

(b) a top membrane formed from an absorbant material, the top membrane being configured, dimensioned and positioned so that it contacts the main membrane at a position forward of the beginning end of the main membrane and rearward of the first predetermined position on the main membrane, the top membrane having the second labeled reagent releasably immobilized thereon at a second predetermined location, the second labeled reagent having an affinity to bind with the analyte or the first reagent, the main membrane and the top membrane being positioned so that a sample introduced at the beginning end of the main membrane would split into two flows, the first flow continuing to flow in a direction from the beginning end toward the terminal end of the main membrane and the second flow flowing parallel to the first flow through the top membrane to cause the second labeled reagent to be released into the second flow, the second flow containing the second labeled reagent then reentering the main membrane and reuniting with the first flow so that the combined flow containing the second labeled reagent flows toward the first reagent immobilized at the first predetermined location.

5,770,459

**METHODS AND APPARATUS FOR IMPROVED LUMINESCENCE ASSAYS USING PARTICLE CONCENTRATION, ELECTROCHEMICAL GENERATION OF CHEMILUMINESCENCE DETECTION**

Richard J. Massey, Rockville; Gary F. Blackburn, Gaithersburg; Elizabeth W. Wilkins, Germantown, and Jonathan K. Leland, Laurel, all of Md., assignors to IGEN International, Inc., Gaithersburg, Md.

Continuation of Ser. No. 728,093, Jul. 10, 1991, abandoned, which is a continuation-in-part of Ser. No. 652,427, Feb. 6, 1991, abandoned, which is a continuation-in-part of Ser. No. 539,389, Jun. 18, 1990, abandoned, which is a continuation of Ser. No. 266,882, Nov. 3, 1988, abandoned, which is a continuation-in-part of Ser. No. 117,017, Nov. 4, 1987, abandoned, which is a continuation-in-part of Ser. No. 858,354, Apr. 30, 1986, abandoned. This application Dec. 1, 1994, Ser. No. 348,749

Int. Cl.<sup>6</sup> G01N 33/53

U.S. Cl. 436—526

23 Claims

1. A method for performing a binding assay for an analyte of interest possibly present in a sample comprising the steps of:

- forming a composition containing:
    - said sample
    - an assay-performance-substance containing at least one component selected from the group consisting of:
      - added analyte of interest or added analogue of said analyte;
      - one or more binding partners of said analyte or said analogue; and
      - one or more reactive components capable of binding with (1) or (2);
- wherein said assay-performance-substance further contains a label compound linked to at least one of said components, and wherein said label compound is capable of chemiluminescing when triggered, and





**5,770,465  
TRENCH-FILLING ETCH-MASKING  
MICROFABRICATION TECHNIQUE**

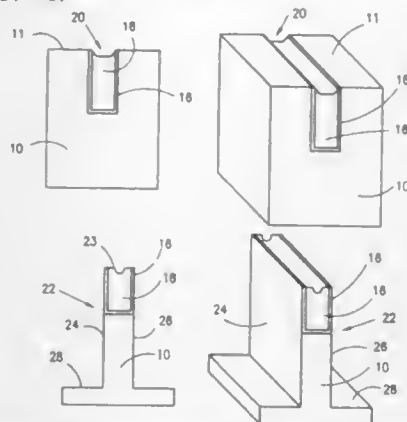
Noel C. MacDonald; Xiaojun Trent Huang, and Liang-Yuh Chen, all of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jun. 21, 1996, Ser. No. 668,378

Int. Cl.<sup>6</sup> H01L 21/76

U.S. Cl. 437—67

6 Claims



4. A process for manufacturing submicron, ultra-high aspect ratio microstructures using trench filling masks of differing heights comprising the steps of:

- etching a first trench into a substrate to a depth equal to a first predetermined desired mask height;
- etching a second trench into said substrate to a depth equal to a second predetermined desired mask height;
- filling said first and second trenches with a trench filling material;
- planarizing said trench filling material to a level exposing a top surface of said substrate; and,
- etching said substrate wherein said trench filling material serves as an etch mask, preventing etching of said substrate immediately below said trench filling material.

**5,770,466  
SEMICONDUCTOR OPTICAL INTEGRATED CIRCUITS  
AND METHOD FOR FABRICATING THE SAME**

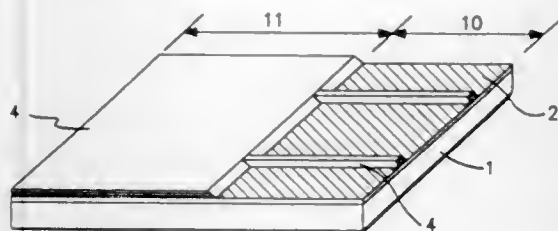
Tatsuya Sasaki; Mitsuhiro Kitamura; Kiichi Hamamoto; Shota Kitamura; Keiro Komatsu, and Yasutaka Sakata, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan Division of Ser. No. 179,049, Jan. 7, 1994. This application Mar. 8, 1995, Ser. No. 400,570

Claims priority, application Japan, Jan. 7, 1993, 5-914; Jun. 25, 1993, 5-154040; Jun. 25, 1993, 5-154042; Dec. 28, 1993, 5-337967

Int. Cl.<sup>6</sup> H01L 21/20

U.S. Cl. 437—89

28 Claims



1. A method of fabricating an optical monolithic-integrated semiconductor device on a semiconductor substrate having active and passive regions, said method comprising the steps of: providing a first mask material only in said active region, said first mask material varying in width, and defining a first selective growth area in said active region; growing epitaxial layers including a multiple quantum well structure by a metal organic vapor phase epitaxy using said first mask material, so that said epitaxial layers are grown

selectively on said first selective growth area in said active region and simultaneously grown non-selectively on an entire surface of said passive region, said epitaxial layers having variations in their band gap energy and thickness in a waveguide direction, said quantum well structure in said active region having varied band gap energies which are smaller than a band gap energy of said quantum well structure in said passive region, said epitaxial layers having a mesa structure in said active region and having a plane structure in said passive region;

removing said first mask material; providing a second mask material which remains unchanged in its width over said active and passive regions, said second mask material defining a second selective growth area over said active and passive regions; and growing a cladding layer with a ridged structure by a metal organic vapor phase epitaxy on an entire surface of said second selective growth area, so that in said active region said ridged structure of said cladding layer completely embeds said mesa structure of said mesa epitaxial layers, and so that in said passive region, said ridged structure of said cladding layer is placed on said plane structure of said epitaxial layers.

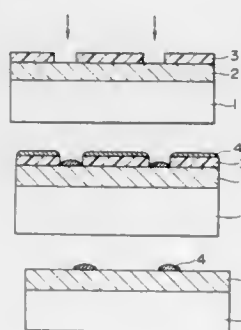
**5,770,467  
METHOD FOR FORMING ELECTRODE ON DIAMOND  
FOR ELECTRONIC DEVICES**

Kozo Nishimura; Koji Kobashi; Shigeaki Miyauchi; Rie Kato; Hisashi Koyama, and Kimitsugu Saito, all of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan Continuation of Ser. No. 219,422, Mar. 29, 1994, abandoned, which is a continuation of Ser. No. 958,754, Oct. 9, 1992, abandoned. This application Mar. 29, 1996, Ser. No. 622,858 Claims priority, application Japan, Oct. 11, 1991, 3-264159

Int. Cl.<sup>6</sup> H01L 21/441

U.S. Cl. 437—187

1 Claim



1. A method for forming an electronic device, comprising the steps of:

- coating a surface of a diamond with a photoresist; followed by photolithographically forming openings in the photoresist according to a specified electrode pattern, thereby exposing a region or regions of said surface through said openings; followed by treating said region or regions of said surface with a plasma, without damaging said photoresist; followed by depositing a thin metal film on said photoresist and said region or regions of said surface; followed by removing the photoresist from said surface; followed by performing a heat treatment on said diamond with said thin metal film thereon; wherein said plasma is generated by an alternating current, said plasma consists essentially of at least one gas selected from the group consisting of helium, neon, argon, krypton, xenon and nitrogen, said thin metal film comprises titanium or gold, and said plasma is generated by a RF output of less than 600 W.

**5,770,468  
PROCESS FOR MOUNTING A SEMICONDUCTOR CHIP  
TO A CHIP CARRIER BY EXPOSING A SOLDER LAYER  
TO A REDUCING ATMOSPHERE**

Katsuya Kosaki, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 57,790, May 6, 1993, Pat. No. 5,338,967.

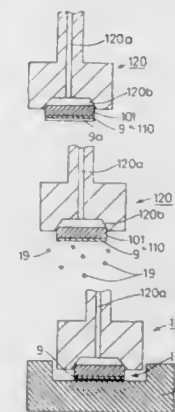
This application May 18, 1994, Ser. No. 245,657

Claims priority, application Japan, Jan. 12, 1993, 5-003034

Int. Cl.<sup>6</sup> H01L 21/58

U.S. Cl. 437—210

11 Claims



1. A method of producing a semiconductor chip on a chip carrier comprising:

- forming a solder layer on a rear surface of a semiconductor chip having a front surface with an active element thereon;
- picking up the semiconductor chip with a collet after forming the solder layer with the rear surface of the semiconductor chip facing away from the collet;
- exposing a lower surface of the solder layer facing away from the semiconductor chip to a reducing atmosphere to remove an oxide film on the lower surface of the solder layer while supporting the semiconductor chip with the collet;
- placing the semiconductor chip on a chip carrier with the lower surface of the solder layer contacting the chip carrier after removing the oxide film; and
- applying heat and pressure to the semiconductor chip to adhere the semiconductor chip to the chip carrier by means of the solder layer.

**5,770,469  
METHOD FOR FORMING SEMICONDUCTOR  
STRUCTURE USING MODULATION DOPED SILICATE  
GLASSES**

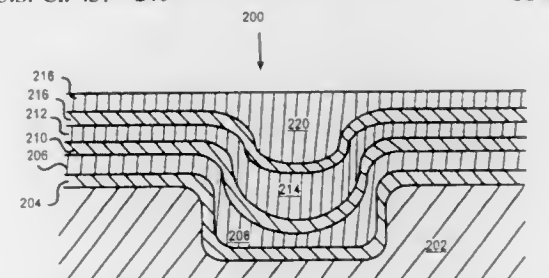
Kevin J. Uram, Union City; John K. Shugrue; Nathan P. Sandler, both of Fremont, all of Calif.; Son Van Nguyen, Hopewell Junction, and Matthias Ilg, Fishkill, both of N.Y., assignors to Lam Research Corporation, Fremont, Calif.

Filed Dec. 29, 1995, Ser. No. 578,165

Int. Cl.<sup>6</sup> H01L 21/316

U.S. Cl. 437—240

38 Claims



1. On a substrate of a wafer, a method for fabricating a semiconductor structure utilizing doped silicate glass, comprising the step of:

- forming a modulation doped silicate glass structure over a first layer of said wafer by depositing at least two alternating

layers of heavily-doped silicate glass and lightly-doped silicate glass over said first layer, wherein said heavily-doped silicate glass layer and said lightly-doped silicate mass layer are deposited and reflowed substantially simultaneously at a temperature of about 650° C. to about 800° C. and wherein said heavily-doped silicate glass layer and said lightly-doped silicate glass layer of said modulation doped silicate glass structure are permitted to remain in a modulated, non-homogenous state after said semiconductor structure is fabricated.

**5,770,470  
HIGH TEMPERATURE SUPERCONDUCTING ELECTRIC  
FIELD EFFECT DEVICE AND A METHOD FOR  
FABRICATING THE SAME**

Gun-Yong Sung, and Jeong-Dae Suh, both of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

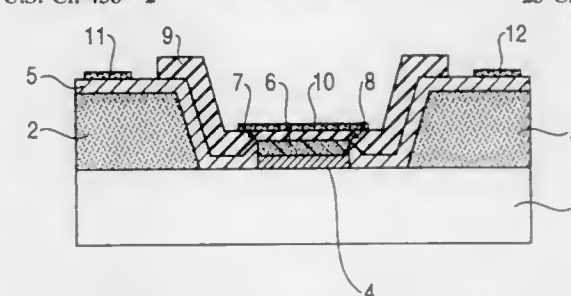
Filed Aug. 8, 1996, Ser. No. 694,300

Claims priority, application Rep. of Korea, Dec. 21, 1995, 95-53636

Int. Cl.<sup>6</sup> H01B 12/00

U.S. Cl. 438—2

23 Claims



1. A method for manufacturing a high temperature superconducting electric field effect device comprises the steps of:

- (a) forming a high temperature superconducting thin film on a substrate, to thereby form a high temperature source and a high temperature drain with a predetermined thickness;
- (b) growing an oxide on the substrate and etching the grown oxide to thereby form a bottom layer;
- (c) forming and etching said high temperature superconducting thin film on said bottom layer, the high temperature source and the high temperature drain being a c-axis superconductor thin film, to thereby form a high temperature superconducting thin film channel layer and a dual grain boundary channel region;
- (d) depositing and etching a gate insulating layer on the channel region, to thereby form the gate insulating layer; and
- (e) forming a metal electrode layer on the high temperature source, the high temperature drain and the gate insulating layer.

**5,770,471  
METHOD OF MAKING SEMICONDUCTOR LASER  
WITH ALUMINUM-FREE ETCH STOPPING LAYER**

Yutaka Nagai, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 27, 1995, Ser. No. 508,211

Claims priority, application Japan, Jul. 28, 1994, 6-176702

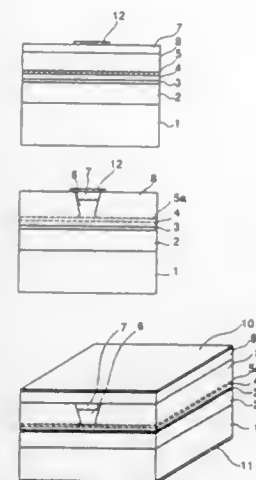
Int. Cl.<sup>6</sup> H01L 21/00

U.S. Cl. 438—31

25 Claims

1. A method of fabricating a semiconductor laser comprising: forming, by successive crystal growth on a first conductivity type semiconductor substrate, a first conductivity type cladding layer, an active layer, a first second conductivity type cladding layer comprising a semiconductor material containing Al as a constituent, an etch stopping layer containing a concentration of a dopant impurity and comprising a semicon-





ductor material not containing Al as a constituent, and a second second conductivity type cladding layer comprising the semiconductor material containing Al as a constituent, thereby fabricating a semiconductor laminated structure; forming a stripe-shaped insulating film pattern masking part of the second second conductivity type cladding layer; etching the second second conductivity type cladding layer utilizing the stripe-shaped insulating film pattern as a mask until the etching front reaches the etch stopping layer, thereby forming a ridge having a stripe configuration; forming a current blocking layer by crystal growth so that the ridge is buried by the current blocking layer; removing the insulating film pattern; forming a second conductivity type contact layer on the ridge and on the current blocking layer; and disordering the etch stopping layer by heat treatment of the semiconductor laminated structure.

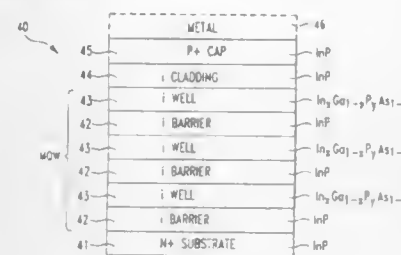
**5,770,472**  
**METHOD FOR MAKING MONOLITHICALLY INTEGRATED SIGNAL PROCESSING CIRCUIT HAVING ACTIVE AND PASSIVE COMPONENTS**

Weimin Zhou, Eatontown, N.J.; Paul H. Shen, North Potomac; Mitra Dutta, Silver Spring, both of Md., and Jagadeesh Pamulapati, Eatontown, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 9, 1996, Ser. No. 709,997  
Int. Cl.<sup>6</sup> H01L 21/00

U.S. Cl. 438—24

4 Claims



1. A method of fabricating an optical waveguide for processing light signals, comprising:  
forming a semiconductor substrate;  
placing parallel masking strips on the substrate, with a gap disposed therebetween; and

epitaxially growing optical devices within the gap by selectively varying the width of the masking strips to tailor a band-gap profile in accordance with each optical device incorporated along the waveguide.

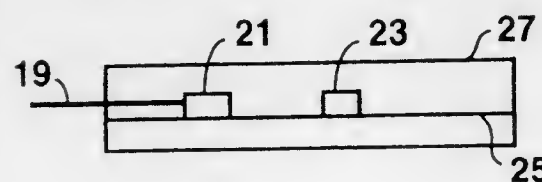
**5,770,473**  
**PACKAGING OF HIGH POWER SEMICONDUCTOR LASERS**

Douglas W. Hall; Paul A. Jakobson; Julia Alyson Sharps, all of Corning, and Roger F. Bartholomew, Painted Post, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Continuation of Ser. No. 481,009, Jun. 7, 1995, abandoned, which is a division of Ser. No. 168,125, Dec. 17, 1993, Pat. No. 5,513,198, which is a continuation-in-part of Ser. No. 91,657, Jul. 14, 1993, Pat. No. 5,392,305. This application Apr. 7, 1997, Ser. No. 833,548  
Int. Cl.<sup>6</sup> H01L 21/00

U.S. Cl. 438—26

39 Claims



1. A method for packaging a high power GaAs substrate semiconductor laser in a container, said laser having a facet structure and said method comprising:

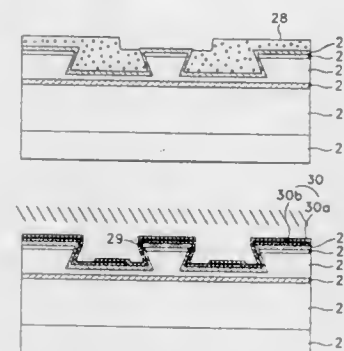
- fixedly positioning said laser in said container;
- introducing into said container a getter for adsorbing or absorbing organic impurities;
- introducing into said container a gaseous medium comprising an oxygen content of at least 100 parts per million; and
- hermetically sealing said container containing said introduced gaseous medium.

**5,770,474**  
**METHOD OF FABRICATING LASER DIODE**

Ang-Seo Kim, Ichon, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Ich'on, Rep. of Korea  
Filed Jun. 25, 1997, Ser. No. 882,179  
Claims priority, application Rep. of Korea, Jun. 29, 1996, 96-26310

U.S. Cl. 438—31

7 Claims



1. A method of fabricating a laser diode, comprising the steps of: sequentially forming a buffer layer of a first conductivity type, an active layer, a clad layer of a second conductivity type and a high-concentration contact layer of the second conductivity type on a compound semiconductor substrate of the first conductivity type;

etching portions of said contact layer and of said clad layer to form a reverse mesa structure;  
forming a passivation layer on the overall substrate;  
removing said passivation existing on the reverse mesa structure to expose said contact layer;  
forming a metal layer on said exposed contact layer to contact therewith;  
uniformly forming a conductive metal layer on said metal layer and said passivation layer; and  
forming a pad metal layer on the conductive metal layer to fill the etched portions of either side of the reverse mesa structure.

**5,770,475**  
**CRYSTAL GROWTH METHOD FOR COMPOUND SEMICONDUCTOR**

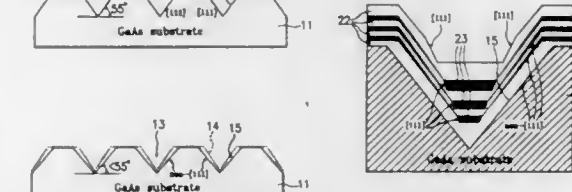
Sung-Bock Kim; Jeong-Rae Ro, and El-Hang Lee, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

Filed Sep. 23, 1996, Ser. No. 717,903

Int. Cl.<sup>6</sup> H01L 21/00

U.S. Cl. 438—43

12 Claims



1. A crystal growth method for a compound semiconductor, said method comprising the steps of:

- forming a plurality of stripe-shaped photoresist film patterns in the direction of (011) on a compound semiconductor substrate having a (100) surface;
- first-etching an exposed portion of the compound semiconductor substrate using the photoresist patterns as an etching mask to form a first V-shaped groove having a (111) slope surface at a slope angle  $\theta_1$  with respect to the (100) surface;
- second-etching the compound semiconductor substrate to convert said (111) slope surface into a non-(111) surface thus forming a second V-shaped groove having a non-(111) slope surface at a slope angle  $\theta_2$  with respect to the (100) surface,  $\theta_2$  being less than  $\theta_1$ ; and
- growing a plurality of pairs of quantum wells having a barrier layer and an active layer using surface-oriented growth.

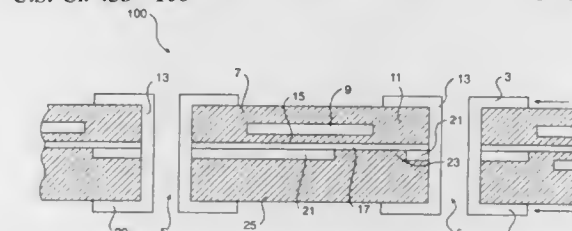
**5,770,476**  
**PASSIVE INTERPOSER INCLUDING AT LEAST ONE PASSIVE ELECTRONIC COMPONENT**

David Brian Stone, Owego, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 469,869, Jun. 6, 1995, abandoned, which is a division of Ser. No. 321,677, Dec. 9, 1994, Pat. No. 5,530,288. This application May 15, 1997, Ser. No. 857,005  
Int. Cl.<sup>6</sup> H01L 21/44

U.S. Cl. 438—106

12 Claims



1. A method of forming an interposer including at least one passive electronic component, said method comprising the steps of:

- forming a core structure comprised of a first electrically conductive plane and a second electrically conductive plane, said electrically conductive planes functioning as a ground, signal, and/or power planes, said electrically conductive planes being separated by a first plane of an electrically insulating material;
- providing at least one passive electronic component in or on one of said electrically conductive planes;
- forming a second electrically insulating plane by depositing a layer of an electrically insulating material on an exposed surface of one of said electrically conductive planes and forming a third electrically insulating plane by depositing a layer of an electrically insulating material on an exposed surface of the other of said electrically conductive planes;
- forming a plurality of through holes through said electrically insulating planes, said electrically conductive planes, and said at least one passive electronic component;
- forming a mounting plane by depositing a layer of an electrically conducting material on said second and third electrically insulating planes and selectively etching said electrically conducting material; and
- plating electrically conductive material on a surface of said through holes, so as to selectively electrically connect said plated through holes with said at least one passive electronic component, said electrically conducting planes, said electrically insulating planes, and said mounting planes; thereby forming a functional single layer interposer.

**5,770,477**  
**FLIP CHIP-ON-FLIP CHIP MULTI-CHIP MODULE**

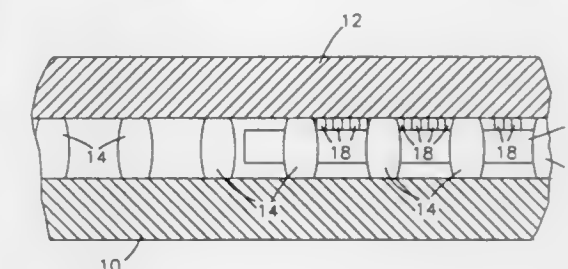
Scott David Brandenburg, Kokomo, Ind., assignor to Delco Electronics Corporation, Kokomo, Ind.

Filed Feb. 10, 1997, Ser. No. 798,457

Int. Cl.<sup>6</sup> H01L 21/44; 21/48; 21/50

U.S. Cl. 438—108

7 Claims



1. A method of forming a multi-chip module, the method comprising the steps of:

- providing a mother board having a conductor pattern formed on a surface thereof;
- providing a silicon substrate having solder bump terminals and multiple conductor patterns on a surface thereof;
- providing multiple flip chip devices having solder bump terminals on a surface thereof;
- registering and soldering the solder bump terminals of each flip chip device to each of the multiple conductor patterns of the silicon substrate, wherein each of the flip chip devices is disposed between the silicon substrate and the mother board; and then
- registering and soldering the solder bump terminals of the silicon substrate to the conductor pattern of the mother board; wherein the flip chip devices are disposed between the silicon substrate and the mother board.

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5,770,478

**INTEGRAL MESH FLAT PLATE COOLING METHOD**

Sushumna Iruvanti, Wappingers Falls; Martin Klepeis, Poughkeepsie; Gaetano Paolo Messina, Hopewell Junction, and Raed Sherif, Croton, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

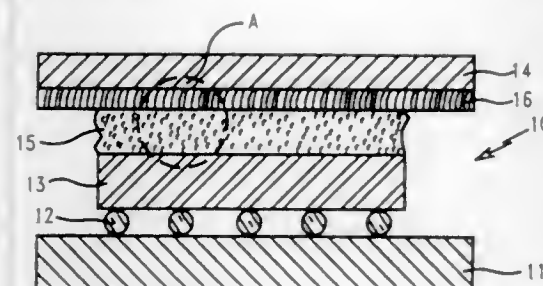
Division of Ser. No. 758,789, Dec. 3, 1996. This application

Apr. 7, 1997, Ser. No. 837,497

Int. Cl.<sup>6</sup> H01L 21/60; 21/00

U.S. Cl. 438—122

6 Claims



1. A method for cooling at least one integrated circuit chip mounted on a substrate comprising:

providing a substrate having at least one chip mounted thereon; providing a cooling plate overlying the substrate and the chip; providing a thermal paste or thermal adhesive between an upper surface of the chip and a lower surface of the cooling plate wherein the thickness of the paste or adhesive is above about 1 mil;

wherein the lower surface of the cooling plate has a roughened surface wherein the roughened surface comprises channels which channels form a plurality of corresponding protrusions which roughened surface penetrates and improves the adhesion of the thermal paste and/or thermal conductive adhesive and inhibits the flow of thermal paste from between the upper surface of the chip and the lower surface of the cooling plate.

5,770,479

**BONDING SUPPORT FOR LEADS-OVER-CHIP PROCESS**

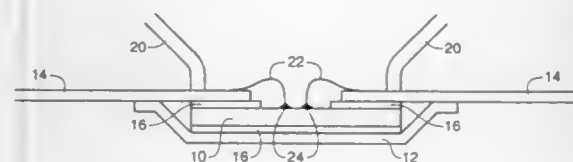
Mike Brooks, Caldwell, and Alan G. Wood, Boise, both of Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jan. 11, 1996, Ser. No. 584,672

Int. Cl.<sup>6</sup> H01L 21/60

U.S. Cl. 438—123

24 Claims



1. A method for forming a semiconductor assembly comprising the following steps:

a) forming a protective material over a semiconductor wafer section; b) contacting a lead frame with said protective material; c) subsequent to said contacting step, removing said protective material from said wafer section.

5,770,480

**METHOD OF LEADS BETWEEN CHIPS ASSEMBLY**

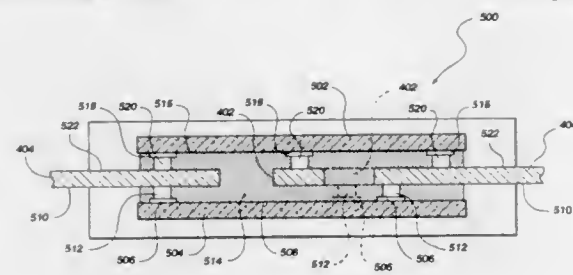
Manny Kin F. Ma; Jeffrey D. Bruce; Daryl L. Habersetzer, all of Boise; Gordon D. Roberts, Meridian, and James E. Miller, Boise, all of Id., assignors to Micron Technology, Inc., Boise, Id.

Division of Ser. No. 664,409, Jun. 17, 1996, Pat. No. 5,677,567. This application Apr. 10, 1997, Ser. No. 833,863

Int. Cl.<sup>6</sup> H01L 21/44; 21/48; 21/50

U.S. Cl. 438—123

15 Claims



1. A method of assembling a multi-die semiconductor die assembly, comprising the steps of:

providing a first die having a face surface, with said first die face surface having a configuration of bond pads positioned thereon; providing a second die having a face surface, with said second die face surface having a plurality of bond pads positioned thereon in a configuration different by at least one bond pad location from said first die bond pad configuration; providing a leadframe having a first side and a second side, and a plurality of lead finger elements of differing length, orientation or configuration; providing a die paddle on said leadframe; employing said die paddle as a power bus for said first and second dice; attaching said first die by its face surface to said leadframe first side, wherein at least some of said first die bond pads are in electrical communication with at least some of said plurality of lead finger elements; and attaching said second die by its face surface to said leadframe second side wherein at least some of said second die bond pads are in electrical communication with at least some of said plurality of lead finger elements.

5,770,481

**WIRING DESIGNING APPARATUS FOR AUTOMATICALLY DESIGNING LAYOUT OF INTEGRATED CIRCUIT AND WIRING DESIGNING METHOD THEREFOR**

Takashi Fujii, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

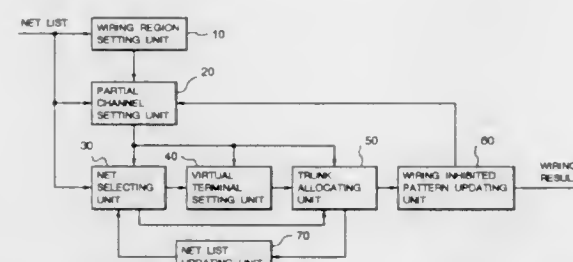
Filed Apr. 1, 1996, Ser. No. 626,011

Claims priority, application Japan, Mar. 31, 1995, 7-075716

Int. Cl.<sup>6</sup> H01L 21/00

U.S. Cl. 438—129

12 Claims



8. A wiring designing method executed in a wiring designing apparatus for automatically designing a wiring layout on an integrated circuit having at least one wiring inhibited pattern, comprising the steps of:

5,770,483

**MULTI-LEVEL TRANSISTOR FABRICATION METHOD WITH HIGH PERFORMANCE DRAIN-TO-GATE CONNECTION**

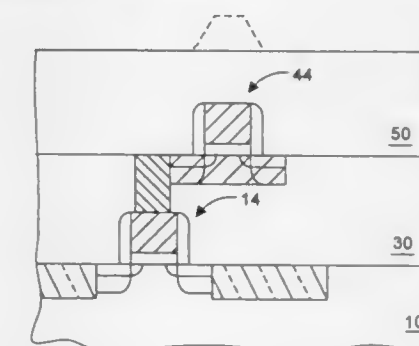
Daniel Kadosh, Austin; Mark I. Gardner, Cedar Creek, and Fred N. Hause, Austin, all of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 8, 1996, Ser. No. 729,795

Int. Cl.<sup>6</sup> H01L 21/00; 21/84

U.S. Cl. 438—152

18 Claims



1. A method for interconnecting a gate of a first transistor to a drain of a second transistor, comprising:

providing a first transistor comprising a gate conductor formed upon a first topography; depositing a dielectric across said gate conductor and said first topography; forming a trench within said layer of dielectric and filling said trench with a polysilicon; etching an opening through said dielectric to said gate conductor; filling said opening with a metal, wherein said metal contacts a drain side of said polysilicon; and implanting dopants within said drain side of said polysilicon to form a drain region of a second transistor.

5,770,482

**MULTI-LEVEL TRANSISTOR FABRICATION METHOD WITH A PATTERNED UPPER TRANSISTOR SUBSTRATE AND INTERCONNECTION THERETO**

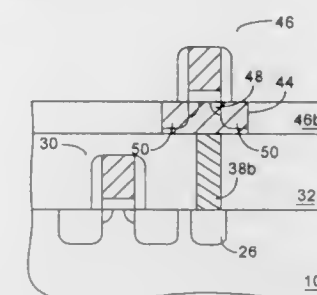
Daniel Kadosh, Austin; Mark I. Gardner, Cedar Creek, and Jon D. Cheek, Austin, all of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Oct. 8, 1996, Ser. No. 727,049

Int. Cl.<sup>6</sup> H01L 21/00; 21/84

U.S. Cl. 438—152

18 Claims



1. A method for interconnecting a substrate of a first transistor to a substrate of a second transistor, comprising:

providing a first substrate encompassing a well-connect implant, a source region and a drain region, wherein said source and drain regions are spaced about a channel region of a first transistor; depositing a first layer of dielectric across said first transistor; etching an opening through said first dielectric to said well-connect implant; filling said opening with a metal; depositing a layer of polysilicon across said first dielectric and said metal and thereafter removing portions of said layer of polysilicon to form a second substrate residing directly upon and in electrical communication with said metal; forming a second layer of dielectric upon said first dielectric in regions removed of said layer of polysilicon; depositing dopants within said second substrate to render the second substrate conductive and thereafter depositing films and subsequent dopants upon and within, respectively, said second substrate to form a second transistor.

5,770,484

**METHOD OF MAKING SILICON ON INSULATOR BURIED PLATE TRENCH CAPACITOR**

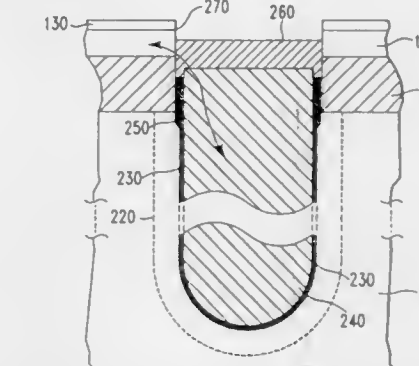
Richard Leo Kleinhenz, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 13, 1996, Ser. No. 768,018

Int. Cl.<sup>6</sup> H01L 21/8242

U.S. Cl. 438—155

23 Claims



1. A method of forming a trench capacitor, having a first and second electrode and a node dielectric, in an SOI substrate having a semiconductor body (SC body), a buried oxide layer overlying said SC body and a single crystalline device layer (SC device layer) overlying said buried oxide layer, comprising the steps of: forming a masking layer over the SC device layer; patterning an opening in the masking layer;



# UMI

1. A method of manufacturing an MOS semiconductor device, which method comprises:

- forming a gate oxide film on an n type first region and on a p-type second region in a semiconductor substrate, and forming a gate on each gate oxide film;
- forming n- source/drain regions with a channel region therebetween under each gate oxide film by implanting n- type first impurities concurrently into said first region and said second region;

forming a sidewall spacer on a side surface of each gate oxide film and gate thereon in said first region and said second region;  
forming a p+ type source/drain region deeper than said n-layer by oblique ion implantation of p- type impurities into said first region;  
forming an n+ type source/drain region deeper than said n-layer by ion implantation of n- type second impurities into said second region; and  
heating said first region and second region.

5,770,492

## SELF-ALIGNED TWIN WELL PROCESS

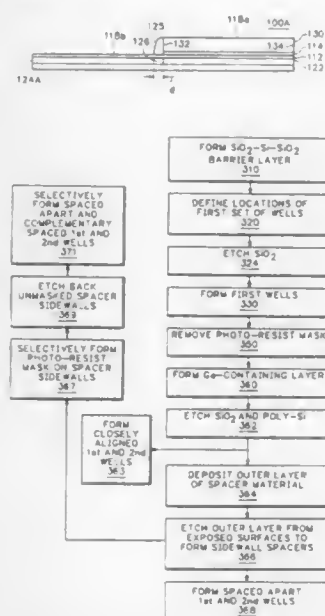
Ashok K. Kapoor, Palo Alto, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Continuation-in-part of Ser. No. 704,472, Aug. 20, 1996, which is a continuation-in-part of Ser. No. 488,075, Jun. 7, 1995, Pat. No. 5,583,062. This application Dec. 18, 1996, Ser. No. 768,845

Int. Cl.<sup>6</sup> H01L 21/8238

U.S. Cl. 438—199

26 Claims



1. A method for forming self-aligned, doped wells in a semiconductor structure, comprising the steps of:

forming a silicon dioxide-polysilicon-silicon dioxide barrier layer on a surface of a substrate to produce a modified substrate having an outer silicon dioxide layer, the silicon dioxide layers of the barrier layer having a thickness of between about 100 and about 1000 Å thick, and the polysilicon layer having a thickness of between about 50 and 500 Å thick;

etching the outer silicon dioxide layer of the modified substrate to expose the polysilicon of the barrier layer at selected locations;

forming wells having a first conductivity type at the selected locations;

exposing the modified substrate to a germanium-silicon mixture to deposit a germanium-silicon alloy layer selectively on the exposed polysilicon, said germanium-silicon alloy layer including an outer sidewall, an inner sidewall and an exposed horizontal surface at selected locations;

etching the outer silicon dioxide and polysilicon layers of the barrier layer on the modified substrate at locations adjacent to the deposited germanium-silicon alloy layer;

forming sidewall spacers of a selected thickness on said inner sidewalls of said germanium-silicon alloy layer; and

forming wells having a second conductivity type at the etched locations spaced apart at a distance from said wells having a

first conductivity type, said distance being substantially equal to the thickness of said sidewall spacers.

5,770,493

## METHOD OF MAKING NMOS AND PMOS DEVICES WITH SIMULTANEOUSLY FORMED GATES HAVING DIFFERENT GATE LENGTHS

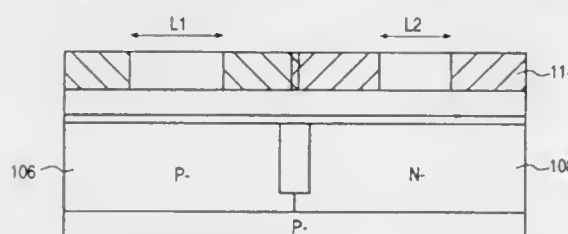
H. Jim Fulford, Jr., Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 25, 1997, Ser. No. 805,538

Int. Cl.<sup>6</sup> H01L 21/8238

U.S. Cl. 438—199

20 Claims



1. A method of making N-channel and P-channel devices with different gate lengths, comprising the steps of:

providing a semiconductor substrate with first and second active regions;

forming a gate material over the first and second active regions; forming a photoresist layer over the gate material;

irradiating the photoresist layer with a first image pattern over the first active region, wherein the first image pattern has a first radiation energy per unit area of the photoresist layer;

irradiating the photoresist layer with a second image pattern over the second active region, wherein the second image pattern has a second radiation energy per unit area of the photoresist layer;

developing the photoresist layer so that the photoresist layer includes a first photoresist segment over the first active region and a second photoresist segment over the second active region, wherein the first and second photoresist segments have different lengths primarily due to a difference between the first and second radiation energies per unit area;

etching the gate material using the photoresist layer as an etch mask after developing the photoresist layer to simultaneously form a first gate over the first active region and a second gate over the second active region, wherein the first and second gates have different lengths primarily due to the difference between the first and second radiation energies per unit area;

forming a source and drain in the first active region; and forming a source and drain in the second active region.

5,770,494

## PROCESS OF FABRICATING SEMICONDUCTOR DEVICE HAVING GATE STRUCTURE DOPED THROUGH DIFFUSION FROM REFRACTORY METAL SILICIDE INTO POLYSILICON

Toyohi Yamamoto, and Kiyoshi Takeuchi, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Mar. 18, 1996, Ser. No. 617,207

Claims priority, application Japan, Mar. 24, 1995, 7-065793

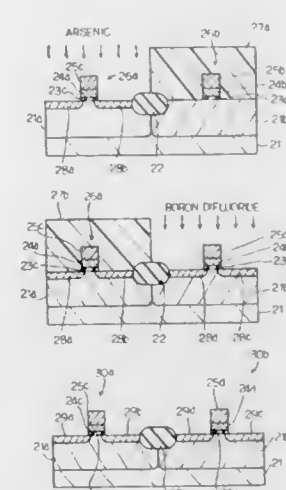
Int. Cl.<sup>6</sup> H01L 21/8234; 21/3205; 21/4763

U.S. Cl. 430—232

9 Claims

1. A process of fabricating first and second field effect transistors opposite in channel conductivity type to each other, comprising the steps of:

a) preparing a semiconductor substrate having a first area covered with a first gate insulating layer and a second area covered with a second gate insulating layer and electrically isolated from one another;



b) depositing a first layer of intentionally undoped polysilicon over said first and second gate insulating layers by using chemical vapor deposition;

c) depositing a second layer of tungsten silicide on said first layer by using sputtering;

d) patterning said first and second layers into a first gate structure on said first gate insulating layer and a second gate structure on said second gate insulating layer by using lithographic techniques, said first gate structure having a first strip of said intentionally undoped polysilicon and a second strip of said tungsten silicide, said second gate structure having a third strip of said intentionally undoped polysilicon and a fourth strip of said tungsten silicide;

e) covering said second gate structure and said second area with a first photo-resist mask layer by using lithographic techniques;

f) implanting a first dopant impurity of one conductivity type into said first area and at least said second strip so as to form first impurity regions in said first area and dope said second strip with said first dopant impurity;

g) removing said first photo-resist mask layer;

h) covering said first gate structure and said second area with a second photo-resist mask layer by using lithographic techniques;

i) implanting a second dopant impurity of the opposite conductivity type to said one conductivity type into said second area and at least said fourth strip so as to form second impurity regions in said second area and dope said fourth strip with said second dopant impurity;

j) removing said second photo-resist mask layer; and

k) heating said first and second impurity regions and said second and fourth strips to a temperature within a range from 800° C. to 1100° C. so as to concurrently form first source and drain regions from said first impurity regions and second source and drain regions from said second impurity regions and concurrently diffuse said first dopant impurity into said first strip and said second dopant impurity into said third strip.

5,770,495

## METHOD OF FABRICATING SEMICONDUCTOR DEVICE INCLUDING HIGH TEMPERATURE HEAT TREATMENT

Nolifumi Sato; Shinji Ohara; Hitoshi Mitani; Hidetaka Natsume, and Takami Hiruma, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Oct. 26, 1995, Ser. No. 548,913

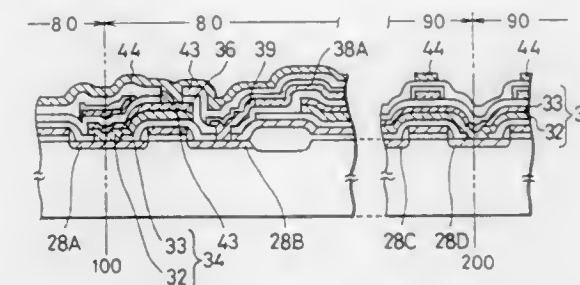
Claims priority, application Japan, Oct. 28, 1994, 6-265872

Int. Cl.<sup>6</sup> H01L 21/283; 21/8244

U.S. Cl. 438—238

20 Claims

17. A method of fabricating a semiconductor device including a static random access memory having a resistive element, a first field effect transistor having a driver insulative gate, and a second field effect transistor having a transfer insulative gate, a source



region of said first field effect transistor being in connection with a source voltage film working as a low level voltage line, an impurity region of said second field effect transistor, which region is to become a source or drain region, being in connection with a bit line or a reverse bit line, said method comprising the steps of:

(a) forming an electrode voltage film on said source region of first field effect transistor and on said source region of second field effect transistor if the said impurity region of second field effect transistor is a source region, said electrode voltage film comprising a refractory metal silicide film and a silicon film overlying on said refractory metal silicide film, said refractory metal silicide film being deposited on said source regions;

(b) forming an interlayer insulative layer over said silicon film;

(c) depositing a polysilicon film over said interlayer insulative layer;

(d) patterning said polysilicon film to form said resistive element; and

(e) heat-treating a resultant product of step (d) at high temperature in an oxidizing atmosphere, step (e) being carried out at any time after step (c) has been completed.

5,770,496

## METHOD OF MAKING A RESISTOR

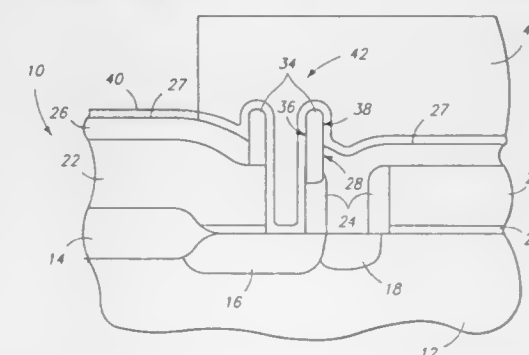
Martin Ceredig Roberts, Boise, Id., assignor to Micron Technology, Inc., Boise, Id.

Continuation of Ser. No. 409,505, Mar. 23, 1995, Pat. No. 5,635,418. This application Jan. 24, 1997, Ser. No. 788,617

Int. Cl.<sup>6</sup> H01L 27/02

U.S. Cl. 438—238

19 Claims



1. A semiconductor processing method of forming a resistor from semiconductive material comprising the following steps:

forming a circuit node to which electrical connection to a resistor is to be made;

forming a first electrically insulative material outwardly of the node;

forming an opening in the first electrically insulative material over the node, the opening having an opening width and sidewalls;

forming a second electrically insulative material outwardly of the first material and within the opening to a thickness which is less than one-half the opening width to less than completely fill the opening with second electrically insulative material, the first and second materials being selectively etchable relative to one another;





epitaxial layer having been grown with a second doping concentration which is smaller than said first doping concentration;  
forming a body region extending at least partly into said first epitaxial layer through said second epitaxial layer from said upper surface, said body region being of a second conductivity type opposite said first conductivity type; and  
forming a source region into said body region to form a channel region at said upper surface, said channel region being disposed at least partly in said second epitaxial layer, said source region being of said first conductivity type.

5,770,504

**METHOD FOR INCREASING LATCH-UP IMMUNITY IN CMOS DEVICES**

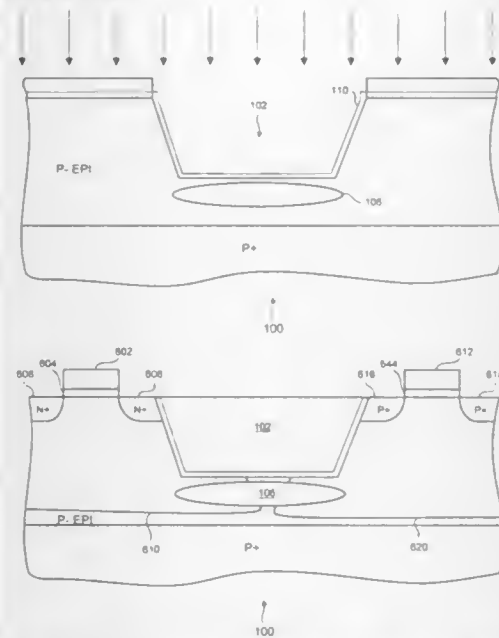
Jeffrey S. Brown, Jeffersonville; Robert J. Gauthier, Jr., Burlington, and Xiaowei Tian, Essex Junction, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 17, 1997, Ser. No. 819,615

Int. Cl.<sup>6</sup> H01L 21/336

U.S. Cl. 438—296

8 Claims



1. A method for reducing the damaging effects of latch-up in CMOS devices comprising the steps of:  
a) providing a semiconductor substrate;  
b) defining a shallow trench in said semiconductor substrate; and  
c) implanting a mobility degrading species below said shallow trench, wherein said mobility degrading species comprises n-type and p-type species in combination to provide a low net dopant profile change in said semiconductor substrate.

5,770,505

**METHOD FOR THE FABRICATION OF A SEMICONDUCTOR DEVICE**

Jae Chul Om, and Hyo Sik Park, both of Ichon-kun, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd, Kyongki-do, Rep. of Korea

Continuation of Ser. No. 397,883, Mar. 2, 1995, abandoned.

This application May 8, 1997, Ser. No. 854,055

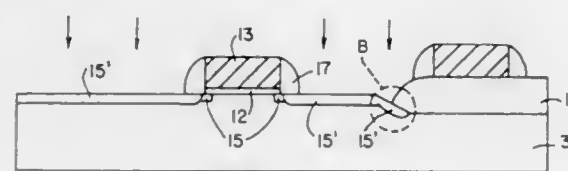
Claims priority, application Rep. of Korea, Mar. 3, 1994, 1994-4114

Int. Cl.<sup>6</sup> H01L 21/336

U.S. Cl. 438—298

1 Claim

1. A method for the fabrication of a semiconductor device, comprising the steps of:



forming a field oxide film on a semiconductor substrate;  
forming a gate oxide and a gate electrode, in sequence;  
implanting a dopant at a low density into the semiconductor substrate, to form an LDD region;  
forming an oxide film spacer at the side wall of the gate electrode by depositing a blanket oxide film and subjecting the blanket oxide film to anisotropic etching;  
implanting an arsenic dopant at a high density into the semiconductor substrate, to form a source and a drain;  
implanting a phosphorus dopant at a low density into the semiconductor substrate, to form a lightly doped region in the portion of the source which is disposed on the bottom of an area at which the semiconductor substrate is exposed by etching an edge portion of the field oxide film upon the anisotropic etching of the field oxide film.

5,770,506

**METHOD OF FABRICATING A FIELD EFFECT TRANSISTOR WITH SHORT GATE LENGTH**

Risho Koh, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

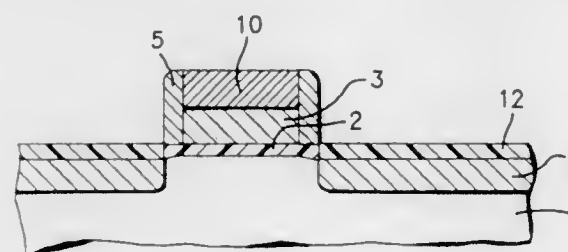
Continuation of Ser. No. 446,062, May 19, 1995, abandoned, which is a division of Ser. No. 191,291, Feb. 3, 1994, abandoned. This application Jun. 24, 1997, Ser. No. 881,749

Claims priority, application Japan, Feb. 4, 1993, 5-16660

Int. Cl.<sup>6</sup> H01L 21/336

U.S. Cl. 438—303

10 Claims



1. A method for fabricating a field effect transistor of a first conductivity type, said method comprising the steps of:  
forming a gate electrode of a polycrystalline semiconductor on an insulating film provided on a semiconductor substrate;  
depositing isotropically a spacer material on and around said gate electrode;  
forming a dummy spacer sidewall by anisotropically etching back said spacer material;  
forming source/drain diffusion layers using said gate electrode and said dummy spacer sidewall as masks, said source/drain diffusion layers not extending beneath said gate electrode;  
removing said dummy spacer sidewall after the formation of said source/drain diffusion layers;  
depositing isotropically a material selected from the group consisting of metal, metal silicide and polycrystalline silicon; and  
forming a sidewall by anisotropically etching back said deposited material, said sidewall being formed at regions corresponding to said removed dummy spacer sidewall and in contact with said gate electrode.

5,770,507

**METHOD FOR FORMING A GATE-SIDE AIR-GAP STRUCTURE IN A SALICIDE PROCESS**

Chun-Cho Chen, Taipei, and Gene Jiing-Chiang Chang, Hsinchu Hsien, both of Taiwan, assignors to Winbond Electronics Corp., Hsinchu, Taiwan

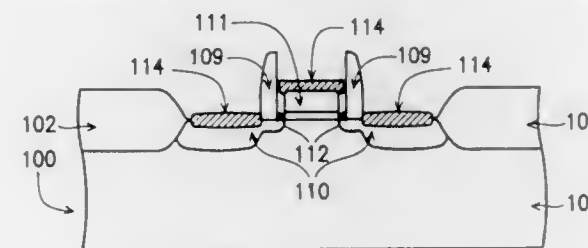
Filed Jan. 21, 1997, Ser. No. 785,782

Claims priority, application Taiwan, Nov. 9, 1996, 85113683

Int. Cl.<sup>6</sup> H01L 21/283; 21/336

U.S. Cl. 438—305

9 Claims



1. A method for forming a gate-side air-gap structure in the salicide process, which starts on a semiconductor wafer with active region defined completely by field oxide, includes the steps of:  
depositing sequentially a thin oxide layer, a polysilicon layer, and a first layer over said wafer;  
patterning said first layer, said polysilicon layer, and said thin oxide layer to form a stack gate which consists of first layer and a gate, wherein said gate consists of said polysilicon layer and said thin oxide layer;  
forming lightly-doped drains beside said stack gate in said active region;  
forming a second layer on the sidewall of said stack gate;  
forming spacer on the sidewall of said second layer;  
forming source and drain regions;  
removing said first layer and said second layer to reveal said gate, wherein air gaps exist between said gate and said spacer;  
depositing a titanium layer over said wafer;  
heating said titanium layer to form TiSi<sub>2</sub> layers on said gate, said drain region, and said source region;  
removing said titanium layer remaining intact over said air gaps, said spacer, and said field oxide; and  
heating said TiSi<sub>2</sub> layer over said wafer.

5,770,508

**METHOD OF FORMING LIGHTLY DOPED DRAINS IN METALLIC OXIDE SEMICONDUCTOR COMPONENTS**

Wen-Kuan Yeh, Chupei; Coming Chen, Taoyuan Hsien, and Jih-Wen Chou, Hsinchu, all of Taiwan, assignors to United Microelectronics Corp., Hsinchu, Japan

Filed Jun. 4, 1997, Ser. No. 868,816

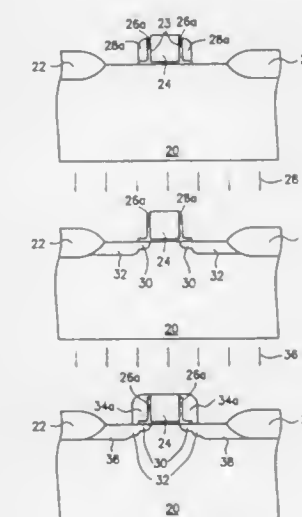
Claims priority, application Taiwan, Mar. 17, 1997, 86103275

Int. Cl.<sup>6</sup> H01L 21/336

U.S. Cl. 438—305

18 Claims

1. A method of forming lightly doped drains in MOS components comprising:  
providing a silicon substrate doped with first type ions, a first insulating layer, and a gate;  
forming a second insulating layer and a third insulating layer above the silicon substrate;  
etching back the third and the second insulating layers so as to completely remove the second insulating layer above the gate while leaving behind L-shaped first spacers and second spacers on sidewalls of the gate;  
removing the second spacers, followed by doping second type ions into the silicon substrate to form first lightly doped drains in the silicon substrate surface below the L-shaped first spacers, and second lightly doped drains in the silicon substrate surface elsewhere;  
forming a fourth insulating layer above the silicon substrate, followed by etching back the fourth insulating layer so as to form third spacers; and



using the third spacers, the first insulating layer, and the gate as masks when doping second type ions into the silicon substrate so as to form source/drain regions in silicon substrate surfaces not covered by the third spacers.

5,770,509

**METHOD FOR FORMING AN INDUCTOR DEVICES USING SUBSTRATE BIASING TECHNIQUE**

Hyun-Kyu Yu, and Min Park, both of Daejeon, DPR of Korea, assignors to Electronics & Telecommunications Research Institute, Daejeon, DPR of Korea

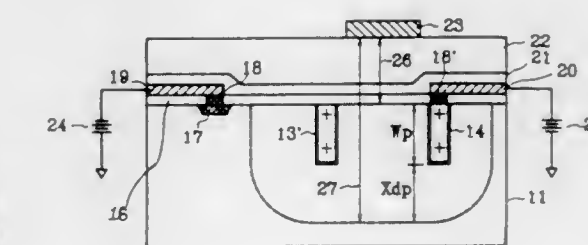
Filed Apr. 22, 1997, Ser. No. 844,750

Claims priority, application DPR of Korea, Dec. 6, 1996, 9662617

Int. Cl.<sup>6</sup> H01L 21/20

U.S. Cl. 438—381

8 Claims



1. A method of forming an inductor device on a semiconductor substrate, comprising the steps of:  
forming a predetermined



5,770,510

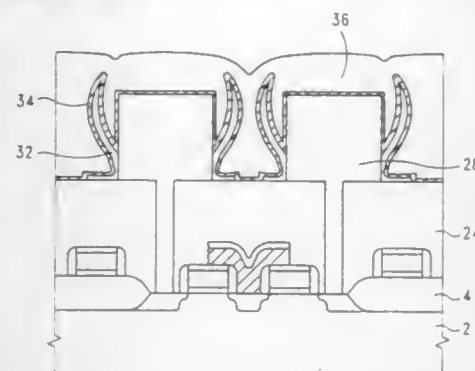
**METHOD FOR MANUFACTURING A CAPACITOR USING NON-CONFORMAL DIELECTRIC**  
Yeh-Sen Lin, Tao-Yuan, and Chao-Ming Koh, Hsinchu, both of Taiwan, assignors to Vanguard International Semiconductor Corporation, Hsinchu, Taiwan

Filed Dec. 9, 1996, Ser. No. 760,945

Int. Cl.<sup>6</sup> H01L 21/20

U.S. Cl. 438—396

25 Claims



1. A method of forming a capacitor on a semiconductor substrate, said method comprising:

- forming a first dielectric layer over said semiconductor substrate;
- forming a contact hole in said first dielectric layer, exposing a portion of said substrate;
- forming a first conductive layer over said first dielectric layer, wherein said first conductive layer fills said contact hole and contacts the exposed portion of said substrate;
- patterning a photoresist on said first conductive layer to cover a portion of said first conductive layer over said contact hole;
- removing portions of said first conductive layer not covered by said photoresist;
- stripping said photoresist;
- forming a non-conformal dielectric layer on said first conductive layer and said first dielectric layer, wherein said non-conformal dielectric layer includes an overhang portion and a lower portion on a sidewall of said first conductive layer;
- removing said lower portion of said non-conformal dielectric to expose a lower portion of the sidewall of said first conductive layer;
- forming a second conductive layer on said non-conformal dielectric layer, said lower portion of the sidewall of said first conductive layer and on said first dielectric layer;
- removing portions of said second conductive layer not covered by said overhang portion of said non-conformal dielectric layer;
- removing said non-conformal dielectric layer while leaving said first and second conductive layers intact, wherein said first and second conductive layers form a bottom storage node of said capacitor;
- forming a dielectric film on said first conductive layer and said second conductive layer; and
- forming a third conductive layer on said dielectric film, wherein said third conductive layer serves as a top storage node of said capacitor.

5,770,511

**SILICON-ON-INSULATOR SUBSTRATE AND A METHOD FOR FABRICATING THE SAME**

Kei Matsumoto; Hirotaka Kato, and Hiroshi Furukawa, all of Hiratsuka, Japan, assignors to Komatsu Electronic Metals Co., Ltd., Kanagawa, Japan

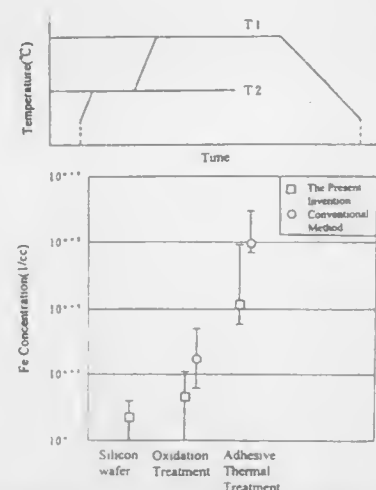
Filed Oct. 15, 1996, Ser. No. 729,870

Int. Cl.<sup>6</sup> H01L 21/76

U.S. Cl. 438—406

4 Claims

1. A method of fabricating a silicon-on-insulator substrate comprising:



- a pre-oxidation layer formation step of forming a pre-oxidation layer on a first semiconductor substrate by oxidizing the first semiconductor substrate at a first temperature;
- an oxide layer formation step of forming an oxide layer on the pre-oxidation layer by oxidizing the first semiconductor substrate on which the pre-oxidation layer is formed by the pre-oxidation layer formation step at a second temperature that is higher than the first temperature;
- a semiconductor substrate bonding step of bonding a second semiconductor substrate to the first semiconductor substrate on which the oxide layer is formed by the oxide layer formation step; and
- a thin layer formation step of making the first semiconductor substrate on which the oxide layer is formed by the oxide layer formation step and bonded to the second semiconductor substrate into a thin layer.

5,770,512

**SEMICONDUCTOR DEVICE**

Atsushi Murakoshi, Kawasaki; Masao Iwase; Kyoichi Suguro, both of Yokohama; Mitsuo Koike, Kamakura, and Tadayuki Asaishi, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiha, Kawasaki, Japan

Division of Ser. No. 622,589, Mar. 26, 1996, Pat. No.

5,656,859, This application Apr. 30, 1997, Ser. No. 841,575

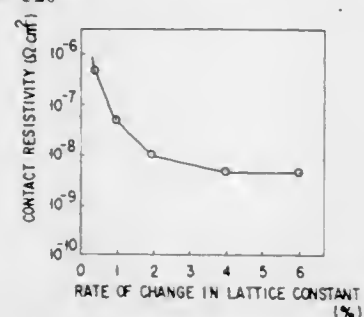
Claims priority, application Japan, Mar. 27, 1995, 7-068131;

Sep. 14, 1995, 7-237467; Mar. 13, 1996, 8-056281

Int. Cl.<sup>6</sup> H01L 21/265; 21/44

U.S. Cl. 438—520

19 Claims



- 1. A method of manufacturing a semiconductor device, having a surface layer formed in a surface of a silicon underlayer, and an electrode having a metallic conductivity arranged on said surface layer such that a contact is formed between said surface layer and said electrode, said method comprising the steps of:
- ion-implanting first and second impurities into a surface of said underlayer to form an ion-implanted layer in the surface of said underlayer;
- heating and crystallizing said ion-implanted layer to turn said ion-implanted layer into said surface layer; and
- forming said electrode on said surface layer, wherein said first impurity causes said surface layer to have a value of a lattice

5,770,514

**METHOD FOR MANUFACTURING A VERTICAL TRANSISTOR HAVING A TRENCH GATE**

Noboru Matsuda, Kawasaki; Yoshiro Baba, Yokohama; Satoshi Yanagiya, Kawasaki, and Masanobu Tsuchitani, Tokyo, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

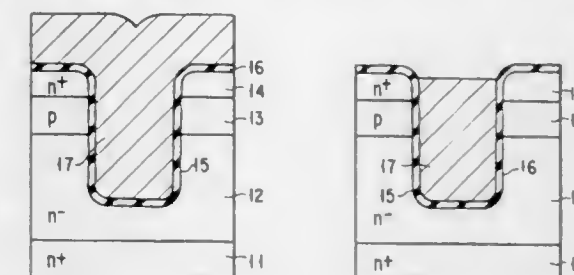
Division of Ser. No. 449,578, May 24, 1995, abandoned. This application Jan. 22, 1997, Ser. No. 787,573

Claims priority, application Japan, May 30, 1994, 6-117050

Int. Cl.<sup>6</sup> H01L 21/3205; 21/4763

U.S. Cl. 438—589

1 Claim



- 1. A method of manufacturing a transistor having at least one insulated gate, comprising the steps of:
- providing a groove portion in part of an element region formed on a semiconductor substrate, said groove portion penetrating an impurity diffusing layer;
- providing a gate layer in said groove portion with an insulation film interposed therebetween, said gate layer having a width which is smaller than that of said groove portion; and
- wherein said gate layer is provided by selectively growing a polysilicon layer having impurities by epitaxial growth on a polysilicon layer having impurities which is buried into said groove portion to substantially the same level as an entrance of said groove portion.

5,770,515

**METHOD OF IN-SITU WAFER COOLING FOR A SEQUENTIAL WSi/ALPHA-SI SPUTTERING PROCESS**

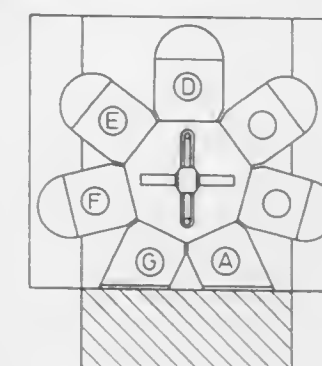
Hsien-Liang Meng; Elvis Huang; Pei-Jan Wang, and Yeong Rvey Shiue, all of Hsin-Chu, Taiwan, assignors to Mosel Vitelic Incorporated, Hsin-Chu, Taiwan

Filed Dec. 12, 1996, Ser. No. 764,335

Int. Cl.<sup>6</sup> H01L 21/28

U.S. Cl. 438—592

2 Claims



- 1. A method for producing a semiconductor device including:
- preparing a semiconductor substrate having opposite front and rear surfaces and a heat generating element disposed on the front surface;
- forming two recesses in the semiconductor substrate at opposite sides of the heat generating element by selectively etching the semiconductor substrate from the front surface using a gas mixture in a direction perpendicular to the front surface of the substrate;
- forming two cavities in the semiconductor substrate beneath the respective recesses by selectively etching the semiconductor substrate from the front surface using a gas and connecting the cavities to each other directly opposite the heat generating element to form a single cavity; and
- filling the single cavity with a first metal.
- 3. A method for producing a semiconductor device comprising:
- preparing a semiconductor substrate having opposite front and rear surfaces and a heat generating element disposed on the front surface; and
- selectively wet etching the semiconductor substrate from the rear surface, using an etching mask having a first aperture opposite a region of the substrate where a via-hole is to be formed, and a plurality of second apertures opposite the heat generating element on the front surface of the substrate, each of the second apertures being smaller than the first aperture, thereby simultaneously forming a via-hole penetrating through the substrate and a recess in the substrate opposite the heat generating element, the recess having a depth extending from the rear surface of the substrate through only part of the substrate.

- 1. A method of in-situ wafer cooling for sequential sputtering WSi/α-Si, comprising the steps of:
- sputtering a WSi layer on a wafer in a multi-chamber sputtering apparatus;
- then, transporting the wafer to another chamber and cooling down the wafer by blowing of inert gas at the rear of the wafer; and
- sputtering an α-Si layer in condition of continuing blowing of inert gas.

5,770,516

Patent Not Issued For This Number

5,770,517

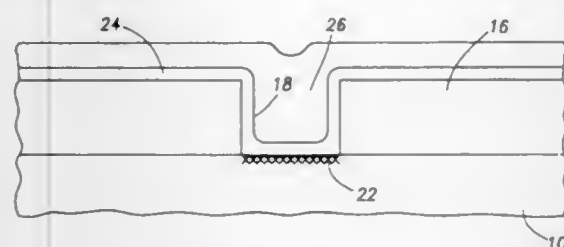
**SEMICONDUCTOR FABRICATION EMPLOYING  
COPPER PLUG FORMATION WITHIN A CONTACT  
AREA**Mark I. Gardner, Cedar Creek, and Fred N. Hause, Austin,  
both of Tex., assignors to Advanced Micro Devices, Inc.,  
Sunnyvale, Calif.

Filed Mar. 21, 1997, Ser. No. 823,046

Int. Cl.<sup>6</sup> H01L 21/265; 21/283

U.S. Cl. 438—627

16 Claims



1. A method for forming an integrated circuit, comprising:  
providing an interlevel dielectric disposed upon a semiconductor topography;  
removing a portion of the interlevel dielectric to form a via extending to a contact region of the semiconductor topography;  
implanting inert species through the via at an energy and concentration density sufficient to at least partially amorphize the contact region;  
depositing copper within the via and upon the interlevel dielectric; and  
removing said copper exclusive of said via.

5,770,518

**SEMICONDUCTOR DEVICE AND METHOD OF  
MANUFACTURING WITHOUT UNDERCUTTING  
CONDUCTIVE LINES**Lewis Shen, Cupertino, Calif., assignor to Advanced Micro  
Devices, Inc., Sunnyvale, Calif.

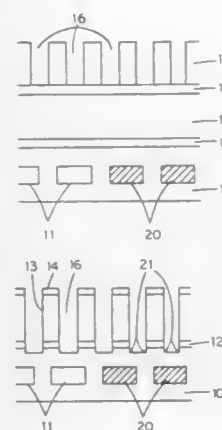
Division of Ser. No. 423,497, Apr. 19, 1995, Pat. No. 5,604,381.

This application Oct. 10, 1996, Ser. No. 728,225

Int. Cl.<sup>6</sup> H01L 21/4763; 21/302

U.S. Cl. 438—631

19 Claims



1. A method of manufacturing a semiconductor device comprising:

forming a dielectric layer containing functional circuit components bordered by one or more selectively placed non-functional circuit components;  
forming a layer of conductive material on the dielectric layer extending over the functional and over the one or more non-functional circuit components;  
forming a mask on the conductive layer, which mask contains a pattern defining lines to constitute a dense array of upper conductive lines extending over the functional and one or more non-functional circuit components; and  
etching the conductive layer through the mask to form the dense array of upper conductive lines on the dielectric layer extending over the functional circuit components and over the one or more selectively placed non-functional circuit components, wherein all of the non-functional circuit components included in the device are disposed only directly under portions of the dense array of conductive lines, and a distance between upper conductive lines is less than about 1.0 micron.

5,770,519

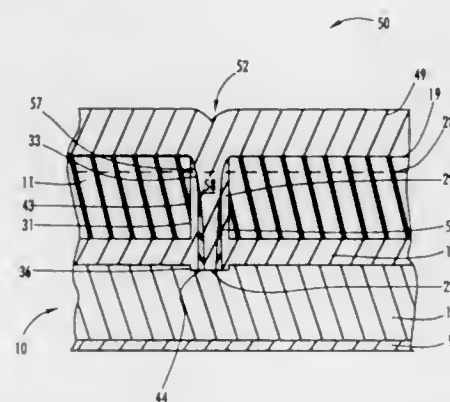
**COPPER RESERVOIR FOR REDUCING  
ELECTROMIGRATION EFFECTS ASSOCIATED WITH A  
CONDUCTIVE VIA IN A SEMICONDUCTOR DEVICE**Richard K. Klein, Mountain View; Darrell Erb, Los Altos;  
Steven Avanzino; Robin Cheung, both of Cupertino; Scott  
Luning, Menlo Park; Bryan Tracy, Oakland; Subhash  
Gupta, San Jose, and Ming-Ren Lin, Cupertino, all of Calif.,  
assignors to Advanced Micro Device, Inc., Sunnyvale, Calif.

Filed Jun. 5, 1995, Ser. No. 464,305

Int. Cl.<sup>6</sup> H01L 21/4763; 21/44

U.S. Cl. 438—639

19 Claims



1. A method of fabricating a semiconductor structure including a conductive line formed over an insulating layer, the insulating layer having a top side and a via extending from the top side of the insulating layer to a bottom, the semiconductor structure being less susceptible to electromigration failures associated with the via, the method comprising steps of:  
depositing a conformal barrier layer over the via;  
removing the conformal barrier layer from the top side of the insulating layer and the bottom of the via, thereby leaving a barrier sidewall in the via;  
depositing a first metal, wherein the first metal includes copper, within the via; and  
forming a plug by depositing a second metal above the first metal, thereby reducing electromigration failures on the conductive line.

5,770,520

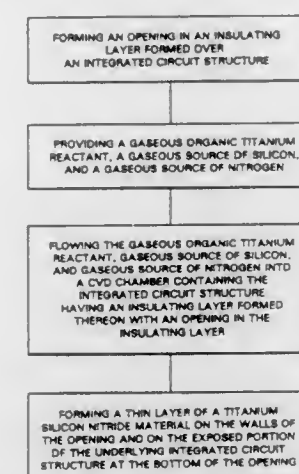
**METHOD OF MAKING A BARRIER LAYER FOR VIA OR  
CONTACT OPENING OF INTEGRATED CIRCUIT  
STRUCTURE**Joe W. Zhao, San Jose; Zhihai Wang, Sunnyvale, and Wilbur  
G. Catabay, Santa Clara, all of Calif., assignors to LSI Logic  
Corporation, Milpitas, Calif.

Filed Dec. 5, 1996, Ser. No. 760,466

Int. Cl.<sup>6</sup> H01L 21/44

U.S. Cl. 438—653

21 Claims



1. A process for forming a single barrier layer of titanium silicon nitride in a via or contact opening in an integrated circuit structure which comprises:

- a) providing an integrated circuit structure on a semiconductor substrate with an insulating layer thereon and one or more vias or contact openings formed through said insulating layer to an underlying conductive portion selected from the group consisting of a metal and said semiconductor substrate;  
b) mounting said semiconductor substrate in a CVD chamber;  
c) flowing into said chamber reactant gases comprising:  
i) a gaseous source of titanium;  
ii) a gaseous source of silicon; and  
iii) a gaseous source of nitrogen;  
whereby a barrier layer of TiSiN is formed on sidewall surfaces of said via or contact opening and over said underlying conductive portion to separate said conductive portion from filler material subsequently placed in said one or more vias or contact openings.

21. A process for forming a single barrier layer of titanium silicon nitride having a resistivity level not exceeding 1000  $\Omega$ /square for use in a via or contact opening in an integrated circuit structure to separate conductive filler material in said via or contact opening from underlying conductive material which comprises:

- a) providing an integrated circuit structure on a semiconductor substrate with an insulating layer thereon and one or more vias or contact openings formed in said insulating layer over an underlying conductive material selected from the group consisting of silicon and a metal;  
b) mounting said semiconductor substrate in a CVD chamber;  
c) forming a single barrier layer of titanium silicon nitride directly on the sidewall surfaces of said via or contact opening and directly over exposed portions of said underlying conductive material beneath said via or contact opening by flowing into said chamber reactant gases comprising:  
i) a gaseous source of titanium;  
ii) a gaseous source of silicon; and  
iii) a gaseous source of nitrogen;  
whereby a single barrier layer of titanium silicon nitride is formed directly on said sidewall surfaces of said via or contact opening and directly over said underlying conductive material beneath said barrier layer to separate said underlying conductive material from conductive filler material subsequently used to fill said via or contact opening.

5,770,521

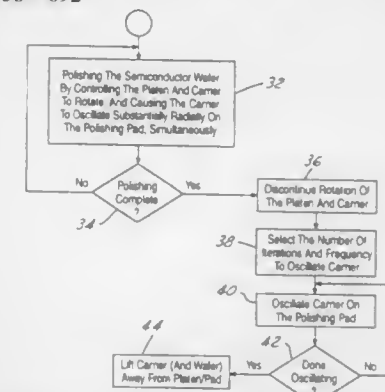
**ANTI-SHEAR METHOD AND SYSTEM FOR  
SEMICONDUCTOR WAFER REMOVAL**John J. Pollock, Bloomington, Minn., assignor to Cypress  
Semiconductor Corporation, San Jose, Calif.

Filed May 30, 1996, Ser. No. 657,718

Int. Cl.<sup>6</sup> H01L 21/00

U.S. Cl. 438—692

20 Claims



17. A method of operating a semiconductor wafer polishing apparatus having a platen rotatable about a first axis for receiving a polishing pad, a carrier rotatable about a second axis for receiving the semiconductor wafer, comprising the steps of:

- (A) polishing the semiconductor wafer by simultaneously rotating the platen, rotating the carrier, and moving the carrier parallel to the platen and along a path between first and second positions; and,  
(B) discontinuing rotation of the platen and carrier while maintaining movement of the carrier between the first and second positions to thereby reduce a separation-resisting force between the wafer and the polishing pad.

5,770,522

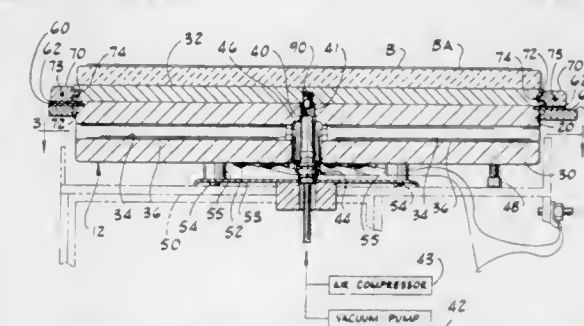
**POLISHING BLOCK HEATER**Francis Richard Bronson, High Ridge, Mo., assignor to  
MEMC Electronic Materials, Inc., St. Peters, Mo.

Filed Nov. 12, 1996, Ser. No. 764,458

Int. Cl.<sup>6</sup> H01L 21/00

U.S. Cl. 438—692

20 Claims



1. A method for mounting a semiconductor wafer on a polishing block to hold the semiconductor wafer during polishing, the method comprising the steps of:

- providing a polishing block having a surface for mounting the semiconductor wafer thereon;  
providing a heater comprising a heater body and a thermally conductive buffer plate selectively moveable with respect to the heater body between a pre-heating position in which the plate is spaced from the heater body and a heating position in which the plate contacts the heater body;  
applying a bonding agent to the polishing block surface;  
placing the polishing block on the buffer plate when the buffer plate is positioned in the pre-heating position;  
moving the buffer plate from the pre-heating position to the heating position to heat the buffer plate, the polishing block and the bonding agent;



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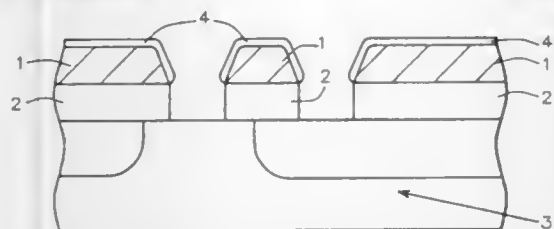
UMI

holding the buffer plate in the heating position with the polishing block on the buffer plate for a period of time sufficient to prepare the bonding agent; and applying the semiconductor wafer to the prepared bonding agent.

5,770,523  
METHOD FOR REMOVAL OF PHOTORESIST RESIDUE AFTER DRY METAL ETCH  
Ming-Yeon Hung, Hsin-Chu; Janet Yu, Chang-hua; Weng-Liang Fang, Hsin-Chu, and Chang-Ching Kin, Hsin-chu Hsien, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chu, Taiwan  
Filed Sep. 9, 1996, Ser. No. 709,697  
Int. Cl.<sup>6</sup> C25F 3/30

U.S. Cl. 438—725

14 Claims



1. A method for removal of photoresist residues remaining after metal subtractive etching in the fabrication of semiconductor integrated circuit devices comprising:  
placing integrated circuit devices containing photoresist residues into the stripping chamber of a metal subtractive etch reactor after metal etching;  
admitting a fluorine-containing reactive gas flow to the reactor stripping chamber;  
supplying radio frequency power input to the reactor chamber; and  
exposing the photoresist residue surface to the fluorine-containing reactive gas to form volatile compounds with the surface for a time and radio frequency input sufficient to allow the residue surface to be removed and to permit subsequent photoresist stripping in an oxygen plasma.

5,770,524

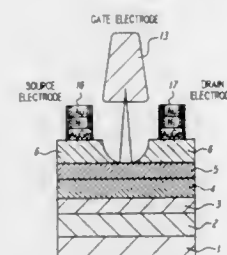
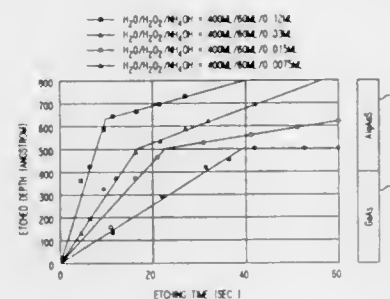
Patent Not Issued For This Number

5,770,525  
METHOD OF FABRICATING SEMICONDUCTOR DEVICE AND METHOD OF FABRICATING HIGH-FREQUENCY SEMICONDUCTOR DEVICE  
Tomoyuki Kamiyama, Saitama-ken, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan  
Filed Nov. 16, 1995, Ser. No. 558,548  
Claims priority, application Japan, Nov. 18, 1994, 6-285669; Aug. 7, 1995, 7-201145  
Int. Cl.<sup>6</sup> H01L 21/302

U.S. Cl. 438—745

15 Claims

1. A method of fabricating a semiconductor device having a heterojunction structure between an AlGaAs layer and a GaAs layer disposed thereon, comprising the steps of:  
forming a resist having an opening which has a width of at most 0.5 mm on the GaAs layer;  
selectively etching only the GaAs layer through said opening with an etchant which comprises a mixture of ammonia water and hydrogen peroxide solution which are mixed at a ratio of at least 1:4000, said mixture being diluted with water, thereby to form a recess in said GaAs layer; and



forming an electrode on the AlGaAs layer in said recess through said opening, using said resist as a mask.

5,770,526

Patent Not Issued For This Number

5,770,527

Patent Not Issued For This Number

5,770,528  
METHYLATED HYDROXYPROPYLCELLULOSE AND TEMPERATURE RESPONSIVE PRODUCTS MADE THEREFROM

Pavneet Singh Mumick, and Yihua Chang, both of Appleton, Wis., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Filed Dec. 31, 1996, Ser. No. 775,223

Int. Cl.<sup>6</sup> A61F 13/00; 13/20; C08B 11/08

U.S. Cl. 442—59

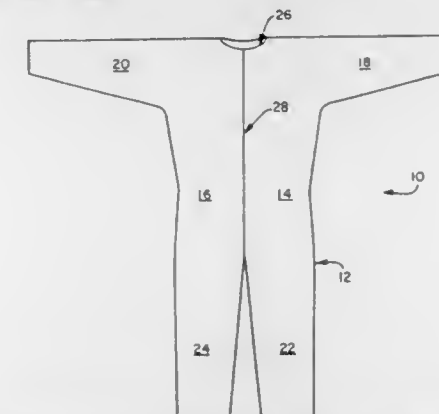
38 Claims

1. A binder composition for binding fibrous material into an integral web, said binder composition comprising methylated hydroxypropylcellulose.  
21. A water-dispersible product containing at least one fibrous substrate, wherein the fibrous substrate comprising:  
at least one fibrous material; and  
a binder composition for binding said at least one fibrous material into an integral web, said binder composition comprising methylated hydroxypropylcellulose (m-HPC).  
35. A water-dispersible thermoformable article comprising methylated hydroxypropylcellulose (m-HPC).

5,770,529  
LIQUID-DISTRIBUTION GARMENT  
Kimberly Bradshaw Dennis, Roswell; Ronald Francis Cook, and Craig Farrell Thomaschefskey, both of Marietta, all of Ga., assignors to Kimberly-Clark Corporation, Neenah, Wis.  
Filed Apr. 28, 1995, Ser. No. 430,684  
Int. Cl.<sup>6</sup> B32B 27/02; 27/16

U.S. Cl. 442—268

29 Claims



1. A liquid-distribution garment worn in body-side combination with substantially impermeable protective apparel, the garment comprising:

a body portion constructed of a liquid pervious hydrophilic sheet material, said body portion defining a neck opening and configured to cover at least a portion of a user's body torso; said hydrophilic sheet material including:

- at least one layer of a hydrophilically transmuted, liquid pervious reinforcing fabric comprising the body-side of the hydrophilic sheet material; and
- at least one layer of a hydrophilically transmuted, liquid pervious absorbent nonwoven fabric joined to the layer of reinforcing fabric so that the joined layers have a water wicking rate of at least about 4 centimeters per 30 seconds in at least one direction.

5,770,530  
PROTECTIVE LAYER, PARTICULARLY ANTI-VANDALISM PROTECTIVE LAYER

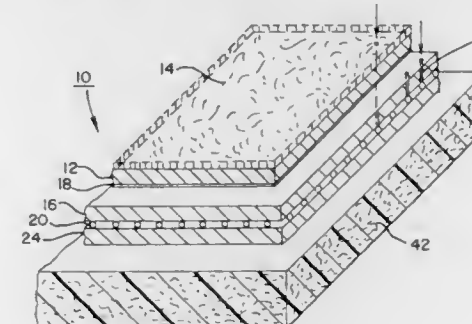
Hans Nockemann, Wuppertal, and Bruno Schwarz, Oberlaudenbach, both of Germany, assignors to Happpich Fahrzeug-und Industrieteile GmbH, Wuppertal, Germany  
Filed Oct. 25, 1995, Ser. No. 548,054

Claims priority, application Germany, Oct. 25, 1994, 44 38 013.5

Int. Cl.<sup>6</sup> B32B 5/06

U.S. Cl. 442—319

12 Claims



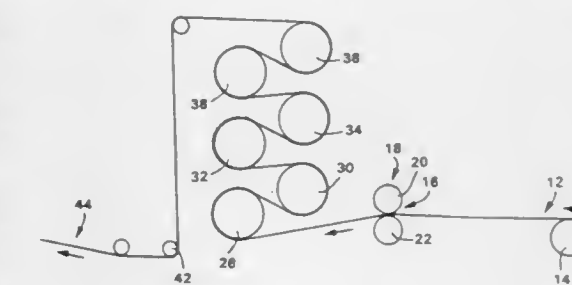
1. A protective layer comprising:  
a cover layer of woven seat upholstery fabric;  
a cut resisting layer of generally knitted material comprising cut resisting fibers selected from the group consisting of aromatic polyamide fibers, polyethylene fibers spun by the gel-spin process, or glass fibers, and further comprising a respective sheathed wire having a diameter of 0.1 to 2 mm contained

among at least some of the fibers in the cut resisting layer, wherein some of the wires protrude toward the cover layer from a plane of the cut resisting layer; and  
a layer of textile nonwoven material applied by needling to at least one side of the cut resisting layer; and by linear bonding to the sheathed wires protruding from the plane of the cut resisting layer, the nonwoven layer being connected by bonding to the cover layer.

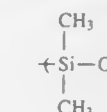
5,770,531  
MECHANICAL AND INTERNAL SOFTENING FOR NONWOVEN WEB  
Gregory Todd Sudduth, Lawrenceville, and Ali Yahlaoui, Roswell, both of Ga., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.  
Filed Apr. 29, 1996, Ser. No. 639,637  
Int. Cl.<sup>6</sup> B32B 23/16

U.S. Cl. 442—361

17 Claims



1. A nonwoven web comprising a polymer and between a positive amount and about 3 weight percent of an internal softening agent having a formula consisting essentially of



wherein n is from 3 to about 1,000, and which web has been mechanically softened wherein the web has a cup crush value which is less than 50 percent of a cup crush value of the same fabric without said internal additive and said mechanical softening.

5,770,532  
METHOD FOR MANUFACTURING A SOLIDIFIED FIBER FLEECE, THE RESULTING SOLIDIFIED FIBER FLEECE, AND USE OF THIS FLEECE  
Gerold Fleissner, Zug, Switzerland, assignor to Hitachi, Ltd., Tokyo, Japan  
Filed Jan. 11, 1996, Ser. No. 584,674  
Int. Cl.<sup>6</sup> D04H 1/46

U.S. Cl. 442—408

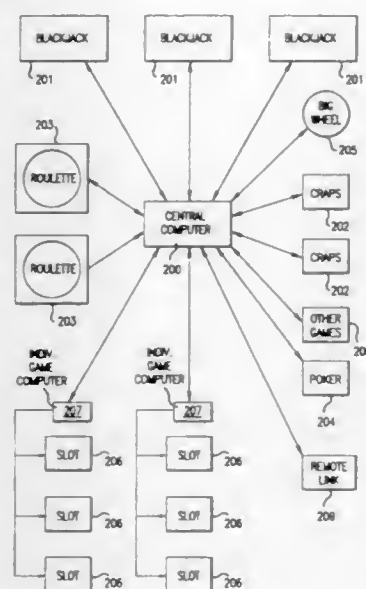
13 Claims

1. A method for solidifying a fiber fleece which is made of artificial staple fibers including polyester, polyethylene, or polypropylene fibers, or of spun filaments of artificial fiber-forming materials including polyester, polyethylene or polypropylene and produced in a thickness as much as 10 mm or more without binding fibers, including bicomponent or special melt fibers, and without binding agents and which may be mixed with natural fibers, characterized in that the fleece is solidified solely by a single water needling operation with a water pressure of only 60 bars at most.

5,770,533  
**OPEN ARCHITECTURE CASINO OPERATING SYSTEM**  
 John Franco Franchi, 601 Pennsylvania Ave., N.W. Suite 700  
 North Building, Washington, D.C. 20004  
 Filed May 2, 1994, Ser. No. 235,988  
 Int. Cl.<sup>6</sup> A63F 9/24

U.S. Cl. 463—42

50 Claims



1. A casino operating system for enabling at least one player to gamble against a representative of a casino comprising:

at least one computerized player console for enabling a player to monitor a gambling game, to enter commands necessary to play the gambling game, and to place bets, wherein said computerized player console is activated upon insertion into said computerized player console of a betting card on which at least player identification and cash balance data are stored, said computerized player console displaying the cash balance data of the player, game information and command data, and winnings and losses data of the player, and updating said data stored on the betting card;

a dealer console for enabling a dealer to monitor the gambling game, and to enter commands necessary to play the gambling game, said dealer console being interconnected with said computerized player console; and

a gaming apparatus for playing the gambling game interconnected with said at least one computerized player console and said dealer console, said gaming apparatus including encoded game pieces and encoded game chips and sensors that automatically generate play data of the gambling game, said gaming apparatus transmitting said play data to said computerized player console

said computerized player console displaying said game information and said winnings and losses data of the player and automatically updating said cash balance data stored on said betting card in response to said play data.

5,770,534  
**CERAMIC COMPOSITION FOR ABSORBING ELECTROMAGNETIC WAVES AND METHOD FOR MANUFACTURING THE SAME**  
 Sung-Yong Hong, 210-702, Hanbomdo Apartment, 511 Daechi-Dong, Kangnam-Ku, Seoul, Rep. of Korea  
 Filed Jun. 24, 1997, Ser. No. 881,764  
 Claims priority, application Rep. of Korea, Feb. 12, 1997, 97-4095

Int. Cl.<sup>6</sup> C04B 35/26; B28B 1/00; H05K 9/00  
 U.S. Cl. 501—1

10 Claims

1. A ceramic composition for absorbing electromagnetic waves, comprising:

a raw powder comprising by weight between about 60% and about 80% Fe<sub>2</sub>O<sub>3</sub>, between about 3% and about 8% NiO, between about 15% and about 25% ZnO, and between about 3% and about 8% CuO; and

a mixture around the raw powder comprising by weight between about 30% and about 50% water, between about 0.2% and about 0.6% a dispersing agent, between about 0.5% and about 1.0% a plasticizer, and between about 0.1% and about 0.4% a lubricant.

4. A method for manufacturing a ceramic composition for absorbing electromagnetic waves, comprising the steps of:

i) homogeneously mixing a raw powder comprising by weight between about 60% and about 80% Fe<sub>2</sub>O<sub>3</sub>, between about 3% and about 8% NiO, between about 15% and about 25% ZnO, and between about 3% and about 8% CuO, and a mixture around the raw powder comprising by weight between about 30% and about 50% water, between about 0.2% and about 0.6% a dispersing agent, between about 0.5% and about 1.0% a polyvinyl alcohol, between about 0.0005 and about 0.004 Bi<sub>2</sub>O<sub>3</sub>, and between about 0.1% and about 0.4% a lubricant;

ii) grinding the mixed powder;

iii) converting the grounded powder into granulates;

iv) forming the granulates into a shaped body;

v) sintering the shaped body to form a sintered body; and

vi) cooling the sintered body gradually.

5,770,535  
**ALKALI-FREE ALUMINOBOROSILICATE GLASS AND ITS USE**

Peter Brix, Mainz; Gerhard Lautenschlager, Jena; Klaus Schneider, Apolda, and Thomas Kloss, Jena, all of Germany, assignors to Schott Glaswerke, Mainz, Germany

Filed Jan. 31, 1997, Ser. No. 791,949

Claims priority, application Germany, Feb. 2, 1996, 196 03 698 .4

Int. Cl.<sup>6</sup> C03C 3/093

U.S. Cl. 501—67

13 Claims

1. Alkali-free aluminoborosilicate glass of the following composition, in % by weight based on oxide:

SiO<sub>2</sub> 52–62

B<sub>2</sub>O<sub>3</sub> 4–14

Al<sub>2</sub>O<sub>3</sub> 12–20

MgO 0–8

CaO 4–11

BaO 0–2

ZnO 2–8

ZrO<sub>2</sub> 0–2

SaO<sub>2</sub> 0.52 0–2.

5,770,536  
**FIBER REINFORCED SPRAY MIX**

Peter T. Sutor, Pittsburgh, Pa., assignor to Harbison-Walker Refractories Company, Pittsburgh, Pa.

Filed Aug. 6, 1996, Ser. No. 693,034

Int. Cl.<sup>6</sup> C04B 35/03

U.S. Cl. 501—95.1

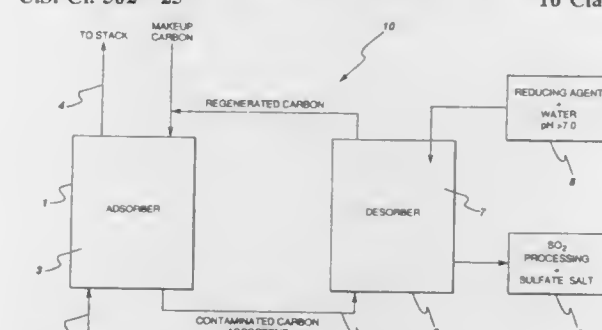
12 Claims

1. A pulverulent fiber-reinforced spray mix comprising 100 wt. % solids comprising a refractory aggregate and for each 100 wt. % of said solids, about 0.02 to 0.3 wt. % flexible, thermoset polymer fibers resistant to decomposition at a temperature up to about 400° F. and wherein the polymer fibers are selected from the group consisting of thermoset aramid, polyamide, or polyester.

5,770,537  
**LOW-TEMPERATURE METHOD TO REGENERATE CARBON LOADED WITH SULFUR COMPOUNDS**  
 Youssef El-Shoubary, Clifton Park; Bang Mo Kim, Schenectady; Donald Franklin Foust, Scotia, and Norman Zethward Shilling, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.  
 Filed Dec. 4, 1995, Ser. No. 566,517  
 Int. Cl.<sup>6</sup> B01J 20/36; 38/48; 38/64

U.S. Cl. 502—25

10 Claims



1. A method for regenerating a carbon adsorbent contaminated with sulfur or sulfur-containing compounds comprising the steps of:

forming a basic reducing solution by admixing a sufficient amount of a reducing agent with water to form an admixture and if needed, adjusting the pH of the admixture to above 7.0 with a sufficient amount of base to obtain the basic reducing solution; and then

soaking the contaminated carbon adsorbent in the basic solution at room temperature for a sufficient amount of time to reduce SO<sub>3</sub> to a SO<sub>2</sub> by-product and to neutralize sulfuric acid to a sulfate salt by-product thereby reducing carbon loss during regeneration of the carbon adsorbent.

5,770,538  
**GROUP 4 METAL DIENE COMPLEXES AND ADDITION POLYMERIZATION CATALYSTS THEREFROM**

David D. Devore; Francis J. Timmers, both of Midland, Mich.; James C. Stevens, Richmond, and Robert K. Rosen, Sugar Land, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

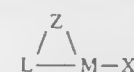
Division of Ser. No. 429,974, Apr. 27, 1995, Pat. No. 5,539,068, which is a division of Ser. No. 267,993, Jun. 28, 1994, Pat. No. 5,486,632. This application Feb. 20, 1996, Ser. No. 602,544. The portion of the term of this patent subsequent to Jun. 28, 2014, has been disclaimed.

Int. Cl.<sup>6</sup> C08F 4/643

U.S. Cl. 502—117

4 Claims

1. A supported catalyst for use in the polymerization of an addition polymerizable ethylenically unsaturated monomer comprising a support and a catalyst composition comprising a metal complex which is catalytically activated by combination with an activating cocatalyst or by use of an activating technique, said metal complex containing one and only one cyclic, delocalized, anionic,  $\pi$ -bonded group, and corresponding to the formula:



wherein:

M is a Group 4 metal in the +4 formal oxidation state;

L is a group containing a cyclic, delocalized, anionic,  $\pi$ -system through which the group is bound to M, and which group is also bound to Z;

Z is a moiety bound to M via a  $\sigma$ -bond, comprising an element selected from the group consisting of boron, and the members of Group 14 of the Periodic Table of the Elements, and also

comprising an element selected from the group consisting of nitrogen, phosphorus, sulfur and oxygen, said moiety having up to 60 non-hydrogen atoms; and

X is a conjugated diene or a hydrocarbyl-, halocarbyl-, or silyl-substituted derivative thereof, said X having from 4 to 40 non-hydrogen atoms, and being coordinated to M so as to form a metallocyclopentene therewith.

5,770,539  
**LEWIS ACID CATALYSTS SUPPORTED ON POROUS POLYMER SUBSTRATE**

Frank Joung-Yei Chen, Edison, N.J.; Tze-Chiang Chung, State College, Pa.; Jon Edmond Stanat, Westfield, N.J., and Soon Hong Lee, State College, Pa., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 65,325, May 20, 1993, abandoned.

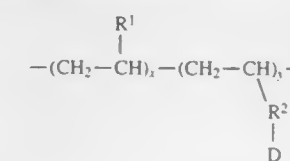
This application Jan. 18, 1996, Ser. No. 588,276

Int. Cl.<sup>6</sup> B01J 31/00

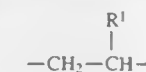
U.S. Cl. 502—152

26 Claims

1. Immobilized Lewis Acid catalyst comprising porous polymer film substrate having at least one Lewis Acid immobilized on pore surfaces thereof, said polymer film substrate, prior to having said Lewis Acid immobilized thereon, comprising a porous film of functionalized polymer and, optionally, unfunctionalized polymer, said functionalized polymer having within its structure units represented by the formula



and said unfunctionalized polymer having within its structure repeating monomer units represented by the formula



wherein

D represents OH, halide, NH<sub>2</sub>, NHR<sup>3</sup>, OM', or OM";

R<sup>1</sup> represents hydrogen, C<sub>1</sub>–C<sub>24</sub> alkyl, C<sub>3</sub>–C<sub>24</sub> cycloalkyl, C<sub>6</sub>–C<sub>18</sub> aryl or C<sub>7</sub>–C<sub>30</sub> alkylaryl;

R<sup>2</sup> represents C<sub>3</sub>–C<sub>24</sub> alkyl, C<sub>3</sub>–C<sub>24</sub> cycloalkyl, C<sub>6</sub>–C<sub>18</sub> aryl or C<sub>7</sub>–C<sub>30</sub> alkylaryl;

R<sup>3</sup> represents C<sub>1</sub>–C<sub>24</sub> alkyl, C<sub>3</sub>–C<sub>24</sub> cycloalkyl, C<sub>6</sub>–C<sub>18</sub> aryl or C<sub>7</sub>–C<sub>30</sub> alkylaryl;

M' represents alkali metal;

M" represents alkaline-earth metal; and

x and y represent the mole % of each respective subunit, the sum of x+y being 100%.

5,770,540  
**PROCATALYST FOR ETHYLENE POLYMER PRODUCTION, METHOD FOR ITS PREPARATION AND USE**

Thomas Garoff, Helsinki; Solveig Johansson, Stenungsund; Ulf Palmqvist, Porvoo; Daniel Lindgren, Hjalteby; Marita Sutela, Porvoo; Päivi Waldvogel, Porvoo, and Arja Kostinen, Porvoo, all of Finland, assignors to Borealis Polymers Oy, Porvoo, Finland

Filed Jun. 20, 1995, Ser. No. 492,799

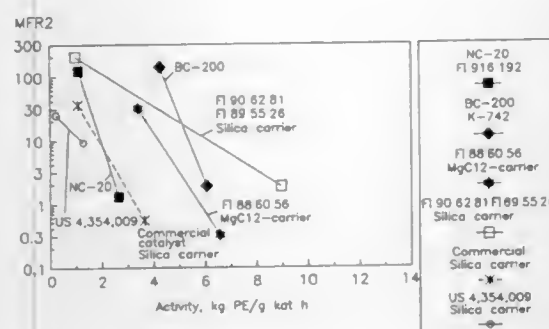
Int. Cl.<sup>6</sup> B01J 31/00

U.S. Cl. 502—154

25 Claims

1. A high activity procatalyst for the production of ethylene polymers, which procatalyst comprises an inorganic support, a chlorine compound carried on said support, a magnesium compound carried on said support, and a titanium compound carried on





said support, wherein the chlorine compound is the same or different from the magnesium compound and/or the titanium compound, and wherein said procatalyst has an activity balance AB, which is greater than 3.2, wherein  $AB = \{(A+A') \cdot 2 \cdot \log(MFR_2' : MFR_2) : (A-A')\}$ . A represents the polymerization activity expressed as kg PE/g cat-h for a polymer of a first molecular weight, A' represents the polymerization activity for a polymer of a second molecular weight, MFR<sub>2</sub>' means the melt flow rate for said polymer of a first molecular weight. MFR<sub>2</sub>' means the melt flow rate for said polymer of a second molecular weight, expressed in g/min units at a load of 2.16 kg, according to the standard ISO 1133, the absence of the upper index ' means low melt flow rate polymerization and the presence of the upper index ' means high melt flow polymerization.

5,770,541

## ISOBUTANOL SYNTHESIS CATALYST

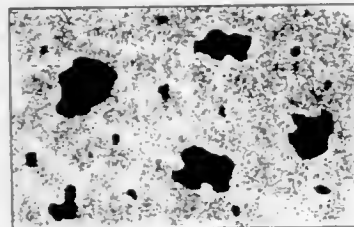
Thomas Henry Vanderspurt, Delaware Township, N.J.; Mark Alan Greaney, Upper Black Eddy, Pa.; Daniel Paul Leta, Flemington, N.J.; Russell John Koveal, Baton Rouge, La.; Mark Michael Disko, High Bridge, N.J.; Angela V. Klaus, Highland Park, N.J.; Sutinder K. Behal, Somerville, N.J., and Robert B. Harris, Billings, Mont., assignors to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Dec. 8, 1995, Ser. No. 569,382

Int. Cl.<sup>6</sup> B01J 23/32; C07C 27/00

U.S. Cl. 502—324

1 Claim



1. A catalyst for conversion of methanol, ethanol, and mixtures thereof with n-propanol to isobutanol, comprising: a noble metal supported on at least a first phase of mixed oxide crystallites containing from about 60 to about 74 atomic % zirconium, from about 21 to about 31 atomic % manganese and from about 5 to about 9 atomic % zinc, and less than about one atomic % alkali, a second phase of zirconium doped heterolite particles containing from about 65 to about 69 atomic % manganese, from about 31% to about 35% zinc, about 0.5 to 5 atomic % zirconium, and optionally a trace atomic % of alkali, and a third phase containing from about 29 to about 55 atomic % manganese, from about 13 to 55 atomic % zinc, and from about 13 to 35 atomic % zirconium, wherein the first phase mixed oxide crystallites have a zirconium

oxide structure have a particle size of about 40 Å to about 100 Å, wherein the second phase particles have a particle size of about 200 Å to greater than about 2000 Å, wherein the third phase has a particle size of about 1000 Å to greater than 4000 Å, wherein the first phase zirconium oxide is cubic, and wherein the mole ratio in the bulk composition of Zr to the sum of the moles of Mn and Zr is between about 0.41 to about 0.50 and the mole ratio of Zn to the sum of the moles of Mn and Zr is between about 0.29 and 0.40.

5,770,542

## METHOD FOR UPGRADING WAXY FEEDS USING A CATALYST COMPRISING MIXED POWERED DEWAXING CATALYST AND POWDERED ISOMERIZATION CATALYST FORMED INTO A DISCRETE PARTICLE

Dee Anne Brandes, Calgary; David N. Zinkie, and Sandra J. Alward, both of Sarnia, all of Canada, assignors to Exxon Research & Engineering Company, Florham Park, N.J.

Continuation of Ser. No. 343,387, Nov. 22, 1994, abandoned.

This application Feb. 5, 1997, Ser. No. 795,057

Int. Cl.<sup>6</sup> B01J 21/00

U.S. Cl. 502—527

3 Claims

1. A unitized mixed powder pellet upgrading catalyst made by mixing powdered molecular sieve dewaxing catalyst comprising a 10 member ring unidirectional pore inorganic oxide molecular sieve with a powdered amorphous isomerization catalyst comprising a catalytically active metal selected from Group VIB, Group VIIIB and Group VIII metals and mixtures thereof on a refractory metal oxide support base, wherein the dewaxing catalyst has an acidity of from about 2.5 to 3.0 and the isomerization catalyst has an acidity of from about 0.3 to 2.5, said acidity being determined by the ability of the dewaxing catalyst and the isomerization catalyst to convert 2-methylpent-2-ene to 3-methylpent-2-ene and 4-methylpent-2-ene and is expressed as the mole ratio of 3-methylpent-2-ene to 4-methylpent-2-ene, and wherein the powdered molecular sieve dewaxing catalyst and the powdered isomerization catalyst are combined in a ratio in the range 1:100 to 100:1, mixing the powdered material together to form a homogeneous mass, compressing/extruding the mass and pelleting the compressed/extruded mass.

5,770,543

## AGRICULTURAL COMPOSITIONS COMPRISING ALKYL POLYGLYCOSIDES AND FATTY ACIDS

Roger H. Garst, Cincinnati, and David R. Clark, Loveland, both of Ohio, assignors to Henkel Corporation, Plymouth Meeting, Pa.

Filed Sep. 6, 1996, Ser. No. 709,548

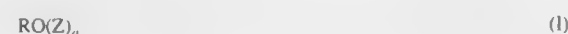
Int. Cl.<sup>6</sup> A01N 25/30; C05G 3/00

U.S. Cl. 504—116

22 Claims

1. An agricultural composition comprising:

- (a) an agricultural active agent selected from the group consisting of micro-nutrients, pesticides, plant growth regulators, biological agents and mixtures thereof present in an amount not greater than 15% by weight;
- (b) a fixative composition containing:
- (i) an alkyl polyglycoside having formula I:



wherein R is a monovalent organic radical having from about 6 to about 30 carbon atoms; Z is a saccharide residue having 5 or 6 carbon atoms; and a is a number having a value from about 1 to about 6, and

- (ii) a fatty acid having from about 6 to about 22 carbon atoms, and
- (c) remainder, up to 100%, of a liquid carrier.

5,770,544

## CONDENSED HETEROCYCLIC DERIVATIVES AND HERBICIDES

Sumio Yokota; Masafumi Matsuzawa; Nobuyuki Ohba; Toshihiro Nagata; Shigehiko Tachikawa; Takeshige Miyazawa, and Katsutada Yanagisawa, all of Shizuoka, Japan, assignors to Kumiai Chemical Industry Co., Ltd., and Ihara Chemical Industry Co., Ltd., both of Tokyo, Japan

Division of Ser. No. 204,199, Mar. 1, 1994, Pat. No. 5,616,537.

This application Oct. 9, 1996, Ser. No. 728,531

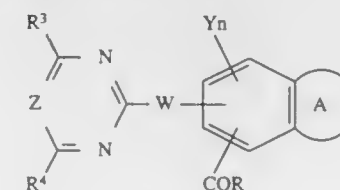
Claims priority, application Japan, Jul. 3, 1992, 4-199054; May 14, 1993, 5-136808

Int. Cl.<sup>6</sup> C07D 403/10; 405/10; 409/10; A01N 43/66

U.S. Cl. 504—230

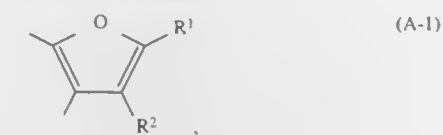
6 Claims

1. A pyrimidine of the formula (I):

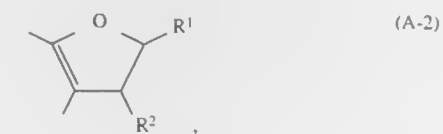


wherein

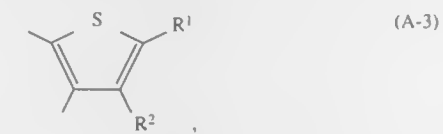
A is a heterocyclic ring of the formula:



(A-1)

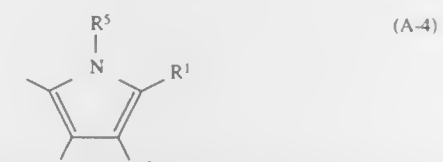


(A-2)



(A-3)

or



(A-4)

R is a hydrogen atom; a hydroxyl group; an alkoxy group which may be substituted with pentanoyloxy, butanoyloxy, hexanoyloxy, ethoxycarbonyl, ethoxy, ethylmalonyl, benzoyloxy, (2'-trimethylsilyl)ethyl, methoxy, trimethylsilyl or (2'-methoxy)ethoxy; a benzoyloxy group which may be substituted with methoxy; a phenyloxy group; a C<sub>1</sub>-C<sub>6</sub>-alkylthio group; a benzylthio group; a phenylthio group; a C<sub>3</sub>-alkenyloxy group which may be substituted with Br, a C<sub>3</sub>-alkynyloxy group; a C<sub>3</sub>-alkenylthio group; a C<sub>3</sub>-alkynylthio group; a C<sub>3</sub>-alkylideneaminoxy group; O<sup>-</sup>[N(CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub>)<sub>4</sub>]<sup>-</sup>; O<sup>-</sup>(CH<sub>2</sub>)<sub>2</sub>CHNH<sub>3</sub><sup>+</sup>; O<sup>-</sup>CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>NH<sub>3</sub><sup>+</sup>; O<sup>-</sup>Na<sup>+</sup>; or a group of the formula —NR<sup>6</sup>R<sup>7</sup>, wherein:

each of R<sup>6</sup> and R<sup>7</sup>, which may be the same or different, is a hydrogen atom, a C<sub>1</sub>-C<sub>6</sub>-alkyl group, a benzyl group, a phenyl group, a methylsulfonyl group or a phenylsulfonyl group; or R<sup>6</sup> and R<sup>7</sup> may, together with the nitrogen atom, form a 1,3-imidazole ring, pyrrolidine ring, piperidine ring or morpholine ring;

each of R<sup>1</sup> and R<sup>2</sup>, which may be the same or different, is a hydrogen atom; a formyl group; a C<sub>1</sub>-C<sub>6</sub>-alkylcarbonyl group which may be substituted with fluorine; a cyclopentylcarbonyl group; a benzoyl group which may be substituted with chlorine; a pyridylcarbonyl group; a carbomoyl group; a C<sub>2</sub>-C<sub>4</sub> alkoxy-carbonyl group; a phenyloxy-carbonyl group; a benzoyloxy-carbonyl group; a methylthiocarbonyl group; a phenylthiocarbonyl group; a methylsulfonyl group; a p-tolylsulfonyl group; a tri-C<sub>1</sub>-C<sub>4</sub>-alkylsilyl group; a propenyl group; a propynyl group; a 4,6-dimethoxypyridin-2-yl group or a trichloromethylthio group;

tylcarbonyl group; a benzoyl group which may be substituted with chlorine; a pyridylcarbonyl group which may be substituted with methylsulfonyl; a carboxyl group; a group of the formula —CONR<sup>8</sup>R<sup>9</sup>; a C<sub>1</sub>-C<sub>6</sub> alkylthiocarbonyl group which may be substituted with diethylamino; a C<sub>3</sub>-C<sub>6</sub>-cycloalkylthiocarbonyl group; a phenyloxy-carbonyl group which may be substituted with chlorine or methoxy; a C<sub>1</sub>-C<sub>6</sub>-alkoxy-carbonyl group which may be substituted with fluorine, chlorine, bromine, 2-furyl, 2-thienyl, cyano, ethoxycarbonyl hydroxy, dimethylamino, cyclopropyl, methoxy, ethoxy or methylthio; a C<sub>3</sub>-cycloalkyl group; a C<sub>1</sub>-C<sub>6</sub> alkyl group which may be substituted with fluorine, chlorine, methoxy, nitro, cyano, methoxycarbonyl, dimethylamino or hydroxy; a C<sub>2</sub>-C<sub>3</sub> alkenyl group which may be substituted with CN or nitro; a C<sub>3</sub> alkynyl group; an ethoxy group; a methoxy group; a phenyl group which may be substituted with chlorine; a halogen atom; a benzyloxy-carbonyl group which may be substituted with methoxy; a benzylthiocarbonyl group; a C<sub>3</sub>-C<sub>6</sub> cycloalkoxy-carbonyl group; a phenylthiocarbonyl group; a C<sub>3</sub>-C<sub>6</sub> alkenyloxy-carbonyl group which may be substituted with chlorine; a C<sub>3</sub>-C<sub>6</sub> alkenyloxy-carbonyl group; a C<sub>3</sub>-C<sub>6</sub> alkenylthiocarbonyl group; an isopropylideneaminoxy-carbonyl group; a nitro group; a cyano group; a halogenated carbonyl group; a group of the formula CR<sup>8</sup>=N—R<sup>9</sup>; a group of the formula NR<sup>10</sup>R<sup>11</sup> or a group of the formula N=CR<sup>12</sup>R<sup>13</sup>, wherein:

R<sup>6</sup> and R<sup>7</sup> are as defined above;R<sup>8</sup> is a hydrogen atom, a phenyl group, or a methyl group;R<sup>9</sup> is a hydroxyl group, a propyl group, a phenyl group, a benzyl group, a benzyloxy group, a methoxy group, a propoxy group, a propenyl group, a propynyl group, a phenoxy group, a methylamino group, a dimethylamino group, a phenylamino group or a phenylsulfonylamino group which may be substituted with methyl;each of R<sup>10</sup> and R<sup>11</sup>, which may be the same or different, is a hydrogen atom, a methyl group, a phenyl group, a benzyl group, a formyl group, an acetyl group, a benzoyl group, a pyridylcarbonyl group, an ethoxycarbonyl group, a methylsulfonyl group, a phenylsulfonyl group, a carbamoyl group, an ethylthiocarbonyl group or a phenylthiocarbonyl group which may be substituted with chlorine, or R<sup>10</sup> and R<sup>11</sup> may, together with the nitrogen atom, form a morpholine ring; andeach of R<sup>12</sup> and R<sup>13</sup>, which may be the same or different, is a hydrogen atom, a methyl group or a phenyl group, or R<sup>12</sup> and R<sup>13</sup> may, together with the carbon atom to which they are bound, form a cyclopentylidene group;each of R<sup>3</sup> and R<sup>4</sup>, which may be the same or different, is a hydrogen atom; a methoxy group which may be substituted with fluorine; a halogen atom; a methylamino group; a dimethylamino group or a C<sub>1</sub>-C<sub>6</sub> alkyl group;

R<sup>5</sup> is a hydrogen atom; a methyl group which may be substituted with methoxycarbonyl, ethoxycarbonyl, t-butylcarbonyloxy or methoxy; a formyl group; a C<sub>1</sub>-C<sub>6</sub> alkylcarbonyl group; a benzoyl group which may be substituted with chlorine; a pyridylcarbonyl group; a carbomoyl group; a C<sub>2</sub>-C<sub>4</sub> alkoxy-carbonyl group; a phenyloxy-carbonyl group; a benzoyloxy-carbonyl group; a methylthiocarbonyl group; a phenylthiocarbonyl group; a methylsulfonyl group; a p-tolylsulfonyl group; a tri-C<sub>1</sub>-C<sub>4</sub>-alkylsilyl group; a propenyl group; a propynyl group; a 4,6-dimethoxypyridin-2-yl group or a trichloromethylthio group;

Y is a halogen atom, a methyl group, a methoxy group, a phenyl group, a nitro group, a methylamino group or a dimethylamino group,

n is an integer of from 0 to 2, provided that when n is 2, it may represent a combination of different groups,

W is an oxygen atom, a sulfur atom, an N-formyl group, a methylene group, a carbonyl group or a cyanomethylene group, and

Z is a nitrogen atom; or a salt thereof.

5,770,545

## 2,6-DINITROANILINE HERBICIDE

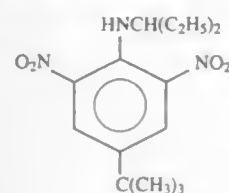
Lowell J. Lawrence; Terry L. Johnson; Stephan Kwiatkowski, all of Lexington, Ky., and Paul D. Smith, Seabrook, Tex., assignors to SRM Chemical, Ltd. Co., League City, Tex.

Filed Mar. 14, 1997, Ser. No. 818,541  
Int. Cl.<sup>6</sup> A01N 33/18; C07C 211/00

U.S. Cl. 504—347

20 Claims

1. A compound having the structure:



5,770,546

## SUPERCONDUCTOR BANDPASS FILTER HAVING PARAMETERS CHANGED BY A VARIABLE MAGNETIC PENETRATION DEPTH

Wolfgang Grothe, Tiefenbrunn; Klaus Voigtlaender, Wangen; Matthias Klauda, Erlangen, and Claus Schmidt, Magstadt, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

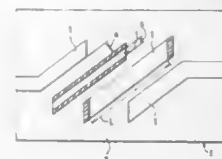
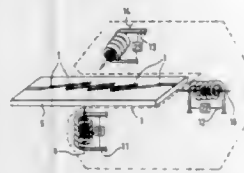
Filed Nov. 1, 1995, Ser. No. 551,654

Claims priority, application Germany, Nov. 22, 1994, 44 41 488.9

Int. Cl.<sup>6</sup> H01P 1/203; H01B 12/02

U.S. Cl. 505—210

10 Claims



7. A superconductor bandpass filter for electromagnetic signals, said superconductor bandpass filter having a bandwidth for said electromagnetic signals and a center frequency and comprising a substrate (5); a plurality of striplines (1) consisting of type II superconductive material arranged on said substrate and means (2) for tuning the superconductor bandpass filter consisting of means for changing a magnetic penetration depth ( $\lambda(T)$ ) of the striplines, so as to change an effective length (L), an effective width (b) and an effective spacing (a) of the striplines and which in turn effects a change in at least one of said center frequency and said bandwidth, wherein said means for changing a magnetic penetration depth includes means (11,12,13) for applying a magnetic field to the striplines (1) on the substrate (5).

5,770,547

## PROCESS FOR MAKING CUO SUPERCONDUCTORS

Linh Ngo Phong, Ste Foy, Canada, assignor to Her Majesty the Queen in right of Canada as represented by Minister of National Defence of her Majesty's Canadian Government, Ontario, Canada

Continuation of Ser. No. 452,489, May 30, 1995, abandoned, which is a continuation of Ser. No. 98,000, Jul. 29, 1993, abandoned. This application Mar. 25, 1997, Ser. No. 823,115  
Claims priority, application Canada, Jul. 29, 1992, 2074896  
Int. Cl.<sup>6</sup> H01L 39/24; C04B 40/00; B29C 71/00

U.S. Cl. 505—501

28 Claims

1. A crystallization process for obtaining the highest  $T_c$  phase in PbBiSrCaCuO superconductors, said highest  $T_c$  phase having a cation ratio of Bi:Sr:Ca:Cu=2:2:2:3, the steps comprising:

- heating PbBiSrCaCuO material film in an oxygen-rich atmosphere,
  - cooling the material resulting from step "i" to room temperature,
  - heating the material resulting from step "ii" in air,
  - cooling the material resulting from step "iii" to room temperature,
- wherein the total heating time of steps (i) and (iii) is from 60 to about 120 minutes.

5,770,548

## RINSEABLE HARD SURFACE CLEANER COMPRISING SILICATE AND HYDROPHOBIC ACRYLIC POLYMER

James J. Leskiewicz, and Marygrace G. Horner, both of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed May 14, 1996, Ser. No. 649,936

Int. Cl.<sup>6</sup> C11D 3/08; 3/37; 3/43

U.S. Cl. 510—181

8 Claims

1. A method for cleaning a sheet of window glass, comprising: applying a glass cleaner to a surface of the sheet of window glass; rinsing the surface with water; and allowing the surface to dry by run-off and evaporation; wherein the glass cleaner has: a silicate selected from the group consisting of alkali metal silicate and alkali earth metal silicate, wherein the silicate is between 0.0000001% and 0.025% by weight of the cleaner; more than 95% water by weight; a hydrophobic acrylic polymer that is between 0.000001% and 10% by weight of the cleaner; and a surfactant that is at least 0.01% of the cleaner.

5,770,549

## SURFACTANT BLEND FOR NON-SOLVENT HARD SURFACE CLEANING

Stephen F. Gross, Souderton, Pa., assignor to Henkel Corporation, Plymouth Meeting, Pa.

Filed Mar. 18, 1996, Ser. No. 617,449

Int. Cl.<sup>6</sup> C11D 1/52; 1/72

U.S. Cl. 510—238

2 Claims

1. A process for removing oils and grease from a hard surface comprising contacting the hard surface with a cleaning composition comprising:
- from about 3 to about 67% by weight of an alkyl polyglycoside corresponding to formula I:



- wherein  $R_1$  is a monovalent organic radical having from about 6 to about 30 carbon atoms;  $R_2$  is divalent alkylene radical having from 2 to 4 carbon atoms; Z is a saccharide residue having 5 or 6 carbon atoms; b is a number having a value from 0 to about 12; a is a number having a value from 1 to about 6;
- from about 1 to about 33% by weight of a  $C_6$ - $C_{12}$  linear alcohol ethoxylate having from about 3 to about 6 moles of ethylene oxide; wherein (a) and (b) are present in the said composition in a percent active ratio of from about 3:1 to about 2:1 and
  - up to about 96% by weight water, all weights being based on the weight of the composition, with the proviso that the said cleaning composition is free of solvents that are harmful to the environments.

5,770,550

## SURFACTANTS

Harold Russell Motson, Stockton-on-Tees, United Kingdom, assignor to Imperial Chemical Industries PLC, Great Britain

PCT No. PCT/GB94/01815, § 371 Date Feb. 22, 1996, § 102(e)  
Date Feb. 22, 1996, PCT Pub. No. WO95/06096, PCT Pub. Date Mar. 2, 1995

PCT Filed Aug. 19, 1994, Ser. No. 596,333

Claims priority, application United Kingdom, Aug. 23, 1993, 9317476

Int. Cl.<sup>6</sup> C11D 1/52; 1/08; 1/74

U.S. Cl. 510—238

15 Claims

1. A single phase aqueous surfactant composition with a high electrolyte loading including alkali comprising from 1 to 40% by weight of the total composition of at least one surfactant compound of the formula (I) or (II):



where

- one of R and  $R^1$  is  $C_6$  to  $C_{22}$  alkenyl or alkyl and the other is hydrogen;  
A and  $A^1$  are each independently —O— or —NR<sup>4</sup>—; where  $R^4$  is hydrogen or  $C_1$  to  $C_6$  alkyl;  
n is 2 to 100;  
m is 2 or 3;  
 $R^2$  is hydrogen or  $C_1$  to  $C_6$  alkyl;  
Y is a cation forming group, a  $C_1$  to  $C_6$  alkyl group or a group of the formula  $(C_mH_{2m}O)_n.R^2$  where m, n and  $R^2$  are independently as defined above;

or



where:

- n, m and each R,  $R^1$ , A,  $A^1$  and Y are independently as defined above; and  
p is 2 or 3;  
in which  
from 1 to 400% by weight of the total composition of matrix materials and/or builder(s); and  
from 1 to 10 % by weight of the total composition of alkali.

5,770,551

## AMIDO- AND IMIDO- PEROXYCARBOXYLIC ACID BLEACH GRANULES

Philip Alan Block, North Bergen; Samuel Qcheng Lin, Paramus; Robert Madeira Andrews, Oakland, and Scott David Manske, Ridgfield, all of N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Aug. 19, 1996, Ser. No. 699,314

Int. Cl.<sup>6</sup> C11D 7/18

U.S. Cl. 510—310

2 Claims

1. A bleach granule comprising 20–100% by weight of an intimate mixture of:
- N,N-phthaloylaminoperoxyacetic acid; and
  - dimethyl  $C_{16}$  alkyl amine oxide, the acid and amine oxide being present in a weight ratio of 7:1 to 2:1.

5,770,552

## LAUNDRY DETERGENT COMPOSITION CONTAINING POLY(OXYALKYLENE)-SUBSTITUTED REACTIVE DYE COLORANT

John D. Bruhnke, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Mar. 13, 1997, Ser. No. 815,968

Int. Cl.<sup>6</sup> C11D 17/00; 3/00; 3/40; D06D 5/13

U.S. Cl. 510—343

17 Claims

1. A laundry detergent composition comprising:
- from 5 to 70% of tensoactive, or mixtures thereof;

b) from 2 to 95% builders;

c) from 0 to 25% of at least one additive selected from the group consisting essentially of bleaches, bleach activators, suds boosters, suds suppressors, anti-tarnish agents, anti-corrosion agents, soil suspending/release agents, anti-redeposition agents, germicides, fungicides, pH adjusting agents, enzymes, enzyme stabilizing agents, smectite clays, chlorine scavengers, and perfumes; and

d) from 1 ppm to 5000 ppm of a poly(oxyalkylene)-substituted colorant which is liquid in its undiluted state having the structure ABXYZ, where

AB is a reactive dye moiety wherein

A is an organic chromophore, and

B is an electrophilic group covalently bonded to A directly or through a linking group;

X is a nucleophilic linking group covalently bonding B and Y, selected from the group consisting of NR, O, S, and 4-oxyanilino ( $-HN-Ph-O-$ ); where R is selected from the group consisting of H, alkyl, aryl, and YZ;

Y is a poly(oxyalkylene)-containing moiety; and

Z is a terminal group for Y.

5,770,553

## USE OF POLYASPARTIC ACID IN DETERGENTS AND CLEANERS

Matthias Kroner, Eisenberg; Gunnar Schornick, Neuleiningen; Richard Baur, Mutterstadt; Alexander Kud, Eppelsheim, and Volker Schwendemann, Neustadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP94/04057, § 371 Date May 20, 1996, § 102(e)  
Date May 20, 1996, PCT Pub. No. WO95/16020, PCT Pub. Date Jun. 15, 1995

PCT Filed Dec. 6, 1994, Ser. No. 646,263

Claims priority, application Germany, Dec. 11, 1993, 43 42 316.7

Int. Cl.<sup>6</sup> C11D 17/00; 3/37; C08F 283/00; C02F 5/02

U.S. Cl. 510—360

5 Claims

1. A method of preparing a detergent or cleaner, comprising polycondensing aspartic acid in the presence of phosphoric acid in a molar ratio of from 1:0.05 to 1:10 at temperatures of at least 120° C. to give polysuccinimide, and subsequently hydrolyzing the polysuccinimide with bases to give at least partially neutralized polyaspartic acid, and adding said partially neutralized polyaspartic acid to detergents or cleaners in amounts of from 0.1 to 10% by weight based on the detergents and cleaners.

5,770,554

## LIQUID CLEANING COMPOSITIONS

Anne-Marie Misselyn, Villers-l'evêque; Patrick Durbut, Verviers, and Guy Broze, Grace-Hollogne, all of Belgium, assignors to Colgate-Palmolive Co., Piscataway, N.J.

Filed Jul. 9, 1996, Ser. No. 677,291

Int. Cl.<sup>6</sup> C11D 3/37; 3/04; 3/12; 1/02

U.S. Cl. 510—426

16 Claims

1. A cleaning composition comprising approximately by weight:
- 1% to 15% of at least one anionic surfactant selected from the group consisting of alkali metal salts of sulfonates, alkali metal salts of sulfates, alkaline earth metal salts of sulfonates and alkaline earth metal salts of sulfates;
  - 3% to 30% of a surfactant selected from the group consisting of an amine oxide surfactant and an alkylene carbonate said surfactant being complexed with said anionic surfactant in a molar ratio of said anionic surfactant to said amine oxide surfactant of about 4:1 to 0.4:1, and in a molar ratio of said anionic surfactant to said alkylene carbonate of about 7:1 to 1.2:1;
  - about 0.5% to about 15% of a water soluble glycol ether or a  $C_3$ - $C_6$  aliphatic carboxylic acid cosurfactant;
  - about 0 to about 10 wt. % of a water insoluble hydrocarbon or a perfume; and



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(d) the balance being water, wherein the composition does not contain an ethoxylated nonionic surfactant and has a pH of acid to neutral.

5,770,555

**HIGH ALKALI-CONTAINING CLEANING CONCENTRATES**

Barry Weinstein, Dresher, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 13, 1996, Ser. No. 748,260  
Int. Cl.<sup>6</sup> C11D 3/37

U.S. Cl. 510—434 18 Claims  
1. A method for preparing a stable aqueous cleaning concentrate comprising combining in an aqueous solution:

- (a) from 1 to 10 percent, based on total cleaning concentrate weight, of a water-soluble polymer comprising as polymerized units:
- (i) from 20 to 80 percent, based on total polymer weight, of unsaturated monocarboxylic acid monomer selected from one or more of acrylic acid, methacrylic acid and water-soluble salts thereof;
  - (ii) from 0 to 65 percent, based on total polymer weight, of unsaturated dicarboxylic acid monomer; and
  - (iii) from 10 to 30 percent, based on total polymer weight, of unsaturated non-ionizable monomer selected from one or more monomers of Formula I:



where:

- R<sup>1</sup> is selected from hydrogen, methyl and —CH<sub>2</sub>OH;  
R<sup>2</sup> is selected from hydrogen, methyl and —CH<sub>2</sub>OH;  
R<sup>3</sup> is selected from hydrogen, —CH<sub>2</sub>CH(CH<sub>3</sub>)OH, —CH<sub>2</sub>CH<sub>2</sub>OH and (C<sub>3</sub>—C<sub>12</sub>)-containing polyol residues; and  
(b) from 15 to 50 percent, based on total cleaning concentrate weight, of an alkali metal hydroxide selected from one or more of sodium hydroxide and potassium hydroxide.

5,770,556

**PROCESS FOR MAKING BAR COMPOSITIONS HAVING ENHANCED DEPOSITION OF BENEFIT AGENT COMPRISING USE OF SPECIFIC SPRAY DRYABLE ADJUVANT POWDERS**

Terence Farrell, West New York; David Quinn, N. Arlington; Gregory McFann, E. Rutherford; Gail Beth Rattinger, Teaneck, and Liang Sheng Tsur, Norwood, all of N.J., assignors to Lever Brothers Company, Division of Conopco, Inc., New York, N.Y.

Filed Mar. 21, 1997, Ser. No. 821,501  
Int. Cl.<sup>6</sup> C11D 11/00

U.S. Cl. 510—447 16 Claims  
1. A process for making bar composition with enhanced deposition of benefit agent which process comprises mixing

- (a) about 1% to 30% by weight of an adjuvant powder comprising by weight of adjuvant powder:
- (i) 1% to 70% benefit agent which is an emollient oil;
  - (ii) 15% to 98% carrier having a melting point above a temperature in a drying chamber in which said adjuvant is formed;
  - (iii) about 1% to 10% water; and
  - (iv) 0% to 30% deposition/processing aid selected from the group consisting of:
    - (I) anionic, cationic, nonionic and amphoteric surfactants;
    - (II) cationic polymers; and
    - (III) hydrophilic polymers; and
- (b) about 99% to 70% by weight chips comprising 5% to 90% by weight of a surfactant system consisting essentially of 10% to 90% by weight of a first synthetic anionic surfactant and the balance a second synthetic surfactant selected from the group consisting of a second anionic surfactant different from the first, a nonionic surfactant, an amphoteric surfactant and mixtures thereof;

wherein (a) and (b) are separately prepared;

wherein (a) is prepared by mixing (i), (ii), (iii) and optional (iv) at 40° C. to 80° C. to form a slurry and spray drying said slurry at 80° C. to 200° C. at a pressure of 0.10 to 0.30 MPa to obtain the adjuvant powder of (a);

and wherein (a) and (b) are mixed, plodded and extruded into a final bar.

5,770,557

**FABRIC SOFTENER COMPOSITION CONTAINING POLY(OXYALKYLENE)-SUBSTITUTED COLORANT**

John D. Bruhnke, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Mar. 13, 1997, Ser. No. 816,680  
Int. Cl.<sup>6</sup> C11D 1/38; 3/00; 3/40; D06P 5/13

U.S. Cl. 510—515 18 Claims

1. A fabric softener composition comprising:

- a) from 3 to 50% by weight of a fabric softener, or mixtures thereof;
- b) a liquid carrier including water, the pH of the composition being less than 7;

and

c) from 1 ppm to 5000 ppm of a poly(oxyalkylene)-substituted colorant which is liquid in its undiluted state having the structure ABXYZ, where

AB is a reactive dye moiety wherein

A is an organic chromophore, and

B is an electrophilic group covalently bonded to A directly or through a linking group;

X is a nucleophilic linking group covalently bonding B and Y, selected from the group consisting of NR, O, S, and 4-oxyanilino (—HN—Ph—O—); where R is selected from the group consisting of H, alkyl, aryl, and YZ;

Y is a poly(oxyalkylene)-containing moiety; and

Z is a terminal group for Y.

5,770,558

**PROCESS FOR MAKING SOIL RELEASE POLYMER GRANULES**

Benjamin Edgar Chapman, and Michael Timothy Creedon, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 694,133, Aug. 8, 1996, Pat. No. 5,700,386.  
This application Aug. 27, 1997, Ser. No. 918,917

Int. Cl.<sup>6</sup> D06M 15/00; C11D 7/26; 17/06

U.S. Cl. 510—528 6 Claims

1. Soil release polymer granules comprising:

- (a) from about 70% to about 94% polymers comprising at least about 25% polymer esters having, per mole of esters,
- i) from about 1 to about 2 moles of sulfobenzoyl end-capping units of the formula (MO<sub>3</sub>S)(C<sub>6</sub>H<sub>4</sub>)C(O)—, wherein M is a salt-forming cation; or from about 1 to about 2 moles of sulfonated poly-ethoxy/propoxy end-capping units of the formula (MO<sub>3</sub>S)(CH<sub>2</sub>)<sub>m</sub>(CH<sub>2</sub>CH<sub>2</sub>O)(R'O)—, wherein M is a salt-forming cation, m is 0 or 1, R' is ethylene or propylene or a mixture thereof, and n is from 0 to about 4;
  - ii) from about 0.5 to about 66 moles of backbone units selected from:
    - a) a mixture of oxyethyleneoxy and oxy-1,2-propyleneoxy units, wherein the units are present in an oxyethyleneoxy to oxy-1,2-propyleneoxy mole ratio of from about 4:1 to about 1:2; and
    - b) a mixture of a) with poly(oxyethylene)oxy units wherein the poly(oxyethylene)oxy units have a degree of polymerization of from 2 to 4; provided that when the poly(oxyethylene)oxy units have a degree of polymerization of 2, the mole ratio of poly(oxyethylene)oxy units to total group ii) units ranges from 0.1 to about 0.33:1; and when the poly(oxyethylene)oxy units have a degree of polymerization of 3, the mole ratio of poly(oxyethylene)oxy units to total group ii) units ranges from 0.1 to about 0.22:1; and when the poly(oxyethylene)oxy units

have a degree of polymerization of 4, the mole ratio of poly(oxyethylene)oxy units to total group ii) units ranges from 0.1 to about 0.14:1;

iii) from about 1 to about 40 moles of backbone terephthaloyl units; and

iv) from 0 to about 30 moles of backbone anionic 5-sulfoisophthaloyl units of the formula —(O)(C<sub>6</sub>H<sub>3</sub>)(SO<sub>3</sub>M)C(O)—, wherein M is a salt forming cation;

(b) from about 3% to about 12% alkylethoxy alcohol nonionic surfactant, the alkyl portion being linear or branched, saturated or unsaturated, having an average of from about 12 to about 18 carbon atoms, there being from about 25 to about 100 moles ethoxy per mole surfactant;

(c) from about 3% to about 14% alkylaryl or alkyl sulfonate crystallization-reducing stabilizers; and

(d) no more than about 2% water;

the granules having a bulk density of from about 300 g/l to about 850 g/l, and the granules being of a size such that at least about 95% by weight pass through an about 833 micron-opening screen, at least about 90% are retained on an about 246 micron-opening screen, and no more than about 1% pass through an about 75 micron-opening screen.

5,770,559

**SOLUBILIZATION OF PHARMACEUTICAL SUBSTANCES IN AN ORGANIC SOLVENT AND PREPARATION OF PHARMACEUTICAL POWDERS USING THE SAME**

Mark C. Manning, Fort Collins; Theodore W. Randolph, Niwot, both of Colo.; Eli Shefter, LaJolla, Calif., and Richard F. Falk, III, Boulder, Colo., assignors to The Regents of the University of Colorado, Boulder, Colo.

Continuation-in-part of Ser. No. 961,162, Oct. 14, 1992, abandoned. This application Jun. 6, 1995, Ser. No. 473,008

Int. Cl.<sup>6</sup> A61K 38/00; A23J 1/00

U.S. Cl. 514—2 31 Claims

1. A method for making particles including a pharmaceutical material, which particles may be recovered in a powder form desirable for use in some pharmaceutical delivery methods such as inhalation for direct pulmonary delivery and injection in a slurry form, the method comprising the steps of:

forming solid particles comprising a pharmaceutical substance from a liquid solution, which particles could be recovered in powder form;

said liquid solution comprising said pharmaceutical substance and an amphiphilic material in solution in a carrier liquid wherein, said pharmaceutical substance, alone, is substantially not soluble in said carrier liquid and said amphiphilic material is capable of interacting with said pharmaceutical substance such that said pharmaceutical substance, in combination with said amphiphilic material as a hydrophobic ion pair complex, is present in a true, homogeneous solution in said carrier liquid prior to said step of forming said solid particles.

5,770,560

**METHOD FOR INCREASING TISSUE OXYGENATION USING FISH HEMOGLOBIN EXHIBITING A ROOT EFFECT**

James J. Fischer, Dept of Ther. Rad., Yale University School of Medicine, 333 Cedar St., New Haven, Conn. 06510, and Susan J. Baserga, New Haven, Conn., assignors to James J. Fischer, Guilford, Conn.

Continuation of Ser. No. 235,118, Apr. 28, 1994, Pat. No. 5,428,007, which is a continuation of Ser. No. 959,286, Oct. 9, 1992, abandoned, which is a division of Ser. No. 417,949, Oct. 6, 1989, Pat. No. 5,173,426. This application Jun. 2, 1995, Ser. No. 459,604

Int. Cl.<sup>6</sup> A61K 38/42

U.S. Cl. 514—6 9 Claims

1. A method for increasing oxygenation in hypoxic cells of a tissue in a warm blooded patient comprising administering to said

patient a therapeutically effective amount of a fish hemoglobin, said fish hemoglobin exhibiting a Root effect.

5,770,561

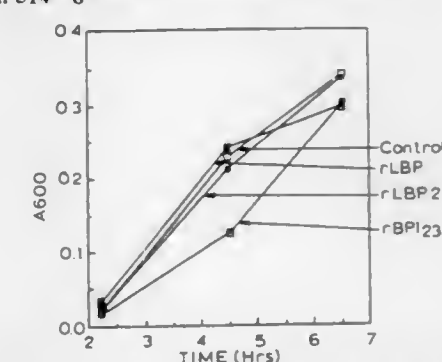
**METHOD FOR POTENTIATING BPI PROTEIN PRODUCT BACTERICIDAL ACTIVITY BY ADMINISTRATION OF LBP PROTEIN PRODUCTS**

Arnold Horwitz, Los Angeles, Calif., assignor to Xoma Corporation, Berkeley, Calif.

Continuation-in-part of Ser. No. 93,201, Jul. 14, 1993, abandoned. This application Jul. 11, 1994, Ser. No. 274,303

Int. Cl.<sup>6</sup> A61K 38/16; 38/14

U.S. Cl. 514—8 21 Claims



1. A method of treating a gram-negative bacterial infection in a subject comprising administering a bactericidal/permeability-increasing protein (BPI) protein product and a lipopolysaccharide binding protein (LBP) protein product, to said subject in amounts effective to treat the gram-negative bacterial infection.

5,770,562

**PRODUCTS AND METHODS FOR IMPROVING KERATINOCYTE ADHESION TO THE DERMIS**

Robert E. Burgeson, Boston, Mass.; Gregory P. Lunstrum, Portland, Oreg.; Patricia Rousselle, Lyon, France; Douglas R. Keene, Portland, and M. Peter Marinkovich, Beaverton, both of Oreg., assignors to Oregon Health Sciences University, Portland, Oreg.

Continuation of Ser. No. 319,064, Oct. 6, 1994, abandoned, which is a continuation of Ser. No. 966,974, Oct. 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 936,850, Aug. 28, 1992, Pat. No. 5,352,668, which is a continuation-in-part of Ser. No. 675,563, Mar. 26, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 469,500

Int. Cl.<sup>6</sup> A61K 38/39; C07K 14/78

U.S. Cl. 514—8 3 Claims



3. A method of improving the adhesion of epidermal cells to an underlying dermal substrate, the method comprising providing

between the epidermal cells and the dermal substrate a purified preparation of an isolated heterotrimeric laminin variant of molecular weight about 650 kDa wherein said laminin variant comprises:

- a first subunit substantially identical to a B1 chain of EHS laminin;
- a second subunit substantially identical to a B2 chain of EHS laminin; and
- a third subunit of about 190 kDa that is specifically recognized by monoclonal antibody BM165 (ATCC Accession Number).

5,770,563

#### HEPARIN- AND SULFATIDE BINDING PEPTIDES FROM THE TYPE I REPEATS OF HUMAN THROMBOSPONDIN AND CONJUGATES THEREOF

David D. Roberts, Bethesda, Md.; Philip J. Browning, Brentwood, Tenn.; Joseph L. Bryant, Bethesda, Md.; John K. Inman, Bethesda, Md.; Henry C. Kruttsch, Bethesda, Md., and Nenghua Guo, Galthersburg, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 215,085, Mar. 21, 1994, abandoned, which is a continuation-in-part of Ser. No. 801,812, Dec. 6, 1991, Pat. No. 5,357,041. This application Jun. 7, 1995, Ser. No. 487,568

Int. Cl.<sup>6</sup> A61K 38/00:38/04; C07K 5/00:7/00

U.S. Cl. 514—8

41 Claims

1. A substantially pure peptide from 10 to 30 amino acids in length, wherein said peptide comprises an amino acid sequence (SEQ ID NO:98 through SEQ ID NO:105):



where  $X_5$  is selected independently from R or acK;

$X_6$  is K;

$X_9$  is O or A;

$X_{10}$  D or A;

$X_{11}$  is G or U (Dav) and m is 1 or 0;

n is 1 or 0;

$X_{12}$  is H or P; and

$X_{13}$  is H or P and z is 1 or 0.

5,770,564

#### PLATELET AGGREGATION INHIBITORS

Robert M. Scarborough, Belmont; David Lawrence Wolf, Palo Alto, and Israel F. Charo, Lafayette, all of Calif., assignors to COR Therapeutics, Inc., South San Francisco, Calif.

Continuation of Ser. No. 88,611, Jul. 7, 1993, abandoned, which is a continuation of Ser. No. 542,488, Jun. 22, 1990, abandoned, which is a continuation-in-part of Ser. No. 483,229, Feb. 20, 1990, Pat. No. 5,318,899, which is a continuation-in-part of Ser. No. 418,028, Oct. 6, 1989, abandoned, which is a continuation-in-part of Ser. No. 367,509, Jun. 16, 1989, abandoned. This application Jun. 5, 1995, Ser. No. 465,178

Int. Cl.<sup>6</sup> A61K 38/00:38/02; C07K 5/00:7/00

U.S. Cl. 514—9

36 Claims

1. A method of treating a platelet associated ischemic disorder in a patient comprising administering to said patient an effective amount of a platelet aggregation inhibitor of the formula:



wherein  $Y_1-X_1$  is Mpr, n1 is 0,  $K^*$  is lysine, (Gly or Sar) is Gly,  $AA_2$  is Trp, n2 is 1,  $AA_3$  is a proline residue, n3 is 1,  $n_4$  is 0,  $X_2$  is Cys,  $Y_2$  is  $NH_2$ , and

represents a disulfide bond, or a physiologically acceptable basic or acid addition salt thereof.

5,770,565

#### PEPTIDES FOR REDUCING OR INHIBITING BONE RESORPTION

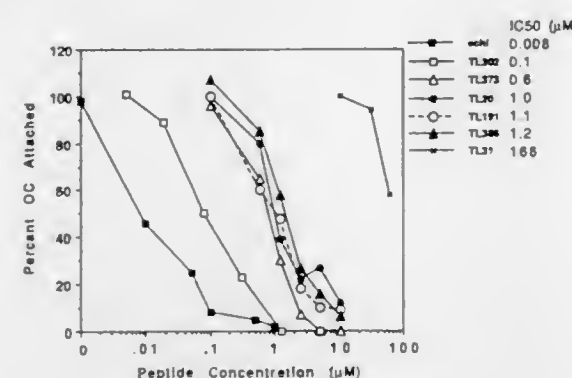
Soan Cheng, San Diego; Ronald Ingram, Oceanside; Daniel Mullen, and Juerg Tschopp, both of San Diego, all of Calif., assignors to La Jolla Cancer Research Center, La Jolla, Calif.

Continuation-in-part of Ser. No. 227,316, Apr. 13, 1994, abandoned. This application Sep. 8, 1994, Ser. No. 303,052

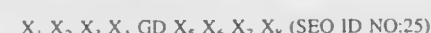
Int. Cl.<sup>6</sup> A61K 38/08:38/10; C07K 7/06:7/08

U.S. Cl. 514—11

38 Claims



1. A method of reducing or inhibiting osteoclast binding to a matrix, comprising contacting the osteoclast in a subject needing reduction of bone resorption with an effective amount of a non-naturally occurring peptide having the structure:



wherein:

$X_1$  is  $R_1R_2$  (wherein  $R_1$  is an H or alkyl group and  $R_2$  is an H, alkyl,  $CH_3CO$ , alkyl-CO or phenyl-CO group) or 1 to 10 amino acids, which can be protected by acetylation at the N-terminus;

$X_2$  is 0 or 1 amino acid;

$X_3$  is 0, 1 or 2 amino acids;

$X_4$  is a positively charged amino acid;

$X_5$  is an amino acid which can provide a hydrogen bond interaction with an integrin receptor;

$X_6$  is an amino acid that has the characteristics of hydrophobicity or conformational constraint;

$X_7$  is a residue forming a bond with a bridging amino acid of  $X_2$ , or with  $X_3$  when  $X_2$  is 0, or with  $X_4$  when  $X_2$  and  $X_3$  are 0, to conformationally restrain the peptide; and

$X_8$  is  $-NR_3R_4$  (wherein  $R_3$  is an H or alkyl group and  $R_4$  is an H or alkyl group) or  $-OR_5$  (wherein  $R_5$  is an H or alkyl group) or 1 to 10 amino acids, which can be protected as an amide at the C-terminus,

and wherein when  $X_5$  is serine and  $X_6$  is proline,  $X_3$  is 0 or 2 amino acids.

5,770,566

Patent Not Issued For This Number

5,770,567

#### SENSORY AND MOTOR NEURON DERIVED FACTOR (SMDF)

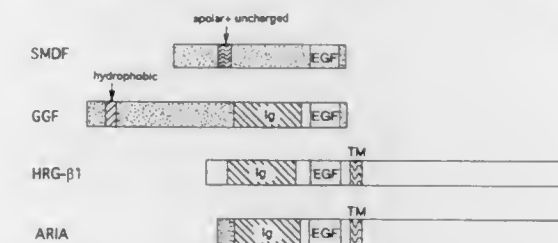
Wei-Hsien Ho, Palo Alto, and Phyllis L. Osheroff, Woodside, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Filed Nov. 14, 1994, Ser. No. 339,517

Int. Cl.<sup>6</sup> A61K 38/18; C07K 14/475

U.S. Cl. 514—12

22 Claims



2. An isolated protein molecule which activates the HER2 receptor and comprises an amino acid sequence selected from the group consisting of:

(a) the translated sequence for mature soluble SMDF shown in FIG. 1A (SEQ ID NO: 2);

(b) allelic variants of (a); and

(c) the sequences of (a), or (b) comprising an exemplary amino acid substitution as defined in Table 1.

5,770,568

#### VARIANTS OF BOVINE PANCREATIC TRYPSIN INHIBITOR PRODUCED BY RECOMBINANT DNA TECHNOLOGY, PROCESS EXPRESSION VECTOR AND RECOMBINANT HOST THEREFOR AND PHARMACEUTICAL USE THEREOF

Ernst-August Auerswald, Munich; Wolfgang Bruns, Wuppertal; Dietrich Hörlein, Wuppertal; Gerd Reinhardt, Wuppertal; Eugen Schnabel, Wuppertal, and Werner Schröder, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 156,515, Nov. 23, 1993, abandoned, which is a continuation of Ser. No. 808,318, Dec. 13, 1991, abandoned, which is a division of Ser. No. 221,835, Jul. 20, 1988, Pat. No. 5,118,668. This application Jan. 9, 1995, Ser. No. 369,987

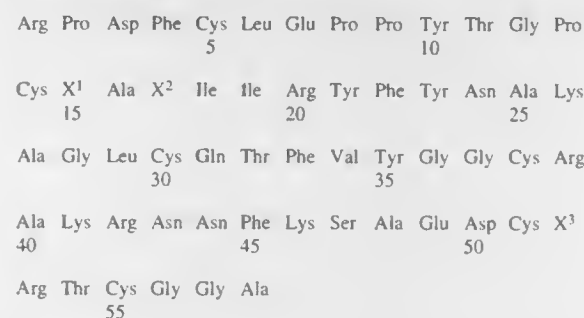
Claims priority, application United Kingdom, Aug. 7, 1987, 8718777

Int. Cl.<sup>6</sup> A61K 38/57; C07K 14/81

U.S. Cl. 514—12

6 Claims

1. An aprotinin variant having proteinase inhibitor activity and comprising the amino acid sequence:



wherein:

$X^1$  represents an amino acid selected from the group consisting of Leu, Ile, Val, Met and Arg;

$X^2$  represents an amino acid selected from the group consisting of Leu, Ile, Val, Met, Ala, Gly, His, Lys and Arg; and

$X^3$  represents an amino acid selected from the group consisting of Met, Thr and Glu;

provided said aprotinin variant does not have an amino acid sequence selected from the group consisting of:

(a) aprotinin having only a replacement in position 15 by an amino acid selected from the group consisting of Val, Leu, Ile, Met and Arg;

(b) aprotinin having in addition to a replacement in position 15 as specified in (a) an additional replacement in position 52 by an amino acid selected from the group consisting of Glu and Thr; and

(c) aprotinin as specified in (a) and (b) with an additional Met preceding the N-terminal amino acid Arg-1.

5,770,569

#### DIAGNOSTIC AND THERAPEUTIC AGENTS USING A LYMPHOCYTE ADHESION RECEPTOR FOR HIGH ENDOTHELIUM CD44

Thomas P. St. John, Issaquah; W. Michael Gallatio, Mercer Island, and Rejean L. Idzerda, Seattle, all of Wash., assignors to Fred Hutchinson Cancer Research Center, Seattle, Wash.

Division of Ser. No. 884,624, May 15, 1992, Pat. No. 5,504,194, which is a continuation of Ser. No. 628,646, Dec. 12, 1990, abandoned, which is a division of Ser. No. 325,224, Mar. 17, 1989, Pat. No. 5,002,873. This application Jun. 7, 1995, Ser. No. 472,542

Int. Cl.<sup>6</sup> C07K 14/47:14/705; A61K 38/17; C12N 15/12

U.S. Cl. 514—12

6 Claims

1. A tumor imaging agent comprising a diagnostic moiety conjugated to a polypeptide comprising an amino acid sequence encoded by an isolated mammalian DNA molecule consisting of a DNA sequence which hybridizes under stringent conditions to nucleotides 182 through 931 of the sequence set forth in FIG. 4, and encodes a lymphocyte adhesion receptor for high endothelium, said polypeptide being free of proteins from the same mammal.

5,770,570

#### METHOD OF DELIVERING A VASOACTIVE INTESTINAL POLYPEPTIDE, AN ENCAPSULATED VASOACTIVE INTESTINAL POLYPEPTIDE, AND A METHOD OF MAKING THE ENCAPSULATED VASOACTIVE INTESTINAL POLYPEPTIDE

Sudhir Paul, 6827 S. 145 St., Omaha, Nebr. 68137; Yasuko Noda, 4016 Emile St., Apartment 11, Omaha, Nebr. 68105, and Israel Rubinstein, 2999 Lexington St., Highland Park, Ill. 60035

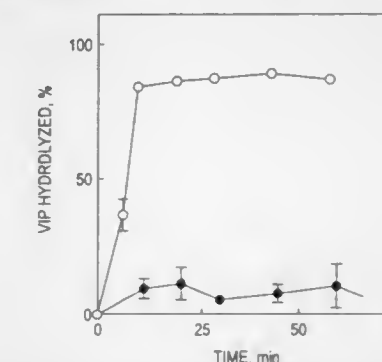
Continuation of Ser. No. 224,488, Apr. 7, 1994, abandoned.

This application Aug. 25, 1995, Ser. No. 519,180

Int. Cl.<sup>6</sup> A61K 9/127:38/17;38/22:38/25

U.S. Cl. 514—12

20 Claims



1. A method of delivering a vasoactive intestinal polypeptide liposome product to a target tissue comprising the steps of:

encapsulating said vasoactive intestinal polypeptide (VIP) under conditions which result in VIP being expressed both on and in liposomes in a receptor active conformation to form a VIP liposome product; and



administering a biologically effective amount of said VIP liposome product to said target tissue.

5,770,571

**METHOD AND AGENTS FOR INHIBITING PROTEIN AGING**

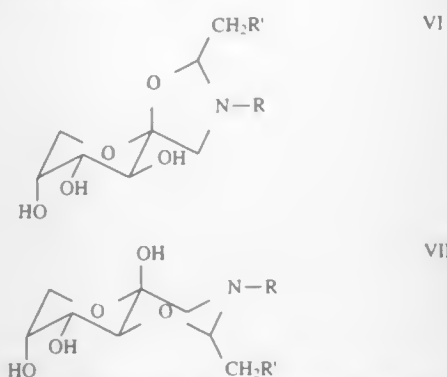
Anthony Cerami; Yousef Al-Abed; Richard J. Bucala, all of New York, N.Y., and Peter C. Ulrich, Old Tappan, N.J., assignors to The Picower Institute for Medical Research, Manhasset, N.Y.

Filed Nov. 15, 1996, Ser. No. 746,742

Int. Cl.<sup>6</sup> A61K 38/00; C08J 89/06; C07K 13/00; A21D 4/00  
U.S. Cl. 514—12

4 Claims

1. A compound of the formula VI or VIII:



wherein R is the residue of an amino-containing amino acid, peptide, protein, biomolecule or compound,

said compound of the formula VI or VIII prepared by reaction of the glycosyl-amino moiety of the early glycosylation product (also known as the Amadori product or the Heyns product) formed by the reaction of glucose, or other reactive sugars, with said amino-containing amino acid, peptide, protein, biomolecule, or compound with an agent containing a reactive aldehyde group; and

CH<sub>2</sub>R' the residue of the reactive aldehyde group wherein R' is an alkyl group of 1-12 carbons, an alkenyl group of 1-20 carbon atoms containing 1-4 degrees of unsaturation, and alkynyl group of 1-20 carbon atoms containing one or more triple bonds, an aryl or a heteroaryl group, each of which can optionally be substituted by one or more halogen or hydroxyl groups.

5,770,572

**METHODS AND COMPOSITIONS USING MOLECULAR DECOYANTS FOR AMELIORATING THE UNDESIRE EFFECTS OF FOREIGN AGENTS WHICH BIND TO ENDOGENOUS RECEPTORS**

Jonathan M. Gershoni, 297 Congressional La., Rockville, Md. 20251

Filed Jun. 30, 1989, Ser. No. 410,778

Claims priority, application Israel, Aug. 30, 1987, 83687; WIPO, Aug. 30, 1988, PCT/US88/02991

Int. Cl.<sup>6</sup> A61K 38/00; 38/02; 38/04

U.S. Cl. 514—13

26 Claims

I. A method for the treatment of an organism which has been subjected to a foreign agent which exerts an undesired effect only after first binding to an endogenous receptor, said treatment being for the amelioration of said undesired effect, comprising:

administering to said organism, in a quantity sufficient to ameliorate said undesired effect of said foreign agent, a molecular decoyant having a chemical structure which functionally resembles the ligand binding site of said endogenous receptor for the foreign agent, said decoyant being a substance selected from the group consisting of:

(1) a substance which is a portion of a natural receptor for said foreign agent, said portion being (a) sufficiently small

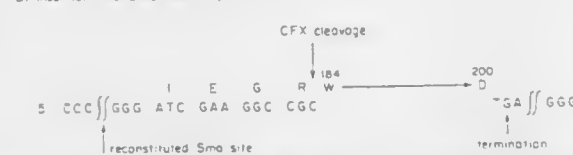
1) Synthetic oligonucleotides

4' 3'-GTCCACATCATTTGGGTACAAAGGTCGCCGAAGCTAGGG-5'  
37 5'-GATGTGGACGACGGGCTGTGAGGCATGGACCTGACT-5'

2) Klenow fill-in



3) Insertion into Sma site of pATH2



so as not to elicit an autoimmune response against the endogenous receptor when administered in vivo, and (b) not substantially larger than the smallest size needed to retain the elements of the binding site of said natural receptor which are essential for retaining the ability of said receptor to selectively and specifically recognize and bind to said foreign agent with an affinity permitting competition with binding of said foreign agent to said endogenous receptor;

(2) a substance having a chemical structure which substantially corresponds to that of said substance of (1), synthesized by chemical and/or recombinant DNA techniques and having the ability to selectively and specifically recognize and bind of the foreign agent without eliciting an autoimmune response against the endogenous receptor when administered in vivo; and

(3) a substance having a chemical structure consisting essentially of the chemical structure of the substance of (1) or (2).

5,770,573

**CS-1 PEPTIDOMIMETICS, COMPOSITIONS AND METHODS OF USING THE SAME**

Thomas S. Arrhenius; Mariano J. Elices, both of San Diego, and Federico C.A. Gaeta, Olivenhain, all of Calif., assignors to Cytel Corporation, San Diego, Calif.

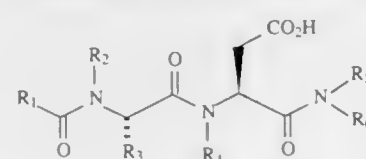
Continuation-in-part of Ser. No. 349,024, Dec. 2, 1994, which is a continuation-in-part of Ser. No. 164,101, Dec. 6, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 462,219

Int. Cl.<sup>6</sup> A61K 38/05; 38/06; C07K 5/04

U.S. Cl. 514—18

14 Claims

1. A compound of the following formula:



wherein:

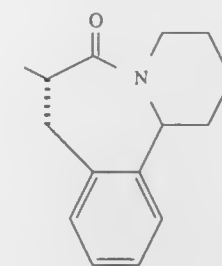
R<sub>1</sub> is a R<sub>1</sub> ring structure, lower alkyl, or lower amino alkyl; the R<sub>1</sub> ring structure can form at R<sub>1</sub>, between R<sub>1</sub> and R<sub>2</sub> or between R<sub>1</sub> and R<sub>3</sub> with the proviso that, if the R<sub>1</sub> ring structure forms at R<sub>1</sub>, the R<sub>1</sub> ring structure is connected by a spacer 0 to about 5 atoms long forming one or more alkyl, N-amido, N-sulfonimido, N-urea, N-carboxyl groups; the spacer can be optionally substituted by an amino group; the R<sub>1</sub> ring structure is a substituted or unsubstituted 5-, 6-, fused 6,6- or fused 6,5-membered ring wherein the substituent is one or more alkyl, carbonyl, alcohol, halogen, or alkyl phenyl groups; the R<sub>1</sub> ring structure is cyclic or heterocyclic with the proviso that the heteroatoms are 1 or 2 nitrogen atoms, and, if the R<sub>1</sub> ring structure is formed between R<sub>1</sub> and R<sub>3</sub>, the heteroatoms are 2 nitrogen atoms; the R<sub>1</sub> ring structure can be conjugated, partially saturated, or saturated; the lower alkyl or lower amino alkyl group can be branched;

R<sub>2</sub> is a H, methyl or R<sub>2</sub> and R<sub>1</sub> form the R<sub>1</sub> ring structure group; R<sub>3</sub> is a R<sub>3</sub> ring structure, lower alkyl, lower alkyl alcohol or lower thioalkyl; the R<sub>3</sub> ring structure group is a 6-membered ring that is connected by an alkyl group 0 to about 3 carbon atoms long; the lower alkyl, lower alkyl alcohol, or lower thioalkyl group can be branched;

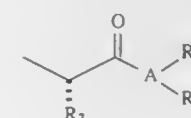
R<sub>4</sub> is a H or R<sub>4</sub> and R<sub>1</sub> form the R<sub>1</sub> ring structure;

R<sub>5</sub> is H or R<sub>5</sub> and R<sub>6</sub> form a R<sub>5</sub> ring structure; the R<sub>5</sub> ring structure is a fused 6,6- ring structure and can be aromatic, partially saturated, or saturated;

R<sub>6</sub> is a benzyl, or 1,1 diphenylmethine group, the R<sub>5</sub> ring structure, a group of the formula



or a group of the formula



wherein:

A is nitrogen or oxygen; and

when A is nitrogen;

R<sub>7</sub> is a R<sub>7</sub> ring structure, lower alkyl, lower alkyl alcohol, lower thioalkyl or H group; the R<sub>7</sub> ring structure can form at R<sub>7</sub> or between R<sub>7</sub> and R<sub>8</sub> with the proviso that, if the R<sub>7</sub> ring structure forms at R<sub>7</sub>, the R<sub>7</sub> ring structure is connected by an alkyl group 0 to about 3 carbon atoms long; if the R<sub>7</sub> ring structure is formed at R<sub>7</sub>, the R<sub>7</sub> ring structure is a 6-, or fused 6,5-membered aromatic or non-aromatic cyclic or heterocyclic ring group wherein the heteroatom is a nitrogen atom; if the R<sub>7</sub> ring forms between R<sub>7</sub> and R<sub>8</sub>, the R<sub>7</sub> ring structure is a 5-, fused 6,6-, fused 6,5-, or 7-membered heterocyclic ring group wherein the heteroatoms are 1 or 2 nitrogen atoms; the R<sub>7</sub> ring structure can optionally be substituted by an alcohol, nitro or lower alkyl ether group;

R<sub>8</sub> is a ring structure, alkyl, alkyl alcohol, or thioalkyl amide group; the ring structure can form at R<sub>8</sub> and is (N-morpholino) amino, between R<sub>7</sub> and R<sub>8</sub> and is the R<sub>7</sub> ring structure, or between R<sub>8</sub> and R<sub>9</sub> and is an R<sub>8</sub> ring structure; the R<sub>8</sub> ring structure is a 5-, 6- or fused 6,5-membered heterocyclic ring wherein the heteroatoms are 1 or 2 nitrogen atoms and 0 or 1 oxygen or sulfur atoms; the R<sub>8</sub> ring structure optionally can be substituted by one or more lower alkyl, lower dialkyl, lower alkyl carboxamide, alcohol, lower alkyl alcohol, lower hydroxy alkyl ether, carboxylic acid, lower alkyl carboxylic acid, carbonyl, sulfide, or alkyl substituted phenyl sulfonamido groups; the (N-morpholino) amino, alkyl, alkyl alcohol, or thioalkyl amide group can optionally contain one or more alcohol, amide, sulfhydryl, or alkyl ester groups;

R<sub>9</sub> is the R<sub>8</sub> ring structure, a lower alkyl, lower alkyl carboxamide, lower alkyl morpholine amide, cyclohexane or H group;

when A is oxygen:

R<sub>8</sub> is a lower alkyl that can be branched and R<sub>9</sub> is absent.

5,770,574

**LONG-CHAIN ALKYLAMIDES OF AMINO ACIDS AND PEPTIDES ANTI-PROLIFERATIVE AND ANTI-INFLAMMATORY PROPERTIES**

Bernhard Kutscher, Maintal; Michael Bernd, Frankfurt; Heinz Grossmann, Regensburg; Maria Kick, Regensburg; Jürgen Arp, Regensburg; Manfred Liefänder, Sinzing; Jürgen Engel, Alzenau, and Rainer Voegel, Offenbach, all of Germany, assignors to ASTA Medica Aktiengesellschaft, Dresden, Germany

Continuation of Ser. No. 399,711, Mar. 3, 1995, abandoned.

This application Jun. 19, 1997, Ser. No. 878,842

Claims priority, application Germany, Mar. 4, 1994, 44 07 193.0

Int. Cl.<sup>6</sup> A61K 38/05; 38/06; C07K 5/00

U.S. Cl. 514—18

8 Claims

1. A long-chain, unbranched alkylamide of the formula



in which n=11-20 and R is a di- or tripeptide of amino acids selected from the group consisting of lysine, serine, proline, thiazoline, and hydroxyproline and their D- and L-enantiomers as well as their physiologically compatible salt forms, wherein lysine can be coupled via the  $\alpha$  position as well as via the terminal  $\omega$  position.

5,770,575

**NIPECOTIC ACID DERIVATIVES AS ANTITHROMBOTIC COMPOUNDS**

Mary Pat Beavers, Warrington; Patricia Andrade-Gordon, Doyletown, and William J. Hoekstra, Bryn Mawr, all of Pa., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation-in-part of Ser. No. 364,896, Dec. 27, 1994, abandoned, which is a continuation-in-part of Ser. No. 213,772, Mar. 16, 1994, abandoned. This application Mar. 6, 1995, Ser. No. 395,533

Int. Cl.<sup>6</sup> A61K 38/00

U.S. Cl. 514—19

7 Claims

I. A compound represented by the general formula (1): wherein X<sup>1</sup> and X<sup>2</sup> are the same or different and selected from either of H<sub>2</sub> or O;

wherein Y is selected from any of (CH<sub>2</sub>)<sub>m</sub>, CH(NHCOR<sup>3</sup>)(CH<sub>2</sub>)<sub>m</sub> or CH(NH<sub>2</sub>)(CH<sub>2</sub>)<sub>m</sub>;

wherein A is a cycloalkyl ring containing a nitrogen therein which ring is selected from any of piperidin-2-yl, piperidin-3-yl, piperidin-4-yl, pyrrolidin-2-yl and pyrrolidin-3-yl;

wherein Z is selected from any of (CH<sub>2</sub>)<sub>n</sub> or CH(CO<sub>2</sub>R<sup>4</sup>)(CH<sub>2</sub>)<sub>n</sub>;

wherein R<sup>2</sup> is selected from any of H or alkyl(C<sub>1</sub>-C<sub>8</sub>);

wherein R<sup>3</sup> is selected from any of alkoxy (C<sub>1</sub>-C<sub>8</sub>) or alkyl (C<sub>1</sub>-C<sub>8</sub>);

wherein R<sup>4</sup> is alkyl (C<sub>1</sub>-C<sub>8</sub>) or arylalkyl (C<sub>1</sub>-C<sub>8</sub>);

wherein R<sup>5</sup> is H, alkyl (C<sub>1</sub>-C<sub>8</sub>) or arylalkyl (C<sub>1</sub>-C<sub>8</sub>);

wherein m is the integer 0, 1, 2, or 3;

wherein n is the integer 0, 1, or 2;

or the enantiomer or the pharmaceutically acceptable salt thereof.

5,770,576

**PHARMACEUTICAL DIPEPTIDE COMPOSITIONS AND METHODS OF USE THEREOF: SYSTEMIC TOXICITY**

Vyacheslav G. Morozov, and Vladimir Kh. Khavinson, both of St. Petersburg, Russian Federation, assignors to Cytran, Inc., Kirkland, Wash.

Continuation of Ser. No. 337,341, Nov. 10, 1994, Pat. No. 5,538,951, which is a division of Ser. No. 415,283, Aug. 30, 1989, and a continuation-in-part of Ser. No. 278,463, Jul. 21, 1994, abandoned, which is a continuation-in-part of Ser. No. 257,495, Jun. 7, 1994, abandoned, which is a continuation of Ser. No. 783,518, Oct. 28, 1991, abandoned, which is a continuation-in-part of Ser. No. 678,129, Apr. 1, 1991, abandoned, which is a continuation-in-part of Ser. No. 415,283, Aug. 30, 1989, abandoned. This application May 26, 1995, Ser. No. 452,077

Int. Cl.<sup>6</sup> A61K 38/00

U.S. Cl. 514—19

13 Claims

1. A method for stimulating a binding function of T-lymphocytes comprising the step of administering to the T-lymphocytes an effective amount of L-Glu-L-Trp or a salt thereof.

5,770,577

**BDNF AND NT-3 POLYPEPTIDES SELECTIVELY LINKED TO POLYETHYLENE GLYCOL**

Olaf Boris Kinstler, and Qiao Yan, both of Thousand Oaks, Calif., assignors to Amgen Inc., Thousand Oaks, Calif.

Filed Nov. 14, 1994, Ser. No. 340,131

Int. Cl.<sup>6</sup> A61K 38/00;39/385; C07K 16/00

U.S. Cl. 514—21

16 Claims

1. A polyethylene glycol derivative of a polypeptide neurotrophic factor, wherein said polypeptide is connected to said polyethylene glycol, and said polypeptide is selected from the group consisting of brain-derived neurotrophic factor (BDNF) and neurotrophin-3 (NT-3).

5,770,578

**USE OF TRITERPENSAPONINS, SUCH AS NOTOGINSENOSE R1 (NR1) AND/OR ASTRAGALOSIDE (ASIV) FOR PREPARING MEDICAMENTS**

Bernd Binder; Weijian Zhang, and Johann Wojta, all of Vienna, Austria, assignors to Bergi GmbH, Vienna, Austria

PCT No. PCT/AT95/00049, § 371 Date Jan. 4, 1996, § 102(e)

Date Jan. 4, 1996, PCT Pub. No. WO95/24905, PCT Pub. Date Sep. 21, 1995

PCT Filed Mar. 16, 1995, Ser. No. 553,611

Claims priority, application Austria, Mar. 16, 1994, 561/94

Int. Cl.<sup>6</sup> A61K 31/705

U.S. Cl. 514—26

5 Claims

1. A method of directly blocking liberation of a bacterial endotoxin in a mammalian subject by administering a therapeutically effective amount of a triterpensaponin to the subject in need of treatment.

5,770,579

**ERYTHROMYCIN COMPOUNDS**

Constantin Agouridas, Nogent sur Marne; Yannick Benedetti, Rosny Sous Bois; Jean-François Chantot, Gressy en France; Alexis Denis, Paris; Claude Fromentin, de Flandres, and Odile Le Martret, de Versailles, all of France, assignors to Roussel Uclaf, France

Division of Ser. No. 220,484, Mar. 31, 1994, which is a continuation of Ser. No. 958,235, Oct. 8, 1992, abandoned, which is a division of Ser. No. 793,864, Nov. 18, 1991, abandoned.

This application Jan. 25, 1995, Ser. No. 378,186

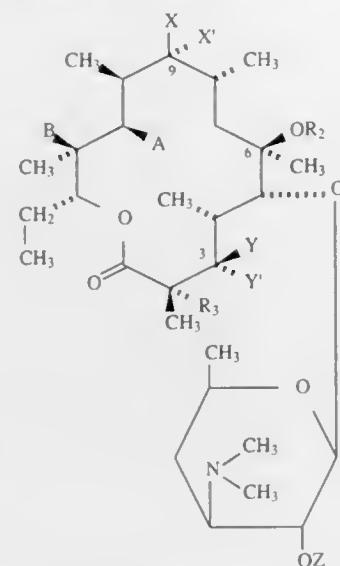
Claims priority, application France, Nov. 21, 1990, 90-14499; May 27, 1991, 90-06333; Aug. 29, 1991, 91-10728

Int. Cl.<sup>6</sup> A61K 31/70; C07H 17/08

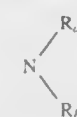
U.S. Cl. 514—29

23 Claims

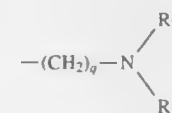
1. A compound of the formula



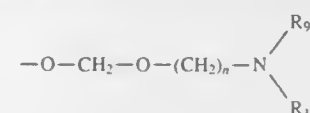
wherein X and X' together with the carbon atoms to which they are attached is —C=O or C=NOR, R is selected from the group consisting of a heterocyclic selected from the group consisting of pyrrolyl, pyrrolidinyl, pyridyl, pyrazinyl, pyrimidyl, piperidinyl, piperazinyl, quinuclidinyl, oxazolyl, isoxazolyl, morpholinyl, indolyl, imidazolyl, benzimidazolyl, triazolyl, thiazolyl, azetidinyl, and aziridinyl



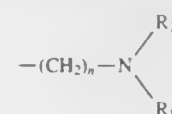
group consisting of a) hydrogen, b) hydrocarbon of up to 18 carbon atoms optionally containing at least one heteroatom selected from the group consisting of —O—, —S— and nitrogen and optionally substituted by at least one halogen, c) heterocyclic selected from the group consisting of pyrrolyl, pyrrolidinyl, pyridyl, pyrazinyl, pyrimidyl, piperidinyl, piperazinyl, quinuclidinyl, oxazolyl, isoxazolyl, morpholinyl, indolyl, imidazolyl, benzimidazolyl, triazolyl, thiazolyl, azetidinyl and aziridinyl or R<sub>a</sub> and R<sub>b</sub> together with the nitrogen atom to which they are attached form a heterocycle selected from the group consisting of pyrrolyl, pyrrolidinyl, pyridyl, pyrazinyl, pyrimidyl, piperidinyl, piperazinyl, quinuclidinyl, oxazolyl, isoxazolyl, morpholinyl, indolyl, imidazolyl, benzimidazolyl, triazolyl, thiazolyl, azetidinyl, and aziridinyl or R<sub>a</sub> and R<sub>b</sub> form with A a 9-N, 11-O ring, and X' is hydrogen, Y and Y' individually have the meaning of X and X' B is hydrogen or OR<sub>4</sub>, R<sub>4</sub> is hydrogen, or forms with A a carbonate or carbamate, A forms with the carbon which carries it and the carbon in position 10 a double bond, or A is OR', R' is hydrogen or forms with B a carbonate, or A is NR', R' is hydrogen or forms with B a carbonate, or A is NR', R' is C=O forming with B a carbamate group, R' is hydrogen or alkyl, aralkyl or alkoxy of up to 12 carbon atoms or



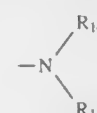
R<sub>7</sub> and R<sub>8</sub> are individually hydrogen or alkyl or aralkyl of up to 18 carbon atoms, or form together with the nitrogen a heterocycle as defined above, q is an integer between 1 and 6, or A is



R<sub>9</sub> and R<sub>10</sub> are hydrogen or alkyl of 1 to 8 carbon atoms, or form together with the nitrogen a heterocycle as defined above, n is an integer between 1 and 6, R<sub>2</sub> is selected from the group consisting of alkyl of 1 to 8 carbon atoms, —COHN<sub>2</sub>, —CONHCOR<sub>11</sub> and —CONHSO<sub>2</sub>R<sub>11</sub>, R<sub>11</sub> is a hydrocarbon of 1 to 18 carbon atoms optionally containing at least one heteroatom, R<sub>3</sub> is in the alpha or beta position and is selected from the group consisting of a) hydrogen, b) alkyl of 1 to 8 carbon atoms, or form together with the nitrogen a heterocycle as defined above, n is an integer between 1 and 6, R<sub>2</sub> is selected from the group consisting of alkyl of 1 to 8 carbon atoms, —CONH<sub>2</sub>, —CONHCOR<sub>11</sub> and —CONHSO<sub>2</sub>R<sub>11</sub>, R<sub>11</sub> is a hydrocarbon of 1 to 18 carbon atoms optionally containing at least one heteroatom, R<sub>3</sub> is in the alpha or beta position and is selected from the group consisting of a) hydrogen, b) alkyl of 1 to 8 carbon atoms,



R<sub>12</sub> and R<sub>13</sub> are selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms or form with the nitrogen atom a heterocycle as defined above, n is an integer between 1 and 6 and



R<sub>14</sub> and R<sub>15</sub> are individually hydrogen or alkyl of 1 to 8 carbon atoms or a heteroatom or alkyl or alkoxy of 1 to 8 carbon atoms, Z is hydrogen or the remainder of a carboxylic acid of 1 to 18 carbon atoms, the oximes that can be represented by X and X' or Y and Y' can be of syn or anti configuration or its non-toxic, pharmaceutically acceptable acid addition salts.

21. A method of treating bacterial infections in warm-blooded animals comprising administering to warm-blooded animals an antibacterially effective amount of at least one compound of claim 1.

5,770,580

**SOMATIC GENE THERAPY TO CELLS ASSOCIATED WITH FLUID SPACES**

Fred D. Ledley, and Bert W. O'Malley, Jr., both of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Division of Ser. No. 184,547, Jan. 21, 1994, which is a continuation-in-part of Ser. No. 181,707, Jan. 13, 1994, abandoned, which is a continuation-in-part of Ser. No. 912,934, Jul. 13, 1992, abandoned, and a continuation-in-part of Ser. No. 868,061, Apr. 13, 1992, abandoned. This application May 30, 1995, Ser. No. 453,501

Int. Cl.<sup>6</sup> A61K 31/735; C12P 21/02; C12N 15/64;5/16

U.S. Cl. 514—44

14 Claims

1. A method for gene delivery and transient gene expression comprising the steps of introducing a DNA expression vector into

a fluid space formed by the vitreous of the eye under conditions in which cells associated with said fluid space transiently incorporate said DNA expression vector into said cells and transiently expressing, from said expression vector, said gene inside said cells; wherein said DNA expression vector comprises:

a nucleic acid cassette;

a 5' flanking region including necessary sequences for expression of said nucleic acid cassette;

a linker connecting said 5' flanking region to said nucleic acid cassette, said linker having a position for inserting said nucleic acid cassette, wherein said linker lacks the coding sequences of a gene with which it is naturally associated; and a 3' flanking region which is 3' to said position for inserting said nucleic acid cassette.

5,770,581

**GENE TRANSCRIPTION AND IONIZING RADIATION: METHODS AND COMPOSITIONS**

Ralph R. Weichselbaum, Chicago; Dennis E. Hallahan, Park Ridge; Vikas P. Sukhatme, Chicago, all of Ill., and Donald W. Kufe, Wellesley, Mass., assignors to Arch Development Corp., Chicago, Ill., and Dana-Farber Cancer Institute, Boston, Mass.

Division of Ser. No. 943,812, Sep. 11, 1992, which is a continuation-in-part of Ser. No. 633,626, Dec. 20, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 474,445

Int. Cl.<sup>6</sup> A61K 48/00

U.S. Cl. 514—44

15 Claims

1. A process of inhibiting growth of a tumor comprising the steps of:

(a) delivering to said tumor a therapeutically effective amount of a DNA molecule comprising a radiation responsive enhancer-promoter operatively linked to an encoding region that encodes a polypeptide having the ability to inhibit growth of a tumor cell, which encoding region is operatively linked to a transcription-terminating region; and

(b) exposing said cell to an effective expression-inducing dose of ionizing radiations;

whereby the polypeptide is expressed and inhibits the growth of said tumor.

5,770,582

**PHARMACEUTICAL COMPOSITIONS CONTAINING DEOXYRIBONUCLEOSIDES FOR WOUND HEALING**

Reid Warren von Borstel, Kensington, and Michael Kevin Bamat, Chevy Chase, both of Md., assignors to Pro-Neuron, Inc., Gaithersburg, Md.

Continuation of Ser. No. 96,407, Jul. 26, 1993, abandoned, which is a division of Ser. No. 911,379, Jul. 13, 1992, Pat. No. 5,246,708, which is a continuation of Ser. No. 341,925, Apr. 21, 1989, abandoned, which is a continuation-in-part of Ser. No. 186,031, Apr. 25, 1988, abandoned, which is a

continuation-in-part of Ser. No. 115,923, Oct. 28, 1987, abandoned. This application Apr. 10, 1995, Ser. No. 419,767

Int. Cl.<sup>6</sup> C07H 19/073;19/10;19/173;19/20

U.S. Cl. 514—45

54 Claims

1. A pharmaceutical composition consisting essentially of:

(a) from 10 to 90 percent by mol 2'-deoxycytidine, (b) from 90 to 10 percent by mol 2'-deoxyguanosine, wherein each of said 2'-deoxycytidine and 2'-deoxyguanosine are in the free form or a 3', or 5' phosphate, or 3',5' diphosphate ester derivative thereof, or the pharmaceutically acceptable salts thereof, and

(c) a pharmaceutically acceptable carrier, said carrier being adapted for local or topical administration,

wherein said composition is in a form selected from the group consisting of an ointment, gel, cream, lotion, and paste.



5,770,583

## STABLE SULFIDE COMPOSITIONS USES AND PROCESS FOR PREPARATION THEREOF

Joseph A. Haslwanter, Germantown; Gerald R. Dever, Cordova, and Thomas J. Laughlin, Germantown, all of Tenn., assignors to Schering-Plough HealthCare Products, Inc., Memphis, Tenn.

PCT No. PCT/US94/00435, § 371 Date Jul. 26, 1995, § 102(e) Date Jul. 26, 1995, PCT Pub. No. WO94/16991, PCT Pub. Date Aug. 4, 1994

PCT Filed Jan. 25, 1994, Ser. No. 495,427

Int. Cl.<sup>6</sup> A61K 31/715; C14C 1/06; C07H 1/06

U.S. Cl. 514—57 41 Claims



1. A stable sulfide-containing composition containing an inert atmosphere comprising:

- a sulfide, a polysulfide or mixtures thereof, of an alkali or an alkaline earth metal; and
- a carrier which is an aqueous or water-containing formulation of a modified cellulosic material within which the sulfide is dissolved or dispersed and in which the utilized water is deionized and/or distilled.

5,770,584

## METHOD OF TREATING HEPATITIS VIRUS INFECTIONS

Louis S. Kucera, Pfafftown, and Susan L. Morris-Natschke, Apex, both of N.C., assignors to Wake Forest University, Winston-Salem, and University of North Carolina, Chapel Hill, both of N.C.

Continuation-in-part of Ser. No. 74,943, Jun. 10, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 465,947

Int. Cl.<sup>6</sup> A61K 31/70

U.S. Cl. 514—77 14 Claims

1. A method of treating a hepatitis B virus infection comprising administering to a human subject in need of such treatment an effective hepatitis virus-combating amount of a compound of Formula I:



wherein

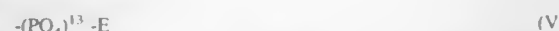
Y is S, O, NH, NCH<sub>3</sub>, NHC(O), or NCH<sub>2</sub>C(O);

R<sub>1</sub> is unbranched or branched, saturated or unsaturated C<sub>14</sub>-C<sub>18</sub> alkyl, alkenyl, or alkynyl;

X is a covalent bond or methylene optionally substituted with hydroxyl, C<sub>1</sub>-C<sub>20</sub> alkyl, C<sub>1</sub>-C<sub>20</sub> alkoxy, C<sub>1</sub>-C<sub>20</sub> alkylthio or C<sub>1</sub>-C<sub>20</sub> alkylamido;

and D is selected from the group consisting of moieties of Formula V or Formula VI;

wherein Formula V is



wherein E is -J-N<sup>+</sup>(R<sub>2</sub>)(R<sub>3</sub>)(R<sub>4</sub>), wherein J is C<sub>1</sub>-C<sub>4</sub> alkyl optionally substituted one to three times with methyl or ethyl; and R<sub>2</sub>, R<sub>3</sub>, and R<sub>4</sub> are independently selected from the group consisting of H and C<sub>1</sub>-C<sub>3</sub> alkyl;

or a pharmaceutical salt thereof.

5,770,585

## HOMOGENEOUS WATER-IN-PERFLUOROHEMICAL STABLE LIQUID DISPERSION FOR ADMINISTRATION OF A DRUG TO THE LUNG OF AN ANIMAL

Robert J. Kaufman, 8129 Stanford Ave., University City, Mo. 63130; Thomas J. Richard, 8607 Rowland Ave., University City, Mo. 63132; Richard A. Stephens, 11951 Stonywood Dr., St. Louis, Mo. 63122; Thomas H. Goodin, 311 Stephanie La., Manchester, Mo. 63011; John S. Allen, 1295 Chambers Rd., St. Louis, Mo. 63137, and Tony E. Layton, 1112 Merlin La., Godfrey, Ill. 62035

Filed May 8, 1995, Ser. No. 438,098

Int. Cl.<sup>6</sup> A61K 31/685

U.S. Cl. 514—78 21 Claims

1. A homogenous water-in-perfluorochemical stable liquid dispersion, for acceptable therapeutic administration of a drug to the lung of an animal, comprising:

a perfluorochemical liquid, water, surfactant and drug, wherein said water is homogeneously dispersed in said perfluorochemical to form a stable water-in-perfluorochemical liquid dispersion, said perfluorochemical constituting greater than 50% by volume of said dispersion, said drug contained in said dispersion in an effective therapeutic amount.

5,770,586

## QUATERNARY NITROGEN-CONTAINING PHOSPHONATE COMPOUNDS, PHARMACEUTICAL COMPOSITIONS, AND METHODS OF TREATING ABNORMAL CALCIUM AND PHOSPHATE METABOLISM AND METHODS OF TREATING AND PREVENTING DENTAL CALCULUS AND PLAQUE

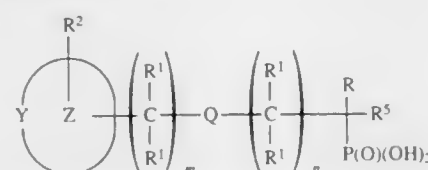
Frank Hallock Ebetino, Cincinnati, Ohio; Susan Mary Kaas, Sherburne, N.Y.; Marion David Francis, Cincinnati, Ohio; Dennis George Anthony Nelson, and John Michael Janusz, both of West Chester, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 052,695, Apr. 30, 1993, Pat. No. 5,391,743, which is a continuation of Ser. No. 890,885, May 29, 1992, abandoned. This application Nov. 3, 1994, Ser. No. 333,652

Int. Cl.<sup>6</sup> A61K 31/40; 31/415; 31/42; 31/425

U.S. Cl. 514—91 31 Claims

1. A quaternary nitrogen-containing phosphonate or the pharmaceutically-acceptable salts and esters thereof, having the following structure:



wherein m and n are integers from 0 to 10; m+n is from 0 to 10;

(a) Q is a covalent bond or a moiety selected from O, S, NR<sup>1</sup>;

(b) Y is N<sup>+</sup>(R<sup>2</sup>)<sub>2</sub>;

(c) Z is a five-membered saturated, unsaturated, or aromatic, monocyclic ring, wherein Z may contain an additional heteroatom selected from O, S, or N;

(d) R is PO<sub>3</sub>H<sub>2</sub> or P(O)(OH)R<sub>4</sub>, wherein R<sub>4</sub> is substituted or unsubstituted alkyl or 1-8 carbon atoms;

(e) Each R<sub>1</sub> is selected from the group consisting of nil; —SR<sup>6</sup>; R<sup>6</sup>SR<sup>6</sup>; hydrogen; hydroxy; substituted or unsubstituted C<sub>1</sub>-C<sub>8</sub> alkyl; —OR<sup>7</sup>; —CO<sub>2</sub>R<sup>7</sup>; —O<sub>2</sub>CR<sup>7</sup>; —NR<sup>7</sup>; —N(R<sup>7</sup>)C(O)R<sup>7</sup>; —C(O)N(R<sup>7</sup>)<sub>2</sub>; halogen; —C(O)R<sup>7</sup>; arylalkyl; nitro; substituted or unsubstituted aryl, and combinations thereof;

(f) each R<sub>2</sub> is one or more substituents on the Z moiety independently selected from the group consisting of N<sup>+</sup>(R<sup>6</sup>)<sub>2</sub>; —SR<sup>6</sup>; R<sup>6</sup>SR<sup>6</sup>; hydrogen; substituted or unsubstituted C<sub>1</sub>-C<sub>8</sub> alkyl; —OR<sup>7</sup>; —CO<sub>2</sub>R<sup>7</sup>; —O<sub>2</sub>CR<sup>7</sup>; —NR<sup>7</sup>; —N(R<sup>7</sup>)C(O)R<sup>7</sup>; —C(O)N(R<sup>7</sup>)<sub>2</sub>; halogen; hydroxy; —C(O)R<sup>7</sup>; arylalkyl; nitro; substituted or unsubstituted aryl;

5,770,589

## TREATMENT OF MACULAR DEGENERATION

Francis Alfred Billson, and Philip Leslie Penfold, both of New South Wales, Australia, assignors to The University of Sydney, New South Wales, Australia

PCT No. PCT/AU94/00424, § 371 Date Sep. 27, 1996, § 102(e) Date Sep. 27, 1996, PCT Pub. No. WO95/03807, PCT Pub. Date Feb. 9, 1995

PCT Filed Jul. 27, 1994, Ser. No. 586,750

Claims priority, application Australia, Jul. 27, 1993, PM0182

Int. Cl.<sup>6</sup> A61K 31/58

U.S. Cl. 514—174

15 Claims

1. A method for the treatment of macular degeneration in a patient requiring said treatment, comprising administering by intravitreal injection to said patient an effective amount of an anti-inflammatory steroid.

5,770,587

## ANTIFUNGAL AGENTS

Angela Basilio; Fernando Pelaez; Maria Teresa Diez; Francisca Vicente, all of Madrid, Spain; Sandra A. Morris, Westfield, N.J.; James E. Curotto, Morgan, N.J.; Gerald F. Bills, Clark, N.J.; Sarah J. Dreikorn, Scotch Plains, N.J.; Otto D. Hensens, Red Bank, N.J.; Jerrold M. Liesch, Princeton Junction, N.J.; Rosalind G. Jenkins, Somerset, N.J., and John R. Thompson, Scotch Plains, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

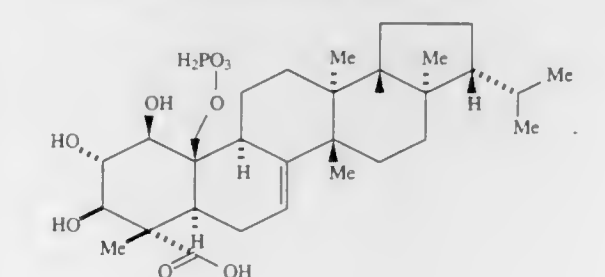
Filed Oct. 21, 1996, Ser. No. 734,701

Int. Cl.<sup>6</sup> A61K 31/56

U.S. Cl. 514—120

6 Claims

1. An isolated compound having the structure:



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## NON-ANTIBACTERIAL TETRACYCLINE COMPOSITIONS OF THE PREVENTION AND TREATMENT OF ROOT CARIES

Thomas F. McNamara, Port Jefferson; Lorne M. Golub, and Nangavarum S. Ramamurthy, both of Smithtown, all of N.Y., assignors to The Research Foundation of State University of New York, Albany, N.Y.

Continuation of Ser. No. 164,478, Dec. 9, 1993, abandoned, which is a continuation-in-part of Ser. No. 874,369, Apr. 27, 1992, abandoned, which is a continuation-in-part of Ser. No. 654,073, Feb. 11, 1991, Pat. No. 5,223,248. This application Jan. 23, 1996, Ser. No. 591,949

Int. Cl.<sup>6</sup> A61K 31/65

U.S. Cl. 514—152

9 Claims

1. A method of treating tooth surfaces to prevent root caries in humans, comprising contacting topically said tooth root surfaces that are exposed as a result of recession of gingiva and alveolar bone due to periodontal disease for a sufficient time and with an effective amount sufficient to prevent root caries of a systemically non-absorbable non-antimicrobial tetracycline selected from the group consisting of 4-hydroxy-4-dimethylaminotetracycline and tetracyclonitrile.

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## CYCLIC COMPOUNDS, THEIR PRODUCTION AND USE

Hideaki Natsugari, Hyogo; Takenori Ishimaru; Takayuki Doi, both of Osaka; Yoshinori Ikeura, Nara; Chiharu Kimura, Hyogo, and Naoki Tarui, Nara, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 621,360, Mar. 25, 1996, This application Sep. 23, 1996, Ser. No. 717,801

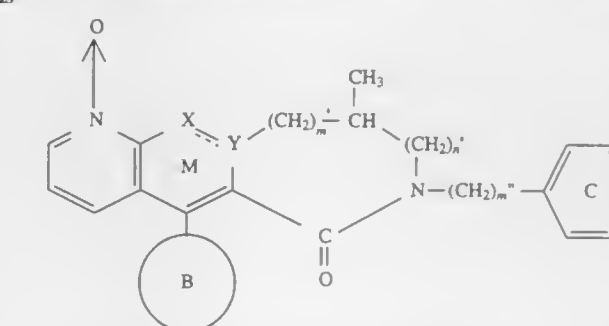
Claims priority, application Japan, Mar. 24, 1995, 7-091436; Jul. 20, 1995, 7-207553; Sep. 18, 1995, 7-264727; Jan. 23, 1996, 8-030033; Mar. 22, 1996, 8-066337; Aug. 14, 1996, 8-214698

Int. Cl.<sup>6</sup> A61K 31/33; 31/55; C07D 245/00; 487/00

U.S. Cl. 514—183

3 Claims

1. A compound of a formula:



wherein m' and n' are, independently, an integer from 0 to 4, with the proviso that the sum of m' and n' is 2, 3 or 4;

—X—Y< is one of —CO—N< or —CS—N<;

Ring B is a benzene ring optionally substituted with 1 to 3 substituents selected from the group consisting of (1) a halogen atom, (2) C<sub>1-6</sub> alkyl groups optionally having from 1 to 5 substituents selected from the group consisting of a hydroxyl group, an amino group, a carboxyl group, a nitro group, a mono- or di-C<sub>1-6</sub> alkylamino group, a C<sub>1-6</sub> alkyl-carbonyloxy group, and a halogen atom, (3) an optionally halogenated C<sub>1-6</sub> alkoxy group, (4) an optionally halogenated C<sub>1-6</sub> alkylthio group, (5) a C<sub>6-10</sub> aryl group, (6) an acylamino group, (7) an acyloxy group, (8) a hydroxyl group, (9) a nitro group, (10) a cyano group, (11) an amino group, (12) a mono- or di-C<sub>1-6</sub> alkylamino group, (13) a cyclic amino group optionally having a hetero atom selected from the group consisting of an oxygen atom, a sulfur atom, and a nitrogen atom, (14) a C<sub>1-6</sub> alkylcarbonylamino group, (15) a C<sub>1-6</sub> alkylsulfonylamino group, (16) a C<sub>1-6</sub> alkoxy carbonyl group, (17) a carboxyl group, (18) a C<sub>1-6</sub> alkylcarbonyl group, (19) a carbamoyl group, (20) a mono- or di-C<sub>1-6</sub> alkylcarbamoyl group, (21) a C<sub>1-6</sub> alkylsulfonoyl group, and (22) an oxo group;

Ring C is a benzene ring optionally substituted with 1 to 3 substituents selected from the group consisting of a halogen atom, an optionally-halogenated C<sub>1-10</sub> alkyl group, an amino-substituted C<sub>1-4</sub> alkyl group, a mono- or di-C<sub>1-4</sub> alkylamino-substituted C<sub>1-4</sub> alkyl group, a carboxyl-substituted C<sub>1-4</sub> alkyl

group, a C<sub>1-4</sub> alkoxy-carbonyl-substituted C<sub>1-4</sub> alkyl group, a hydroxyl-substituted C<sub>1-4</sub> alkyl group, a C<sub>1-4</sub> alkoxy-carbonyl-substituted C<sub>1-4</sub> alkyl group, a C<sub>3-10</sub> cycloalkyl group, a nitro group, a cyano group, a hydroxyl group, an optionally-halogenated C<sub>1-10</sub> alkoxy group, an optionally-halogenated C<sub>1-4</sub> alkylthio group, an amino group, a mono- or di-C<sub>1-4</sub> alkylamino group, a 5-membered to 9-membered cyclic amino group optionally having from 1 to 3 hetero atoms, a C<sub>1-4</sub> alkyl-carbonylamino group, an aminocarbonyloxy group, a mono- or di-C<sub>1-4</sub> alkylaminocarbonyloxy group, a C<sub>1-4</sub> alkylsulfonylamino group, a C<sub>1-4</sub> alkoxy-carbonyl group, a benzyloxycarbonyl group, a carboxyl group, a C<sub>1-6</sub> alkyl-carbonyl group, a C<sub>3-6</sub> cycloalkyl-carbonyl group, a carbamoyl group, a mono- or di-C<sub>1-4</sub> alkylcarbamoyl group, and a C<sub>1-6</sub> alkylsulfonyl group; and

m" is an integer from 1 to 6, or a salt thereof.

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**BIS-PLATINUM COMPLEXES AS  
CHEMOTHERAPEUTIC AGENTS**

Nicholas Farrell, Winooski, Vt., assignor to The University of Vermont and State Agricultural College, Burlington, Vt. Division of Ser. No. 95,829, Jul. 22, 1993, abandoned, which is a continuation of Ser. No. 713,105, Jun. 11, 1991, abandoned, which is a division of Ser. No. 401,919, Sep. 1, 1989, Pat. No. 5,107,007, which is a continuation-in-part of Ser. No. 294,790, Jan. 9, 1989, Pat. No. 4,871,729, which is a division of Ser. No. 889,397, Jul. 25, 1996, Pat. No. 4,797,393. This application Nov. 10, 1994, Ser. No. 339,291

Int. Cl.<sup>6</sup> C07F 15/00; A61K 31/555

U.S. Cl. 514—187

12 Claims

1. A cytotoxic complex of trans geometry, said complex having the formula PtX<sub>2</sub>(L)(L') where L is selected from the group consisting of quinoline, isoquinoline, acridine, pyrazole, thiazole, imidazole, and benzimidazole, X<sub>2</sub> is either two monoanionic ligands, which monoanionic ligands may be the same or different, or X<sub>2</sub> is a single di-anionic ligand, and L' is the same as L or is a primary amine, or a secondary amine, wherein said primary or secondary amine is selected from the group consisting of branched and straight-chain lower alkyl amines, aryl amines, aralkyl amines, lower alkenyl amines, cycloalkyl amines, cycloalkenyl amines, and polycyclic hydrocarbon amines.

5,770,592

**PREVENTION AND TREATMENT OF OCULAR  
NEOVASCULARIZATION USING ANGIOSTATIC  
STEROIDS**

Abbot F. Clark, Arlington, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Continuation of Ser. No. 342,524, Nov. 21, 1994, Pat. No. 5,679,666, and Ser. No. 796,169, Nov. 22, 1991, abandoned. This application Jul. 16, 1997, Ser. No. 895,184

Int. Cl.<sup>6</sup> A61K 31/33

U.S. Cl. 514—179

5 Claims

1. A method for preventing and treating the ocular neovascularization associated with conditions or diseases selected from the group consisting of diabetic retinopathy, chronic glaucoma, retinal detachment, sickle cell retinopathy, senile macular degeneration, rubeosis iritis, uveitis, neoplasms, Fuchs' heterochromic iridocyclitis, neovascular glaucoma, corneal neovascularization, neovascularization resulting from combined vitrectomy and lensectomy, retinal ischemia, choroidal vascular insufficiency, choroidal thrombosis, carotid artery ischemia, and contusive ocular injury, which comprises: administering, topically, systemically, or intraocularly, to a host in need thereof, a pharmaceutically effective amount of an angiostatic steroid selected from the group consisting of: 4,9(11)-Pregnadien-17a,21-diol-3,20-dione, 11-Epicortisol, 17 alpha-Hydroxprogesterone, and Tetrahydrocortexolone (THS).

**5,770,593  
METHOD OF DETERMINING A PHARMACEUTICAL  
COMBINATION PREPARATIONS FOR USE IN ANTI-  
NEOPLASTIC THERAPY**

Hans Hermann Grunicke, Mills, Austria; Dieter Herrmann, Heidelberg, Germany; Johann Hofmann, Scharnitz, Austria, and Elmar Bosies, Weinheim, Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Germany Division of Ser. No. 319,478, Oct. 7, 1994, Pat. No. 5,578,590, which is a division of Ser. No. 759,201, Sep. 11, 1991, abandoned, which is a continuation of Ser. No. 395,698, Aug. 18, 1989, abandoned. This application Jun. 5, 1995, Ser. No. 464,343

Claims priority, application Germany, Aug. 18, 1988, 38 27 974.6

Int. Cl.<sup>6</sup> A61K 31/545; 31/55; 31/70; 31/35

U.S. Cl. 514—200

10 Claims

1. Process for preparing a synergistic pharmaceutical combination preparation with anti-neoplastic action, comprising the steps: (a) determining the protein kinase C inhibition of a first active material which shows protein kinase C inhibition effect, wherein the determining is done by an assay of inhibition of protein kinase in vitro or inhibition of protein kinase in vivo; (b) determining the synergistic effect of said first active material with a second active material having an antineoplastic action by measuring cell proliferation; (c) identifying the combinations of said first active material and said second active material which have a synergistic antineoplastic effect; and (d) preparing a pharmaceutical preparation comprising said first active material and said second active material.

5,770,594

**NAPHTHYL-BENZOXAZEPINES OR  
-BENZOTHAZEPINES AS SQUALENE SYNTHETASE  
INHIBITORS**

Ernest S. Hamanaka, Gales Ferry, Conn.; Cheryl M. Hayward, North Providence, R.I., and Joel M. Hawkins, Old Lyme, Conn., assignors to Pfizer Inc., New York, N.Y.

PCT No. PCT/IB95/00424, § 371 Date Jun. 17, 1997, § 102(e) Date Jun. 17, 1997, PCT Pub. No. WO96/20184, PCT Pub. Date Jul. 4, 1996

Continuation of Ser. No. 362,713, Dec. 23, 1994, abandoned.

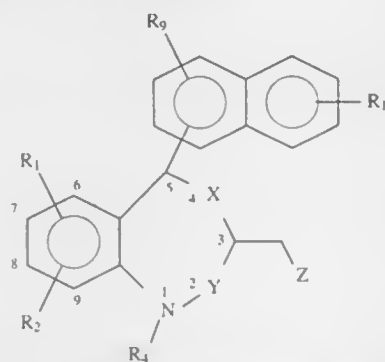
This PCT application Jun. 2, 1995, Ser. No. 860,155

Int. Cl.<sup>6</sup> A61K 31/55; C07D 267/14; 281/10; 281/08

U.S. Cl. 514—211

67 Claims

1. A compound of Formula I



and the pharmaceutically acceptable cationic and anionic salts, prodrugs and stereoisomers thereof

wherein X is oxy, thio, —S(O)— or —S(O)<sub>2</sub>—;

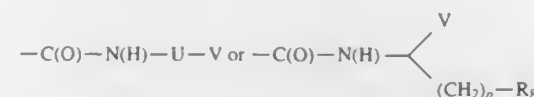
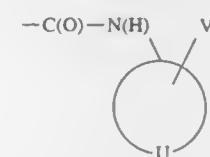
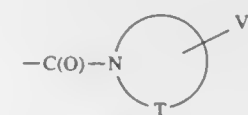
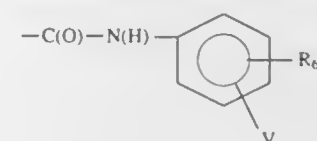
Y is carbonyl or methylene;

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are each independently hydrogen, halo, hydroxyl, trifluoromethyl, (C<sub>1-4</sub>)alkyl, fluorinated (C<sub>1-4</sub>)alkyl having from 1 to 9 fluorines, (C<sub>1-4</sub>)alkoxy, fluorinated (C<sub>1-4</sub>)alkoxy having from 1 to 9 fluorines, (C<sub>1-4</sub>)alkylthio, (C<sub>1-4</sub>)alkylsulfinyl, (C<sub>1-4</sub>)alkylsulfonyl, phenyl, amino, mono-N- or di-N,N-(C<sub>1-4</sub>)alkylamino, carbonyl, (C<sub>1-4</sub>)alkoxycarbonyl, carbamoyl, mono-N- or di-N,N-(C<sub>1-4</sub>)alkylcarbamoyl, (C<sub>1-4</sub>)alkanoylamino, fluorinated (C<sub>1-4</sub>)alkanoylamino having from 1 to 9 fluorines,

(C<sub>1-4</sub>)alkylsulfonylamino or fluorinated (C<sub>1-4</sub>)alkylsulfonylamino having from 1 to 9 fluorines, (C<sub>1-4</sub>)alkanoyl, (C<sub>1-4</sub>)alkanoyl(C<sub>1-4</sub>)alkyl, oxazolyl, thiazolyl, isoxazolyl, pyrazolyl or isothiazolyl wherein said preceding heterocycles are carbon linked and wherein R<sub>1</sub> and R<sub>2</sub> can be taken together to form a five, six or seven membered carbocyclic ring or can be taken together to form methylenedioxy, ethylenedioxy or propylenedioxy and such rings formed by taking R<sub>1</sub> and R<sub>2</sub> together are fused at the 7 and 8 positions;

R<sub>4</sub> is (C<sub>1-4</sub>)alkyl or (C<sub>3-4</sub>)cycloalkylmethyl;

Z is carboxyl, (C<sub>1-4</sub>)alkoxycarbonyl, aminocarbonyl, cyano, hydroxyaminocarbonyl, —C(O)N(H)SO<sub>2</sub>R<sub>5</sub>, tetrazol-5-yl, 4,5-dihydro-5-oxo-1,2,4-oxadiazol-3-yl, tetrazol-6-yl-aminocarbonyl, 3-oxoisoxazolidin-4-yl-aminocarbonyl,



R<sub>5</sub> is amino or mono-N- or di-N,N-(C<sub>1-4</sub>)alkylamino; (C<sub>1-4</sub>)alkyl optionally substituted with 1 to 9 fluorines, amino, mono-N- or di-N,N-(C<sub>1-4</sub>)alkylamino, carboxyl, (C<sub>1-4</sub>)alkoxycarbonyl, carbamoyl or mono-N- or di-N,N-(C<sub>1-4</sub>)alkylcarbamoyl; phenyl optionally mono- or di-substituted independently with methyl, methoxyl, fluoro, trifluoromethoxyl, carboxyl, (C<sub>1-4</sub>)alkoxycarbonyl, methoxy, methylsulfinyl, methylsulfonyl, (C<sub>1-4</sub>)alkylsulfonylamino or mono-N- or di-N,N-(C<sub>1-4</sub>)alkylaminosulfonyl; or thiazolyl, isothiazolyl, thienyl, furyl, pyridinyl or such heterocycles optionally mono-substituted by carboxyl, or mono- or di-substituted with methyl;

R<sub>6</sub> is hydrogen, hydroxyl or methoxyl;

T forms a five to seven membered mono-aza, saturated ring, said ring optionally containing thia and said ring optionally mono-substituted on carbon with hydroxyl;

U forms a three to seven membered saturated carbocyclic ring;

V is —CO<sub>2</sub>R<sub>7</sub>, aminocarbonyl, cyano, tetrazol-5-yl, 4,5-dihydro-5-oxo-1,2,4-oxadiazol-yl, tetrazol-5-yl-aminocarbonyl or 3-oxoisoxazolidin-4-yl-aminocarbonyl;

R<sub>7</sub> is hydrogen or (C<sub>1-4</sub>)alkyl;

p is 1, 2, 3 or 4;

R<sub>8</sub> is hydroxyl, thiol, carboxyl, (C<sub>1-4</sub>)alkoxycarbonyl, carbamoyl, amino, sulfamoyl, (C<sub>1-4</sub>)alkoxy, fluorinated (C<sub>1-4</sub>)alkoxy having from 1 to 9 fluorines, (C<sub>1-4</sub>)alkylthio, (C<sub>1-4</sub>)alkylsulfonyl, (C<sub>1-4</sub>)alkylsulfinyl, mono-N- or di-N,N-(C<sub>1-4</sub>)alkylcarbamoyl, mono-N- or di-N,N-(C<sub>1-4</sub>)alkylamino, (C<sub>1-4</sub>)alkylsulfonylamino, fluorinated (C<sub>1-4</sub>)alkylsulfonylamino having from 1 to 9 fluorines, (C<sub>1-4</sub>)alkanoylamino, fluorinated (C<sub>1-4</sub>)alkanoylamino having from 1 to 9 fluorines, mono-N- or di-N,N-(C<sub>1-4</sub>)alkylaminosulfonyl, ureido, mono-N- or di-N,N-(C<sub>1-4</sub>)ureido, imidazolyl or pyridyl; and

W is pyridyl, pyrimidyl, 1,3,4-oxadiazolyl, 1,3,4-thiadiazolyl, thiazolyl, 1,3,4-triazolyl or oxazolyl.

5,770,595

**OXIME SUBSTITUTED THERAPEUTIC COMPOUNDS  
J. Peter Klein, Vashon, and Alistair Leigh, Brier, both of Wash.,  
assignors to Cell Therapeutics, Inc., Seattle, Wash.**

Continuation of Ser. No. 6,083, Jan. 19, 1993, abandoned.

This application Feb. 7, 1994, Ser. No. 193,344

Int. Cl.<sup>6</sup> M61K 31/52

U.S. Cl. 514—263

22 Claims

1. A compound, or a hydrate, salt, or solvate of the compound, having the formula:



wherein:

j is an integer from one to three;

the core moiety has from one to three, five- to six-membered ring structures in a predominantly planar configuration, having at least one nitrogen, wherein R is bound to the nitrogen; and

R is independently selected from the group consisting of hydrogen, halogen, hydroxyl, amino, C<sub>(1-10)</sub> alkyl, C<sub>(2-10)</sub> alkenyl, and formula I; wherein at least one R is formula I



wherein:

n is an integer from three to twenty;

p is three;

R<sub>1</sub> is independently selected from the group consisting of hydrogen, halogen, hydroxide, C<sub>(1-10)</sub> alkyl, C<sub>(1-10)</sub> ether, C<sub>(2-10)</sub> alkenyl, —N—O<sub>2</sub>, wherein R<sub>2</sub> is selected from the group consisting of hydrogen, C<sub>(1-10)</sub> alkyl, C<sub>(2-10)</sub> alkenyl, and —(CH<sub>2</sub>)<sub>s</sub>C(R<sub>3</sub>)<sub>n</sub>, wherein s is zero or an integer from one to ten, wherein t is three, wherein R<sub>3</sub> is selected from the group consisting of hydrogen, halogen, hydroxide, C<sub>(1-10)</sub> alkyl, C<sub>(1-10)</sub> alkoxy, C<sub>(2-10)</sub> alkenyl, and —N—OR<sub>2</sub>,

at least one R<sub>1</sub> or one R<sub>3</sub> is —N—OR<sub>2</sub>, p or t corresponding to the at least one R<sub>1</sub> or one R<sub>3</sub> instead being two; and,

a second R<sub>1</sub> or second R<sub>3</sub>, bonded to the same —C as the at least one R<sub>1</sub> or one R<sub>3</sub>, is other than —N—OR<sub>2</sub>, with the proviso that if the core moiety is a xanthine, n is an integer not less than five.

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**PHARMACEUTICAL COMPOSITIONS BASED ON  
MEQUITAZINE**

Claude Coquelet, Saint Gely Sur Fesc; Elisabeth Latour, Montpellier, and Florence Maurin, Vallhauges, all of France, assignors to Laboratoire Chauvin S.A., Montpellier, France Filed Dec. 5, 1996, Ser. No. 757,969

Claims priority, application France, Dec. 6, 1995, 95 14425

Int. Cl.<sup>6</sup> A61K 31/54; 31/70

U.S. Cl. 514—225.2

9 Claims

1. Ready-for-use collyrium intended for the treatment of ocular allergies, comprising, in aqueous solution, mequitazine and a β- or a γ-cyclodextrin optionally etherified by C<sub>1-4</sub> alkyl or C<sub>1-4</sub> hydroxyalkyl groups, the said cyclodextrin being present in a molar ratio of at least one in relation to mequitazine.

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**QUINOLONE DERIVATIVES AND PROCESSES FOR  
PREPARING THE SAME**

Wan Joo Kim; Tae Ho Park; Moon Hwan Kim; Bong Jin Kim, all of Daejeon, Rep. of Korea, and Neil D. Pearson, Surrey, England, assignors to Korea Research Institute of Chemical Technology, Daejeon, Rep. of Korea, and Smithkline Beecham P.L.C., Brentford, United Kingdom

PCT No. PCT/KR94/00005, § 371 Date Oct. 11, 1995, § 102(e) Date Oct. 11, 1995, PCT Pub. No. WO94/15938, PCT Pub. Date Jul. 21, 1994

PCT Filed Jan. 18, 1994, Ser. No. 492,086

Claims priority, application Rep. of Korea, Jan. 18, 1993, 1993-543

Int. Cl.<sup>6</sup> A61K 31/47; C07D 215/56

U.S. Cl. 514—230.2

5 Claims

1. A trans-racemic mixture of a quinolone of Formula (I):



VOL

1  
2  
1  
1

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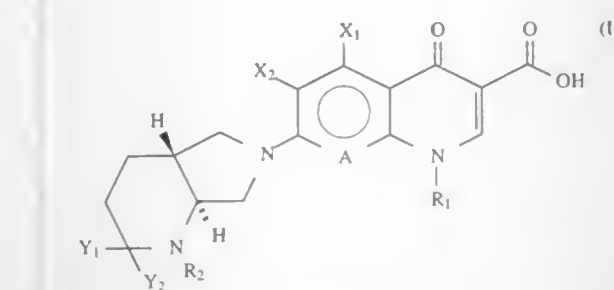
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UMI



wherein,  
 $X_1$  represents hydrogen, amino, halogen, or lower alkyl;  
 $X_2$  represents hydrogen or halogen;  
 $Y_1$  and  $Y_2$  each represents hydrogen, or lower alkyl ( $C_{1-3}$ ) group;  
 $R_1$  represents a straight chain or cyclic lower alkyl group having 1 to 3 carbon atoms or a straight chain or cyclic lower alkyl group having 1 to 3 carbon atoms which is substituted with a halogen atom, a phenyl group or a phenyl group substituted with one or two halogen atoms;  
 $R_2$  represents hydrogen, or lower alkyl; and  
 $A$  represents nitrogen atom or



in which  $Y$  represents hydrogen, halogen, lower alkyl or alkoxy or together with  $R_1$  forms  $-\text{CH}_2\text{CH}_2\text{CH}_2-$ ,  $-\text{CH}_2\text{CH}_2\text{CH}(\text{CH}_3)-$ ,  $-\text{OCH}_2\text{CH}_2-$ ,  $-\text{OCH}_2\text{CH}(\text{CH}_3)-$ ,  $-\text{SCH}_2\text{CH}_2-$ , or  $-\text{SCH}_2\text{CH}(\text{CH}_3)-$ .

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## HETEROCYCLIC COMPOUNDS

David D. Miller, Stevenage; Paul Barraclough, Loose; Sadie Vile; Ann L. Walker, both of Stevenage; Patrick V. R. Shannon, Penarth, all of United Kingdom; Laddawan Chunchatprasert, Khon THX; Pierre P. M. Debont, Canterbury, and Alan T. Hudson, Otford, both of United Kingdom, assignors to University College Cardiff Consultants Limited, United Kingdom

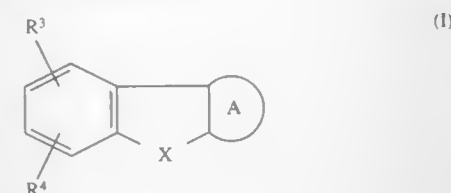
PCT No. PCT/GB95/01598, § 371 Date Apr. 10, 1997, § 102(e) Date Apr. 10, 1997, PCT Pub. No. WO96/01827, PCT Pub. Date Jan. 25, 1996

PCT Filed Jul. 6, 1995, Ser. No. 765,227

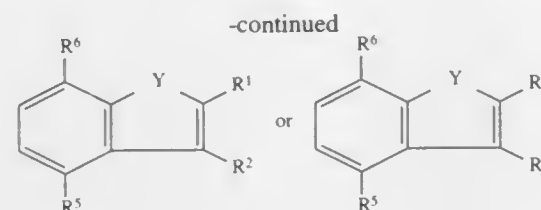
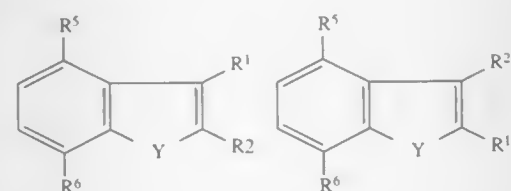
Claims priority, application United Kingdom, Jul. 7, 1994, 9413758

Int. Cl. <sup>6</sup> A61K 31/41; C07D 491/048; 495/04; 487/04 U.S. Cl. 514—232.8 7 Claims

1. A compound of the formula (I)



or a salt thereof, wherein  
 $A$  is



$X$  is  $\text{O}$ ,  $\text{S}$ ,  $\text{SO}$ ,  $\text{SO}_2$ ,  $\text{CH}_2$ ,  $\text{CO}$  or  $\text{NR}^7$ , wherein  $R^7$  is  $\text{H}$  or the following groups which may be optionally substituted: cycloalkyl, cycloalkenyl, alkyl, alkenyl, alkynyl, aryl, aralkyl, acyl, aroyl, alkylsulphonyl or arylsulphonyl;

$Y$  is  $\text{O}$ ,  $\text{S}$ ,  $\text{SO}$ ,  $\text{SO}_2$ ,  $\text{CH}_2$ ,  $\text{CO}$  or  $\text{NR}^7$ ;

$R^1$  is an optionally substituted 5- or 6-membered heterocyclic ring containing 1 to 4 heteroatoms wherein the 5- or 6-membered ring may be aromatic or non-aromatic;

$R^2$  is  $\text{H}$ , hydroxy, halo, haloalkyl, cyano, alkyl, aryl, alkenyl, alkynyl, alkoxy, wherein alkyl, aryl, alkenyl, alkynyl, and alkoxy may be substituted,  $\text{CHO}$ ,  $\text{COR}^8$ ,  $\text{COOR}^8$  wherein  $R^8$  is hydrogen or is a  $C_{1-10}$  optionally substituted hydrocarbyl group which may contain one or two oxygen atoms;

$R^3$  and  $R^4$  are independently  $\text{H}$ , hydroxy, alkyl, haloalkyl, azido,  $\text{CHO}$ ,  $\text{COR}^8$ ,  $\text{CO}_2\text{R}^8$ ,  $\text{CONHR}^8$ ,  $\text{CONR}^8\text{R}^9$ , alkoxy, halo, cyano, nitro, amino, alkyl amino, dialkyl amino, carboxyl wherein  $R^9$  is alkyl, aryl or aralkyl;

$R^5$  is  $\text{H}$ , hydroxy, nitro, amino, halo, cyano,  $\text{CHO}$ ,  $\text{COR}^8$ , or the following groups which may be optionally substituted: alkyl, aryl, aryloxy, aralkyloxy, alkoxy, aralkyl;

$R^6$  is  $\text{H}$ , hydroxy, amino, nitro, halo,  $\text{CHO}$ ,  $\text{COR}^{10}$ ,  $\text{CO}_2\text{R}^{10}$  wherein  $R^{10}$  is optionally substituted alkyl or aryl, or  $R^6$  is alkyl, aralkyl, or aryl wherein alkyl, aralkyl or aryl may be optionally substituted.

5,770,599

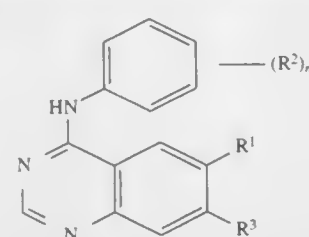
## QUINAZOLINE DERIVATIVES

Kieth Hopkinson Gibson, Macclesfield, United Kingdom, assignor to Zeneca Limited, London, United Kingdom  
 Filed Apr. 26, 1996, Ser. No. 638,331

Claims priority, application United Kingdom, Apr. 27, 1995, 9508538

Int. Cl. <sup>6</sup> A61K 403/02; 403/04; C07D 31/535; 31/54 U.S. Cl. 514—228.2 19 Claims

1. A quinazoline derivative of the formula I



wherein  
 $n$  is 1, 2 or 3 and each  $R^2$  is independently halogeno or trifluoromethyl

$R^3$  is (1-4C)alkoxy; and

$R^1$  is di-[(1-4C)alkyl]amino-(2-4C)alkoxy, pyrrolidin-1-yl-(2-4C)alkoxy, piperidino-(2-4C)alkoxy, morpholino-(2-4C)alkoxy, piperazin-1-yl-(2-4C)alkoxy, 4-(1-4C)alkylpiperazin-1-yl-(2-4C)alkoxy, imidazol-1-yl-(2-4C)alkoxy, di-[(1-4C)alkoxy-(2-4C)alkyl]amino-(2-4C)alkoxy, thiamorpholino-(2-4C)alkoxy, 1-oxothiamorpholino-(2-4C)alkoxy or 1,1-dioxothiamorpholino-(2-4C)alkoxy, and wherein any of the above-mentioned  $R^1$  substituents comprising a  $\text{CH}_2$  (methylene) group which is not attached to a N or O atom optionally bears on said  $\text{CH}_2$  group a hydroxy substituent; or a pharmaceutically-acceptable salt thereof.

5,770,600

## METHIONINE SULFONE AND S-SUBSTITUTED CYSTEINE SULFONE DERIVATIVES AS ENZYME INHIBITORS

Matthew Mark Abelman, Solana Beach; Robert John Ardecky, Encinitas, and Ruth Foelsche Nutt, San Diego, all of Calif., assignors to Corvas International, Inc., San Diego, Calif.

Continuation of Ser. No. 423,584, Apr. 18, 1995, which is a continuation-in-part of Ser. No. 234,811, Apr. 28, 1994, which is a continuation-in-part of Ser. No. 229,298, Apr. 18, 1994.

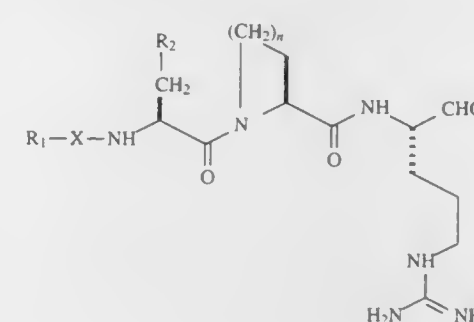
This application Jun. 6, 1995, Ser. No. 473,647

Int. Cl. <sup>6</sup> A61K 31/535; 31/445; C07D 401/12; 413/12

U.S. Cl. 514—237.2

24 Claims

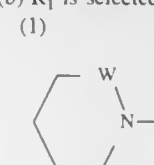
1. A compound of the formula:



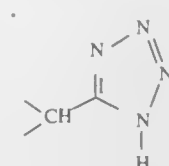
wherein

(a)  $X$  is selected from the group consisting of  $-\text{C}(\text{O})-$ ,  $-\text{O}-\text{C}(\text{O})-$ ,  $-\text{NH}-\text{C}(\text{O})-$ ,  $-\text{S}(\text{O}_2)-$ ,  $-\text{O}-\text{S}(\text{O}_2)-$ ,  $-\text{NH}-\text{S}(\text{O}_2)-$  and  $-\text{N}(\text{R}')-\text{S}(\text{O}_2)-$ , wherein  $R'$  is alkyl of 1 to about 4 carbon atoms, aryl of about 6 to about 14 carbon atoms, or aralkyl of about 6 to about 15 carbon atoms;

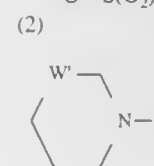
(b)  $R_1$  is selected from the group consisting of:



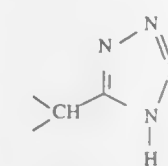
wherein  $W$  is methylene,  $-\text{C}(\text{O})-$ ,  $-\text{CH}(\text{OH})-$ ,  $-\text{CH}(\text{OA}_1)-$ ,  $-\text{CH}(\text{C}(\text{O})-\text{OH})-$ ,  $-\text{CH}(\text{C}(\text{O})-\text{OR}')-$ ,  $-\text{CH}(\text{C}(\text{O})-\text{NHR}')-$ ,  $-\text{CH}(\text{C}(\text{O})-\text{NR}'\text{R}')-$ , or



where  $X$  is not  $-\text{O}-\text{C}(\text{O})-$ ,  $-\text{NH}-\text{C}(\text{O})-$ ,  $-\text{O}-\text{S}(\text{O}_2)-$ ,  $-\text{NH}-\text{S}(\text{O}_2)-$  or  $-\text{N}(\text{R}')-\text{S}(\text{O}_2)-$ .

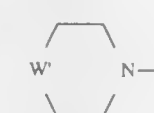


wherein  $W'$  is methylene,  $-\text{C}(\text{O})-$ ,  $-\text{CH}(\text{OH})-$ ,  $-\text{CH}(\text{OA}_1)-$ ,  $-\text{CH}(\text{C}(\text{O})-\text{OH})-$ ,  $-\text{CH}(\text{C}(\text{O})-\text{OR}')-$ ,  $-\text{CH}(\text{C}(\text{O})-\text{NHR}')-$ ,  $-\text{CH}(\text{C}(\text{O})-\text{NR}'\text{R}')-$ , or

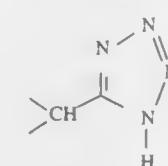


where  $X$  is not  $-\text{O}-\text{C}(\text{O})-$ ,  $-\text{NH}-\text{C}(\text{O})-$ ,  $-\text{O}-\text{S}(\text{O}_2)-$ ,  $-\text{NH}-\text{S}(\text{O}_2)-$  or  $-\text{N}(\text{R}')-\text{S}(\text{O}_2)-$ , and

(3)



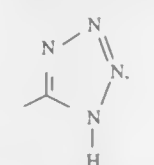
wherein  $W'$  is oxygen, methylene,  $-\text{C}(\text{O})-$ ,  $-\text{CH}(\text{OH})-$ ,  $-\text{CH}(\text{OA}_1)-$ ,  $-\text{CH}(\text{C}(\text{O})-\text{OH})-$ ,  $-\text{CH}(\text{C}(\text{O})-\text{OR}')-$ ,  $-\text{CH}(\text{C}(\text{O})-\text{NHR}')-$ ,  $-\text{CH}(\text{C}(\text{O})-\text{NR}'\text{R}')-$ , or



where  $X$  is not  $-\text{O}-\text{C}(\text{O})-$ ,  $-\text{NH}-\text{C}(\text{O})-$ ,  $-\text{O}-\text{S}(\text{O}_2)-$ ,  $-\text{NH}-\text{S}(\text{O}_2)-$  or  $-\text{N}(\text{R}')-\text{S}(\text{O}_2)-$ .

wherein

$Y_1$ ,  $Y_2$  and  $Y_3$  are independently selected from the group consisting of bromo, chloro, fluoro,  $-\text{Z}_1$ ,  $-\text{OH}$ ,  $-\text{OZ}_1$ ,  $-\text{NH}_2$ ,  $-\text{NHZ}_1$ ,  $-\text{NZ}_1\text{Z}_2$ ,  $-\text{NH}-\text{C}(\text{O})-\text{Z}_1$ ,  $-\text{N}(\text{Z}_1)-\text{C}(\text{O})-\text{Z}_2$ ,  $-\text{NH}-\text{C}(\text{O})-\text{OZ}_1$ ,  $-\text{N}(\text{Z}_1)-\text{C}(\text{O})-\text{OZ}_2$ ,  $-\text{NH}-\text{C}(\text{O})-\text{NH}_2$ ,  $-\text{NH}-\text{C}(\text{O})-\text{NHZ}_1$ ,  $-\text{NH}-\text{C}(\text{O})-\text{NZ}_1\text{Z}_2$ ,  $-\text{N}(\text{Z}_1)-\text{C}(\text{O})-\text{NHZ}_2$ ,  $-\text{N}(\text{Z}_1)-\text{C}(\text{O})-\text{NZ}_2\text{Z}_3$ ,  $-\text{C}(\text{O})-\text{OH}$ ,  $-\text{C}(\text{O})-\text{OZ}_1$ ,  $-\text{C}(\text{O})-\text{NHZ}_1$ ,  $-\text{C}(\text{O})-\text{NZ}_1\text{Z}_2$ ,  $-\text{SH}$ ,  $-\text{SZ}_1$ ,  $-\text{S}(\text{O})-\text{Z}_1$ ,  $-\text{S}(\text{O}_2)-\text{Z}_1$ ,  $-\text{S}(\text{O}_2)-\text{OH}$ ,  $-\text{S}(\text{O}_2)-\text{OZ}_1$ ,  $-\text{S}(\text{O}_2)-\text{NH}_2$ ,  $-\text{S}(\text{O}_2)-\text{NHZ}_1$ ,  $-\text{S}(\text{O}_2)-\text{NZ}_1\text{Z}_2$  and



wherein  $Z_1$ ,  $Z_2$  and  $Z_3$  are independently selected from the group consisting of trifluoromethyl, pentafluoroethyl, alkyl of 1 to about 12 carbon atoms, aryl of about 6 to about 14 carbon atoms, and aralkyl of about 6 to about 15 carbon atoms.

$R''$  is alkyl of 1 to about 4 carbon atoms, aryl of about 6 to about 14 carbon atoms, or aralkyl of about 6 to about 15 carbon atoms.

$A_1$  is aryl of about 6 to about 14 carbon atoms, aryl of about 6 to about 14 carbon atoms which is substituted with  $Y_1$ , aralkyl of about 6 to about 15 carbon atoms, or aralkyl of about 6 to about 15 carbon atoms which is substituted with  $Y_1$ ;

(c)  $R_2$  is selected from the group consisting of

$-\text{CH}_2-\text{S}(\text{O})_n-\text{CH}_3$ ,  
 $-\text{CH}_2-\text{S}(\text{O})_n-(\text{CH}_2)_m-\text{C}(\text{O})-\text{OH}$ ,  
 $-\text{CH}_2-\text{S}(\text{O})_n-(\text{CH}_2)_m-\text{C}(\text{O})-\text{OR}'$ ,  
 $-\text{CH}_2-\text{S}(\text{O})_n-(\text{CH}_2)_m-\text{C}(\text{O})-\text{NH}_2$ ,  
 $-\text{CH}_2-\text{S}(\text{O})_n-(\text{CH}_2)_m-\text{C}(\text{O})-\text{NHR}'$ .

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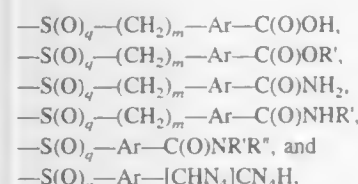
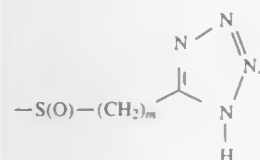
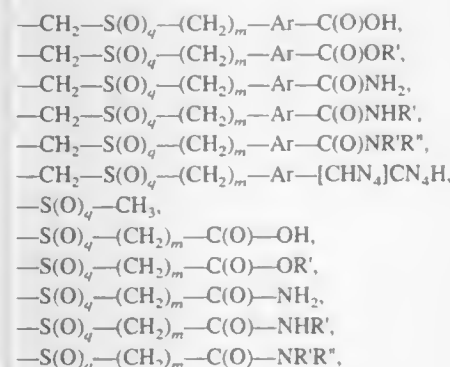
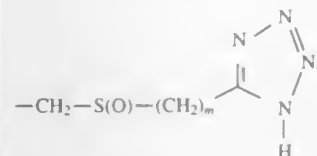
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wherein m is 1, 2, 3, 4, 5 or 6; q is 0, 1 or 2 and Ar is a divalent aryl group of 6 to 14 carbon atoms and

(d) n is 1, 2 or 3; or pharmaceutically acceptable salts thereof.

5,770,601

#### COMPOSITIONS AND METHODS FOR CONTROLLING PEST INSECTS

Heather N. Wren, Hampstead, N.C., assignor to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

Continuation-in-part of Ser. No. 291,072, Aug. 17, 1994, Pat. No. 5,514,681. This application Feb. 6, 1996, Ser. No. 595,899 Int. Cl.<sup>6</sup> A01N 43/42; 43/54; 43/90

U.S. Cl. 514—258

16 Claims

1. A composition for controlling an insect pest which salvages, stores, or excretes its nitrogenous wastes via the purine metabolic pathway, comprising a purine selected from the group consisting of xanthine, hypoxanthine, guanine, uric acid, and mixtures thereof, in an amount of about 0.5% to about 3%, by weight, and a xanthine oxidase inhibitor selected from the group consisting of allopurinol, oxypurinol, mercapto-allopurinol, 4-mercapto,6-hydroxypyrazolo[3,4-d]pyrimidine, 4,6-dimercaptopyrazolo[3,4-d]pyrimidine, 4-amino-6-hydroxypyrazolo[3,4-d]pyrimidine, and mixtures thereof, in an amount of about 0.5% to about 5%, by weight.

5,770,602

#### QUINOLINE OR QUINAZOLINE DERIVATIVES, THEIR PRODUCTION AND USE

Takashi Sohma, Takatsuki; Haruhiko Makino, Inagawa-cho, and Atsuo Baba, Ashiya, all of Japan, assignors to Takeda Chemical Industries, Osaka, Japan

Division of Ser. No. 186,638, Jan. 26, 1994, Pat. No. 5,436,247. This application May 8, 1995, Ser. No. 436,629

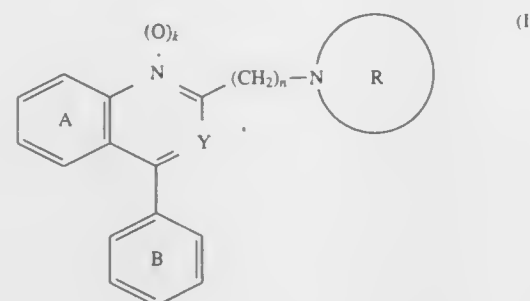
Claims priority, application Japan, Jan. 28, 1993, 5-012628; Aug. 20, 1993, 5-206128

Int. Cl.<sup>6</sup> A61K 31/47; 31/505; C07D 239/72; 215/58

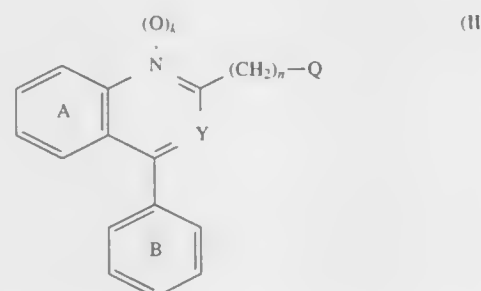
U.S. Cl. 514—259

5 Claims

1. A method of producing a compound represented by the general formula:



wherein Y represents a nitrogen atom or C—G wherein G represents a carboxyl group which may be esterified; rings A and B may have a substituent; ring R represents a nitrogen-containing unsaturated heterocyclic group which may be substituted or unsubstituted; n represents an integer from 1 to 4; and k represents the integer 0 or 1, or a salt thereof; by reacting a compound represented by the general formula:



wherein Q represents a leaving group; the other symbols have the same definitions as defined in the formula (I), with a compound represented by the general formula:



wherein ring R has the same definition as defined in the formula (I).

5,770,603

#### QUINAZOLINE DERIVATIVES

Keith Hopkinson Gibson, Macclesfield, United Kingdom, assignor to Zeneca Limited, London, United Kingdom

Filed Apr. 10, 1997, Ser. No. 871,989

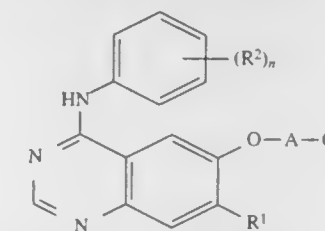
Claims priority, application United Kingdom, Apr. 13, 1996, 9607729

Int. Cl.<sup>6</sup> A61K 31/495; 31/50; C07D 403/02; 403/14

U.S. Cl. 514—259

10 Claims

1. A quinazoline derivative of the formula I



wherein n is 1, 2 or 3 and each R<sup>2</sup> is independently halogeno, trifluoromethyl or (1-4C)alkyl;

R<sup>1</sup> is (1-4C)alkoxy;

A is (1-4C)alkylene; and

Q is a saturated, monocyclic 4-, 5-, 6- or 7-membered heterocyclic ring consisting of carbon atoms and one or two oxygen heteroatoms, which ring optionally bears up to four (1-4C)alkyl substituents; or a pharmaceutically-acceptable salt thereof.

5,770,604

#### ACONITINE COMPOUND AND AN ANTIPYRETIC/ANALGESIC/ANTI-INFLAMMATORY AGENT

Mitsuo Murayama, Tochigi-ken, Japan, assignor to Sanwa Shoyaku Kabushiki Kaisha, Utsunomiya, Japan

PCT No. PCT/JP95/00180, § 371 Date Oct. 6, 1995, § 102(e) Date Oct. 6, 1995, PCT Pub. No. WO95/21827, PCT Pub. Date Aug. 17, 1995

PCT Filed Feb. 9, 1995, Ser. No. 530,189

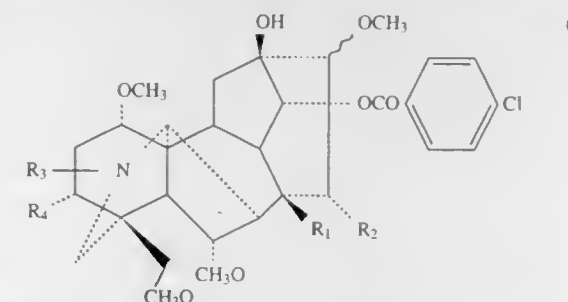
Claims priority, application Japan, Feb. 9, 1994, 6-047646

Int. Cl.<sup>6</sup> A61K 31/435; C07D 221/22

U.S. Cl. 514—279

20 Claims

1. A compound of the general formula (I) possessing an aconitine structure, or a salt thereof



wherein,

R<sub>1</sub> is a hydrogen atom or hydroxyl group;

R<sub>2</sub> is an acetyloxy group;

R<sub>3</sub> is an alkyl having 1-4 carbon atoms; and

R<sub>4</sub> is a hydrogen atom, a hydroxyl group, or an acetyloxy group.

2. An antipyretic or analgesic or anti-inflammatory composition comprising a compound of the general formula (I), or a salt thereof as claimed in claim 1 as an active ingredient and at least one excipient.

5,770,605

#### METHOD FOR TREATING LEUKEMIA WITH A HEXA-CYCLIC COMPOUND

Hirofumi Terasawa, Sagami-hara; Akio Ejima, Tokyo; Satoru Ohsuki, Ichihara, and Kouichi Uoto, Tokyo, all of Japan, assignors to Daiichi Pharmaceutical Co., Ltd., and Kabushiki Kaisha Yakult Honsha, both of Tokyo, Japan

Continuation of Ser. No. 455,706, May 31, 1995, Pat. No.

5,658,920, which is a continuation of Ser. No. 274,143, Jul. 14, 1994, abandoned, which is a continuation-in-part of Ser. No. 820,232, Jan. 14, 1992, abandoned. This application

Mar. 3, 1997, Ser. No. 811,239

Claims priority, application Japan, Jan. 16, 1991, 3-015812

Int. Cl.<sup>6</sup> A61K 31/47

U.S. Cl. 514—279

1 Claim

1. A method of treating leukemia in a subject in need of treatment which comprises administering to said subject an effective amount of a hexa-cyclic compound:

(9S)-1-Amino-9-ethyl-5-fluoro-2,3-dihydro-9-hydroxy-

4-methyl-1H,12H-benzo-[de]pyrano[3',4':6,7]indolizino[1,2-

b]quinoline-10,13(9H,15H)-dione hydrochloride or

(9S)-1-Amino-9-ethyl-5-fluoro-2,3-dihydro-9-hydroxy-

4-methyl-1H,12H-benzo-[de]pyrano[3',4':6,7]indolizino[1,2-

b]quinoline-10,13(9H,15H)-dione methanesulfonate.

5,770,606

#### DOSAGE FORMS AND METHOD FOR AMELIORATING MALE ERECTILE DYSFUNCTION

Ragab El-Rashidy, Deerfield, Ill.; Jeremy P. W. Heatton, Gananoque, Canada; Alvaro Morales, and Michael A. Adams, both of Kingston, Canada, assignors to Pentech Pharmaceuticals, Inc., Wheeling, Ill., and Queen's University at Kingston, Ontario, Canada

Continuation-in-part of Ser. No. 231,250, Apr. 22, 1994, abandoned. This application Oct. 20, 1995, Ser. No. 546,498

Int. Cl.<sup>6</sup> A61K 31/44

U.S. Cl. 514—284

21 Claims

1. A method of ameliorating erectile dysfunction in a psychogenic male patient which comprises administering to said patient apomorphine or a pharmaceutically acceptable acid addition salt thereof sublingually prior to sexual activity, and in an amount sufficient to induce an erection adequate for vaginal penetration but less than the amount that induces nausea.

5,770,607

#### AQUEOUS LIQUID COMPOSITION FOR EXTERNAL USE

Toshiyasu Honbo, Kobe; Sachiyo Tanimoto, Kadoma, both of Japan; Hiromitsu Yoshida, Leiden, Netherlands; Takehisa Hata, Nagaokakyo, Japan; Sotao Asakura, Kyoto, Japan; Yasuto Koyama, Itami, Japan, and Youhei Kiyota, Ikeda, Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 853,020, Mar. 18, 1992, abandoned, which is a continuation of Ser. No. 546,883, Jul. 2, 1990, abandoned. This application Jul. 18, 1994, Ser. No. 276,495

Claims priority, application Japan, Jul. 5, 1989, 1-176637

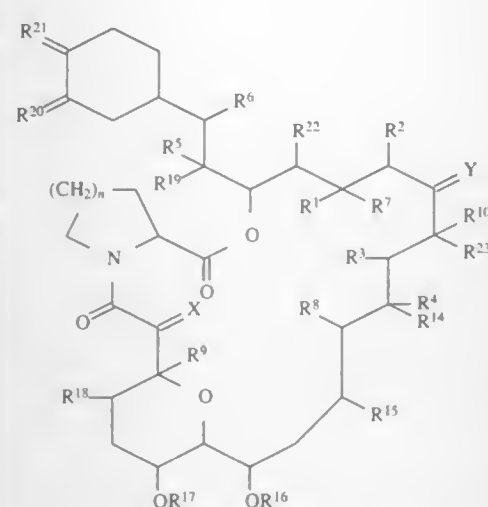
Int. Cl.<sup>6</sup> A61K 31/44; 31/515

U.S. Cl. 514—302

5 Claims

1. An aqueous liquid eye drop suspension composition comprising a tricyclo compound of the formula:





wherein each vicinal pair of substituents [R<sup>1</sup> and R<sup>2</sup>], [R<sup>3</sup> and R<sup>4</sup>], [R<sup>5</sup> and R<sup>6</sup>] independently

- represent two vicinal hydrogen atoms, or
  - form a second bond between the vicinal carbon atoms to which they are attached; in addition to its significance above, R<sup>2</sup> may represent an alkyl group;
- R<sup>7</sup> represents H, OH, protected hydroxy or O-alkyl, or in conjunction with R<sup>1</sup> it may represent =O;  
 R<sup>8</sup> and R<sup>9</sup> independently represent H or OH;  
 R<sup>10</sup> represents H, alkyl, alkyl substituted by one or more hydroxyl groups, alkenyl, alkenyl substituted by one or more hydroxyl groups, or alkyl substituted by =O;  
 X represents O, (H.OH), (H.H) or —CH<sub>2</sub>—;  
 Y represents O, (H, OH), (H.H.), N—NR<sup>11</sup>R<sup>12</sup> or N—OR<sup>13</sup>;  
 R<sup>11</sup> and R<sup>12</sup> independently represent H, alkyl, aryl or tosyl;  
 R<sup>13</sup>, R<sup>14</sup>, R<sup>15</sup>, R<sup>16</sup>, R<sup>17</sup>, R<sup>18</sup>, R<sup>19</sup>, R<sup>22</sup> and R<sup>23</sup> independently represent H or alkyl;  
 R<sup>20</sup> and R<sup>21</sup> independently represent O, or they may independently represent (R<sup>20a</sup>,H) and (R<sup>21a</sup>,H) respectively; R<sup>20a</sup> and R<sup>21a</sup> independently represent OH, O-alkyl or OCH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>OCH<sub>3</sub>, or R<sup>21a</sup> is protected hydroxy;  
 in additional, R<sup>20a</sup> and R<sup>21a</sup> may together represent an oxygen atom in an epoxide ring;  
 n is 1, 2 or 3;

or a pharmaceutically acceptable salt thereof; polyvinyl alcohol; and a balance water, wherein said compound and polyvinyl alcohol are present in a ratio of 1:0.01 to 1:100 by weight.

5,770,608

## HETEROCYCLIC DERIVATIVES

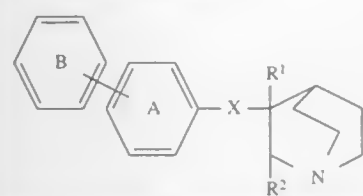
George Robert Brown; Keith Blakeney Mallion, both of Cheshire, England, and Peter John Harrison, deceased, late of Cheshire, England, by Alison Harrison, executor, assignors to Imperial Chemical Industries PLC, London, United Kingdom

Continuation of Ser. No. 256,123, Jun. 23, 1994, Pat. No. 5,654,315. This application Feb. 24, 1997, Ser. No. 805,231  
 Claims priority, application United Kingdom, Dec. 23, 1991, 9127279

Int. Cl.<sup>6</sup> A01N 43/90; C07D 453/02

U.S. Cl. 514—305

1. A compound of formula I



or a pharmaceutically acceptable salt thereof, wherein

- R<sup>1</sup> is hydroxy  
 R<sup>2</sup> is hydrogen;  
 X is selected from —CH<sub>2</sub>CH<sub>2</sub>— and —OCH<sub>2</sub>—;  
 wherein one or both of ring A and ring B may be optionally unsubstituted or independently substituted by one or more substituents selected from halogen, hydroxy, amino, nitro, cyano, carboxy, carbamoyl, (1-6C)alkyl, (2-6C)alkenyl, (1-6C)alkoxy, (1-6C)alkylamino, di-[(1-6C)alkyl]amino, N-[(1-6C)alkyl]carbamoyl, N,N-di-[(1-6C)alkyl]carbamoyl, (1-6C)alkoxycarbonyl, (1-6C)alkylthio, (1-6C)alkylsulphanyl, (1-6C)alkylsulphonyl and halogen- (1-6C).

5,770,609

## PREVENTION AND TREATMENT OF CARDIOVASCULAR PATHOLOGIES

David J. Grainger; James C. Metcalfe, both of Cambridge, England; Lawrence L. Kunz, Redmond, Wash.; Robert W. Schroff, Edmonds, Wash., and Peter L. Weissberg, Cambridge, England, assignors to NeoRx Corporation, Seattle, Wash.

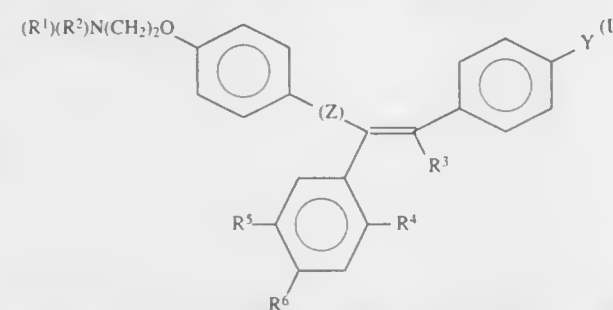
Continuation-in-part of Ser. No. 242,161, May 12, 1994, which is a continuation-in-part of Ser. No. 61,714, May 13, 1993, abandoned, and a continuation-in-part of Ser. No. 241,844, May 12, 1994, which is a continuation-in-part of Ser. No. 62,451, May 13, 1993, abandoned, which is a continuation-in-part of Ser. No. 11,669, Jan. 28, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 486,334

Int. Cl.<sup>6</sup> A61K 31/445; 31/40; 31/38; 31/135

U.S. Cl. 514—319

56 Claims

1. A therapeutic method comprising inhibiting smooth muscle cell (SMC) proliferation associated with procedural vascular trauma comprising the systemic administration to a mammal subjected to said procedure, an effective cytostatic SMC proliferative inhibitory amount of a compound of formula (I):



wherein Z is C=O or a covalent bond; Y is H or O(C<sub>1</sub>—C<sub>4</sub>)alkyl, R<sup>1</sup> and R<sup>2</sup> are individually (C<sub>1</sub>—C<sub>4</sub>)alkyl or together with N are a saturated heterocyclic group, R<sup>3</sup> is ethyl or chloroethyl, R<sup>4</sup> is H, R<sup>5</sup> is I, O(C<sub>1</sub>—C<sub>4</sub>)alkyl or H and R<sup>6</sup> is I, O(C<sub>1</sub>—C<sub>4</sub>)alkyl or H; or a pharmaceutically acceptable salt thereof.

5,770,610

## MELATONIN AGONISTS FOR USE IN THE TREATMENT OF BENIGN PROSTATIC HYPERPLASIA (BPH)

David Oakley Clarke, Indianapolis; William Henry Jordan, Greenfield, and Lisa Ann Shipley, Fishers, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jun. 11, 1996, Ser. No. 661,535

Int. Cl.<sup>6</sup> A61K 31/405

U.S. Cl. 514—415

2 Claims

1. A method for the treatment of benign prostatic hyperplasia in mammals comprising administration to a mammal in need of such treatment an effective dose of R-(+)-N-[2-methyl-2-(5-methoxy-6-chloroindol-3-yl)ethyl] acetamide.

5,770,611

INDOLE DERIVATIVES AS 5HT<sub>1</sub>-LIKE AGONISTS

Alan Daniel Brown, Sandwich, United Kingdom, assignor to Pfizer Inc., New York, N.Y.

PCT No. PCT/EP95/03884, § 371 Date Apr. 3, 1997, § 102(e) Date Apr. 3, 1997, PCT Pub. No. WO96/11195, PCT Pub. Date Apr. 18, 1996

PCT Filed Sep. 29, 1995, Ser. No. 809,600

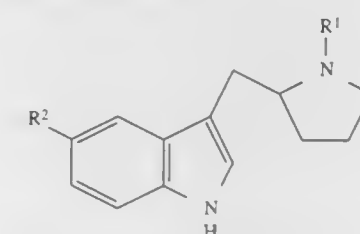
Claims priority, application United Kingdom, Oct. 11, 1994, 9420503

Int. Cl.<sup>6</sup> C07D 403/14; 405/14; A61K 31/40; 31/445

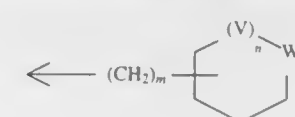
U.S. Cl. 514—323

9 Claims

1. A compound of formula (I):



or a pharmaceutically acceptable salt thereof, or a pharmaceutically acceptable solvate of either entity, wherein R<sup>1</sup> is

R<sup>2</sup> is R<sup>3</sup>R<sup>4</sup>C(OH)A;V is C=O or CH<sub>2</sub>;W is O or NR<sup>5</sup>;

R<sup>3</sup> and R<sup>4</sup> are each independently selected from H and C<sub>1</sub>—C<sub>4</sub> alkyl; or, together with the carbon atom to which they are attached, form a 4- or 5-membered carbocyclic ring;

R<sup>5</sup> is H, benzyl, C<sub>1</sub>—C<sub>3</sub> alkanoyl or SO<sub>2</sub>(C<sub>1</sub>—C<sub>4</sub>)alkyl;A is C<sub>2</sub>—C<sub>3</sub> alkylene;

m is 0 or 1;

and

n is 0 or 1;

with the provisos that when n is 1 and V is C=O then W is NH, and when n is 1 and V is CH<sub>2</sub> then W is O.

5,770,612

## METHODS OF TREATING MENSTRUAL SYMPTOMS AND COMPOSITIONS THERE FOR

Steven A. Fontana, Martinsville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 171,392, Dec. 21, 1993, Pat. No.

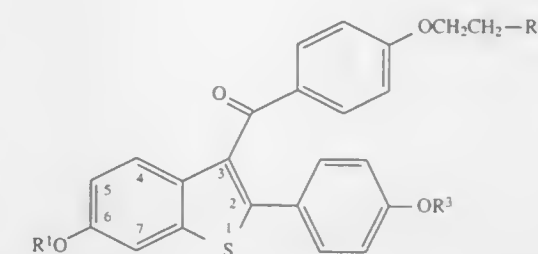
5,462,950. This application May 16, 1995, Ser. No. 442,048

Int. Cl.<sup>6</sup> A61K 31/445; 31/40; 31/38

U.S. Cl. 514—324

12 Claims

1. A method for alleviating one or more psychologic menstrual symptoms selected from the group consisting of poorer work or school performance, increased napping and time in bed, increased time at home, avoiding social activities, decreased efficiency, insomnia, forgetfulness, confusion, poorer judgment, difficulty concentrating, distractibility, increased accidents, poorer motor coordination, crying, loneliness, anxiety, restlessness, irritability, mood swings, depression, and tension in a woman comprising administering to said woman in need thereof an effective amount of a compound of formula I



wherein R<sup>1</sup> and R<sup>3</sup> are independently hydrogen, —CH<sub>3</sub>, —CO—(C<sub>1</sub>—C<sub>6</sub> alkyl), or —CO—Ar in which Ar is optionally substituted phenyl; and  
 R<sup>2</sup> is selected from the group consisting of pyrrolidino, hexamethyleneimino and piperidino; or a pharmaceutically acceptable salt or solvate thereof.

5,770,613

## TELOMERASE INHIBITORS

Federico C. A. Gaeta, Foster City, and Elaine C. Stracker, Vacaville, both of Calif., assignors to Geron Corporation, Menlo Park, Calif.

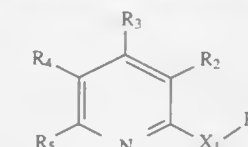
Filed Sep. 29, 1995, Ser. No. 535,988

Int. Cl.<sup>6</sup> A61K 31/44; C07D 213/64; 213/643

U.S. Cl. 514—332

45 Claims

1. A telomerase inhibiting compound having the structure:



and the pharmaceutically acceptable salts thereof, wherein:

X<sub>1</sub> is selected from the group consisting of oxygen, sulfur, sulfone, sulfinyl;

R<sub>1</sub> is —Y<sub>n</sub>R<sub>6</sub>, where n is an integer between 0 and 10 and each Y<sub>n</sub> for n greater than 0 independently is methylene, methine, or quaternary carbon, and R<sub>6</sub>, for any value of n, is alkyl, aryl, heterocycle, heteroaryl, aralkyl, heteroaralkyl, alkylcarbonyl, arylcarbonyl, heteroalkylcarbonyl, heteroaralkylcarbonyl, aralkylcarbonyl, aminocarbonyl, alkylaminocarbonyl, arylaminocarbonyl, dialkylaminocarbonyl, diarylaminocarbonyl, arylalkylaminocarbonyl, carbonyl, alkoxy, alkoxyalkyl, aryloxy, aryloxyalkyl, alkoxyalkyl, aldehyde, sulfo, alkylsulfonyl, arylsulfonyl, alkylsulfinyl, arylsulfinyl, or a linker L selected from the group consisting of alkyl, aryl, aralkyl, heterocycle, and heterocyclealkyl to which linker between 1 and 3 additional compounds having the structure shown above are attached;

R<sub>2</sub> is hydrogen, alkyl, aryl, hydroxyl, alkoxy, aryloxy, halogen, cyano, amino, alkylamino, arylamino, dialkylamino, diarylamino, arylalkylamino, aminocarbonyl, alkylaminocarbonyl, arylaminocarbonyl, dialkylaminocarbonyl, diarylaminocarbonyl, arylalkylaminocarbonyl, carbonyl, alkoxy, alkoxyalkyl, aryloxy, aryloxyalkyl, alkoxyalkyl, aldehyde, sulfo, alkylsulfonyl, arylsulfonyl, alkylsulfinyl, or arylsulfonyl;

R<sub>3</sub> and R<sub>4</sub> are selected independently from the group consisting of hydrogen, halogen, hydroxyl, aryloxy, alkoxy, lower alkyl, aryl, heteroaryl, aralkyl, cyano, carboxyl, alkoxy, alkoxyalkyl, aryloxy, aryloxyalkyl, heteroaralkyl, nitro, amino, alkylamino, arylamino, dialkylamino, diarylamino, and arylalkylamino; and

R<sub>5</sub> is selected from the group consisting of bis(alkoxy)methyl, bis(alkylthio)methyl, and —HC=X<sub>2</sub>, where X<sub>2</sub> is oxygen or sulfur;

provided that R<sub>3</sub> is not hydrogen, hydroxyl, alkoxy, alkoxyalkyl, or alkoxy when

X<sub>1</sub> is oxygen or sulfur;

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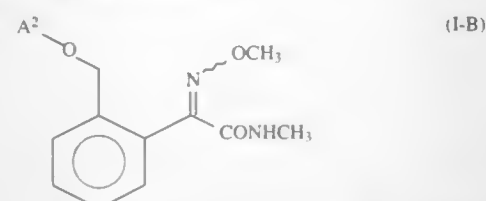
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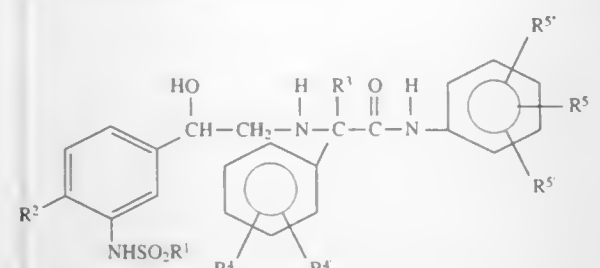
n is 0;  
R<sub>4</sub> is hydrogen, methyl, or nitro;  
R<sub>2</sub> is hydrogen, alkyl, alkoxy, or halogen; and  
R<sub>1</sub> is alkyl or aryl.

- 5,770,614  
2-(SUBSTITUTED PHENYL)-2-ALKOXYIMINO-N-  
ALKYLACETAMIDE COMPOUNDS AND FUNGICIDES  
CONTAINING THE SAME  
Akira Murabayashi, Ibaraki; Akira Takase, Otsu; Hideyuki  
Takenaka, Nabari, and Michio Masuko, Shiga, all of Japan,  
assignors to Shionogi & Co., Ltd., Osaka, Japan  
PCT No. PCT/JP95/00902, § 371 Date Nov. 12, 1996, § 102(e)  
Date Nov. 12, 1996, PCT Pub. No. WO95/32182, PCT Pub.  
Date Nov. 30, 1995  
PCT Filed May 11, 1995, Ser. No. 737,320  
Claims priority, application Japan, May 20, 1994, 6-106599;  
Jun. 8, 1994, 6-126511; Jul. 20, 1994, 6-167723  
Int. Cl.<sup>6</sup> A01N 43/40; C07D 213/64; 213/69; C07C 251/40  
U.S. Cl. 514—348 8 Claims  
1. A compound of the formula (I-B):



wherein A<sup>2</sup> is 3-chloro-2-pyridyl, 5-chloro-2-pyridyl, 3-trifluoromethyl-2-pyridyl, 4-trifluoromethyl-2-pyridyl, 6-trifluoromethyl-2-pyridyl, 6-methoxy-2-pyridyl, 6-isopropoxy-2-pyridyl, 6-methylthio-2-pyridyl, 5-chloro-3-trifluoromethyl-2-pyridyl, 6-methoxy-3-trifluoromethyl-2-pyridyl, 6-isopropoxy-3-trifluoromethyl-2-pyridyl, 6-chloro-4-trifluoromethyl-2-pyridyl, 3,5,6-trichloro-4-trifluoromethyl-2-pyridyl, 6-chloro-3,5-di(trifluoromethyl)-2-pyridyl, 6-methoxy-5-trifluoromethyl-2-pyridyl, 6-isopropoxy-5-trifluoromethyl-2-pyridyl, 6-methylamino-5-trifluoromethyl-2-pyridyl, or 3,6-dichloro-5-trifluoromethyl-2-pyridyl, and ~ indicates a configuration of an E- or Z-isomer or a mixture thereof, or a salt thereof.

- 5,770,615  
CATECHOLAMINE SURROGATES USEFUL AS β<sub>3</sub>  
AGONISTS  
Peter T. W. Cheng, Lawrenceville; Gregory S. Bisacchi, Ringoes; Ashvinikumar V. Gava, Plainsboro; Kathleen M. Poss, Lawrenceville; Denis E. Ryono, Princeton; Philip M. Sher, Plainsboro; Chong-qing Sun, East Windsor, and William N. Washburn, Titusville, all of N.J., assignors to Bristol-Myers Squibb Company, Princeton, N.J.  
Filed Mar. 28, 1997, Ser. No. 825,309  
Int. Cl.<sup>6</sup> A61K 31/425; 31/165; C07D 277/28; C07C 321/00  
U.S. Cl. 514—365 23 Claims  
1. A compound of the formula

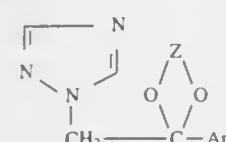


or pharmaceutically acceptable salts thereof wherein:  
R<sup>1</sup> is lower alkyl, aryl or arylalkyl;

R<sup>2</sup> is hydrogen, hydroxyl, hydroxymethyl or halogen;  
R<sup>3</sup> is hydrogen or alkyl;  
R<sup>4</sup> and R<sup>5</sup> are independently hydrogen, alkoxy, alkoxyethyl, hydroxyl, —CN, —CON(R<sup>6</sup>)R<sup>6</sup>, —CO<sub>2</sub>R<sup>6</sup>, —N(R<sup>6</sup>)R<sup>6</sup>, —NR<sup>6</sup>COR<sup>6</sup>, —NR<sup>6</sup>SO<sub>2</sub>R<sup>6</sup>; or R<sup>4</sup> and R<sup>5</sup> may together with the carbon atoms to which they are bonded form a heterocycle;  
R<sup>5</sup>, R<sup>6</sup> and R<sup>7</sup> are independently A or B, wherein A is hydrogen, alkyl, cycloalkyl, halogen, hydroxyl, aryl, alkoxy, cyano, —SR<sup>7</sup>, —SOR<sup>7</sup>, —SO<sub>2</sub>R<sup>7</sup>, —N(R<sup>6</sup>)R<sup>6</sup>, —NR<sup>6</sup>COR<sup>6</sup>, —OCH<sub>2</sub>CON(R<sup>6</sup>)R<sup>6</sup>, —OCH<sub>2</sub>CO<sub>2</sub>R<sup>6</sup>, CON(R<sup>6</sup>)R<sup>6</sup>, —CO<sub>2</sub>R<sup>6</sup>; and B is —(CH<sub>2</sub>)<sub>m</sub>PO(OR<sup>6</sup>)OR<sup>6</sup>, —O-aryl, —OCH<sub>2</sub>CH<sub>2</sub>N(R<sup>6</sup>)R<sup>6</sup>, —COR<sup>7</sup>, —SO<sub>2</sub>N(R<sup>6</sup>)R<sup>6</sup>, —NR<sup>6</sup>CO<sub>2</sub>R<sup>7</sup>, —NR<sup>6</sup>CO(N(R<sup>6</sup>)R<sup>6</sup>), heterocycle or —R<sup>5</sup> and R<sup>5</sup> may together with the carbon atoms to which they are bonded form a heterocycle; provided that at least one of R<sup>5</sup>, R<sup>6</sup> and R<sup>7</sup> is B;  
R<sup>6</sup> and R<sup>7</sup> are independently hydrogen or lower alkyl;  
R<sup>7</sup> is lower alkyl;  
R<sup>8</sup> is hydrogen, lower alkyl, aryl or arylalkyl;  
m is an integer of 0 to 6.

- 5,770,616  
PHARMACEUTICAL COMPOSITION FOR INHIBITING  
THE GROWTH OF CANCERS  
James Berger Camden, West Chester, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio  
Filed Jun. 7, 1995, Ser. No. 473,819  
Int. Cl.<sup>6</sup> A61K 31/425

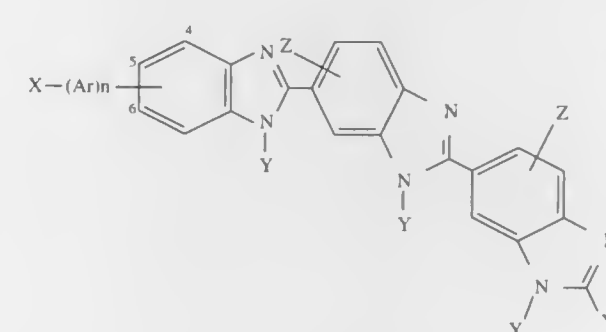
U.S. Cl. 514—383 16 Claims  
1. A pharmaceutical composition for treating cancers and viruses comprising from about 150 mg to about 400 mg of a 1H-1,2,4-triazole of the formula:



wherein Z is an alkylene selected from the group consisting of CH<sub>2</sub>—CH<sub>2</sub>—, —CH<sub>2</sub>—CH<sub>2</sub>—CH<sub>2</sub>—, —CH(CH<sub>3</sub>)—CH(CH<sub>3</sub>)— and —CH<sub>2</sub>—CH(alkyl) wherein said alkyl has from 1 to about 10 carbon atoms; and Ar is a member selected from the group consisting of phenyl, substituted phenyl, thienyl, halothieryl, naphthyl and fluorenyl or pharmaceutically acceptable acid addition salts thereof and a pharmaceutical carrier.

- 5,770,617  
TERBENZIMIDAZOLES USEFUL AS ANTIFUNGAL  
AGENTS  
Edmond J. LaVoie, Princeton Junction; Leroy Fong Liu, Bridgewater, both of N.J., and Qun Sun, Zhejiang, China, assignors to Rutgers, The State University of New Jersey, New Brunswick, N.J.  
Continuation-in-part of Ser. No. 618,988, Mar. 20, 1996. This application Jan. 21, 1997, Ser. No. 786,629  
Int. Cl.<sup>6</sup> A61K 31/415

U.S. Cl. 514—394 24 Claims  
1. A therapeutic method to treat fungal infection comprising administering to a mammal afflicted with a fungal infection, an effective antifungal amount of a compound of the formula:



wherein Ar is (C<sub>6</sub>—C<sub>12</sub>)aryl, (5- to 12-membered)heteroaryl comprising 1-3 N, S or non-peroxide O, wherein N is unsubstituted or is substituted with H, (C<sub>1</sub>—C<sub>4</sub>)alkyl or benzyl; X is H, CN, CHO, OH, acetyl, CF<sub>3</sub>, O(C<sub>1</sub>—C<sub>4</sub>)alkyl, NO<sub>2</sub>, NH<sub>2</sub>, halogen or halo-(C<sub>1</sub>—C<sub>4</sub>)alkyl; each of Y is H, (C<sub>1</sub>—C<sub>4</sub>)alkyl or aralkyl; Y' is H, (C<sub>1</sub>—C<sub>4</sub>)alkyl, phenyl or methoxyphenyl; each Z is individually H, (C<sub>1</sub>—C<sub>4</sub>)alkyl, halogen or halo(C<sub>1</sub>—C<sub>4</sub>)alkyl; and n is 0-1; or a pharmaceutically acceptable salt thereof.

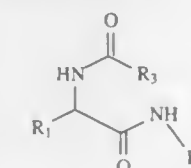
- 5,770,618  
METHOD FOR INCREASING THE SOLUBILITY OF  
CLEMASTINE AND PHARMACEUTICAL  
COMPOSITIONS PREPARED THEREFROM  
Charanjit R. Behl, Hauppauge; Jorge C. deMeireles, Syosset; Vincent D. Romeo, Massapequa Park; Anthony P. Sileno, Brookhaven Hamlet; Harish K. Pimplaskar, Lindenhurst, and Wei J. Xia, Melville, all of N.Y., assignors to Natestech Pharmaceutical Company, Inc., Hauppauge, N.Y.  
Filed Nov. 13, 1996, Ser. No. 748,356  
Int. Cl.<sup>6</sup> A61K 31/40

U.S. Cl. 514—408 66 Claims  
1. A pharmaceutical composition for administering clemastine or its pharmaceutically acceptable salt to a mammal, which comprises a pharmaceutically acceptable solvent having dissolved therein a therapeutically effective amount of said clemastine and a solubilizing effective amount of an organic acid or its salt, wherein said solubilizing effective amount provides the solution with a concentration of at least about 0.1M of said organic acid or said salt.

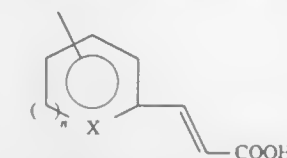
- 5,770,619  
METHOD OF ACTIVATING PHOTOSENSITIVE AGENTS  
Anna M. Richter, Elizabeth Waterfield, and Julia G. Levy, all of Vancouver, Canada, assignors to University of British Columbia, Vancouver, Canada  
Continuation of Ser. No. 391,414, Feb. 16, 1995, which is a continuation of Ser. No. 979,546, Nov. 20, 1992, abandoned.  
This application Nov. 1, 1995, Ser. No. 551,471  
Int. Cl.<sup>6</sup> A61K 31/41

U.S. Cl. 514—410 13 Claims  
1. A method to destroy or impair an area of neovascularization in an animal, which animal comprises both an area of neovascularization and normal tissue, which method comprises:  
(a) administering to said animal an effective amount of a photosensitizing agent;  
(b) administering to said area of neovascularization an effective amount of light of a wavelength that matches an excitation wavelength of said photosensitizing agent,  
wherein said light is administered to said area of neovascularization before said photosensitizing agent has permeated said normal tissue.

- 5,770,620  
ARYL ACRYLIC ACID DERIVATIVES USEFUL AS  
PROTEIN TYROSINE PHOSPHATASE INHIBITORS  
Adnan M. M. Mjalli, Vista; Xiaodong Cao, Carlsbad, and Edmund J. Moran, Cardiff, all of Calif., assignors to Ontogen Corporation, Carlsbad, Calif.  
Filed Oct. 16, 1995, Ser. No. 543,630  
Int. Cl.<sup>6</sup> A61K 31/405; C07D 209/18  
U.S. Cl. 514—415 27 Claims  
1. A protein tyrosine phosphatase activity modulating compound having the formula (I):

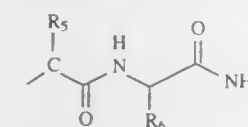


(a) wherein at least one of R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> has the formula (IR):  
(IR)



wherein n=0 or 1, X is selected from the group consisting of N and CH when n=1, and X is selected from the group consisting of O and S when n=0; and  
(b) wherein the remaining of R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> are independently selected from the group consisting of  
(i) hydrogen, C<sub>1-11</sub> alkyl,  
(ii) substituted C<sub>1-11</sub> alkyl, wherein the substituent is selected from the group consisting of hydroxy, halo, mercapto, amino, carboxy, carbamoyl, guanidino, aryl, hydroxyphenyl, C<sub>1-6</sub> alkoxy, C<sub>1-6</sub> alkylthio, C<sub>1-6</sub> alkylamino, phenyl C<sub>1-6</sub> alkoxy, phenyl C<sub>1-6</sub> alkylthio and phenyl C<sub>1-6</sub> alkylamino;  
(iii) aryl,  
(iv) C<sub>1-11</sub> alkyl aryl;  
(v) mono-, di- and tri-substituted aryl, wherein the substituents are independently selected from C<sub>1-6</sub> alkyl, trifluoromethyl, hydroxy, halo, C<sub>1-6</sub> alkoxy, C<sub>1-6</sub> alkylthio, amino, C<sub>1-6</sub> alkylamino, amino C<sub>1-6</sub> alkyl, C<sub>1-6</sub> alkylcarbonyl, C<sub>1-6</sub> alkylcarbonylamino, C<sub>1-6</sub> alkylaminocarbonyl, carboxy, and carboxy C<sub>1-6</sub> alkyl; and  
(vi) CH<sub>2</sub>COX'R<sub>4</sub>, wherein X' is oxygen or NH and R<sub>4</sub> is independently selected from hydrogen, C<sub>1</sub>—C<sub>11</sub> alkyl, aryl, and C<sub>1</sub>—C<sub>11</sub> alkyl aryl;

wherein the aryl of (ii), (iii), (iv), (v), and (vi) are independently selected from the group consisting of phenyl, naphthyl, pyridyl, furyl, pyrrol, thienyl, isothiazolyl, imidazolyl, benzimidazolyl, tetrazolyl, pyrazinyl, pyrimidyl, quinolyl, isoquinolyl, benzofuryl, benzothienyl, pyrazolyl, indolyl, benzodioxolyl, piperonyl, isindolyl, purinyl, carbazolyl, isoxazolyl, thiazolyl, oxazolyl, benzthiazolyl, and benzoxazolyl; and  
(c) wherein when R<sub>3</sub> of Formula (I) has the formula (IR), R<sub>2</sub> may further be of the formula (B):



wherein R<sub>5</sub> and R<sub>6</sub> are independently selected from the group consisting of (b) (i) and (b) (ii);  
or a pharmaceutically acceptable salt, ester, or solvate of said compound.



5,770,621

## CONTROL OF SEA LICE IN FISH

Julian Charles Braidwood, Cumbria, and Jayne Laura Hart, Helensburgh, both of United Kingdom, assignors to Gramplan Pharmaceuticals Limited, Leyland, United Kingdom  
PCT No. PCT/GB95/02153, § 371 Date Mar. 11, 1997, § 102(e)  
Date Mar. 11, 1997, PCT Pub. No. WO96/08138, PCT Pub. Date Mar. 21, 1996

PCT Filed Sep. 8, 1995, Ser. No. 809,278

Claims priority, application United Kingdom, Sep. 12, 1994, 9418328

Int. Cl.<sup>6</sup> A61K 31/275

U.S. Cl. 514—521

12 Claims

1. A method for the treatment of the chalimus and copepodid phases of sea lice infestation of fish said method comprising administering to fish in need of said treatment a pyrethroid compound in an amount effective to reduce the number of said chalimus and copepodid phases of sea lice on the treated fish.

5,770,622

## METHOD OF PRESERVING MATERIALS USING 4-METHYLENE-2-AMINO-CYCLOPENTANE-1-CARBOXYLIC ACIDS

Joachim Mittendorf, Wuppertal; Franz Kunisch, Odenthal; Michael Matzke, Wuppertal; Hans-Christian Militzer, Bergisch Gladbach; Rainer Endermann, Wuppertal; Karl Georg Metzger, Wuppertal; Klaus-Dieter Bremm, Wuppertal, and Manfred Plempel, Haan, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany  
Division of Ser. No. 336,584, Nov. 9, 1994, Pat. No. 5,631,291, which is a division of Ser. No. 308,873, Sep. 19, 1994, which is a continuation of Ser. No. 66,751, May 21, 1993, abandoned.

This application Sep. 6, 1996, Ser. No. 709,073

Claims priority, application Germany, May 29, 1992, 42 17 776.6; Jan. 27, 1993, 43 02 155.7

Int. Cl.<sup>6</sup> A01N 37/00

U.S. Cl. 514—561

4 Claims

1. A method of preserving a material from contamination from microorganisms comprising applying to said material an antimicrobially effective amount of a cyclopentane-β-amino acid compound of the formula (I)



A, B, D, L, M and T are identical or different and, represent hydrogen, halogen, benzyl, hydroxyl or straight-chain or branched alkyl having up to 8 carbon atoms, which is optionally monosubstituted or disubstituted by identical or different halogen, hydroxyl, phenyl, benzyloxy, carboxyl, a group of the formula —NR<sup>3</sup>R<sup>3</sup>, or by straight-chain or branched alkoxy, acyl or alkoxycarbonyl each having up to 6 carbon atoms;

in which

R<sup>4</sup> and R<sup>5</sup> are identical or different and represent hydrogen, phenyl or straight-chain or branched alkyl having up to 6 carbon atoms;

E and G together represent a radical of the formula =CR<sup>6</sup>R<sup>7</sup>; in which

R<sup>6</sup> and R<sup>7</sup> are identical or different and represent hydrogen, halogen or straight-chain or branched alkyl, alkoxy or oxyacyl each having up to 8 carbon atoms, benzyl or phenyl;

R<sup>2</sup> represents hydrogen, an amino-protective group, straight-chain or branched alkyl having up to 8 carbon atoms, which is optionally monosubstituted or disubstituted by identical or different substituents selected from the group consisting of hydroxyl, formyl, straight-chain or branched acyl having up to 6 carbon atoms, straight-chain or branched alkyl having up to 6 carbon atoms, or phenyl or benzoyl, each of which is

optionally substituted up to 2 times by identical or different substituents selected from the group consisting of halogen, nitro or cyano; or

R<sup>2</sup> represents straight-chain or branched acyl having up to 8 carbon atoms, benzoyl which is optionally substituted as described above, or a group of the formula —SO<sub>2</sub>R<sup>8</sup>, in which

R<sup>8</sup> represents straight-chain or branched alkyl having up to 8 carbon atoms, or benzyl or phenyl, each of which is optionally substituted up to 3 times by identical or different substituents selected from the group consisting of halogen, hydroxyl, nitro, cyano, trifluoromethyl, trifluoromethoxy, straight-chain or branched alkyl, alkoxy or alkoxycarbonyl each having up to 6 carbon atoms, carboxyl, or —NR<sup>4</sup>R<sup>5</sup>; or

R<sup>2</sup> represents phenyl which is optionally substituted up to 3 times by identical or different substituents selected from the group consisting of halogen, hydroxyl, nitro, trifluoromethyl, trifluoromethoxy, straight-chain or branched alkyl, acyl, alkoxy or alkoxycarbonyl, each having up to 6 carbon atoms, —NR<sup>4</sup>R<sup>5</sup>, or —SO<sub>2</sub>R<sup>8</sup>; or

R<sup>2</sup> represents an amino acid radical of the formula —CO—CH(R<sup>9</sup>)—NHR<sup>10</sup>;

in which

R<sup>9</sup> represents cycloalkyl having 3 to 8 carbon atoms, aryl having 6 to 10 carbon atoms, hydrogen, or straight-chain or branched alkyl having up to 8 carbon atoms, which is optionally substituted by a substituent selected from the group consisting of cyano, methylthio, hydroxyl, mercapto, guanidyl, cycloalkyl having 3 to 8 carbon atoms, aryl having 6 to 10 carbon atoms, which is in turn substituted by a substituent selected from the group consisting of hydroxyl, halogen, nitro, alkoxy having up to 8 carbon atoms and a group of the formula —NR<sup>11</sup>R<sup>12</sup>, or by a group of the formula —NR<sup>11</sup>R<sup>12</sup> or R<sup>13</sup>—OH—; in which

R<sup>11</sup> and R<sup>12</sup> independently represent hydrogen, straight-chain or branched alkyl having up to 8 carbon atoms or phenyl; and

R<sup>13</sup> represents hydroxyl, benzyloxy, alkoxy having up to 6 carbon atoms or —NR<sup>10</sup>R<sup>11</sup>; and

R<sup>10</sup> represents hydrogen or an amino-protective group;

R<sup>3</sup> represents hydrogen or straight-chain or branched alkyl having up to 8 carbon atoms, which is optionally substituted by phenyl; or

R<sup>2</sup> and R<sup>3</sup> together represent a radical of the formula =CHR<sup>14</sup>; in which

R<sup>14</sup> represents hydrogen or straight-chain or branched alkyl having up to 8 carbon atoms, which is optionally substituted by a substituent selected from the group consisting of halogen, hydroxyl, phenyl, carboxyl, or straight-chain or branched alkoxy or alkoxycarbonyl each having up to 6 carbon atoms;

V represents an oxygen or sulphur atom or the —NH group;

R<sup>1</sup> represents hydrogen, straight-chain or branched alkyl having up to 8 carbon atoms, which is optionally substituted up to 3 times by identical or different substituents selected from the group consisting of hydroxyl, halogen, nitro, cyano, carboxyl, trifluoromethyl, trifluoromethoxy or straight-chain or branched alkoxy, or phenyl, which is optionally substituted up to 3 times by identical or different substituents selected from the group consisting of hydroxyl, halogen, nitro, cyano, carboxyl, trifluoromethyl, trifluoromethoxy, straight-chain or branched alkoxy, alkyl, acyl or alkoxycarbonyl each having up to 6 carbon atoms, —NR<sup>4</sup>R<sup>5</sup> or —SO<sub>2</sub>R<sup>8</sup>;

or in case in which V represents the —NH group, then R<sup>1</sup> may represent —SO<sub>2</sub>R<sup>8</sup>;

an isomeric form of said compound, an acid addition salt thereof, or a metal salt complex thereof.

5,770,623

## ARGINE ANTAGONISTS FOR INHIBITION OF SYSTEMIC HYPOTENSION ASSOCIATED WITH NITRIC OXIDE PRODUCTION OR ENDOTHELIAL DERIVED RELAXING FACTOR

Robert G. Kilbourn, Naperville, Ill.; Steven S. Gross; Roberto Levi, both of New York, N.Y., and Owen W. Griffith, Milwaukee, Wis., assignors to Board of Regents, The University of Texas System, Austin, Tex., and Cornell Research Foundation, Inc., Ithaca, N.Y.

Continuation of Ser. No. 838,814, Mar. 13, 1992, abandoned, which is a continuation-in-part of Ser. No. 406,909, Sep. 19, 1989, Pat. No. 5,028,627. This application Nov. 22, 1995, Ser. No. 561,717

Int. Cl.<sup>6</sup> A61K 31/195

U.S. Cl. 514—565

25 Claims

1. A method for treating toxicity in a patient caused by excess levels of nitric oxide, the method comprising administering a therapeutically effective amount of a nitric oxide synthesis inhibitor to said patient.

5,770,624

## CERTAIN ALPHA-SUBSTITUTED ARYLSULFONAMIDO ACETOHYDROXAMIC ACIDS

David Thomas Parker, Livingston, N.J., assignor to Novartis Corp., Summit, N.J.

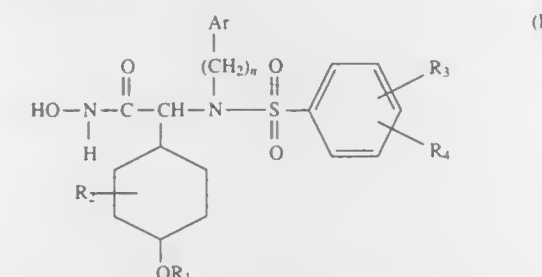
Filed Dec. 10, 1996, Ser. No. 763,273

Int. Cl.<sup>6</sup> A61K 31/19; 31/44; C07C 311/15; C07D 211/70

U.S. Cl. 514—575

23 Claims

1. A compound of the formula I



wherein

Ar represents carbocyclic aryl, heterocyclic aryl or biaryl;  
R<sub>1</sub> represents lower alkyl, cycloalkyl, (carbocyclic or heterocyclic aryl)-lower alkyl, lower alkoxy-lower alkyl, carbocyclic aryl, heterocyclic aryl, cycloalkyl-lower alkyl or halogen-lower alkyl;  
R<sub>2</sub> represents hydrogen or lower alkyl;  
R<sub>3</sub> and R<sub>4</sub> represent independently hydrogen, lower alkyl, lower alkoxy, halogen, hydroxy, acyloxy, lower alkoxy-lower alkoxy, trifluoromethyl or cyano; or R<sub>3</sub> and R<sub>4</sub> together on adjacent carbon atoms represent lower alkylenedioxy;  
n represents an integer from 1 to 5;  
a pharmaceutically acceptable prodrug derivative thereof; or a pharmaceutically acceptable salt thereof.

5,770,625

## BUTYRYL-TYROSINYL SPERMINE, ANALOGS THEREOF AND METHODS OF PREPARING AND USING SAME

Koji Nakanishi, New York, N.Y.; Amira T. Eldefrawi; Mohyee E. Eldefrawi, both of Baltimore, Md., and Peter N. R. Usherwood, Nottingham, United Kingdom, assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

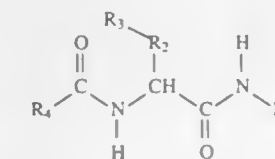
Continuation of Ser. No. 701,223, May 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 153,151, Feb. 8, 1988, abandoned. This application Jul. 14, 1994, Ser. No. 275,336

Int. Cl.<sup>6</sup> A61K 31/16; C07C 233/05

U.S. Cl. 514—616

24 Claims

1. A compound having the structure:



wherein R<sub>1</sub> is hydrogen or —(CH<sub>2</sub>)<sub>n</sub>NH(CH<sub>2</sub>)<sub>m</sub>(CHR<sub>3</sub>)<sub>2</sub>(CH<sub>2</sub>)<sub>2</sub>NH(CH<sub>2</sub>)<sub>2</sub>NHR<sub>6</sub>;

wherein R<sub>3</sub> is present or absent; wherein when R<sub>3</sub> is absent, R<sub>2</sub> is hydrogen, methyl, or a branched or unbranched, substituted or unsubstituted alkyl having from two to twenty atoms in the chain; wherein when R<sub>3</sub> is present, R<sub>2</sub> is methylene

and R<sub>3</sub> is C<sub>6</sub>H<sub>5</sub>, C<sub>6</sub>H<sub>4</sub>OH-p or C<sub>6</sub>H<sub>4</sub>OH-p-I<sub>2</sub>-m,m;

wherein R<sub>4</sub> is —(CH=CH)<sub>2</sub>—R<sub>5</sub>;

wherein R<sub>5</sub> is hydrogen, CH<sub>3</sub>, CH<sub>2</sub>CH<sub>3</sub>, CH<sub>2</sub>CH<sub>2</sub>CH<sub>3</sub>, or C<sub>4</sub>H<sub>9</sub>;

wherein R<sub>6</sub> is hydrogen or —(C=O) (CHR<sub>8</sub>) (CH<sub>2</sub>)<sub>2</sub>NHR<sub>7</sub>;

wherein R<sub>7</sub> is hydrogen, —(C=O) CH<sub>3</sub> or —(CH=NH) (NH<sub>2</sub>); wherein R<sub>8</sub> is hydrogen or NH<sub>2</sub>; wherein R<sub>9</sub> is a substituted or unsubstituted alkyl having from two to twenty carbon atoms or C<sub>6</sub>H<sub>5</sub>;

wherein a and d are each independently 3 or 4; wherein b, c and f are each independently 0, 1 or 2 and b+c is 2 or 3; and wherein e is 2, 3 or 4.

5,770,626

## TETRAHYDRONAPHTHALENE AND INDANE COMPOUNDS USEFUL FOR REVERSING THE PHOTODAMAGE IN SUN-EXPOSED SKIN

Graeme Findlay Bryce, Upper Montclair, and Stanley Seymour Shapiro, Livingston, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

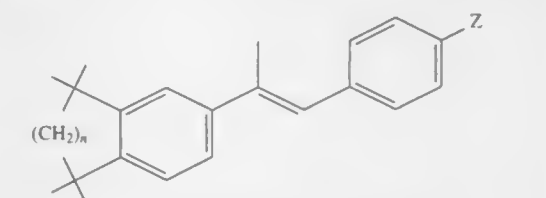
Continuation of Ser. No. 219,616, Jul. 14, 1988, abandoned, which is a continuation-in-part of Ser. No. 86,992, Aug. 19, 1987, abandoned. This application May 8, 1990, Ser. No. 520,166

Int. Cl.<sup>6</sup> A61K 31/10

U.S. Cl. 514—709

14 Claims

1. A method of treating the conditions associated with photodamaged skin comprising topically administering a compound of the formula



wherein n represents 1 or 2; Z represents —SO<sub>2</sub>R;

wherein R represents lower-alkyl, lower-alkenyl,

lower-alkynyl, lower-alkoxy-lower-alkyl, lower-alkanoyl-lower-alkyl,

hydroxy-lower-alkyl, halo-lower-alkyl,

lower-carbalkoxy-lower-alkyl, lower-alkoxy, hydroxy,

mono-lower-alkyl amino or di-lower-alkylamino,

or a pharmaceutically acceptable salt thereof to an area of the skin in need of said treatment, said compound of formula I being applied to said area in an amount effective to reverse the effects of photodamage in said area.





a polyoxyalkylene polyether polyol having an average functionality of greater than 3.1 and an equivalent weight of greater than 130, said blowing agent comprising a mixture of formic acid and water, wherein said rigid polyurethane foam being dimensionally stable according to the ASTM D 2126-87 test method by exhibiting a volume change of  $\pm 10$  percent or less at 158° F. and 100 percent relative humidity, of  $\pm 7$  percent or less at 200° F. and 0.0 percent relative humidity, and of  $\pm 10$  percent or less at -20° F. and 0.0 percent relative humidity, and exhibiting a surface friability of less than 5% according to the ASTM C 421 test method.

5,770,636

# OPEN CELLED FOAM AND METHOD OF MAKING AN OPEN CELLED FOAM

David Gerald Wernsing, Littleton, and Carol Jean Claypool, Lakewood, both of Colo., assignors to Johns Manville International, Inc., Denver, Colo.

Filed Aug. 20, 1997, Ser. No. 915,028

Int. Cl.<sup>6</sup> C08J 9/02; C08G 18/34

U.S. Cl. 521—157

16 Claims

1. A process for producing a lightweight open celled foam comprising the steps of: reacting in the absence of a solvent, an organic polyisocyanate having at least two functional groups per molecule and a mixture of a difunctional acid and a difunctional anhydride in the presence of a tertiary amine catalyst and a nonionic, organic surfactant having a hydrophilic/lipophilic balance (HLB) of at least 12; generating carbon dioxide in situ; interrupting the reaction when the theoretical amount of carbon dioxide generated is from about 1% to about 80%; transferring the reaction mass after the interruption step to a second stage and completing the carbon dioxide generation and forming a polyimide and polyamide foam product having a density no greater than 6 pounds per cubic foot (pcf) wherein the ratio of imide to amide groups in the final product is greater than 1 to 1 and no greater than 19 to 1.

5,770,637

# ANTI-BACTERIAL, UV ABSORBABLE, TINTED, METAL-CHELATING POLYMERS

Douglas G. Vanderlaan, and Susan B. Orr, both of Jacksonville, Fla., assignors to Johnson & Johnson Vision Products, Inc., Jacksonville, Fla.

Filed May 1, 1996, Ser. No. 641,409

Int. Cl.<sup>6</sup> B05D 5/06; G02B 3/00; C08F 20/54; 12/28

U.S. Cl. 523—106

16 Claims

1. A soft contact lens which comprises a water-swollen gel of a polymer prepared by polymerizing one or more hydrophilic monomers, one or more cross-linking monomers, and a monomer which contributes or which can, after completion of lens polymerization, be developed to contribute, metal-chelating functionality, wherein the monomer that contributes metal-chelating functionality is selected from the group consisting of methacrylic acid amides containing an alkylamino-N,N-diacetic acid group, and acrylic acid amides containing an alkylamino-N,N-diacetic acid group.

5,770,638

# ADHESIVE FOR DENTAL RESIN COMPOSITE MATERIALS

Takayuki Ueno, Tokyo, and Tomohiro Kumagai, Kuki, both of Japan, assignors to GC Corporation, Tokyo, Japan

Filed Mar. 27, 1996, Ser. No. 622,384

Claims priority, application Japan, Apr. 5, 1995, 6-103214

Int. Cl.<sup>6</sup> A61K 6/00; A61C 13/23

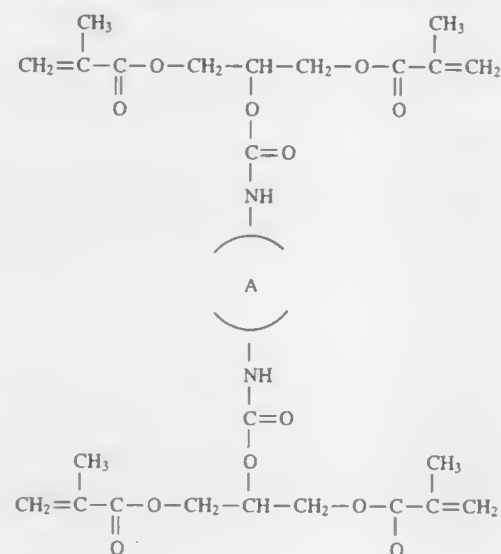
U.S. Cl. 523—116

6 Claims

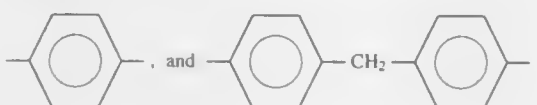
1. An adhesive for dental resin composite materials, which comprises:

(a) from 10 to 40 parts by weight of tetrahydrofurfuryl methacrylate;

(b) from 90 to 60 parts by weight of one or more methacrylates having at least one unsaturated double bond per molecule, and which is selected from the group consisting of di-2-methacryloxyethyl-2,2,4-trimethylhexamethylene dicarbamate and a compound having the formula:



wherein —(A)— is selected from the group consisting of: —(CH<sub>2</sub>)—,



and

(c) from 0.04 to 0.12 parts by weight, based on 100 parts by weight of the monomer mixture consisting of (a) and (b), of a photopolymerization initiator.

5,770,639

# USE OF SELECTED, BIOLOGICALLY SAFE STABILIZERS IN POLYVINYL-ESTER-BASED IMPREGNATING COMPOSITIONS FOR SOIL STABILIZATION

Wolfgang Ritter, Haan; Stephan von Tapavicza, Erkrath, and Christiane Hoeltgen, Duesseldorf, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP95/03066, § 371 Date Mar. 26, 1997, § 102(e) Date Mar. 26, 1997, PCT Pub. No. WO96/05268, PCT Pub. Date Feb. 22, 1996

PCT Filed Aug. 1, 1995, Ser. No. 776,867

Claims priority, application Germany, Aug. 10, 1994, 44 28 269.9

Int. Cl.<sup>6</sup> C09K 17/20; C08K 5/101; 5/103

U.S. Cl. 523—132

16 Claims

1. The process of increasing the water resistance of soil impregnated with esters of polyvinyl alcohol and monocarboxylic acids selected from the group consisting of C<sub>1</sub>–C<sub>5</sub> monocarboxylic acids and C<sub>6</sub>–C<sub>16</sub> monocarboxylic acids and mixtures thereof comprising adding to said soil a stabilizer selected from the group consisting of mono- or polyolefinically unsaturated fatty acids, fatty alcohols, and water-insoluble esters, ethers and salts thereof.

5,770,640

# FINISHING AGENTS AND METHOD OF USING THE SAME

Kazufumi Ogawa, Nara, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

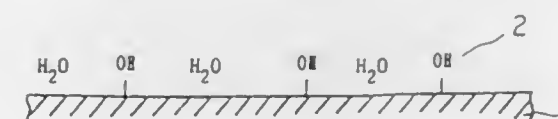
Division of Ser. No. 661,729, Jun. 11, 1996. This application Jan. 2, 1997, Ser. No. 778,136

Claims priority, application Japan, Jun. 14, 1995, 7-147850; Jul. 24, 1995, 7-187536

Int. Cl.<sup>6</sup> C08K 9/10; G09G 1/08

U.S. Cl. 523—210

8 Claims



1. A finishing agent comprising an alkoxysilane surface active agent, an acid catalyst and a liquid or solid medium, wherein at least one of the alkoxysilane surface active agent and the acid catalyst is microencapsuled.

5,770,641

# VINYL CHLORIDE-BASED PLASTISOL

Susumu Iijima, Toyonaka, and Tetsuya Yamamoto, Ibaraki, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jan. 26, 1994, Ser. No. 186,618

Claims priority, application Japan, Jan. 26, 1993, 5-010711

Int. Cl.<sup>6</sup> C08K 3/00

U.S. Cl. 523—342

16 Claims

1. A vinyl chloride-based plastisol comprising

a) powder of a vinyl chloride polymer obtained by spray drying an aqueous dispersion of a vinyl chloride polymer prepared by the emulsion polymerization or the microdispersion polymerization of vinyl chloride or a mixture of vinyl chloride and an unsaturated compound copolymerizable with vinyl chloride, said dispersion containing a polyhydric alcohol in an amount of 0.3 to 5 parts by weight per 100 parts by weight of the vinyl chloride polymer, and

b) a plasticizer in an amount of 30 to 300 parts by weight per 100 parts by weight of the vinyl chloride polymer.

5,770,642

# CATHODIC ELECTRODEPOSITION PAINT

Hirohisa Kanato, Osaka; Makoto Ando, Suita; Yoshio Kojima, Nara; Mitsuo Yamada, Suita, and Ryoichi Murakami, Nara, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Feb. 28, 1997, Ser. No. 807,208

Claims priority, application Japan, Mar. 1, 1996, 8-071413; Mar. 1, 1996, 8-071414

Int. Cl.<sup>6</sup> C08K 3/20; C08L 63/02

U.S. Cl. 523—404

17 Claims

1. In a cathodic electrodeposition paint comprising a mixture of (a) a cationically modified epoxy resin and (b) a blocked polyisocyanate crosslinker dispersed in an aqueous medium containing a neutralizing agent, the improvement wherein said cationically modified epoxy resin has at least one oxazolidone ring in the molecule and a T<sub>g</sub> ranging between 10° C. and 35° C., wherein said blocked polyisocyanate crosslinker is a bicyclic alkane diisocyanate or isophorone diisocyanate or a dimer, trimer or polyhydric alcohol adduct thereof, reversibly blocked with a lactam or oxime blocking agent, and wherein the paint contains less than 800 ppm of lead ions.

5,770,643

# PYRROLODIAZINE DERIVATIVES AS STABILIZERS FOR CHLORINE-CONTAINING POLYMERS

Wolfgang Wehner, Ober-Ramstadt; Hans-Helmut Friedrich, Lautertal, and Rolf Drewes, Lindenfels, all of Germany, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Filed Mar. 20, 1996, Ser. No. 618,591

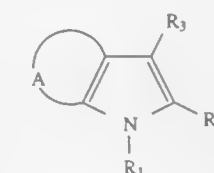
Claims priority, application European Pat. Off., Mar. 28, 1995, 95-810-204-8

Int. Cl.<sup>6</sup> C08K 5/34; 5/04; 5/09

U.S. Cl. 524—91

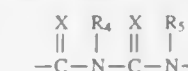
14 Claims

1. A composition comprising a) chlorinated polymer, and at least one compound of the formula II

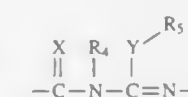


in which

A is a group of the formula III or IV



(III)

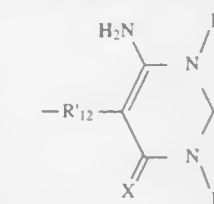


(IV)

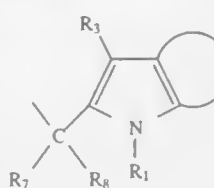
X is oxygen or sulfur,

Y is oxygen, sulfur or >N—R<sub>4</sub>.

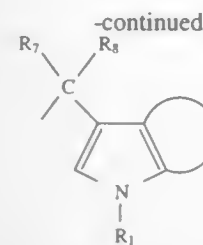
R<sub>1</sub> is hydrogen, C<sub>1</sub>–C<sub>12</sub>alkyl, C<sub>1</sub>–C<sub>12</sub>alkyl which is interrupted by oxygen, sulfur or carboxyl; hydroxyl-substituted C<sub>1</sub>–C<sub>12</sub>alkyl; C<sub>3</sub>–C<sub>6</sub>alkenyl, C<sub>5</sub>–C<sub>8</sub>cycloalkyl which is unsubstituted or substituted by one to three R<sub>6</sub> radicals; phenyl which is unsubstituted or substituted by one to three R<sub>6</sub> radicals; C<sub>7</sub>–C<sub>9</sub>phenylalkyl which is unsubstituted or substituted on the phenyl ring by one to three R<sub>6</sub> radicals; an alkali metal or an alkaline earth metal, R<sub>2</sub> and R<sub>3</sub>, independently of one another, are hydrogen, C<sub>1</sub>–C<sub>12</sub>alkyl, C<sub>2</sub>–C<sub>12</sub>alkyl which is interrupted by oxygen, sulfur or carboxyl; hydroxyl-substituted C<sub>1</sub>–C<sub>12</sub>alkyl; C<sub>3</sub>–C<sub>6</sub>alkenyl, C<sub>5</sub>–C<sub>8</sub>cycloalkyl which is unsubstituted or substituted by one to three R<sub>6</sub> radicals; phenyl which is unsubstituted or substituted by one to three R<sub>6</sub> radicals; C<sub>7</sub>–C<sub>9</sub>phenylalkyl which is unsubstituted or substituted on the phenyl ring by one to three R<sub>6</sub> radicals;



or a radical of the formula V or VI

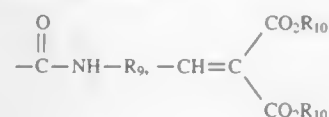


(V)



(VI)

in which A and R<sub>1</sub> are as defined above, or furthermore one of the radicals R<sub>2</sub> and R<sub>3</sub> is hydroxyl, formyl, C<sub>1</sub>-C<sub>12</sub>alkoxy, phenoxy which is unsubstituted by one to three R<sub>6</sub> radicals; C<sub>1</sub>-C<sub>12</sub>alkanoyloxy, benzyloxy which is unsubstituted or substituted by one to three R<sub>6</sub> radicals;



-CH=N-R<sub>11</sub>,

R<sub>4</sub> and R<sub>5</sub>, independently of one another, are hydrogen, C<sub>1</sub>-C<sub>12</sub>alkyl, C<sub>2</sub>-C<sub>12</sub>alkyl which is interrupted by oxygen, sulfur or carboxyl; hydroxy-substituted C<sub>1</sub>-C<sub>12</sub>alkyl; C<sub>3</sub>-C<sub>6</sub>alkenyl, C<sub>5</sub>-C<sub>8</sub>cycloalkyl which is unsubstituted by one to three R<sub>6</sub> radicals; phenyl which is unsubstituted or substituted by one to three R<sub>6</sub> radicals; or C<sub>7</sub>-C<sub>9</sub>phenylalkyl which is unsubstituted or substituted on the phenyl ring by one to three R<sub>6</sub> radicals.

R<sub>6</sub> is C<sub>1</sub>-C<sub>4</sub>alkyl, C<sub>1</sub>-C<sub>4</sub>alkoxy, C<sub>5</sub>-C<sub>8</sub>cycloalkyl; hydroxyl or chlorine.

R<sub>7</sub> and R<sub>8</sub>, independently of one another, are hydrogen, CF<sub>3</sub>, C<sub>1</sub>-C<sub>12</sub>alkyl, phenyl or

C<sub>7</sub>-C<sub>9</sub>phenylalkyl, or R<sub>7</sub> and R<sub>8</sub>, together with the carbon atom to which they are bonded, form an unsubstituted or C<sub>1</sub>-C<sub>4</sub>alkyl-substituted C<sub>5</sub>-C<sub>12</sub>cycloalkylidene ring.

R<sub>9</sub> is phenyl which is unsubstituted or substituted by one to three R<sub>6</sub> radicals;

R<sub>10</sub> is hydrogen, C<sub>1</sub>-C<sub>12</sub>alkyl, C<sub>2</sub>-C<sub>12</sub>alkyl which is interrupted by oxygen or sulfur, hydroxy-substituted C<sub>1</sub>-C<sub>12</sub>alkyl; C<sub>3</sub>-C<sub>6</sub>alkenyl, C<sub>5</sub>-C<sub>8</sub>cycloalkyl which is unsubstituted or substituted by one to three R<sub>6</sub> radicals; phenyl which is unsubstituted or substituted by one to three R<sub>6</sub> radicals; or C<sub>7</sub>-C<sub>9</sub>phenylalkyl which is unsubstituted or substituted on the phenyl ring by one to three R<sub>6</sub> radicals.

R<sub>11</sub> is C<sub>1</sub>-C<sub>12</sub>alkyl, C<sub>2</sub>-C<sub>12</sub>alkyl which is interrupted by oxygen or sulfur; hydroxy-substituted C<sub>1</sub>-C<sub>12</sub>alkyl; C<sub>3</sub>-C<sub>6</sub>alkenyl, C<sub>5</sub>-C<sub>8</sub>cycloalkyl which is unsubstituted or substituted by one to three R<sub>6</sub> radicals; phenyl which is unsubstituted or substituted by one to three R<sub>6</sub> radicals; or C<sub>7</sub>-C<sub>9</sub>phenylalkyl which is unsubstituted or substituted on the phenyl ring by one to three R<sub>6</sub> radicals.

R<sub>12</sub> is a direct bond or >CH-R<sub>13</sub>, and R<sub>13</sub> is hydrogen or C<sub>1</sub>-C<sub>8</sub>alkyl.

5,770,644

#### FIRE RETARDANT POLYESTER RESIN COMPOSITION AND PROCESS FOR PRODUCING THE SAME

Masanori Yamamoto, and Shintaro Kishimoto, both of Tokyo-To, Japan, assignors to Mitsubishi Engineering Plastics Corporation, Tokyo-To, Japan

Filed Feb. 26, 1997, Ser. No. 806,651

Claims priority, application Japan, Feb. 26, 1996, 8-037904; Jul. 9, 1996, 8-179114

Int. Cl.<sup>6</sup> C08K 5/49; 5/52; 5/51

U.S. Cl. 524-120

11 Claims

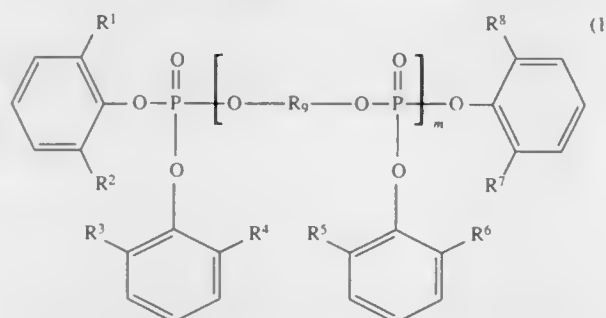
1. A fire retardant polyester resin composition comprising the following components (A) to (H):

(A) 95 to 30 parts by weight of a polyester resin, and

(B) 5.0 to 70 parts by weight of a polyphenylene ether resin and/or polyphenylene sulfide resin, and, for 100 parts by weight in total of the components (A) and (B),

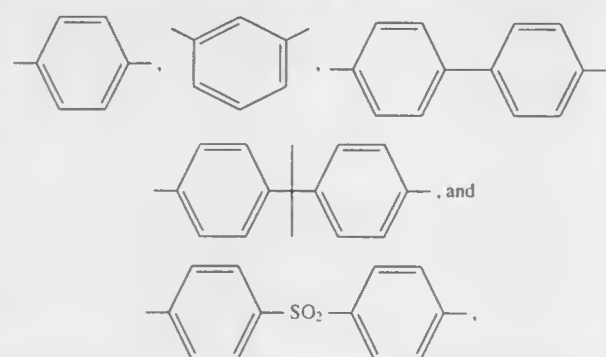
(C) 0.05 to 10 parts by weight of a compatibilizing agent,

(D) 2.0 to 45 parts by weight of a phosphoric ester compound or phosphonitrile compound, wherein said phosphoric ester compound is represented by the general formula (1):

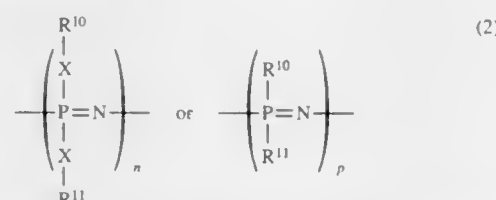


(1)

wherein R<sup>1</sup> to R<sup>8</sup> are hydrogen atom or an alkyl group having 1 to 6 carbon atoms, m is an integer of 1 to 4, and R<sup>9</sup> represents a structure selected from the following:



and wherein said phosphonitrile compound has a group represented by the general formula (2):



(2)

wherein X represents O, S or N-H, R<sup>10</sup> and R<sup>11</sup> are an aryl, alkyl or cycloalkyl group having 1 to 20 carbon atoms, -X-R<sup>10</sup> and -X-R<sup>11</sup> may be the same or different, and n and p are an integer of 1 to 12.

(E) 0 to 150 parts by weight of a reinforcing filler,

(F) 0.001 to 15 parts by weight of an anti-dripping agent,

(G) 0 to 45 parts by weight of a melamine cyanurate, and

(H) 0 to 15 parts by weight of a polystyrene resin having an epoxy group, provided that the amount of the component (G) is from 0.5 to 45 parts by weight for 100 parts by weight in total of the components (A) and (B) when the amount of the component (B) is less than 35 parts by weight.

5,770,645

#### POLYMERS FOR DELIVERING NITRIC OXIDE IN VIVO

Jonathan S. Stamler, Chapel Hill; Eric J. Toone, Durham, and Richard S. Stack, Chapel Hill, all of N.C., assignors to Duke University Medical Center, Durham, N.C.

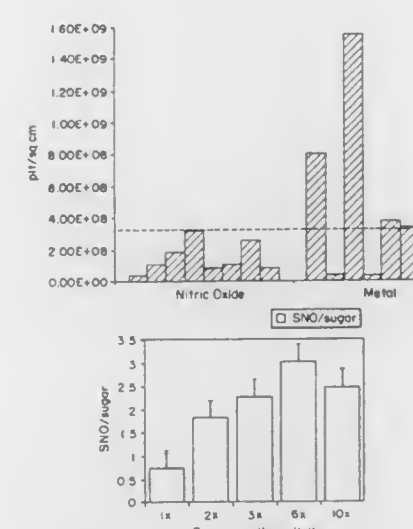
Filed Aug. 2, 1996, Ser. No. 691,862

Int. Cl.<sup>6</sup> A61K 31/785; 31/095; 31/795

U.S. Cl. 524-419

34 Claims

1. An S-nitrosylated polysaccharide having at least one



-S-NO group per 1200 atomic mass units.

5,770,646

#### AQUEOUS BRANCHED POLYMER DISPERSANT FOR HYDROPHOBIC MATERIALS

Joseph Albert Antonelli, Riverton, N.J.; Christopher Scopazzi, Wilmington, Del., and Kerstin Stranmaier, Hennef, Germany, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 29, 1996, Ser. No. 740,464

Int. Cl.<sup>6</sup> C08L 51/00; 61/32; 61/28

U.S. Cl. 524-504

8 Claims

1. A stable waterbased dispersion useful for forming aqueous coating compositions comprising a dispersed hydrophobic partially or fully alkylated melamine resin having 1-4 carbon atoms in the alkyl group and a degree of polymerization of 1-3, an aqueous carrier and a branched polymer dispersant (binder); wherein

the branched polymer formed in organic solvent has a weight average molecular weight of about 5,000-100,000 and comprises 20-80% by weight of a hydrophilic backbone and correspondingly 80-20% by weight of macromonomer side chains; wherein

the backbone consists essentially of polymerized ethylenically unsaturated monomers and 2-30% by weight, based on the weight of the backbone of polymerized ethylenically unsaturated monomers having an acid-functional group; and the side chains consist essentially of macromonomers of polymerized ethylenically unsaturated monomers that are polymerized into the backbone via an ethylenically unsaturated group and the macromonomers have a weight average molecular weight of about 1,000-30,000 and

wherein the weight ratio of hydrophobic melamine resin to binder is about 1/100-200/100; and

wherein the hydrophobic melamine resin being dispersed in the branched polymer formed in organic solvent and thereafter adding water and amine or an inorganic base thereby inverting the polymer into water to form the dispersion wherein at least 10% of the acid functional groups of the polymer are neutralized with the amine or inorganic base and the backbone of the polymer is hydrophobic in comparison to the side chains.

5,770,647

#### FRICTION SOUND-PREVENTING SURFACE-TREATING AGENT

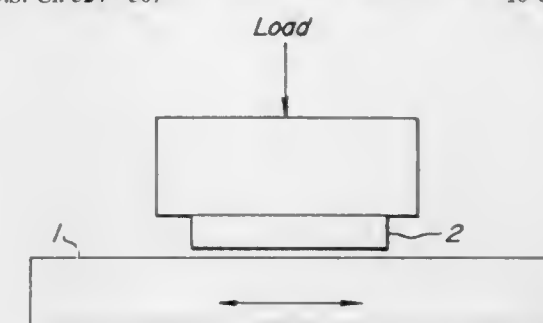
Tetsuro Watanabe, Iwaki; Kimihiro Matsumoto, Kashiwa; Satoru Ichikawa, Yokosuka, and Kuniko Matsuya, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, and Tokushu Shikiryō Color & Chemicals, Inc., Kashiwa, both of Japan

Continuation-in-part of Ser. No. 575,611, Dec. 20, 1995, abandoned. This application Sep. 12, 1997, Ser. No. 928,584

Claims priority, application Japan, Dec. 27, 1994, 6-325649; Dec. 27, 1994, 6-325650; Jun. 8, 1995, 7-141650

Int. Cl.<sup>6</sup> C08J 3/00; C08K 3/20; C08L 75/00; B32B 5/16 U.S. Cl. 524-507

10 Claims



1. A friction sound-preventing surface-treating agent comprising an acryl-vinyl chloride based paint resin, and 2-60 wt. % of spherical and/or non-spherical polyurethane particles having an average particle diameter of 1-50 μm as a solid component, based on the weight of said acryl-vinyl chloride based paint resin.

5,770,648

#### PIGMENT DISPERSIONS CONTAINING AQUEOUS BRANCHED POLYMER DISPERSANT

Joseph Albert Antonelli, Riverton, N.J.; Henry L. Jakubauskas, Chadds Ford, Pa., and Christopher Scopazzi, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 29, 1996, Ser. No. 738,633

Int. Cl.<sup>6</sup> C08L 33/02

U.S. Cl. 524-533

10 Claims

1. A waterbased pigment dispersion useful for forming aqueous coating, composition comprising a dispersed pigment, an aqueous carrier and a branched polymer dispersant (binder); wherein the branched polymer has a weight average molecular weight of about 5,000-100,000 and comprises 20-80% by weight of a hydrophilic backbone and correspondingly 80-20% by weight of macromonomer side chains; wherein

the backbone consists of polymerized ethylenically unsaturated monomers and 2-30% by weight, based on the weight of the backbone of polymerized ethylenically unsaturated monomers having a carboxylic acid-functional group; and wherein at least 10% of the carboxylic acid-functional groups are neutralized with an amine or an inorganic base and is hydrophilic in comparison to the side chains;

the side chains consist of macromonomers of polymerized ethylenically unsaturated monomers that are polymerized into the backbone via an ethylenically unsaturated group and the macromonomers have a weight average molecular weight of about 1,000-30,000 and

wherein said backbone and macromonomers further consist of polymerized ethylenically unsaturated monomers not containing carboxylic functionality, which monomers are selected from the group consisting of alkyl acrylates, alkyl methacrylates, cycloaliphatic acrylates, cycloaliphatic methacrylates, aryl acrylates, aryl methacrylates, styrene, alkyl styrene, acrylonitrile, hydroxy alkyl acrylates, hydroxy alkyl methacrylates and mixtures thereof; and wherein the ethylenically unsaturated monomers containing carboxylic functionality of the backbone are selected from the group consisting of acrylic



acid and methacrylic acid, wherein the above mentioned alkyl, cycloaliphatic, and aryl groups each have 1 to 12 carbon atoms and wherein the weight ratio of pigment to binder is about 1/100–200/100.

5,770,649

Patent Not Issued For This Number

5,770,650

## CURABLE COMPOSITIONS FOR COATINGS

John D. McGee; Brian D. Bammel, both of Highland; Walter H. Ohrbom, Hartland Township, all of Mich.; Todd A. Seaver, Fort Wayne, Ind.; Gregory G. Menoveik, Farmington Hills, Mich.; Paul J. Harris, West Bloomfield, Mich., and John W. Rehffuss, West Bloomfield, Mich., assignors to BASF Corporation, Southfield, Mich.

Continuation of Ser. No. 540,279, Oct. 6, 1995, abandoned.

This application Aug. 15, 1996, Ser. No. 698,523

Int. Cl.<sup>6</sup> C08J 3/00; C08K 3/20; C08L 75/00; C08G 63/91

U.S. Cl. 524—590 22 Claims

I. A curable coating composition comprising (A) a compound comprising a plurality of functional crosslinking groups, at least one of which is a primary carbamate or primary urea group, which compound also includes at least one ester or amide group derived from a reaction of an active hydrogen group with a lactone ring or a hydroxy carboxylic acid, and (B) a curing agent comprising a plurality of groups that are reactive with the functional groups on compound (A).

5,770,651

## USE OF OLIGOURETHANES AS FORMULATING AGENTS FOR AQUEOUS PIGMENT PREPARATIONS

Harro Träubel, Leverkusen; Hans-Werner Müller, Köln, and Fritz Novotny, Bergisch Gladbach, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 865,429, Apr. 9, 1992, abandoned. This application Oct. 13, 1993, Ser. No. 136,439

Claims priority, application Germany, Apr. 16, 1991, 41 12 327.1

Int. Cl.<sup>6</sup> C08J 3/00; C08K 3/20; C08L 75/00

U.S. Cl. 524—591 6 Claims

I. An aqueous pigment preparation comprising

(a) a formulating agent comprising an oligourethane having a number average molecular weight range of from 5000 to 50,000 and containing

(1) no primary or secondary amino groups,  
(2) 5 to 25% by weight, based on the oligourethane, of incorporated ethoxy groups, and  
(3) anionic and cationic groups, wherein the quantity of anionic groups is from 0.2 to 0.8 mol per 1000 g of the oligourethane and the molar ratio of anionic to cationic groups is from 0.8 to 4,

wherein said oligourethane comprises a reaction product of a polyisocyanate, hydroxyl compounds, wherein at least one such hydroxyl compound is a dihydroxyl compound containing ionic groups; and an amino alcohol having tertiary nitrogen atoms;

(b) from 2 to 20 ml, per 100 gram of pigment preparation, of a pigment having a density of from 0.8 to 7 g/ml; and

(c) an aqueous phase containing up to 30% by weight of organic solvent.

5,770,652

## DISPERSIVE REACTIVE EXTRUSION OF POLYMER GELS

William David Richards, 22 Heritage Pkwy., Scotia, N.Y. 12302; Greg R. Bradtke, 20 Charlton Rd., Ballston Spa, N.Y. 12020-3509; Robert Howard Wildi, Rte. 1, Box 207D, Parkersburg, W. Va. 26101; Linda McAdam Gemmell, 9 Merrywood La.; Jack Alvon Hill, 1311 27th St., both of Vienna, W. Va. 26105; Vinod Kumar Berry, 104 Brentwood Heights, Parkersburg, W. Va. 26101; Catherine Marie Monique Pottier-Metz, 62 rue Larris, 60650 Mont Saint Adrien, France; John Robert Campbell, 41 Pepper Hollow, Clifton Park, N.Y. 12065; Jack Lew Little, Rte. 2, Box 198, Belpre, Ohio 45714, and Kenneth Gordon Powell, 4513 Wood Valley Dr., Raleigh, N.C. 27613

Continuation-in-part of Ser. No. 345,196, Nov. 28, 1994, abandoned. This application Nov. 17, 1995, Ser. No. 545,059

Int. Cl.<sup>6</sup> C08L 69/00; 25/06; 25/12; 63/00

U.S. Cl. 525—65 15 Claims

I. A reactive extrusion process for making gel-containing low gloss additive concentrate, said reactive extrusion process comprising:

A. mixing a nitrile-containing polymer with a carrier polymer selected from the group consisting of polycarbonate polymers, polystyrene polymers and mixtures thereof; and

B. reactively extruding said nitrile-containing polymer and said carrier polymer in the presence of a polyepoxide crosslinking agent and an acid catalyst selected from organic acids, mineral acids, Lewis acids and mixtures thereof, such that said nitrile-containing polymer crosslinks to form a gel.

5,770,653

## RESIN COMPOSITION AND MANUFACTURING METHOD THEREOF

Kenji Matsukawa; Toshio Hayashiya, both of Osaka, and Daisaku Yamamoto, Suita, all of Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, Japan

Filed Aug. 5, 1996, Ser. No. 692,263

Claims priority, application Japan, Aug. 17, 1995, 7-209590; Jul. 3, 1996, 8-173957

Int. Cl.<sup>6</sup> C08F 8/00; C08L 67/00

U.S. Cl. 525—168 22 Claims

I. Resin composition, comprising:  
a dicyclopentenyl-group-containing unsaturated polyester whose content ratio of dicyclopentenyl groups is not less than 20 percent by weight;  
a cross-linking monomer; and  
a curing accelerator,  
wherein storable time measured with anti-skinning stability test at 60° C. is not shorter than 8 days, and gel time at room temperature measured for a mixture of 0.55 part by weight of the methylethylketone peroxide per 100 parts by weight of said resin composition is not longer than 60 minutes.

5,770,654

## POLYAMIDE COMPOSITIONS TOUGHENED WITH WASTE PLASTICIZED POLYVINYL BUTYRAL

Philip Strubing Blatz, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 135,244, Oct. 13, 1993, abandoned.

This application Mar. 20, 1997, Ser. No. 822,577

Int. Cl.<sup>6</sup> C08L 77/00

U.S. Cl. 525—179 16 Claims

I. Composition consisting essentially of a uniform blend of about 50–90 weight percent of a polyamide melt-processable at a temperature within the range of about 180°–270° C.; 50–10 weight percent of recovered plasticized polyvinylbutyral, the amount of plasticizer in said recovered polyvinylbutyral being about 15–35% by weight; and 0–10 weight percent of an elastomer which is either

an ethylene copolymer with at least one other  $\alpha$ -olefin or an EPDM rubber, said elastomer having pendant succinic anhydride groups; said blend comprising a polyamide matrix, and a dispersed phase consisting of plasticized polyvinylbutyral together with any elastomer having pendant succinic anhydride groups that may be present;

with a proviso that when an elastomer having pendant succinic anhydride groups is not present, the amount of polyamide is 50–75 weight percent, and the amount of plasticized polyvinylbutyral is 25–50 weight percent; said blend having a notched Izod impact strength of at least 200 J/m and a flexural modulus of at least 1000 MPa;

but when an elastomer having pendant succinic anhydride groups also is present, the amount of polyamide is 70–85 weight percent, and the amount of plasticized polyvinylbutyral is 10–25 weight percent; said blend having a notched Izod impact strength of at least 500 J/m and a flexural modulus of at least 1700 MPa;

in either case, the total amount of the recited components always being 100 weight percent.

5,770,655

## POLYMER COMPOSITION AND CORE-SHELL ELASTOMER USED THEREFOR

Toshihiro Sagane, Tokyo; Masayuki Okabe, and Masahiro Kishine, both of Yamaguchi-ken, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan, and Hoechst Aktiengesellschaft, Frankfurt, Germany

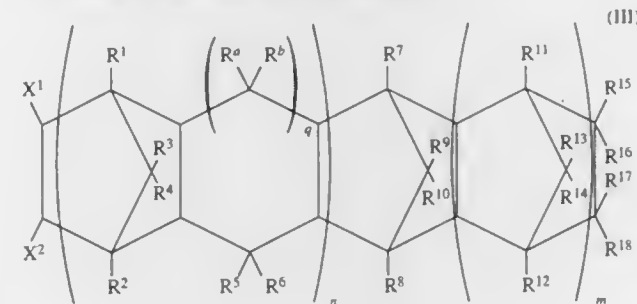
Division of Ser. No. 401,911, Mar. 9, 1995, Pat. No. 5,574,100. This application Aug. 14, 1996, Ser. No. 696,799

Claims priority, application Japan, Mar. 9, 1994, 6-038860; Apr. 22, 1994, 6-084833

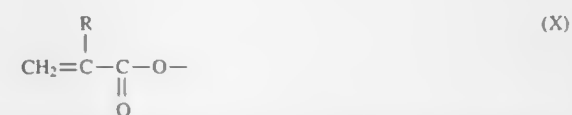
Int. Cl.<sup>6</sup> C08F 51/04

U.S. Cl. 525—310 1 Claim

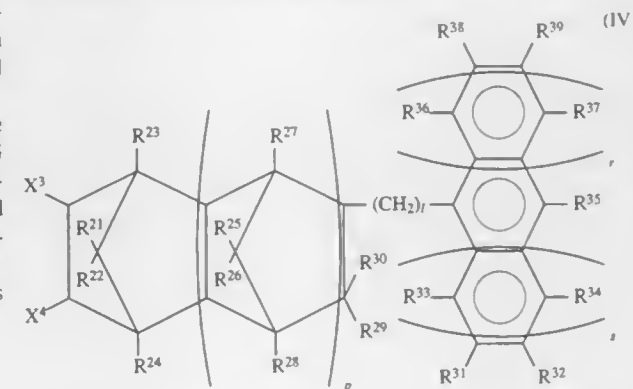
I. A core-shell elastomer, wherein the core-shell elastomer is obtained by graft polymerizing 100 parts by weight of a core-shell elastomer which contains (B-1) 40 to 85 parts by weight of a core component which comprises styrene-butadiene copolymer rubber including 50% or less by weight of styrene unit and (B-2") 15 to 60 parts by weight of a shell component which comprises a copolymer having a unit derived from a monomer mixture consisting of (b-2) 20 to 80% by weight of a monovinyl aromatic monomer, (b-3) 20 to 80% by weight of other monovinyl monomer, and (b-4) 0 to 3% by weight of a polyfunctional monomer with (B-2") 5 to 100 parts by weight of at least one acrylate or methacrylate having an alicyclic skeleton and selected from the group consisting of: compounds represented by a formula (III):



wherein n is 0 or 1, m is 0 or a positive integer, q is 0 or 1, R<sup>1</sup> to R<sup>18</sup> and R<sup>a</sup> and R<sup>b</sup> are independently selected from the group consisting of a hydrogen atom, a halogen atom and a hydrocarbon group, R<sup>15</sup> to R<sup>18</sup> may be bonded together to form a single ring or multiple rings, the single ring or the multiple rings may have a double bond, R<sup>15</sup> and R<sup>16</sup>, or R<sup>17</sup> and R<sup>18</sup> may form an alkylidene group, either one of X<sup>1</sup> and X<sup>2</sup> is an acryloyloxy group or a methacryloyloxy group represented by a formula (X):



wherein R is a hydrogen atom or a methyl group, and the other is a hydrogen atom or an ethyl group; compounds represented by a formula (IV):



wherein p and l are each 0 or an integer of 1 or more, r and s are 0, 1 or 2, R<sup>21</sup> to R<sup>39</sup> are independently selected from the group consisting of a hydrogen atom, a halogen atom, an aliphatic hydrocarbon group, an aromatic hydrocarbon group and an alkoxy group, the carbon atom to which R<sup>29</sup> and R<sup>30</sup> are bonded and the carbon atom to which R<sup>33</sup> is bonded or the carbon atom to which R<sup>31</sup> is bonded may be bonded together directly or via an alkylene group having 1 to 3 carbon atoms, R<sup>35</sup> and R<sup>32</sup>, or R<sup>35</sup> and R<sup>39</sup> may be bonded together to form a single aromatic ring or multiple aromatic rings when r=s=0, either one of X<sup>3</sup> and X<sup>4</sup> is an acryloyloxy group represented by the formula (X), and the other is a hydrogen atom or an alkyl group; and compounds represented by a formula (V):



wherein t is 4 or 5, R<sup>41</sup> to R<sup>43</sup> are independently selected from the group consisting of a hydrogen atom, a halogen atom and a hydrocarbon group, and X<sup>5</sup> is an acryloyloxy group or a methacryloyloxy group represented by the formula (X).

5,770,656

## PARTIAL FLUOROTERS OR THIOESTERS OF MALEIC ACID POLYMERS AND THEIR USE AS SOIL AND STAIN RESISTS

Engelbert Pechhold, Chadds Ford, Pa., assignor to E.I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 22, 1995, Ser. No. 532,346

Int. Cl.<sup>6</sup> C08F 8/18

U.S. Cl. 525—326.4 19 Claims

I. A composition comprising a copolymer having units of formula



wherein  
D is a vinyl monomer selected from the group consisting of styrene, vinyl ether, and alpha olefin;  
M is H, alkali metal or ammonium cation;  
W is O, S or a mixture thereof;

N is a mixture of R' and R" in a molar ratio of M:R':R" of {1-(e+g)}:e:g;  
R' is R<sub>1</sub>-Ad-B-;  
R<sub>1</sub> is a fully fluorinated straight or branched aliphatic radical which can be interrupted by at least one oxygen atom;  
A is a divalent radical selected from the group consisting of -SO<sub>2</sub>N(R)-, -CON(R)-, -S-, and -SO<sub>2</sub>- wherein R is H or a C<sub>1</sub> to C<sub>6</sub> alkyl radical;

d is 0 or 1;  
B is a divalent linear hydrocarbon radical -C<sub>n</sub>H<sub>2n</sub>- optionally endcapped by -(O-CH<sub>2</sub>-CH<sub>2</sub>)<sub>n</sub>-, -(O-CH<sub>2</sub>-CH(CH<sub>3</sub>))<sub>n</sub>-, or -(O-CH<sub>2</sub>-CH(CH<sub>2</sub>Cl))<sub>n</sub>- wherein n is 2 to 12 and z is 0 to 50;  
R" is either a C<sub>1</sub> to C<sub>30</sub> alkyl group or a polysiloxane group of the formula III



wherein

j is 5 to 20;

e is 0.1 to 1.0;

g is 0 to 0.5;

h is 3 to 1000; and

k is 3 to 1000;

wherein said composition has less than about 0.65 mole of ester group per mole of maleic anhydride group and provides soil resistance and resistance to staining by acid dyes to fibers.

5,770,657

**CURING AGENTS FOR AQUEOUS EPOXY RESINS**  
Jason L. Chou; Shailesh Shah, both of Dresher; Brian G. Jewell, North Wales, and Robert M. Moon, Maple Glen, all of Pa., assignors to Henkel Corporation, Plymouth Meeting, Pa.

Continuation of Ser. No. 279,587, Jul. 25, 1994, abandoned.

This application Jul. 3, 1996, Ser. No. 675,514

Int. Cl.<sup>6</sup> C08G 65/32; 59/68

U.S. Cl. 525—407 19 Claims

1. An epoxy curing agent comprising the reaction product of reactants consisting essentially of:

an amine component consisting essentially of a mono-alkylene polyamine having less than about 12 carbon atoms and an alicyclic polyamine, said alicyclic polyamine being present in an amount greater than about 10% of the amine equivalents of said amine component,

an aromatic mono-glycidyl ether having less than about 18 carbon atoms, and

a diglycidyl ether of an aromatic diol having an average degree of oligomerization of less than about 3.5, wherein:

the ratio of primary amine equivalents of said amine component to the total epoxide equivalents of said aromatic glycidyl ether and said diglycidyl ether of an aromatic diol is greater than one, and

the ratio of epoxide equivalents of said aromatic mono-glycidyl ether to epoxide equivalents of said diglycidyl ether of an aromatic diol is greater than one.

5,770,658

**ALK(EN)YL AND HYDROXY-SUBSTITUTED AROMATIC ACID MODIFIED EPOXY RESINS**

Francoise Jacqueline Aline Baudouin, and Seetha Maha Lakshmi Coleman-Kamimula, both of Louvain-La-Neuve, Belgium, assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 14, 1996, Ser. No. 664,335

Claims priority, application European Pat. Off., Jun. 15, 1995, 95201607

Int. Cl.<sup>6</sup> C08L 63/00; 63/02; 63/04

U.S. Cl. 525—423 21 Claims

1. A curable coating composition comprising a modified epoxy resin and a curing agent, said modified epoxy resin comprising the

reaction product of an epoxy resin with less than one mol equivalent per epoxy group of an alkyl ar alkenyl substituted, hydroxy substituted aromatic acid; said curing agent comprising a primary or secondary polyamine, a polyamide, a polyamidoamine, a polyaminadduct, a polycarboxylic acid or anhydride thereof, or a polyphenolic compound.

5,770,659

**PROCESS FOR MAKING STORAGE-STABLE EPOXY-CAPPED POLYETHERESTER RESINS**

Gangfeng Cai; Daniel M. Trauth, both of West Chester, Pa., and Lau S. Yang, Wilmington, Del., assignors to Arco Chemical Technology, L.P., Greenville, Del.

Filed Nov. 10, 1997, Ser. No. 967,140

Int. Cl.<sup>6</sup> C08F 20/00; C08G 63/82

U.S. Cl. 525—438 20 Claims

1. A process for making a storage-stable, epoxy-capped polyetherester resin, said process comprising:

(a) reacting a polyether with a carboxylic acid derivative selected from the group consisting of anhydrides, dicarboxylic acids, and diol diesters in the presence of an insertion catalyst under conditions effective to promote insertion of the carboxylic acid derivative into carbon-oxygen bonds of the polyether to produce a polyetherester resin having free carboxylic acid groups;

(b) reacting the resin with a capping agent to produce an intermediate resin having a reduced content of carboxylic acid groups compared with that of the polyetherester resin produced in step (a); and

(c) reacting the intermediate resin with an epoxy compound in the presence of a finishing catalyst under conditions effective to react free carboxylic acid groups in the intermediate resin with the epoxy compound to produce an epoxy-capped polyetherester resin that has a weight average molecular weight less than about 8000 and a Mw/Mn less than about 6.

5,770,660

**CONTINUOUS POLYMERIZATION PROCESS FOR PRODUCING NBR RUBBER HAVING A HIGH BOUND CONTENT OF ACRYLONITRILE**

John W. Lightsey, 647 Barrosa Way, Baton Rouge, La. 70808

Continuation of Ser. No. 242,807, May 16, 1994, abandoned, which is a continuation of Ser. No. 72,249, Jun. 4, 1993, abandoned, which is a continuation of Ser. No. 918,921, Jul. 22, 1992, abandoned, which is a continuation of Ser. No. 730,028, Jul. 12, 1991, abandoned, which is a continuation of Ser. No. 441,284, Nov. 27, 1989, abandoned. This application Apr. 27, 1995, Ser. No. 429,830

Int. Cl.<sup>6</sup> C08F 236/12

U.S. Cl. 526—66 12 Claims

1. A continuous process for polymerizing acrylonitrile and butadiene monomers to produce substantially consistent composition and component distribution NBR rubbers having a bound acrylonitrile content of about fifty percent by weight comprising the steps of:

continuously charging quantities of acrylonitrile monomer and butadiene monomer in a ratio of about 80 parts acrylonitrile to 20 parts±10% butadiene and quantities of at least one polymerization initiator, water and at least one emulsifying agent to a first reaction vessel in amounts effective to produce a latex;

continuously copolymerizing the acrylonitrile and butadiene monomers in the first reaction vessel to achieve and maintain a ratio of unconverted monomers in the range of about 70 to 90 parts acrylonitrile to about 30 to 10 parts butadiene;

continuously transferring the copolymerized acrylonitrile and butadiene, acrylonitrile monomer, butadiene monomer, polymerization initiator, water and emulsifying agent from the first reaction vessel to a second reaction vessel;

continuously charging additional monomer consisting essentially of butadiene to the second reaction vessel effective to maintain a ration of unconverted monomers in the range of about 70 to 90 parts acrylonitrile to about 30 to 10 parts butadiene; and

continuing the steps of copolymerizing, transferring and adding butadiene until the total quantity of butadiene added is equal to the amount necessary to obtain monomer conversion of about 75% to 90% and final copolymer composition of about 50% acrylonitrile in a last reaction vessel.

5,770,661

**POLYCARBODIIMIDE DERIVATIVE AND PROCESS FOR PRODUCING THE SAME**

Hiroshi Miyoshi; Ken Yahata; Yasuyoshi Komoto; Yasuyuki Takiguchi, and Akira Hayashida, all of Kawasaki, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Jan. 13, 1997, Ser. No. 785,170

Claims priority, application Japan, Jan. 16, 1996, 8-004629; Jan. 19, 1996, 8-006998

Int. Cl.<sup>6</sup> C08G 18/82

U.S. Cl. 525—452 8 Claims

1. A polycarbodiimide derivative, which is obtained by reacting a polycarbodiimide compound with an amine compound having a silicon atom in the molecule.

5,770,662

**MODIFIED RESINS MADE FROM THE REACTION OF EPOXIDIZED ESTERS AND RESIN ACIDS**

Ulrich Eicken, Korshenbroich; Manfred Gorzinski, Duesseldorf; Paul Birnbroich, Solingen, and Thomas Tamcke, Duesseldorf, all of Germany, assignors to Henkel Kommanditgesellschaft Auf Aktien (Henkel KGaA), Dusseldorf, Germany

PCT No. PCT/EP95/00862, § 371 Date Sep. 18, 1996, § 102(e) Date Sep. 18, 1996, PCT Pub. No. WO95/25773, PCT Pub. Date Sep. 28, 1995

PCT Filed Mar. 9, 1995, Ser. No. 716,144

Claims priority, application Germany, Mar. 18, 1994, 44 06 240.7

Int. Cl.<sup>6</sup> C08F 283/00

U.S. Cl. 525—530 24 Claims

1. A composition of matter comprising a resin obtained by a process comprising reacting at an elevated temperature (1) an epoxidized ester of an unsaturated fatty acid and an aliphatic alcohol with (2) a resin acid which is a polycyclic C<sub>20</sub> carboxylic acid.

5,770,663

**METALLOCENE PREPARATION AND USE**

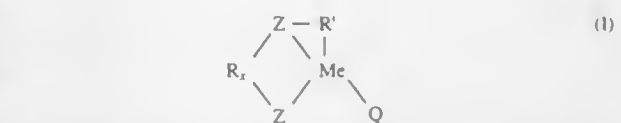
Bernd Peifer; Helmut G. Alt, both of Bayreuth, Germany, and M. Bruce Welch, Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 452,946, May 30, 1995, Pat. No. 5,654,454. This application Mar. 7, 1997, Ser. No. 813,753

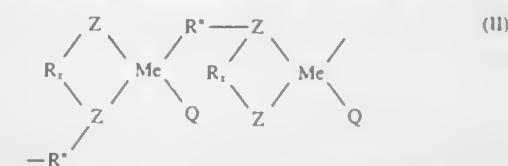
Int. Cl.<sup>6</sup> C08F 4/642

U.S. Cl. 526—127 23 Claims

1. A process for forming a polymer comprising contacting an unsaturated monomer selected from alpha-olefin having 2 to 10 carbon atoms under suitable polymerization conditions with a catalyst composition resulting from the combination of (a) a double bound metallocene selected from metallocenes of the formula



wherein each Z is the same or different cyclopentadienyl-containing radical, R is a divalent organo radical connecting the two Z radicals, x is 1 or 0, R' is a divalent organo radical which connects Z and Me in such a fashion that there are only four atoms separating the connected Z and Me and those atoms are carbon atoms, Me is a Group IV or VI transition metal, and Q is selected from the group consisting of hydrocarbyl, hydrocarbyloxy, and halides and metallocenes having at least one unit of the formula



wherein Z, Me, Q, and x are as defined above and wherein R\* is a divalent organo radical connecting a Z to an Me, said R\* being such that the number of atoms separating the respective joined Z and Me is 2, 3, or more than 4 and (b) a cocatalyst selected from organometallic compounds of metals of Groups IA, IIA, and IIIB.

5,770,664

**CATALYST COMPONENT FOR PRODUCING POLYOLEFIN, CATALYST FOR PRODUCING POLYOLEFIN COMPRISING THE CATALYST COMPONENT, AND PROCESS FOR PRODUCING POLYOLEFIN IN THE PRESENCE OF THE CATALYST**

Yoshikuni Okumura; Nobuyuki Kibino; Tetsuya Maki; Akihiro Hori; Kiyotaka Ishida; Shigenobu Miyake, and Shintaro Inazawa, all of Oita, Japan, assignors to Japan Polyolefins Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 542,706, Oct. 13, 1995, abandoned.

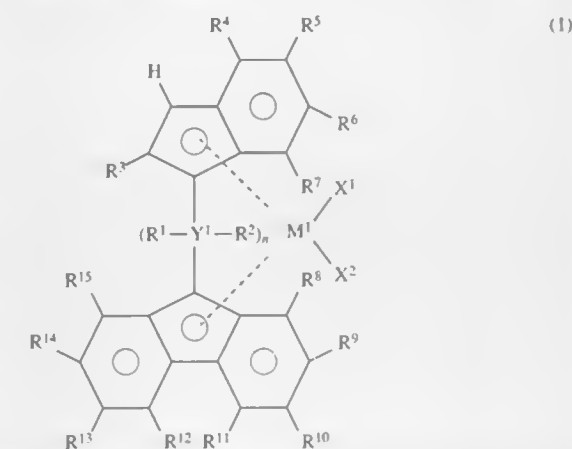
This application May 13, 1997, Ser. No. 855,510

Claims priority, application Japan, Oct. 13, 1994, 6-248130 Int. Cl.<sup>6</sup> C08F 4/64

U.S. Cl. 526—127 14 Claims

1. A process for producing a polyolefin, said process comprising the step of homopolymerizing ethylene or copolymerizing ethylene and at least one of propylene, 1-butene, 1-hexene or 1-octene, in the presence of a catalyst comprising:

(A) a catalyst component;  
(B) a Lewis acid compound; and  
(C) an organoaluminum compound,  
said catalyst component comprising a metallocene compound represented by formula (1):



wherein  
M<sup>1</sup> represents a transition metal atom selected from the group consisting of Ti, Zr, and Hf;



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X<sup>1</sup> and X<sup>2</sup> are the same or different and each represents a hydrogen atom, a halogen atom, a hydrocarbon group having from 1 to 20 carbon atoms which may contain a halogen atom, an OR group, an SR group, an OCOR group, an SO<sub>2</sub>R group, an OSO<sub>2</sub>R group, or an NRR' group, in which R and R' are the same or different and each represents a hydrogen atom or a hydrocarbon group having from 1 to 7 carbon atoms which may optionally contain a halogen atom;

R<sup>1</sup> and R<sup>2</sup> are the same or different and each represents a hydrogen atom, a hydrocarbon group having from 1 to 20 carbon atoms, an OR group, or an SR group, in which R represents a hydrogen atom or a hydrocarbon group having from 1 to 7 carbon atoms which may optionally contain a halogen atom, R<sup>1</sup> and R<sup>2</sup> may be connected to each other to form a ring;

R<sup>3</sup> represents a hydrocarbon group having from 1 to 5 carbon atoms which may contain a silicon atom;

R<sup>4</sup> represents an aryl group having from 6 to 20 carbon atoms which may contain a silicon atom;

R<sup>5</sup> to R<sup>15</sup> each represents a hydrogen atom;

Y<sup>1</sup> represents a carbon atom, a silicon atom, or a germanium atom; and

n represents an integer of from 1 to 3.

5,770,665

## FREE RADICAL POLYMERIZATION PROCESS

David M. Haddleton, Kenilworth; Andrew V. G. Muir, London, and Stephen W. Leeming, Manchester, all of Great Britain, assignors to Zeneca Limited, London, England

PCT No. PCT/GB94/02769, § 371 Date Aug. 28, 1996, § 102(e) Date Aug. 28, 1996, PCT Pub. No. WO95/17435, PCT Pub. Date Jun. 29, 1995

PCT Filed Dec. 20, 1994, Ser. No. 663,218

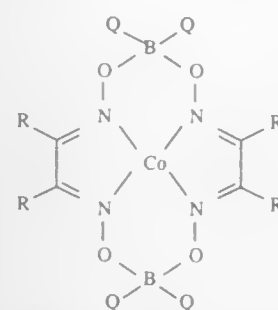
Claims priority, application United Kingdom, Dec. 20, 1993, 9325950; Oct. 11, 1994, 9420448

Int. Cl.<sup>6</sup> C08F 4/12; 4/80; 20/18; C07F 5/02

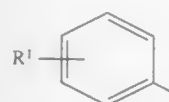
U.S. Cl. 526—131

17 Claims

1. A process for the free-radical polymerization of at least one olefinically unsaturated monomer in the presence of a compound for effecting molecular weight control, wherein the molecular weight control compound is a Coll chelate of the following formula I:

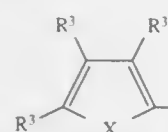


wherein each group R is an organic group and each group R is the same organic group as each other group R, which group R is selected from  
(a) the group



wherein R<sup>1</sup> is a C<sub>1-12</sub> alkoxy group; and

(b) the group



(XI)

or corresponding compounds in which at least one of the 5-membered ring groups is joined at the 3 position instead of the 2 position (as shown above in XI) in which case R<sup>3</sup> is attached to a 2-position;

wherein each R<sup>3</sup> is selected independently, from hydrogen, C<sub>1-12</sub> alkyl, optionally substituted C<sub>6-10</sub> aryl, OH, OR<sup>2</sup>, NH<sub>2</sub>, NHR<sup>2</sup>, NR<sup>2</sup><sub>2</sub>, SO<sub>3</sub>H, SO<sub>3</sub>M where M is a cationic radical, SO<sub>3</sub>R<sup>2</sup>, SO<sub>2</sub>NH<sub>2</sub>, SO<sub>2</sub>NHR<sup>2</sup>, CO<sub>2</sub>H, CO<sub>2</sub>R<sup>2</sup>, NO<sub>2</sub>, CN, C(=O)H, C(=O)R<sup>2</sup>, halogen, SH, and SR<sup>2</sup>, wherein R<sup>2</sup> is a C<sub>1-12</sub> alkyl or (CH<sub>2</sub>CH<sub>2</sub>—O)<sub>n</sub>T where n is 1 to 40 and T is H or a capping group selected from C<sub>1-10</sub> alkyl, C<sub>1-11</sub> aryl and (meth)acryloyl and wherein each X is selected, independently from O, S, NH and NR<sup>4</sup> where R<sup>4</sup> is C<sub>1-6</sub> alkyl, C<sub>6-10</sub> aryl or C<sub>6-10</sub> cycloalkyl, and each group Q is independently selected from F, Cl, Br, OH, C<sub>1-12</sub> alkoxy and C<sub>1-12</sub> alkyl.

5,770,666

## ORGANIC TRANSITION METAL COMPOUND AND PROCESS FOR THE PREPARATION OF POLYOLEFIN USING SAME

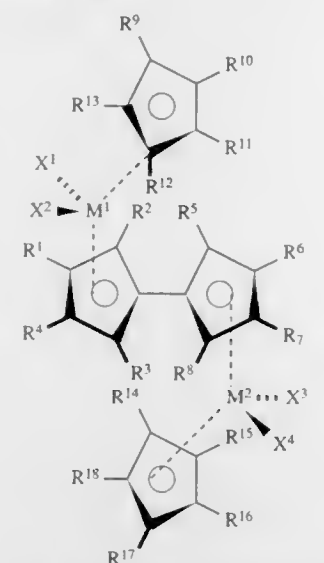
Satoshi Hamura, Toru Yoshida, and Morihiko Sato, all of Mie, Japan, assignors to Tosoh Corporation, Shinnanyo, Japan  
Filed Dec. 7, 1995, Ser. No. 568,518

Claims priority, application Japan, Dec. 8, 1994, 6-305102  
Int. Cl.<sup>6</sup> C08F 4/643

U.S. Cl. 526—134

8 Claims

1. An organic transition metal compound, represented by the following formula (1):



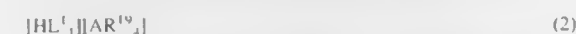
(1)

wherein M<sup>1</sup> and M<sup>2</sup>, which may be the same or different from each other, each represents a transition metal atom selected from the group consisting of Ti, Zr and Hf; R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup> and R<sup>8</sup>, which may be the same or different from each other, each represents a hydrogen atom, a C<sub>1-10</sub> hydrocarbon group or a C<sub>1-10</sub> alkylsilyl group and may be connected to each other to form rings, with the proviso that at least one of R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup> and R<sup>8</sup> is not a hydrogen atom; R<sup>9</sup>, R<sup>10</sup>, R<sup>11</sup>, R<sup>12</sup>, R<sup>13</sup>, R<sup>14</sup>, R<sup>15</sup>, R<sup>16</sup>, R<sup>17</sup> and R<sup>18</sup>, which may be the same or different from each other, each represents a hydrogen atom, a C<sub>1-10</sub> hydrocarbon group or a C<sub>1-10</sub> alkylsilyl group and may be connected to each other to form rings; and X<sup>1</sup>, X<sup>2</sup>, X<sup>3</sup> and X<sup>4</sup>, which may be the same or different from each other, each represents a hydrogen atom, a C<sub>1-10</sub> hydro-

carbon group, a C<sub>1-10</sub> alkoxy group, a C<sub>1-10</sub> alkylamino group, a C<sub>1-10</sub> alkylsilyl group or a halogen atom.

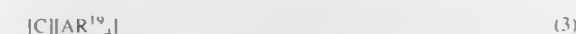
2. A polymerization catalyst, comprising an organic transition metal compound of claim 1, an organic aluminum compound, and at least one compound selected from the group consisting of:

a protonic acid represented by the following formula (2):



wherein H represents a proton; L<sup>1</sup>'s each independently represents a Lewis base; l represents a number of more than 0 to not more than 2; A represents a boron atom or a gallium atom; and R<sup>19</sup>'s each independently represents a C<sub>6-20</sub> halogen-substituted aryl group;

a Lewis acid represented by the following formula (3):



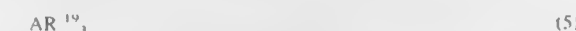
wherein C represents a carbonium cation or a tropylium cation; A represents a boron atom or a gallium atom; and R<sup>19</sup>'s each independently represents a C<sub>6-20</sub> halogen-substituted aryl group;

an ionized ionic compound represented by the following formula (4):



wherein D represents a cation of a metal selected from metals of the groups 1, 2, 8, 9, 10, 11 and 12 in the Periodic Table; A represents a boron atom or a gallium atom; R<sup>19</sup>'s each independently represents a C<sub>6-20</sub> halogen-substituted aryl group; L<sup>2</sup>'s each represents a Lewis base or a cyclopentadienyl group; and m represents a number of from not less than 0 to not more than 2; and

a Lewis-acid compound represented by the following formula (5):



wherein A represents a boron atom or gallium atom; and R<sup>19</sup>'s each independently represent a C<sub>6-20</sub> halogen-substituted aryl group.

3. A process for the preparation of a polyolefin, which comprises polymerizing an olefin in the presence of the polymerization catalyst of claim 2.

5,770,667

## FUNCTIONAL COPOLYMERS OF LOW MOLAR MASS, PROCESSES FOR THEIR PREPARATION, AND THEIR USE

Ulrich Epple, and Annegret Bittner, both of Wiesbaden, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 29, 1995, Ser. No. 564,800

Claims priority, application Germany, Dec. 1, 1994, 44 2769.7

Int. Cl.<sup>6</sup> C08F 2/00; 14/00; 20/54; 56/36; 20/10; 18/04

U.S. Cl. 526—213

29 Claims

1. A process for the preparation of a functional polymer of low molar mass, which comprises

initially charging a first quantity M1 of a mixture comprising at least one component selected from olefinically unsaturated monomers B and compounds A which are not themselves copolymerizable but which are able to react with at least one of the monomers B to form a copolymerizable addition compound.

metering in prior to or during polymerization a second quantity M2 of a mixture whose composition can be identical to or different from that of the first mixture M1 and which comprises at least one component selected from olefinically unsaturated monomers B and compounds A.

initiating polymerization by use of a polymerization initiator and optionally a chain transfer agent.

5,770,668

Patent Not Issued For This Number

5,770,669

## SILICONE-CONTAINING POLYMER HAVING OXYGEN PERMEABILITY SUITABLE FOR OPHTHALMIC APPLICATIONS

J. Richard Robertson, Alpharetta, and Cheryl R. Allen, Berkeley Lake, both of Ga., assignors to CIBA Vision Corporation, Duluth, Ga.

Continuation-in-part of Ser. No. 349,646, Dec. 5, 1994, abandoned. This application Apr. 10, 1996, Ser. No. 630,802

Int. Cl.<sup>6</sup> C08F 30/08

U.S. Cl. 526—279

24 Claims

1. A copolymer having high oxygen permeability, ocular biocompatibility and visual clarity, said copolymer being formed from monomers comprising:

- 50 to 95 percent by weight vinyl reactive silicone having up to 20 silicon atoms; and
- 5 to 50 percent by weight divinyl polyalkylene glycol, wherein said copolymer is formed in the substantial absence of addition cross-linking agents, and wherein said copolymer has a Dk/t of at least about 87 barrers/mm.

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## ALLYL PEROXIDE CHAIN TRANSFER AGENTS

Luc Louis Theophile Vertommen, Westervoort; John Meijer, Deventer, both of Netherlands, and Bernard Jean Maillard, Pessac, France, assignors to E.I. duPont de Nemours & Co., Wilmington, Del.

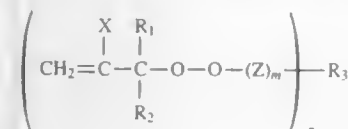
Division of Ser. No. 857,916, May 15, 1992, Pat. No. 5,708,104. This application May 1, 1997, Ser. No. 847,217. Claims priority, application European Pat. Off., Nov. 15, 1989, 892028895.

Int. Cl.<sup>6</sup> C08F 20/18; 18/04; 36/04; 20/44; 12/08; 210/00; 4/36

U.S. Cl. 528—328

6 Claims

1. A copolymer produced by radically copolymerizing monomers in the presence of an effective amount of one or more peroxides represented by the following formula:

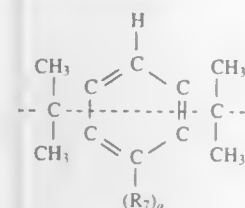


wherein

n is an integer from 2-4,

R<sub>1</sub> and R<sub>2</sub> may be the same or different and are selected from the group consisting of hydrogen and lower alkyl or R<sub>1</sub> and R<sub>2</sub> may combine to form a C<sub>5</sub>-C<sub>7</sub> aliphatic ring, R<sub>3</sub> has a valency of n and

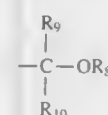
when n=2, R<sub>3</sub> is an alkylene group having 8-12 carbon atoms, an alkynylene group having 8-12 carbon atoms or a group of the general formula:



wherein

q=0 or 1, and

R<sup>7</sup> is an isopropenyl group, a 2-hydroxyisopropyl group, and an isopropyl group:



wherein R<sub>8</sub>, R<sub>9</sub> and R<sub>10</sub> are independently selected from the group consisting of alkyl, alkenyl and aryl groups all of which may be optionally substituted with one or more of hydroxyl, amino, epoxy and carboxy groups, hydrogen, or two of R<sub>8</sub>, R<sub>9</sub> and R<sub>10</sub> may combine to form a ring; or the group —COOR<sup>6</sup> where R<sup>6</sup> is hydrogen or an optionally substituted alkyl, alkenyl or aryl group; and

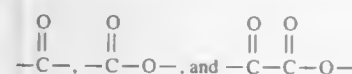
when n=3, R<sub>3</sub>=1,2,4-triisopropylbenzene-α,α',α"-triyl; and for n=2-4,

R<sub>3</sub> can be a silicon-containing group and

X is an electron withdrawing group and together with R<sub>1</sub>, may combine to form a C<sub>5</sub>-C<sub>7</sub> aliphatic ring,

m is 0 or 1 and

Z is selected from the group consisting of



5,770,671

## PROCESS FOR POLYMERIZING ISOCYANATES

Hartmut Nefzger, New Martinsville, W. Va., and Bernd Quiring, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 1, 1997, Ser. No. 905,256

Claims priority, application Germany, Aug. 7, 1996, 196 31 859.9

Int. Cl.<sup>6</sup> C08G 18/22

U.S. Cl. 528—56

6 Claims

1. A process for polymerizing isocyanates, comprising the step of polymerizing aliphatic and/or aromatic isocyanates in the presence of metallocenes having the general formula



wherein

M represents nickel or cobalt and

L represents a cyclopentadienyl, indenyl, naphthalene or benzene residue optionally substituted individually or in a multiple manner and whereby, the ligands L may be bridged by one or more hydrocarbon bridges with 2 to 4 carbon atoms at temperatures between 20° and 220° C., optionally subject to increased or reduced pressure and optionally, in the presence of an inert organic solvent, the metallocenes being used in an amount of 5 to 50,000 ppm relative to the amounts of isocyanates used.

5,770,672

## CATALYST FOR LOW TEMPERATURE CURE OF BLOCKED ISOCYANATES

Melvin H. Gitlitz, Berwyn, and Sri R. Seshadri, Newtown, both of Pa., assignors to Elf Atochem North America, Inc., Philadelphia, Pa.

Filed Apr. 3, 1997, Ser. No. 826,603

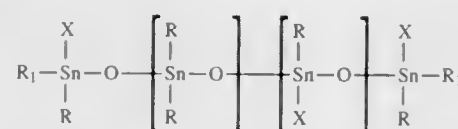
Int. Cl.<sup>6</sup> C08G 18/24

U.S. Cl. 528—58

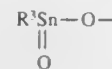
34 Claims

1. A curable coating composition comprising:

- a blocked isocyanate;
- a functional component containing at least one active hydrogen and reactive with said blocked polyisocyanate; and
- a polystannoxane catalyst for the reaction of said blocked polyisocyanate with said functional component, of the formula:



wherein each R is the same or different, and independently selected from an alkyl group having 1 to 20 carbon atoms, and an aromatic group; each X is the same or different and independently selected from halogen, hydroxyl, alkoxy, carbonate, phosphate, phosphinate, isocyanate, sulfonate, carboxylic, acyloxy, a mono organotin group of the formula:



in which R<sup>3</sup> is selected from among the same group as R, or a tri organotin group of the formula (R<sup>3</sup>)<sub>3</sub>SnO— in which each R<sup>3</sup> is selected from among the same group as R; each R<sub>1</sub> is the same or different and selected from among the same groups as R or X; n is an integer from 1 to 20, m is an integer from zero to 19, and the sum of n plus m is an integer from 3 to 20.

5,770,673

## NON-SAGGING, LIGHT STABLE POLYURETHANE COMPOSITIONS, A PROCESS FOR PRODUCING THEM, AND THEIR USE AS SEAM SEALANTS

Peter H. Markusch, McMurray, Pa.; Robert L. Cline, Paden City, W. Va., and A. M. Sarpeshkar, Upper St. Clair, Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

Filed Apr. 10, 1996, Ser. No. 630,660

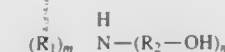
Int. Cl.<sup>6</sup> C08G 18/48

U.S. Cl. 528—61

11 Claims

1. A non-sagging, light stable polyurethane composition comprising the reaction product of:

- a liquid hexamethylene diisocyanate adduct having a functionality of at least 2.5, an NCO group content of 12 to 25% by weight, a viscosity of at least 50 mPa.s and no more than 20,000 mPa.s at 25° C., and a monomeric diisocyanate content of less than 1% by weight, and being modified by the presence of one or more uretdione groups, isocyanurate groups, allophanate groups, biuret groups, or mixtures thereof; and
- an isocyanate-reactive component comprising:
  - from 70 to 96% by weight, based on the weight of component b), of at least one organic compound containing hydroxyl groups, and having a functionality of from 2 to 4, and a molecular weight of from 400 to 4,000,
  - from 2 to 15% by weight, based on the weight of component b), of at least one aliphatic or alicyclic diamine having a molecular weight of from 60 to 300 and being selected from the group consisting of primary diamines, secondary diamines and mixtures thereof, and
  - from 2 to 15% by weight, based on the weight of component b), of at least one alkanolamine having a molecular weight of from 60 to 300 and corresponding to the general formula:



wherein:

- R<sub>1</sub> represents a hydrogen atom or an alkyl group containing from 1 to 4 carbon atoms,  
 R<sub>2</sub> represents an alkylene group containing from 2 to 30 carbon atoms which can be linked by ether groups  
 m represents 0 or 1,  
 n represents 1 or 2, and  
 m+n equals 2;

with the proviso that at least 10 equivalents of the isocyanate-reactive hydrogen in said isocyanate-reactive component are present in the form of amino groups being derived from said alkanolamine and diamine components.

5,770,674

## METHOD OF PRODUCING GASKETS FROM POLYURETHANE/UREA COMPOSITIONS AND GASKETS PRODUCED THEREFROM

Ronald A. Cageao, Beaver, Pa.; A. Donald Meltzer, Brecksville, Ohio, and Brian R. Suddaby, Pittsburgh, Pa., assignors to Bayer Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 484,402, Jun. 7, 1995, abandoned. This application Nov. 5, 1996, Ser. No. 744,037

Int. Cl.<sup>6</sup> C08G 18/79; 18/40; 18/48; B65D 53/06

U.S. Cl. 528—73

15 Claims

1. In a method of forming a gasket of a polyurethane/urea composition along one or more edges of a substrate, comprising placing at least a portion of a substrate in a mold, injecting a solidifiable polyurethane/urea composition into a cavity space defined between the surface of said edge(s) of said substrate and the internal surface of said mold, and removing said substrate from said mold after solidification of said polyurethane/urea composition, the improvement wherein said polyurethane/urea composition comprises:

A) a (cyclo)aliphatic polyisocyanate having a viscosity of less than about 25,000 mPa.s at 25° C. and an average NCO functionality of 2.0 to 4.0,

with

B) an isocyanate-reactive component comprising:

- from about 60 to 99% by weight, based on the weight of isocyanate-reactive components, of at least one compound having an average functionality of from 1 to 8 and a number average molecular weight of from about 401 to 10,000, and containing at least one of the functional groups selected from the group consisting of hydroxyls, amines, imines and mixtures thereof,
  - from about 1 to 40% by weight, based on the weight of isocyanate-reactive components, of an organic chain extender having a number average molecular weight of from 61 to 400, an average functionality of about 2, and being selected from the group consisting of alcohols, primary amines, secondary amines, aminoalcohols and mixtures thereof,
  - from about 0 to 15% by weight, based on the weight of isocyanate-reactive components, of an organic chain terminator having a molecular weight of from 32 to 400, an average functionality of about 1, and being selected from the groups consisting of alcohols, primary amines, secondary amines, or mixtures thereof, and
  - from about 0 to 20% by weight, based on the weight of isocyanate-reactive components, of an organic crosslinker having a molecular weight of from 90 to less than 400, an average functionality of greater than 2, and being selected from the group consisting of organic alcohols, organic amines, and mixtures thereof in the presence of
- C) from 0.1 to 10% by weight, based on the weight of isocyanate-reactive components, of at least one catalyst, wherein the reaction mixture is processed via the one-shot process at an isocyanate index of 80 to 115, and said A), b1), b2), and, optionally, b3) and b4) are selected such that the resultant polyurethane/urea composition has a crosslink density of at least 0.3 moles/kg.

5,770,675

## CYCLIC OLIGOMERS COMPRISING M-PHENYLENE ISOPHTHALAMIDE AND POLYMERS THEREOF

Young Hwan Kim, Hockessin, and Wesley Memeger, Jr., Wilmington, both of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

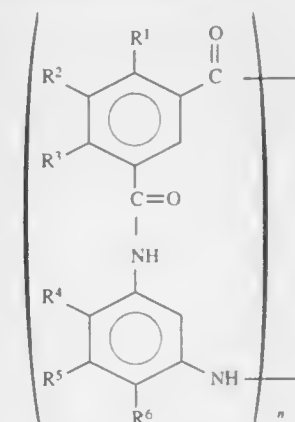
Filed Jun. 18, 1996, Ser. No. 664,898

Int. Cl.<sup>6</sup> C08G 73/00

U.S. Cl. 528—170

22 Claims

1. A cyclic oligomer of the formula



wherein:

- n is an integer ranging from 3 to 12;  
 each of R<sup>1</sup>, R<sup>2</sup>, and R<sup>3</sup> is independently hydrogen, halogen, hydrocarbyl containing 1 to 6 carbon atoms, or nitro; and  
 each of R<sup>4</sup>, R<sup>5</sup>, and R<sup>6</sup> is independently hydrogen, halogen, or hydrocarbyl containing 1 to 6 carbon atoms.



5,770,676

**PROCESS FOR CONTROLLING MORPHOLOGY AND IMPROVING THERMAL MECHANICAL PERFORMANCE OF HIGH PERFORMANCE INTERPENETRATING AND SEMIINTERPENETRATING POLYMER NETWORKS**

Ruth H. Pater, Yorktown, Va., and Marion G. Hansen, Knoxville, Tenn., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

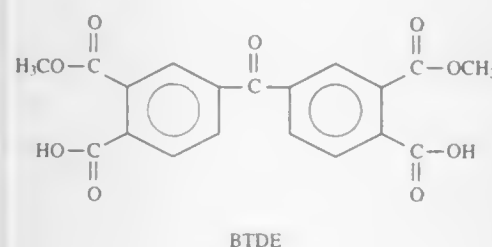
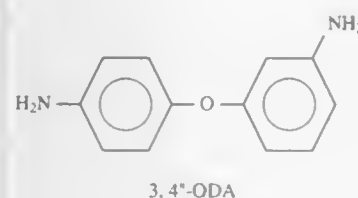
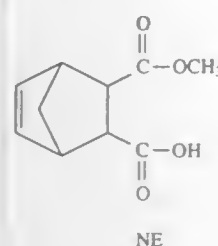
Continuation of Ser. No. 487,790, Jun. 7, 1995, which is a continuation of Ser. No. 215,792, Mar. 11, 1994, which is a continuation-in-part of Ser. No. 679,381, Apr. 2, 1991, abandoned. This application Apr. 10, 1996, Ser. No. 630,814

Int. Cl.<sup>6</sup> C08G 73/10; 69/26

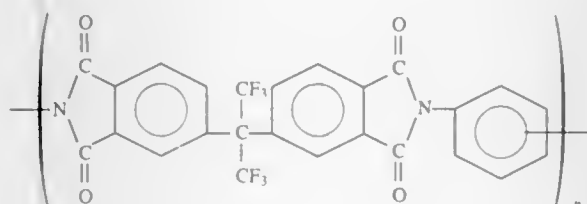
U.S. Cl. 528—188

20 Claims

1. A semi-IPN comprising a thermosetting and a thermoplastic polyimide component, wherein the thermosetting polyimide component is prepared from the following monomer reactants:



and the thermoplastic polyimide component has the following repeating unit:



5,770,677

**PROCESS FOR THE REMOVAL OF ALKALI FROM CONDENSATION RESINS**

Srinivasan Sridhar, Marl; Ulrich Diester, Offen, and Christian Rohde, Marl, all of Germany, assignors to Huels Aktiengesellschaft, Marl, Germany

Filed Feb. 10, 1997, Ser. No. 797,124

Claims priority, application Germany, Feb. 10, 1996, 196 04 903.2

Int. Cl.<sup>6</sup> C08G 2/18

U.S. Cl. 528—227

18 Claims

1. A process for the preparation of a condensation resin of low catalyst content from a ketone and an aldehyde comprising reacting said ketone and said aldehyde in a polycondensation reaction in an aqueous medium in the presence of a basic catalyst to form said resin, said resin being contaminated with alkali ions from said basic catalyst, and then exposing the resin to an electrical field in a cell demarcated by ion-selective membranes permeable to the alkali ions whereby alkali ions are caused to migrate out of the resin through the membranes.

5,770,678

**POLYMERIZATION OF, AND DEPOLYMERIZATION TO, CYCLIC ETHERS USING SELECTED METAL COMPOUND CATALYSTS**

Neville Everton Drysdale, Newark; Richard Edmund Bockrath, Wilmington; Norman Herron, Newark, and Joel David Citron, Wilmington, all of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 424,675, Apr. 19, 1995, Pat. No. 5,635,585, which is a division of Ser. No. 283,108, Jul. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 198,024, Feb. 17, 1994, abandoned, Ser. No. 141,160, Oct. 21, 1993, abandoned, Ser. No. 93,243, Jul. 16, 1993, abandoned, Ser. No. 93,119, Jul. 16, 1993, abandoned, Ser. No. 21,368, Feb. 23, 1996, abandoned, and Ser. No. 964,313, Oct. 21, 1992, abandoned. This application Dec. 9, 1996, Ser. No. 762,813

Int. Cl.<sup>6</sup> C08G 4/00; 65/20; 65/26; 65/16

U.S. Cl. 528—233

36 Claims

1. A process for the polymerization of cyclic ethers, comprising, contacting, at a temperature of about -80° C. to about 130° C., one or more tetrahydrofurans, oxepanes, 1,3-dioxolanes or 1,3,5-trioxanes with a catalytic system consisting essentially of a compound of the formula MZ<sub>2</sub>Q<sub>n</sub>, and an accelerator selected from the group consisting of carboxylic acids whose pKa in water is less than 6, carboxylic anhydrides and acyl halides, wherein:

M is a metal selected from the group consisting of niobium, tungsten, yttrium, the rare earth metals, zirconium, hafnium, molybdenum, tantalum, rhenium, ruthenium, osmium, rhodium, iridium, palladium, platinum, gold, cadmium, germanium, tin, lead, arsenic, antimony and bismuth;

at least one of Z is an anion of the formula R<sup>2</sup>SO<sub>3</sub><sup>-</sup>, wherein R<sup>2</sup> is perfluoroalkyl containing 1 to 12 carbon atoms or part of a fluorinated polymer wherein the carbon atoms alpha and beta to the sulfonate group are together bonded to at least four fluorine atoms, or tetraphenylborate, and the remainder of Z is oxo or one or more monovalent anions;

s is 2 when M is rhodium, iridium, palladium, platinum, or cadmium;

s is 3 when M is yttrium, a rare earth metal, arsenic, antimony, bismuth, gold, ruthenium, or osmium;

s is 4 when M is zirconium, hafnium, molybdenum, germanium, tin, or lead;

s is 5 when M is rhenium, niobium or tantalum;

s is 6 when M is tungsten;

Q is a neutral ligand;

t is 0 or an integer of 1 to 6;

and provided that each oxo group present as part of Z is considered to account for two of s.

5,770,679

**POLYAMIDE RESIN COMPOSITIONS AND PRODUCTION PROCESS**

Ryuichi Hayashi, Tokyo, and Reiko Koshida, Kanagawa, both of Japan, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

PCT No. PCT/US93/12281, § 371 Date Jun. 13, 1996, § 102(e) Date Jun. 13, 1996, PCT Pub. No. WO95/16750, PCT Pub. Date Jun. 22, 1995

PCT Filed Dec. 16, 1993, Ser. No. 663,151

Int. Cl.<sup>6</sup> C08L 77/06; 79/08

U.S. Cl. 528—310

4 Claims

1. A polyamide resin composition consisting essentially of (A) from 10 to 89% by weight of a polyamide resin having an amine end group concentration of 60×10<sup>-6</sup> to 200×10<sup>-6</sup> mol/g;

(B) from 1 to 30% by weight of at least one elastomer selected from the group consisting of

(a) elastomers of ethylene/propylene/dienes;

(b) elastomers of ethylene/propylene/dienes graft-modified by a carboxylic acid or carboxylic anhydride;

(c) elastomers of ethylene/unsaturated carboxylic acid/unsaturated carboxylic acid esters, said elastomers having unsaturated monomers which are reactable to polyamide and

(d) elastomers of ethylene/unsaturated carboxylic acid/unsaturated carboxylic acid esters graft-modified by unsaturated epoxide; and

(C) from 10 to 60% of a polyolefin that is a copolymer of ethylene and olefin, said polyolefin being noncrystalline and having a cyclic structure and a glass transition temperature from about 100° to about 190° C.

5,770,680

**AQUEOUS DISPERSIONS OF POLYAMIDES**

Stephen A. Fischer, 307 Anderson Rd., Yardley, Pa. 19067; David I. Devore, 112 Alberts Way, Langhorne, Pa. 19047; Kartar S. Arora, 106 Harrison Forge Ct., Chalfont, Pa. 18914, and Reimar Heucher, 1101 Ashford La., Westmont, Ill. 60559

Filed Oct. 25, 1996, Ser. No. 738,402

Int. Cl.<sup>6</sup> C08G 69/08; 73/10; C08L 47/08

U.S. Cl. 528—310

67 Claims

1. A process of preparing a dispersion of a polyamide in water, said process comprising:

dissolving a polyamide having an amine value of greater than about 2 in an organic solvent to form a solution of said polyamide in said solvent, said polyamide and said solvent being at a temperature below the softening point of said polyamide during said dissolving, said solution further comprising a surfactant and an inorganic alkaline material, and wherein said polyamide has a weight average molecular weight greater than about 35,000,

adding sufficient water containing an acid to said solution with mixing to form an oil-in-water dispersion, the temperature of said solution and said water being below the softening point of said polyamide during said adding, the amount of said acid being sufficient to neutralize a portion of said inorganic alkaline material, but insufficient to coagulate said polyamide from the resulting oil-in-water dispersion, and removing at least a major amount of said organic solvent from said oil-in-water dispersion.

5,770,681

**MODIFIED BISIMIDE COMPOSITIONS**

Larry Steven Corley, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 545,745, Jun. 29, 1990, Pat. No. 5,086,139. This application May 30, 1991, Ser. No. 707,717

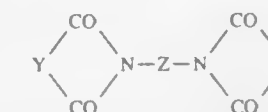
Int. Cl.<sup>6</sup> C08G 73/10; C08F 22/40

U.S. Cl. 528—322

15 Claims

1. A process comprising:

(1) providing a monomer mixture comprising (a) a bisimide of an unsaturated dicarboxylic acid which bisimide can be represented by the formula



in which Y is a substituted or unsubstituted divalent group containing at least 2 carbon atoms and a carbon-carbon double bond, and Z is a divalent linking group, and (b) a triene which contains both a conjugated diene moiety capable of unhindered Diels-Alder reaction with a Y group of the bisimide and a carbon-carbon double bond separated from the conjugated pair by a divalent linking group; and

(2) subjecting said monomer mixture to a non-gelling elevated temperature for a time sufficient to increase the viscosity of the mixture and to enhance the solubility thereof in an organic solvent.

5,770,682

**METHOD FOR PRODUCING POLYLACTIC ACID**

Hitomi Ohara, Kyoto; Seiji Sawa, Ohtsu; Masahiro Ito; Yasuhiro Fujii, both of Kyoto; Masaaki Oota, Mukou, and Hideshi Yamaguchi, Chohu, all of Japan, assignors to Shimadzu Corporation, Kyoto, Japan

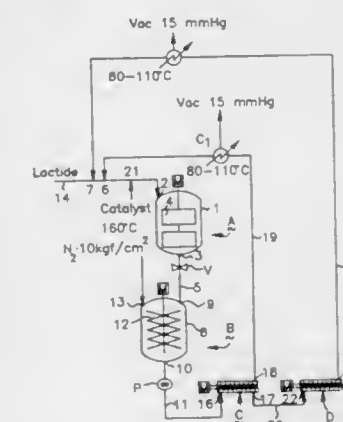
Filed Jul. 11, 1996, Ser. No. 678,328

Claims priority, application Japan, Jul. 25, 1995, 7-188796; Nov. 30, 1995, 7-312180; Nov. 30, 1995, 7-312181; Nov. 30, 1995, 7-312182

Int. Cl.<sup>6</sup> C08G 63/08

U.S. Cl. 528—354

18 Claims



1. A method for producing a polylactic acid, comprising the steps of:

carrying out a ring-opening polymerization of lactide in the presence of a catalyst for ring-opening polymerization of the lactide to give polylactic acid;

adding a compound capable of inactivating the catalyst to the resulting reaction mixture; and

reducing pressure in a reactor containing the reaction mixture, and/or allowing an inert gas to pass through the reactor to remove unchanged lactide from the polylactic acid.

5,770,683

PREPARATION PROCESS OF  
POLYHYDROXYCARBOXYLIC ACID

Yasunori Yoshida, Kanagawa-ken; Michihiko Miyamoto, Fukuoka-ken; Shoji Obuchi, Kanagawa-ken; Kan Ideda, Fukuoka-ken, and Masahiro Ohta, Kanagawa-ken, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

Filed Oct. 20, 1995, Ser. No. 546,311

Claims priority, application Japan, Nov. 2, 1994, 6-269512; Nov. 7, 1994, 6-272084; Nov. 17, 1994, 6-283609; Nov. 28, 1994, 6-292775; Dec. 7, 1994, 6-303410; Dec. 7, 1994, 6-303411; Dec. 21, 1994, 6-318188

Int. Cl. C08G 63/06

U.S. Cl. 528—361

24 Claims

1. A preparation process of polyhydroxycarboxylic acid comprising conducting dehydration polycondensation of hydroxycarboxylic acid or an oligomer of the same in a reaction mixture containing said hydroxycarboxylic acid or the oligomer of the same and an organic solvent substantially in the absence of water to give polyhydroxycarboxylic acid having an weight average molecular weight of 50,000 or more, successively mixing the reaction mixture containing said polyhydroxycarboxylic acid with at least one of the binder selected from the group consisting of (1) polyisocyanate compound, (2) polybasic acid anhydride, (3) cyclic imino ester, (4) cyclic imino ether, (5) aromatic hydroxycarboxylic acid, (6) polyamino compound, (7) polyhydric alcohol, (8) epoxy compound, (9) polyfunctional aziridine compound, (10) lactam, (11) lactone, and (12) diethylene glycol bischloroformate and reacting to obtain polyhydroxycarboxylic acid having a weight average molecular weight greater than the weight average molecular weight of the polyhydroxycarboxylic acid prior to the reaction with the binder and being 100,000 or more.

5,770,684

## CATALYST COMPOSITIONS

Nevin John Stewart, Guildford, and Stephen John Dossett, Aldershot, both of United Kingdom, assignors to BP Chemicals Limited, London, England

Filed Aug. 13, 1996, Ser. No. 696,344

Claims priority, application United Kingdom, Aug. 21, 1995, 9517105

Int. Cl. C08G 67/02

U.S. Cl. 528—392

9 Claims

1. A catalyst composition prepared by reacting together:  
(a) a source of a Group VIII metal,  
(b) a bidentate phosphine ligand having at least two phosphorus atoms joined by a bridging group of the formula  $-NR^2(CX)NR^2$  where  $X=O, S$  or  $Se$ , each  $R^2$  is the same or different and is a hydrogen or hydrocarbyl group, and  
(c) a promoter.

5,770,685

PHOTOLABILE POLYMERS WITH TRIAZENEDOR/AND  
PENTAZADIENE BUILDING

Jürgen Stebani, Krefeld; Oskar Nuyken, München; Peter Sluka, Weilheim, and Peter Finckh, Diessen, all of Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

Continuation of Ser. No. 221,796, Apr. 1, 1994, abandoned.

This application Feb. 26, 1996, Ser. No. 606,682

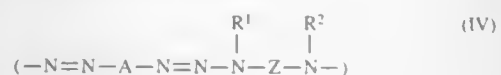
Claims priority, application Germany, Apr. 6, 1993, 43 11253.6

Int. Cl. C08G 83/00

U.S. Cl. 528—422

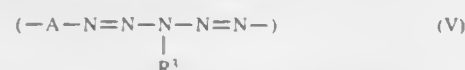
5 Claims

1. Triazene polymer with the linking unit



or

pentazadiene polymer with the linking unit



in which A is the residue of a bifunctional aromatic or heteroaromatic amino compound after diazotization and subsequent reaction of the two amino groups, Z represents a non-aromatic hydrocarbon group which is unsubstituted or substituted with ether or an alkylamino bridge or a polymeric residue derived from an amino-functional polymer selected from the group consisting of polyethylenes, poly(allyl)amines, polyethers, polyethylenimines, polysaccharides and polypeptides,  $R^1$ ,  $R^2$ , and  $R^3$  are the same or different and each represents hydrogen, an aliphatic, unsaturated or/and aromatic hydrocarbon group which is unsubstituted or substituted with aryl, heteroaryl, o-alkyl, carboxyl groups, halogen, CN, thioether, dialkyl-amino groups, sulfonic acid groups,  $C_1-C_4$  alkyl,  $C_1-C_4$  alkoxy, aryloxy,  $N=N$ -aryl, or carboxylic acid groups or a polymeric residue derived from an amino-functional polymer selected from the group consisting of polyethylenes, poly(allyl)amines, polyethers, polyethylenimines, polysaccharides and polypeptides,

wherein said polymer contains at least two triazene or pentazadiene groups.

5,770,686

## ICAM-RELATED PROTEIN FRAGMENTS

W. Michael Gallatin, and Rosemary Vazeux, both of Seattle, Wash., assignors to ICOS Corporation, Bothell, Wash.

Division of Ser. No. 425,870, Apr. 20, 1995, abandoned, which is a continuation of Ser. No. 102,852, Aug. 5, 1993, abandoned, which is a continuation-in-part of Ser. No. 009,266, Jan. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 894,061, Jun. 5, 1992, abandoned, which is a continuation-in-part of Ser. No. 889,724, May 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 827,689, Jan. 27, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 474,368

Int. Cl. C07K 14/705

U.S. Cl. 530—300

5 Claims

2. An ICAM-R peptide fragment which specifically inhibits CD18-independent binding of ICAM-R to cells.  
4. An ICAM-R peptide fragment comprising amino acid residues 72 to 76, of SEQ ID NO: 1 which specifically inhibits CD18-dependent binding of ICAM-R to cells.

5,770,687

CONFORMATIONALLY CONSTRAINED BACKBONE  
CYCLIZED SOMATOSTATIN ANALOGS

Vered Hornik, Rehovot; Alon Seri-Levy, Jerusalem; Gary Gellerman, Jerusalem, and Chaim Gilon, Jerusalem, all of Israel, assignors to Peptor Limited, Rehovot, and Yissim Research Development Co. of Hebrew University of Jerusalem, Jerusalem, both of Israel

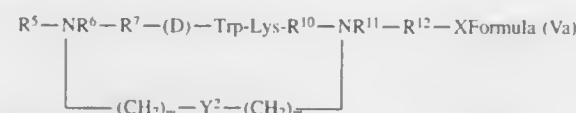
Continuation-in-part of Ser. No. 488,159, Jun. 7, 1995, and Ser. No. 569,042, Dec. 7, 1995. This application Jul. 31, 1996, Ser. No. 690,090

Int. Cl. C07K 7/64; A61K 38/04; 38/12

U.S. Cl. 530—311

17 Claims

1. A backbone cyclized somatostatin analog having the general Formula (Va):



wherein m and n are 1 to 5; X designates a carboxy terminal amide or alcohol;  $R^5$  is absent or is Gly, (D)- or (L)-Ala, Phe, Nal and  $\beta$ -Asp(Ind);  $R^6$  and  $R^{11}$  are independently Gly or (D)- or (L)-Phe;  $R^7$  is Phe or Tyr;  $R^{10}$  is absent or is Gly, Abu, Thr

or Val;  $R^{12}$  is absent or is Val, Thr or Nal, and  $Y^2$  is selected from the group consisting of amide, thioether, thioester and disulfide.

5,770,688

METHOD AND COMPOSITION FOR THE TREATMENT  
OF MAMMALIAN HIV INFECTION

Torben Saermark, Malmö, Sweden, and Volker Erfle, Munich, Germany, assignors to GSF-Forschungszentrum für Umwelt und Gesundheit GmbH, Oberschleissheim, Germany

Continuation of Ser. No. 33,200, Mar. 16, 1993, abandoned,

which is a continuation-in-part of Ser. No. 625,677, Dec. 7, 1990, abandoned. This application Jun. 6, 1995, Ser. No.

467,623

Claims priority, application Germany, Dec. 7, 1989, 39 40

526.5

Int. Cl. A67K 38/16

10 Claims

1. A method for inhibiting retroviral replication in mammalian cells, the method comprising:

administering a therapeutically-effective amount of melittin or one or more structural analogues thereof whereby virus replication in the retroviral infected cells is inhibited and/or growth of the retroviral infected cells is inhibited.

5,770,689

## HEPATITIS E VIRUS ORF Z PEPTIDES

Gregory R. Reyes, Palo Alto, Calif.; Daniel W. Bradley, Lawrenceville, Ga.; Jr-Shin Twu, Daly City, Calif.; Michael A. Purdy, Atlanta, Ga.; Albert W. Tam, San Francisco, Calif.; Krzysztof Z. Krawczynski, Tucker, Ga.; and Patrice O. Yarbough, Union City, Calif., assignors to Genelabs Technologies, Inc., Redwood City, Calif., and The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 870,985, Apr. 20, 1992, which is a continuation-in-part of Ser. No. 822,335, Jan. 17, 1992, abandoned, which is a continuation-in-part of Ser. No. 681,078, Apr. 5, 1991, abandoned, which is a continuation-in-part of Ser. No. 505,888, Apr. 5, 1990, abandoned, which is a continuation-in-part of Ser. No. 420,921, Oct. 13, 1989, abandoned, which is a continuation-in-part of Ser. No. 367,486, Jun. 16, 1989, abandoned, which is a continuation-in-part of Ser. No. 336,672, Apr. 11, 1989, abandoned, which is a continuation-in-part of Ser. No. 208,997, Jun. 17, 1988, abandoned. This application Jun. 7, 1995, Ser. No. 484,054

Int. Cl. A61K 38/00; 39/29; 39/00; C07K 5/00

U.S. Cl. 530—324

1 Claim

1. An isolated HEV peptide selected from the group consisting of peptides identified by the sequences SEQ ID NO:13, SEQ ID NO:14, SEQ ID NO:15, SEQ ID NO:16, SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, and SEQ ID NO:22.

5,770,690

## BAX OMEGA PROTEIN AND METHODS

Catherine Mastroni Bitler; Stephen Scott Bowersox, both of Menlo Park; Roberto Crea, San Mateo; Susan Dunham Demo, San Francisco; William A. Horne, San Diego, and Mei Zhou, Palo Alto, all of Calif., assignors to Neurex Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 495,042, Jun. 27, 1995, abandoned. This application Mar. 15, 1996, Ser. No. 616,732

Int. Cl. C07K 14/00; 7/00

U.S. Cl. 530—324

7 Claims

1. A substantially isolated Bax- $\omega$  polypeptide containing a region of at least seven consecutive amino acids that is identical to

a corresponding region of SEQ ID NO:13, said SEQ ID NO:13 consisting of amino acids 159–221 of SEQ ID NO: 9, said SEQ ID NO:9 encoding a full-length Bax- $\omega$  protein that is effective to inhibit apoptosis.

5,770,691

DISCRIMINATORY SUBSTRATES FOR MMP  
HYDROLYSIS

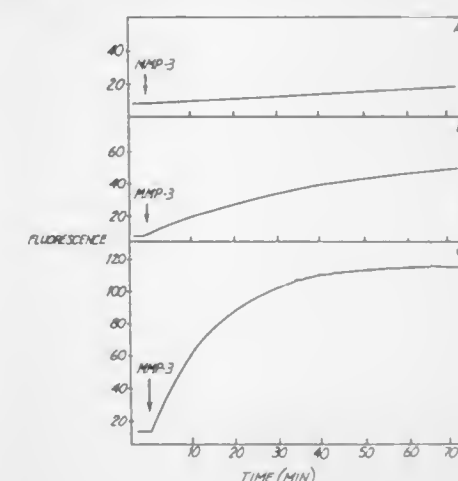
Gregg B. Fields, Brooklyn Park, Minn., and Hideaki Nagase, Fairway, Kans., assignors to Regents of the University of Minnesota, Minneapolis, Minn., and The University of Kansas Medical Center, Kansas City, Miss.

Filed Jun. 5, 1995, Ser. No. 464,337

Int. Cl. A61K 38/04; 38/00; 7/16; C12Q 1/37

U.S. Cl. 530—328

2 Claims



1. A peptide compound of the formula Mca-Arg-Pro-Lys-Pro-Tyr-Ala-Nva-Trp-Met-Lys(Dnp)-NH<sub>2</sub>.

5,770,692

CARBAMOYLATION OF AMINO GROUPS IN PEPTIDES  
VIA N-ARYLOXYCARBONYL INTERMEDIATES

Marc Anteunis, Welpengang, 12, B-9030 Mariakerke; Frank Becu, Gistelsteenweg, 440, B-8490 Jabbeke; Roland Callens, Varendrieskouter, 7, B-9031 Drongen, and Georges Blondeel, Hoezestraat, 10, B-9300 Aalst, all of Belgium

Continuation of Ser. No. 34,705, Mar. 19, 1993, abandoned. This application Jun. 22, 1994, Ser. No. 264,358

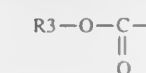
Claims priority, application Belgium, Mar. 20, 1992, 09200273

Int. Cl. C07K 1/107

U.S. Cl. 530—333

14 Claims

1. A method for producing a stereochemically preserved peptide containing at least one N-carbamoyl functional group comprising reacting an intermediate peptide containing one or more aryloxy-carbonyl groups consisting of a group of general formula



attached to the nitrogen atom of an amino functional group and in which  $R^3$  is selected from the group consisting of phenyl, naphthyl, tolyl, xylyl, mesityl, ethylphenyl, diethylphenyl, propylphenyl and isopropylphenyl with a compound of general formula  $R^1R^2NH$  in which  $R^1$  and  $R^2$  represent, independently of each other, hydrogen atoms, alkyl, cycloalkyl or aralkyl radicals, containing at most 12 carbon atoms, or in which  $R^1$  and  $R^2$  together form an alicyclic radical containing 3 to 6 carbon atoms, to produce said peptide.



5,770,693

## CALPAIN-INHIBITING PEPTIDE ANALOGS OF THE KININOGEN HEAVY CHAIN

Robert W. Colman, Moylan, Pa.; Harlan N. Bradford, Lindenwold, N.J., and Bradford A. Jameson, Philadelphia, Pa., assignors to Temple University-Of The Commonwealth System of Higher Education, Philadelphia, Pa.

Division of Ser. No. 385,391, Feb. 7, 1995, Pat. No. 5,663,294, which is a continuation of Ser. No. 109,854, Aug. 20, 1993, abandoned, which is a continuation of Ser. No. 719,051, Jun. 21, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 468,858

Int. Cl.<sup>6</sup> A61K 38/00;38/02; C07K 5/00;7/00

U.S. Cl. 530—333

16 Claims

1. A method of designing a peptide analog to domain 2 of human kininogen heavy chain comprising:

determining the distance between two parts of a molecular model of the kininogen heavy chain domain 2, at conformational equilibrium;

modifying the primary structure of the domain to restrict the distance between said two parts to the determined distance; and

synthesizing a peptide comprising said modified primary structure.

5,770,694

GENETICALLY ENGINEERED BPI VARIANT PROTEINS  
Randal W. Scott, Cupertino, and Marian N. Marra, San Mateo, both of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 567,016, Aug. 13, 1990, abandoned, and Ser. No. 681,551, Apr. 5, 1991, Pat. No. 5,171,739. This application Jul. 22, 1992, Ser. No. 915,720

Claims priority, application WIPO, Aug. 13, 1991, PCT/US91/05758

Int. Cl.<sup>6</sup> C07K 14/00;14/435; A61K 38/03;38/17

U.S. Cl. 530—350

2 Claims

1. A biologically active recombinant variant of bactericidal/permeability increasing protein (BPI) as shown in FIG. 23 (SEQ ID NO:17).

5,770,695

## BACILLUS THURINGIENSIS ISOLATES SELECTIVELY ACTIVE AGAINST CERTAIN COLEOPTERAN PESTS

Jewel M. Payne, San Diego, and Tracy Ellis Michaels, Escondido, both of Calif., assignors to Mycogen Corporation, San Diego, Calif.

Division of Ser. No. 101,863, Aug. 4, 1993, Pat. No. 5,427,786, which is a division of Ser. No. 977,386, Nov. 17, 1992, abandoned, which is a division of Ser. No. 771,964, Oct. 4, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 466,635

Int. Cl.<sup>6</sup> C07K 14/325

U.S. Cl. 530—350

1 Claim

1. A toxin from *Bacillus thuringiensis* isolate PS28Q2, wherein said toxin is free from naturally associated impurities, and wherein said toxin is active against a coleopteran pest selected from the group consisting of the genera *Hypera*, *Diabrotica*, and *Phyllotreta*.

5,770,696

## AUXILIARY PROTEINS FOR ENHANCING THE INSECTICIDAL ACTIVITY OF PESTICIDAL PROTEINS

Gregory W. Warren; Michael G. Koziel, both of Cary; Martha A. Mullins, Raleigh; Gordon J. Nye, Apex; Brian Carr; Nalini M. Desai, both of Cary; Kristy Kostichka, Durham; Nicholas B. Duck, Cary, and Juan J. Estruch, Durham, all of N.C., assignors to Novartis Corporation

Division of Ser. No. 463,483, Jun. 5, 1995, which is a continuation-in-part of Ser. No. 314,594, Sep. 28, 1994, which is a continuation-in-part of Ser. No. 218,018, Mar. 23, 1994, abandoned, which is a continuation-in-part of Ser. No. 37,057, Mar. 25, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 471,033

Int. Cl.<sup>6</sup> C07K 14/32

U.S. Cl. 530—350

6 Claims

1. An auxiliary protein isolated from *Bacillus* which enhances the insecticidal activity of a pesticidal protein, wherein said auxiliary protein is expressed during vegetative growth and has a molecular weight of about 50 kDa.

5,770,697

## PEPTIDES COMPRISING REPETITIVE UNITS OF AMINO ACIDS AND DNA SEQUENCES ENCODING THE SAME

Franco A. Ferrari, La Jolla, Calif.; Charles Richardson, Florence, Mont.; James Chambers, San Diego, Calif.; Stuart Causey, Palo Alto, Calif.; Thomas J. Pollock, San Diego, Calif.; Joseph Cappello, San Diego, Calif., and John W. Crissman, San Diego, Calif., assignors to Protein Polymer Technologies, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 175,155, Dec. 29, 1993, Pat. No. 5,641,648, which is a continuation-in-part of Ser. No. 53,049, Apr. 22, 1993, abandoned, which is a continuation of Ser. No. 114,618, Oct. 29, 1987, Pat. No. 5,243,038, which is a continuation-in-part of Ser. No. 927,258, Nov. 4, 1986, abandoned. This application Jun. 7, 1995, Ser. No. 477,509

Int. Cl.<sup>6</sup> A61K 38/17;38/39; C12P 21/02

U.S. Cl. 530—353

16 Claims

1. A recombinantly produced protein of from 30 kDa to 250 kDa comprising at least 50 number percent of amino acids of at least one naturally occurring repeating unit of a naturally occurring structural protein, wherein said repeating unit is from 3 to 20 amino acids in length and repeating units having the same amino acid sequence are tandemly repeated at least once in said recombinantly produced protein.

5,770,698

## PROCESS FOR THE PURIFICATION OF AQUEOUS EXTRACTS CONTAINING ALLERGENICALLY ACTIVE PROTEINS, EXTRACTS OBTAINABLE ACCORDING TO THIS PROCESS AS WELL AS THEIR USE

Lubertus Berrens, Utrecht, Netherlands, assignor to C.B.F. Leti S.A., Madrid, Spain

PCT No. PCT/NL92/00160, § 371 Date Aug. 14, 1995, § 102(e) Date Aug. 14, 1995, PCT Pub. No. WO94/06821, PCT Pub. Date Mar. 31, 1994

PCT Filed Sep. 21, 1992, Ser. No. 403,832

Int. Cl.<sup>6</sup> A61K 35/78; C07K 14/00

U.S. Cl. 530—379

9 Claims

1. A process for obtaining aqueous extracts containing allergenically active proteins which are substantially free of adherence to undesirable compounds comprising the steps of

a) preparing an aqueous extract containing allergenically active proteins to which undesirable non-allergenic compounds are adhered by electrostatic, hydrophobic or other physical forces; b) disrupting the electrostatic, hydrophobic or other physical forces under such conditions as to disadhere said non-allergenic compounds from said allergenically active proteins; and

c) collecting the resulting aqueous extract, containing allergenically active proteins which are substantially free from adherence to non-allergenic compounds.

5,770,699

## PROCESS FOR PRODUCTION OF INHIBITED FORMS OF ACTIVATED BLOOD FACTORS

Robert King, Fremont, Calif., assignor to COR Therapeutics, Inc., South San Francisco, Calif.

Continuation of Ser. No. 330,978, Oct. 28, 1994, Pat. No. 5,589,571. This application Dec. 30, 1996, Ser. No. 774,592

Int. Cl.<sup>6</sup> C07K 14/745;1/18; A61K 38/36; C12P 21/06

U.S. Cl. 530—381

31 Claims

1. A process for preparing a permanently inhibited form of an activated blood factor, comprising the steps of providing a partially purified preparation containing a blood factor, treating the partially purified preparation to convert the blood factor to an activated blood factor and to convert the activated blood factor to a permanently inhibited blood factor in a single step, and then recovering the resulting permanently inhibited activated blood factor.

5,770,700

## LIQUID FACTOR IX FORMULATIONS

Chandra Webb, Pelham, N.H., and Lawrence Bush, Tewksbury, Mass., assignors to Genetics Institute, Inc., Cambridge, Mass.

Filed Jan. 25, 1996, Ser. No. 591,332

Int. Cl.<sup>6</sup> A61K 47/00;38/48;38/36;47/26

U.S. Cl. 530—383

6 Claims

1. A factor IX composition comprising about:  
65 to 235 mM arginine, and  
5 to 50 mM citrate.

5,770,701

## PROCESS FOR PREPARING TARGETED FORMS OF METHYLTRITHIO ANTITUMOR AGENTS

William James McGahren, Demarest, N.J.; Martin Leon Sasser, Spring Valley, N.Y.; George A. Ellestad, Pearl River, N.Y.; Philip R. Hamann, Garnerville, N.Y.; Lois M. Hinman, North Tarrytown, N.Y., and Janis Upeslaci, Pomona, N.Y., assignors to American Cyanamid Company, Madison, N.J.

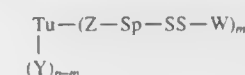
Continuation of Ser. No. 777,436, Oct. 11, 1991, abandoned, which is a continuation-in-part of Ser. No. 339,323, Apr. 14, 1989, abandoned, which is a continuation-in-part of Ser. No. 246,247, Sep. 21, 1988, abandoned, which is a continuation-in-part of Ser. No. 114,940, Oct. 30, 1987, abandoned. This application Oct. 26, 1994, Ser. No. 329,610

Int. Cl.<sup>6</sup> C07K 16/00; C07H 1/00

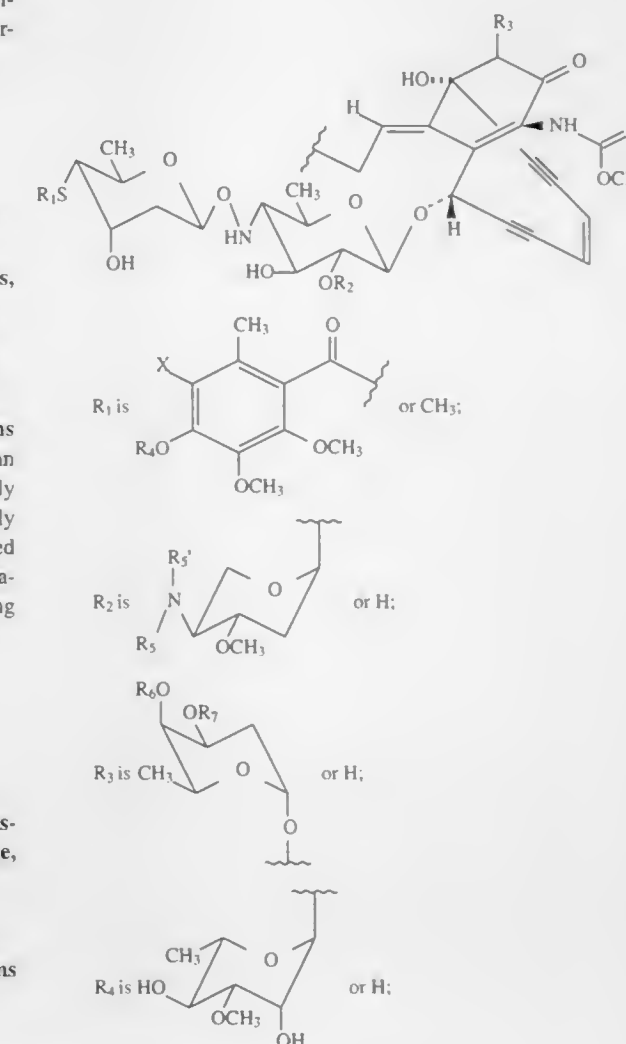
U.S. Cl. 530—388.8

21 Claims

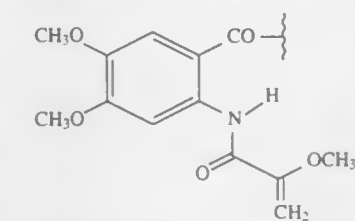
1. A process for preparing the targeted derivatives



of compounds of formula  $\text{CH}_3\text{SSS}-\text{W}$ , wherein  $\text{CH}_3\text{SSS}-\text{W}$  is an N-acyl derivative of an antitumor antibiotic LL-E33288  $\alpha_1^{\text{Br}}$ ,  $\alpha_2^{\text{I}}$ ,  $\beta_1^{\text{Br}}$ ,  $\beta_1^{\text{I}}$ ,  $\gamma_1^{\text{Br}}$ ,  $\gamma_1^{\text{I}}$ ,  $\delta_1^{\text{I}}$ , BBM-1675, FR-900405, FR-900406, PD 114759, PD 115028, CL-1577A, CL-1577B, CL-1577D, CL-1577E or CL-1724 wherein W is



each of  $R_4$  and  $R_7$  independently is H or



where  $R_5$  is  $\text{CH}_3$ ,  $\text{C}_2\text{H}_5$ , or  $(\text{CH}_3)_2\text{CH}$ ; X is an iodine or bromine atom;  $R^2$  is the group  $\text{RCO}$  wherein R is hydrogen or a branched or unbranched alkyl ( $\text{C}_1-\text{C}_{10}$ ) or alkylene ( $\text{C}_1-\text{C}_{10}$ ) group, an aryl or heteroaryl group, or an aryl-alkyl ( $\text{C}_1-\text{C}_3$ ) or heteroaryl-alkyl ( $\text{C}_1-\text{C}_3$ ) group, all optionally substituted by one or more hydroxy, amino, carboxy, halo, nitro, lower ( $\text{C}_1-\text{C}_3$ ) alkoxy, or lower ( $\text{C}_1-\text{C}_3$ ) thioalkoxy groups, comprising

reacting  $\text{CH}_3\text{SSS}-\text{W}$  with a compound of formula  $\text{Q}-\text{Sp}-\text{SH}$ , wherein Sp is a straight or branched-chain divalent or trivalent ( $\text{C}_1-\text{C}_{18}$ ) radical, divalent or trivalent ( $\text{C}_6-\text{C}_{11}$ ) aryl or heteroaryl radical, divalent or trivalent ( $\text{C}_3-\text{C}_{18}$ ) cycloalkyl or heterocycloalkyl radical, divalent or trivalent ( $\text{C}_6-\text{C}_{11}$ ) aryl- or heteroaryl-alkyl ( $\text{C}_4-\text{C}_{18}$ ) radical, divalent or trivalent ( $\text{C}_3-\text{C}_{18}$ ) cycloalkyl or heterocycloalkyl-alkyl ( $\text{C}_4-\text{C}_{18}$ ) radical, divalent or trivalent ( $\text{C}_2-\text{C}_{18}$ ) unsaturated alkyl radical, wherein heteroaryl is (4-methyl-coumarin-7-yl)amino and wherein if Sp is a trivalent radical, it can be additionally substituted by amino, ( $\text{C}_1-\text{C}_{10}$ ) alkylamino, ( $\text{C}_6-\text{C}_{11}$ ) arylamino, heteroaryl-amino, carboxyl, lower alkoxy, hydroxy, thiol, or lower alkylthio groups; and Q is halogen, amino,  $\text{C}_1-\text{C}_{10}$  alkylamino, carboxyl, carboxaldehyde, hydroxy or

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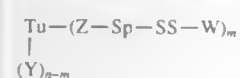
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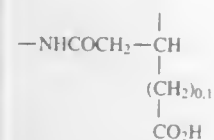
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lower alkylidicarboxyl anhydride in acetonitrile in the presence of one equivalent of triethylamine or one equivalent of triethylamine and one equivalent of acetic acid at  $-10^{\circ}$  to  $-30^{\circ}$  C. for 1-48 hours.

isolating the intermediate of formula Q-Sp-SS-W, wherein Q, Sp, and W are as hereinbefore defined, then reacting the compound of formula Q-Sp-SS-W, wherein Sp and W are as hereinbefore defined and Q is halogen, amino, alkylamino, carboxyl, carboxaldehyde, hydroxy, or lower alkylidicarboxylic anhydride with a molecule of the formula Tu-(Y)<sub>n</sub>, wherein Tu-(Y)<sub>n</sub> is a mono- or polyclonal antibody, its tumor-associated antigen-binding fragments, its chemically or genetically manipulated tumor-associated antigen-binding counterparts, or growth factors or steroids; Y is a side-chain amino or carboxy functionality of the antibody and n is 1-100, in aqueous buffer at a pH of between 6.5 and 9, at  $40^{\circ}$  to  $40^{\circ}$  C. either directly or in the presence of a water-soluble carbodiimide, to generate the compound



wherein Tu, Sp, W, n, and Y are as hereinbefore defined, m is 1-15 and Z is formed from covalent reaction of the groups Q and Y and is  $-\text{CONH}-$ ,  $-\text{NH}-$ ,



$-\text{N}=\text{CH}-$ , or  $-\text{CO}_2-$ .

5,770,702

**FIBRONECTIN BINDING PROTEIN AS WELL AS ITS PREPARATION**

Magnus H66k, 4734 Bridge Water Rd., Birmingham, Ala. 35243; Martin Kjell Lindberg, Kornvägen 5, S-752 57 Uppsala, Sweden; Lars Christer Signäs, Hamnesplanaden 2 A, S-753 23 Uppsala, Sweden; Torkel Mikael Wadström, Rek-torsvägen 7, S-223 67 Lund, Sweden, and Gunnar Fröman, Lindsbergsgatan 5B, S-752 40 Uppsala, Sweden

Division of Ser. No. 259,000, Jun. 13, 1994, Pat. No. 5,571,514, which is a division of Ser. No. 7,817, Jan. 22, 1993, Pat. No. 5,320,951, which is a continuation of Ser. No. 201,028, Jun. 1, 1988, abandoned. This application Oct. 7, 1996, Ser. No. 729,767

Claims priority, application Sweden, Jun. 1, 1987, 8702272 Int. Cl.<sup>6</sup> C07K 13/00; C12P 21/00

U.S. Cl. 530-388.25 5 Claims  
1. An isolated fibronectin binding protein or polypeptide comprising at least one of the amino acid sequences

Gly Gln Asn Ser Gly Asn Gln Ser Phe Glu Glu Asp Thr Glu Glu Asp Lys Pro Lys Tyr Glu Gln Gly Gly Asn Ile Val Asp Ile Asp Phe Asp Ser Val Pro Gln Ile His (SEQ ID NO: 3)

Gly Gln Asn Lys Gly Asn Gln Ser Phe Glu Glu Asp Thr Glu Lys Asp Lys Pro Lys Tyr Glu His Gly Gly Asn Ile Ile Asp Ile Asp Phe Asp Ser Val Pro His Ile His (SEQ ID NO: 4)

Gly Phe Asn Lys His Thr Glu Ile Ile Glu Glu Asp Thr Asn Lys Asp Lys Pro Ser Tyr Gln Phe Gly Gly His Asn Ser Val Asp Phe Glu Glu Asp Thr Leu Pro Lys Val (SEQ ID NO: 5).

5,770,703

**NUCLEIC ACIDS ENCODING PEPTIDES OF THE ENVELOPE REGION OF HIV-2 AND PEPTIDES, POLYPEPTIDES, AND METHODS FOR PRODUCING THE PEPTIDES AND POLYPEPTIDES OF THE HIV-2 ENVELOPE GENE**

Marc Alizon, Paris; Luc Montagnier, Le Plessis Robinson; Denise Goutard, Paris, all of France; Francois Clavel, Rockville, Md.; Pierre Sonigo, and Mireille Guyader, both of Paris, France, assignors to Institut Pasteur, Paris, France

Continuation of Ser. No. 214,221, Mar. 17, 1994, which is a division of Ser. No. 810,908, Dec. 20, 1991, which is a division of Ser. No. 752,368, Sep. 3, 1991, abandoned, which is a division of Ser. No. 13,477, Feb. 11, 1987, Pat. No. 5,079,342, which is a continuation-in-part of Ser. No. 3,764, Jan. 16, 1987, Pat. No. 5,051,496, which is a continuation-in-part of Ser. No. 933,184, Nov. 21, 1986, abandoned, which is a continuation-in-part of Ser. No. 916,080, Oct. 6, 1986, abandoned, which is a continuation-in-part of Ser. No. 835,228, Mar. 3, 1986, Pat. No. 4,839,288. This application Jun. 6, 1995, Ser. No. 468,774

Claims priority, application France, Jan. 22, 1986, 86 00911; Feb. 6, 1986, 86 01635; Feb. 13, 1986, 86 01985; Mar. 18, 1986, 86 03881; Mar. 24, 1986, 86 04215

Int. Cl.<sup>6</sup> C07K 14/155; A61K 39/21; C12Q 1/70; C07H 21/04 U.S. Cl. 530-395 6 Claims

1. An isolated or purified nucleic acid of HIV-2 capable of encoding for the envelope glycoprotein having the following nucleotide sequence;

ATGATGAATCAGCTGCTTATTGCCATTTTATTAGCTAGTGCTTGC

TTAGTATATTGCACCCAATATGTAAGTCTTTCTATGGCGTACCC

ACGTGGAAAAATGCAACCAATCCCTGTTTGTGCAACAGAAAT 100

AGGGATACTTGGGGAACCATACAGTGTCTGCTGACAATGATGAT

TATCAGGAAATAACTTTGAATGTAACAGAGGCTTTTGATGCATGG 200

AATAATACAGTAACAGACAAGCAATAGAAGATGTCTGGCATCT

ATTCGAGACATCAATAAAACCATGTGTGAACTAACACCTTTATG 300

TGTAGCAATGAAATGCAGCAGCAGAGAGCAGCAGGGAACA

ACACAACCTCAAAGAGCACAAGCACAACCAACCAACCAACCCAGA 400

GACCAAGGAGCAAGAGATAAGTGAGGATACTCCATGCGCAGCGC

AGACAACCTGCTCAGGATTGGGAGAGGAAGAAACGATCAATTGCC

AGTTCAATATGACAGGATTAGAAAGAGATAAGAAAAACAGTAT 500

AATGAAACATGGTACTCAAAGATGTGTTTGTGAGACAAAATAAT

AGCACAATCAGACCCAGTGTACATGAACCATGCAACACATCA 600

GTCATCAGAGAATCATGTGACAAGCACTATTGGGATGCTATAAG

TTTAGATACTGTGCCACCCGGGTTATGCCCTATTAAGATGTAAT 700

GATACCAATTATTCAGGCTTTGACCCCACTGTTCTAAAGTAGTA

-continued

GCTTCTACATGCACCAGGATGATGGAAACGCAAACTTCCACATGG 800

TTTGGCTTTAATGGCACTAGAGCAGAGAATAGACATATATCTAT

TGGCATGGCAGAGATAATAGAACTATCATCAGCTTAAACAAATAT

TATAATCTCAGTTTGCATTGTAAGAGGCCAGGAATAAGACAGTG 900

AAACAAATAATGCTTATGTGACGACATGTGTTTCACTCCACTAC

CAGCCGATCAATAAAGACCCAGACAAGCATGGTGTGGTTCAA 1000

AGGCAATGGAAAGACGCCATGCAGGAGGTGAAGACCTTGCAA

AACATCCAGGTATAGAGGAACCAATGACACAAGGAATATTAGC 1100

TTTGACGCCAGGAAAAGGCTCAGACCCAGAAGTAGCATACA

TGTGGACTAAGTCAGAGGAGAGTTTCTTACTGCAACATGACTT 1200

GGTTCCTCAATTGGATAGAGAATAAGACACACCGCAATTATGCAC

CGTGCCATATAAGCAATAATTAACACATGGCATAAGGTAGGG

AGAAATGTATATTTGCCTCCAGGGAAGGGAGCTGTCTGCAAC 1300

TCAACAGTAACAGCATAATTGCTAACATTGACTGGCAAAAGAAAT

AATCAGACAAACATTACCTTTAGTCAGAGGTGGCAGAACTATAC 1400

AGATTGGAGTTGGCAGATTATAAATGGTAGAAATAACACCAATT

GGCTTCGCACCTACAAAAGAAAAAGATACTCTCTGCTCACGGG 1500

AGACATACAAGAGGTGTGTCGTGCTAGGGTTCTGGGTTTTCTCG

CAACAGCAGGTTCTGCAATGGGCGCTCGAGCGTCCCTGACCGTGT 1600

CGGCTCAGTCCCGGACTTTACTGGCCGGGATAGTCAGCAACAGC

AACAGCTGTTGGACGTGGTCAAGAGACAACAAGAACTGTTGCGA 1700

CTGACCGTCTGGGGAACGAAAAACCTCCAGGCAAGAGTCACTGC

TATAGAGAAGTACCTACAGGACCGGCGGGCTAAATTCATGGG

GATGTGCGTTTACACAAGTCTGCCACACTACTGTACCATGGGTT 1800

AATGATTCCTTAGCACCTGACTGGGACAATATGACGTGGCAGGA

ATGGGAAAAACAAGTCCGCTACCTGGAGGCAAAATATCAGTAAAA 1900

GTITAGAACAGGCACAAATTCAGCAAGAGAAAAATATGTATGAA

CTACAAAAATTAATAGCTGGGATATTTTTGGCAATTGGTTTACT 2000

TAACCTCTGGGTCAAGTATATTCAATATGGAGTGCTTATAATAG

-continued

TAGCAGTAATAGCTTTAAGAATAGTGATATATGTAGTACAAATGT 2100

TAAAGTAGGCTTAGAAAGGGCTATAGGCTGTTTTCTCTCCCCCCC

CGGTTATATCCAATAGATCCATATCCACAAGGACCGGGGAC

AGCCAGCCAACGAAGAAACAGAAGAGACGGTGAAGCAACGG 2200

TGGAGACAGATACTGGCCCTGGGCGATAGCATATATACATTCCT

GATCCGCCAGCTGATTCGCTCTTGACCAGACTATACAGCATCT 2300

GCAGGGACTTACTATCCAGGAGCTTCTGACCCCTCAACTCATCT

ACCAGAATCTCAGAGACTGGCTGAGACTTAGAACAGCCTTCTTGC 2400

AATATGGGTGCGAGTGATCCAAGAAGCATTCCAGGCCCGCGG

AGGGCTACAAGAGAGACTCTTGGCGGCGGTGACGGGGCTTGTG

GAGGGTATTGGAACGAATCGGGAGGGGAATACTCGCGGTCCA 2500

AGAAGGATCAGACAGGGAGCAGAAATCGCCCTCTGTGAGGGA

CGGCAGTATCAGCAGGGAGACTTTATGAATACTCCATGGA 2600

AGGACCCAGCAGCAGAAAGGGAGAAAAATTTGTACAGGC

AACAAAATATGGA.

3. An isolated or purified envelope protein of HIV-2 having the following amino acid sequence;

Met Met Asn Gln Leu Leu Ile Ala Ile Leu Leu Ala Ser Ala Cys

Leu Val Tyr Cys Thr Gln Tyr Val Thr Val Phe Tyr Gly Val Pro

Thr Trp Lys Asn Ala Thr Ile Pro Leu Phe Cys Ala Thr Arg Asn

Arg Asp Thr Trp Gly Thr Ile Gln Cys Leu Pro Asp Asn Asp Asp

Tyr Gln Glu Ile Thr Leu Asn Val Thr Glu Ala Phe Asp Ala Trp

Asn Asn Thr Val Thr Glu Gln Ala Ile Glu Asp Val Trp His Leu

Phe Glu Thr Ser Ile Lys Pro Cys Val Lys Leu Thr Pro Leu Cys

Val Ala Met Lys Cys Ser Ser Thr Glu Ser Ser Thr Gly Asn Asn

Thr Thr Ser Lys Ser Thr Ser Thr Thr Thr Thr Thr Thr Asp

Gln Glu Gln Glu Ile Ser Glu Asp Thr Pro Cys Ala Arg Ala Asp

Asn Cys Ser Gly Leu Gly Glu Glu Glu Thr Ile Asn Cys Gln Phe

Asn Met Thr Gly Leu Glu Arg Asp Lys Lys Lys Gln Tyr Asn Glu



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Thr Trp Tyr Ser Lys Asp Val Val Cys Glu Thr Asn Asn Ser Thr

Asn Gln Thr Gln Cys Tyr Met Asn His Cys Asn Thr Ser Val Ile

Thr Glu Ser Cys Asp Lys His Tyr Trp Asp Ala Ile Arg Phe Arg

Tyr Cys Ala Pro Pro Gly Tyr Ala Leu Leu Arg Cys Asn Asp Thr

Asn Tyr Ser Gly Phe Ala Pro Asn Cys Ser Lys Val Val Ala Ser

Thr Cys Thr Arg Met Met Glu Thr Gln Thr Ser Thr Trp Phe Gly

Phe Asn Gly Thr Arg Ala Glu Asn Arg Thr Tyr Ile Tyr Trp His

Gly Arg Asp Asn Arg Thr Ile Ile Ser Leu Asn Lys Tyr Tyr Asn

Leu Ser Leu His Cys Lys Arg Pro Gly Asn Lys Thr Val Lys Gln

Ile Met Leu Met Ser Gly His Val Phe His Ser His Tyr Gln Pro

Ile Asn Lys Arg Pro Arg Gln Ala Trp Cys Trp Phe Lys Gly Lys

Trp Lys Asp Ala Met Gln Glu Val Lys Thr Leu Ala Lys His Pro

Arg Tyr Arg Gly Thr Asn Asp Thr Arg Asn Ile Ser Phe Ala Ala

Pro Gly Lys Gly Ser Asp Pro Glu Val Ala Tyr Met Trp Thr Asn

Cys Arg Gly Glu Phe Leu Tyr Cys Asn Met Thr Trp Phe Leu Asn

Trp Ile Glu Asn Lys Thr His Arg Asn Tyr Ala Pro Cys His Ile

Lys Gln Ile Ile Asn Thr Trp His Lys Val Gly Arg Asn Val Tyr

Leu Pro Pro Arg Glu Gly Glu Leu Ser Cys Asn Ser Thr Val Thr

Ser Ile Ile Ala Asn Ile Asp Trp Gln Asn Asn Asn Gln Thr Asn

Ile Thr Phe Ser Ala Glu Val Ala Glu Leu Tyr Arg Leu Glu Leu

Gly Asp Tyr Lys Leu Val Glu Ile Thr Pro Ile Gly Phe Ala Pro

Thr Lys Glu Lys Arg Tyr Ser Ser Ala His Gly Arg His Thr Arg

Gly Val Phe Val Leu Gly Phe Leu Gly Phe Leu Ala Thr Ala Gly

Ser Ala Met Gly Ala Arg Ala Ser Leu Thr Val Ser Ala Gln Ser

Arg Thr Leu Leu Ala Gly Ile Val Gln Gln Gln Gln Leu Leu

Asp Val Val Lys Arg Gln Gln Glu Leu Leu Arg Leu Thr Val Trp

Gly Thr Lys Asn Leu Gln Ala Arg Val Thr Ala Ile Glu Lys Tyr

Leu Gln Asp Gln Ala Arg Leu Asn Ser Trp Gly Cys Ala Phe Arg

Gln Val Cys His Thr Thr Val Pro Trp Val Asn Asp Ser Leu Ala

-continued

Pro Asp Trp Asp Asn Met Thr Trp Gln Glu Trp Glu Lys Gln Val

Arg Tyr Leu Glu Ala Asn Ile Ser Lys Ser Leu Glu Gln Ala Gln

Ile Gln Gln Glu Lys Asn Met Tyr Glu Leu Gln Lys Leu Asn Ser

Trp Asp Ile Phe Gly Asn Trp Phe Asp Leu Thr Ser Trp Val Lys

Tyr Ile Gln Tyr Gly Val Leu Ile Ile Val Ala Val Ile Ala Leu

Arg Ile Val Ile Tyr Val Val Gln Met Leu Ser Arg Leu Arg Lys

Gly Tyr Arg Pro Val Phe Ser Ser Pro Pro Gly Tyr Ile Gln \*\*\*

Ile His Ile His Lys Asp Arg Gly Gln Pro Ala Asn Glu Glu Thr

Glu Glu Asp Gly Gly Ser Asn Gly Gly Asp Arg Tyr Trp Pro Trp

Pro Ile Ala Tyr Ile His Phe Leu Ile Arg Gln Leu Ile Arg Leu

Leu Thr Arg Leu Tyr Ser Ile Cys Arg Asp Leu Leu Ser Arg Ser

Phe Leu Thr Leu Gln Leu Ile Tyr Gln Asn Leu Arg Asp Trp Leu

Arg Leu Arg Thr Ala Phe Leu Gln Tyr Gly Cys Glu Trp Ile Gln

Glu Ala Phe Gln Ala Ala Ala Arg Ala Thr Arg Glu Thr Leu Ala

Gly Ala Cys Arg Gly Leu Trp Arg Val Leu Glu Arg Ile Gly Arg

Gly Ile Leu Ala Val Pro Arg Arg Ile Arg Gln Gly Ala Glu Ile

Ala Leu Leu \*\*\* Gly Thr Ala Val Ser Ala Gly Arg Leu Tyr Glu

Tyr Ser Met Glu Gly Pro Ser Ser Arg Lys Gly Glu Lys Phe Val

Gln Ala Thr Lys Tyr Gly.

5,770,704

RECEPTOR ACTIVATION WITH INACTIVE  
HEPATOCTE GROWTH FACTOR LIGANDSPaul J. Godowski, Pacifica, Calif., assignor to Genentech, Inc.,  
South San Francisco, Calif.Continuation of Ser. No. 423,291, Apr. 17, 1995, abandoned,  
which is a division of Ser. No. 268,880, Jun. 30, 1994, aban-  
doned, which is a continuation of Ser. No. 950,572, Sep. 22,  
1992, abandoned, which is a continuation-in-part of Ser. No.  
884,811, May 18, 1992, Pat. No. 5,316,921, and Ser. No.  
885,971, May 18, 1992, Pat. No. 5,328,837. This application  
Jan. 31, 1997, Ser. No. 792,078Int. Cl.<sup>6</sup> A61K 38/18; C07K 14/475

U.S. Cl. 530—402

4 Claims

1. A method for recovering the biological activity of an inactive  
hepatocyte growth factor (HGF) variant which includes at least the  
Kringel 1 domain of native human HGF and selectively binds to an  
HGF receptor, comprising:a) coupling two molecules of said inactive HGF variant to obtain  
a homodimer; or

coupling said inactive HGF variant with a second HGF receptor  
binding amino acid sequence to obtain a heterodimer; and  
b) contacting said homodimer or heterodimer with at least two  
molecules of HGF receptor such that one molecule of said  
HGF variant binds to a first molecule of the HGF receptor and  
a second molecule of said HGF variant or said second recep-  
tor binding amino acid sequence binds to a second molecule  
of the HGF receptor wherein said binding results in biological  
activity.

5,770,705

METHOD FOR RECOVERING PROTEINS FROM  
PLASMA USING INSOLUBLE, WATER-ABSORBING  
MATERIALEdward Shanbrom, Santa Ana, Calif., assignor to Shanbrom  
Technologies LLC, Ojai, Calif.

Filed Nov. 1, 1996, Ser. No. 742,510

Int. Cl.<sup>6</sup> A23J 1/00; C07K 1/00; A61K 35/14

U.S. Cl. 530—421

13 Claims

1. A process for producing purified proteins from plasma by cold  
precipitation without addition of hydrophilic additives comprising  
the steps of:contacting the plasma with a quantity of chromatographic gel,  
the gel sufficiently unswollen to reduce volume of the plasma  
by absorbing water therefrom;removing water from the plasma by allowing the gel to swell;  
maintaining intimate contact between the plasma and the chro-  
matographic gel for a sufficient time for water absorption by  
the gel to be substantially complete;

removing the gel from contact with the plasma;

chilling the plasma to a sufficiently low temperature for a protein  
precipitate to form;

separating the protein precipitate from liquid plasma; and

redissolving the precipitate to produce a purified protein solu-  
tion.

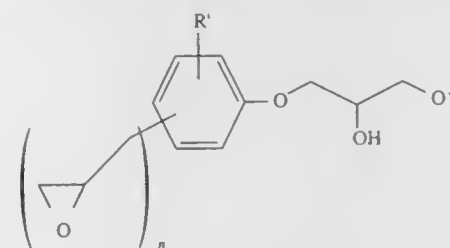
5,770,706

## SNAP-CURE EPOXY ADHESIVES

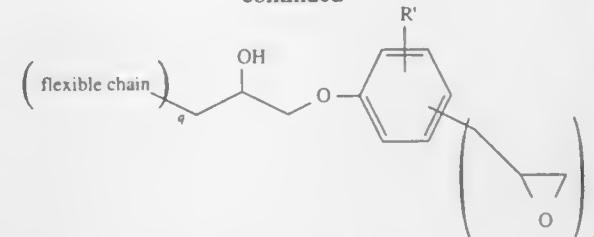
Bing Wu, Marina Del Rey, Calif.; Quinn K. Tong, Belle Mead,  
and Rose Ann Schultz, Princeton, both of N.J., assignors to  
National Starch and Chemical Investment Holding Corpora-  
tion, Wilmington, Del.Continuation-in-part of Ser. No. 482,540, Jun. 7, 1995, aban-  
doned. This application May 31, 1996, Ser. No. 656,621Int. Cl.<sup>6</sup> C08L 63/00; C08K 3/10

U.S. Cl. 523—429

24 Claims

1. An adhesive formulation for microelectronics use comprising  
in parts by weight:(i) 20–80 parts of a liquid epoxy resin having a center flexible  
portion, characterized in that it has a total chlorine content of  
less than 0.1% by weight and the general structure:

-continued



in which:

R' is H, C<sub>1-18</sub>alkyl, C<sub>1-15</sub>alkoxy, aryl or alkylaryl,  
C<sub>1-5</sub>perfluoroalkyl, C<sub>1-5</sub>acyl;

n is an integer 1–3; and

the flexible chain is CH<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>O and q is an integer 1–10,  
CH<sub>2</sub>CH<sub>2</sub>O and q is an integer 3–10, or CH<sub>2</sub> and q is an integer  
6–20; and(ii) 80–20 parts of an aromatic O-glycidyl ether resin having one  
or more aromatic rings, the aromatic rings substituted with  
two or more O-glycidyl ether groups and optionally one or  
more C<sub>1-3</sub> groups, the aromatic O-glycidyl ether having an  
epoxy equivalent weight (WPE, weight per epoxy) of 200 or  
less,

the total parts of (i) and (ii) to equal 100 parts by weight, and

(iii) a curing catalyst, and

(iv) optionally, a conductive filler.

5,770,707

MONOAZO COMPOUNDS AND DYEING OR PRINTING  
METHODS USING THE SAMEYoshimi Ebike, Izumi; Takeshi Washimi, Toyonaka; Yasuyoshi  
Ueda, Hirakata, and Takashi Omura, Kobe, all of Japan,  
assignors to Sumitomo Chemical Company, Limited, Osaka,  
Japan

Filed Feb. 22, 1996, Ser. No. 605,432

Claims priority, application Japan, Feb. 22, 1995, 7-033481

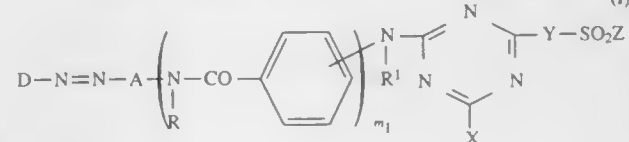
Int. Cl.<sup>6</sup> C09B 62/51

U.S. Cl. 534—641

11 Claims

1. A monoazo compound represented by the general formula (I):

(I)

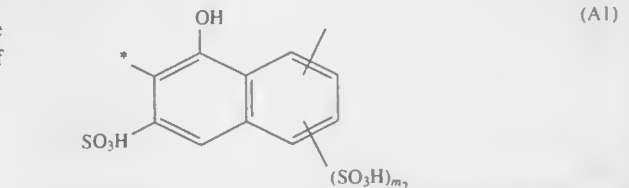
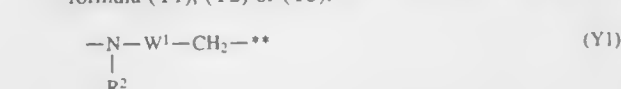


wherein

D is a phenyl or naphthyl group which is unsubstituted or  
substituted with alkyl having 1 to 4 carbon atoms, alkoxy  
having 1 to 4 carbon atoms, carboxy, sulfo, halogeno or nitro;  
R and R', which are same or different, are hydrogen or an  
optionally substituted lower alkyl;m<sub>1</sub> is 0 or 1;

A is a naphthylene represented by the general formula (A1):

(A1)

in which m<sub>2</sub> is 0 or 1, and \* indicate the position bonding to  
azo group;Y is an alphatic connecting group represented by the general  
formula (Y1), (Y2) or (Y3):



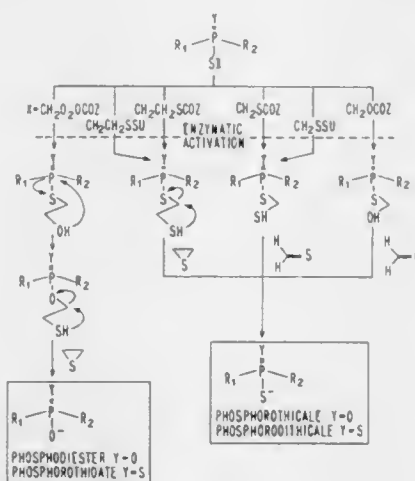


5,770,711  
POLYSACCHARIDES SUBSTITUTED WITH  
POLYCARBOXYLATED MOIETIES

Sharon Linda Greene, Canton; Rosann Marie Kaylor, Cumming, and Kenneth Raymond Smith, Norcross, all of Ga., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.  
Filed Sep. 30, 1996, Ser. No. 723,799

Int. Cl.<sup>6</sup> C08B 11/12; 15/10; 37/00; D21H 13/04  
U.S. Cl. 536—18.6 21 Claims

1. A derivatized polysaccharide comprising:  
a polysaccharide in which at least a portion of the active hydrogens originally present in the polysaccharide are substituted by monovalent aliphatic groups containing at least two carboxylic acid groups to an extent sufficient to provide a degree of substitution of at least about 0.1, wherein the monovalent aliphatic groups contain from 4 to about 10 carbon atoms and the substitution results from the reaction of an epoxy group in an aliphatic polycarboxylic acid with the active hydrogens originally present in the polysaccharide.



Z is optionally substituted alkyl or sugar residue.

5,770,712  
CROSSLINKED HYDROGEL BEADS FROM CHITOSAN  
Swapn K. Roy, East Brunswick, N.J.; Jason G. Todd, Newport News, and Wolfgang G. Glasser, Blacksburg, both of Va., assignors to Virginia Tech Intellectual Properties, Inc., Blacksburg, Va., and LigoChem, Inc., North Caldwell, N.J.  
Filed Mar. 14, 1997, Ser. No. 818,398

U.S. Cl. 536—20 30 Claims  
1. A method for making a crosslinked chitosan having spacer arms presenting activation sites at distal ends thereof, comprising the step of combining chitosan material having unreacted primary amine groups with an excess amount of a polyfunctional epoxide compound having at least two epoxide groups effective to crosslink said chitosan material to form a crosslinked chitosan support material and install spacer arms on said chitosan support material wherein said spacer arms have an unreacted terminal epoxide group at a distal end of said spacer arm.

5,770,713  
PHOSPHOROTHIOATE TRIESTER  
OLIGONUCLEOTIDES AND METHOD OF  
PREPARATION  
Jean-Louis Imbach, and Bernard Rayner, both of Montpellier, France, assignors to Centre National de la Recherche Scientifique, Cedex, France  
PCT No. PCT/FR94/00563, § 371 Date Jan. 17, 1996, § 102(e) Date Jan. 17, 1996, PCT Pub. No. WO94/26764, PCT Pub. Date Nov. 24, 1994

PCT Filed May 11, 1994, Ser. No. 545,785  
Claims priority, application France, May 12, 1993, 93/05706  
Int. Cl.<sup>6</sup> C12Q 1/68; C07H 19/00; 21/02; 21/04  
U.S. Cl. 536—22.1 35 Claims

1. An oligonucleotide comprising the general formula



in which:

Y is O or S;

R<sub>1</sub> and R<sub>2</sub> are, respectively, a residue in the 3' -O and 5' -O positions of a nucleoside or of an oligonucleotide, the internucleotide linkage of which is natural or modified;

X is  $-(CH_2)_n-S-S-U$ ,  $-(CH_2)_n-O-C(=Y^2)-Z$  or  $-(CH_2)_n-S-C(=O)-Z$ ;

each n is independently an integer from 1 to 6;

U is an optionally substituted alkyl, aryl or sugar residue;

Y<sup>2</sup> is O or S; and

5,770,714  
CHLAMYDIA MAJOR OUTER MEMBRANE PROTEIN  
Nina Agabian, San Francisco; Richard Stephens, Oakland, both of Calif.; Cho-Chou Kuo, Seattle, Wash., and Guy Mullenbach, Oakland, Calif., assignors to Washington Research Foundation, Seattle, Wash., and Chiron Corporation, Emeryville, Calif.

Division of Ser. No. 144,095, Oct. 28, 1993, abandoned, which is a continuation of Ser. No. 691,639, Apr. 25, 1991, abandoned, which is a continuation of Ser. No. 818,523, Jan. 13, 1986, abandoned, which is a continuation-in-part of Ser. No. 692,001, Jan. 14, 1985, abandoned. This application Jun. 6, 1995, Ser. No. 466,814

Int. Cl.<sup>6</sup> C07H 21/02; 21/04; C07K 5/00; 13/00  
U.S. Cl. 536—23.1 13 Claims

1. A DNA construct comprising a first DNA sequence segment encoding a polypeptide of at least 12 amino acids of the *Chlamydia trachomatis* major outer membrane protein (MOMP), operably linked to additional DNA sequence segments required for the expression of said first DNA sequence segment.

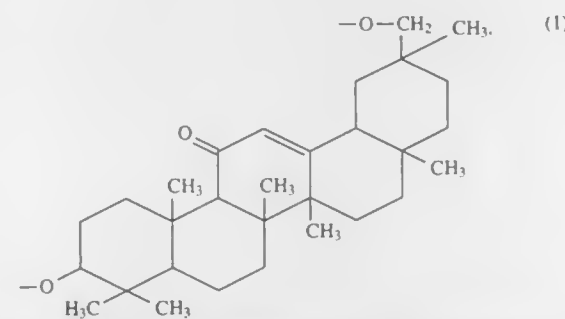
5,770,715  
HAMMERHEAD-LIKE NUCLEIC ACID ANALOGUES  
AND THEIR SYNTHESIS  
Hiroshi Sugiyama; Ken Hatano; Isao Saito, all of Kyoto; Takayoshi Uchida, Ibaraki; Yoko Matsuda, Ibaraki, and Kiyoshi Uchida, Ibaraki, all of Japan, assignors to Toagosei Co., Ltd., Tokyo, Japan

Filed Mar. 20, 1996, Ser. No. 618,960  
Claims priority, application Japan, Mar. 22, 1995, 7-063188  
Int. Cl.<sup>6</sup> C07H 21/00

U.S. Cl. 536—23.1 15 Claims

1. A nucleic acid compound which has a moiety of a non-nucleic acid structure with a ring skeleton to which two functional groups are bound with a fixed conformation and are able to point to substantially the same direction, and a moiety of a pair of nucleotide chains which are bound to the functional groups.

6. A nucleic acid compound according to claim 1, wherein said non-nucleic acid skeleton is shown in chemical formula(I);

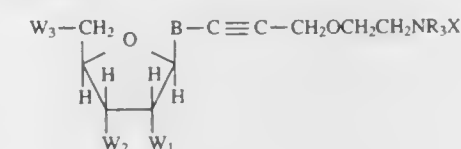


8. A synthetic method for making a nucleic acid compound, said method comprising:

- introducing a protecting group into one hydroxyl group of non-nucleic acid compound with a ring skeleton to which two hydroxyl groups are bound with a fixed conformation and are able to point to substantially the same direction;
- binding the other hydroxyl group of said compound to the first nucleotide chain of a pair of nucleotide chains;
- removing said protecting group of the compound; and
- binding the deblocked hydroxyl group of the compound to the second nucleotide chain of said pair of nucleotide chains.

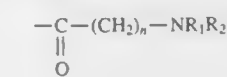
5,770,716  
SUBSTITUTED PROPARGYLETHOXYAMIDO  
NUCLEOSIDES, OLIGONUCLEOTIDES AND METHODS  
FOR USING SAME  
Shaheer H. Khan, Foster City; Steven M. Menchen, Fremont, and Barnett B. Rosenblum, San Jose, all of Calif., assignors to The Perkin-Elmer Corporation, Foster City, Calif.  
Filed Apr. 10, 1997, Ser. No. 833,855

Int. Cl.<sup>6</sup> C07H 21/02; C12P 19/34  
U.S. Cl. 536—23.1 12 Claims  
1. A polynucleotide comprising a nucleotide compound having the structure:

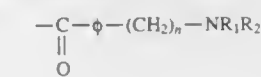


wherein:

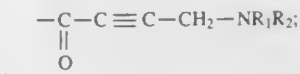
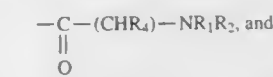
X is selected from the group consisting of



where n ranges from 1 to 5,



where n ranges from 1 to 5,



R<sub>1</sub> and R<sub>2</sub> taken separately are selected from the group consisting of —H, lower alkyl, protecting group, and label; R<sub>3</sub> is selected from the group consisting of —H and lower alkyl; B is a 7-deazapurine, purine, or pyrimidine nucleoside base; wherein when B is purine or 7-deazapurine, the sugar moiety is attached at the N<sup>9</sup>-position of the purine or deazapurine, and

when B is pyrimidine, the sugar moiety is attached at the N<sup>1</sup>-position of the pyrimidine; and

wherein when B is a purine, the adjacent triple-bonded carbon is attached to the 8-position of the purine, when B is 7-deazapurine, the adjacent triple-bonded carbon is attached to the 7-position of the 7-deazapurine, and when B is pyrimidine, the adjacent triple-bonded carbon is attached to the 5-position of the pyrimidine;

W<sub>1</sub> is selected from the group consisting of —H and —OH;

W<sub>2</sub> is —OH or a moiety which renders the nucleoside incapable of forming a phosphodiester bond at the 3'-position; and

W<sub>3</sub> is selected from the group consisting of —PO<sub>4</sub>, phosphate analog, and —OH.

5,770,717  
NUCLEIC ACID ENCODING A STRESS-RESPONSIVE  
SUBUNIT OF HUMAN RNA POLYMERASE II  
Erica A. Golemis, Orelan, Pa.; Vladimir Khazak, Princeton, N.J., and Joanne Estojak, Jenkintown, Pa., assignors to Fox Chase Cancer Center, Philadelphia, Pa.  
Filed Jan. 20, 1995, Ser. No. 376,157

Int. Cl.<sup>6</sup> C12N 9/12; 15/54 11 Claims  
1. An isolated nucleic acid molecule that includes a sequence encoding an RPB4 subunit of human RNA polymerase II.

5,770,718  
GENE FOR APRT FROM PLANT TISSUE  
Barbara Moffatt, Waterloo, Canada, assignor to University of Waterloo, Waterloo, Canada  
Continuation of Ser. No. 230,695, Apr. 21, 1994, abandoned, which is a continuation of Ser. No. 888,132, May 26, 1992, abandoned. This application May 22, 1995, Ser. No. 447,010  
Claims priority, application United Kingdom, May 23, 1991, 9111126

Int. Cl.<sup>6</sup> C12N 15/54; 15/29; 9/10; 9/12  
U.S. Cl. 536—23.2 6 Claims  
1. An isolated and purified cDNA from a plant which is the coding sequence for adenine phosphoribosyltransferase (APRT) of the plant, wherein said plant is *Arabidopsis thaliana*.

5,770,719  
MEMBRANE-ASSOCIATED IMMUNOGENS OF  
MYCOBACTERIA  
Archana Kapoor, Maison De L. Inde, 35 Boulevard Jourdan, 75014 Paris, France, and Anil Munshi, 9450 Gilman Dr., No. 920573, LaJolla, Calif. 92092-0573  
Division of Ser. No. 192,632, Feb. 7, 1994, Pat. No. 5,559,011, which is a division of Ser. No. 906,395, Jun. 29, 1992, Pat. No. 5,330,754. This application Sep. 23, 1996, Ser. No. 710,676  
Int. Cl.<sup>6</sup> C07H 21/04

U.S. Cl. 536—24.1 5 Claims  
1. An isolated nucleic acid comprising a promoter sequence from a gene encoding an ion-motive ATPase of a mycobacterium.

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5,770,720

UBIQUITIN CONJUGATING ENZYMES HAVING  
TRANSCRIPTIONAL REPRESSOR ACTIVITY

Thomas F. Deuel, Cambridge, Mass.; Zhao-Yi Wang, Millford, Conn., and Thomas E. Shenk, Princeton, N.J., assignors to Barnes-Jewish Hospital, St. Louis, Mo.

Filed Aug. 30, 1996, Ser. No. 706,214

Int. Cl.<sup>6</sup> C12N 9/00; 15/12; 15/31; 15/52; 15/85

U.S. Cl. 536—24.5

70 Claims

1. A eukaryotic host cell co-transfected with a deoxyribonucleic acid polymer encoding a transcriptional repressor protein, and with a deoxyribonucleic acid polymer encoding an adapter protein, the adapter protein having transcriptional repressor activity and an amino acid sequence which includes at least a portion of the amino acid sequence of a ubiquitin conjugating enzyme having transcriptional repressor activity, the included portion being at least about 12 amino acid residues in length and conferring the repressor activity on the adapter protein.

5,770,721

METHOD OF MANUFACTURING A MATRIX FOR THE  
DETECTION OF MISMATCHES

Gennady Moiseevich Ershov, and Andrei Dariyevich Mirzabekov, both of Moscow, Russian Federation, assignors to University of Chicago, Chicago, Ill.

PCT No. PCT/RU94/00180, § 371 Date May 19, 1995, § 102(e) Date May 19, 1995, PCT Pub. No. WO95/04834, PCT Pub. Date Feb. 16, 1995

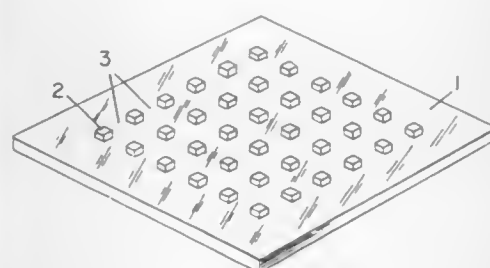
PCT Filed Aug. 5, 1994, Ser. No. 411,794

Claims priority, application Russian Federation, Aug. 11, 1993, 93040897

Int. Cl.<sup>6</sup> C07H 21/00; 21/04; C12Q 1/68; G01N 21/00

U.S. Cl. 536—25.3

4 Claims



1. A method to prepare a patterned matrix for immobilizing oligonucleotides at distinct intervals on said matrix, comprising:
- (a) precoating a solid support at distinct intervals with a sublayer of a substance to form a precoated matrix with a prescribed topology, wherein said solid support is virtually transparent to laser radiation and wherein said sublayer substance absorbs laser radiation;
- (b) applying a continuous gel coat onto said precoated matrix wherein said continuous gel coat is also virtually transparent to laser radiation to form a gel coated matrix;
- (c) irradiating said gel coated matrix with a laser beam so that upon irradiation those parts of the continuous gel coat which are immediately above said sublayer substance are evaporated together with said substance, wherein said evaporation forms a multiplicity of gel cells in the gel coated matrix which are spaced from one another by intervals forming a patterned matrix; and
- (d) immobilizing oligonucleotides from a chosen set of oligonucleotides into the gel cells wherein one oligonucleotide is immobilized per gel cell.

5,770,722  
SURFACE-BOUND, UNIMOLECULAR, DOUBLE-  
STRANDED DNA

David J. Lockhart, Santa Clara, Calif.; Dirk Vetter, Freiburg, Germany, and Martin Diggelmann, Niederdorf, Switzerland, assignors to Affymetrix, Inc., Santa Clara, Calif.

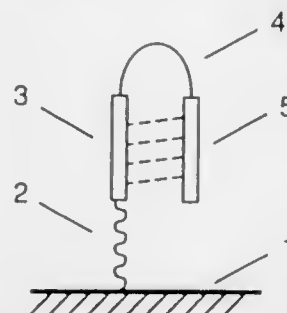
Division of Ser. No. 327,687, Oct. 24, 1994, Pat. No. 5,556,752.

This application Jun. 13, 1996, Ser. No. 664,093

Int. Cl.<sup>6</sup> C07H 21/00; 21/02; 21/04; C12Q 1/68

U.S. Cl. 536—25.3

15 Claims



1. A method of forming a plurality of diverse unimolecular, double-stranded oligonucleotides on a solid support, said support comprising a surface with a plurality of preselected regions, said method comprising:

- (a) forming on each of said preselected regions a different first oligonucleotide, each of said first oligonucleotides comprising from 6 to 30 monomers;
- (b) attaching to the distal end of each of said first oligonucleotides of step (a) a linking group; and
- (c) forming on the distal end of each of said linking groups a second oligonucleotide, wherein each of said second oligonucleotides is complementary to said first oligonucleotide which is attached within the same preselected region, and wherein said linking groups have sufficient length such that said first and second oligonucleotides form a unimolecular, double-stranded oligonucleotide.

5,770,723

PROCESSES FOR PURIFYING SYNTHETIC  
OLIGONUCLEOTIDES

M. Paraweswara Reddy, 219 Valverde Ave., and Firdous Farooqui, 1520 Alexander Ct., both of Brea, Calif. 92821

Filed Mar. 12, 1997, Ser. No. 815,787

Int. Cl.<sup>6</sup> C07H 21/00

U.S. Cl. 536—25.4

58 Claims

1. A process for preparing purified synthesized oligonucleotide, said process comprising the steps of:
- providing synthesized oligonucleotide, said oligonucleotide being attached to a solid support and having protected exocyclic amino functionalities;
- treating said synthesized oligonucleotide with a composition comprising methylamine;
- adding to said treated synthesized oligonucleotide a composition comprising an additive selected from the group consisting of sodium chloride and ammonium acetate;
- loading said treated synthesized oligonucleotide and additive on a reverse phase purification cartridge;
- eluting said treated synthesized oligonucleotide from said reverse phase purification cartridge; and
- recovering purified synthesized oligonucleotide from said reverse phase purification cartridge eluate.

5,770,724

Patent Not Issued For This Number

5,770,725

PHOSPHOTRIESTER TYPE BIOLOGICALLY ACTIVE  
COMPOUNDS

Gilles Gosselin, Résidence "Parc-des-Arceaux", Bât. F1, Rue Paul-Rimbaud - 34000 Montpellier, and Jean-Louis Imbach, Laboratoire de Chimie Bio Organique USTL, Place Eugène Bataillon - 34095 Montpellier, both of France

Continuation-in-part of Ser. No. 343,433, Nov. 23, 1994, abandoned. This application Apr. 4, 1995, Ser. No. 416,515

Claims priority, application France, May 25, 1992, 92 06383;

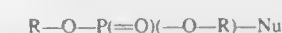
Apr. 7, 1993, 93 04117

Int. Cl.<sup>6</sup> C07H 1/00; 19/00

U.S. Cl. 536—26.7

13 Claims

1. A compound having the formula:



wherein:

- each R is, independently,  $-(CH_2)_n-S-X$  where:
- X is  $-C(=Z)Y$  or  $-S-U$ ;
- Z is O or S;
- each of Y and U is, independently, an alkyl, aryl or saccharide group optionally substituted with an OH, SH, or NH group;
- n is 1 to 4; and
- Nu is a nucleoside which comprises a ribose or deoxyribose sugar portion covalently bound to a base portion.

5,770,726

PROCESS FOR PREPARING A CELLULOSE  
ACETOACETATE ALKANOATES

Chung Ming Kuo, and Kevin Joseph Edgar, both of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Filed Mar. 10, 1997, Ser. No. 814,944

Int. Cl.<sup>6</sup> C08B 3/06; 1/02

U.S. Cl. 536—69

25 Claims

1. A process for preparing a substituted cellulose acetoacetate alkanate comprising contacting cellulose in a carboxylic acid diluent with an acetylating compound selected from the group consisting of a carboxylic acid anhydride and an acid chloride, provided that the acid chloride is employed in combination with an acid acceptor, an acetoacetylating compound selected from the group consisting of diketene, an alkyl acetoacetate and 2,2,6-trimethyl-4H-1,3-dioxin-4-one, and a mineral acid catalyst under conditions and in a molar ratio sufficient to cause the cellulose, acetylating compound and acetoacetylating compound to react to produce a substituted cellulose acetoacetate alkanate.

5,770,727

CROSSLINKED HEMOGLOBIN PRODUCT COMPRISING  
TETRAMERIC AND OLIGOMERIC HEMOGLOBIN  
UNITS

Diana Pliura, Mississauga; Lawrence T. Wong, North York, and Song Swee Er, Scarborough, all of Canada, assignors to Hemosol Inc., Etobicoke, Canada

Continuation of Ser. No. 231,945, Apr. 21, 1994, Pat. No. 5,532,352, which is a continuation-in-part of Ser. No. 31,830, Mar. 16, 1993, abandoned. This application Jun. 28, 1996, Ser. No. 672,868

Int. Cl.<sup>6</sup> C07D 487/22; C07K 15/22

U.S. Cl. 540—145

3 Claims

1. A chemically modified, crosslinked hemoglobin product comprising a mixture of hemoglobin species and consisting essentially of about 40% tetrameric hemoglobin units of molecular weight about 64,000 daltons, up to 5% dimeric hemoglobin units of molecular weight about 32,000 daltons, and the balance being oligomeric hemoglobin units of molecular weight up to about 600,000 daltons, the mixture containing no polymeric hemoglobin species of molecular weight greater than 600,000 daltons.

5,770,728

ALKANE OXIDATION WITH PORPHYRINS AND METAL  
COMPLEXES THEREOF HAVING HALOALKYL SIDE  
CHAINS

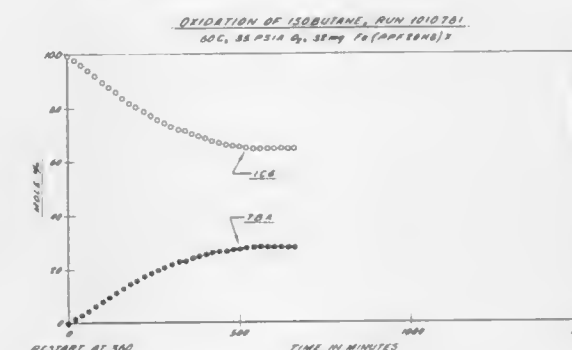
Tilak Wijesekera, Glen Mills; James E. Lyons, Wallingford; Paul E. Ellis, Jr., Downingtown, and Manoj V. Bhide, Boothwyn, all of Pa., assignors to Sun Company, Inc. (R&amp;M), Philadelphia, Pa.

Division of Ser. No. 405,684, Mar. 17, 1995, Pat. No. 5,608,054, which is a continuation-in-part of Ser. No. 174,732, Dec. 29, 1993, Pat. No. 5,571,908, which is a continuation-in-part of Ser. No. 175,057, Dec. 29, 1993, abandoned. This application Dec. 19, 1996, Ser. No. 769,814

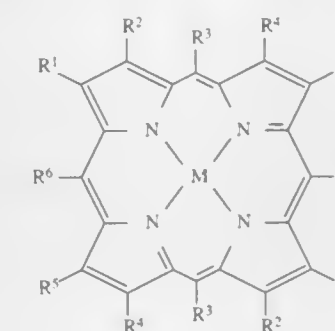
Int. Cl.<sup>6</sup> C07D 487/22; C07C 45/32

U.S. Cl. 540—145

12 Claims



1. Process for partially oxidizing alkanes which comprises contacting an alkane under partial oxidation conditions with oxygen and a catalyst comprising a compound having the following structural formula:



where M is transition metal with or without halide, hydroxide, azide or nitride associated therewith, and R<sup>3</sup> is hydrogen or halo-carbyl and R<sup>6</sup> is hydrogen or halo-carbyl, but R<sup>3</sup> and R<sup>6</sup> are not both hydrogen, R<sup>3</sup> and R<sup>6</sup> are not both the same halo-carbyl, and at least one of said R<sup>3</sup> and R<sup>6</sup> is haloalkyl having 2 to 8 carbon atoms, and R<sup>1</sup>, R<sup>2</sup>, R<sup>4</sup> and R<sup>5</sup> are independently hydrogen, hydrocarbyl, halogen, nitro, cyano or halo-carbyl; or polymeric forms thereof: to produce a partial oxidation product.

5,770,729

## OZONIDE REDUCING AGENT

Michio Sasaoka, Itano-gun; Daisuke Suzukl, Naruto, and Takashi Shirol, Itano-gun, all of Japan, assignors to Otsuka Kagaku Kabushiki Kaisha, Osaka, Japan

PCT No. PCT/JP94/02224, § 371 Date Jan. 22, 1996, § 102(e) Date Jan. 22, 1996, PCT Pub. No. WO95/18082, PCT Pub. Date Jul. 6, 1995

PCT Filed Dec. 26, 1994, Ser. No. 530,292

Claims priority, application Japan, Dec. 28, 1993, 5-338068

Int. Cl.<sup>6</sup> C07B 31/00; 33/00

U.S. Cl. 540—353

3 Claims

1. A method of reducing an ozonide, comprising:



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adding an ozonide reducing agent to an ozonide-containing solvent in an amount sufficient to reductively decompose the ozonide, said ozonide reducing agent being one or more compounds selected from the group consisting of a compound represented by the formula



wherein  $R^1$  and  $R^4$  are the same or different and each represents a single bond or a straight- or branched-chain  $C_{1-6}$  alkylene group;  $R^2$  and  $R^3$  are the same or different and each is a straight- or branched-chain  $C_{1-6}$  alkylene group, a straight- or branched-chain  $C_{2-8}$  alkenylene group, a straight- or branched-chain  $C_{2-6}$  alkyne group, a  $C_{3-8}$  cycloalkylene group or a phenylene group which may have a  $C_{1-6}$  alkyl group and/or an amino group as a substituent on the phenyl ring; X and Y are the same or different and each represents a hydroxyl group, a nitrile group or a carboxyl group; and a compound represented by the formula



wherein  $R^5$  and  $R^6$  are the same or different and each represents thienyl, furyl, pyridyl, pyranyl, pyrrolyl, chromenyl, imidazolyl, pyrazolyl, thiazolyl, oxazolyl, pyrazinol, pyrimidyl, pyridazinyl, or quinolyl, having as a substituent at least one group selected from a hydroxyl group, a hydroxymethyl group, a nitrile group, a cyanomethyl group, a carboxyl group and a carboxymethyl group;

reductively decomposing the ozonide with said ozonide reducing agent; and removing the sulfoxide resulting from the ozonolysis reaction of said ozonide with said ozonide reducing agent.

5,770,730

**SYNTHESIS OF CARBODIIMIDE ANALOGS OF CHLORINS AND BACTERIOCHLORINS AND THEIR USE FOR DIAGNOSIS AND TREATMENT OF CANCER**  
Ravindra K. Pandey, Williamsville; Andrei N. Kozyrev, Amherst, and Thomas J. Dougherty, Grand Island, all of N.Y., assignors to Health Research, Inc., Buffalo, N.Y.

Filed Mar. 8, 1996, Ser. No. 613,134

Int. Cl.<sup>6</sup> C07D 487/22

U.S. Cl. 540—472

8 Claims

I. A method for the preparation of an imide derivative of purpurin comprising:

reacting hexylamine with a chlorin or bacteriochlorin having a macrocycle with a six membered anhydride ring fused thereto, said macrocycle containing a and b rings which may be saturated or unsaturated at  $R_4$  to  $R_{11}$ , positions of the rings and which  $R_4$  and  $R_{11}$  positions may contain at least one group selected from the group consisting of hydrogen, hydroxy, formyl, substituted and unsubstituted alkyl, alkoxy, alkenyl, aryl and aryloxy wherein carbon containing groups may be substituted with a substituent selected from carboxyl, hydroxy, phosphoro, carboxy, halo, sulfo, amino and ether, to obtain a purpurin derivative; and reacting the purpurin derivative with a carbodiimide to obtain the imide derivative of purpurin.

5,770,731  
**IMPROVEMENTS RELATING TO PRODRUGS**  
Caroline Joy Springer, Sutton, and Richard Marais, London, both of United Kingdom, assignors to Cancer Research Campaign Technology Limited, London, United Kingdom  
PCT No. PCT/GB94/01610, § 371 Date Apr. 19, 1996, § 102(e)  
Date Apr. 19, 1996, PCT Pub. No. WO95/03830, PCT Pub. Date Feb. 9, 1995

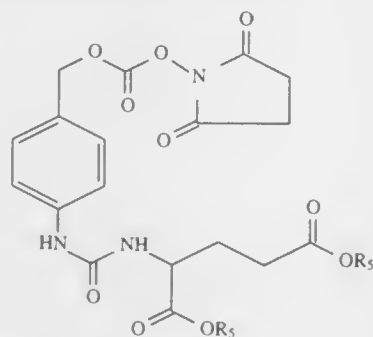
PCT Filed Jul. 27, 1994, Ser. No. 586,637  
Claims priority, application United Kingdom, Jul. 27, 1993, 9315494

Int. Cl.<sup>6</sup> C07D 243/24; 261/06; 207/40; 313/04

U.S. Cl. 540—509

6 Claims

I. A compound of formula (XVI):



(XVI)

wherein  $R_5$  is  $C_{1-6}$  alkyl.

5,770,732

**PYRROLINONE-BASED PEPTIDOMIMETICS**  
Ralph F. Hirschmann, Blue Bell; Amos B. Smith, III, Merion; Paul Sprengeler, Philadelphia, all of Pa.; Ryan C. Holcomb, Glen Rock, N.J.; Terence Keenan, Cambridge, Mass.; John L. Wood, Hamden, Conn.; Mark Guzman, and Alexander Pasternak, both of Philadelphia, Pa., assignors to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

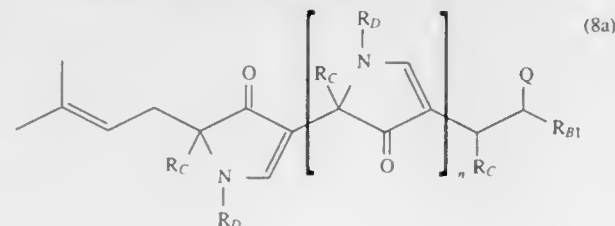
Continuation-in-part of Ser. No. 18,696, Feb. 17, 1993, Pat. No. 5,489,692. This application Aug. 2, 1994, Ser. No. 285,027

Int. Cl.<sup>6</sup> C07D 413/00; 207/00

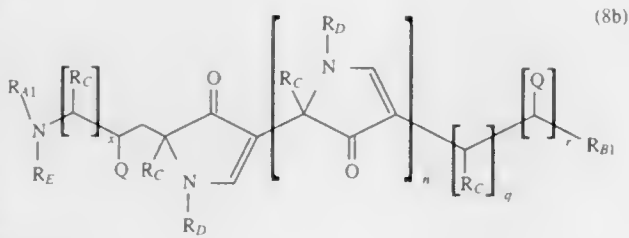
U.S. Cl. 544—141

23 Claims

I. A compound having structure (8a) or (8b):



(8a)



(8b)

wherein:

$R_{A1}$  is H, a C-terminal amino acid, a C-terminal peptide, an amine protecting group, an amide protecting group, a group that improves the pharmacokinetic properties of the compound, or a group that improves the pharmacodynamic properties of the compound;

$R_{B1}$  is  $OR_D$ ,  $NR_D R_D$ , a N-terminal amino acid, a N-terminal peptide, a carboxyl protecting group, a group that improves

the pharmacokinetic properties of the compound, or a group that improves the pharmacodynamic properties of the compound;

each  $R_C$  is, independently, an amino acid side chain;

$R_D$  is H, an amine protecting group, or alkyl having 1 to about 7 carbon atoms;

$R_E$  is H or an amine protecting group, or  $R_{A1}$  and  $R_E$  together are a group that improves the pharmacokinetic properties of the compound or a group that improves the pharmacodynamic properties of the compound;

each Q is, independently, OH or =O;

n is 0–200;

q is 0 or 1;

r is 0 or 1; and

x is 0 or 1.

5,770,733

**MEDICINAL PRODUCTS AND PURE PREPARATIONS OF MELARSOMINE DIHYDROCHLORIDE, PROCESS FOR OBTAINING THEM AND INTERMEDIATE PRODUCTS OBTAINED**

Robert Floc'h, Plaisance du Touch; Jean-Pierre Etchegaray, Toulouse Saint-Simon; Gérard Wolf, Toulouse; Patrick Lubert, Artois, and Régine Jackie Anne-Marie Mazars, Ramonville Saint-Agne, all of France, assignors to Rhone Merieux, Lyon, France

Division of Ser. No. 459,797, Jun. 2, 1995, Pat. No. 5,635,499, which is a division of Ser. No. 984,934, Dec. 2, 1992, Pat. No. 5,459,263. This application Sep. 5, 1996, Ser. No. 707,613

Claims priority, application France, Dec. 2, 1991, 91-14904

Int. Cl.<sup>6</sup> C07F 9/80; C07D 251/70

U.S. Cl. 544—181

4 Claims

1. Purified preparation of melarsen acid hydrochloride, obtained by the steps comprising:

step 1: converting trichlorotriazine to diaminochlorotriazine by gradual addition of trichlorotriazine in an ammoniacal medium, and step 2: converting the diaminochlorotriazine to melarsen acid hydrochloride in the presence of arsenic acid.

4. Melarsen oxide dihydrate preparation of purity greater than 99%.

5,770,734

**N-SUBSTITUTED-2-AMINOQUINOLINES USEFUL FOR TREATING HYPOFUNCTION OF THE CHOLINERGIC SYSTEM**

Annmarie Louise Sabb, Pennington, N.J., assignor to American Home Products Corporation, Madison, N.J.

Division of Ser. No. 794,277, Nov. 19, 1991, Pat. No.

5,149,815, which is a division of Ser. No. 692,743, Apr. 29,

1991, Pat. No. 5,093,333. This application Jun. 22, 1992, Ser.

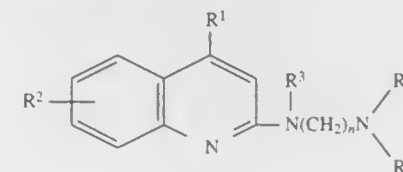
No. 902,109

Int. Cl.<sup>6</sup> C07D 401/02

U.S. Cl. 544—363

5 Claims

1. A compound of the formula I



I

wherein

$R^1$  is H, alkyl or cycloalkyl of 1 to 6 carbon atoms;

$R^2$  is H, alkyl of 1 to 6 carbon atoms, cyano, halo, nitro, amino or mono or dialkylamino in which the alkyl groups have 1 to 6 carbon atoms;

$R^3$  is H or alkyl of 1 to 6 carbon atoms;

n is 1 to 5

and  $R^4$  and  $R^5$  taken with the nitrogen atom to which they are attached are a piperazin-1-yl moiety in the 4-position of which is H, alkyl of 1 to 6 carbon atoms or unsubstituted or substituted piperidenyl, pyrimidinyl, pyridinyl, or pyrazinyl wherein the substituents are alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, halo, cyano, nitro or trifluoromethyl or a pharmaceutically acceptable salt, hydrate or solvate thereof.

5,770,735

**POLYCYCLIC AMINE COMPOUNDS AND THEIR ENANTIOMERS, THEIR METHOD OF PREPARATION AND PHARMACEUTICAL COMPOSITIONS IN WHICH THEY ARE PRESENT**

Xavier Emonds-Alt, Combaillaux; Patrick Gueule, Teyrand; Vincenzo Proietto, Saint Georges D'Orques, and Pierre Goulaouic, Montpellier, all of France, assignors to Elf Sanofi, Paris, France

Division of Ser. No. 878,710, May 4, 1992, Pat. No. 5,340,822.

This application Jun. 15, 1994, Ser. No. 261,269

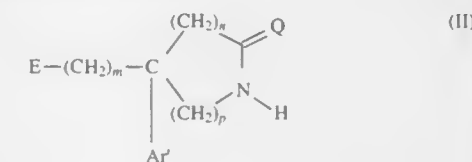
Claims priority, application France, May 3, 1991, 91 05487

Int. Cl.<sup>6</sup> C07D 211/08; A61K 31/445

U.S. Cl. 546—191

24 Claims

10. A compound of the formula



(II)

in which

m is 2 or 3;

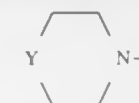
$Ar'$  is a phenyl which is unsubstituted or monosubstituted or polysubstituted by a substituent selected from the group consisting of a halogen atom, a trifluoromethyl, a  $C_1-C_4$  alkoxy and a  $C_1-C_4$  alkyl, said substituents being identical or different; a thienyl; a benzothienyl; a naphthyl or an indolyl;

n is 0, 1, 2 or 3;

p is 1 or 2, and when p is equal to 2, n is then equal to 1 and Q is two hydrogen atoms;

Q is oxygen or two hydrogen atoms;

E is a hydroxyl or an O-protected group selected from the group consisting of tetrahydropyran-2-yloxy and a group



in which

Y is

either a group  $Cy-N$  or  $Cy-CH_2-N$ , in which:

$Cy$  is a phenyl which is unsubstituted or monosubstituted or polysubstituted by a substituent selected from the group consisting of a halogen atom, a hydroxyl, a  $C_1-C_4$  alkoxy, a  $C_1-C_4$  alkyl and a trifluoromethyl, said substituents being identical or different; a  $C_3-C_7$  cycloalkyl group; a pyrimidyl group or a pyridyl group.

provided that when Q is 2H, E is OH, m is 2, p is 2, and n is 1, then  $Ar'$  is a phenyl which is monosubstituted or polysubstituted by a substituent selected from the group consisting of a halogen atom, a trifluoromethyl, a  $C_1-C_4$  alkoxy and a  $C_1-C_4$  alkyl, said substituents being identical or different; a thienyl; a benzothienyl; a naphthyl or an indolyl; and when Q is 2H or oxygen, E is OH, m is 2, and n and p are 1, then  $Ar'$  is a phenyl which is mono- or polysubstituted by a trifluoromethyl; a thienyl; a benzothienyl; a naphthyl or an indolyl;

or a salt thereof with a mineral or organic acid.

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## REAGENTS FOR CLEAVAGE OR CROSSLINKING OF BIOMOLECULES USING NONDIFFUSIBLE REACTIVE INTERMEDIATES

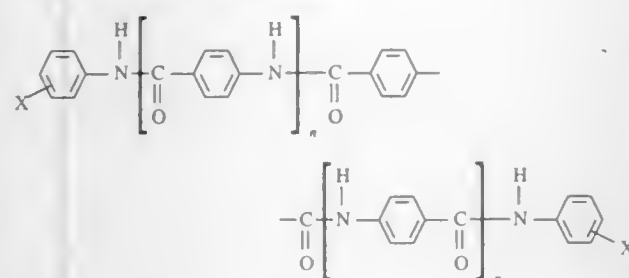
Dev P. Arya, Boston; Theresa Ann Devlin, Jamaica Plain; David Jebaratnam, Lexington, and Philip Warner, Sharon, all of Mass., assigns to Northeastern University, Boston, Mass.

Filed Jun. 21, 1994, Ser. No. 263,929  
Int. Cl.<sup>6</sup> C07C 233/00; 235/00; 221/00

U.S. Cl. 546—268.1

12 Claims

1. A compound of the formula



wherein

n = 0 or 1;

X = N<sub>2</sub><sup>+</sup>, N<sub>3</sub>, N = N—CO<sub>2</sub>R;wherein R = CH<sub>3</sub>, K<sup>+</sup>, CH<sub>2</sub>(CH<sub>2</sub>)<sub>m</sub>N<sup>+</sup>(CH<sub>3</sub>)<sub>3</sub>, Ar, CH<sub>2</sub>CH<sub>2</sub>SO<sub>2</sub>Ar, or (CH<sub>2</sub>)<sub>p</sub>CO<sub>2</sub>-succinyl, m = 1–5, p = 1–5;

at least one X being present; and

X being oriented either meta or para with respect to the NH group.

5,770,737

## ASYMMETRICAL DYES WITH LARGE TWO-PHOTON ABSORPTION CROSS-SECTIONS

Bruce A. Reinhardt, Tipp City; Jayprakash C. Bhatt, Riverside; Lawrence L. Brott, Cincinnati, and Stephen J. Clarkson, Loveland, all of Ohio, assigns to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 18, 1997, Ser. No. 933,067  
Int. Cl.<sup>6</sup> C07D 409/10; 213/02

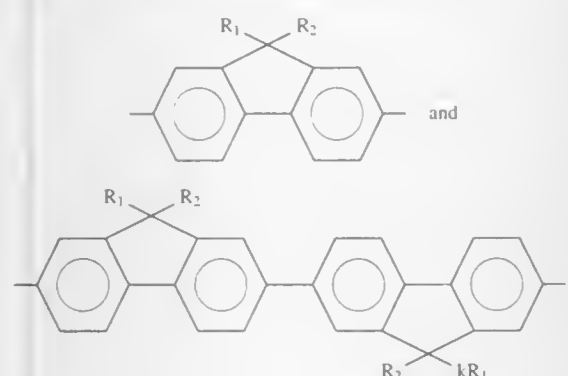
U.S. Cl. 546—285

2 Claims

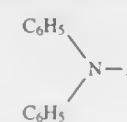
1. A two-photon absorbing chromophore of the formula

D—Ar—A

wherein Ar is selected from the group consisting of



D is selected from the group consisting of



and A is selected from the group consisting of



wherein R<sub>1</sub> and R<sub>2</sub> are alkyl groups having 8 to 12 carbon atoms, and wherein R<sub>1</sub> and R<sub>2</sub> are the same or different.

5,770,738

## ESTERS OF BI- AND TRICYCLIC AMINO ALCOHOLS, THEIR PREPARATION AND THEIR USE IN PHARMACEUTICAL COMPOSITIONS

Rolf Banholzer, Ingelheim am Rhein; Rudolf Bauer, Ockenheim, and Richard Reichl, Gau-Algesheim, all of Germany, assigns to Boehringer Ingelheim KG, Ingelheim am Rhein, Germany

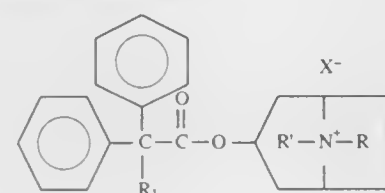
Continuation of Ser. No. 117,199, Dec. 2, 1993, abandoned.  
This application Mar. 28, 1995, Ser. No. 412,408

Int. Cl.<sup>6</sup> A01N 43/42

U.S. Cl. 514—304

14 Claims

1. A compound of formula



wherein

R is an optionally halo- or hydroxy-substituted C<sub>1-4</sub>-alkyl group;R' is a C<sub>1-4</sub>-alkyl group; orR and R' together form a C<sub>4-6</sub>-alkylene group;X<sup>-</sup> is an anion;

and

R<sub>1</sub> is H, OH, CH<sub>2</sub>OH, C<sub>1-4</sub>-alkyl or C<sub>1-4</sub>-alkoxy.

5,770,739

## NON-AQUEOUS HYDROGEN PEROXIDE COMPLEX

Szu-Min Lin; James Archie Swanzy, and Paul Taylor Jacobs, all of Arlington, Tex., assigns to Johnson & Johnson Medical, Inc., Irvine, Calif.

Division of Ser. No. 369,786, Jan. 6, 1995, Pat. No. 5,674,450, which is a continuation-in-part of Ser. No. 264,738, Apr. 28, 1994, abandoned. This application Aug. 26, 1996, Ser. No. 697,547

Int. Cl.<sup>6</sup> C07C 209/00; C07D 233/64

U.S. Cl. 548—335.5

19 Claims

1. A process for preparing a substantially non-aqueous hydrogen peroxide complex, comprising the steps of:

evacuating a chamber that contains a composition capable of reacting with hydrogen peroxide vapor to a pressure that is below the vapor pressure of said hydrogen peroxide vapor; then

introducing the hydrogen peroxide vapor into the chamber, wherein the hydrogen peroxide vapor reacts with the composition to form the hydrogen peroxide complex.

5,770,740

## AMINOALKYLOXIMERS

Gregory M. Shutske, Pittstown; Brian S. Freed, Phillipsburg, both of N.J.; John D. Tomer, IV, Perkasi, Pa., and R. Richard L. Hamer, Lehanon, N.J., assigns to Hoechst Marion Roussel, Inc., Cincinnati, Ohio

Division of Ser. No. 285,668, Aug. 3, 1994, Pat. No. 5,665,756.

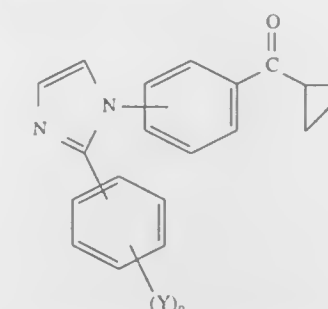
This application Jul. 29, 1997, Ser. No. 902,462

Int. Cl.<sup>6</sup> C07D 233/54; 233/60

U.S. Cl. 548—341.5

2 Claims

1. A compound of the formula



wherein Y is hydrogen or loweralkyl and p is 1 or 2.

5,770,741

## PROCESS FOR CYLOPROPANE DERIVATIVES

Patrick Jelf Crowley, Crowthorne; Christopher John Urch, Bracknell, and Paul Anthony Worthington, Maidenhead, all of Great Britain, assigns to Sandoz Ltd., Basel, Switzerland

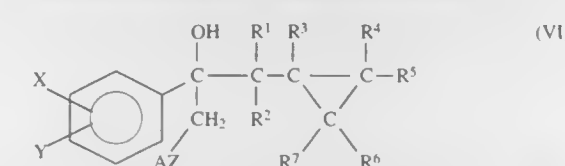
Continuation of Ser. No. 827,454, Jan. 29, 1992, Pat. No. 5,223,190, which is a continuation of Ser. No. 589,344, Sep. 27, 1990, abandoned, which is a division of Ser. No. 283,393, Dec. 12, 1988, Pat. No. 4,973,767. This application May 19, 1995, Ser. No. 444,663

Int. Cl.<sup>6</sup> C07D 249/08

U.S. Cl. 548—267.8

6 Claims

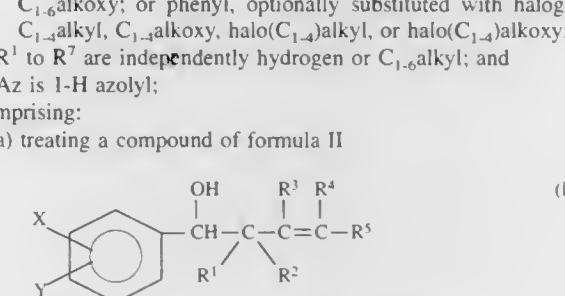
1. A process for preparing a compound of formula VI



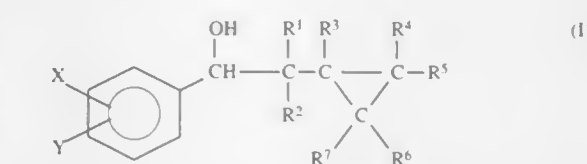
wherein X is hydrogen; halogen; C<sub>1-6</sub>-alkyl; halo(C<sub>1-6</sub>)-alkyl; C<sub>3-6</sub>-cycloalkyl; C<sub>3-6</sub>-cycloalkyl(C<sub>1-4</sub>)-alkyl; C<sub>2-6</sub>-alkenyl; C<sub>2-6</sub>-alkynyl; C<sub>1-6</sub>-alkoxy; or phenyl, optionally substituted with halogen, C<sub>1-4</sub>-alkyl, C<sub>1-4</sub>-alkoxy, halo(C<sub>1-4</sub>)-alkyl, or halo(C<sub>1-4</sub>)-alkoxy; Y is halogen; C<sub>1-6</sub>-alkyl; halo(C<sub>1-6</sub>)-alkyl; C<sub>3-6</sub>-cycloalkyl; C<sub>3-6</sub>-cycloalkyl(C<sub>1-4</sub>)-alkyl; C<sub>2-6</sub>-alkenyl; C<sub>2-6</sub>-alkynyl; C<sub>1-6</sub>-alkoxy; or phenyl, optionally substituted with halogen, C<sub>1-4</sub>-alkyl, C<sub>1-4</sub>-alkoxy, halo(C<sub>1-4</sub>)-alkyl, or halo(C<sub>1-4</sub>)-alkoxy; R<sup>1</sup> to R<sup>7</sup> are independently hydrogen or C<sub>1-6</sub>-alkyl; and Az is 1-H azolyl;

comprising:

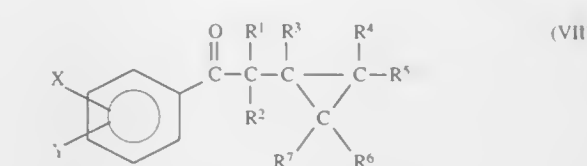
a) treating a compound of formula II

wherein X, Y, and R<sup>1</sup> to R<sup>5</sup> are as defined above, with a compound of the formula IIICR<sup>6</sup>R<sup>7</sup>Z<sub>1</sub>Z<sub>2</sub>

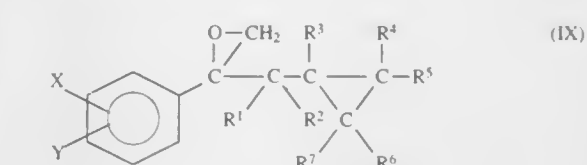
whereas R<sup>6</sup> and R<sup>7</sup> are as defined above and Z<sub>1</sub> and Z<sub>2</sub> are the same or different and are halogen, in the presence of metallic zinc to form a compound of the formula (I)

whereas X, Y, and R<sup>1</sup> and R<sup>7</sup> are as defined above;

b) oxidizing a compound of formula I in the presence of an oxidizing agent to obtain a compound of the formula (VII)

wherein X, Y, and R<sup>1</sup> to R<sup>7</sup> are as defined above;

c) epoxidizing the compound of formula VII to obtain a compound of formula (IX)

wherein X, Y, and R<sup>1</sup> to R<sup>7</sup> are as defined above; and

d) treating the compound of the formula IX with an azole to obtain the compound of the formula VI.

5,770,742

## THIOPHENE-TRYPTAMINE DERIVATIVES

Qingchang Meng, Georgetown; Abdelmalik Slassi, Brampton, and Sumanas Rakhit, Mississauga, all of Canada, assigns to Allelix Biopharmaceuticals Inc., Mississauga, Canada

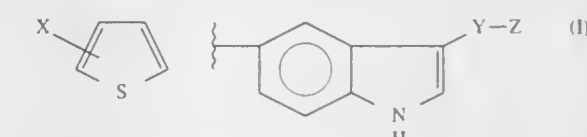
Filed May 16, 1996, Ser. No. 648,842

Int. Cl.<sup>6</sup> C07D 403/06

U.S. Cl. 548—466

23 Claims

1. 5-thiophene-substituted tryptamine analogs exhibiting selectivity towards human 5-HT<sub>1D</sub> receptors, and corresponding to the general formula I:



wherein X represents H, C<sub>1-4</sub>-alkyl, C<sub>1-4</sub>-hydroxyalkyl or halogen, at the 4- or 5-position of the thiophene nucleus, Y represents a direct bond or C<sub>1-3</sub>-alkylene group optionally substituted with hydroxyl, and Z represents amino, mono- or di-N-lower alkyl-substituted amino, or optionally N-lower alkyl-substituted pyrrolidine.



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**1,2-DIOXETANE COMPOUNDS AS  
CHEMILUMINESCENT LABELS FOR ORGANIC AND  
BIOLOGICAL MOLECULES**

Arthur P. Schaap; Louis J. Romano, and Jaidev S. Goudar, all of Detroit, Mich., assignors to Board of Governors of Wayne State University, Detroit, Mich.

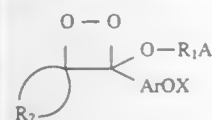
Continuation of Ser. No. 579,837, Sep. 7, 1990, abandoned, which is a continuation-in-part of Ser. No. 289,837, Dec. 27, 1988, Pat. No. 5,616,729, which is a continuation-in-part of Ser. No. 887,139, Jul. 17, 1986. This application Mar. 25, 1994, Ser. No. 218,308

Int. Cl.<sup>6</sup> C07D 405/02; 305/04

U.S. Cl. 548—526

10 Claims

1. A dioxetane compound of the formula:



wherein Ar is an aromatic substituent selected from the group consisting of phenyl and naphthyl, wherein A is a substituent which couples with an organic or biological molecule to provide the dioxetane compound as a label on the molecule and wherein A is selected from the group consisting of hydroxyl, amino, halogen, cyano, carboxylic acid, NH(CH<sub>2</sub>)<sub>m</sub>OH where m is 2 to 20, succinimidoxyl, biotin and carboxyfluorescein substituents, wherein R<sub>1</sub> is a linking substituent selected from the group consisting of a —CH<sub>2</sub>— group, a —(CH<sub>2</sub>)<sub>n</sub>NH— group and a —(CH<sub>2</sub>)<sub>n</sub>CO— group, where n is an integer between about 1 and 30, wherein X is a chemically labile substituent which is removed by an activating agent other than an enzyme so that light is produced by the dioxetane and wherein



is a polycyclic alkylene substituent containing 6 to 30 carbon atoms.

5,770,744

**PROCESS FOR THE PREPARATION OF SUCCINIC  
ANHYDRIDE**

Gerhard Darsow, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 11, 1996, Ser. No. 584,866

Claims priority, application Germany, Jan. 20, 1995, 195 01 676.9

Int. Cl.<sup>6</sup> C07D 307/60; C07C 5/00; C08F 24/00

U.S. Cl. 549—233

15 Claims

1. A process for the continuous preparation of succinic anhydride by catalytic hydrogenation of maleic anhydride, wherein the hydrogenation is carried out in the liquid phase at a H<sub>2</sub> pressure of 50 to 400 bar, a 10 to 80 times molar amount of H<sub>2</sub>, based on the stoichiometric amount, and at a temperature of 60° to 180° C. and on oxygen-free support-free catalysts which are arranged in the fixed bed and are present as pressed shaped bodies produced from metal powders and have a compressive strength of 20 to 250N and an internal surface area of 10 to 90 m<sup>2</sup>/g and in which the metal powders contain 60 to 100% by weight of one or more ferrous metals, 0 to 15% by weight of one or more metals of subgroup VI and 0 to 25% by weight of one or more hydrogenation-inert elements from the group consisting of aluminium, silicon, titanium and carbon, all based on the total weight of metal powder.

5,770,745

**SYNTHESIS OF TAXOL, TAXOL ANALOGS AND THEIR  
INTERMEDIATES WITH VARIABLE A-RING SIDE  
CHAIN STRUCTURES AND COMPOSITIONS THEREOF**  
Charles S. Swindell, Bryn Mawr, Pa., and Nancy Krauss, Palo Alto, Calif., assignors to Bryn Mawr College, Bryn Mawr, Pa.

Continuation of Ser. No. 15,095, Feb. 5, 1993, abandoned.

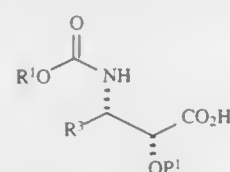
This application Dec. 15, 1994, Ser. No. 357,507

Int. Cl.<sup>6</sup> C07D 305/14

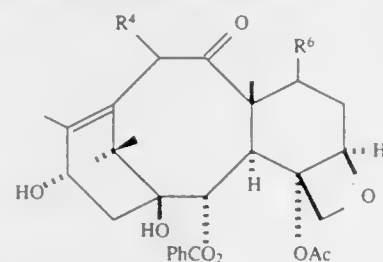
U.S. Cl. 549—510

13 Claims

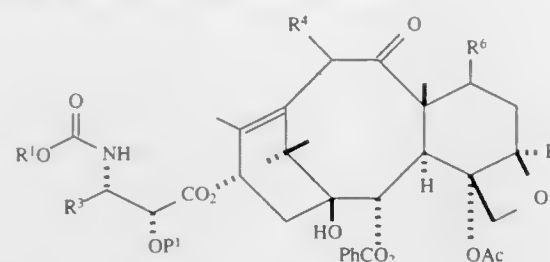
1. A chemical process useful in production of taxol, taxol analogues and their intermediates comprising the step of condensing a compound of the general formula:



with a taxane of the general structure:



to give an intermediate of the general structure:



wherein:

R<sup>1</sup>=an olefinic group, an aromatic group or PhCH<sub>2</sub>  
R<sup>2</sup>=hydrogen or Ph  
R<sup>4</sup>=hydroxyl, acetoxy or a hydroxyl protecting group  
R<sup>6</sup>=hydroxyl or a hydroxyl protecting group  
p<sup>1</sup>=hydroxyl protecting group.

5,770,746

**EPOXIDATION PROCESS USING SUPPORTED SILVER  
CATALYSTS PRETREATED WITH ORGANIC CHLORIDE**  
Bernard Cooker, Malvern; Anne M. Gaffney, West Chester; Jennifer D. Jewson, Pottstown; Andrew P. Kahn, Eagleville, and Rangasamy Pitchai, West Chester, all of Pa., assignors to Arco Chemical Technology, L.P., Greenville, Del.

Filed Jun. 23, 1997, Ser. No. 880,896

Int. Cl.<sup>6</sup> C07D 301/10

U.S. Cl. 549—534

20 Claims

1. A propylene epoxidation process comprising:  
(a) contacting a supported silver catalyst with a treatment stream comprised of a C<sub>1</sub>—C<sub>10</sub> organic chloride and molecular oxygen in the vapor phase at a temperature of from 150° C. to 350° C. for a time effective to incorporate chloride into the supported silver catalyst to form a chloride-containing catalyst, wherein the supported silver catalyst is comprised of (i)

an inert refractory solid support, (ii) a catalytically effective amount of silver, and (iii) a promoting amount of a potassium promoter derived from a potassium salt comprising potassium cation and a nitrogen oxyanion or precursor thereof; and  
(b) contacting the chloride-containing catalyst with a feedstream comprised of propylene and molecular oxygen, but essentially free of C<sub>1</sub>—C<sub>10</sub> organic chloride, for a time and at a temperature effective to form propylene oxide.

5,770,747

**PREPARATION OF 1,2-BUTYLENE OXIDE**

Peter Lingelbach, Mutterstadt; Joachim Roser, Mannheim; Christoph Sigwart, Schriesheim; Werner Schnurr, Herxheim, and Hans-Jürgen Weyer, Bobenheim-Roxheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP95/02337, § 371 Date Dec. 27, 1996, § 102(e) Date Dec. 27, 1996, PCT Pub. No. WO96/00222, PCT Pub. Date Jan. 4, 1996

PCT Filed Jun. 16, 1995, Ser. No. 765,618

Claims priority, application Germany, Jun. 27, 1994, 44 22 046.4

Int. Cl.<sup>6</sup> C07D 301/00

U.S. Cl. 549—540

6 Claims

1. A process for the preparation of 1,2-butylene oxide by the catalytic hydrogenation of vinyl oxirane, wherein a palladium catalyst on a support of barium sulfate, zirconium dioxide or titanium dioxide or a rhenium-containing supported palladium catalyst is used.

5,770,748

**INTERMEDIATE STEROID COMPOUND**

Patrick Roussel, Thiais, and Michel Vivat, Lagny Sur Marne, both of France, assignors to Roussel Uclaf, France

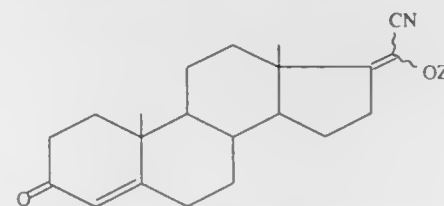
Division of Ser. No. 519,772, Aug. 28, 1995, Pat. No. 5,650,526. This application Dec. 2, 1996, Ser. No. 758,951  
Claims priority, application France, Sep. 6, 1994, 94-10661

Int. Cl.<sup>6</sup> C07J 31/00

U.S. Cl. 552—531

1 Claim

1. A compound having a formula



Z is a protective ester group of hydroxy and the wavy lines indicate a mixture of isomers.

5,770,749

**PROCESS OF ISOLATING A PHYTOSTEROL  
COMPOSITION FROM PULPING SOAP**

James P. Kutney, Vancouver; Egon Novak, Richmond, and Peter J. Jones, Montreal, all of Canada, assignors to The University of British Columbia - University Maison Office (Industrial), Vancouver, Canada

Continuation of Ser. No. 314,945, Sep. 29, 1994, abandoned.  
This application Aug. 30, 1996, Ser. No. 706,354

Int. Cl.<sup>6</sup> C07J 75/00

U.S. Cl. 552—545

6 Claims

1. A process for isolating a phytosterol composition from a pulping soap which comprises:  
extracting from the pulping soap a creamy precipitate using a solvent mixture—having no alcohol and—comprising water, ketone and hydrocarbon; and

purifying the creamy precipitate to form the phytosterol composition.

5,770,750

**ALKYD AND ARAKYD DERIVATIVES OF PHENOLIC  
POLYMERS**

David A. Hutchings, Tucker; Rajan Hariharan, Duluth; Edward Lucas, Jr., Peachtree City; Syed A. Elahi, Woodstock, all of Ga.; Alan K. Randall, Delaware, Ohio, and Kenneth Bourlier, Decatur, Ga., assignors to Georgia-Pacific Resins, Inc., Atlanta, Ga.

Filed Jan. 10, 1997, Ser. No. 781,669

Int. Cl.<sup>6</sup> C07C 53/00

U.S. Cl. 554—223

36 Claims

1. An ester comprising the reaction product of a fatty acid with an aliphatic hydroxyl moiety of an alkoxyated phenolic aralkylation polymer comprising the alkoxylation reaction product of (1) an alkoxyating agent selected from the group consisting of alkylene oxides, alkylene carbonates, diene oxides, diene carbonates, glycerol carbonate, glycerol carbonate (meth)acrylate, glycidyl (meth)acrylate, lactones, and blends thereof with (2) a phenolic aralkylation polymer comprising the reaction product of a phenolic monomer having at least two free reactive positions; a styrene derivative; and a coupling agent.

5,770,751

**MEADOWFOAM SULFOSUCCINATES**

Anthony J. O'Lenick, Jr., Lilburn, Ga., assignor to Fan Tech Ltd., Chicago, Ill.

Continuation-in-part of Ser. No. 692,376, Jul. 31, 1996, which is a continuation-in-part of Ser. No. 516,138, Aug. 17, 1995.

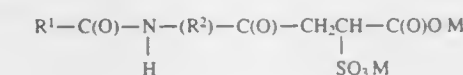
This application Dec. 16, 1996, Ser. No. 767,475

Int. Cl.<sup>6</sup> C07C 233/00

U.S. Cl. 554—49

10 Claims

1. A meadowfoam sulfosuccinate conforming to the following structure;



R<sup>1</sup> is derived from meadowfoam and is 60–65% by weight

—(CH<sub>2</sub>)<sub>3</sub>—CH=CH—(CH<sub>2</sub>)<sub>13</sub>—CH<sub>3</sub>

12–20% by weight a mixture of

—(CH<sub>2</sub>)<sub>3</sub>—CH=CH—(CH<sub>2</sub>)<sub>15</sub>—CH<sub>3</sub>

and

—(CH<sub>2</sub>)<sub>11</sub>—CH=CH—(CH<sub>2</sub>)<sub>7</sub>—CH<sub>3</sub>

and

15–28% by weight

—(CH<sub>2</sub>)<sub>3</sub>—CH=CH—(CH<sub>2</sub>)<sub>6</sub>—CH=CH—(CH<sub>2</sub>)<sub>6</sub>—CH<sub>3</sub>;

R<sup>2</sup> is:

—(CH<sub>2</sub>CH<sub>2</sub>—O)<sub>x</sub>—(CH<sub>2</sub>CH(CH<sub>3</sub>)O)<sub>y</sub>—

x, and y are independently 0 or 1 with the proviso that x + y is greater than 0;

M is a cation selected from K or Na.

5,770,752

## PROCESS FOR REDUCING THE CONCENTRATION OF BY-PRODUCTS IN PRODUCT MIXTURES

Wilhelm Kaufmann, Rödermark; Thomas Wisser, Limburg; Johann Streb, Frankfurt; Thomas Rink; Roland Zenk, both of Bad Soden; Michael Riedel, Essen, and Ivan Cabrera, Dreieich, all of Germany, assignors to Targor GmbH, Ludwigshafen, Germany

Filed Dec. 18, 1996, Ser. No. 768,638

Claims priority, application Germany, Dec. 18, 1995, 195 47 247.0; Dec. 18, 1995, 195 47 248.9

Int. Cl.<sup>6</sup> C07F 17/00; 7/02

U.S. Cl. 556—11

12 Claims

1. A process for reducing the concentration of organometallic byproducts or inorganic by-products or both organometallic and inorganic products in product mixtures formed in the synthesis of metallocene products, which comprises treating a mixture comprising one or more metallocene products and one or more organometallic byproducts or one or more inorganic byproducts or both said byproducts with a polar extractant composition comprising a polar organic solvent, to obtain the desired product with reduced concentration of byproducts, said polar organic solvent being an alcohol, an amine, an aldehyde, a ketone, a carboxylic acid, a carboxylic acid ester, an ether, a heteroaromatic compound, a nitrile, a haloaromatic compound, a nitro compound, or a combination thereof.

2. The process as claimed in claim 1, wherein the mixture is a crude product formed in the synthesis of at least one metallocene product.

5,770,753

## METALLOCENES CONTAINING ARYL-SUBSTITUTED INDENYL DERIVATIVES AS LIGANDS, PROCESS FOR THEIR PREPARATION, AND THEIR USE AS CATALYSTS

Frank Küber, Oberursel; Bernd Bachmann, Eppstein/Taunus; Walter Spaleck, Liederbach/Taunus; Andreas Winter, Glashütten/Taunus, and Jürgen Rohrmann, Kelkheim, all of Germany, assignors to Targor GmbH, Germany

Division of Ser. No. 83,816, Jun. 28, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 475,155

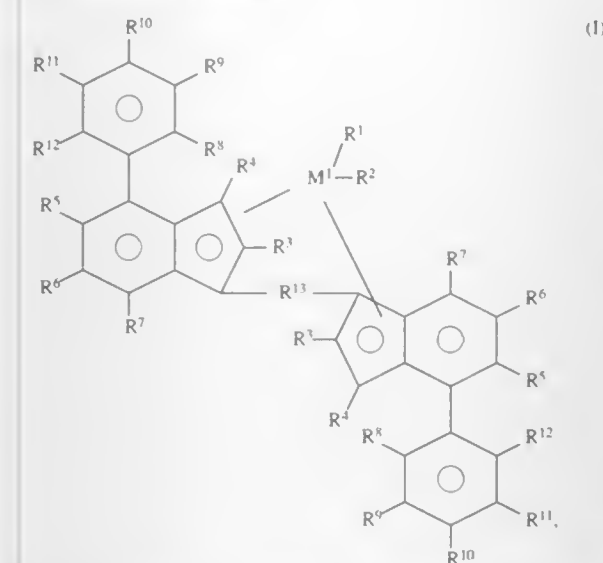
Claims priority, application Germany, Jun. 27, 1992, 4221244.8

Int. Cl.<sup>6</sup> C08F 4/642

U.S. Cl. 556—11

5 Claims

1. A compound of formula I



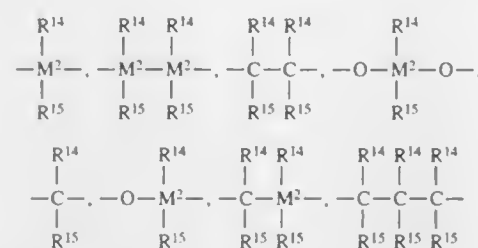
in which

M<sup>1</sup> is a metal from group IVb, Vb or VIb of the Periodic Table, R<sup>1</sup> and R<sup>2</sup> are identical or different and are a hydrogen atom, a C<sub>1</sub>-C<sub>10</sub>-alkyl group, a C<sub>1</sub>-C<sub>10</sub>-alkoxy group, a C<sub>8</sub>-C<sub>10</sub>-aryl group, a C<sub>6</sub>-C<sub>10</sub>-aryloxy group, a C<sub>2</sub>-C<sub>10</sub>-alkenyl group, a

C<sub>7</sub>-C<sub>40</sub>-arylalkyl group, a C<sub>7</sub>-C<sub>40</sub>-alkylaryl group, a C<sub>8</sub>-C<sub>40</sub>-arylalkenyl group, an OH group or a halogen atom,

the radicals R<sup>3</sup> are identical or different and are a hydrogen atom, a halogen atom, a C<sub>1</sub>-C<sub>10</sub>-alkyl group, which may be halogenated, a C<sub>8</sub>-C<sub>10</sub>-aryl group, an —NR<sup>16</sup>, —SR<sup>15</sup>, —OSiR<sup>16</sup>, —SiR<sup>16</sup>, or —PR<sup>16</sup> radical, in which R<sup>16</sup> is a halogen atom, a C<sub>1</sub>-C<sub>10</sub>-alkyl group or a C<sub>6</sub>-C<sub>10</sub>-aryl group, the radicals R<sup>8</sup> are identical or different and are a C<sub>1</sub>-C<sub>10</sub>-alkyl group, which may be halogenated, a C<sub>8</sub>-C<sub>10</sub>-aryl group, an —NR<sup>16</sup>, —SR<sup>16</sup>, —OSiR<sup>16</sup>, —SiR<sup>16</sup>, or —PR<sup>16</sup> radical, in which R<sup>16</sup> is a halogen atom, a C<sub>1</sub>-C<sub>10</sub>-alkyl group or a C<sub>8</sub>-C<sub>10</sub>-aryl group.

R<sup>4</sup> to R<sup>7</sup> and R<sup>9</sup> to R<sup>12</sup> are identical or different and are as defined for R<sup>3</sup>, or adjacent radicals R<sup>4</sup> to R<sup>12</sup>, together with the atoms connecting them, form one or more aromatic or aliphatic rings, or the radicals R<sup>5</sup> and R<sup>8</sup> or R<sup>12</sup> together with the atoms connecting them, form an aromatic or aliphatic ring, R<sup>13</sup> is



—BR<sup>14</sup>, —AlR<sup>14</sup>, —Ge—, —O—, —S—, —SO, —SO<sub>2</sub>, —NR<sup>14</sup>, —CO, —PR<sup>14</sup> or —P(O) R<sup>14</sup>, where R<sup>14</sup> and R<sup>15</sup> are identical or different and are a hydrogen atom, a halogen atom, a C<sub>1</sub>-C<sub>10</sub>-alkyl group, a C<sub>1</sub>-C<sub>10</sub>-fluoroalkyl group, a C<sub>1</sub>-C<sub>10</sub>-alkoxy group, a C<sub>8</sub>-C<sub>10</sub>-aryl group, a C<sub>8</sub>-C<sub>10</sub>-fluoroaryl group, a C<sub>8</sub>-C<sub>10</sub>-aryloxy group, a C<sub>2</sub>-C<sub>10</sub>-alkenyl group, a C<sub>7</sub>-C<sub>40</sub>-arylalkyl group, a C<sub>7</sub>-C<sub>40</sub>-alkylaryl group or a C<sub>8</sub>-C<sub>40</sub>-arylalkenyl group, or R<sup>14</sup> and R<sup>15</sup>, in each case together with atoms connecting them, form one or more rings; and

M<sup>2</sup> is silicon, germanium or tin.

5,770,754

## METHOD OF PREPARING POLYSULPHIDIC SILYL ETHERS

Thomas Scholl, Gladbach, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 10, 1997, Ser. No. 814,290

Claims priority, application Germany, Mar. 15, 1996, 196 10 281.2

Int. Cl.<sup>6</sup> C07F 7/08

U.S. Cl. 556—427

4 Claims

1. A method of preparing polysulphidic silyl ethers by the reaction of metal polysulphides with halogenoalkylsilanes, characterised in that, starting from hydrated metal sulphides and/or metal polysulphides, these are first dehydrated in the presence of a non water mixable organic solvent and in the presence of an emulsifier at temperatures of 90° to 220° C., optionally in vacuum or under pressure, if metal sulphides are used these are subsequently reacted with sulphur to form metal polysulphides, and thereafter the dehydrated metal polysulphides obtained are converted into the corresponding polysulphidic silyl ethers with halogenoalkylsilanes, optionally in the presence of polyhalogen compounds, at temperatures of 20° to 150° C.

5,770,755

## PROCESS TO PREPARE POLYMERIC METALLOCENES

Peter Schertl; Helmut G. Alt; Bernd Peifer, all of Bayreuth, Germany; Syriac J. Palackal, and M. Bruce Welch, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 15, 1994, Ser. No. 339,537

Int. Cl.<sup>6</sup> C07F 9/00; 14/00; C08G 61/00; C08F 10/00

U.S. Cl. 556—43

20 Claims

1. A process for preparing a polymeric metallocene, said process comprising reacting a polymeric ligand, an alkali metal compound, and a transition metal-containing compound;

wherein said polymeric ligand is represented by the formula [Q]<sub>n</sub>, wherein Q is a unit containing at least one cyclopentadiene-type group and wherein said polymeric ligand is a homopolymer or a copolymer, wherein said homopolymer or said copolymer comprises monomers selected from the group consisting of cyclopentadienyl, substituted cyclopentadienyl, indenyl, substituted indenyl, fluorenyl, substituted fluorenyl, styrene, and substituted styrene;

wherein said alkali metal compound is represented by the formula AR', wherein A is an alkali metal selected from the group consisting of lithium, sodium, and potassium and wherein R' is a hydrocarbyl group selected from the group consisting of alkyl, cycloalkyl, and aryl groups containing 1 to 12 carbon atoms; and

wherein said transition metal-containing compound is represented by the formula MX<sub>4</sub> wherein M is a Group IVB or VB transition metal, and each X is individually a hydrocarbyl group containing 1 to 20 carbon atoms, an alkoxy group containing 1 to 12 carbon atoms, an aryloxy group containing 6 to 20 carbon atoms, a halide, or hydride.

5,770,757

## AMMOXIDATION CATALYSTS CONTAINING GERMANIUM TO PRODUCE HIGH YIELDS OF ACRYLONITRILE

Tama Lee Drenski, Twinsburg; Maria Strada Friedrich, Lyndhurst; Christos Paparizos, Willowick; Michael J. Seely, Twinsburg, and Dev Dhanaraj Suresh, Hudson, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 461,996, Jun. 5, 1995, abandoned. This application May 3, 1996, Ser. No. 646,742

Int. Cl.<sup>6</sup> C07C 255/08; 253/12

U.S. Cl. 558—300

8 Claims

1. A process for the preparation of acrylonitrile or methacrylonitrile by the reaction of propylene or isobutylene, molecular oxygen and ammonia at a temperature of between 200° C. to about 600° C. in the presence of a catalyst, the improvement comprising using a catalyst having the atomic ratios described by the empirical formula set forth below:



where

A=two or more of alkali metals, In and Tl

B=the combination of Fe plus at least one element selected from the group consisting of Ni and Co plus at least one element selected from the group consisting of Mg, Mn, Ca, Ce, Sn, Cr, Sb, and W

C=one or more of Pb, Eu, B, Sn, Te and Cu

a=0.05 to 5.0

b=5 to 12

c=0 to 5.0

d=0.1 to 2.0

e=0.1 to 2.0

x=the number of oxygen atoms required to satisfy the valency requirements of the other elements and

b>a+c.

5,770,758

## 3-AMINO-2-MERCAPTOBENZOIC ACID DERIVATIVES AND PROCESSES FOR THEIR PREPARATION

Walter Kunz, Oberwil, and Beat Jau, Aesch, both of Switzerland, assignors to Novartis Corporation, Summit, N.J.

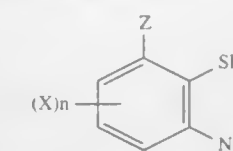
Filed Dec. 20, 1996, Ser. No. 770,353

Int. Cl.<sup>6</sup> C07C 255/07; 321/08; 327/16

U.S. Cl. 558—422

5 Claims

1. A compound of the formula I



or the disulfide thereof or a salt thereof,

in which:

X is halogen,

n is 0, 1, 2 or 3;

Z is CN, CO-A or CS-A,

A is hydrogen, halogen, OR<sub>1</sub>, SR<sub>2</sub> and N(R<sub>3</sub>)R<sub>4</sub>;

R<sub>1</sub> to R<sub>4</sub> are hydrogen, a substituted or unsubstituted, open-chain, saturated or unsaturated hydrocarbon radical containing not more than 8 carbon atoms, a substituted or unsubstituted cyclic, saturated or unsaturated hydrocarbon radical containing not more than 10 carbon atoms, substituted or unsubstituted benzyl or phenethyl, a substituted or unsubstituted alkanoyl group containing not more than 8 carbon atoms, a substituted or unsubstituted benzoyl group or a substituted or unsubstituted heterocyclyl radical; or R<sub>3</sub> and R<sub>4</sub>, together with the nitrogen atom to which they are bonded, are a 5- or 6-membered, substituted or unsubstituted heterocyclic radical having 1-3 heteroatoms O, S and/or N.



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## PROSTAGLANDINS OF THE F SERIES

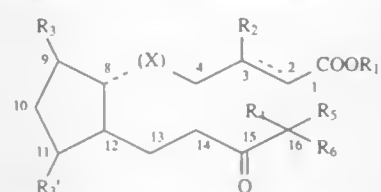
Ryuzo Ueno; Ryuji Ueno, both of Nishinomiya, and Tomio Oda, Itami, all of Japan, assignors to R-Tech Ueno, Ltd., Osaka-Fu, Japan

Division of Ser. No. 361,712, Dec. 22, 1994, Pat. No. 5,591,887, which is a continuation of Ser. No. 43,177, Apr. 2, 1993, abandoned, which is a division of Ser. No. 945,594, Sep. 16, 1992, Pat. No. 5,221,763, which is a continuation of Ser. No. 607,791, Oct. 31, 1990, abandoned, which is a continuation of Ser. No. 189,100, May 2, 1988, abandoned. This application Aug. 23, 1996, Ser. No. 701,865

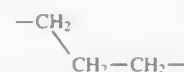
Claims priority, application Japan, Apr. 30, 1987, 62-107529; Sep. 18, 1987, 62-235890

Int. Cl.<sup>6</sup> C07C 405/00

U.S. Cl. 560—53 13 Claims  
1. A 13,14-dihydro-15-keto-PGF represented by the formula:



in which a bond between C-2 and C-3 is a single or a double bond. X is a group:



R<sub>1</sub> is a hydrogen atom or a C<sub>1-4</sub> alkyl, phenyl, benzoyl, hydroxy-alkyl, alkoxyalkyl, trialkylsilyl or tetrahydropyranyl group;  
R<sub>2</sub> is a hydrogen atom or a lower alkyl group;  
R<sub>3</sub> is hydroxyl;  
R<sub>3</sub> is hydroxyl; R<sub>4</sub> and R<sub>5</sub> are independently a hydrogen atom or a lower alkyl group. R<sub>6</sub> is a C<sub>1-9</sub> alkyl group containing a C<sub>1-2</sub> alkoxy substituent or



(wherein R<sub>7</sub> is a hydrogen or halogen atom or a halogenated methyl group; and a physiologically acceptable salt of said 13,14-dihydro-15-keto-PGF.

5,770,760

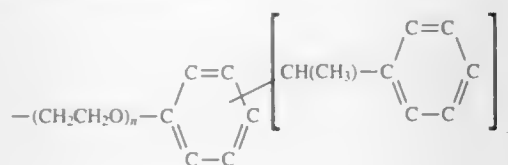
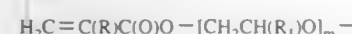
## POLYMERS USEFUL AS PH RESPONSIVE THICKENERS AND MONOMERS THEREFOR

Fred Robinson, Newton, Pa., assignor to Rhodia Inc., Cranbury, N.J.

Continuation of Ser. No. 317,261, Oct. 3, 1994, abandoned. This application Apr. 2, 1996, Ser. No. 627,958

Int. Cl.<sup>6</sup> C07C 69/52

U.S. Cl. 560—221 5 Claims  
1. An ethylenically unsaturated biphenyl monomer of the formula:



wherein R and R<sub>1</sub> represent hydrogen or methyl, n is an average number from about 6 to about 100, m is an average number of from about 0-50 provided that n is > or =m and SIGMA (m+n) is an average number from about 6-100, and x is an average number of from about 2 to about 3.

5,770,761

## PROCESS FOR ETHYL ACETATE PRODUCTION

Tzong-Bin Lin, Chia-Yi, Taiwan; Karl T. Chuang, Alberta, Canada; Kun-Yung Tsai, Tao-Yuan, and Jen-Ray Chang, Chia-Yi, both of Taiwan, assignors to Chinese Petroleum Corporation, Taipei, Taiwan

Filed Nov. 8, 1996, Ser. No. 744,880

Int. Cl.<sup>6</sup> C07C 69/02

U.S. Cl. 560—231 18 Claims  
1. A process for the production of ethyl acetate from ethanol by oxidation of ethanol characterized by:

contacting excess liquid ethanol with oxygen in the presence of a metallic oxidation catalyst to form acetic acid and in the presence of excess liquid ethanol to absorb the acetic acid; allowing the acetic acid to react with the excess liquid ethanol to produce ethyl acetate and water; and removing ethyl acetate and water.

5,770,762

## PROCESS FOR PRODUCING A 4-SUBSTITUTED-2-BUTENALS

Hideharu Iwasaki, and Takashi Onishi, both of Hasaki-machi, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Apr. 22, 1997, Ser. No. 837,850

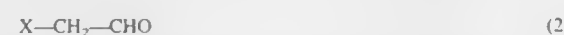
Claims priority, application Japan, Apr. 24, 1996, 8-127789 Int. Cl.<sup>6</sup> C07C 45/45; 67/00

U.S. Cl. 560—238 21 Claims  
1. A process for producing a 4-substituted-2-butenal having the formula (1):

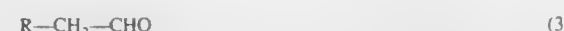


wherein X is acyloxy or halogen; R is hydrogen, aliphatic hydrocarbon group or aromatic hydrocarbon group; each of which hydrocarbon groups may be substituted with hydroxyl, alkoxy, aryloxy, acyl or alkoxy carbonyl;

which process comprises reacting a substituted acetaldehyde of the formula (2):



wherein X is as defined above, with an aldehyde having the formula (3):



wherein R is as defined above, in the presence of an amino carboxylic acid selected from the group consisting of glycine, alanine, β-alanine, valine, leucine, isoleucine, serine, cysteine, methionine, threonine, tyrosine, α-aminobutyric acid, β-aminobutyric acid, phenylalanine, aspartic acid, sodium aspartate, potassium aspartate, glutamic acid, sodium glutamate and potassium glutamate.

5,770,763

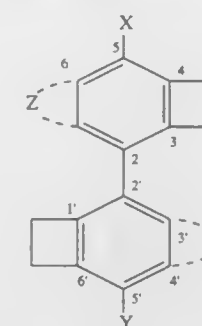
## DIFUNCTIONAL BITRICYCLOBECATRIENE MONOMERS

David C. Martin, Ann Arbor, Mich.; Jeffrey S. Moore, Savoy, Ill.; Larry J. Markoski, Ypsilanti, Mich.; Kenneth A. Walker, Urbana, Ill., and Gary E. Spilman, Ann Arbor, Mich., assignors to The Board of Regents of the Univ. of Michigan, Ann Arbor, Mich.

Division of Ser. No. 448,637, May 23, 1995, Pat. No. 5,552,508, which is a continuation-in-part of Ser. No. 284,006, Aug. 1, 1994, Pat. No. 5,418,312, which is a continuation-in-part of Ser. No. 907,430, Jul. 1, 1992, Pat. No. 5,334,752. This application Aug. 30, 1996, Ser. No. 705,630

Int. Cl.<sup>6</sup> C07C 205/12

U.S. Cl. 560—358 13 Claims  
1. A monomer of the general formula:



wherein Z is hydrogens or a cyclobutane ring; and X and Y are carboxyl, amino, alcohol, isocyanate, acid halide, or 4-halobenzoyl groups.

5,770,764

## PROCESS FOR PREPARING PURIFIED AROMATIC POLYCARBOXYLIC ACIDS

Martin A. Zeitlin, Naperville; David L. Sikkenga, Wheaton; Stephen V. Hoover, Aurora, and Paul K. Behrens, Warrenville, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed May 19, 1997, Ser. No. 858,362

Int. Cl.<sup>6</sup> C07C 51/16

U.S. Cl. 562—412 20 Claims  
1. An integrated process for preparation of a purified aromatic polycarboxylic acid obtained by liquid-phase oxidation of a corresponding aromatic compound having at least two oxidizable alkyl or acyl ring substituents or an oxidizable alkyl and acyl ring substituent in non-adjacent positions, with a dioxygen-containing gas in a solvent at an elevated temperature and pressure and in the presence of an oxidation catalyst comprising a heavy metal component to prepare crude solids containing the desired aromatic polycarboxylic acid wherein the level of monofunctional, difunctional and/or trifunctional aromatic impurities retained by the crude solids is equal to or less than about 5 percent, based upon the weight of polycarboxylic acid present, which process comprises:

(a-1) introducing crude solids containing the desired aromatic polycarboxylic acid into an aqueous solution of a polyalkyl amine containing up to about 20 carbon atoms while maintaining the solution at a level of pH in a range upward from about 7 and at temperature and pressure sufficient to maintain the solution substantially in the liquid phase, to form soluble salts of the polycarboxylic acid and one or more of the monofunctional, difunctional and/or trifunctional aromatic impurities in the aqueous solution;

(b-1) contacting the aqueous solution with an immiscible liquid solvent or solid adsorbent, transferring a substantial fraction of the salt of at least one of the monofunctional aromatic impurities from the aqueous solution to the immiscible liquid solvent or solid adsorbent, and recovering therefrom purified aqueous solution;

(c-1) acidifying the purified aqueous solution of the polyalkyl amine salt of the polycarboxylic acid with a carboxylic acid containing from 1 to 6 carbon atoms to a level of pH in a range downward from about 6.7 to form a slurry of precipitated polycarboxylic acid in mother liquor which retains a substantial fraction of the soluble salts of the trifunctional aromatic impurities, and

(d-1) recovering from the slurry purified polycarboxylic acid product which contains less than about 1 percent of the mono-functional and/or trifunctional aromatic impurities, based upon the weight of the polycarboxylic acid present.

5,770,765

## PROCESS FOR THE PRODUCTION OF HIGH-PURITY ISOPHTHALIC ACID

Fumio Ohkoshi, Kurashiki, Japan, assignor to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jul. 8, 1997, Ser. No. 890,006

Int. Cl.<sup>6</sup> C07C 51/16

U.S. Cl. 562—414 6 Claims

1. A process for the production of high-purity isophthalic acid by liquid-phase oxidizing a m-phenylene compound in an acetic acid solvent to form a crude isophthalic acid and purifying the crude isophthalic acid, which comprises the steps of

a) separating the liquid-phase oxidation solution into an oxidation mother liquor and a crude isophthalic acid by crystallization and evaporating the oxidation mother liquor to form acetic acid vapor or a condensate thereof;  
b) dissolving the crude isophthalic acid in water, then catalytically hydrogenating, catalytically treating or oxidizing the resultant solution of isophthalic acid in water to form a purified solution, cooling the purified solution to crystallize isophthalic acid and separating the purified solution into a mother liquor and a crystal of the isophthalic acid, and  
c) feeding the acetic acid vapor or condensate prepared by the evaporation of the oxidation mother liquor in step a) to a middle stage of a distillation column, feeding the mother liquor separated from the purified solution in the step b) to a top portion of the distillation column to carry out distillation, and discharging concentrated acetic acid containing aromatic carboxylic acids from a bottom portion of the distillation column.

5,770,766

## METHOD FOR SEPARATING AND PURIFYING HYDROXYNAPHTHALENECARBOXYLIC ACIDS

Ryuzo Ueno, Nishinomiya; Masaya Kitayama, Takarazuka; Kuniyo Yanagawase, Ibaraki; Yoshiro Uchiyama, Nishinomiya, and Shigeji Mori, Itami, all of Japan, assignors to Kabushiki Kaisha Ueno Seryaku Oyo Kenkyujo, Osaka, Japan

PCT No. PCT/JP96/03314, § 371 Date Jul. 10, 1997, § 102(e) Date Jul. 10, 1997, PCT Pub. No. WO97/18182, PCT Pub. Date May 22, 1997

PCT Filed Nov. 12, 1996, Ser. No. 860,803

Claims priority, application Japan, Nov. 13, 1995, 7-294335 Int. Cl.<sup>6</sup> C07C 63/34

U.S. Cl. 562—467 3 Claims

1. A method of separation and purification of hydroxynaphthalenecarboxylic acids which comprises treating a solution containing a mixture of two or more kinds of hydroxynaphthalenecarboxylic acids with a nonionic porous synthetic adsorbent having as a basic structure aromatic copolymers mainly composed of styrene and divinylbenzene as main monomers or methacryl copolymers mainly composed of monomethacrylates and dimethacrylates.

5,770,767

**PROCESS FOR PRODUCING 2-FLUOROCYCLOPROPANECARBOXYLIC ACID**  
Nobushige Itaya, Nishinomiya; Ryuhei Wakita; Asako Kubo, both of Toyonaka; Mikio Sasaki, Ibaraki; Takashi Namba, Matsubara, and Yusuke Yukimoto, Chiba, all of Japan, assignors to Sumitomo Chemical Company Limited., Osaka-Fu, and Daiichi Pharmaceutical Co., Ltd., Tokyo-To, both of Japan

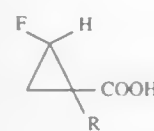
Filed Jan. 30, 1996, Ser. No. 593,940

Claims priority, application Japan, Jan. 31, 1995, 7-014578; Jan. 31, 1995, 7-014580

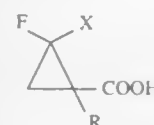
Int. Cl.<sup>6</sup> C07C 61/04

U.S. Cl. 562—506 13 Claims

1. A process for producing a 2-fluorocyclopropanecarboxylic acid represented by the formula [I]



wherein R is a hydrogen atom or a lower alkyl group comprising subjecting to reduction a 2-halo-2-fluorocyclopropanecarboxylic acid represented by formula [II]



wherein R is as defined above and X is a chlorine atom, a bromine atom or an iodine atom, the reduction being carried out by it developing a Raney nickel alloy in the presence of the 2-halo-2-fluorocyclopropanecarboxylic acid represented by formula [II].

5,770,768

**METHOD FOR PREPARING CARBOXYLIC ACIDS BY CARBONYLATION IN THE PRESENCE OF IRIIDIUM**  
Philippe Denis, Decines; Robert Perron, Charly, and Joël Schwartz, Caluire, all of France, assignors to Acetex Chimie, Paris, France

PCT No. PCT/FR95/01446, § 371 Date Jun. 3, 1997, § 102(e) Date Jun. 3, 1997, PCT Pub. No. WO96/14286, PCT Pub. Date May 17, 1996

PCT Filed Nov. 3, 1995, Ser. No. 817,701

Claims priority, application France, Nov. 4, 1994, 94 13175

Int. Cl.<sup>6</sup> C07C 51/12

U.S. Cl. 562—519 12 Claims

1. Method for preparing a carboxylic acid by carbonylation of an alcohol or a reactive compound thereof, comprising reacting the alcohol or reactive compound thereof with carbon monoxide in the presence of an iridium-based catalyst, in a liquid phase reaction medium in a first zone, to produce a reaction mixture which is partially vaporized in a second zone to produce a vaporized fraction containing the carboxylic acid which is subsequently purified and an unvaporized liquid fraction containing the catalyst, and recycling the unvaporized liquid fraction to the first zone, wherein said unvaporized liquid fraction being recycled is placed in contact with carbon monoxide in such a way that carbon monoxide does not return towards the second zone.

5,770,769

**PROCESS FOR THE PREPARATION OF D,L-METHIONINE OR THE SALT THEREOF**  
Friedhelm Geiger, Erlensee, Germany; Baudouin Halsberghe, Mobile, Ala.; Hans-Joachim Hasselbach, Gelnhausen, Germany; Klaus Hentschel, Rodenbach, Germany; Klaus Huthmacher, Gelnhausen, Germany; Martin Körfer, Johannesberg, Germany; Sven-Peter Mannsfeld, Mobile, Ala.; Herbert Tanner, Hanau; Ferdinand Theissen, Bornheim, both of Germany; Jose Vanrobaeys, and Klaus Willigerodt, both of Mobile, Ala., assignors to Degussa Aktiengesellschaft, Frankfurt, Germany

Filed Dec. 18, 1996, Ser. No. 768,624

Claims priority, application Germany, Dec. 18, 1995, 195 47 236.5

Int. Cl.<sup>6</sup> C07C 321/00

U.S. Cl. 562—559 31 Claims

1. A process for the preparation of methionine or a salt of methionine, said process comprising the steps of

- reacting the components 3-methylmercaptopropionaldehyde, hydrogen cyanide, ammonia and carbon dioxide or precursors from which said components can be prepared, optionally in the presence of water, to obtain 5-(2-methylmercaptoethyl)-hydantoin; and
- reacting 5-(2-methylmercaptoethyl)-hydantoin to obtain methionine or the salt thereof;

wherein step (i) is initiated by means of at least one premixture so that a first mixture is formed containing at least 1/10 of the 3-methylmercaptopropionaldehyde and at least 1/10 of the hydrogen cyanide component or corresponding quantities of the precursors from which said components can be prepared, and containing less than 1/10 of one of the components ammonia, carbon dioxide or of the precursor from which ammonia or carbon dioxide can be prepared, and this first mixture is combined with the other component(s) or precursor(s) for the reactive conversion to 5-(2-methylmercaptoethyl)-hydantoin, wherein the latter component(s) may be premixed in one or more additional mixtures.

5,770,770

**REACTIVE DISTILLATION PROCESS AND EQUIPMENT FOR THE PRODUCTION OF ACETIC ACID AND METHANOL FROM METHYL ACETATE HYDROLYSIS**  
Ki-Joo Kim, and Hang Duk Roh, both of Suwon-si, Rep. of Korea, assignors to Sunkyoung Industries, Kyunggi-do, Rep. of Korea

Filed Dec. 21, 1995, Ser. No. 576,485

Claims priority, application Rep. of Korea, Dec. 29, 1994, 94-38355

Int. Cl.<sup>6</sup> C07C 51/42; 53/08

U.S. Cl. 562—608 8 Claims

1. A reactive distillation process for producing acetic acid and methanol as hydrolysis products from a composition containing more than 50% of methyl acetate, comprising the steps of:

- hydrolysing said composition to acetic acid and methanol in a reaction zone having an upper portion and a lower portion, said reaction zone containing an acidic ion exchange resin catalyst, supplying water downwardly to said ion exchange resin catalyst and supplying said composition upwardly to said ion exchange resin catalyst to form a reaction mixture;
- collecting unreacted methyl acetate and water vapor in said upper portion of said reaction zone, condensing said collected methyl acetate and water vapor to form a condensate and resupplying said condensate to said reaction zone; and
- at the same time as said step (b), collecting said reaction mixture from said lower portion of said reaction zone, separating said reaction mixture into acetic acid, methanol and impurities by reboiling, resupplying said impurities to said reaction zone and recovering said acetic acid and methanol.

5,770,771

**PREPARATION OF N-HYDROCARBYLTHIOPHOSPHORIC TRIAMIDES**  
Gerald M. Sulzer; Chi Ilung Cheng; W. Dirk Klobucar, and Charles H. Kolich, all of Baton Rouge, La., assignors to Albemarle Corporation, Richmond, Va.

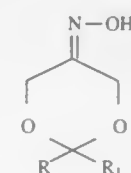
Filed Jan. 21, 1997, Ser. No. 786,396

Int. Cl.<sup>6</sup> C07F 9/22

U.S. Cl. 564—14 40 Claims

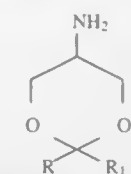
1. A process for the preparation of N-hydrocarbylthiophosphoric triamide, which process comprises:

- continuously feeding to and mixing in a first reaction chamber (i) a preformed mixture of primary hydrocarbyl monoamine, tertiary amine and at least one liquid inert organic solvent, and (ii) thiophosphoryl chloride and removing heat of reaction at a rate sufficient to maintain the temperature of the reaction mixture in the range of about -20° C. to about +50° C., to produce a reaction mixture containing N-hydrocarbylaminothiophosphoryl dichloride;
- continuously feeding and mixing in a second reaction chamber (i) an effluent stream of reaction mixture formed in the first reaction chamber, and (ii) ammonia in proportions (1) that are at least about 16 moles of ammonia per mole of N-hydrocarbylaminothiophosphoryl dichloride, (2) that produce a reaction mixture containing N-hydrocarbylthiophosphoric triamide, and (3) that keep in solution substantially all of the ammonium chloride co-product formed in the reaction, and removing heat of reaction from the mixture formed in b) at a rate of removal such that the temperature of the reaction mixture remains high enough to keep ammonium chloride-ammonia complex from forming an appreciable amount of solid phase in said reaction mixture, but low enough to avoid significant reduction in yield of N-hydrocarbylthiophosphoric triamide; and
- withdrawing effluent from the second reaction chamber at a rate sufficient to maintain a substantially constant volume of reaction mixture in the second reaction chamber.



wherein

R and R<sub>1</sub>, the same or different, represent a hydrogen atom, a straight or branched C<sub>1</sub>-C<sub>4</sub> alkyl, an unsubstituted substituted phenyl or, together with the carbon atom to which they are bonded, form a C<sub>5</sub>-C<sub>6</sub> cycloaliphatic ring, by catalytic hydrogenation in a solvent, to the corresponding 5-amino-1,3-dioxanes of formula



and, subsequently, hydrolyzing the compounds of formula 1 to 2-amino-1,3-propanediol.

5,770,774

**METHOD FOR PREPARING 2-METHYL-1,4-NAPHTHOQUINONE (VITAMIN K<sub>3</sub>)**

Young J. Joo; Jin-Eok Kim; Jeong-Im Won, and Kum-Ui Hwang, all of Taejeon, Rep. of Korea, assignors to Korea Kumho Petrochemical Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 2, 1996, Ser. No. 758,921

Claims priority, application Rep. of Korea, Apr. 25, 1996, 96-12872

Int. Cl.<sup>6</sup> C07C 46/00

U.S. Cl. 568—317 5 Claims

1. A method for preparing 2-methyl-1,4-naphthoquinone through a [2+4] Diels-Alder reaction of 2-methyl-1,4-benzoquinone with 1,3-butadiene to obtain 2-methyl-4a,5,8,8a-tetrahydro-1,4-naphthoquinone and a dehydrogenation of the obtained 2-methyl-4a,5,8,8a-tetrahydro-1,4-naphthoquinone in the presence of a dehydrogenating catalyst, the dehydrogenating catalyst selected from the group consisting of a Lewis acid and a Brønsted acid, the method comprising the step of:

carrying out simultaneously the [2+4] Diels-Alder reaction and a dehydrogenation in a single pot by using dimethylsulfoxide as a dehydrogenating agent and as a solvent for the [2+4] Diels-Alder reaction.

5,770,775

**METHOD FOR PREPARING 3,3-DIMETHYLBUTYRALDEHYDE**

Alan R. Katritzky, Gainesville, Fla., and Indra Prakash, Hoffman Estates, Ill., assignors to The NutraSweet Company, Deerfield, Ill.

Filed Feb. 10, 1997, Ser. No. 796,443

Int. Cl.<sup>6</sup> C07C 45/51

U.S. Cl. 568—450 2 Claims

1. A method for preparing 3,3-dimethylbutyraldehyde comprising the step of isomerizing 3,3-dimethyl-1,2-epoxybutane in the presence of a basic lithium salt to form said 3,3-dimethylbutyraldehyde.



5,770,776

## PROCESS FOR PREPARING 1,3-PROPANEDIOL

Joseph Broun Powell, Houston; Stephen Blake Mullin, Katy; Paul Richard Weider; David Cleve Eubanks, both of Houston, and Juan Pedro Arhancet, Katy, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 316,676, Sep. 30, 1994, abandoned. This application Mar. 11, 1996, Ser. No. 615,544  
Int. Cl.<sup>6</sup> C07C 29/36

U.S. Cl. 568—862

17 Claims

1. A process for preparing 1,3-propanediol comprising the steps of:

- contacting ethylene oxide with carbon monoxide and hydrogen in an essentially non-water-miscible solvent in the presence of an effective amount of a non-phosphine-ligated cobalt catalyst and an effective amount of a catalyst promoter under reaction conditions effective to produce an intermediate product mixture comprising less than 15 wt % 3-hydroxypropanal;
- adding an aqueous liquid to said intermediate product mixture and extracting into said aqueous liquid a major portion of the 3-hydroxypropanal so as to provide a first aqueous phase comprising 3-hydroxypropanal in greater concentration than the concentration of 3-hydroxypropanal in the intermediate product mixture, and a first organic phase comprising a major portion of the cobalt carbonyl or a cobalt-containing derivative thereof;
- separating the first aqueous phase from the first organic phase;
- adding fresh non-water-miscible solvent to the first aqueous phase and extracting into such solvent at least a portion of any cobalt catalyst or cobalt-containing derivative thereof present in such aqueous phase, to provide a second aqueous phase comprising 3-hydroxypropanal and a second organic phase comprising the cobalt catalyst or a cobalt-containing derivative thereof;
- separating the second aqueous phase from the second organic phase;
- passing the first organic phase and the second organic phase to the process of step (a);
- contacting the second aqueous phase comprising 3-hydroxypropanal with hydrogen in the presence of a hydrogenation catalyst under hydrogenation conditions to provide a hydrogenation product mixture comprising 1,3-propanediol; and
- recovering 1,3-propanediol from said hydrogenation product mixture.

5,770,777

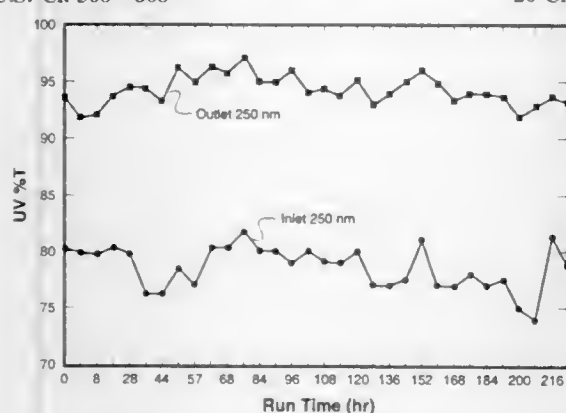
## METHOD REDUCING UV ABSORPTION IN ETHYLENE GLYCOLS, WATER, AND MIXTURES

David E. Albright, Niagara Falls, and Edward A. Dietz, Grand Island, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed May 9, 1996, Ser. No. 647,289  
Int. Cl.<sup>6</sup> C07C 45/00; 27/26

U.S. Cl. 568—868

20 Claims



1. A method of reducing the UV absorbance of a solvent that consists essentially of ethylene glycol, water, or a mixture thereof,

and at least 0.01 ppm of a dione, comprising passing said solvent through an anionic exchange resin that contains strong base sites regenerated with hydroxide.

5,770,778

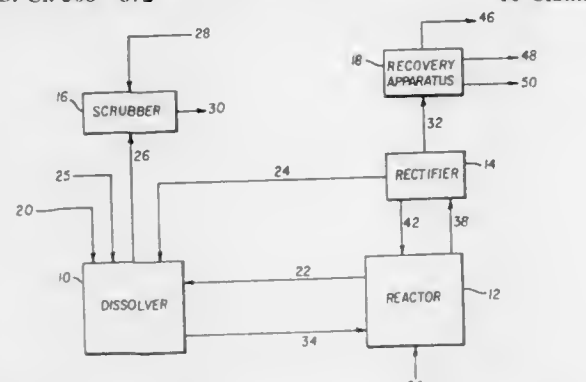
## PURIFICATION OF ETHYLENE GLYCOL RECOVERED FROM POLYESTER RESINS

Andrius Algimantas Naujokas, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 10, 1996, Ser. No. 678,018  
Int. Cl.<sup>6</sup> C07C 31/18; 27/26

U.S. Cl. 568—872

10 Claims



8. A process for recovering and purifying liquid ethylene glycol from polyester resins using apparatus that comprises:

- a dissolver for receiving polyester,
  - a reactor for depolymerizing polyester into monomer components, and
  - a rectifier for separating monomer components;
- the process comprising
- adding polyester to the dissolver and combining it with melt from the reactor to reduce the chain length of the polyester,
  - transferring reduced chain length polyester from the dissolver to the reactor,
  - passing super-heated methanol through the reactor to depolymerize polyester into its constituent monomers,
  - transferring depolymerization products from the reactor to the rectifier;
  - separating the depolymerization products in the rectifier into a vapor phase containing monomer components and a liquid phase containing higher molecular weight materials;
  - recovering ethylene glycol exiting the rectifier,
  - purifying the ethylene glycol recovered in step f) by distillation, and
  - further purifying the ethylene glycol purified in step g) by contacting it with, in either order,
    - a first adsorbent that has a high affinity for polar contaminants, and
    - a second adsorbent that has a high affinity for non-polar contaminants.

5,770,779

## PROCESS FOR PREPARATION OF FLUORINATED HYDROCARBONS

Mario Joseph Nappa, Newark, Del., and William Robert Williams, New Fairfield, Conn., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 2, 1997, Ser. No. 778,427  
Int. Cl.<sup>6</sup> C07C 17/08

U.S. Cl. 570—166

10 Claims

1. A process for the manufacture of fluorinated hydrocarbon comprising:

- providing a first liquid phase mixture comprising: at least one chlorinated hydrocarbon selected from the group consisting of the formula  $R^1R^2C=CR^3R^4$  and  $CR^5R^6R^7R^8$ , wherein at least

one of  $R^1$  through  $R^4$  in  $R^1R^2C=CR^3R^4$ , and at least one of  $R^5$  through  $R^8$  in  $CR^5R^6R^7R^8$  is chlorine, and wherein the remainder of  $R^1$  through  $R^4$  in  $R^1R^2C=CR^3R^4$ , and  $R^5$  through  $R^8$  in  $CR^5R^6R^7R^8$  are identical or different and are selected from the group consisting of H, F, Cl, Br, and  $C_{1-6}Z_{(2-6-1)}$ , wherein Z is identical or different and is selected from the group consisting of H, F, Cl and Br, and y is an integer from 1 to 6,

hydrogen fluoride,

at least one tin catalyst, and

at least one additive selected from the group consisting of a metal alkoxide and a nonmetal alkoxide represented by  $M(OR)^x$ , wherein M is selected from the group of elements consisting of Li, Na, K, Rb, Cs, Be, Mg, Ca, Sr, Ba, Ti, B, Al, Si, Ge, Sn, and Pb,  $R^9$  is selected from the group consisting of  $C_1$  through  $C_6$  alkyl, and x is from 1 to 4;

b) heating said first mixture, and;

c) recovering a second mixture comprising fluorinated hydrocarbon wherein said second mixture is substantially free of oligomeric and polymeric compounds.

5,770,780

## PROCESS FOR PREPARING ALKYL HALIDES

Josef Metz, Marl, and Clemens Osterholt, Dorsten, both of Germany, assignors to Huels Aktiengesellschaft, Marl, Germany

Filed Feb. 10, 1997, Ser. No. 799,068

Claims priority, application Germany, Feb. 8, 1996, 196 04 566.5

Int. Cl.<sup>6</sup> C07C 17/08

25 Claims

1. A process for the preparation of cycloalkyl halides, consisting essentially of:

- reacting an olefin and concentrated hydrohalic acid, without the addition of a catalyst and without addition of a solvent; wherein said reacting is carried out at a temperature below the boiling point of said olefin, and said olefin is a cycloaliphatic olefin having 5–16 carbon atoms.

5,770,781

## METHOD FOR ELIMINATING CARBON OXIDES IN FEEDS TO A C5 AND C6 PARAFFIN ISOMERIZATION PROCESS

Andrew P. Voss, Cerritos, and Michael J. Pedersen, Irvine, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 15, 1996, Ser. No. 732,823

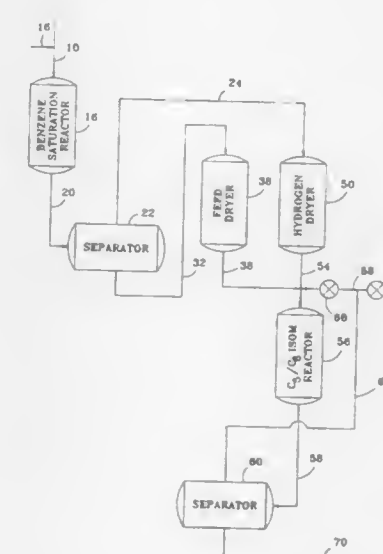
Int. Cl.<sup>6</sup> C07C 5/22; 1/00; 5/13

U.S. Cl. 585—253

13 Claims

1. A method for reducing the benzene content and isomerizing at least a portion of a paraffinic stream containing benzene and at least 50 volume percent  $C_5$  and  $C_6$  paraffins using a hydrogen stream containing at least one carbon oxide selected from the group consisting of carbon monoxide and carbon dioxide, the method comprising:

- charging the paraffinic stream containing benzene and at least 50 volume percent  $C_5$  and  $C_6$  paraffins to a benzene saturation zone;
- charging a hydrogen stream containing at least one carbon oxide to the benzene saturation zone;
- saturating at least a major portion of the benzene and methanating at least a major portion of the carbon oxide present in the benzene saturation zone at a temperature from about 325° to about 800° F., a pressure from about 200 to about 700 psig in the presence of a benzene saturation catalyst to produce a reduced benzene content paraffinic stream and a reduced carbon oxide content hydrogen stream;



5,770,783

ALKANE ISOMERIZATION USING REVERSIBLE FLOW  
REACTIVE CHROMATOGRAPHYHerman A. Zinnen, Evanston, and Charles P. McGonagal,  
Addison, both of Ill., assignors to UOP LLC, Des Plaines, Ill.  
Filed Feb. 3, 1997, Ser. No. 794,250  
Int. Cl.<sup>6</sup> C07C 5/13

U.S. Cl. 585—738 20 Claims

1. A process for isomerizing at least one normal or mono-methyl-branched alkane containing from about 6 to about 8 carbon atoms to form at least one multi-methyl-branched alkane comprising:

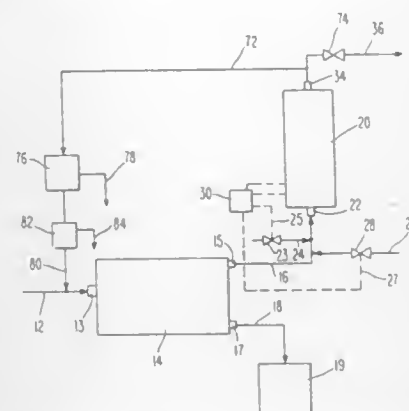
- introducing a pulse of feed containing said normal or mono-methyl-branched alkane to a first end of a reactive chromatography fixed bed reaction and adsorption zone containing a hydrogen atmosphere at a mole ratio of hydrogen to hydrocarbon in the range of about 0.1 to about 2, a catalyst effective to isomerize the normal or mono-methyl-branched alkane, and an adsorbent effective to selectively adsorb normal and mono-methyl-branched alkanes relative to multi-methyl-branched alkanes, and operating under conditions effective to isomerize the normal or mono-methyl-branched alkane;
- introducing a desorbent comprising at least one alkane having from about 4 to about 8 carbon atoms to the first end of said zone and withdrawing an effluent containing at least one multi-methyl-branched alkane from a second end of said zone;
- reversing, after a period of time, fluid flow in the zone by redirecting the introduction of the desorbent and a second pulse of feed to the second end of said zone and concurrently moving the location of the withdrawal of the effluent to the first end of said zone to retain said normal and mono-methyl-branched alkanes within the zone for isomerization; and
- continuing to periodically reverse fluid flow in the zone by alternating introducing the desorbent and additional pulses of feed to the first end and then the second end of said zone while concurrently withdrawing the effluent from the second end and then the first end of said zone to retain said normal and mono-methyl-branched alkanes within the zone for isomerization.

5,770,784

SYSTEMS FOR THE TREATMENT OF COMMINGLED  
WASTES AND METHODS FOR TREATING  
COMMINGLED WASTESAnn C. Heywood, Danville; Mark R. Holst, Concord; Richard J. Martin, San Jose, all of Calif., and John T. Schofield, Villanova, Pa., assignors to Thermatrix, Inc., San Jose, Calif.  
Continuation-in-part of Ser. No. 631,708, Apr. 10, 1996, abandoned. This application Jan. 28, 1997, Ser. No. 789,271  
Int. Cl.<sup>6</sup> F23D 3/40

U.S. Cl. 588—209

34 Claims



1. A method for treating commingled waste, comprising the steps of:

- feeding a commingled waste stream into a primary treatment unit, said commingled waste comprising organic material and inorganic material;
- separating a portion of the organic material from the inorganic material in said primary treatment unit and decomposing a portion of the organic material into decomposition products comprising CO, CO<sub>2</sub>, H<sub>2</sub>, and H<sub>2</sub>O in said primary treatment unit to form an organic gas stream comprising at least CO or volatile organic compounds, wherein the portion of the organic material decomposed in said primary treatment unit is less than 75% by volume of the organic material;
- removing said organic gas stream from said primary treatment unit;
- feeding said organic gas stream at a temperature of at least 400° F. into a first portion of a matrix bed of heat resistant material contained within a flameless oxidizer;
- injecting supplemental air, oxygen, fuel, or combinations thereof into said first portion of said matrix bed to react with said organic gas stream;
- heating said organic gas stream to a temperature of at least 1400° F. in said matrix bed and oxidizing the volatile organic compounds or CO into gaseous products in an oxidation wave within said matrix bed.

5,770,785

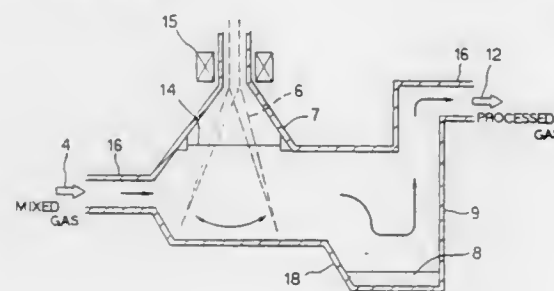
APPARATUS AND METHOD FOR REMOVING CARBON  
DIOXIDE CONTAINED IN EXHAUST GASMasataka Tamura, Kawasaki; Yutaka Ishiwata, Zushi, and Yoshiyasu Itoh, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan  
Filed Jul. 8, 1993, Ser. No. 88,738

Claims priority, application Japan, Jul. 9, 1992, 4-181443; Jun. 10, 1993, 5-138641

Int. Cl.<sup>6</sup> B09B 3/00

U.S. Cl. 588—900

15 Claims



1. An apparatus for removing carbon dioxide contained in exhaust gas, comprising:

- a hydrogen supply apparatus for supplying a hydrogen source, said hydrogen source being a gas selected from the group consisting of hydrogen, methane, ethane, ethylene, acetylene and water;
- a mixer for uniformly mixing the hydrogen source supplied from the hydrogen supply apparatus with exhaust gas containing carbon dioxide in order to form mixed gas;
- a beam generator for generating high energy beams that are irradiated to the mixed gas from a direction perpendicular to the flow direction of the mixed gas;
- a reaction container for activating the mixed gas by irradiating high energy beams from the beam generator and for causing reduction reaction of the carbon dioxide; wherein mesh materials for promoting the reduction reaction between the activated hydrogen source and carbon dioxide contained in the exhaust gas are disposed in multiple layers within the reaction container, and the cross-sectional area of the reaction container is gradually decreased in the direction of the flow of the mixed gas; and
- a recovery section for separating a product formed by the reduction reaction from the exhaust gas and recovering the product.

5,770,786

METHOD FOR THE ISOLATION AND/OR TESTING OF  
GENES AND PROMOTERS INVOLVED IN PLANT-  
NEMATODE INTERACTIONS USING PLANTS OF THE  
GENUS ARABIDOPSISPeter Christiaan Sijmons, Amsterdam, Netherlands, assignor to Mogen International N.V., Leiden, Netherlands  
PCT No. PCT/EP92/00662, § 371 Date Jan. 5, 1994, § 102(e)  
Date Jan. 5, 1994, PCT Pub. No. WO92/17054, PCT Pub. Date Oct. 15, 1990

PCT Filed Mar. 24, 1992, Ser. No. 122,456

Claims priority, application European Pat. Off., Mar. 26, 1991, 91200698

Int. Cl.<sup>6</sup> A01H 5/06; 4/00; C12N 5/04; A01K 29/00

U.S. Cl. 800—200

25 Claims

1. A plant root system comprising a root of a plant of the genus Arabidopsis, a root-supporting substance, a nutrient medium and a plant-parasitic nematode that causes at least one nematode feeding structure in said root for supporting development of the nematode for a complete life cycle, the root supporting substance and nutrient medium being suitable for supporting development of the nematode on the root for said complete life cycle, said root comprising the at least one nematode feeding structure supporting the development of said plant-parasitic nematode, said root supporting substance comprising a highly purified gelling matrix that provides sufficient water-retaining capacity and mechanical support for supporting said development, said root supporting substance being substantially devoid of nematode-inhibiting substances.

5,770,787

## NUTRIENT STATUS OF PLANTS IN SOILS

James Alexander Montague, Bethanga, and Gregory Laurence Bender, New South Wales, both of Australia, assignors to SGB Australia Pty. Ltd., Melbourne Vic, Australia  
Filed Nov. 22, 1994, Ser. No. 345,781

Claims priority, application Australia, Nov. 22, 1993, PM 2564

Int. Cl.<sup>6</sup> A01H 5/10; C12N 1/00; A01G 7/00

U.S. Cl. 800—250

13 Claims

1. *Penicillium radicum* deposited with the Australian Government Analytical Laboratories and accorded the accession number N93/472267 and herein referred to as *Penicillium radicum* N93/47267.

5,770,788

INDUCING CHROMOSOME DOUBLING IN ANTHER  
CULTURE IN MAIZEXu Jia, Institute of Genetics, Academia Sinica, Beijing, China  
Continuation of Ser. No. 251,655, May 31, 1994, abandoned, which is a continuation of Ser. No. 689,175, Apr. 23, 1991, abandoned. This application Jun. 6, 1995, Ser. No. 469,794  
Claims priority, application United Kingdom, Apr. 23, 1990, 9009090.3Int. Cl.<sup>6</sup> C12N 15/00; 15/29; A01H 4/00; 5/00

U.S. Cl. 800—200

1 Claim

1. A method for the production of fertile corn plants, comprising culturing anthers or microspores of *Zea mays* in a culture medium

for seven to fourteen days, adding to the medium at a concentration of at least 50 ppm of colchicine to induce chromosome doubling in microspores, allowing said colchicine to act upon the cultured microspores, removing the microspores from said medium and said colchicine within three days and thereafter regenerating fertile doubled haploid plants from the cultured microspores.

5,770,789

HERITABLE REDUCTION IN INSECT FEEDING ON  
BRASSICACEAE PLANTS

Storrs Thomas Mitchell-Olds, and David Henry Siemens, both of Missoula, Mont., assignors to University of Montana, Missoula, Mont.

Filed Jun. 28, 1995, Ser. No. 496,016

Int. Cl.<sup>6</sup> A01H 5/00; 1/04; 1/06; C12N 15/01

U.S. Cl. 800—200

25 Claims

1. A method for producing a cruciferous plant having a heritable reduction in susceptibility to cotyledon or leaf feeding by Phyllotreta insects, comprising the steps of:

- selecting, in a population of P<sub>0</sub> Brassicaceae plants having a mean total non-seed glucosinolate level, at least one P<sub>0</sub> plant having a total non-seed glucosinolate level that is decreased sufficiently, relative to said total non-seed glucosinolate level in said P<sub>0</sub> population, to reduce susceptibility to cotyledon or leaf feeding by Phyllotreta insects;
  - producing P<sub>1</sub> progeny from said at least one P<sub>0</sub> plant;
  - identifying at least one P<sub>1</sub> plant that inherits said decreased total glucosinolate level, thereby producing said plant having said reduced susceptibility to cotyledon or leaf feeding by said insects.
23. A cruciferous plant produced by the method of claim 1.

5,770,790

## INBRED MAIZE LINE PH41E

Loren John Hoffbeck, Tipton, Ind., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Mar. 5, 1996, Ser. No. 610,950

Int. Cl.<sup>6</sup> A01H 5/00; 4/00; 1/00; C12N 5/04

U.S. Cl. 800—200

19 Claims

1. Seed of maize inbred line designated PH41E having been deposited under ATCC Accession No. 209269.



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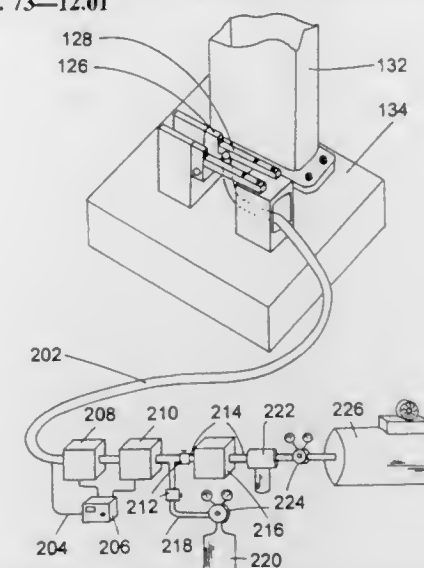
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**5,770,791**  
**METHOD AND APPARATUS FOR ACCURATE MEASUREMENT OF IMPACT FRACTURE BEHAVIOR**  
 Michael Peter Manahan, Sr., 2274 Oak Leaf Dr., State College, Pa. 16803

Filed Jun. 14, 1996, Ser. No. 663,917  
 Int. Cl.<sup>6</sup> G01H 7/00; G01N 3/30; 3/32  
 U.S. Cl. 73—12.01

8 Claims

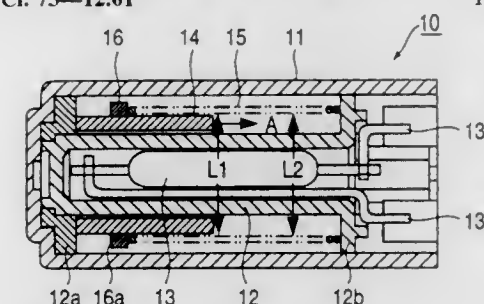


1. A method for thermally conditioning a specimen in-situ prior to performing an impact test, comprising the steps of:  
 a. positioning said specimen in a test fixture;  
 b. thermally conditioning said specimen in said test fixture by flowing a thermally conditioned fluid over surfaces of said specimen which are adjacent to volume of material which undergoes deformation during said impact test which affects fracture behavior;  
 c. impacting said specimen; and  
 d. measuring at least one key variable in step c.;  
 whereby said specimen will be impact tested at a known temperature.

**5,770,792**  
**SHOCK SENSORS**  
 Tsutomu Nakada; Akira Fuse; Yoshiyuki Sugiyama; Yuji Tsuda, and Okihiro Iwaki, all of Kanagawa, Japan, assignors to Nippon Aleph Corporation, Kanagawa, Japan  
 Filed Oct. 28, 1996, Ser. No. 738,699

Claims priority, application Japan, Oct. 27, 1995, 7-280756;  
 Dec. 18, 1995, 7-328753; Dec. 27, 1995, 7-340747  
 Int. Cl.<sup>6</sup> G01P 15/02; H01H 35/14  
 U.S. Cl. 73—12.01

17 Claims



1. A shock sensor, comprising:  
 a magnetic reed switch extending in a direction in which shocks are detected;  
 a moving member movable along the magnetic reed switch due to the shocks and capable of imparting a magnetic force to turn on the magnetic reed switch;  
 a biasing member to normally urge the moving member toward one side of the magnetic reed switch; and  
 an adjuster to adjust when the magnetic reed switch is on,

## ELECTRICAL

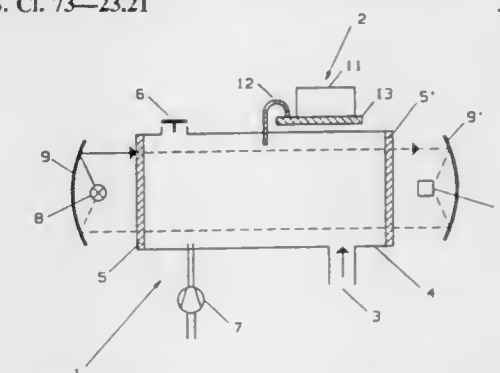
wherein the adjuster reduces a speed at which the moving member moves, and,  
 wherein the biasing member comprises a coil spring contacting the moving member;  
 the moving member comprises a spring stop provided fixedly on an outer periphery of the moving member, with the coil spring abutting the spring stop; and  
 the adjuster comprises interaction portions on the coil spring and the moving member which form a small space between the coil spring and the moving member.

**5,770,793**  
**METHOD FOR DETERMINING THE CONCENTRATION OF A SUBSTANCE IN A GAS**  
 Burkhard Stock, Lübeck, Germany, assignor to Drägerwerk Aktiengesellschaft, Lübeck, Germany

Filed Feb. 20, 1997, Ser. No. 802,903  
 Claims priority, application Germany, Feb. 24, 1996, 196 07 062.7

Int. Cl.<sup>6</sup> G01N 21/35; 33/98; 33/497  
 U.S. Cl. 73—23.21

3 Claims



1. A method for determining the concentration of a substance in a gaseous sample to be measured, the substance also being in ambient air, the method utilizing a first gas analyzer for measuring infrared absorption of said substance and a second gas analyzer configured as an electrochemical measuring cell;

said first gas analyzer including:  
 a measurement cuvette having a gas inlet and a gas outlet;  
 a pump connected to said cuvette for scavenging the latter;  
 an infrared radiator for generating and transmitting infrared radiation through said measurement cuvette;  
 and, an infrared radiation detector for receiving said infrared radiation transmitted through said cuvette; and, said second gas analyzer including a sample-taking line for connecting said second gas analyzer directly to said measurement cuvette; and,

the method comprising the steps of:  
 filling said measurement cuvette with ambient air and utilizing said second gas analyzer to draw a sample via said sample-taking line to analyze said ambient air and determine the concentration ( $\Delta c$ ) of said substance in said ambient air;  
 infrared-optically measuring said ambient air in said measurement cuvette to measure the infrared absorption ( $I_0 - \Delta I_0$ ) thereof;  
 emptying said measurement cuvette of said ambient air;  
 filling said measurement cuvette with said gaseous sample;  
 infrared-optically measuring said gaseous sample to measure the infrared absorption ( $I_1$ ) thereof; and,  
 determining the true concentration ( $c$ ) of said substance in said gaseous sample by adding an apparent concentration ( $c'$ ) to the concentration ( $\Delta c$ ) of said substance present in said ambient air wherein ( $c'$ ) is determined with the aid of said infrared absorption ( $I_0 - \Delta I_0$ ) in said ambient air utilizing the relationship:

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$$c' = a \cdot \frac{(I_0 - \Delta I_0) - I_1}{I_0}$$

wherein:

a=calibration factor which is determined by calibrating measurements on a gaseous sample of known concentration of said substance.

5,770,794  
MONITORING APPARATUS FOR MONITORING  
IMPENDING FAULTS IN THE INTEGRITY OF A  
COMPONENT OR STRUCTURE

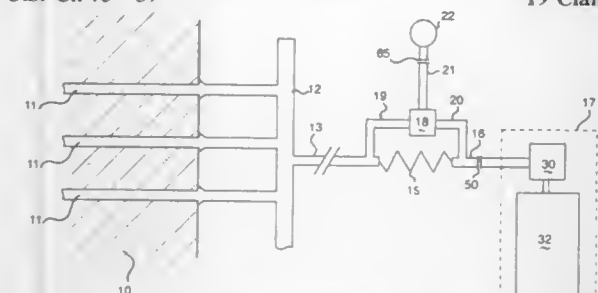
Kenneth John Davey, Bassendean, Australia, assignor to Tulip Bay Pty Ltd, South Perth, Australia  
PCT No. PCT/AU94/00235, § 371 Date Sep. 29, 1995, § 102(e)  
Date Sep. 29, 1995, PCT Pub. No. WO94/27130, PCT Pub.  
Date Nov. 24, 1994

PCT Filed May 6, 1994, Ser. No. 530,368  
Claims priority, application Australia, May 6, 1993, PL8682;  
Dec. 31, 1993, PM3203; Dec. 31, 1993, PM3205

Int. Cl.<sup>6</sup> G01M 3/26

U.S. Cl. 73—37

19 Claims



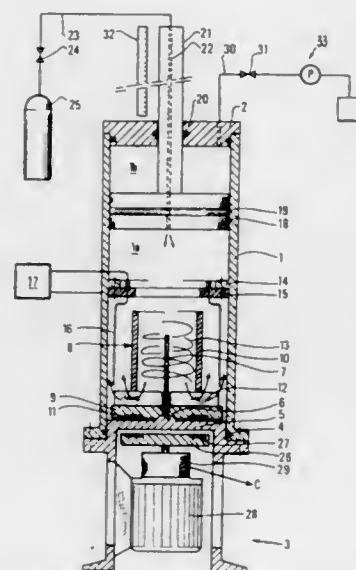
1. An apparatus for the monitoring of impending faults in the integrity of a component or structure in static or dynamic application comprising a sealed cavity on or within the component or structure, a source of substantially constant vacuum, a connection between the cavity and the source incorporating a device of high impedance fluid flow and means to monitor the change in pressure between the cavity and source.

5,770,795  
FLUID MIXTURE TESTING CELL SUITED FOR  
DETECTING PHASE CHANGES  
Emmanuel Behar, Jouy Le Moutier; Gérard Moracchini,  
Andilly, and José Sanchez, Viarmes, all of France, assignors  
to Institut Francais du Pétrole, Rueil-Malmaison, France  
Filed Aug. 12, 1996, Ser. No. 695,908  
Claims priority, application France, Aug. 11, 1995, 95 09814  
Int. Cl.<sup>6</sup> G01N 11/10

U.S. Cl. 73—54.23

17 Claims

1. A test cell for testing a fluid mixture suited for detecting phase discontinuities occurring in said mixture, comprising a body provided with a cylindrical inner cavity, means for feeding the mixture into the inner cavity, two coaxial electrodes including a tubular inner electrode and an outer electrode, said inner and outer electrodes being electrically insulated and connected to an electrical conductivity measuring device, a mixing means including a tubular element internally provided with a helix, placed inside the tubular inner electrode and suitable for establishing a closed circulation of the mixture between the inner and outer electrodes, to provide a

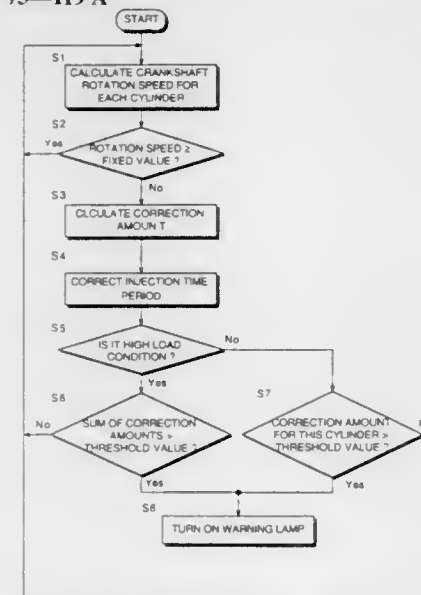


circulating mixture, means for driving the mixing means in rotation and means for measuring an apparent viscosity of the circulating mixture.

5,770,796  
FAILURE DIAGNOSIS DEVICE FOR A FUEL PUMP  
Atsuhiko Sakamoto, Zushi; Toshikazu Oshidari, Yokosuka;  
Iwane Inokuchi, Yokohama, and Shigeru Kamegaya, Tokyo,  
all of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa,  
Japan  
Filed Sep. 3, 1996, Ser. No. 707,183  
Claims priority, application Japan, Aug. 31, 1995, 7-224283  
Int. Cl.<sup>6</sup> G01M 15/00

U.S. Cl. 73—119 A

15 Claims

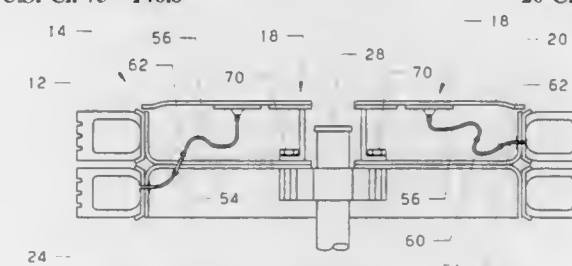


1. A failure diagnosis device for a fuel pump, said pump having a plurality of pressure chambers that, according to a rotation of an input shaft which turns together with an engine, in turn discharge fuel which is supplied to said engine, wherein a fuel supply capacity of said pump is set to be lower, when one of said pressure chambers has a failure so as not to be able to discharge fuel, than a maximum value of a fuel supply amount which is required by said engine, comprising:  
means for determining whether or not a fuel supply requirement of said engine is satisfied, and  
means for diagnosing that said pump has a failure when said fuel supply requirement is not satisfied.

5,770,797  
TIRE PRESSURE MAINTENANCE SYSTEM  
Gary G. Lapohn, 827 Bassett Rd., Westlake, Ohio 44145  
Continuation of Ser. No. 608,671, Feb. 29, 1996, abandoned.  
This application Apr. 9, 1997, Ser. No. 831,581  
Int. Cl.<sup>6</sup> B60C 23/04

U.S. Cl. 73—146.8

20 Claims

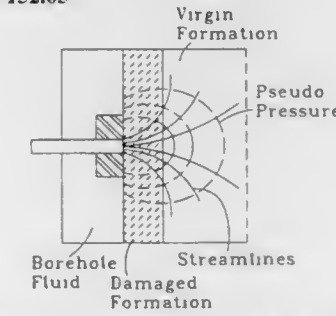


1. A hub cap mounted tire monitoring system comprising:  
a hub cap having a series of apertures therein;  
a tire pressure gauge mountably extending through one of said series of apertures;  
a valve stem assembly extending through one of said series of apertures;  
manifold means for communicating tire pressure to said tire pressure gauge and said valve stem assembly whenever said manifold means is connected to monitor tire pressure, and wherein said valve stem assembly is formed as a single unit to have said tire pressure gauge rigidly connected thereto to thereby mount both said tire pressure gauge and said valve stem assembly on said hub cap proximate to each other through said one of said series of apertures with said valve stem assembly having a concave formed section along an outside surface of said hub cap for mounting said valve stem therein below said outside surface of said hub cap to protect said valve stem and maintain a smooth streamlined flow of air past the hub cap during high speed wheel rotation.

5,770,798  
VARIABLE DIAMETER PROBE FOR DETECTING  
FORMATION DAMAGE  
Daniel T. Georgi; John M. Michaels, both of Houston, and  
Michael J. Moody, Katy, all of Tex., assignors to Western  
Atlas International, Inc., Houston, Tex.  
Filed Feb. 9, 1996, Ser. No. 599,337  
Int. Cl.<sup>6</sup> E21B 49/00

U.S. Cl. 73—152.05

28 Claims



1. An apparatus for evaluating damage proximate to a rock surface, comprising:  
a housing;  
a probe engaged with said housing and having a hollow contact end for sealing engagement with the rock surface to enclose a first interior volume and to define a discrete first surface area on the rock surface, wherein said hollow contact end is areally variable to define a discrete second surface area on the rock surface, which is smaller than said first surface area defined by said probe, and to define a second interior volume in contact with said second surface area;  
a device for selectively changing the pressure within said first interior volume and within said second interior volume; and

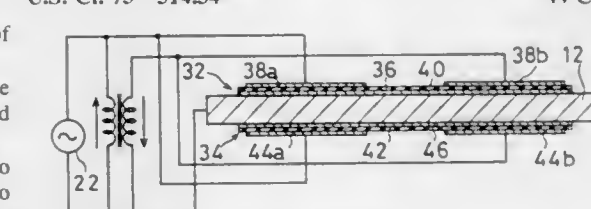
a sensor for monitoring changes within said first interior volume after said device has changed the pressure in contact with said first surface area, and for monitoring changes within said second interior volume after said device has changed the pressure in contact with said second surface area.

5,770,799  
PIEZOELECTRIC VIBRATOR AND ACCELERATION  
SENSOR USING THE SAME  
Takeshi Nakamura, and Takayuki Kaneko, both of Nagaoka-  
kyo, Japan, assignors to Murata Manufacturing Co., Ltd.,  
Kyoto-fu, Japan  
Continuation of Ser. No. 202,017, Feb. 25, 1994, abandoned.  
This application Apr. 4, 1997, Ser. No. 833,088

Claims priority, application Japan, Mar. 1, 1993, 5-066231;  
Mar. 1, 1993, 5-066233; Mar. 19, 1993, 5-085712; Apr. 26, 1993,  
5-123421; Apr. 26, 1993, 5-123422; Apr. 28, 1993, 5-125485  
Int. Cl.<sup>6</sup> G01P 15/09

U.S. Cl. 73—514.34

44 Claims

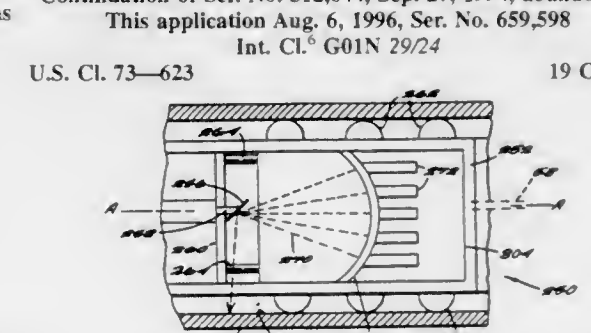


1. A piezoelectric vibrator comprising:  
a vibrating body having a longitudinal direction; and  
piezoelectric elements formed on said vibrating body, wherein said vibrating body vibrates by using the piezoelectric effect of said piezoelectric elements, and said vibrating body vibrates in the longitudinal direction in such a manner that only longitudinal expansion and contraction take place simultaneously in part of said vibrating body.

5,770,800  
FLEXIBLE ULTRASONIC PIPE INSPECTION  
APPARATUS  
Charles F. Jenkins, Aiken, S.C., and Boyd D. Howard, Augusta,  
Ga., assignors to The United States of America as repre-  
sented by the United States Department of Energy, Washing-  
ton, D.C.  
Continuation of Ser. No. 312,644, Sep. 27, 1994, abandoned.  
This application Aug. 6, 1996, Ser. No. 659,598  
Int. Cl.<sup>6</sup> G01N 29/24

U.S. Cl. 73—623

19 Claims



1. An apparatus for inspecting piping, said apparatus comprising:  
a housing;  
a body having an axis, said body made of a resilient material;  
an inspection instrument carried by said body comprising an ultrasonic transducer having a plurality of transmitting elements for generating a focused single high intensity ultrasonic beam, said beam being directed by a positionable reflector for directing the focused beam across the inner-surface of a pipe in a helical path as said apparatus moves axially through said pipe;  
a flexible outer-surface comprising a flexible tube having a plurality of ribs formed thereon for increasing the flexibility



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of said body transverse to said axis so that said apparatus can pass through bends in said piping, said flexible outer surface covering said body and said ultrasonic transducer; means for connecting a plurality of consecutive modules comprising said body to one another flexibly so that said connecting means flexes to allow said modules to change a relative orientation thereof.

5,770,801

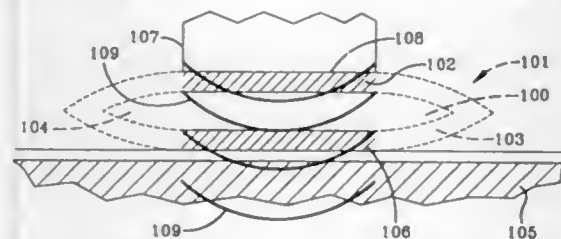
## ULTRASOUND TRANSMISSIVE PAD

Jianjun Wang, Columbus; Annette G. Bouska, Dublin, both of Ohio, and Lonnie R. Drayer, Plant City, Fla., assignors to Abbott Laboratories, Abbott Park, Ill.  
Continuation-in-part of Ser. No. 428,380, Apr. 25, 1995, Pat. No. 5,494,038. This application Feb. 26, 1996, Ser. No. 606,986

Int. Cl.<sup>6</sup> G01N 29/04

U.S. Cl. 73—644

24 Claims



1. A pad for transmitting acoustical waves between an ultrasound probe and a target surface, said pad comprising:  
a first layer having a first porous portion, said first porous portion defining first layer pores therethrough, said first layer pores having a first layer pore dimension;  
a second layer having a first porous portion, said first porous portion defining second layer pores therethrough, said second layer attached to said first layer, said first and second layers defining a space therebetween, said second layer pores having a second layer pore dimension, said first porous portion of said first layer overlying said first porous portion of said second layer; and  
an ultrasound couplant disposed in said space defined between said first layer and said second layer, said ultrasound couplant having a molecule size, said molecule size being less than or substantially equal to said first layer pore dimension, and said molecule size being less than or substantially equal to said second layer pore dimension.

5,770,802

## SENSOR WITH IMPROVED CAPACITIVE TO VOLTAGE CONVERTER INTEGRATED CIRCUIT

James P. Berthold, North Attleboro, and Keith W. Kawate, Attleboro Falls, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

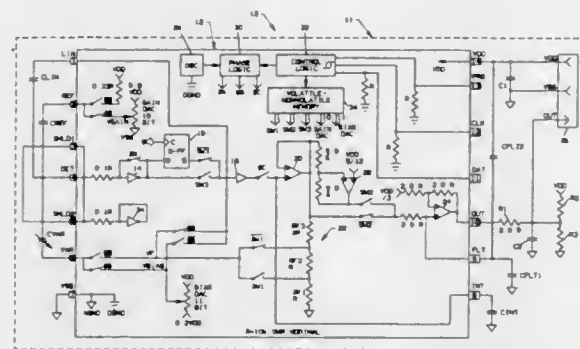
Filed Apr. 16, 1997, Ser. No. 840,744

Int. Cl.<sup>6</sup> G01L 9/12

U.S. Cl. 73—765

6 Claims

1. A variable capacitor transducer having an electrical output which varies in response to changes in a mechanical stimulus being monitored comprising an electric circuit having a variable capacitor and a reference capacitor coupled together to form a common node, a charge comparator, the common node coupled to the charge comparator for comparing the charge on the variable capacitor to the charge on the reference capacitor, an integrator buffer having an analog output, the charge comparator having an output coupled to the integrator buffer to provide an output signal which is approximately a linear function of the mechanical stimulus applied to the variable capacitor, a plurality of selected switches, a timing circuit for providing actuation signals during instruction cycles for controlling the state of energization of the



selected switches, one of the selected switches connected to the output of the integrator buffer, a closed analog feedback loop extending from the output of the integrator buffer through said one of the selected switches to the variable capacitor wherein the said one of the selected switches is closed during a portion of each instruction cycle to feedback the analog output signal to the variable capacitor to null out a charge on the common node.

5,770,803

## SEMICONDUCTOR STRESS SENSOR

Yoshimitsu Saito, Saitama-ken, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

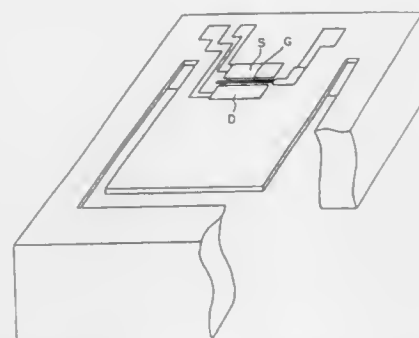
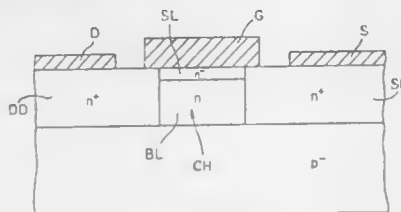
Filed Sep. 4, 1996, Ser. No. 707,461

Claims priority, application Japan, Sep. 4, 1995, 7-250210

Int. Cl.<sup>6</sup> G01L 1/00

U.S. Cl. 73—777

11 Claims



1. A semiconductor stress sensor comprising a semiconductor substrate including a field-effect transistor for detecting a stress in the field-effect transistor based on a change in an output signal of the field-effect transistor, said field effect transistor including a p-type semiconductor substrate having an n-type source diffusion layer and an n-type drain diffusion layer deposited on the p-type substrate, the field-effect transistor further including a channel layer disposed between the source and drain diffusion layers, the channel layer comprising an inner channel layer and a surface channel layer disposed on the inner channel layer, and a gate electrode on an upper surface of the channel layer, and respective source and drain electrodes on the source and drain diffusion layers.

5,770,804

Patent Not Issued For This Number

5,770,805

## METHOD AND DEVICE FOR MEASURING A PARAMETER OF A FLUID HAVING VARIABLE DENSITY

Yvon Castel, Croissy sur Seine, France, assignor to Institut Francais du Pétrole, Rueil Malmaison, France

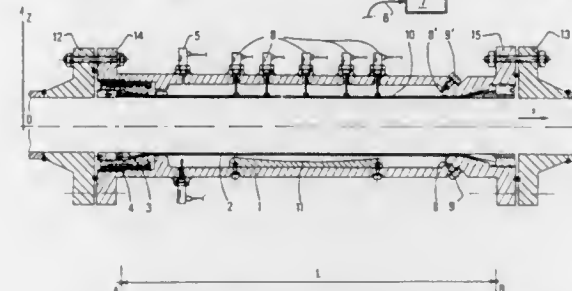
Filed Oct. 21, 1996, Ser. No. 734,269

Claims priority, application France, Oct. 19, 1995, 95 12422

Int. Cl.<sup>6</sup> G01F 1/74

U.S. Cl. 73—861.04

15 Claims



5. A device for determining at least one parameter characteristic of a fluid with a variable density and at least one phase having different density values, the device comprising:  
an enclosure with at least one internal wall;  
at having at least one flexible element having a shape that matches that of at least one internal wall of the enclosure, said flexible element being fixed at two points of said at least one wall of the enclosure and positioned relative to the at least one internal wall of said enclosure so that a space is created between said internal wall and said flexible element, said flexible element forming a passage through which the fluid can flow and capable of deforming upon contact with the fluid;  
an inlet for introducing at least one auxiliary, non-compressible fluid into said space, to surround said flexible element and to place said flexible element at equi-pressure,  
at least one sensor for measuring deformation of said flexible element when said fluid is flowing inside the element; and  
a processing device, linked to said sensor, for using measured values to determine said at least one parameter.

5,770,806

## ACOUSTIC FLOW MEASUREMENT METHOD AND MEASUREMENT APPARATUS IMPLEMENTING THE METHOD

Pekka Hiismäki, Espoo, Finland, assignor to Valtion Teknillinen Tutkimuskeskus, Finland

PCT No. PCT/FI95/00168, § 371 Date Mar. 14, 1997, § 102(e) Date Mar. 14, 1997, PCT Pub. No. WO95/28619, PCT Pub. Date Oct. 26, 1995

PCT Filed Mar. 29, 1995, Ser. No. 727,499

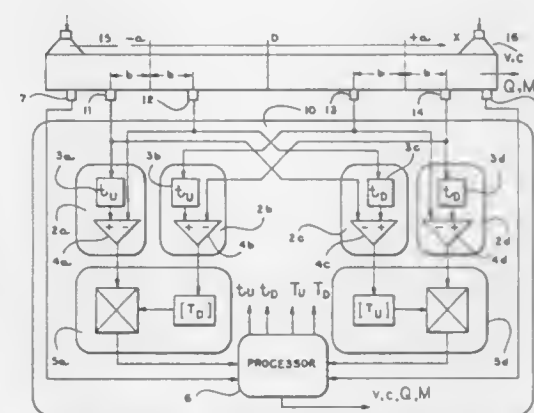
Claims priority, application Finland, Apr. 19, 1994, 941805

Int. Cl.<sup>6</sup> G01F 1/00

U.S. Cl. 73—861.29

10 Claims

1. An acoustic method of flow measurement for the determination of fluid flow velocity (v), volumetric flow (Q) or mass flow rate (M) in a measurement pipe section have an axial direction by determining over an exactly determined length 2a the downstream propagation time  $T_D$  and upstream propagation time  $T_U$  for naturally occurring or artificially generated acoustic wave modes (15,16) propagating upstream and downstream in the measurement pipe section in the form of plane wavefronts of low frequency sound, comprising the steps of:



- mounting two pairs of opposed transducers (11,12; 13,14), separated in the axial direction by a certain interpair distance (2a) and a certain intrapair distance (2b) on the measurement pipe section;  
delaying, scaling, and summing signals from the transducers into four direction-discriminating filters (2a, 2b, 2c, 2d) of which two filters (2c, 2d) are tuned to eliminate signals related to downstream acoustic waves and two filters (2a, 2b) are tuned to eliminate signals related to the upstream acoustic waves in the measurement pipe section;  
comparing with each other the output signals of said two direction-discriminating filters by forming a symmetrical equilibrium function with respect to a delay variable about a true time shift between the said signals to be compared from (a) cross-correlation function, (b) a time integral function of squared difference, or (c) a time integral function of squared sum, of the output signals, whereby one of the alternative functions (a), (b), and (c) is computed for acoustic waves in both downstream and upstream directions, said equilibrium functions being maximally symmetrical with respect to their maxima or minima; and  
determining from any of said maximally correct symmetric equilibrium function (a,b,c), with the help of a certain predetermined algorithm, correct values of the acoustic wavefront propagation times  $T_D$  and  $T_U$  for use in the computation of both the measurement result given by the method and values of delay time variables to be employed in the direction-discriminating filters.

5,770,807

## APPARATUS FOR TAKING UP AND GUIDING A CONNECTION DEVICE

David Finn, König-Ludwig-Weg 24, D-87459 Pfronten, and Manfred Rietzler, Am Alsterberg 10, D-87616 Marktoberdorf, both of Germany

PCT No. PCT/DE95/00642, § 371 Date Nov. 4, 1996, § 102(e) Date Nov. 4, 1996, PCT Pub. No. WO95/32073, PCT Pub. Date Nov. 30, 1995

PCT Filed May 11, 1995, Ser. No. 737,349

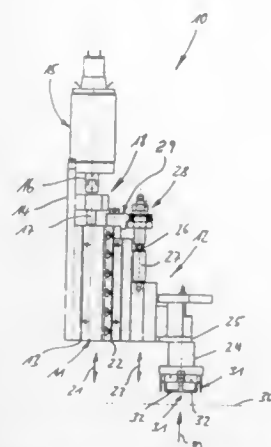
Claims priority, application Germany, May 19, 1994, 44 17 625.2

Int. Cl.<sup>6</sup> B23K 11/24

U.S. Cl. 73—862.541

14 Claims

1. An apparatus for taking up and guiding a tool device, comprising:  
a feed device being movable by means of a servo-element along a feed axis,  
a take-up device for taking up the tool device, the take-up device being movable by means of the feed device along a motional axis,  
the motional axis being in parallel and offset to the feed axis,  
a force measuring device being disposed on the feed device and movable together with the feed device,  
an elastic element being disposed between and connected with the force measuring device and the take-up device,



the take-up device being guided alongside the feed device in a linear guide in such a way that the elastic element is deformed when a relative motion takes place between the force measuring device and the take-up device.

5,770,808

**PRODUCT QUALITY DETERMINING METHODS FOR DIE CAST MACHINES**

Hiroshi Yokoyama, Kanagawa-ken, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

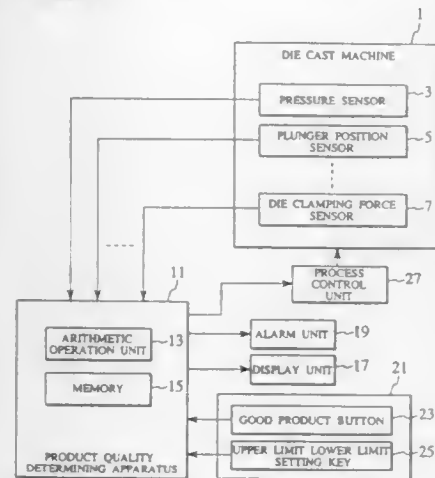
Filed Mar. 24, 1997, Ser. No. 822,796

Claims priority, application Japan, Mar. 29, 1996, 8-076866

Int. Cl.<sup>6</sup> G01N 19/00; B22C 19/04

U.S. Cl. 73-865.9

9 Claims



1. A product quality determining method for cast machines, said method comprising the steps of:

automatically measuring injection and casting conditions by means of measuring means for each shot in actual casting process of the die cast machine;

when a good product button is operated for a shot by an operator setting a measured value relating to the injection and casting condition of the shot as a reference value for determining a product quality;

setting a product quality determining range by determining an upper limit value and a lower limit value of a predetermined allowable width with respect to the reference value; and

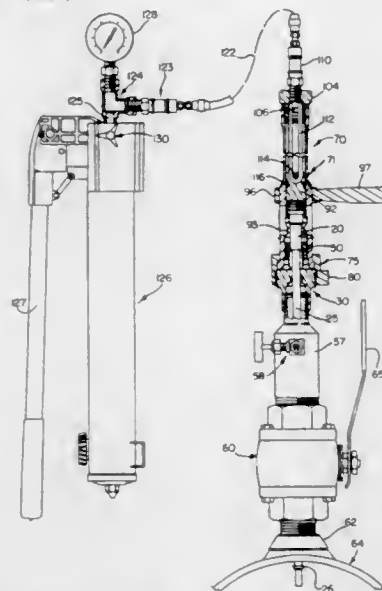
determining whether or not the measured value of the injection and casting condition is within said product quality determining range by means of an arithmetic operation means.

5,770,809  
**PROBE ASSEMBLY SYSTEM, INSERTION AND RETRIEVAL TOOL THEREFOR, AND METHODS**  
David K. Waterman, Santa Fe Springs, Calif., assignor to Rohrbach Cosasco Systems, Inc., Santa Fe Springs, Calif.  
Division of Ser. No. 503,883, Jul. 18, 1995, Pat. No. 5,621,181.  
This application Jan. 13, 1997, Ser. No. 783,585

Int. Cl.<sup>6</sup> G01N 17/00

U.S. Cl. 73-866.5

11 Claims



1. A method of retracting a probe from a pressure vessel, said probe being locked to a stuffing box fitting assembled to an access valve of the pressure vessel, comprising the steps of assembling an hydraulic piston-cylinder retrieval tool to said fitting, advancing the piston to engage the probe under pressure, sensing and reading the pressure of the piston against the probe, then unlocking the probe with respect to the fitting, and gradually relieving the pressure behind the piston to enable the pressure within the vessel to push the probe outwardly of the fitting to clear the access valve, closing the access valve, venting any pressure between the closed access valve and fitting, and removing the fitting and probe.

5,770,810

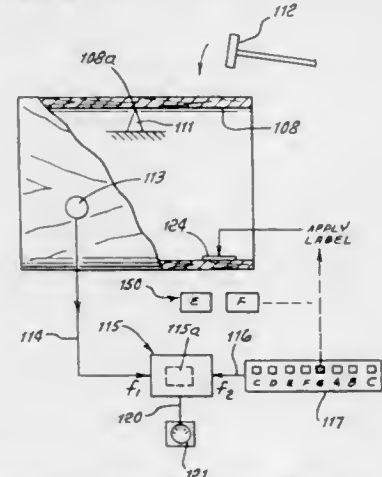
**DRUM TUNING METHOD AND APPARATUS**  
Donald G. Lombardi, Thousand Oaks, Calif., assignor to Drum Workshop, Inc., Oxnard, Calif.

Filed Apr. 28, 1997, Ser. No. 846,233

Int. Cl.<sup>6</sup> G10D 13/02

U.S. Cl. 84-411 R

13 Claims



1. In the method of enabling optimum tuning of a drum having a shell, a head and adjustable tuning members, the steps that include:

- suspending the drum shell to vibrate when struck,
- striking the suspended shell to vibrate at a characteristic acoustic frequency,
- sensing said acoustic frequency and converting the sensed acoustic frequency to a labeling value,
- and using said value to label the drum to indicate said frequency,
- whereby a drum user may tune the drum by adjusting said members to cause the drum to resonate at or near said frequency when the head is struck.

5,770,811

**MUSIC INFORMATION RECORDING AND REPRODUCING METHODS AND MUSIC INFORMATION REPRODUCING APPARATUS**

Yasuyuki Haino, Yokosuka, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

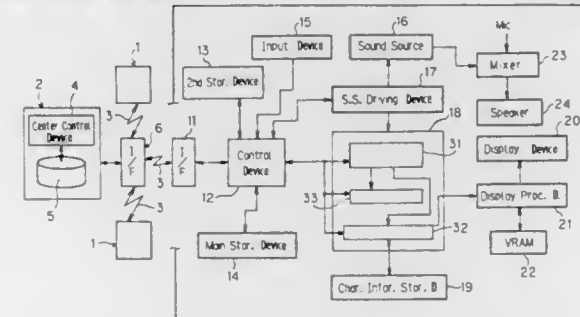
Filed Oct. 31, 1996, Ser. No. 741,668

Claims priority, application Japan, Nov. 2, 1995, 7-309986; Nov. 24, 1995, 7-329664

Int. Cl.<sup>6</sup> G09B 15/02

U.S. Cl. 84-464 R

8 Claims



1. A music information reproducing method for reproducing music information by a music information reproducing apparatus, said music information containing timing clocks; character display information for displaying a plurality of characters on display means; sound source driving information for driving various sound sources; and color change information for color-changing said plurality of characters displayed on said display means, the method comprising the steps of:

preliminarily determining and displaying positions of said plurality of characters on said display means by the character display information before said music information is reproduced;

counting said timing clocks of said music information, while said music information is reproduced; and

changing the color of a whole line of said plurality of characters simultaneously at a color change timing of a first character in said line when the number of said timing clocks reaches a predetermined number designated by said color change information.

5,770,812

**SOFTWARE SOUND SOURCE WITH ADVANCE SYNTHESIS OF WAVEFORM**

Toru Kitayama, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Jun. 3, 1997, Ser. No. 868,413

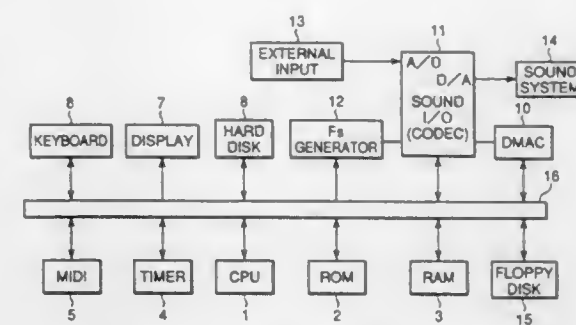
Claims priority, application Japan, Jun. 6, 1996, 8-165161

Int. Cl.<sup>6</sup> G10H 1/40; 7/00

U.S. Cl. 84-603

18 Claims

1. A method of generating musical tones through a plurality of channels according to performance information by means of a processor placed in either of a working state and an idling state and a buffer connected to the processor, the method comprising the steps of:



successively producing control information for the plurality of the channels according to the performance information when the same is successively inputted;

periodically instituting a regular task of the processor according to the control information for successively executing a routine synthesis of waveform samples of the musical tones allotted to the plurality of the channels and for temporarily storing the waveform samples in the buffer;

detecting when the processor occasionally stays in the idling state for instituting an irregular task of the processor to execute an advance synthesis of a waveform sample of a musical tone allotted to a particular one of the channels and for reserving the waveform sample in advance;

controlling the processor to skip the routine synthesis of the waveform sample allotted to the particular channel while loading the reserved waveform sample into the buffer; and sequentially reading the waveform samples from the buffer in response to a sampling frequency to generate the musical tones through the plurality of the channels.

5,770,813

**SOUND REPRODUCING APPARATUS PROVIDES HARMONY RELATIVE TO A SIGNAL INPUT BY A MICROPHONE**

Junichi Nakamura, Chiba, Japan, assignor to Sony Corporation, Tokyo, Japan

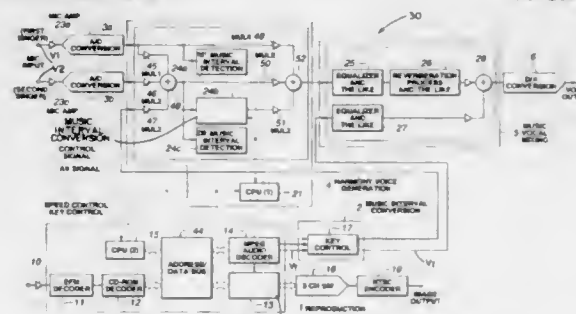
Filed Jan. 14, 1997, Ser. No. 783,247

Claims priority, application Japan, Jan. 19, 1996, 8-007843

Int. Cl.<sup>6</sup> G10H 1/36; 7/00

U.S. Cl. 84-610

16 Claims



1. A sound reproducing apparatus that uses a microphone and a record medium on which an accompaniment sound signal, data indicative of a scale, and song standard information are recorded, said apparatus comprising:

a reproducing section for reproducing the accompaniment sound signal, the song standard information, and the data indicative of the scale from the record medium;

a signal generating section for generating a harmony signal relative to a sound signal from the microphone on the basis of the data indicative of the scale reproduced by said reproducing section and the song standard information; and

an adding section for adding the sound signal from the microphone, the accompaniment sound signal reproduced by said reproducing section, and the harmony signal from said signal generating section to thereby produce an output signal.



5,770,814

## FIRING RATE REGULATING MECHANISM

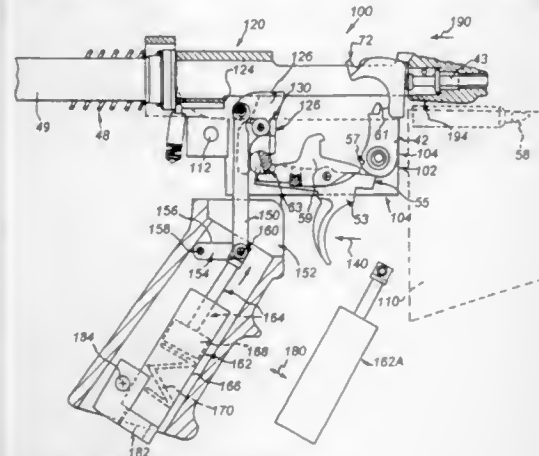
George D. Ealovega, Kennebunk, Me., assignor to Defense Technologies Limited, Portland, Me.

Filed May 9, 1996, Ser. No. 647,381

Int. Cl.<sup>6</sup> F41A 19/04

U.S. Cl. 89—131

19 Claims



1. An automatic firearm comprising:  
a receiver;  
a bolt assembly movably mounted in the receiver and a firing pin movably mounted in the bolt assembly;  
a hammer movably mounted in the receiver, constructed and arranged to move against the firing pin when the bolt assembly is adjacent a forwardmost position;  
a first sear and a second sear each operatively connected to the hammer to release the hammer at predetermined times so that the hammer can move against the firing pin, at least one of the first sear and the second sear being interconnected with a trigger;  
a time delay unit operatively connected with at least one of the first sear and the second sear wherein movement of the bolt assembly causes the time delay unit to move to a first position in which at least one of the first sear and the second sear retain the hammer remote from the firing pin and wherein the time delay unit is constructed and arranged to move to a second position after a predetermined delay time to operate at least one of the first sear and the second sear to release the hammer so that the hammer moves against the firing pin; and  
a time delay unit actuator including a cam pivotally mounted on the frame that engages the bolt assembly upon rearward movement of the bolt assembly and a linkage that transfers movement of the cam into movement of the time delay unit.

5,770,815

## AMMUNITION CARTRIDGE WITH REDUCED PROPELLANT CHARGE

Fred W. Watson, Jr., Montross, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

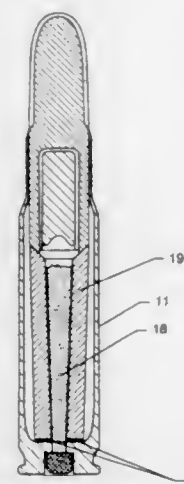
Filed Aug. 14, 1995, Ser. No. 514,888

Int. Cl.<sup>6</sup> F42B 8/12

U.S. Cl. 102—447

5 Claims

1. An ammunition cartridge having a reduced propellant charge comprising:  
a reusable case having a base end and an open end;  
a primer inserted in the base end of said case;  
means for rigidly positioning, forming, and securing a reduced propellant charge within said case, said means being a foam filler which is gasifiable and expellable from said case during firing of the cartridge said foam filler extending from, said base end toward said forward end, said foam filler having a tapered conical interior volume;  
a propellant charge inserted in said means for rigidly positioning, forming and securing;



- a projectile having an open interior volume and being inserted into and affixed to the open end of said case and extending forward of said open end; and  
a tracer material inserted into the open interior volume of said projectile.

5,770,816

## PLANAR, HERMETIC METAL MATRIX HOUSING

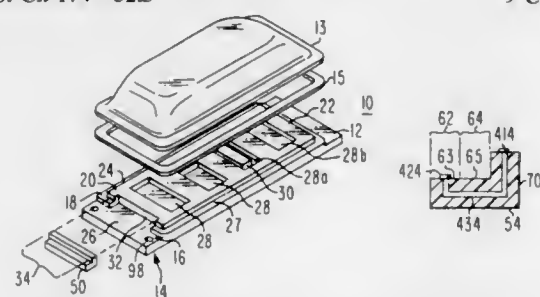
Michael Kevin McNulty, Cherry Hill, N.J., and Bradley David Dufour, Philadelphia, Pa., assignors to Lockheed Martin Corp., Moorestown, N.J.

Filed Mar. 11, 1997, Ser. No. 815,349

Int. Cl.<sup>6</sup> H05K 5/06

U.S. Cl. 174—52.3

9 Claims



1. A hermetically sealable housing adapted for holding at least one semiconductor chip, and for providing electrically conductive paths from the exterior of said housing to the interior thereof, said housing comprising:

- a base member defining a bottom surface, and also defining a lower mesa, an intermediate mesa overlying said lower mesa, and an upper mesa overlying said intermediate mesa, said upper mesa defining a substantially planar top surface and a periphery, an upper portion of said lower mesa defining at least an insert bearing surface being substantially parallel with said top surface, said base member including at least one cavity extending from said top surface of said upper mesa toward said bottom surface, and adapted for holding a semiconductor chip with the upper surface of said chip substantially coplanar with said top surface of said upper mesa, said intermediate mesa and said upper mesa of said base member further including at least one flat end wall perpendicular to said top surface, and extending from said top surface of said upper mesa to said insert bearing surface over a selected portion of said periphery of said upper mesa, said intermediate mesa defining a substantially planar ring support surface lying parallel with said top surface of said upper mesa, and extending about said periphery of said upper mesa except along said selected portion of said periphery of said upper mesa;

- a substantially rectilinear insert having a monolithic stepped body defining a lower surface, and including at least first and second portions, said first portion of said insert defining an upper surface and a flat contact wall having a length dimension substantially equal to the length of said selected portion of said periphery and a height dimension between said upper surface of said first portion of said insert and said lower surface of said insert, said height dimension being equal to the dimension of said flat end wall of said base member from said top surface of said base member to said insert bearing surface of said base member, said second portion of said stepped body of said insert defining at least one upper surface including terminal and non-terminal portions, and also defining a height between said lower surface of said insert and said upper surface of said terminal portion of said second portion of said insert, said height being equal to the distance between said insert bearing surface and said ring support surface of said base member, said insert being made from a dielectric material, and further including a plurality of electrical conductors extending within said dielectric material from said upper surface of said first portion of said insert to said upper surface of said terminal portion of said second portion of said insert, but not to said upper surface of said non-terminal portion of said second portion of said insert, said electrical conductors being insulated except at said upper surface of said first portion of said insert and at said upper surface of said terminal portion of said second portion of said insert, said insert being mounted with said contact wall contiguous with said end wall of said base member, and with said lower surface of said insert contiguous with said insert bearing surface of said base member, whereby said upper surface of said first portion of said insert is substantially coplanar with said top surface of said upper mesa of said base member, and said upper surface of said non-terminal portion of said second portion of said insert is substantially coplanar with said ring support surface of said base member over said selected portion of said periphery, said base member being hermetically sealed to said insert at least along said lower surface of said insert and said contact wall of said first portion of said insert; and  
a peripheral sealing ring extending over said ring support surface of said base member and said top surface of said insert, to form a continuous flat surface about said periphery of said upper mesa, said sealing ring being hermetically joined to said ring support surface of said base member and to said upper surface of said nonterminal portion of said second portion of said insert.

5,770,817

## RACEWAY BOX WITH REPLACEABLE CABLE AND CONNECTOR RECEPTACLES

Jeffrey C. P. Lo, 2405 Coniston Pl., San Marino, Calif. 91108

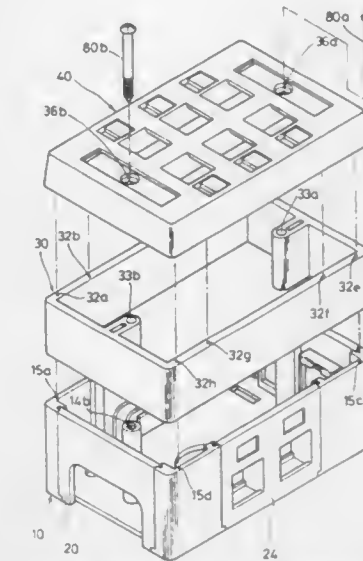
Filed Sep. 20, 1996, Ser. No. 710,721

Int. Cl.<sup>6</sup> H02G 3/08

U.S. Cl. 174—57

19 Claims

1. A raceway box, comprising:  
(a) a base unit including a chassis having a plurality of side pieces mounted substantially upright on an edge of said chassis, said plurality of side pieces defining a plurality of receptacles therebetween;  
(b) at least one connector raceway insert, which is inset in one of said receptacles so as to fill a space between respective adjacent ones of said side pieces and having an opening for mounting at least a first type of connector therein;



- (c) a socket panel having at least one opening for mounting at least a second type of connector therein, said socket panel covering said base unit; and  
(d) means for securing said socket panel on said base unit.

5,770,818

## CONNECTOR FOR ESTABLISHING CONNECTION BETWEEN ELECTRIC WIRES AND FLAT CABLE AND MANUFACTURING METHOD THEREOF

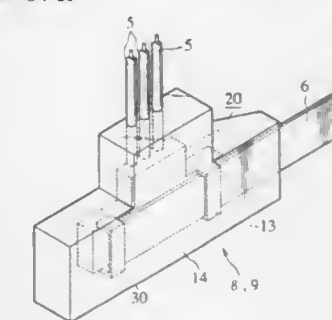
Yoshiyuki Tanaka; Kouji Koike; Masataka Suzuki, and Hiroyuki Ashiya, all of Shizuoka-ken, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Apr. 23, 1996, Ser. No. 636,557

Claims priority, application Japan, Apr. 25, 1995, 7-100892 Int. Cl.<sup>6</sup> H01R 4/00; 4/02

U.S. Cl. 174—84 R

10 Claims



1. A connector for connecting electric wires and a flat cable comprising:  
an attaching plate including,  
a first surface for guiding the electric wires in a first direction toward exposed electric wire conductive ends, and  
a second surface for guiding the flat cable in a second direction toward exposed flat cable conductive ends, the second direction being the same as the first direction; and  
a cover plate coupled to the attaching plate adjacent a joining point of the electric wire conductive ends and the flat cable conductive ends, the cover plate covering the flat cable conductive ends during an insert molding about the attaching plate.

5,770,819

**INSULATED WIRE OR CABLE HAVING FOAMED FLUOROPOLYMER INSULATION**

Ashok Mehan, Union City, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 388,340, Feb. 13, 1995, Pat. No. 5,468,782. This application Oct. 23, 1995, Ser. No. 547,001 Int. Cl.<sup>6</sup> H01B 7/30

U.S. Cl. 174—110 PM

9 Claims

1. An insulated wire or cable which comprises  
(A) a conductor, and  
(B) an insulating jacket which surrounds the conductor and which is composed of a melt extruded, foamed composition comprising  
(1) a copolymer of ethylene and chlorotrifluoroethylene (ECTFE) which has a crystallinity of at least 50%, and  
(2) a polymer of tetrafluoroethylene (PTFE) which has a crystallinity of at least 50% and which is in the form of fine particles dispersed in the ECTFE;

the ratio by weight of the ECTFE to the PTFE being 1:1 to 9:1.

5,770,820

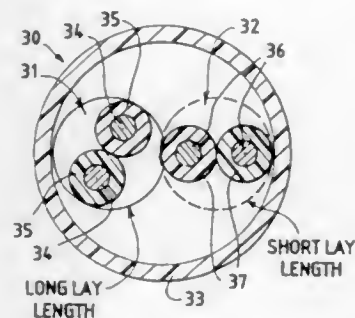
**PLENUM CABLE**

Harry Nelson, 1520 Mallard Ct.; Douglas O'Brien, 3151 Forest Dr., both of Richmond, Ind. 47374, and Robert D. Kenny, 2801 Southeast Pkwy., Richmond, Ind. 47375

Continuation-in-part of Ser. No. 404,415, Mar. 15, 1995, Pat. No. 5,525,757, and Ser. No. 412,052, Mar. 28, 1995, Pat. No. 5,514,837. This application May 7, 1996, Ser. No. 646,506 Int. Cl.<sup>6</sup> H01B 11/02

U.S. Cl. 174—113 R

1 Claim



1. A plenum cable comprising:

a plurality of twisted pair conductors, each of said twisted pair conductors having a lay length of between 0.4 to 1.25 inches, at least one of said plurality of twisted pair conductors having a first lay length of about 1.0 to 1.25 inches, and at least another of said plurality of twisted pair conductors having a second lay length of about 0.5 to less than 1.0 inches wherein said at least one twisted pair conductor has insulating material selected from the group consisting of flame retardant polyethylene and flame retardant polypropylene and said at least another twisted pair conductor has insulating material selected from the group consisting of fluorinated ethylene propylene, tetrafluoroethylene, ethylene chlorotrifluoroethylene, and copolymers of tetrafluoroethylene with perfluoroalkoxy.

5,770,821

**SUBMOUNT**

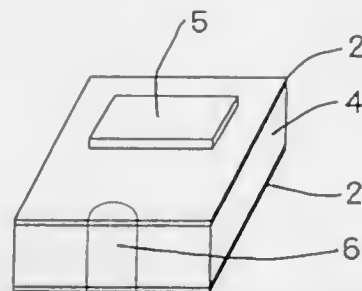
Mitsutoshi Hikasa; Yoshihiko Numata, and Reo Yamamoto, all of Fujisawa, Japan, assignors to Tokuyama Corporation, Japan

Filed Jul. 12, 1996, Ser. No. 679,673  
Claims priority, application Japan, Jul. 18, 1995, 7-181962  
Int. Cl.<sup>6</sup> H01R 9/09

U.S. Cl. 174—264

16 Claims

1. A submount comprising:



an insulating substrate having therein a throughhole filled with a sintered metal powder containing 1.0 to 10% by weight of an aluminum nitride powder or titanium powder dispersed therein for strengthening a bond between the insulating substrate and said sintered metal powder, and  
an electroconductive layer formed on each of the two opposing surfaces of the insulating substrate, wherein the two electroconductive layers are electrically connected with each other at least partially by the sintered metal powder filled in the throughhole of the insulating substrate.

5,770,822

**BULKHEAD GASKET ASSEMBLY**

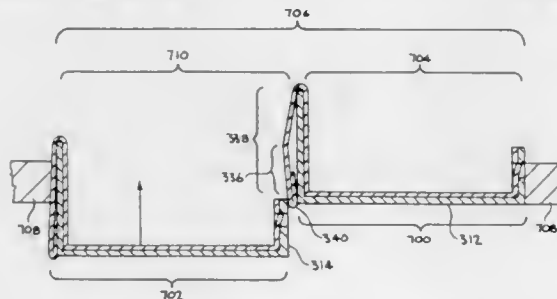
Sarah Abolitz, San Francisco, and Michael Alan Koken, Sunnyvale, both of Calif., assignors to Silicon Graphics, Inc., Mountain View, Calif.

Filed Aug. 19, 1996, Ser. No. 697,073

Int. Cl.<sup>6</sup> H05K 9/00

U.S. Cl. 174—35 GC

13 Claims



1. An EMI bulk head gasket assembly comprising:

a bulk head having a bulk head base plate and first and second bulk head side walls such that a bulk head recess is formed;  
a gasket including a gasket base plate and first and second gasket side walls, said gasket adapted to snap fit into said bulk head recess, such that said gasket lines the interior surface of said bulk head base plate, and said first and said second bulk head side walls;  
a spring finger extending outward from a distal edge of said second gasket side wall, said spring finger having smooth edges such that said spring fingers does not pose a safety hazard to a user of said bulk head gasket assembly, said spring finger being buttressed by said second bulk head side wall which slips between said second gasket side wall and said spring finger such that said spring finger is prevented from being permanently deformed.

5,770,823

**ZERO HEIGHT LOAD MEASURING SYSTEM AND METHOD OF INSTALLING SAME**

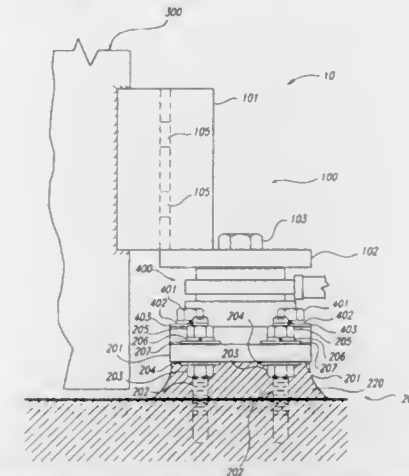
Farid Piroozmandi, Bothell, Wash., assignor to Kistler-Morse Corporation, Bothell, Wash.

Filed Apr. 15, 1996, Ser. No. 632,587

Int. Cl.<sup>6</sup> G01G 9/00; 19/52; 19/02

U.S. Cl. 177—1

20 Claims



1. A load measuring system for measuring the load carried by a support leg having a lower end positioned on a supporting surface, the load measuring system comprising:

an attachment structure fastened to the support leg;  
a support plate;  
a load cell positioned between said attachment structure and said support plate; and  
a lifting mechanism coupled between the support plate and the supporting surface to apply a sufficient upward force to the support plate to transfer the load carried by the support leg to the load cell, said lifting mechanism comprising:  
a plurality of threaded bolts projecting upwardly from the supporting surface through respective holes in said support plate; and  
a lifting nut threaded onto each of said bolts, said lifting nuts having upper surfaces contacting said support plate and applying a sufficient upward force on said support plate so that substantially the entire load carried by the support leg is coupled to said load cell by said attachment structure and said support plate.

5,770,824

**KEY SWITCH ARRANGEMENT FOR NOTEBOOK COMPUTERS**

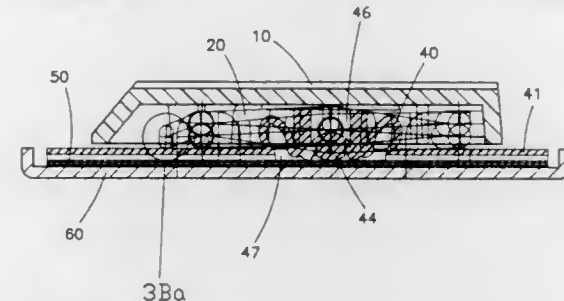
Ching-Cheng Tsai, Keelung; Wen-To Chuo, and Fu-Jen Hsu, both of Taipei Hsien, all of Taiwan, assignors to Chicony Electronics Co., Ltd., Taipei Hsien, Taiwan

Filed Nov. 19, 1996, Ser. No. 746,908

Int. Cl.<sup>6</sup> H01H 13/70

U.S. Cl. 200—5 A

3 Claims



1. A key switch comprising:

a key cap, said key cap comprising a bottom side, a downward plunger perpendicularly downwardly raised from the bottom side at the center, a plurality of radial ventilation grooves disposed at the bottom side and spaced around said plunger,

two symmetrical pairs of downward hooks and two symmetrical axle housings bilaterally raised from the bottom side;

a bottom frame, said bottom frame comprising two first upright lugs which have an angled configuration and define a respective horizontal axle hole, two second upright lugs which have an angled configuration and define a respective horizontal oblong hole, and a plurality of vertical through holes respectively disposed around said first upright lugs and said second upright lugs;

a membrane circuit supported on said bottom frame, said membrane circuit having a plurality of punch angled holes through which the first upright lugs and second upright lugs of said bottom frame pass, said punch angled holes being respectively peripherally sealed with a layer of bonding resin;

a rubber cone mounted on said membrane circuit for pressing by the plunger of said key cap to trigger said membrane circuit in producing an electrical signal, said rubber cone comprising a flat base having a center hole, and a plurality of through holes through which the first upright lugs and second upright lugs of said bottom frame pass, a cone body raised from the periphery of the center hole of said flat base and having a downward trigger rod suspended on the inside spaced above the center hole of said flat base;

a first link coupled between said key cap and said bottom frame, comprising two parallel frame rods and a transverse connecting rod connected between said parallel frame rods at one end, each of said parallel frame rods comprising a first pivot pin perpendicularly and outwardly raised from one end adjacent to said transverse connecting rod and pivoted to one hook of said key cap, a second pivot pin perpendicularly and outwardly raised from an opposite end remote from said transverse connecting rod and slidably inserted into the horizontal oblong hole of one second upright lug of said bottom frame, and a pivot hole in the middle, said transverse connecting rod having an arched springy middle section; and,

a second link coupled between said key cap and said bottom frame, said second link comprising an annular base, two first pivot pins perpendicularly raised from the periphery of said annular base at two opposite sides in transverse direction and respectively inserted into the pivot holes of the two frame rods of said first link, a first pair of parallel springy extension rods and a second pair of parallel springy extension rods bilaterally perpendicularly raised from the periphery of said annular base at two opposite sides in longitudinal direction, two second pivot pins respectively and perpendicularly raised from said first pair of parallel springy extension rods at one end remote from said annular base and respectively inserted into the pivot holes of the first upright lugs of said bottom frame, and two third pivot pins respectively and perpendicularly raised from said second pair of parallel springy extension rods at one end remote from said annular base and respectively pivoted to the axle housings of said key cap.

5,770,825

**SWITCH DEVICE**

Kiyotaka Yamaguchi; Hiroyuki Kuroda, and Kazuya Yoshikawa, all of Kyoto, Japan, assignors to Omron Corporation, Kyoto, Japan

Filed Jul. 26, 1996, Ser. No. 690,168

Claims priority, application Japan, Jul. 27, 1995, 7-212629

Int. Cl.<sup>6</sup> H01H 9/02

U.S. Cl. 200—5 R

8 Claims

1. A switch device comprising:

a plurality of switches which control a plurality of external loads, wherein said plurality of switches comprise a first switch and a second switch;  
a casing which accommodates said plurality of switches therein; operating members which operate said plurality of switches, said operating members located at an upper surface of said casing; and  
a plurality of connector terminals through which said plurality of switches are electrically connected to at least one of said



VOL

1  
2  
1  
1

ISS

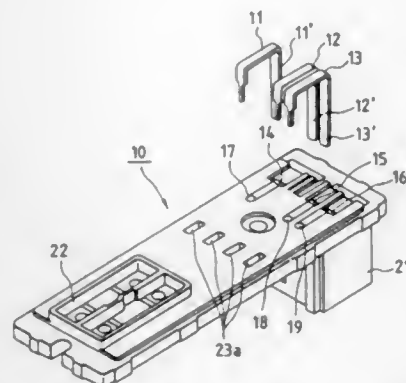
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UMI



plurality of external loads, said plurality of connector terminals being arranged in plural lines in a lower surface or in a side surface of said casing;

wherein said plurality of connector terminals arranged in plural lines further comprise, a first group of said connector terminals formed in one line and connected to a wiring pattern, said first group of connector terminals and said wiring pattern formed by one metal stamping, and a second group of said plurality of connector terminals formed in a second line and constructed by metal pieces separate from said metal stamping, said second group of connector terminals being electrically connected to said second switch, wherein said metal stamping and said metal pieces are formed independently and are accommodated in said casing.

5,770,826

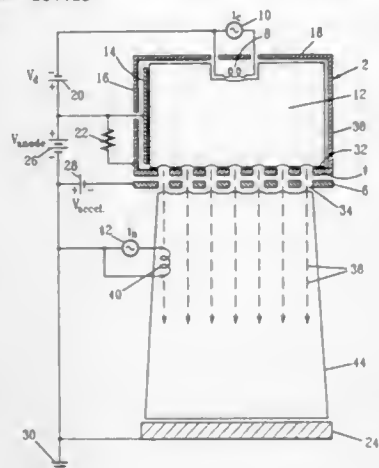
**ATOMIC BEAM ALIGNMENT OF LIQUID CRYSTALS**  
Praveen Chaudhari, Briarcliff Manor; James Andrew Lacey, Mahopac; Shui-Chih Alan Lien, Briarcliff Manor, and Curtis E. Farrell, Tarrytown, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 10, 1996, Ser. No. 644,884

Int. Cl. C07C 1/00; C07F 1/00; G02F 1/1339

U.S. Cl. 204—157.15

16 Claims



1. A method of generating an alignment direction on an alignment surface for a liquid crystal display cell comprising: directing a particle beam at said alignment surface; said particle beam is directed at said surface at an adjustable energy using a voltage less than about 200 V, at an adjustable angle with respect to said alignment surface and at an adjustable time to adjust the pretilt angle of a liquid crystal molecule with respect to said alignment surface to be larger than a few degrees to which said liquid crystal molecule is aligned.

**5,770,827**  
**CIRCUIT BREAKER MAGNETIC BLOWOUT ARC EXTINGUISHING DEVICE WITH ARC RUNNER FEATURES**

Kazuyoshi Maki, Saga-ken, Japan, assignor to Togami Electric Mfg. Co., Ltd., Japan

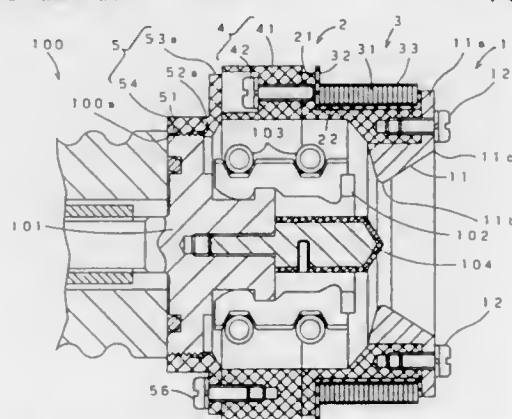
Filed Apr. 16, 1996, Ser. No. 633,208

Claims priority, application Japan, Apr. 28, 1995, 7-129295

Int. Cl. H01H 33/18; 9/44; 73/18

U.S. Cl. 218—22

7 Claims



1. An arc extinguishing device of a circuit breaker which closes and opens an electric line comprising:

first and second contact parts fixed to a base part, an arc runner formed from electrically conductive material arranged on an outer periphery of one of said first and second contact parts,

wherein said arc runner includes a generally cylindrical shape having inner portions which define an opening of said cylindrical shape, wherein said opening is defined by first and second slant angles, wherein said first slant angle is greater than said second slant angle.

2. The arc extinguishing device as claimed in claim 1, further including a coil bobbin, wherein the coil bobbin is arranged on one of said first and second contact parts, and wherein said bobbin is disposed relative to said first and second contact parts such that the closest distance between said first contact part and said bobbin is greater than the closest distance between said second contact part and said arc runner.

5,770,828

**POWER CIRCUIT-BREAKER**

Lutz Niemeyer, Birr, Switzerland, assignor to ABB Research Ltd., Zurich, Switzerland

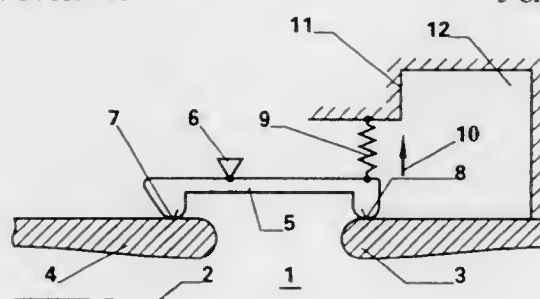
Filed May 17, 1996, Ser. No. 649,178

Claims priority, application Germany, Jul. 3, 1995, 195 24 217.3

Int. Cl. H01H 33/12

U.S. Cl. 218—48

5 Claims



1. A power circuit-breaker comprising: at least one cylindrically constructed arcing chamber which is filled with an insulating medium and has a quenching zone extending along a longitudinal axis,

a fixed contact arrangement which is arranged in a course of a main current path, a moving contact arrangement having a blowing volume which stores an increased pressure of the insulating medium which occurs during a disconnection process, at least one contact link having a first side with a first contact point and a second side with a second contact point, said at least one contact link electrically conductively connects the fixed contact arrangement and the moving contact arrangement to one another in a connected position, wherein the at least one contact link is mounted in a holder such that said contact link can rotate, and wherein the first side of the at least one contact link which interacts with the fixed contact arrangement is acted on by a force directed outward in a radial direction with respect to the longitudinal axis.

5,770,830

**GENERAL PURPOSE POSITION CONTROL SYSTEM HAVING RECURSIVE PROFILE GENERATOR**

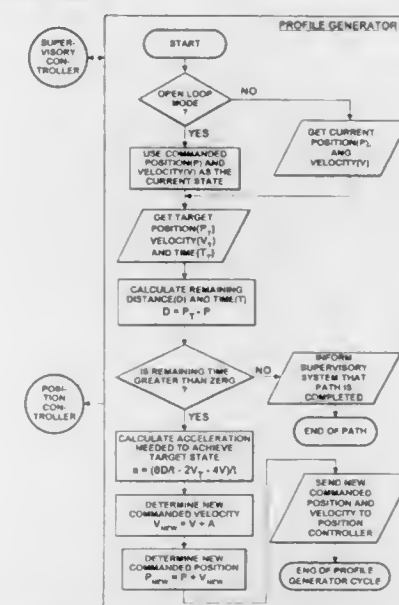
Stanley Maurice Katz, Stoughton, and Francis Brian O'Neill, Canton, both of Mass., assignors to Seiberco Incorporated, Braintree, Mass.

Filed Jun. 9, 1997, Ser. No. 871,370

Int. Cl. G05B 1/08; 19/05

U.S. Cl. 318—560

7 Claims



5. A servomotor motion control system comprising: an electric motor having an armature, with armature-position control capability; and an operating system for supplying electric current to said motor, iteratively controlled to have a cycle with a delay time of value  $t_D$ , for effecting movement of said armature to desired positions, said operating system including a motion generation component that is constructed to carry out the following steps during each cycle of said operating system, and thereby to define an armature travel path comprised of said desired positions taken cumulatively:

- (a) receiving current state signals that are representative of the current position "P" and the current velocity "V" of said armature, and the current time "T";
- (b) receiving target state signals that are representative of a desired armature position "P<sub>T</sub>", a desired armature velocity "V<sub>T</sub>", and a target time "T<sub>T</sub>" for achieving said desired position and desired velocity;
- (c) calculating the remaining armature travel distance "D" required to achieve said desired position, equal to P<sub>T</sub>-P, using said current and target state signals;
- (d) calculating the remaining time "t", equal to T<sub>T</sub>-T, using said current and target state signals;

- (e) calculating the acceleration "a" required to achieve the state represented by said target state signals, where "a" is equal to the quantity  $(6D/t-2V_T-4V)/t$ ;
- (f) calculating the sum of said current velocity V, added to the product of said acceleration a and said delay time t<sub>D</sub>, to determine a commanded velocity "V<sub>NEW</sub>";
- (g) calculating the sum of said current position P, added to the product of said commanded velocity V<sub>NEW</sub> and said delay time t<sub>D</sub>, to determine a commanded position "P<sub>NEW</sub>"; and
- (h) generating signals indicative of said commanded velocity and said commanded position for use in said operating system for supplying electric current to effect movement of said motor armature, said motion generation component being devoid of a capability of utilizing any signal that is representative of any prior state of said armature, and being devoid of a capability of inquiry as to changes in the state of said armature from a state prior to the current state.

5,770,830

**METHOD AND APPARATUS FOR WIRE-CUTTING CURVED WORKPIECES BY COMPENSATING MACHINING PARAMETERS ON WIRE-CUT ELECTRIC DISCHARGE MACHINE**

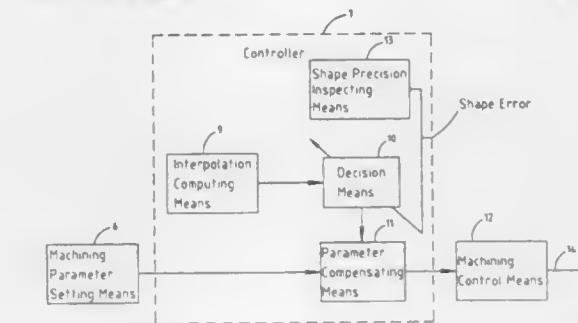
Hsin-Jung Chuang, Yung He, and Jui-Fang Liang, Fu Shing, both of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed Nov. 13, 1995, Ser. No. 555,948

Int. Cl. B23H 7/02

U.S. Cl. 219—69.12

4 Claims



3. An apparatus used on wire-cut electric discharge machines for automatically compensating machining parameters, comprising:

- (a) means for setting machining parameters including: on-time: the discharge time under normal condition; off-time: the time the discharge is off under normal condition; arc-on-time: the discharge time under arc condition; arc-off-time: the time the discharge is off under arc condition; wire-tension: the tension of the wire; and feedrate: reference feed rate of the machining workpiece
- (b) controller means including:
  - (i) interpolation computing means, capable of detecting the shape of workpiece being machined in each segment, if the shape of workpiece being machined in flat, then machining it directly; if a curved shape being detected for machining, then measuring the radius of curvature of the curved shape prior to the machining process, thereafter based on the displacement and feed rate, the locus of machining in flat shape or curved shape is converted to a pulse train output to each axis;
  - (ii) decision means, receiving data of the measured radius of curvature from said interpolation computing means, for computing compensation factors based on the measured radius of curvature by means of a predetermined set of criteria; and
  - (iii) parameter correcting means, receiving the compensation factors from said decision means, for compensating accordingly the preset machining parameters; and
- (c) machining control means, coupled to said parameter correcting means, for transferring the compensated machining parameters for use by the wire-cut electric discharge machine to machine workpiece.

**5,770,831**  
**POWER SUPPLY SYSTEM FOR AN ELECTRIC DISCHARGE MACHINE**

Yuji Kaneko, Yokohama, and Tadao Ueda, Sakai-gun, both of Japan, assignors to Sodick Co. Ltd., Japan  
PCT No. PCT/JP95/00826, § 371 Date Dec. 19, 1995, § 102(e)  
Date Dec. 19, 1995, PCT Pub. No. WO95/29031, PCT Pub.  
Date Nov. 2, 1995

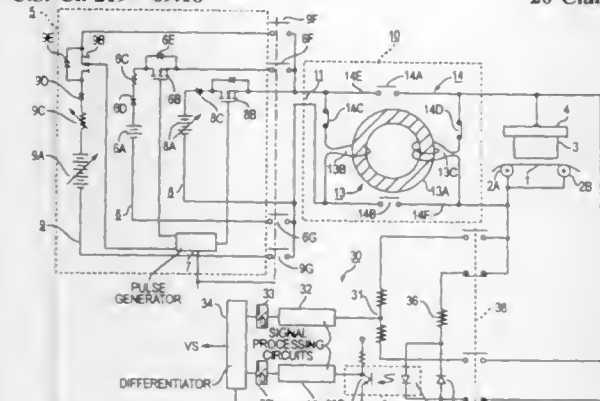
PCT Filed Apr. 26, 1995, Ser. No. 564,324

Claims priority, application Japan, Apr. 26, 1994, 6-124771

Int. Cl.<sup>6</sup> B23H 1/02

U.S. Cl. 219—69.18

20 Claims



16. A power supply system for an electric discharge machine having a machining gap formed between a tool electrode and a workpiece electrode, comprising:

- a first power circuit including a dc power source and a switching element, said first power circuit comprising a low resistance circuit;
- a dc to ac conversion device including a ring core, a primary winding and a secondary winding wound on said ring core, said primary winding being selectively connectable to said first power circuit, and said secondary winding being selectively connectable to said machining gap;
- a bypass path for bypassing said conversion device and connecting said first power circuit directly to said machining gap;
- a first switching device for selectively connecting said first power circuit to the machining gap either via the conversion device or the bypass path;
- a second power supply circuit including a series connected dc power source, a switching element and a current limiting resistance; and
- a second switching device for connecting said second power supply circuit into said power supply system when said first power supply circuit is connected to said machining gap via said conversion device.

**5,770,832**  
**METHOD FOR DETERMINING AND CONTROLLING THE COOLING RATE FOR METAL ALLOYS IN AN ELECTRICAL RESISTANCE WELDING PROCESS**

Robert W. Carnes; Michael W. Harville, both of Austin, and Paul W. Haase, Corpus Christi, all of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

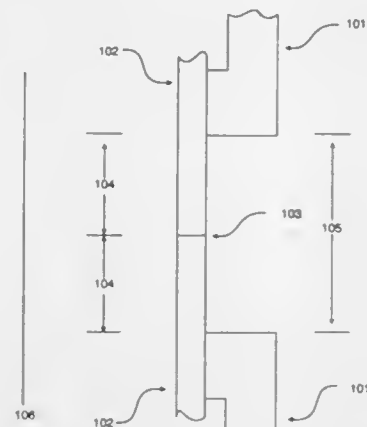
Continuation-in-part of Ser. No. 389,884, Feb. 15, 1995, abandoned. This application Feb. 15, 1996, Ser. No. 602,215

Int. Cl.<sup>6</sup> B23K 11/02

U.S. Cl. 219—109

18 Claims

1. A method for determining a cooling rate for metal alloy pipe in a homopolar pulse welding system, comprising:  
contacting the ends of a first pipe and a second pipe of a first pair of pipes to form a weld interface;  
mounting a first electrode on said first pipe and a second electrode on said second pipe;  
mounting at least one thermoelectric transducer on each pipe proximate said interface;



resistively heating said weld interface by discharging sufficient energy from a homopolar generator through said electrodes and said electrode gap to form a welded pipe segment; and measuring the temperature of said welded pipe segment as indicated by said transducers at periodic time intervals following such discharge to determine a cooling rate for said welded pipe segment.

**5,770,833**  
**LASER CUTTING METHOD INCLUDING PIERCING A WORK PIECE WITH A MOVING PROCESSING HEAD**  
Masaru Kanaoka; Tooru Murai, and Akira Urakawa, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

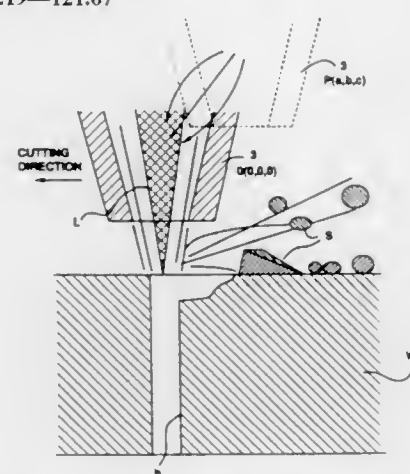
Filed Jan. 21, 1997, Ser. No. 786,418

Claims priority, application Japan, Jan. 30, 1996, 8-014225

Int. Cl.<sup>6</sup> B23K 26/14

U.S. Cl. 219—121.67

11 Claims



1. A laser processing method, comprising the steps of:

- (1) locating a processing head at a piercing starting position where a laser beam is focused at a focal point above a surface of a workpiece and offset from a point above a first point on the workpiece where the laser beam is to pierce the workpiece; and
- (2) conducting irradiation with the laser beam, and, simultaneously, moving said processing head from the piercing start position both in a direction parallel to the workpiece surface and, simultaneously in a direction perpendicular to the workpiece surface such that said focal point approaches said first point.

**5,770,834**  
**ROBOT CONTROL SYSTEM AND METHOD FOR TIG WELDING**

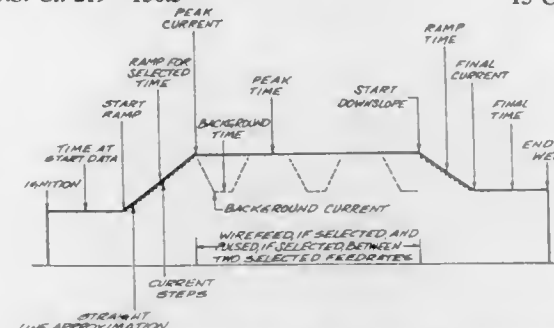
Patrick S. Davis, Fort Collins, and Steven G. Carey, Bellvue, both of Colo., assignors to ABB Flexible Automation, Inc., New Berlin, Wis.

Filed Aug. 14, 1996, Ser. No. 696,686

Int. Cl.<sup>6</sup> B23K 9/09

U.S. Cl. 219—130.5

13 Claims



1. A robotic system for use by an operator, the system comprising:

- a controller capable of accepting operator inputs and having means for storing a program and a program, the program containing a programmed path with a number of predetermined positions;
  - a robot coupled in data communication to the controller, the robot including a robot arm and a current-controlled tool mounted thereon, the robot for moving the current controlled tool along the programmed path; and
  - an electric current source coupled in data communication to the controller and capable of supplying an electric current to the current-controlled tool;
- the controller including
- means for controlling the electric current source, the means capable of ramping current supplied to the current-controlled tool in a step-wise fashion from an initial current level to an operator selected current level over an operator selected time;
  - means for controlling the speed of the current-controlled tool as it moves from one position to another along the programmed path;
  - means for controlling the total time the current-controlled tool is in motion while traveling along the programmed path; and
  - means for controlling the positional accuracy of the current-controlled tool with respect to the desired positions of the programmed path.

**5,770,835**  
**PROCESS AND APPARATUS AND PANEL HEATER FOR SOLDERING ELECTRONIC COMPONENTS TO PRINTED CIRCUIT BOARD**

Seiki Sakuyama; Hiroki Uchida, and Isao Watanabe, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 327,907, Oct. 24, 1994, Pat. No. 5,607,609. This application Jan. 7, 1997, Ser. No. 779,523

Claims priority, application Japan, Oct. 25, 1993, 5-265281; Oct. 26, 1993, 5-266690; Mar. 16, 1994, 6-045798; Jun. 17, 1994, 6-135926

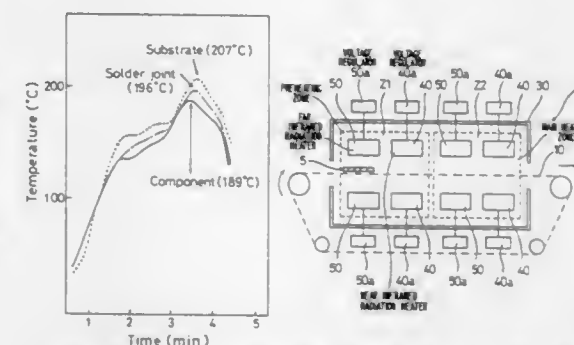
Int. Cl.<sup>6</sup> F27B 9/06; F27D 11/02; H05B 3/20

U.S. Cl. 219—388

17 Claims

1. A soldering apparatus for soldering an electronic component to a printed circuit board by heating the printed circuit board having the electronic component mounted thereon, the apparatus comprising:

- a preheating zone; and
- a reflow zone located downstream from the preheating zone, and the preheating zone having first and second heaters, the first heater adapted to emit far-infrared energy which primarily



heats the printed circuit board and the second heater adapted to emit near-infrared energy which primarily heats the electronic component.

**5,770,836**  
**RESETTABLE SAFETY CIRCUIT FOR PTC ELECTRIC BLANKETS AND THE LIKE**

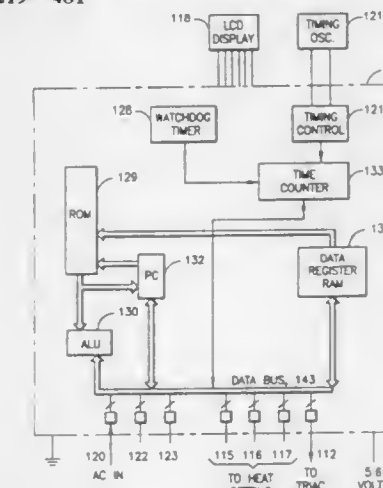
John Weiss, Mount Sinai, N.Y., assignor to Micro Weiss Electronics, West Babylon, N.Y.

Filed Nov. 8, 1996, Ser. No. 745,884

Int. Cl.<sup>6</sup> H05B 1/02

U.S. Cl. 219—481

35 Claims



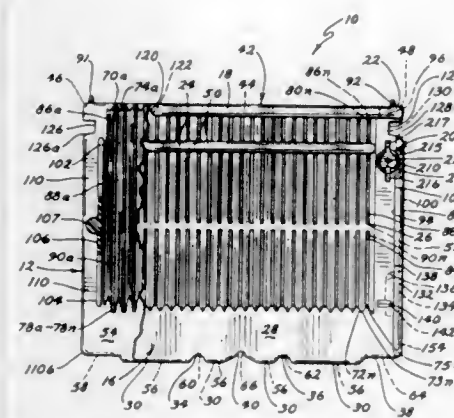
1. A safety-assuring control device for an electric alternating current appliance which includes a heater having first and second heater feed conductors, said first heater feed conductor being connected to a protective fuse and connectable therethrough to an ungrounded pole of a source of electric alternating current and said second heater feed conductor being connected to an electrically controllable heater switch and connectable therethrough to a grounded pole of said source of electric alternating current, said first and second heater feed conductors, at respective ends remote from said fuse and from said heater switch, being respectively connected to primary and secondary safety link return conductors which lead towards respective connections thereof in said control device, said primary safety link conductor being connected with said secondary safety link conductor, said control device comprising:

- an integrated circuit microcontroller unit including:  
a first safety circuit input,  
a second safety circuit input, and  
an output connected to a control input of said electrically controlled heater switch;
- a safety circuit including:  
at least one gas discharge current breakdown element connected between said primary safety link return conductor and said first safety circuit input, and producing:  
a voltage drop when said at least one gas discharge current breakdown element conducts so as to produce, at said first safety input, a voltage clamped at a steady potential



# UMI

1. In a cassette for storing, transporting and processing a plurality of wafers or disks, said cassette having a pair of opposing sides



a front end, and a rear end, said cassette defining an interior region and having a plurality of spaced-apart dividers to receive said plurality of wafers or disks disposed within said interior region, at least one of said pair of opposing sides, said front end, or said rear end of said cassette defining an outer wall having an exterior surface, said cassette being used with a tracking member which permits the location of said cassette and said plurality of wafers or disks contained therein to be remotely monitored and tracked as said cassette traverses through a processing environment between a plurality of stations, said processing environment including a plurality of generally upright planar surfaces past which said cassette traverses, said tracking member being selectively mounted on said cassette and having a face oriented generally away from said interior region of said cassette when said tracking member is mounted on said cassette, the improvement comprising:

a recess defined by the exterior surface of the outer wall for receiving the tracking member therein, said recess having a peripheral edge and a side wall, the tracking member being received within said recess such that the face of the tracking member is at least substantially flush with said peripheral edge of said recess and oriented away from the interior region of the cassette, said tracking member being frictionally engaged and retained within said recess by frictional contact between said tracking member and said side wall of said recess, whereby the face of the tracking member will not readily contact any of the plurality of planar surfaces and be damaged by such contact.

5,770,843

## ACCESS CARD FOR MULTIPLE ACCOUNTS

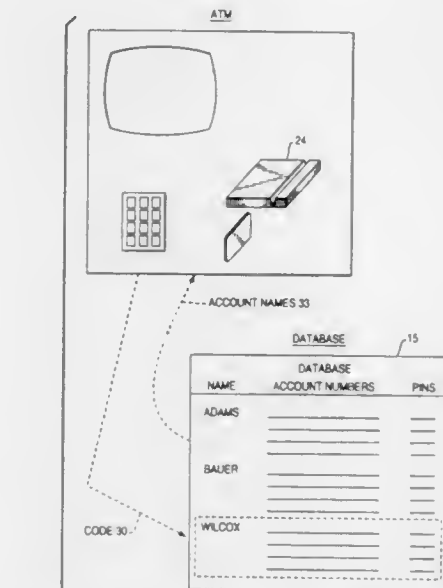
Manning I. Rose, Kettering, and Lee W. Hoevel, Dayton, both of Ohio, assignors to NCR Corporation, Dayton, Ohio  
Filed Jul. 2, 1996, Ser. No. 674,557

Int. Cl. G06K 5/00

U.S. Cl. 235—380

9 Claims

1. In a self-service kiosk, the improvement comprising:
  - a) code-accepting means for accepting a code from a user;
  - b) means for
    - i) contacting a remote database, and
    - ii) retrieving a plurality of account numbers from said database which are associated with said codes
    - iii) retrieving a Personal Identification Number, PIN, for each account number;
    - iv) presenting said account numbers to the user;
    - v) prompting the user to select an account number;
    - vi) prompting the user to enter a PIN for the selected account number; and
    - vii) if the PIN entered matches that associated with the selected account number, transmitting the selected account



number to a system which is different from said remote database.

5,770,844

## SUPERVISION OF TRANSACTIONS WITH CHIP CARDS

Horst Ilenn, Boeblingen, Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

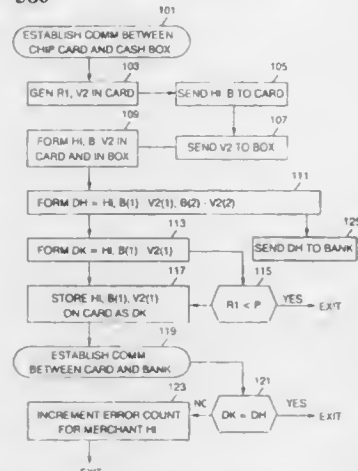
Filed Oct. 25, 1996, Ser. No. 736,888

Claims priority, application Germany, Oct. 26, 1995, 195 39 801.7

Int. Cl. G06K 5/00

U.S. Cl. 235—380

13 Claims



1. Method for supervising a transaction between a transaction provider and a transaction receiver, using a chip card comprising the steps of:

providing a connection between the transaction provider and the transaction receiver, the connection including the chip card communicating with a chip card transceiver;

performing the transaction wherein a transaction identifier is generated to identify the transaction;

storing the transaction identifier in the chip card;

transmitting a transaction receiver data record, comprising the transaction identifier to a third party for completion of the transaction; and

transmitting a transaction provider data record, comprising the transaction identifier to the third party for audit of the transaction.

5,770,845

## METHOD OF BILLING FOR PARKING FACILITIES BY MEANS OF PAY METERS

Torbernt Hjelmvik, Järfälla, Sweden, assignor to Modul-System Sweden AB, Järfälla, Sweden

PCT No. PCT/SE95/00317, § 371 Date Sep. 25, 1996, § 102(e) Date Sep. 25, 1996, PCT Pub. No. WO95/27269, PCT Pub. Date Oct. 12, 1995

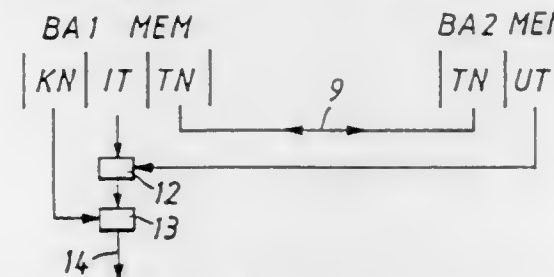
PCT Filed Mar. 24, 1995, Ser. No. 704,759

Claims priority, application Sweden, Mar. 31, 1994, 9401104

Int. Cl. G06F 7/08; 17/00; G06K 15/00

U.S. Cl. 235—382

11 Claims



1. A method of cash card billing with the aid of meters when parking a vehicle, said method comprising the step of:

a. providing a meter system which includes a plurality of meters, each constituting an independent operative unit, wherein the meters each include a cash card reader;

b. inserting into the cash card reader of a first meter a cash card including at least a cash card account number;

c. issuing a from the first meter at the commencement of a parking period a parking ticket subsequent to reading the cash card, said parking ticket including a meter-readable transaction number;

d. storing in the first meter the cash card account number and a parking commencement time, and a first transaction number as a first transaction in a memory associated with the first meter, wherein the first transaction number is unique at least for a given predetermined time period;

e. at the end of a parking period, inserting the parking ticket in a second meter which may be any chosen meter in the meter system, including the first meter;

f. reading in the second meter the parking ticket first transaction number;

g. storing in a memory associated with the second meter the first transaction number read from the parking ticket together with the time at which the ticket was read to provide a parking termination time and a second transaction having a second transaction number;

h. transferring information contained in the memories associated with the first meter and the second meter to a memory of a central computer;

i. combining in the central computer the respective transactions of the first and the second meters with the aid of the transaction numbers; and

j. charging the cash card account number with a parking cost based on the vehicle parking commencement time and the parking termination time.

5,770,846

## METHOD AND APPARATUS FOR SECURING AND AUTHENTICATING ENCODED DATA AND DOCUMENTS CONTAINING SUCH DATA

Robert Mos, 2637 Mission Blvd.; Clay Von Mueller, 804 Anacapa Ct., and Denise Jefferys, 2637 Mission Blvd., all of San Diego, Calif. 92109

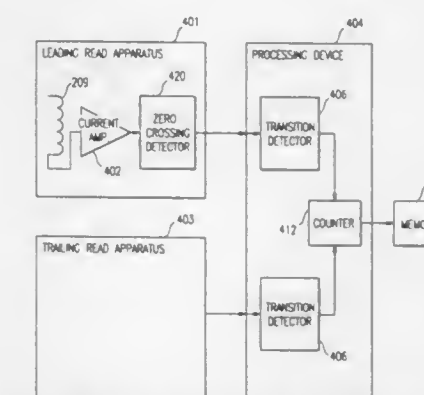
Filed Feb. 15, 1996, Ser. No. 602,214

Int. Cl. G06K 7/00

U.S. Cl. 1235—440

26 Claims

1. A method for determining the distance between a first point and a second point on a storage medium, the first and second points being detectable by a leading and trailing read apparatus as



the first and second points move past the leading and trailing read apparatus, the leading and trailing read apparatus being spaced apart a known distance, the method comprising the steps of:

- (a) detecting the first point as the first point moves past the leading read apparatus;
- (b) detecting the second point as the second point moves past the leading read apparatus;
- (c) detecting the first point as the first point moves past the trailing read apparatus;
- (d) measuring a jitter Value starting from the detection of the first point at the leading read apparatus and ending upon detection of the second point at the leading read apparatus; and
- (e) measuring a Reference Value starting from the detection of the first point at the leading read apparatus and ending upon detection of the first point at the trailing read apparatus.

5,770,847

## BAR CODE READER WITH MULTI-FOCUS LENS

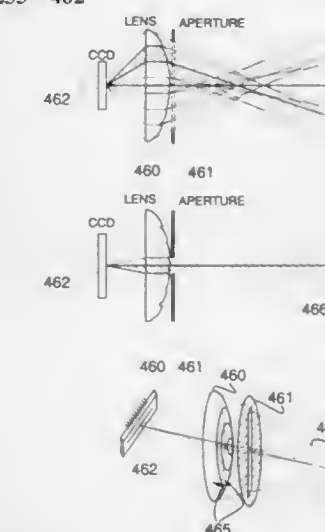
Bryan Olmstead, Eugene, Oreg., assignor to Spectra-Physics Scanning Systems, Inc., Eugene, Oreg.

Filed Dec. 23, 1994, Ser. No. 363,258

Int. Cl. G06K 7/10

U.S. Cl. 235—462

18 Claims



1. A bar code reader comprising:

a light sensitive detector;

a lens having a plurality of zones, at least two or said zones having different focal distances and at least partially overlapping depths of field, such that each zone simultaneously focuses light reflected from a target to be read onto said light sensitive detector;

means for reducing, interference between said zones, said means comprising a compound aperture positioned between said lens and said target;



a signal output from said light sensitive detector containing information corresponding to relatively light portions and darker portions of said target; and  
a decoder coupled to said light sensitive detector.

5,770,848

# APPARATUS AND METHOD FOR TREATING A COMMODITY BY AUTOMATICALLY RECOGNIZING A BARCODE ATTACHED TO A CONVEYED COMMODITY BY SCANNER

Junichi Oizumi; Ryoko Sato; Ikuro Takeuchi, all of Ibaraki-ken; Kousuke Noda, Tsuchiura; Yutaka Nagasawa, Chiba-ken; Noriaki Hagiwara, Owariasahi; Mitsunari Kano, Seto; Shunichi Oohara, Ibaraki-ken; Masao Okayama, Ryugasaki, and Yukio Akimoto, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

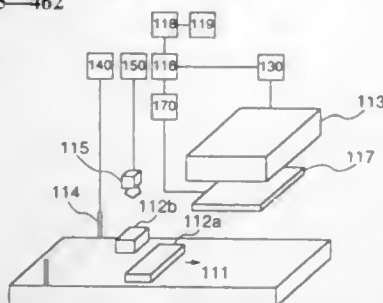
Filed Nov. 28, 1995, Ser. No. 563,330

Claims priority, application Japan, Nov. 28, 1994, 6-292566; Dec. 22, 1994, 6-319863; Feb. 9, 1995, 7-021676

Int. Cl.<sup>6</sup> B06K 7/10

U.S. Cl. 235—462

25 Claims



1. An automatic barcode recognizing apparatus including conveying means having a conveying passage on which an article to which a barcode is attached is conveyed and barcode reading means for recognizing the barcode of the article being conveyed by being placed on the conveying passage, comprising:

article detecting means for detecting that said article is placed on said conveying passage;

height detecting means for detecting the height of said article on said conveying passage;

conveying state detecting means for detecting the position of said article on said conveying passage in the width direction of said conveying passage;

arithmetic operation means for calculating the upper surface center of said article, the distance from said barcode reading means to the upper surface center of said article, the side surface centers of said article and the distances from said barcode reading means to the side surface centers of said article, based on the result of detection of said height detecting means and said conveying state detecting means; and

focal position adjusting means for focusing the focal position of said barcode reading means on the upper surface center of said article and the side surface centers of said article, based on the result of calculation of said arithmetic operation means.

5,770,849

# SMART CARD DEVICE WITH PAGER AND VISUAL IMAGE DISPLAY

Scott R. Novis, Tempe; William E. Carns, Forest Lakes, and Karen E. Jachimowicz, Laveen, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

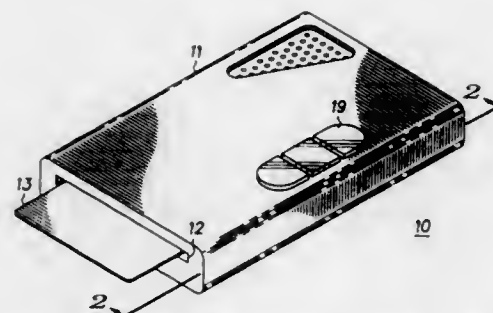
Filed Aug. 23, 1996, Ser. No. 702,087

Int. Cl.<sup>6</sup> G06K 14/067

U.S. Cl. 235—492

25 Claims

1. A portable smart card device comprising:  
a portable housing including a viewing aperture;  
a visual image display mounted in the portable housing and positioned to provide an image for viewing at the viewing



aperture, the visual image display including a data input terminal designed to receive image data thereon;

sensor structure mounted in the portable housing and constructed to have a smart card having data stored thereon positioned adjacent thereto in data sensing juxtaposition, the sensor structure including an input terminal and an output terminal for reading and writing data to the smart card;

electronics mounted in the portable housing and connected to the input terminal and the output terminal of the sensor structure for receiving, processing and transmitting data between a host database and the smart card device and further connected to the input terminal of the visual image display for supplying image data thereto in response to the data; and

a transceiver mounted in the portable housing and connected to the electronics for receiving and transmitting data between the electronics of the portable smart card device and the host database.

5,770,850

# SENSOR ARRAY TRACKING AND DETECTION SYSTEM HAVING AN ALIGNMENT POSITIONER

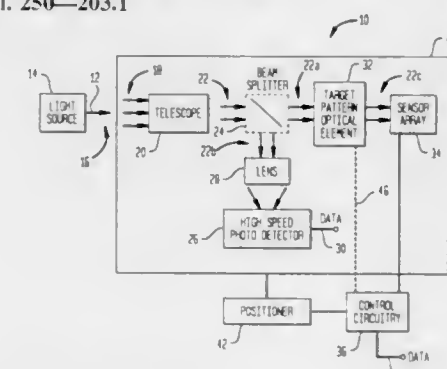
Donald John Bowen, Madison; Gregory M. Durant, Plainfield, and Christopher L. Rutledge, Somerset, all of N.J., assignors to AT&T Corp., Middletown, N.J.

Filed Apr. 30, 1997, Ser. No. 846,937

Int. Cl.<sup>6</sup> G01J 1/20

U.S. Cl. 250—203.1

30 Claims



1. A system for use in tracking and receiving data from an incoming free-space optical communications beam which is collimated and split into a tracking beam and a data beam and in which at least part of the system is positioned relative to the incoming beam by a positioner to maintain alignment with the incoming beam, the system comprising:

a photodetector for receiving data from the data beam;

two-dimensional sensor array having a plurality of rows and columns of pixels;

a target pattern optical element for receiving the tracking beam and creating a corresponding target pattern on the sensor array; and

control circuitry for receiving pixel information from the sensor array and generating corresponding vertical and horizontal alignment information for the positioner so that the positioner maintains alignment with said incoming beam.

5,770,851

# COMPACT OPTICAL LOGIC OPERATOR ARRAY

Hyo-Hoon Park, Daejeon; Kwang-Joon Kim, Yusong-ku; Kyung-Sook Hyun, Daejeon; O-Kyun Kwon, Daejeon; Seok-Ho Song, Daejeon; Byung-Su Yoo, Daejeon, and Hye-Yong Chu, Daejeon, all of Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

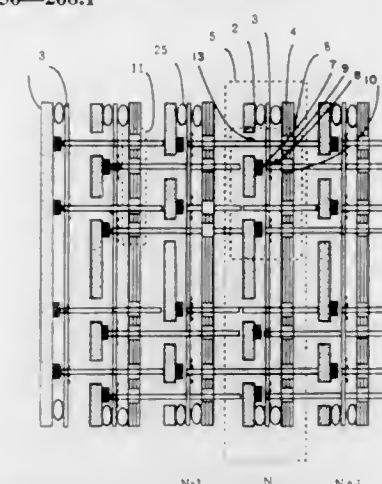
Filed Sep. 13, 1996, Ser. No. 713,535

Claims priority, application Rep. of Korea, Dec. 7, 1995, 95-47435; Dec. 18, 1995, 95-51484

Int. Cl.<sup>6</sup> H01J 40/14

U.S. Cl. 250—208.1

14 Claims



1. A parallel optical logic array comprising:  
a plurality of unit chips each unit chip including:

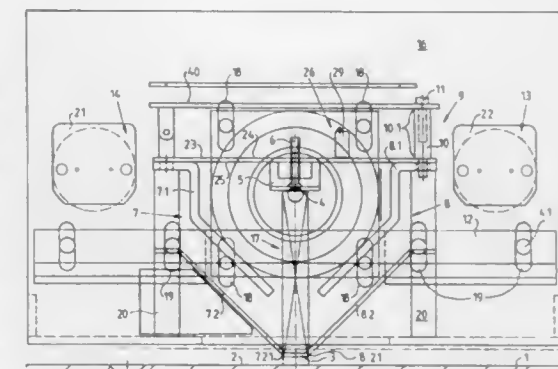
a laser array for generating predetermined light signals in accordance with input electrical signals for a logic process;

a laser array substrate on which said laser array is mounted and in which via holes are formed for passing through light signals input from an adjacent unit chip;

a microlens array (a) for forming light beams respectively emitted from laser devices of the laser array into parallel light beams and (b) for passing light beams coming from another unit chip through said via holes onto optical windows of an adjacent optical logic circuit;

said adjacent optical logic circuit array including an S-SEED for performing a logic function by transmission of a light signal through an optical input window of an S-SEED circuit and for providing logical output data in an optical output window of an S-SEED circuit;

wherein a plurality of said unit chips are laminated together in successive adjacent disposition so that light emitted by a laser device of one of the unit chips passes through an aligned optical output window of an optical logic circuit in unit chip and can be made incident to input data on an aligned optical output window of an optical logic circuit in another unit chip through one of its via holes.



first and second adjustably mounted light funnels forming an aperture therebetween for receiving light reflected from a printing plate, the aperture having a width and length which is smaller than a width and length of the sensing strip.

5,770,853

# PULSE GENERATOR AND PULSE GENERATION METHOD HAVING MAXIMIZED PULSE HEIGHT

Takeshi Konno, and Hitoshi Ujile, both of Tokyo, Japan, assignors to Advantest Corporation, Tokyo, Japan

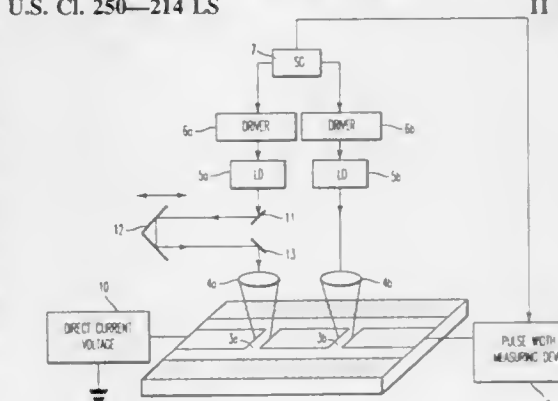
Filed Nov. 18, 1996, Ser. No. 746,841

Claims priority, application Japan, Nov. 20, 1995, 7-301552

Int. Cl.<sup>6</sup> H01J 40/14

U.S. Cl. 250—214 LS

11 Claims



1. A pulse generator comprising:

an electrical pulse generation means that is provided with a photoconductor in which first to third transmission lines made up of conductive film are formed on a semi-insulating substrate and said transmission lines are separated by first and second narrow gaps, and that generates short electrical pulses on said first to third transmission lines in accordance with short optical pulses irradiated upon each narrow gap;

short optical pulse irradiation means that is provided with a semiconductor laser and that irradiates short optical pulses upon said first and second narrow gaps; and

delay means that gives a delay to short optical pulses irradiated upon one of said first and second narrow gaps such that pulse height of short electrical pulses generated on said first to third transmission lines is maximized.

5,770,852

# PLATE SCANNING DEVICE HAVING LIGHT FUNNELS WITH AN ADJUSTABLE APERTURE

Michael R. Rancourt, Merrimack, and Gerald J. Drew, New Durham, both of N.H., assignors to Heidelberg Druckmaschinen AG, Heidelberg, Germany, and Heidelberg Haris, Inc., Dover, N.H.

Filed Aug. 29, 1996, Ser. No. 705,437

Int. Cl.<sup>6</sup> H01J 40/14

U.S. Cl. 250—208.2

16 Claims

1. A plate scanning device, comprising  
a longitudinally extending continuous sensing strip;  
at least one light source extending substantially parallel to the sensing strip;

5,770,854

**PATTERN-RECOGNITION COMPUTING AND METHOD FOR PRODUCING SAME**

John N. Hait, Missoula, Mont., assignor to Rocky Mountain Research Center, Missoula, Mont.

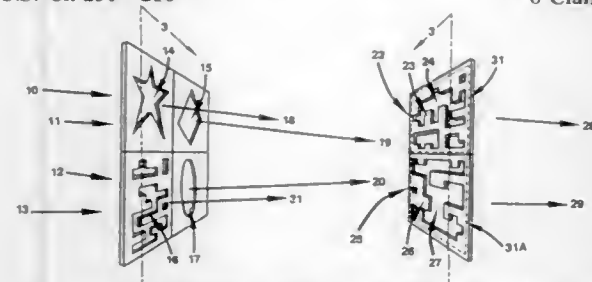
Continuation-in-part of Ser. No. 357,460, Dec. 16, 1994, Pat. No. 5,623,366, and a continuation-in-part of Ser. No. 454,070, May 30, 1995, Pat. No. 5,617,249, which is a continuation-in-part of Ser. No. 357,460, Dec. 16, 1994, Pat. No. 5,623,366.

This application Sep. 19, 1995, Ser. No. 532,329

Int. Cl.<sup>6</sup> G06G 7/00; G06E 1/04

U.S. Cl. 250—216

8 Claims



1. A method of pattern-recognition computing using wave-type energy comprising the following steps:

producing a first input wavefront of at least one wavelength having a first pattern modulated with first quantized information resulting in a first set of modulation states;

producing at least one other input wavefront of said at least one wavelength having at least one other pattern modulated with other quantized information resulting in at least one other set of modulation states, said at least one other set of modulation states having a computing relationship with said first set of modulation states;

combining said first input wavefront and said at least one other input wavefront to produce at least one dynamic image having a set of patterns having component parts, and separating energy from a subset of said component parts that constitutes a computational result to produce at least one output,

thereby providing a method of pattern-recognition computing.

5,770,855

**MICROSCOPIC ELECTROMAGNETIC RADIATION TRANSMITTER OR DETECTOR**Ulrich Fischer, Althausweg 103, D-48159 Münster, Germany  
PCT No. PCT/EP95/03491, § 371 Date May 7, 1996, § 102(e)  
Date May 7, 1996, PCT Pub. No. WO96/07946, PCT Pub. Date Mar. 14, 1996

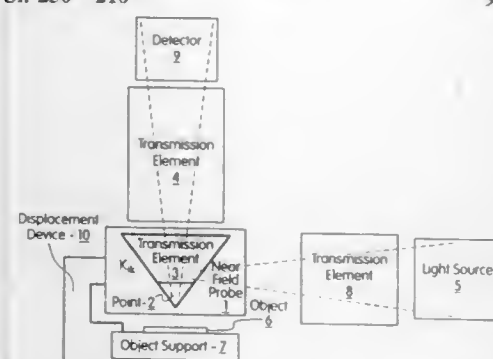
PCT Filed Sep. 5, 1995, Ser. No. 640,942

Claims priority, application Germany, Sep. 9, 1994, 94 14 582 U

Int. Cl.<sup>6</sup> H01J 3/14

U.S. Cl. 250—216

9 Claims



1. Microscopic transmitter or detector of electromagnetic radiation, which is near-field probe, comprising a body K having the form of a polyhedron point and comprising a material at least partially permeable to electromagnetic

radiation in the spectral range used, whereby the polyhedron point is delimited by an imaginary base surface  $P_0$  and continued beyond a substantial part of the body K to form a total body of the probe not defined in greater detail, and has "n" side surfaces  $P_j$  ( $j=1, \dots, n$ ), in a way such that sharp edges  $K_{ik}$  are formed between adjacent side surfaces  $P_j$  and  $P_k$ , such edges leading to an acute point;

said acute point of the near-field probe serves as an almost point-like source for the emission of electromagnetic radiation into the external space of the probe, or as an almost point-like receiver for the penetration of electromagnetic fields into the interior of the near-field probe;

at least two side surfaces  $P_j$  ( $j=1, \dots, n$ ) of the body K of the polyhedron probe are coated with thin electrically conductive layers partially absorbing the electromagnetic radiation in the spectral range used, said layers selected from the group consisting of aluminum, gold and silver and having a thickness of less than 0.2  $\mu\text{m}$ ; and

the most frontal part of the polyhedron point is coated with the material used.

5,770,856

**NEAR FIELD SENSOR WITH CANTILEVER AND TIP CONTAINING OPTICAL PATH FOR AN EVANESCENT WAVE**

Jean Pierre Fillard, Saint Gely Du Fesc; Michel Castagné, Clapiers, and Jacques Bonnafé, Montpellier, all of France, assignors to British Technology Group Ltd, London, England

PCT No. PCT/GB94/01586, § 371 Date Feb. 23, 1996, § 102(e)  
Date Feb. 23, 1996, PCT Pub. No. WO95/03561, PCT Pub. Date Feb. 2, 1995

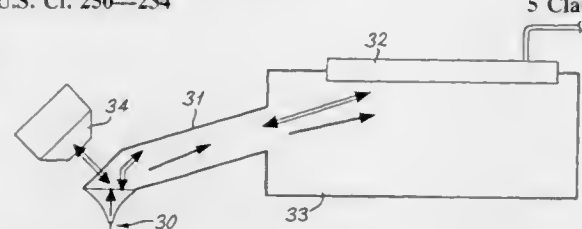
PCT Filed Jul. 22, 1994, Ser. No. 583,051

Claims priority, application European Pat. Off., Jul. 22, 1993, 93305786

Int. Cl.<sup>6</sup> H01J 3/14

U.S. Cl. 250—234

5 Claims



1. An optical sensor comprising:

a light source of a predetermined wavelength;

a probe having a tip, said tip having dimensions which are small with respect to said predetermined wavelength for capturing light from the light source from a surface of interest in the near field region of said tip, and said tip having walls for guiding the captured light;

a cantilever supporting said probe;

a first detector integrated on a substrate, said first detector being arranged to receive the light guided by a first wall of said tip in the direction of said first wall, and an external connection receiving light by a second wall of said tip in the direction of said second wall.

5,770,857

**APPARATUS AND METHOD OF DETERMINING MOLECULAR WEIGHT OF LARGE MOLECULES**

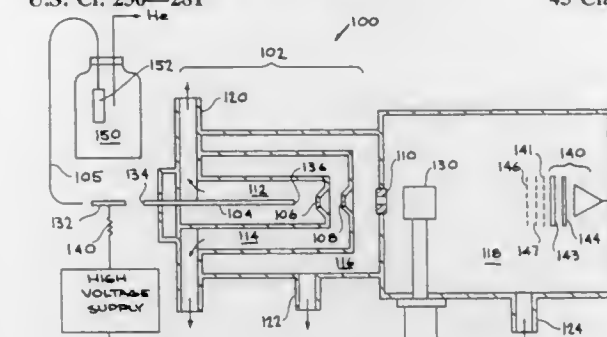
Stephen Fuerstenau, Montrose; W. Henry Benner, Danville; Norman Madden, Livermore, and William Searles, Fremont, all of Calif., assignors to The Regents, University of California, Oakland, Calif.

Filed Nov. 15, 1996, Ser. No. 749,837

Int. Cl.<sup>6</sup> H01J 37/244

U.S. Cl. 250—281

43 Claims



1. A mass spectrometer system for detecting the mass of large molecules comprising:

a) an electrospray ion source that generates an ion beam;

b) an electrically conducting tube having two ends, the tube located in the ion beam path and having a long axis parallel to the flight path of ions in the ion beam;

c) an rf shield comprising an electrical conductor surrounding the tube and having a movable conducting end cap on each end, the caps having openings at their centers, the shield additionally having an opening for an electrical connection inside a support structure;

d) a circuit to calibrate an electrical image charge signal; and

e) an FET located inside the support structure and electrically connected to the tube, the electrical connection located centrally within the shield opening at the support.

5,770,858

**MICROCHANNEL PLATE-BASED DETECTOR FOR TIME-OF-FLIGHT MASS SPECTROMETER**

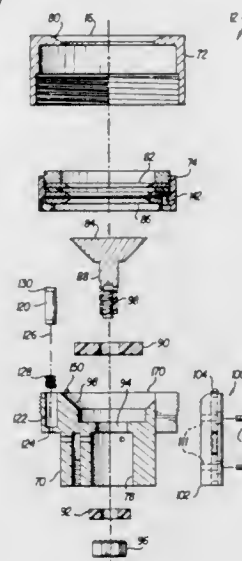
Wolfram B. Fuchs, Brimfield; Bruce N. Laprade, Holland, both of Mass., and Brian A. Lincoln, Woodstock, Conn., assignors to Galileo Corporation, Sturbridge, Mass.

Filed Feb. 28, 1997, Ser. No. 810,228

Int. Cl.<sup>6</sup> H01J 49/40

U.S. Cl. 250—287

20 Claims



1. A detector assembly for a time-of-flight (TOF) mass spectrometer comprising:

a vacuum flange;

a modular detector having an input end for receiving particles adapted to be secured to the flange;

a replaceable cartridge including a MCP disposed within said detector;

high voltage connection means supported within said detector for connection to a first side of the MCP;

voltage dividing means supported within said detector; and an anode secured in confronting relation with a second side of the MCP.

5,770,859

**TIME OF FLIGHT MASS SPECTROMETER HAVING MICROCHANNEL PLATE AND MODIFIED DYNODE FOR IMPROVED SENSITIVITY**

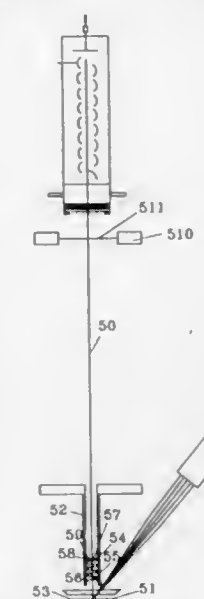
Jacek Bielawski, Saltsjöbaden, Sweden, assignor to The Perkin-Elmer Corporation, Foster City, Calif.

Filed Jul. 25, 1994, Ser. No. 280,261

Int. Cl.<sup>6</sup> B01D 59/44; H01J 49/00

U.S. Cl. 250—287

9 Claims



1. A time of flight mass spectrometer comprising:

a target;

an energy source for directing pulses of energy onto said target to eject ions from said target;

a dynode detector, positioned to receive said ions and having a plurality of dynode plates placed to sequentially amplify a charge pulse produced in response to one of said ions;

a set of Q capacitors, each of which is connected to a uniquely associated one of a set of Q of said dynode plates that are at an output end of said dynode detector, whereby these Q capacitors each functions as a charge reservoir for providing a high current pulse to the dynode plate to which it is connected to enhance an amount of signal amplification needed by such dynode plates which require relatively large amounts of charge for optimal amplification of said charge pulse; and

a timer that is responsive to emission of an ion from said target and that is responsive to reception of this ion by said dynode detector, to measure a time of flight of this ion from said target to said detector.



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5,770,860

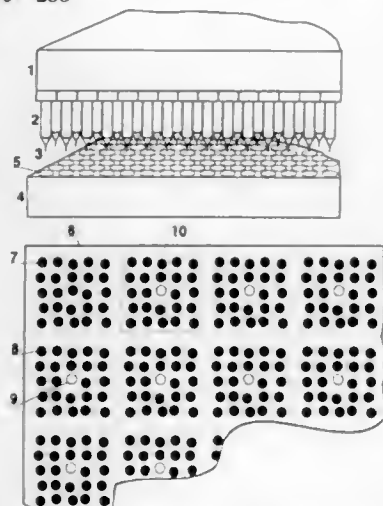
**METHOD FOR LOADING SAMPLE SUPPORTS FOR MASS SPECTROMETERS**Jochen Franzen, Helmer 17, D-28359 Bremen, Germany  
Filed Jul. 10, 1997, Ser. No. 891,362

Claims priority, application Germany, Jul. 12, 1996, 196 28 178,4

Int. Cl.<sup>6</sup> H01J 49/00

U.S. Cl. 250—288

15 Claims



1. Method for rapidly loading of a large number of solved samples for mass spectrometric analysis from microtiter plates onto a sample support plate, comprising the steps

- (a) using a sample support plate in the size of a microtiter plate, and
- (b) transferring amounts of sample solution from microtiter plate wells to the sample support plate simultaneously for a large subset of the samples of the microtiter plate, using a multiple pipette.

5,770,861

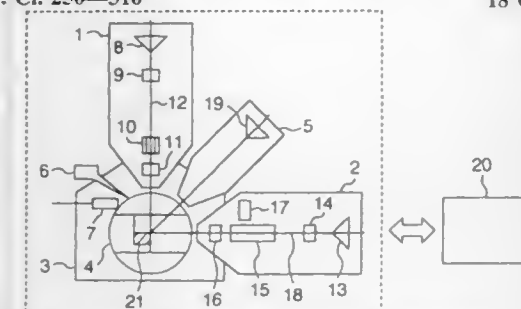
**APPARATUS FOR WORKING A SPECIMEN**Hiroshi Hirose, Hitachinaka, and Setsuo Nomura, Tokyo., both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed Oct. 18, 1996, Ser. No. 733,839

Claims priority, application Japan, Oct. 20, 1995, 7-272287

Int. Cl.<sup>6</sup> H01J 37/26

U.S. Cl. 250—310

18 Claims



1. An apparatus for working a specimen comprising:

an energy beam optical system for etching said specimen;

a charged particle optical system for irradiating said specimen with a charged particle beam;

a control system for setting optical conditions for the charged particle optical system;

a display device for displaying a specimen image based on charged particles generated due to the irradiation of said specimen with said charged particle beam; and

wherein said control system includes means for specifying an interval between specimens displayed on said display device based on said optical conditions.

5,770,862

**CHARGED PARTICLE EXPOSURE APPARATUS, AND A CHARGED PARTICLE EXPOSURE METHOD**

Yoshihisa Ooah; Tomohiko Abe, and Hiroshi Yasuda, all of Kawasaki, Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

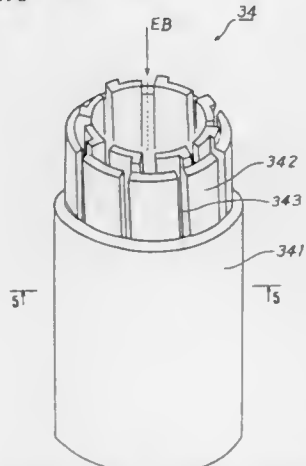
Filed Dec. 4, 1996, Ser. No. 758,824

Claims priority, application Japan, Apr. 26, 1996, 8-107384

Int. Cl.<sup>6</sup> H01J 37/147

U.S. Cl. 250—398

5 Claims



1. A charged particle beam exposure apparatus, deflecting a charged particle beam formed into a predetermined shape by being passed through a predetermined transmission mask, and irradiating a predetermined location on the surface of a sample with the charged particle beam, comprising:

- a barrel through which the charged particle beam is passed; and
- an electrostatic deflector, provided in the barrel, for deflecting the charged particle beam, the electrostatic deflector having a plurality of pairs of electrodes, which are made of a conductive material having carbon as a primary element and are embedded in an internal face of an insulating cylinder.

5,770,863

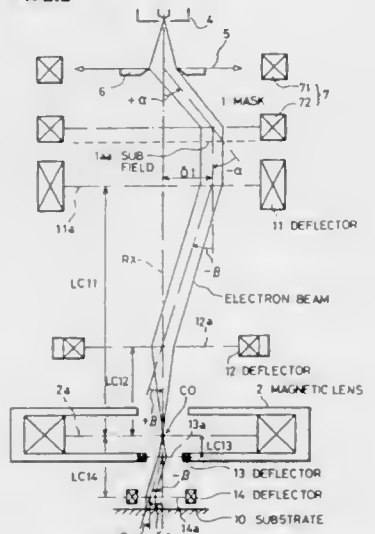
**CHARGED PARTICLE BEAM PROJECTION APPARATUS**Mamoru Nakasuji, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan  
Filed Oct. 24, 1996, Ser. No. 736,239

Claims priority, application Japan, Oct. 24, 1995, 7-275698; Nov. 1, 1995, 7-285117; Nov. 2, 1995, 7-285524

Int. Cl.<sup>6</sup> H01J 37/00

U.S. Cl. 250—492.2

21 Claims



1. A charged particle beam projection apparatus that projects a pattern in each of a plurality of sub fields into which a main field is

partitioned onto a substrate and forms an image of a charged particle beam on the substrate sequentially projecting a pattern included in each of the sub fields, comprising:

- a mask that partitions said main field into a plurality of sub fields;
- a projection lens disposed on an image side of said mask in a path of said charged particle beam;
- a first deflection device provided at a stage preceding said projection lens or in said projection lens that deflects said charged particle beam after said charged particle beam has passed through the sub field so that said charged particle beam advances along a center of said projection lens; and
- a second deflection device that deflects said charged particle beam after said charged particle beam has passed through said projection lens to induce said charged particle beam to a position on the substrate that corresponds to a position in the sub field on the mask.

5,770,864

**APPARATUS AND METHOD FOR DIMENSIONAL WEIGHING UTILIZING A LASER SCANNER OR SENSOR**

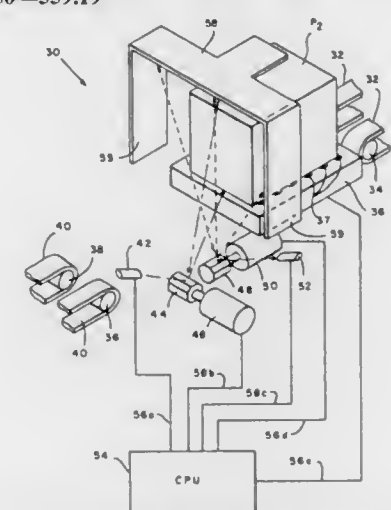
Daniel F. Dlugos, Shelton, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Dec. 31, 1996, Ser. No. 775,850

Int. Cl.<sup>6</sup> G01N 21/86

U.S. Cl. 250—559.19

19 Claims



1. A method of utilizing an emitter/scanner device for measuring the dimensions of a parcel for use in a parcel processing application of a data processing device, and comprising the steps of:

- (a) placing a parcel on a flat surface in a field of measurement; wherein said laser scanner/emitter is positioned either above or below said parcel; and said laser scanner/emitter is further positioned behind said parcel;
- (b) rotating said laser scanner/emitter so as to locate the lead and trail edges of said parcel;
- (c) calculating a length of said parcel by calculating the distance from said lead edge to said trail edge;
- (d) rotating said laser scanner/emitter so as to locate a left side and a right side of said parcel;
- (e) calculating a width of said parcel by calculating the distance from said left side to said right side;
- (f) rotating said laser scanner/emitter so as to locate a top edge and a bottom edge of said parcel; and
- (g) calculating a height of said parcel by measuring the distance from said top edge to said bottom edge; and
- (h) applying said length, said width, and said height of said parcel to a predetermined list of values in a data table so as to determine a shipment value for said parcel based upon said application.

5,770,865

**APPARATUS AND METHOD FOR SENSING A FULL LEVEL CONDITION FOR A LARGE BASKET RECEPTACLE OR THE LIKE**

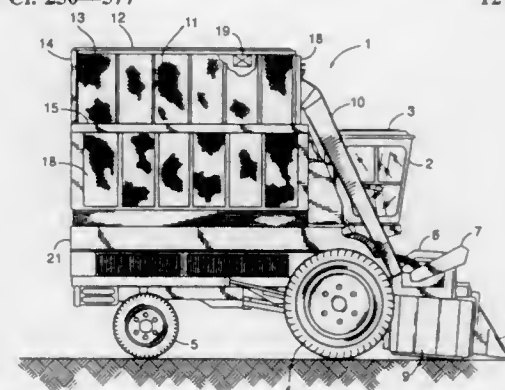
Ronald W. Steffen, Springfield, and John S. Galman, Chatham, both of Ill., assignors to Dickey-john Corporation, Auburn, Ill.

Filed Mar. 21, 1997, Ser. No. 822,230

Int. Cl.<sup>6</sup> G01N 15/06

U.S. Cl. 250—577

12 Claims



1. A sensing apparatus for sensing when a basket for receiving material has been filled to a predetermined level comprising:

- a signal generator capable of generating a reference signal which oscillates at a preselected frequency;
- a plurality of energy emitters mounted to the basket, said emitters receiving said reference signal and emitting energy at said preselected frequency, said energy directed along a plurality of paths;
- a plurality of energy receivers spaced apart from the emitters along said paths and mounted to the basket such that the receivers receive a portion of said emitted energy if the basket has not been filled with material beyond the predetermined level, said receivers producing a receiver output signal representative of the energy received; and
- a first circuit which compares the receiver output signal with the reference signal and produces a status signal indicating whether the receiver output signal does not correspond to the reference signal.

5,770,866

**RESONANT TUNNELING ELECTRONIC DEVICE**

Gyung-Ock Kim, Yusong-ku; Dong-Wan Roh, Seo-ku, and Seung-Won Paek, Chungju, all of Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

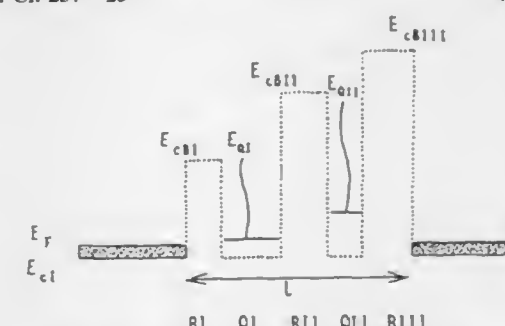
Filed Oct. 25, 1996, Ser. No. 736,213

Claims priority, application Rep. of Korea, Dec. 21, 1995, 1995-53647

Int. Cl.<sup>6</sup> H01L 29/06; 29/15; 29/88

U.S. Cl. 257—25

4 Claims



1. A resonant tunneling electronic device, comprising:

a plurality of nearly decoupled quantum barrier layers; and





- a first semiconductor layer of the first conductive type formed over a portion of said semiconductor substrate, said first semiconductor layer used in said photodiode side only;
- a second semiconductor layer of the first conductive type formed over both said first semiconductor layer and said semiconductor substrate;
- a third semiconductor layer of a second conductive type formed over a portion of said second semiconductor layer on said bipolar element side;
- a fourth semiconductor layer of the second conductive type formed over both said second semiconductor layer and said third semiconductor layer; and
- an electrode formed on said fourth semiconductor layer.

5,770,873

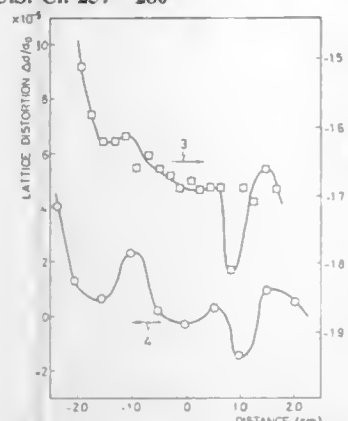
**GAAS SINGLE CRYSTAL AS WELL AN METHOD OF PRODUCING THE SAME, AND SEMICONDUCTOR DEVICE UTILIZING THE GAAS SINGLE CRYSTAL**

Yoshihisa Fujisaki, Setagaya-ku; Yukio Takano, Musashimurayama, and Tsutomu Ishiba, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 108,499, Aug. 18, 1993, which is a continuation of Ser. No. 780,396, Oct. 23, 1991, abandoned, which is a continuation of Ser. No. 325,124, Mar. 17, 1989, abandoned, which is a continuation of Ser. No. 783,365, Oct. 3, 1985, abandoned. This application Jun. 1, 1995, Ser. No. 457,584

Claims priority, application Japan, Oct. 5, 1984, 59-208262  
Int. Cl.<sup>6</sup> H01L 29/20; 29/812

U.S. Cl. 257—280



1. A semiconductor device utilizing a GaAs single crystal characterized in that a substrate is the GaAs single crystal, wherein the ratio  $D/d$ , satisfies the following inequalities in a lattice constant measurement area of a wafer of said GaAs single crystal,

$$4 \times 10^{-6} \leq D/d \leq 4 \times 10^{-5}$$

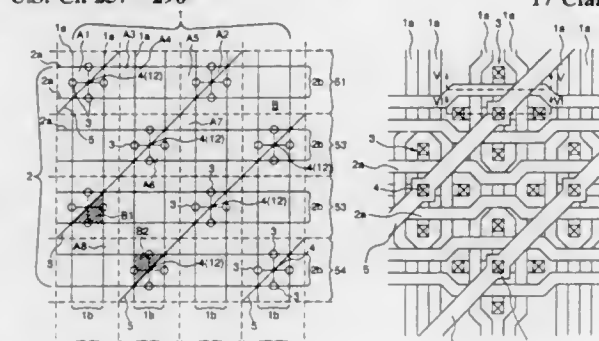
whereby said wafer has at least one straight-line length of 2.5 cm in bidirection from its center, said lattice constant measurement area means an area of said wafer on a straight-line extending at least 2.5 cm in bidirection from the center of the wafer,  $D$  is defined as the value of difference between the maximum and minimum values of lattice constants measured entirely across said lattice constant measurement area at room temperature, with a series of individual measurements having a unit measurement area of 1–100 mm<sup>2</sup> arranged on said straight line, the unit measurement area being an area on which a measurement was taken by a measuring device, and  $d$ , is defined as the lattice constant at room temperature of stoichiometric compositions GaAs single crystal being the theoretical composition of GaAs single crystal,

and wherein a density of contained Si atoms is at most  $1 \times 10^{16}$  cm<sup>-3</sup>;

and that at least one active region is included in said substrate.

**5,770,874**  
**HIGH DENSITY SEMICONDUCTOR MEMORY DEVICE**  
Yulchi Egawa, Tokyo, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan  
Continuation of Ser. No. 558,081, Nov. 13, 1995, abandoned.  
This application Nov. 10, 1997, Ser. No. 966,751  
Claims priority, application Japan, Nov. 14, 1994, 6-304288  
Int. Cl.<sup>6</sup> H01L 27/108

U.S. Cl. 257—296



17 Claims

1. A high density semiconductor memory device comprising:
- a semiconductor substrate;
- a plurality of memory cell groups formed on said semiconductor substrate, each of said memory cell groups including four memory cells having a common source/drain region, each of said memory cells including a capacitor and a transistor having a gate electrode and connecting said capacitor to said common source/drain region;
- a word line arrangement provided on said semiconductor substrate, said word line arrangement including a first group of word line pairs extending in a first direction, each of said word line pairs having two spaced word lines, and a second group of word line pairs extending in a second direction intersecting the first direction, each of said word line pairs having two spaced word lines, wherein a plurality of intersection areas arranged in a matrix of rows extending in said first direction and columns extending in said second direction are defined at intersections between said first group of word line pairs and said second group of word line pairs,
- wherein said common source/drain regions of said plurality of memory cell groups are disposed in selected ones of said intersection areas such that said common source/drain regions are located in every other one of said intersection areas arranged in each row and also in every other one of said intersection areas arranged in each column, while none of said common/source drain regions is arranged in said intersection areas other than said selected ones, and said gate electrodes of said memory cell groups are connected to said word line pair of said first group and said word line pair of said second group which intersect at said selected intersection area where said memory cell group is disposed; and
- a plurality of bit lines formed on said semiconductor substrate extending in a third direction which is a diagonal direction of the matrix of rows and columns, each said bit line contacting one said common source/drain region in each consecutive row and each consecutive column of the matrix.

5,770,875

**LARGE VALUE CAPACITOR FOR SOI**  
Fariborz Assaderaghi, Mahopac; Louis L. Hsu, Fishkill; Jack A. Mandelman, Stormville, all of N.Y., and William R. Tonti, Essex Junction, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

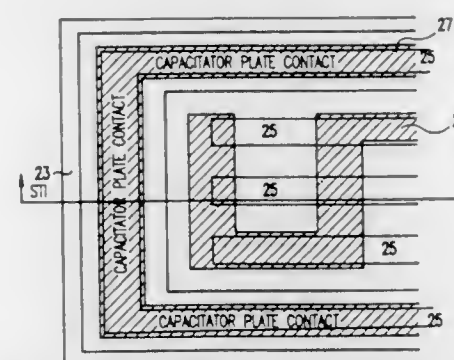
Filed Sep. 16, 1996, Ser. No. 724,287

Int. Cl.<sup>6</sup> H01L 29/786; 21/8242; 27/108

U.S. Cl. 257—301

7 Claims

1. A capacitor for a silicon on insulator circuit, comprising: a semiconductor substrate having a dopant type;



- a silicon on insulator structure on said semiconductor substrate, wherein said SOI structure comprises, in this sequence, a buried insulating layer on said semiconductor substrate and a silicon layer;
- an insulating pad layer on said silicon layer of said silicon on insulator structure;
- a pattern of capacitor trenches extending through said pad layer, said silicon layer, and said buried insulating layer, and extending into said semiconductor substrate, said trenches having sidewalls and a trench bottom;
- a second dopant of a type different from said first dopant type provided in portions of said semiconductor substrate located beneath said trench bottoms and in said silicon layer;
- a dielectric layer over said trench sidewalls and said trench bottoms of said trenches, wherein at least one trench is devoid of said dielectric layer on said sidewalls and said bottom of said at least one of said trenches and surface portions of said silicon layer where bounding said at least one trench are devoid of said insulating pad layer; and
- said trenches filled with conductive material, said conductive material contacting said surface portions of said silicon layer bounding said at least one trench to form an electrical contact and a thermal transmission path to said semiconductor substrate in said at least one trench.

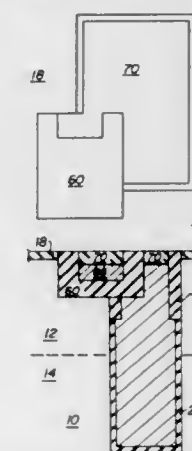
**5,770,876**  
**SEMICONDUCTOR TRENCH CAPACITOR CELL HAVING A BURIED STRAP**

Chung Hon Lam, Williston; David K. Lord, Colchester, and Judith A. Wright, Essex Junction, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.  
Continuation of Ser. No. 550,726, Oct. 6, 1995, abandoned, which is a division of Ser. No. 421,115, Apr. 13, 1995, Pat. No. 5,545,583. This application Nov. 13, 1996, Ser. No. 748,961

Int. Cl.<sup>6</sup> H01L 27/108

U.S. Cl. 257—301

6 Claims



1. A semiconductor structure comprising:
- a semiconductor substrate;
- a trench capacitor, said trench capacitor having an insulating layer and a conductive material situated therein;

- a buried strap recessed below a surface of said semiconductor substrate, said buried strap comprising a contiguous layer of conductive material extending into a section of said semiconductor substrate adjacent said trench capacitor and into a section of said trench capacitor;
- an upper insulation layer positioned above said buried strap; and
- a lower insulation layer positioned beneath and adjacent said buried strap, wherein said upper insulation layer and said lower insulation layer together form a planar surface and wherein a single edge of said buried strap is in electrical contact with said semiconductor substrate and with the conductive material of said trench capacitor.

**5,770,877**  
**SEMICONDUCTOR MEMORY DEVICE AND METHOD FOR FABRICATING THE SAME**  
Keun Hyung Park, Chungcheongbuk-do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea

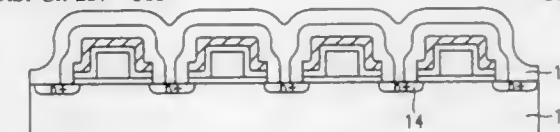
Filed Apr. 15, 1996, Ser. No. 632,162

Claims priority, application Rep. of Korea, Nov. 23, 1995, 43304/1995

Int. Cl.<sup>6</sup> H01L 29/788

U.S. Cl. 257—315

7 Claims



1. A semiconductor memory device comprising:
- a semiconductor substrate of a first conductivity-type having a field region;
- a field insulating layer formed on the field region so that a plurality of active regions are formed in one direction at predetermined intervals;
- a plurality of charge input/output stages formed on the semiconductor substrate of the active regions at predetermined intervals;
- a tunnelling dielectric layer formed on the semiconductor substrate, the tunnelling dielectric layer having a contact hole in the charge input/output stage;
- a plurality of floating gates formed in a matrix arrangement on the tunnelling dielectric layer above the active regions between the charge input/output stages;
- a ferroelectric layer formed on the surface of the semiconductor substrate including the floating gates, the ferroelectric layer having a contact hole at the charge input/output stage;
- a plurality of wordlines each formed on the ferroelectric layer above the floating gates perpendicular to the active regions;
- an interlevel insulating layer formed on the wordlines, the interlevel insulating layer having a contact hole in the charge input/output stage; and
- a plurality of bitlines formed on the interlevel insulating layer to electrically connect the charge input/output stages formed on the same active region.

**5,770,878**  
**TRENCH MOS GATE DEVICE**  
James Douglas Beasom, Melbourne Village, Fla., assignor to Harris Corporation, Palm Bay, Fla.

Filed Apr. 10, 1996, Ser. No. 636,904

Int. Cl.<sup>6</sup> H01L 29/76; 29/94; 31/062; 31/113

U.S. Cl. 257—330

16 Claims

1. An improved trench MOS gate device comprising:
- a trench gate having a floor and sidewalls, said floor and said sidewalls comprising a layer of a dielectric material, said floor layer and said sidewall layers each having a substantially uniform controlled thickness dimension,





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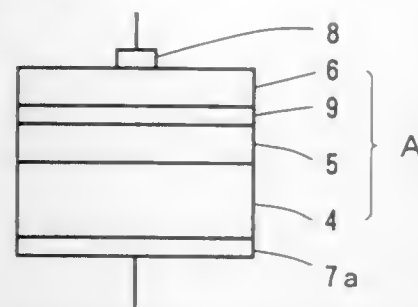
UMI

a dielectric region formed above said first doped region so as to define a dielectric portion of said capacitor;  
a first conductive region formed above said dielectric region so as to define a second plate of said capacitor;  
a resistive region defining a resistor;  
a second conductive region having a first portion formed above and in contact with said first conductive region and a second portion in contact with said resistive region so as to define a first terminal of said resistor and couple said first terminal of said resistor to said second plate of said capacitor;  
a third conductive region in contact with said resistive region so as to define a second terminal of said resistor; and  
an insulating region formed over said first conductive region and said resistive region, said insulating region having a multiplicity of openings through which said first portion of said second conductive region contacts said first conductive region and at least one opening through which said second portion of said second conductive region contacts said resistive region.

5,770,887

## GAN SINGLE CRYSTAL

Kazuyuki Tadamoto; Shinichi Watabe; Hiroaki Okagawa, all of Itami, and Kazumasa Hiramatsu, Yokkaichi, all of Japan, assignors to Mitsubishi Cable Industries, Ltd., Hyogo, Japan  
Filed Oct. 11, 1994, Ser. No. 320,263  
Claims priority, application Japan, Oct. 8, 1993, 5-253098; Mar. 31, 1994, 6-062813; Mar. 31, 1994, 6-062815  
Int. Cl.<sup>6</sup> C30B 35/00; H01L 33/00; 29/14  
U.S. Cl. 257—613 8 Claims



1. A GaN single crystal having a full width at half-maximum of the double-crystal X-ray rocking curve of 5–250 sec and a thickness of not less than 80  $\mu\text{m}$ .

5,770,888

## INTEGRATED CHIP PACKAGE WITH REDUCED DIMENSIONS AND LEADS EXPOSED FROM THE TOP AND BOTTOM OF THE PACKAGE

Chi Jung Song, Daejon, and Ju-Hwa Lee, Choongcheongbook-Do, both of Rep. of Korea, assignors to LG Semicon Co., Ltd., Cheongju, Rep. of Korea  
Filed Aug. 23, 1996, Ser. No. 701,949  
Claims priority, application Rep. of Korea, Dec. 29, 1995, 67335/1995  
Int. Cl.<sup>6</sup> H01L 23/48; 23/495; 23/52; 23/02  
U.S. Cl. 257—696 35 Claims



1. A package for an integrated chip having a plurality of bonding pads, comprising:  
a plurality of leads each, having a first surface and a second surface, said first surface and second surface being opposing surfaces;  
means for attaching said integrated chip to a first predetermined portion of said first surface of said leads;

means for coupling said bonding pads to said leads; and  
means for packaging the integrated chip, said leads, said attaching means and said coupling means, wherein said first surface and said second surface of said leads are exposed from a top surface and a bottom surface of said packaging means, respectively, and wherein said first and second surfaces are substantially co-planar with outer surfaces of said packaging means.

5,770,889

## SYSTEMS HAVING ADVANCED PRE-FORMED PLANAR STRUCTURES

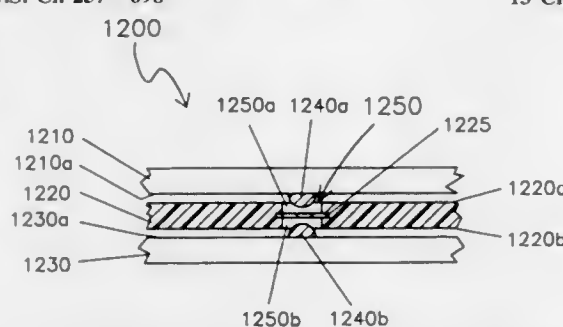
Michael D. Rostoker, Boulder Creek, and Nicholas F. Pasch, Pacifica, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Dec. 29, 1995, Ser. No. 580,578

Int. Cl.<sup>6</sup> H01L 23/04

U.S. Cl. 257—698

13 Claims



1. An electronic system having at least one semiconductor assembly, said system comprising:  
at least one semiconductor device having first solder balls disposed in a ring shaped pattern on a face thereof;  
at least one substrate having second solder balls disposed in a ring shaped pattern on a face thereof and corresponding in pattern with the pattern of the first solder balls;  
a preformed planar structure between said at least one semiconductor device and said at least one substrate, said preformed planar structure having through holes extending therethrough and corresponding to the first and second patterns;  
conductive elements made of noble metal foil in the preformed planar structure and extending into said through holes, wherein said conductive elements delineate each of the through holes into a first portion and a second portion; and  
solder joints formed by the first solder balls and the second solder balls within said through holes to said conductive elements, wherein each of the first solder balls fuses to one side of the noble metal foil in the first portion and each of the second solder balls fuses to another side of the noble metal foil in the second portion.

5,770,890

## USING A THERMAL BARRIER TO PROVIDE A HERMETIC SEAL SURFACE ON ALUMINUM NITRIDE SUBSTRATE ELECTRONIC PACKAGES

Gary A. Dreyer, Torrance; Alan L. Kovacs, Long Beach, both of Calif., and Kenneth G. Maish, Tucson, Ariz., assignors to Raytheon Company, Los Angeles, Calif.

Filed Feb. 25, 1997, Ser. No. 806,885

Int. Cl.<sup>6</sup> H01L 23/10

U.S. Cl. 257—710

16 Claims

1. A microelectronic package comprising:  
a metallized aluminum nitride substrate;

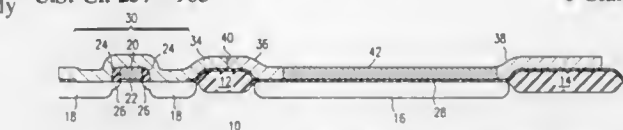
5,770,892

## FIELD EFFECT DEVICE WITH POLYCRYSTALLINE SILICON CHANNEL

Tsiu C. Chan, Carrollton; Yu-Pin Han, Dallas, and Elmer H. Guritz, Terrell, all of Tex., assignors to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Continuation of Ser. No. 218,700, Mar. 28, 1994, abandoned, which is a continuation of Ser. No. 798,615, Nov. 26, 1991, abandoned, which is a division of Ser. No. 531,014, May 31, 1990, Pat. No. 5,135,888, which is a continuation-in-part of Ser. No. 298,530, Jan. 18, 1989, Pat. No. 5,196,233. This application Jun. 2, 1995, Ser. No. 460,494  
Int. Cl.<sup>6</sup> H01L 27/11 6 Claims

U.S. Cl. 257—903



1. A field effect device for integrated circuits, comprising:  
a first active region in a substrate, the first active region having a first conductivity type;  
a first gate dielectric layer over said first active region;  
a polycrystalline silicon layer over said first gate dielectric layer, said polycrystalline silicon layer being patterned to form the channel of a field effect device;  
source/drain regions having a second conductivity type in said polycrystalline silicon layer on opposite sides of said first active region, wherein a channel having the first conductivity type is formed between said source/drain regions over said first active region, and wherein said first active region functions as a control gate for the field effect device;  
a region of the first conductivity type in said polycrystalline silicon layer in contact with a second active region, wherein a lateral junction is formed between said first conductivity type region and one of said source/drain regions within said polycrystalline silicon layer, said lateral junction forming a diode;  
additional transistors having insulated gates formed in an additional conductive layer which is separate from said polycrystalline silicon layer, and which is capacitively coupled to a portion of said second active region through a second gate dielectric layer; and  
an isolation region between said first and second active regions, said isolation region having a thickness greater than a thickness of said first gate dielectric layer and greater than a thickness of said second gate dielectric layer.

5,770,893

## WAVE ENERGY DEVICE

Rodney Graham Youlton, Embley, White Cross Road, East Harptree, Bristol BS18 6AA, Great Britain

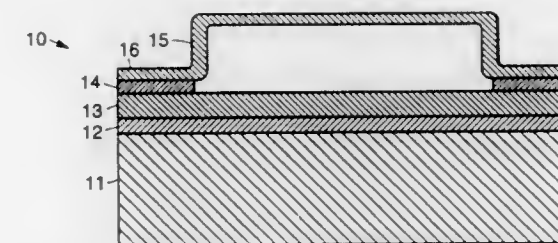
PCT No. PCT/GB95/00793, § 371 Date Jul. 9, 1996, § 102(e) Date Jul. 9, 1996, PCT Pub. No. WO95/27850, PCT Pub. Date Oct. 19, 1995

PCT Filed Apr. 7, 1995, Ser. No. 656,201

Claims priority, application United Kingdom, Apr. 8, 1994, 9406964; Jan. 20, 1995, 9501107  
Int. Cl.<sup>6</sup> F03B 13/12 12 Claims

U.S. Cl. 290—53

1. A wave energy device comprising:  
a) a tube assembly comprising a plurality of open pipes of different lengths and natural resonant frequencies each having an upper end and a lower end, the device being adapted to

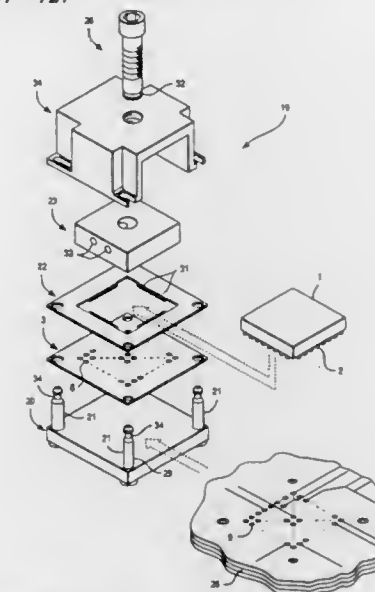


a solder interface, comprising gold and germanium solder, disposed on the metallized aluminum nitride substrate;  
a thermal barrier interposer soldered to the interface;  
a cover; and  
a solder seal disposed between the cover and the interposer that solders the cover to the interposer to produce a hermetically sealed package.

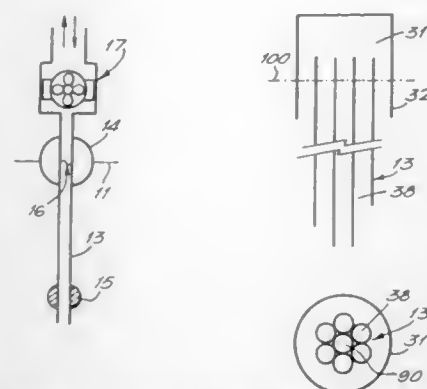
5,770,891

## SOCKET FOR SEMI-PERMANENTLY CONNECTING A SOLDER BALL GRID ARRAY DEVICE USING A DENDRITE INTERPOSER

Richard Francis Frankeny, Elgin; Jerome Albert Frankeny, Taylor; Danny Edward Massey, Georgetown, and Keith Allan Vanderlee, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.  
Division of Ser. No. 536,880, Sep. 29, 1995, Pat. No. 5,691,041.  
This application Sep. 18, 1996, Ser. No. 718,120  
Int. Cl.<sup>6</sup> H01L 23/10; 23/32; 23/522 4 Claims  
U.S. Cl. 257—727



1. A solder ball array device socket, comprising:  
a rigid stiffener with a planar surface;  
a rigid cap with a planar surface alignable to be substantially coplanar with the planar surface of the stiffener;  
alignment pins extending from connections on the stiffener to connections on a compression arch;  
a planar interposer of flexible dielectric material having a multiplicity of vias or pads covered with dendrites, which vias or pads are distributed in a pattern substantially conforming to an electrical ball grid array device, and having holes for the alignment pins;  
means for positioning the ball grid array device having alignment holes for mating to the balls of the ball grid array device, and having holes for the alignment pins; and  
compression adjusting means in the compression arch to compress the planar interposer, the ball grid array device, and a board with an array of corresponding contacts between the cap and the stiffener adequately to cause dendrite penetration into ball grid array device balls and board contacts.



float upright in a body of water which is subject to waves so that the lower end of at least one of said pipes is generally disposed below the effective wave base of the water and is open to the water;

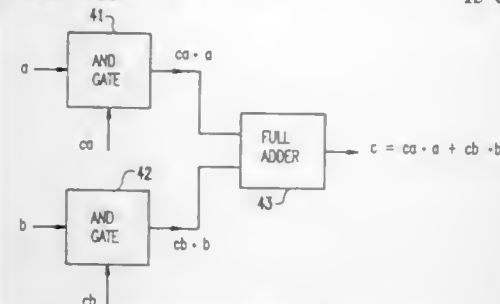
- b) an inverted cup member covering the upper ends of the pipes, the cup member being such that when the device is in use the periphery of the cup member is below the surface of the water so that when the device is acted on by a peaking wave, water is forced up the inside of the cup member which movement complements relative dropping of the fluid in one of said pipes and vice versa when the device is in a wave trough; and
- c) means for harnessing power from the changing fluid levels in the cup member and pipes relative to a datum still water level as a result of the wave motion, the different lengths and natural resonant frequencies of the pipes serving to broaden the resonant frequency of the device to the wave motion and thereby the range of wave frequencies for which power is harnessed by said means.

**5,770,894**  
**PARALLEL PROCESSING METHOD HAVING**  
**ARITHMETICAL CONDITIONS CODE BASED**  
**INSTRUCTIONS SUBSTITUTED FOR CONVENTIONAL**  
**BRANCHES**

Ramesh Chandra Agarwal, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 10, 1996, Ser. No. 678,008  
Int. Cl. G06F 9/45

U.S. Cl. 395—706 15 Claims



1. A computer implemented method performed by a processor having multiple functional units, comprising the steps of:
- identifying at least one branch operation in a code to be performed by said processor, said branch operation having an IF(FUNCTION(OPERAND)) -THEN-OPERATION form;
- substituting for said identified branch operation a plurality of arithmetic instructions, said plurality of arithmetic instructions substantially devoid of said IF(FUNCTION(OPERAND)) -THEN-OPERATION branch operation, said plurality comprising arithmetic instructions for calculating condition codes based on comparative values of said OPERANDS of said identified branch operation, and comprising arithmetic instructions incorporating said condition codes, said condition

codes logically operating on other operands in said arithmetic instructions, wherein said plurality of instructions is substantially devoid of instructions calculating a difference in value between executing according to a first and a second branch of said branch operation to eliminate a conditional execution of said code and thereby enable a parallel execution of said substituted arithmetic instructions;

decoding said plurality of arithmetic instructions and dispatching decoded instructions representing said substitute code to said plurality of functional units for parallel processing; and

executing said plurality of dispatched decoded instructions in parallel using each of the functional units of said processor, thereby fully exploiting the multiple functional units of the processor through instruction level parallelism.

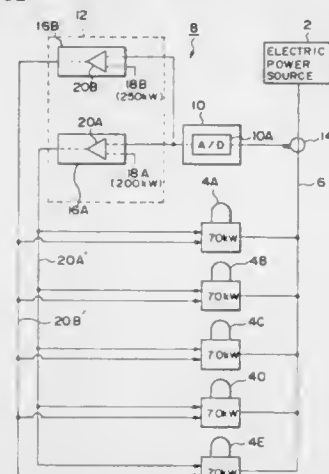
**5,770,895**  
**OPERATION CONTROL DEVICE AND METHOD FOR A**  
**PLURALITY OF ELECTRIC POWER CONSUMING**  
**SYSTEMS**

Iwao Kumasaka, Kanagawa-Ken, Japan, assignor to Tokyo Electron Limited, Tokyo-to, Japan

Filed Jun. 7, 1996, Ser. No. 660,475

Claims priority, application Japan, Jun. 8, 1995, 7-166881  
Int. Cl. G05B 6/02

U.S. Cl. 307—32 5 Claims



1. An operation control device of a heat treatment apparatus for use in an electric power supply system for supplying electric power from one electric power source to a plurality of electric power consuming systems, which can determine based on an outside signal whether or not the electric power consuming systems can proceed operating, said operation control device comprising:
- an output electric power detecting unit for detecting electric power outputted by the electric power source;
- a comparison control unit for comparing a detected value of the output electric power detecting unit with a present reference value to output a comparison signal indicative of a result of the comparison as the outside signal to be supplied to the plural electric power consuming systems, whereby the comparison signal indicating an inoperable stand-by state when the detected value exceeds the reference value; and

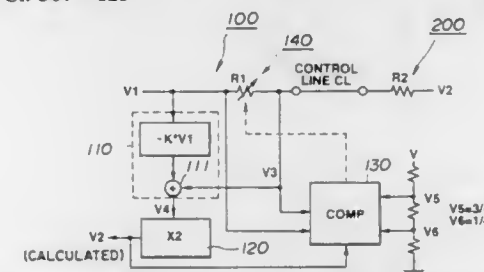
a determination means connected to each one of the plurality of electric power consuming systems for determining based on the comparison signal as the outside signal whether there is sufficient electrical capacity to proceed to a next step, wherein the next step is a step requiring a largest electric power consumption amount as each one of the plurality of electric power consuming systems having a set of steps where each step uses a different electric power consumption amount, whereby if there is insufficient electrical capacity the next step is not executed until sufficient electrical capacity exists.

**5,770,896**  
**INPUT SWITCHING CONTROL DEVICE AND**  
**COMMUNICATION CIRCUIT**  
Yasuhisa Nakajima, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 3, 1995, Ser. No. 538,778

Claims priority, application Japan, Oct. 5, 1994, 6-241073  
Int. Cl. H02H 3/12

U.S. Cl. 307—125 36 Claims



1. A communication apparatus which establishes either bi-directional or uni-directional full duplex communications between transmitting side equipment and receiving side equipment for detecting a transmitting side signal V2 transmitted from said transmission side equipment via said full duplex communication to said receiving side equipment, said transmitting side signal transmitted across a transmitting side impedance R2 of said transmitting side equipment resulting in a signal V3 transmitted to said receiving side equipment and across a receiving side impedance R1 of said receiving side equipment resulting in a receiving side signal V1, said apparatus comprising:

arithmetic means for calculating said transmitting side signal V2 on the basis of said signal V3 transmitted to said receiving side equipment, said receiving side signal V1 and an impedance ratio between said transmitting side impedance R2 and said receiving side impedance R1; and

comparator means for comparing said signal V3 transmitted to said receiving side equipment to a high reference voltage V5 and a low reference voltage V6 and controlling a value of said receiving side impedance R1 such that said signal V3 transmitted to said receiving side equipment is within the range of said high reference voltage V5 and said low reference voltage V6.

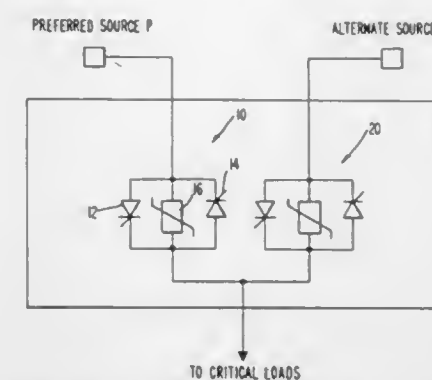
**5,770,897**  
**HYBRID SOLID STATE SWITCH**  
Vinod N. Bapat; John G. Reckleff, both of Raleigh, N.C., and Per A. Danfors, Elm Grove, Wis., assignors to ABB Power T&D Company Inc., Raleigh, N.C.

Filed Sep. 16, 1996, Ser. No. 714,757

Int. Cl. H01H 83/00

U.S. Cl. 307—127 5 Claims

1. Switching apparatus for switching a load between first and second sources, wherein said sources generate AC voltage and current, said apparatus comprising:
- a first solid state switch connected to said load;
- a second solid state switch connected to said load;
- a first mechanical breaker connected between said first switch and said first source;



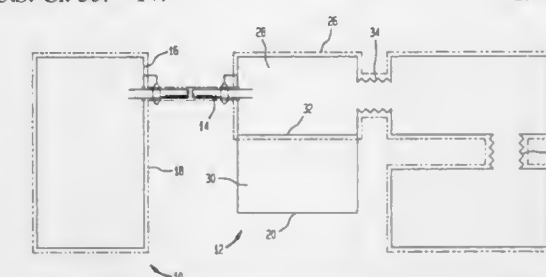
- a second mechanical breaker connected between said second switch and said second source; and
- a controller, connected to said first and second sources and connected to said first and second switches and to said first and second mechanical breakers, wherein said controller operates to open and close said first and second solid state switches and said first and second mechanical breakers to switch said load from said first source to said second source and wherein said controller senses the phase angle difference between the voltage phase angles from said first and second sources, determines when said phase angle difference exceeds a preselected phase angle difference and causes said second mechanical breaker to open in response to said controller determining that said phase angle difference has exceeded said preselected phase angle difference.

**5,770,898**  
**MODULAR POWER MANAGEMENT SYSTEM WITH**  
**COMMON EMC BARRIER**

Matthew T. Hannigan; Ronald R. Carleton; Paul Bonomo, all of San Jose, Calif.; John W. Kerr, Jr., Palm Coast, Fla.; James M. Worsham, Campbell, Calif.; Robin Spires, Munich, Germany; Franz Gisin, Los Altos, and William Beyda, Cupertino, both of Calif., assignors to Siemens Business Communication Systems, Inc., Santa Clara, Calif.

Filed Mar. 29, 1996, Ser. No. 624,325  
Int. Cl. H05K 9/00

U.S. Cl. 307—147 19 Claims



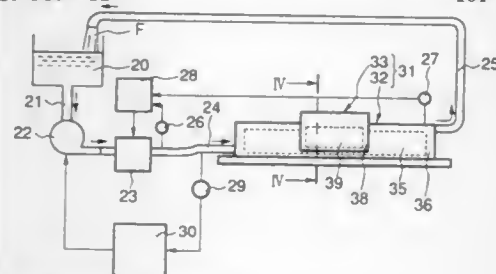
1. A power management system having electromagnetic compatibility containment comprising:
- a first module having walls that define a first generally enclosed area, said first module having circuit means for supplying power required to operate a device of interest, said circuit means being contained within said first generally enclosed area;
- a line current input cable in communication with said circuit means and extending from said first module for connection to a source of power;
- a battery current input cable in communication with said circuit means and extending from said first module for connection to a supply of direct current;
- an output current cable in communication with said circuit means and extending from said first module for connection to said device of interest;
- a second module having walls that define a second generally enclosed area, said second module being adjacent to said first module and having battery management circuitry in commu-



nication with said circuit means via said battery current input cable, said battery management circuitry being contained within said second generally enclosed area; and  
a third module having walls that define a third generally enclosed area, said third module having a battery and being adjacent to said second module, said battery being contained within said third generally enclosed area and being in communication with said battery management circuitry of said second module.

5,770,899  
LINEAR MOTOR

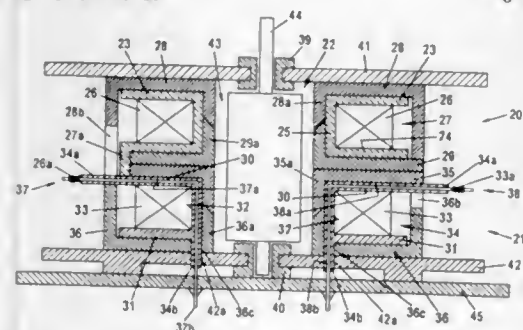
Yutaka Hayashi, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan  
Continuation of Ser. No. 558,985, Nov. 16, 1995, abandoned.  
This application Sep. 22, 1997, Ser. No. 934,815  
Claims priority, application Japan, Dec. 14, 1994, 6-310501  
Int. Cl.<sup>6</sup> H02K 41/00; 41/02; 41/035; 9/00  
U.S. Cl. 310—12 101 Claims



1. A linear motor comprising:  
two relatively movable members;  
a coil mounted to one of said two members;  
a magnet mounted to the other of said two members;  
a tube surrounding said coil;  
a supply system that supplies fluid into said tube;  
a pressure detecting device that detects pressure of said fluid;  
and  
a control system that controls said supply system based on an output of said pressure detecting device to regulate the pressure of said fluid in said tube so as to inhibit deformation of said tube by said fluid.

5,770,900  
STEPPER MOTOR

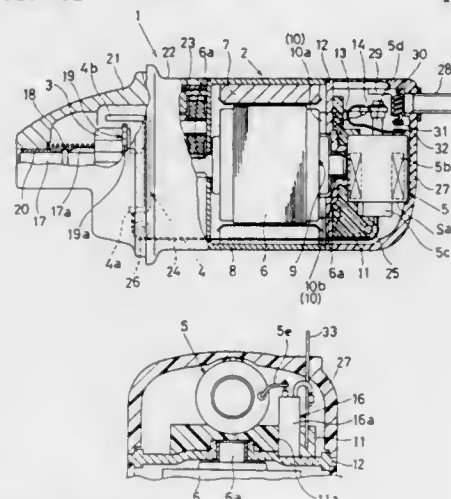
Koichi Sato, and Hiroyasu Numaya, both of Niigata, Japan, assignors to Nippon Seiki K.K., Niigata, Japan  
Filed Nov. 18, 1996, Ser. No. 746,948  
Claims priority, application Japan, Nov. 17, 1995, 7-323879  
Int. Cl.<sup>6</sup> H02K 37/14  
U.S. Cl. 310—49 R 6 Claims



1. A stepper motor comprising:  
a first coil block composed of a first annular bobbin and first annular yokes, said first annular bobbin comprising a first exciting coil wound around a cylindrical winding portion, said first annular yokes being laminated on opposite sides of said first annular bobbin, wherein guide portions on said first

annular yokes guide excitation poles of said first exciting coil toward an inner surface of said winding portion;  
a second coil block composed of a second annular bobbin and second annular yokes, said second annular bobbin comprising a second exciting coil wound around a cylindrical winding portion, said second annular yokes being laminated on opposite sides of said second annular bobbin, wherein guide portions on said second annular yokes guide excitation poles of said second exciting coil toward an inner surface of said winding portion, said second coil block being laminated over said first coil block coaxially;  
a magnet rotor having a rotating shaft rotatably held in a space formed inside said winding portions by laminating said first and second coil blocks, said magnet rotor being rotated by the excitation poles of said first and second annular yokes; and  
connector terminals buried in said annular bobbin of one of said coil blocks and having a first connection portion and a second connection portion, said first connection portion protruding in a direction substantially perpendicular to an axis of said rotating shaft, said first connection portion being electrically connected with terminal ends of a respective coil, said second connection portion protruding from said winding portions in a direction substantially parallel to the axis of said rotating shaft, said second connection portion being electrically connected with an external electric apparatus.

5,770,901  
STARTER WITH OVERHEAT PROTECTION  
Masami Niimi, Handa, and Tsutomu Shiga, Nukata-gun, both of Japan, assignors to Nippondenso, Kariya, Japan  
Filed Jul. 30, 1996, Ser. No. 681,962  
Claims priority, application Japan, Oct. 31, 1995, 7-282322  
Int. Cl.<sup>6</sup> H01H 67/02; H02K 13/00  
U.S. Cl. 310—52 16 Claims



1. A starter comprising:  
a motor including an armature, a commutator disposed at one axial end of said armature and brushes slidably contacting said commutator, wherein said motor generates a rotary force by an electric current carried through said brushes and said commutator;  
a magnet switch having a switch yoke, a coil contained in said switch yoke and a motor contact, said magnet switch being disposed axially adjacent to said commutator, wherein said magnet switch closes said motor contact for supplying the electric current to said brushes by energization of said coil;  
a heat transfer member provided in heat transfer relation to said brushes of said motor and said switch yoke of said magnet switch; and  
energization control means including a temperature responsive element responsive to a temperature of said heat transfer member, said energization control means shutting off energization of said coil when the heat transfer member temperature reaches a predetermined temperature thereby providing over-

heat protection to the starter in response to a high temperature of one of said motor and said magnet switch.

5,770,902  
MOTOR TERMINATION BOARD

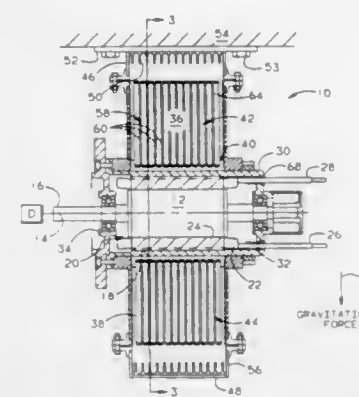
L. Jay Batten, Lebanon, and Dennis L. Queary, Jamestown, both of Ohio, assignors to Globe Motors, Dayton, Ohio  
Filed Nov. 2, 1995, Ser. No. 552,344  
Int. Cl.<sup>6</sup> H02K 11/00  
U.S. Cl. 310—71 21 Claims



1. A motor termination board for facilitating interconnection of control components and power components in a brushless DC motor, the motor including windings, and the windings and control components including leads, the motor termination board comprising:  
(a) a first stamping having a plurality of conductive paths, said first stamping including a plurality of connection points for receiving the leads from said control components and a plurality of control terminals for connecting said motor termination board to an electronic control of said motor;  
(b) a second stamping having a plurality of conductive paths, said second stamping including a plurality of connection points for receiving the leads from the windings of said motor and a plurality of power terminals for connecting said motor termination board to a power supply for said motor;  
(c) a termination board housing for encapsulating the conductive paths of said first and second stampings;  
wherein said first and second stampings lie in substantially parallel, spaced planes and said termination board housing separates said first and second stampings; and  
further comprising a plurality of switching device mounted to said termination board and connected to said first and second stamping, wherein said switching devices operates to open up said motor winding upon detection of an electrical short therein.

5,770,903  
REFLUX-COOLED ELECTRO-MECHANICAL DEVICE  
Timothy J. Bland, and Michael G. Schneider, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.  
Filed Jun. 20, 1995, Ser. No. 492,509  
Int. Cl.<sup>6</sup> H02K 5/18; 5/20; 9/00; 9/19  
U.S. Cl. 310—64 23 Claims

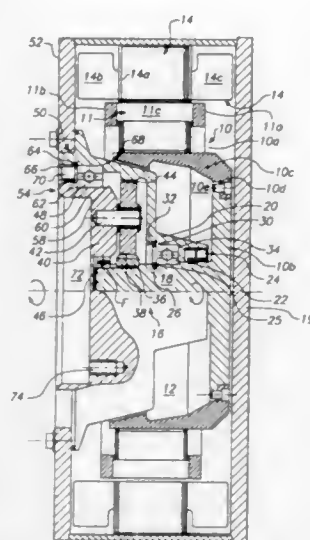
1. An electro-mechanical device comprising:



- a) a movable element mounted for motion with respect to an axis and having an axially extending output shaft adapted for attachment to a driven load;  
b) a stationary stator element disposed about said movable element but separated therefrom by an airgap, and having an electrical winding configured to exert an electromagnetic force for urging said movable element to move with respect to said axis when said winding is supplied with an electrical current;  
c) a housing disposed about and supporting said stator, and allowing said output shaft of said movable element to extend outside of said housing for attachment to said driven load;  
d) said housing further defining a sealed boiling chamber about said stator for containing a two-phase fluid;  
e) a two-phase fluid partially filling said boiling chamber and forming a liquid level defining a vapor space at an upper portion of said boiling chamber for containing a vapor constituent of said two-phase fluid, and a liquid space at a lower portion of said boiling chamber for containing a liquid constituent of said two-phase fluid;  
f) a condenser adapted for attachment in thermal contact with a heat sink;  
g) vapor conducting means for conducting the vapor constituent of said two-phase fluid from said boiling chamber to said condenser;  
h) downcomer means for conducting a condensed constituent of said two-phase fluid from said condenser back to said boiling chamber; and  
i) phase change material disposed in said boiling chamber for providing cooling of said two-phase fluid through latent heat absorption of the phase change material above a predetermined melting temperature of said phase change material.

5,770,904  
ELECTRIC MOTOR  
Reinhard Rasch, Hechendorf; Andreas Gründl, München, and Bernhard Hoffmann, Starnberg, all of Germany, assignors to Grundl und Hoffman GmbH Gesellschaft für elektrotechnische Entwicklungen, Starnberg, Germany  
PCT No. PCT/EP95/00767, § 371 Date Aug. 19, 1996, § 102(e) Date Aug. 19, 1996, PCT Pub. No. WO95/24761, PCT Pub. Date Sep. 14, 1995  
PCT Filed Mar. 2, 1995, Ser. No. 699,507  
Claims priority, application Germany, Mar. 8, 1994, 44 07 714.3  
Int. Cl.<sup>6</sup> H02K 7/10 7 Claims

1. An electric motor, comprising an internal rotor (10) and a stator (14) which is arranged at a radial distance therefrom, with the rotor (10) having a free inner space (12) in which at least a portion of a gear unit (16) which is designed as a planetary gear unit and which includes a sun gear shaft (18), a ring gear (20) and a planet wheel carrier (40) is arranged, the sun gear shaft (18) of which comprises a fastening means for the rotor (10) at an end portion which protrudes from the ring gear (20), and the ring gear (20) of which comprises a fastening means for a supporting plate (52) which encompasses the ring gear (20) in an area of one of its



end faces (54) in an annular manner and which holds the stator (14), said [armature] rotor (10) being supported in the ring gear (20) by means of a rotor bell-side bearing (22) via the sun gear shaft (18), an inner end of the sun gear shaft (18) rotatably bearing against the planet wheel carrier (40) by means of a bearing (46), and said planet wheel carrier (40) being rotatably supported in the ring gear (20) by means of another bearing (48) and comprising an inwardly offset output flange location (72).

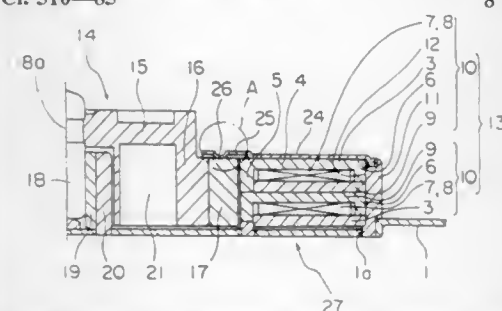
5,770,905

**CLAW POLE TYPE SYNCHRONOUS MOTOR**  
Yuzuru Suzuki, Sakae Fujitani, and Takashi Ishii, all of Asaba-cho, Japan, assignors to Minebea Co., Ltd., Nagano-ken, Japan

Filed Mar. 11, 1997, Ser. No. 814,252  
Claims priority, application Japan, Apr. 19, 1996, 8-120862  
Int. Cl.<sup>6</sup> H02K 21/14

U.S. Cl. 310—85

8 Claims



1. A claw pole type synchronous motor including a plate-like flange, an armature, and a rotor mounted on said flange coaxially with said armature, wherein:

- (I) said armature has two stator assemblies superposed in a direction of a rotating axis of said rotor, each of said stator assemblies comprising:
- (A) stator yokes made of soft steel material, each of said stator yokes including:
- (i) a circular doughnut shaped base having an inner peripheral edge, an outer peripheral edge, an axis, and a shield plate made of a ferromagnetic material for preventing magnetic leakage and reducing acoustic/electromagnetic noise from said motor;
- (ii) pole teeth bent at said inner peripheral edge so as to extend in a direction of said axis of said base;
- (iii) an outer wall bent at said outer peripheral edge so as to extend in said direction of said axis of said base; and
- (iv) an annular armature coil receiving portion defined by said base and said pole teeth; and
- (B) an armature coil formed by wound insulated wires and mounted in said armature coil receiving portion;

(II) said rotor has an outer diameter such that said rotor faces said pole teeth of said stator yokes of said two stator assemblies with a small gap provided between said rotor and said pole teeth, one of said two stator assemblies being mounted on said plate-like flange, and said rotor including a field magnet of a permanent magnet type having an end face at an opposite side of said field magnet to said flange;

(III) said shield plate has a central hole with an edge defining an inner diameter smaller than said outer diameter of said rotor so that the rotor is prevented from being detached from said two stator assemblies, said shield plate being fixed to said armature such that said shield plate covers said armature and said end face of said field magnet with a space provided between said shield plate and said end face of said field magnet; and

(IV) a contact prevention member is provided for preventing said shield plate from contacting said field magnet, said contact prevention member being formed on said shield plate so as to face said end face of said field magnet with a gap therebetween in a normal state of operation of said motor.

5,770,906

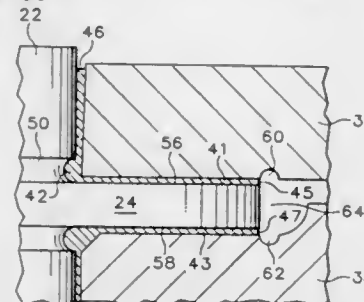
**COMPACT ELECTRIC MOTOR CONSTRUCTION EMPLOYING FLUID BEARINGS**

Mark Hazelton, Cornelius, and Charles J. Cheever, Beaverton, both of Oreg., assignors to SAE Magnetics (H.K.) Ltd., Portland, Oreg.

Filed Jun. 13, 1995, Ser. No. 490,067  
Int. Cl.<sup>6</sup> F16C 17/10; 33/72; H02K 7/08

U.S. Cl. 310—90

10 Claims



1. In a fluid bearing having a rotary member and a stationary member, said members having respective bearing surfaces separated by a gap containing bearing fluid, at least one of said surfaces having a tapered end portion to form a fluid seal zone thereby creating a fluid seal by capillary action, the improvement comprising at least one of said surfaces having a transition groove between said members and annularly adjacent the fluid seal zone to create an area of low pressure for maintaining the integrity of the fluid seal.

5,770,907

**WINDSHIELD WIPER MOTOR FOR USE IN A VEHICLE AND METHOD FOR MANUFACTURING**

Peter John Danish, Scottsville; Frank Richard Lombardo, Rochester, both of N.Y., and Christopher Howard Jones, Dayton, Ohio, assignors to ITT Automotive Electrical Systems, Inc., Auburn Hills, Mich.

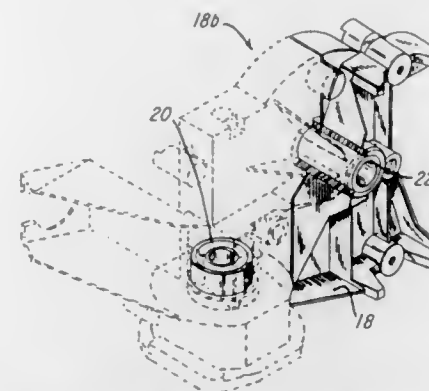
Filed Aug. 14, 1995, Ser. No. 514,537  
Int. Cl.<sup>6</sup> H02K 5/00; 5/02; 5/08; 5/16

U.S. Cl. 310—90

25 Claims

1. A wiper motor for use in a vehicle comprising:

- a motor housing;
- a plurality of prelubricated bearings integrally molded into a predetermined position in said housing member said plurality of prelubricated bearings comprising a lubricant which can survive the molding process when the housing member is molded; and



a motor situated in said motor housing and having a plurality of shafts received in said plurality of bearings.

5,770,908

**MOTOR HAVING VARIABLE AIR GAP**

Sung-min Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Kuwait

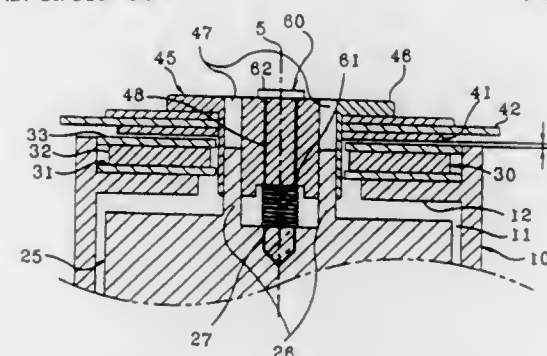
Filed May 24, 1996, Ser. No. 653,351

Claims priority, application Rep. of Korea, May 27, 1995, 1995-13582

Int. Cl.<sup>6</sup> H02K 21/12

U.S. Cl. 310—90

8 Claims



1. An air gap varying motor comprising:

- a base;
- a rotation body rotatably supported by and accommodated within said base;
- a motor rotor;
- a motor stator which is fixed to said base, and which supports said motor rotor to enable said motor rotor to rotate about a predetermined axis, said motor stator being disposed apart from said motor rotor over a predetermined distance to electromagnetically interact with said motor rotor; and
- engagement and adjustment means for connecting said rotation body and said motor rotor and adjusting said distance between said motor rotor and said motor stator;
- wherein said motor rotor has a guide hole formed therein parallel to the predetermined axis and said rotation body has a protrusion supported by and received in said guide hole.

5,770,909

**WOUND ROTOR SYNCHRONOUS MOTOR-GENERATOR AND FIELD CONTROL SYSTEM THEREFOR**

Harold A. Rosen, Santa Monica; Brian R. Jensen, Simi Valley, and Thomas Hudspeth, Malibu, all of Calif., assignors to Rosen Motors, L.P., Woodland Hills, Calif.

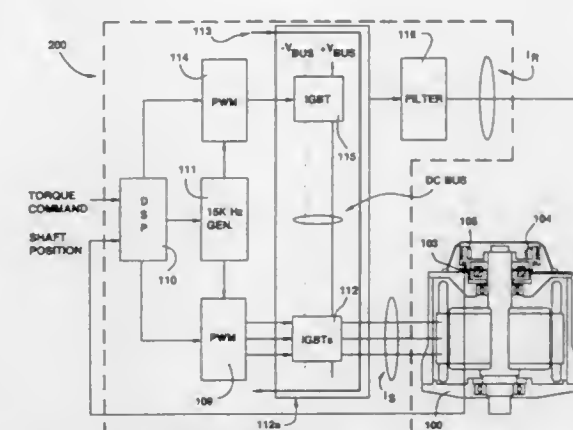
Filed Dec. 13, 1996, Ser. No. 764,589

Int. Cl.<sup>6</sup> H02K 47/04; 16/00; H02P 9/14

U.S. Cl. 310—113

5 Claims

1. A field control system for a wound rotor synchronous motor-generator, comprising:



an adjustable power source operatively connected to the wound rotor synchronous motor-generator;

a rotary transformer disposed within the wound rotor synchronous motor-generator for receiving power from said adjustable power source and generating field current;

a rectifier receiving said field current and generating rectified field current applied to the wound rotor of the wound rotor synchronous motor-generator; and

a filter serially connected between said power source and said rotary transformer for generating a sinusoidal waveform from a rectangular waveform produced by said stationary power source.

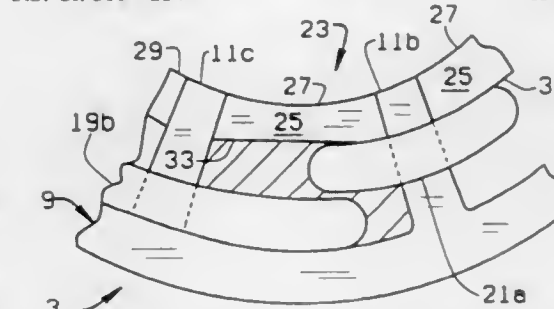
5,770,910

**SWITCHED RELUCTANCE MOTOR STATOR ASSEMBLY**  
Gary E. Horst, Manchester, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 30, 1993, Ser. No. 175,562  
Int. Cl.<sup>6</sup> H02K 3/48

U.S. Cl. 310—214

11 Claims



1. In a switched reluctance motor having a stator assembly and a rotor assembly including a rotor shaft on which the rotor assembly is mounted for rotation relative to the stator assembly, the stator assembly including a stator having a plurality of stator teeth defining stator slots therebetween with a plurality of concatenated stator winding sets inserted in the slots, each set of stator windings including coils which surround one of the stator teeth whereby one part of a coil is installed in one stator slot and another part of the coil is inserted in the adjacent stator slot, a part of a first winding set coil inserted in a slot being positioned adjacent an inner end of said slot and a part of a second winding set coil inserted in said slot being positioned toward an outer end of said slot, the improvement comprising means inserted in the stator slots after the stator winding sets are inserted therein to increase a fill factor of the stator and reduce noise caused by the concatenation of the coils, said means comprising a wedge insertable in each stator slot after coils are installed therein, each wedge being sized to fit in an open end of each stator slot and extend across the slot, each wedge having a curved outer surface the curvature of which generally corresponds to the curvature of the surface of said stator at the outer end of the stator teeth adjacent the rotor assembly so to present a generally smooth surface to the rotor assembly, respective sidewalls of said slots being generally straight and the width of said slots being



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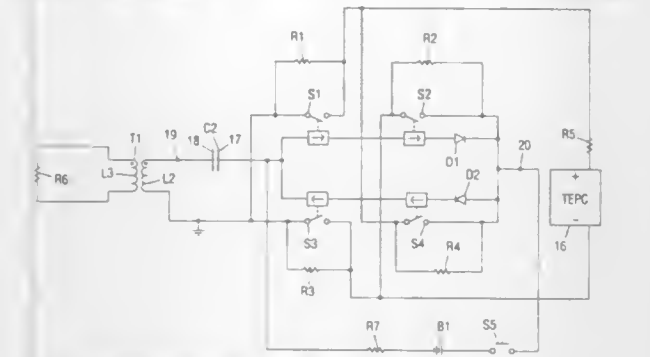
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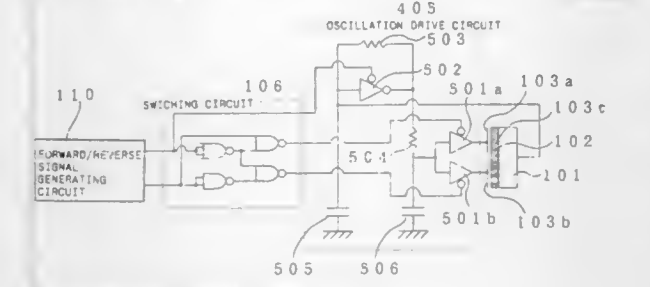
tapered so to increase from the open end of the slot to a closed end thereof, and sidewalls of each wedge being generally straight sidewalls matingly tapered with the sidewalls of a slot for the wedge to fit in the open end of the slot, and an inner surface of each wedge being generally flat and bearing against the portion of a coil located adjacent the outer end of a slot thereby to compress said coil into the slot, installation of the wedge reducing the volume of the slot available to be filled by the coils thereby effectively compressing the coils into the slot.

**5,770,911**  
**RESONANT THERMOELECTRIC GENERATOR**  
Kan Cheng, 40100 San Carlos Pl., Fremont, Calif. 94539  
Filed Jan. 30, 1996, Ser. No. 594,011  
Int. Cl.<sup>6</sup> H01L 37/00  
U.S. Cl. 310—306  
12 Claims



1. A resonant generator, comprising:  
a circuit means for cycling a current in alternate directions;  
a polarized power converter connected in series with said circuit means for supplying said current, said power converter having a negative terminal and a positive terminal, a direction from said negative terminal to said positive terminal being a forward direction; and  
switching means connected to said polarized power converter for switching the polarity of said power converter with respect to said circuit means whenever the direction of said current is reversed, so that the polarity of said power converter is always oriented to match the direction of said current flowing in said circuit means.

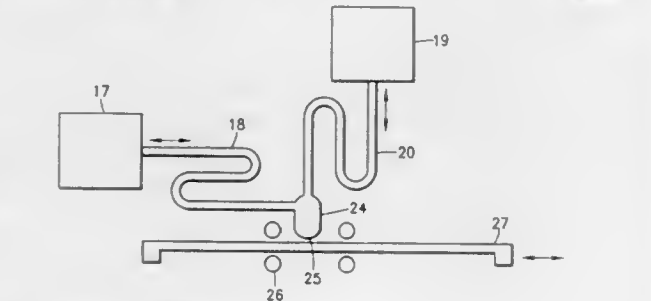
**5,770,912**  
**ULTRASONIC MOTOR AND ELECTRONIC APPARATUS PROVIDED WITH ULTRASONIC MOTOR**  
Kenji Suzuki, Masao Kasuga, Makoto Suzuki, and Akihiro Iino, all of Chiba, Japan, assignors to Selko Instruments Inc., Japan  
Filed Mar. 6, 1996, Ser. No. 611,637  
Claims priority, application Japan, Mar. 7, 1995, 7-047669  
Int. Cl.<sup>6</sup> H02N 2/00  
U.S. Cl. 310—316  
25 Claims



1. An ultrasonic motor comprising:  
a moving member;  
a vibrating member for frictionally driving said moving member with a vibrational wave produced in said vibrating member;

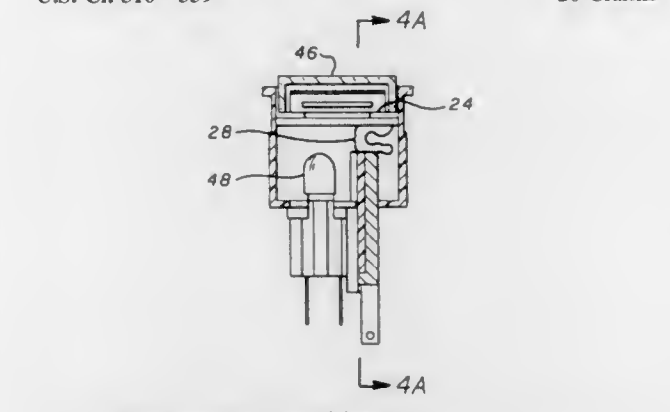
pressure regulating means disposed so that said moving member is brought into contact with said vibrating member for regulating a frictional force between said moving member and said vibrating member under pressure;  
a piezoelectric element bonded to said vibrating member for producing the vibrational wave through a stretching and contracting motion of the piezoelectric element, the piezoelectric element having at least two sets of electrode groups which comprise plural electrodes and are formed on a surface of said piezoelectric element;  
an oscillation drive circuit having at least two power amplifiers each of which has an output terminal connected to one of said at least two sets of electrode groups formed on said piezoelectric element and which excitationally drives one of said electrode groups independently of the other, and a pre-amplifier having an input terminal and an output terminal, the input terminal being connected to said vibrating member and/or an electrode formed on a surface opposite to a surface on which said at least two sets of electrode groups are formed, the output terminal being connected to input terminals of said at least two power amplifiers, and wherein one of said pre-amplifier and said at least two power amplifiers comprises an inverting amplifier;  
forward/reverse signal generating means for producing a forward/reverse signal to set a rotational direction of said moving member; and  
a switching circuit for selecting at least one of said at least two power amplifiers of said oscillation drive circuit on the basis of the forward/reverse signal outputted from said forward/reverse signal generating means.

**5,770,913**  
**ACTUATORS, MOTORS AND WHEELLESS AUTONOMOUS ROBOTS USING VIBRATORY TRANSDUCER DRIVERS**  
John V. Mizzi, Poughkeepsie, N.Y., assignor to Omnific International, Ltd., Poughkeepsie, N.Y.  
Filed Oct. 23, 1996, Ser. No. 735,713  
Int. Cl.<sup>6</sup> H02K 11/00; 41/04; 7/06  
U.S. Cl. 310—328  
22 Claims



1. A device, comprising:  
a first vibratory transducer;  
a second vibratory transducer orthogonal to said first vibratory transducer;  
means to attach said first vibratory transducer to a driving member;  
further means to attach said second vibratory transducer to said driving member;  
a driven member moved relative to said driving member by said driving member through frictional forces;  
both said first vibratory transducer and said second vibratory transducer driven at an identical frequency with an ability to selectively set the phase relationship between said first vibratory transducer and said second vibratory transducer for the purpose of selecting direction of movement and the speed of said driven member.

**5,770,914**  
**ILLUMINATED PIEZOELECTRIC SWITCH**  
Logan L. Pease, and Raymond G. Bryan, both of Reno, Nev., assignors to International Game Technology, Reno, Nev.  
Continuation of Ser. No. 401,875, Mar. 10, 1995, abandoned.  
This application Jun. 27, 1997, Ser. No. 884,428  
Int. Cl.<sup>6</sup> H01L 41/08  
U.S. Cl. 310—339  
20 Claims



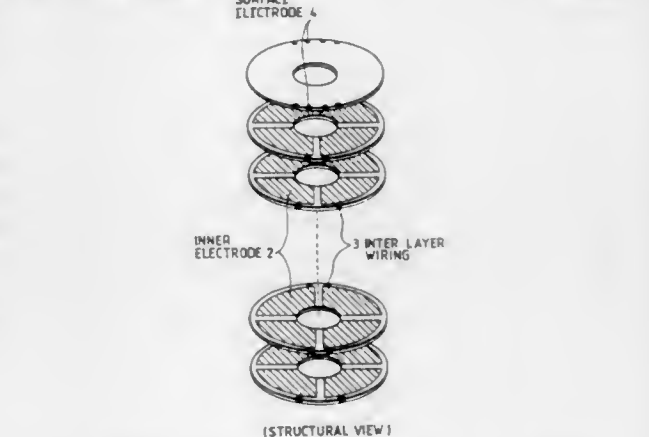
1. A switch assembly comprising:  
a user activation surface for permitting a user to change the state of said switch by pressing said surface, said user activation surface being transparent or translucent;  
a flexible piezoelectric film with first and second surfaces, having at least a first substantially light-conductive region, aligned with at least a portion of said user activation surface, wherein strain produced by flexing of said first region of said piezoelectric film in response to said pressing of said user activation surface by said user produces an electric charge;  
an electronic switch device which is either in a first or a second state, one of said first and second states being a substantially conductive state, and the other of said first and second states being a substantially non-conductive state, said electronic switch including at least a first component mounted on a portion of one of said first and second surfaces of said flexible piezoelectric film spaced from said first region wherein said first component is selected from the group consisting of a transistor, a diode and a discrete capacitor;  
at least a first conductor coupling said first region with said electronic switch, wherein said electric charge produced by said flexing results in said electronic switch changing from said first state to said second state in the absence of using charge produced by flexing a second region of said film for changing state of a second switch; and  
a light source positioned to transmit light through said first region of said piezoelectric film to illuminate said user activation surface.

**5,770,915**  
**TERMINAL FOR A PIEZOELECTRIC DEVICE**  
Manabu Sumita, Toyama; Sigemasa Kusabiraki, Takaoka, and Isao Ikeda, Toyama, all of Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan  
Filed Jul. 31, 1996, Ser. No. 690,534  
Claims priority, application Japan, Jul. 31, 1995, 7-215264  
Int. Cl.<sup>6</sup> H01L 41/08  
U.S. Cl. 310—348  
20 Claims

1. A terminal for a piezoelectric device comprising:  
a contact portion including a base portion and a bent portion, the bent portion extending from the base portion and being folded

over the base portion such that a major surface of the bent portion is disposed opposite to a major surface of the base portion; and  
a lubricant disposed between the base portion and the bent portion, the lubricant containing a hydrophilic group and a lipophilic group.

**5,770,916**  
**LAMINATED PIEZOELECTRIC ELEMENT AND VIBRATION WAVE ACTUATOR**  
Toru Ezaki, Takahiro Yamakawa, Yutaka Maruyama, all of Tokyo, and Nobuyuki Kojima, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, and Nihon Cement Co., Ltd.  
Filed Jan. 24, 1996, Ser. No. 592,859  
Claims priority, application Japan, Jan. 31, 1995, 7-034310  
Int. Cl.<sup>6</sup> H01L 41/08  
U.S. Cl. 310—366  
19 Claims



1. A laminated piezoelectric element formed by laminating a plurality of piezoelectric sheets, sintering the laminated piezoelectric element, and lapping a surface of the laminated piezoelectric element, said laminated piezoelectric element comprising:  
a plurality of surface electrodes formed on the surface of said laminated piezoelectric element, each surface electrode having an area falling within a range of from 0.002 mm<sup>2</sup> to 0.2 mm<sup>2</sup>; and  
a first region on the surface of said laminated piezoelectric element on which said plurality of surface electrodes are formed, excluding said plurality of surface electrodes, and having a level difference which is less than or equal to 20 μm, wherein said plurality of surface electrodes are projected from said first region.

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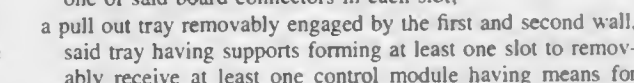
1. An electronic device comprising:  
an electroluminescent light source;  
a battery power source;  
a drive circuit coupled to both the electroluminescent light source and the battery power source that delivers a charge to the electroluminescent light source; and  
the drive circuit recovers at least a portion of the charge delivered to the electroluminescent light source to recharge the battery power source.



**UMI**

adding a first fixed value to a first counter if no errors were detected in said coded super-frame phase value;

## 41 Claims



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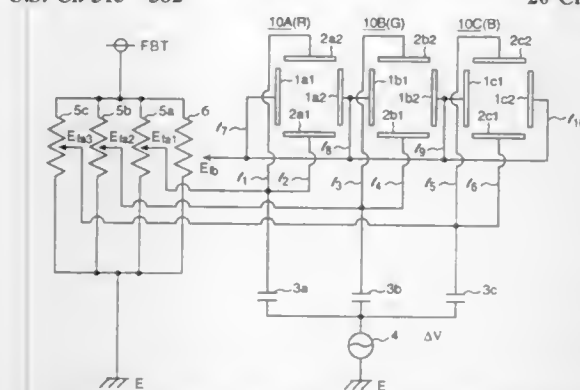
23

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communication of dimmer control levels electrically connected to the board connectors; and  
at least one dimmer module having a chassis receivable in a respective one of said slots in the rack and incorporating mating connectors for the power bus, load connector and board connector associated with the respective one slot, said dimmer module further having a dimmer control circuit including a microcontroller for dimmer level control output, said microcontroller generating dimmer level control output responsive to the dimmer control levels from the communication means.

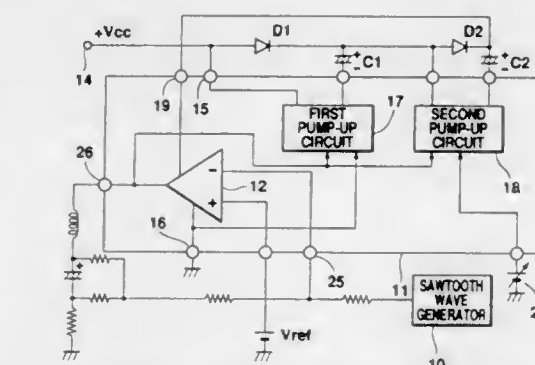
5,770,929  
**ELECTRIC POWER SOURCE ASSEMBLY FOR FOCUSING ELECTRODE OF COLOR CATHODE RAY TUBE APPARATUS**  
Shinji Nohara, Nagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
Filed Aug. 24, 1995, Ser. No. 519,135  
Claims priority, application Japan, Feb. 14, 1995, 7-025339  
Int. Cl.<sup>6</sup> G09G 1/04; H01J 29/46  
U.S. Cl. 315—382 20 Claims



1. An electric power source assembly for focusing electrodes of a color cathode ray tube apparatus, comprising:  
a plurality of electron guns;  
focusing electrode sets, each associated with a said electron gun, for deflecting and focusing electron beams emitted from said guns; and  
electric power source circuit, applying a predetermined voltage to said focusing electrodes, said electric power source circuit separately controlling the voltage applied to the focusing electrodes for each electron gun.

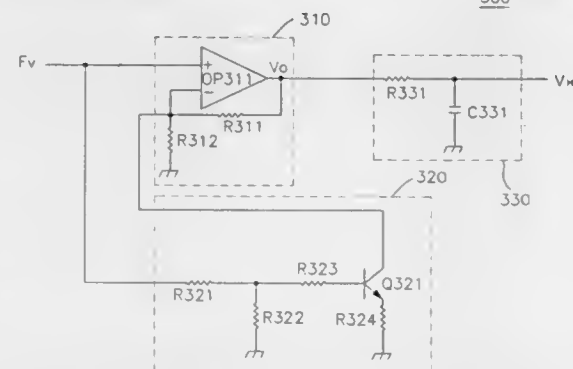
5,770,930  
**VERTICAL DEFLECTING CIRCUIT USING A RAISED SOURCE VOLTAGE**  
Nobuo Itoi, Oizumi-machi, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan  
Filed Jan. 30, 1997, Ser. No. 791,286  
Claims priority, application Japan, Feb. 9, 1996, 8-024253  
Int. Cl.<sup>6</sup> G09G 1/04  
U.S. Cl. 315—403 8 Claims

1. A vertical deflecting circuit which uses a raised source voltage obtained by raising a standard source voltage as a source voltage for a vertical output signal during a fly-back time, comprising:  
a vertical output circuit which amplifies an input sawtooth wave signal and supplies a deflection current to a vertical deflection coil,  
a power source which applies a standard source voltage to the vertical output circuit; and  
a charging pump circuit which raises the standard source voltage to obtain a raised source voltage, the charging pump circuit including  
a first pump-up circuit for raising the standard source voltage from a power source, and



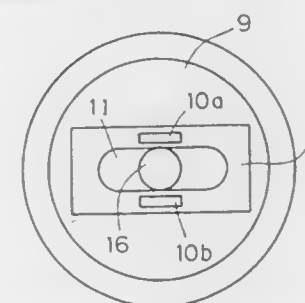
a second pump-up circuit which further raises an output voltage from the first pump-up circuit to obtain the raised source voltage, wherein the vertical output circuit operates at the standard source voltage during a scanning interval of the vertical output signal and at the raised source voltage during the fly-back time of the vertical output signal.

5,770,931  
**CIRCUIT FOR GENERATING A HOLD VOLTAGE OF A MONITOR**  
Sang-Yean Woo, Kyeonggi-Do, Rep. of Korea, assignor to Dae-woo Electronics Co., Ltd., Seoul, Rep. of Korea  
Filed Dec. 27, 1995, Ser. No. 579,198  
Claims priority, application Rep. of Korea, Dec. 27, 1994, 94-37150  
Int. Cl.<sup>6</sup> H01J 29/70  
U.S. Cl. 315—408 4 Claims



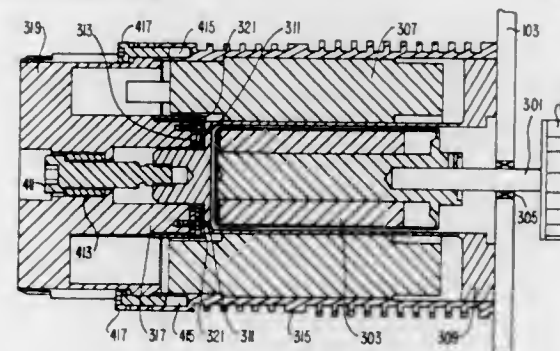
1. A circuit for generating a hold voltage of a monitor comprising:  
a microprocessor for producing a voltage obtained by varying a frequency of an externally-supplied horizontal sync signal;  
a hold voltage generating means for generating a hold voltage in accordance with an output voltage of said microprocessor, including:  
1) an amplifying means for amplifying said output voltage of said microprocessor;  
2) a voltage modifying means for varying an amplifying ratio of said amplifying means to vary an output voltage of said amplifying means in accordance with said output voltage of said microprocessor; and  
3) a shaping means connected to an output side of said amplifying means for smoothing the output voltage of said amplifying means to output it as said hold voltage; and a horizontal deflection means for determining a frequency in accordance with said hold voltage of said hold voltage generating means and said horizontal sync signal, and generating a horizontal deflection signal of triangular wave-form in accordance with the determined frequency.

5,770,932  
**CONVERGENCE CORRECTING DEVICE**  
Takayuki Nakane, Kyoto, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
Filed Aug. 22, 1995, Ser. No. 517,677  
Claims priority, application Japan, Jan. 31, 1995, 7-014018; Mar. 8, 1995, 7-048297  
Int. Cl.<sup>6</sup> H01J 29/70  
U.S. Cl. 313—412 15 Claims



1. A convergence correcting device for correcting convergence of a color image display device comprising:  
a color picture tube, having an inline type electron gun for generating three electron beams along a horizontal deflection axis;  
a deflection yoke for deflecting said three electron beams along said horizontal deflection axis and a vertical deflection axis;  
a subsidiary yoke, composed of a multipolar core, disposed at said electron gun side of said deflection yoke;  
a first pair of magnetic pieces, movable along said horizontal deflection axis, while mutually keeping a first interval, aligned with said electron gun on said horizontal deflection axis;  
a second pair of magnetic pieces, movable along said horizontal deflection axis, while mutually keeping a second interval, aligned on said vertical deflection axis; and  
a base body on which said first pair of magnetic pieces are mounted at said first interval, and said second pair of magnetic pieces are mounted at said second interval, said base body being movable along said horizontal deflection axis; wherein two distances from one and the other of said second pair of magnetic pieces to said electron gun are equal, if moving along said horizontal deflection axis, so that a relative configuration of said first and second pairs of magnetic pieces may be maintained.

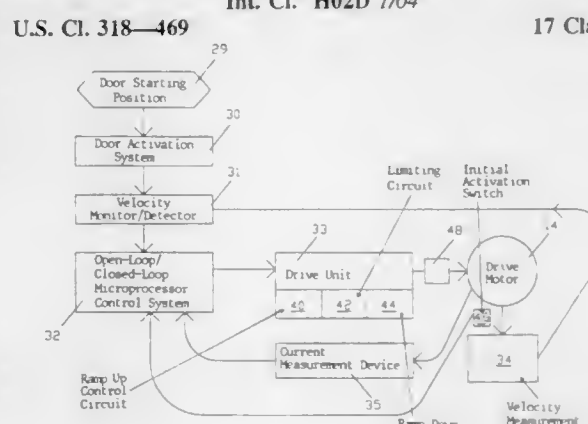
5,770,933  
**BLOWER MOTOR WITH ADJUSTABLE TIMING**  
Donald Glenn Larson, San Diego, and Tom Arthur Watson, Carlsbad, both of Calif., assignors to Cymer, Inc., San Diego, Calif.  
Continuation of Ser. No. 594,571, Jan. 31, 1996, abandoned.  
This application Nov. 13, 1997, Ser. No. 969,387  
Int. Cl.<sup>6</sup> H02K 29/08; H01S 3/22  
U.S. Cl. 318—254 15 Claims



1. A laser gas circulating system, comprising:  
a laser cavity;

at least two discharge electrodes mounted within said laser cavity, said discharge electrodes defining a laser discharge area;  
a fan mounted within said laser cavity, said fan coupled to a drive shaft, said drive shaft extending through an exterior surface of said laser cavity, wherein said fan circulates a gas within said laser cavity through said laser discharge area; and  
a brushless DC motor mounted to said exterior surface of said laser cavity, said motor comprising:  
a rotor coupled to said fan drive shaft;  
a stator surrounding a central axis of said rotor;  
a sealing member interposed between said rotor and said stator, said sealing member partially enclosing said rotor, said sealing member sealed to said exterior surface of said laser cavity, said sealing member preventing said stator from being exposed to said gas;  
a stator housing surrounding said stator;  
a stator housing end cap releasably attached to an end portion of said stator housing, wherein said end cap is finned for improved cooling;  
at least one sensor mounted to said end cap at a location proximate to said rotor and proximate to said stator, said sensor providing rotor position information; and  
an insulator between said sensor and said rotor and said stator, wherein said insulator is fixably attached to said end cap.

5,770,934  
**METHOD FOR THE CLOSED-LOOP CONTROL OF AN AUTOMATIC DOOR WHICH IS PROPELLED BY A DRIVE MOTOR**  
Ulrich Theile, Hagen, Germany, assignor to DORMA GmbH & Co. KG, Ennepetal, Germany  
Filed Dec. 29, 1995, Ser. No. 582,848  
Claims priority, application Germany, May 2, 1994, 44 15 164.0  
Int. Cl.<sup>6</sup> H02D 1/04  
U.S. Cl. 318—469 17 Claims



1. A method for testing the operation of an automatic door, the automatic door including at least one movable door panel and a drive system for moving the at least one movable door panel to permit access through the automatic door, wherein the drive system includes a drive motor, the automatic door includes a control apparatus for controlling the current supplied to the drive motor, and the control apparatus includes a current limiting apparatus for limiting the current supplied to the drive motor during a normal operation of the automatic door to a normal operating motor current limit, said method comprising the steps of:  
a) providing memory means for storing data;  
b) storing in said memory means at least one characteristic of the drive system corresponding to the beginning of at least one movement from rest of the at least one movable door panel;  
c) determining at least one operational characteristic of the drive system, to provide a determined operational characteristic of the drive system, at the beginning of each movement from rest of the at least one movable door panel;



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d) comparing said determined operational characteristic of the drive system as determined in step c) to said at least one characteristic of the drive system corresponding to the beginning of at least one movement from rest of the at least one movable door panel stored in said memory means;

e) if said determined operational characteristic as determined in step c) is outside of at least one given range of said at least one characteristic of the drive system corresponding to the beginning of at least one movement from rest of the at least one movable door panel stored in said memory means in step b), then at least temporarily preventing the drive system from moving the at least one movable door panel;

said step of storing in said memory means at least one characteristic of the drive system comprising the step of setting a desired value of the motor current to a level that is greater than said normal operating motor current limit;

operating the drive motor;

said step of determining at least one operational characteristic of the drive system comprising the step of determining the drive motor current during a first time period  $t_1$ ; and

said step of at least temporarily preventing the drive system from moving the at least one movable door panel comprising the steps of:

verifying that the drive motor current exceeds said normal operating motor current limit during said first time period  $t_1$ ;

setting a desired value of the motor current to a level that is less than said normal operating motor current limit;

determining the drive motor current during a second time period  $t_2$ ; and

if the determined drive motor current does not: (1) have a value that substantially exceeds said normal operating motor current limit during said first time period  $t_1$ ; and (2) have a value that is substantially less than or substantially equal to said normal operating current motor limit during said second time period  $t_2$ , then at least temporarily preventing the drive system from moving the at least one movable door panel.

5,770,935

## DOOR OPENING SYSTEM AND RECEPTACLE

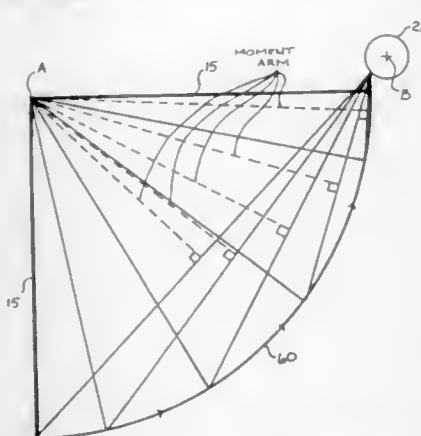
Fred P. Smith, Alpine, and Robert T. Wells, Jr., Moab, both of Utah, assignors to Product Innovations & Sales Co, L.C., Alpine, Utah

Filed Jul. 16, 1996, Ser. No. 680,673

Int. Cl.<sup>6</sup> E05F 15/20; B65D 43/24

U.S. Cl. 318—480

36 Claims



I. A system for moving a door from a normal substantially vertical orientation to a substantially horizontal orientation, said system comprising:

said door having an upper edge mounted to an axis of rotation;

a drive means for moving said door between said substantially vertical orientation and said substantially horizontal orientation, said drive means being spaced apart from said axis of rotation proximate an optimum position for minimizing the

amount of force necessary to move the door from said substantially vertical orientation to said substantially horizontal orientation;

an actuating device for actuating said drive means; and

a moment arm of applied force about the axis of rotation, said moment arm being smallest when said door is disposed in said substantially vertical orientation, and continuously increasing as said door moves toward said substantially horizontal orientation.

5,770,936

## NONCONTACTING ELECTRIC POWER TRANSFER APPARATUS, NONCONTACTING SIGNAL TRANSFER APPARATUS, SPLIT-TYPE MECHANICAL APPARATUS EMPLOYING THESE TRANSFER APPARATUS, AND A CONTROL METHOD FOR CONTROLLING SAME

Junji Hirai, Yoshiji Hiraga, Kenji Hirose, Yuji Nitta, Hiroyuki Hamamoto, and Kenji Nomura, all of Iruma, Japan, assignors to Kabushiki Kaisha Yaskawa Denki, Kitakyushu, Japan

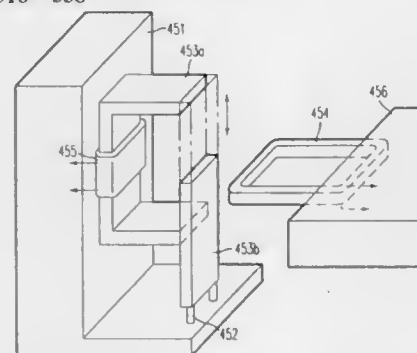
Continuation of Ser. No. 193,009, Feb. 17, 1994, Pat. No. 5,637,973. This application Oct. 3, 1996, Ser. No. 725,171

Claims priority, application Japan, Jun. 18, 1992, 4-159614; Jul. 15, 1992, 4-188306; Dec. 7, 1992, 4-351781

Int. Cl.<sup>6</sup> H02K 23/44

U.S. Cl. 318—538

4 Claims



I. A noncontacting power transfer apparatus for supplying power from a power supplying part to a power receiving part without direct electric contact, said power supplying part and said power receiving part being movable relative to each other, comprising a high-frequency magnetic core having a mechanically openable portion and fixed with respect to said power supplying part, a primary coil wound on said high-frequency magnetic core and connected to a high-frequency alternating power source, and a secondary coil connected to a power receiving load, said secondary coil being moved passing through the mechanically openable portion of said magnetic core, when the portion is opened, to electromagnetically link with a magnetic path in said magnetic core, wherein

said secondary coil is movable relative to said magnetic core in the direction perpendicular to the direction of the axis of said magnetic core,

said mechanically openable portion of said magnetic core comprising a moveable slab of high frequency magnetic material movable in the plane perpendicular to the direction of motion of said secondary coil relative to said magnetic core such that said slab when closed forms a part of a main magnetic path of said magnetic core.

5,770,937

## STEPPING MOTOR DRIVING DEVICE

Yutaka Tsuda, and Hirotake Nozaki, both of Kawasaki, Japan, assignors to Nikon Corporation, Tokyo, Japan

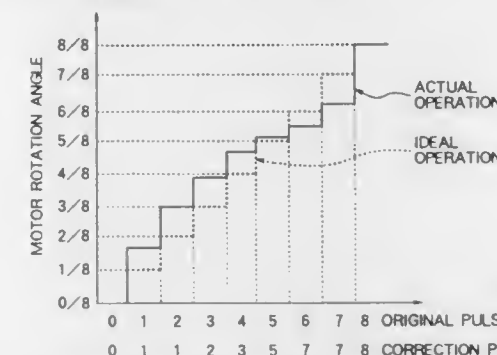
Filed Jul. 11, 1997, Ser. No. 890,800

Claims priority, application Japan, Aug. 21, 1996, 8-219774

Int. Cl.<sup>6</sup> H02P 7/00

U.S. Cl. 318—685

7 Claims



I. A stepping motor driving device which supplies a drive pulse number obtained by dividing a specified number of drive pulses as one basic unit to a stepping motor in order to make the stepping motor perform micro step driving, said stepping motor performing full step driving by receiving said specified number of drive pulses as one group unit, comprising:

- a computing unit for computing ideal moving amounts for driving of said stepping motor depending on a drive pulse number as an integral multiple of said one basic unit by dividing a moving amount when said stepping motor is driven in response to drive pulses of said one group unit;
- a detector for obtaining actual moving amounts when said stepping motor is driven depending on said drive pulse number as an integral multiple of said one basic unit;
- a memory device for storing drive pulse numbers when said stepping motor is actually moved only by a moving amount closest to one of said ideal moving amounts correspondingly to said ideal moving amounts;
- a determining device for determining a drive signal in accordance with a desired moving amount of said stepping motor to be driven and one of said drive pulse numbers stored in said memory device; and
- an output device for outputting said drive signal to said stepping motor.

5,770,938

## REAL TIME CHARGING CONTROL OF A FAST BATTERY CHARGER

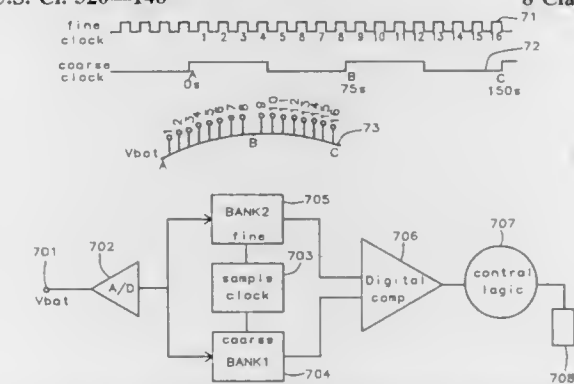
Hsueh-Wu Kao, Hsinchu, Taiwan, assignor to Industrial Technology Research Institute, Hsin-chu, Taiwan

Filed Dec. 9, 1996, Ser. No. 762,485

Int. Cl.<sup>6</sup> H02J 7/02; 7/16

U.S. Cl. 320—148

8 Claims



I. A circuit for detecting when a battery has reached its peak charge and charging must be terminated, comprising:

an analog-to-digital converter with a first input and first output, said analog-to-digital converter changing an analog signal into a digital data;

a digital clocking means with a second and third output, said digital clocking means providing a coarse strobe at said second output and a fine strobe at said third output for latching up data at periodic intervals;

a first register with a second and third input and a fourth output, said second input connected to said first output and said third input connected to said second output, said register latching up and storing digital data;

a second register with a fourth and fifth input and a fifth output, said fourth input connected to said first output and said fifth input connected to said third output, said register latching up and storing digital data;

a digital comparator with a sixth and seventh input and a sixth output, said sixth input connected to said fourth output and said seventh input connected to said fifth output, said digital comparator providing at said sixth output the difference in voltage between said sixth and seventh input, said difference in voltage being negative when the magnitude of said seventh input is less than that of said sixth input;

a control logic with an eighth input and a seventh output, said eighth input connected to said sixth output, said control logic terminating said charging of said battery when said control logic determines that said difference in voltage exceeds a fixed and predetermined amount, and

a battery with a ninth input, said ninth input connected to said first input and said seventh output, said battery being able to accept and deliver electrical charge at said ninth input, wherein a positive going transition of said fine strobe is offset by 180 degrees relative to a positive going transition of said coarse strobe, so that positive transitions of said fine and coarse pulses do not coincide in time.

5,770,939

## PROGRAMMABLE AMPLITUDE RAMP GENERATOR FOR AUTOMOTIVE VOLTAGE REGULATORS

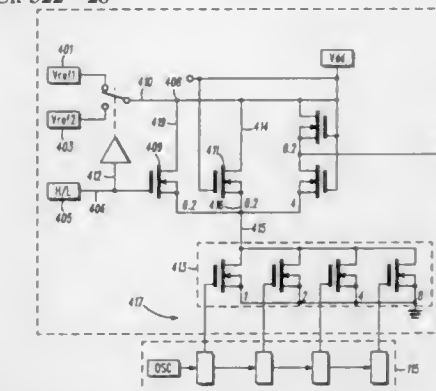
Arthur J. Edwards, Hoffman Estates, Ill., and Nicholas Lee, Toulouse, France, assignors to Motorola Inc., Schaumburg, Ill.

Filed May 30, 1996, Ser. No. 655,793

Int. Cl.<sup>6</sup> H02D 9/30

U.S. Cl. 322—28

5 Claims



I. A voltage regulator useable in an automotive battery charging system, comprising:

- a selection circuit having an output for providing a selection signal having a plurality of states;
- a voltage reference with an output that provides a different reference voltage dependent on each of the plurality of states of the selection signal;
- a resistive device having an input coupled to the output of the voltage reference, and an output;
- a gateable multi-resistive device having an output coupled to the output of the resistive device;
- a coupleable resistive device having an input coupled to the output of the voltage reference and an output coupleable to





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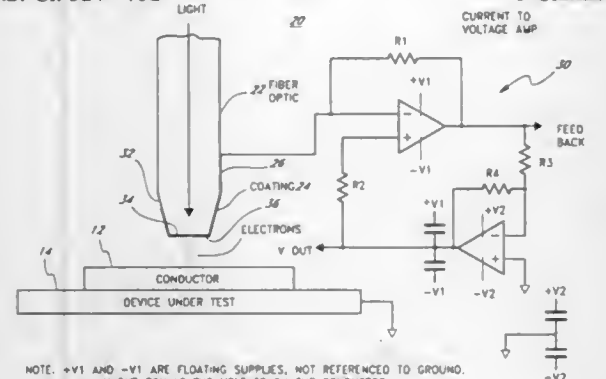
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a power supply for providing electrical power to said data logging processor, said at least two induction sensors, said clocking device and said electric field and magnetic field amplifiers;  
means for deploying said unit to the seafloor; and  
means for retrieving said unit from the seafloor.

5,770,946  
**PHOTON ASSISTED SUB-TUNNELING ELECTRICAL  
PROBE, PROBE TIP, AND PROBING METHOD**  
Joseph M. Patterson, 27901 Perales, Mission Viejo, Calif.  
92692

Continuation-in-part of Ser. No. 240,993, May 19, 1994, Pat.  
No. 5,508,627. This application Feb. 6, 1996, Ser. No. 597,341  
Int. Cl.<sup>6</sup> G01R 31/302

U.S. Cl. 324—752 3 Claims

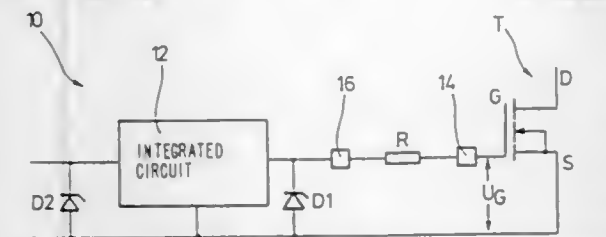


1. An electrical probe comprising:  
a glass substrate having a first surface located within a first plane;  
a photoemissive coating disposed upon said first surface of said glass substrate;  
a light source for generating photons of a selected wavelength and directing said photons in a direction substantially perpendicular to said first plane and toward selected areas of said photoemissive coating such that electron sub-tunneling may be induced between said selected areas of said photoemissive coating and one or more measurement sites; and  
an electrical sensor electrically coupled to said photo-emissive coating for measuring an electrical characteristic of said photoemissive coating when said photons are directed by said light source to said photoemissive coating.

5,770,947  
**ARRANGEMENT FOR TESTING A GATE OXIDE**  
Peter Brauchle, Nehren, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany  
PCT No. PCT/DE94/01199, § 371 Date Mar. 27, 1996, § 102(e)  
Date Mar. 27, 1996, PCT Pub. No. WO95/10785, PCT Pub.  
Date Apr. 20, 1995

PCT Filed Oct. 6, 1994, Ser. No. 619,755  
Claims priority, application Germany, Oct. 13, 1993, 43 34  
856.4

Int. Cl.<sup>6</sup> G01R 31/26  
U.S. Cl. 324—765 6 Claims

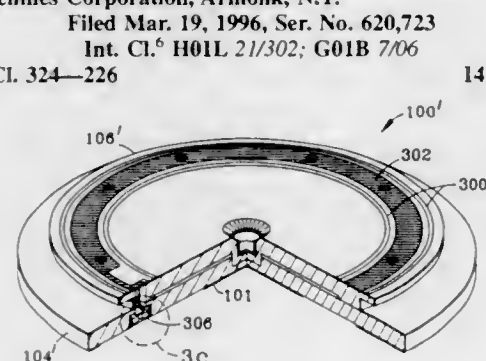


1. A circuit arrangement, comprising: an integrated monocrystalline semiconductor power component having a gate; a first mea-

suring pad; a second measuring pad; and a resistor arranged so that said gate of said power component is connected with said first measuring pad while said first measuring pad is connected with said resistor, said first measuring pad being charged with a gate test voltage which is greater than a gate voltage required for operation of said power component, said power component being integrated with an integrated circuit on a chip, said integrated circuit being connected with said second measuring pad, while said second measuring pad is connected with said resistor, said second measuring pad being charged with an external voltage which is compatible with said integrated circuit.

5,770,948  
**ROTARY SIGNAL COUPLING FOR CHEMICAL  
MECHANICAL POLISHING ENDPOINT DETECTION  
WITH A STRASBAUGH TOOL**  
Leping Li, Poughkeepsie; Steven George Barbee, Dover Plains;  
Arnold Halperin, Cortlandt Manor, all of N.Y.; Richard  
Mars Ruggiero, Danbury, Conn., and William Joseph  
Surovic, Carmel, N.Y., assignors to International Business  
Machines Corporation, Armonk, N.Y.

Filed Mar. 19, 1996, Ser. No. 620,723  
Int. Cl.<sup>6</sup> H01L 21/302; G01B 7/06  
U.S. Cl. 324—226 14 Claims



1. An apparatus for rotary signal coupling in in-situ monitoring of a chemical-mechanical polishing process by a polisher, comprising:  
a sensor fixed to a rotatable wafer carrier for creating a signal responsive to the chemical mechanical polishing process;  
at least one conductor coupled to the sensor for receiving the signal, the conductor fixed to the rotatable wafer carrier;  
a contact coupled to the conductor, the contact fixed to a stationary drive arm; and  
signal transfer means coupled to the contact for transferring the signal to a monitoring means.

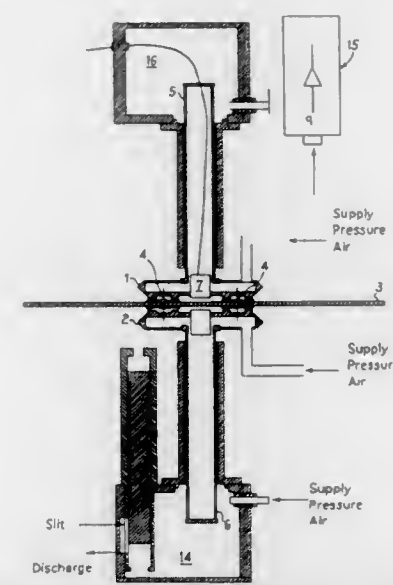
5,770,949  
**DEVICE FOR ON-LINE MEASURING OF THE  
THICKNESS OF A CONTINUOUSLY PRODUCED SHEET**  
Marziano Sgro, Buccinasco, Italy, assignor to Aeonis Systems Italia S.r.l., Italy

PCT No. PCT/IT95/00067, § 371 Date Nov. 4, 1996, § 102(e)  
Date Nov. 4, 1996, PCT Pub. No. WO95/30877, PCT Pub.  
Date Nov. 16, 1995

PCT Filed May 5, 1995, Ser. No. 737,046  
Claims priority, application Italy, May 10, 1994, MI94 A  
0915

Int. Cl.<sup>6</sup> G01B 7/06; 13/06; 13/12; D21F 7/06  
U.S. Cl. 324—229 3 Claims

1. A measuring device for scanning from edge to edge and measuring the thickness of an industrial continuous sheet, comprising: upper and lower disk-shaped hollow sensing heads facing each other on the opposite sides of the sheet, said sensing heads being pressurized by compressed air from an external source, and being separated from the continuous sheet surfaces by air layers produced by multiple air cushions, wherein said sensing heads are mounted on pistons which slide along a path perpendicular to the sheet plane and are guided by the bore of a pipe connected to a

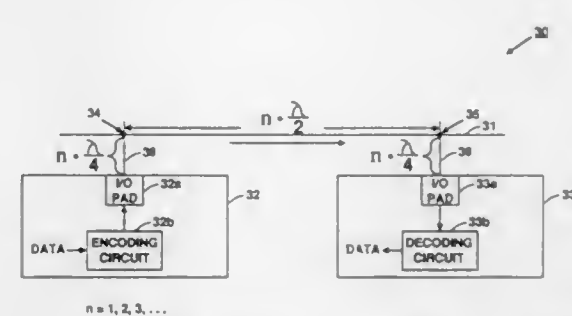


sealed rear chamber housing the rear portion of each associated piston; each sensing head being equipped with a magnetic sensor centrally located which generates a signal proportional to the distance between the sensing heads from which a measurement of thickness of the sheet can be derived; each sensing head further comprising a number of air cushions placed on its base facing the sheet and symmetrically located at a suitable distance around the center to leave enough space for the central magnetic element to be out of the air cushion pressure fields; each air cushion being formed of an air jet outcoming from a calibrated hole located at the center of a circular recessed land surrounded by a flange-shaped annular barrier protruding toward the sheet, the annular barrier having a base next to the sheet surface shaped as a flat annular band extending outwardly in the radial direction so that its area is substantially larger than the area of the inner recessed land; the annular band and the contiguous sheet surface forming an extended restricted passage for the air escaping outwardly causing a relevant pressure drop due to laminar friction and a substantial concurrent compression caused by air velocity decrease due to the radial structure of the air stream so that the air cushion pressure pattern is mainly determined by said two phenomena, and the effective air cushion region being delimited by the outer periphery of the annular band, said two phenomena producing opposite effects to compensate variations of fed air pressure around its nominal value, whereby no variation of repulsive force exerted by the air cushions at constant air cushion is produced; said repulsive force acting on the upper sensing head being counteracted by the weight of the upper sensing head-piston assembly, with the associated rear chamber being open to the ambient pressure, whereas said repulsive force acting on the lower sensing head being counteracted by the action of the lower sensing head piston caused by the pressurized air in the associated rear chamber maintained at constant pressure by a pressure regulator such that a net upward, sheet-approaching force applied to the lower sensing head equals the downward, sheet-approaching force applied to the upper sensing head.

5,770,950  
**MINIMIZING SIGNAL REFLECTION ALONG A  
TRANSMISSION LINE WITHOUT TERMINATING THE  
TRANSMISSION LINE**  
Daniel F. Zurcher, and Ralph P. Trefney, both of Morgan Hill,  
Calif., assignors to Cisco Systems, Inc., San Jose, Calif.

Filed Sep. 28, 1995, Ser. No. 535,899  
Int. Cl.<sup>6</sup> H03K 19/0175  
U.S. Cl. 326—30 20 Claims

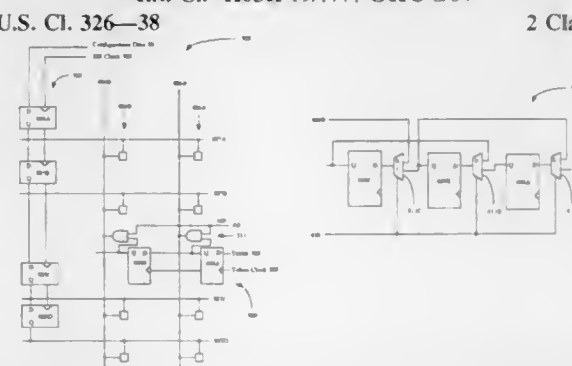
15. A data transmission system, comprising:  
(A) a transmission line that is not terminated at its ends;  
(B) a first data transmission device coupled to the transmission line at a first point;



- (C) a second data transmission device coupled to the transmission line at a second point, wherein a distance between the first and second points is substantially proportional to a wavelength of a predetermined frequency;  
(D) a data encoding circuit in a first data transmission device, the data encoding circuit encoding data to be transmitted from the first device to the second device such that energy of the encoded data is substantially concentrated around the predetermined frequency to minimize the signal reflection without terminating the transmission line.

5,770,951  
**CONFIGURATION TO ELIMINATE SIGNAL  
CONTENTION DURING RECONFIGURATION**  
Edmond Y. Cheung, San Jose, and Charles R. Erickson, Fremont, both of Calif., assignors to Xilinx, Inc., San Jose, Calif.

Continuation of Ser. No. 569,758, Dec. 8, 1995, abandoned, which is a division of Ser. No. 375,763, Jan. 20, 1995, Pat. No. 5,592,105. This application Apr. 23, 1997, Ser. No. 847,326  
Int. Cl.<sup>6</sup> H03K 19/177; G11C 8/04  
U.S. Cl. 326—38 2 Claims



1. A method for accessing data in a logic device including the steps of:  
arranging a plurality of memory cells in sets;  
selecting one of a plurality of directions for programming said plurality of memory cells; and  
programming said plurality of memory cells one set at a time in a selected direction.

5,770,952  
**TIMER THAT PROVIDES BOTH SURVEYING AND  
COUNTING FUNCTIONS**  
Kuo-Cheng Yu, Hsinchu, Taiwan, assignor to Holtek Microelectronics Inc., Hsinchu, Taiwan

Filed Jun. 13, 1995, Ser. No. 489,778  
Int. Cl.<sup>6</sup> H03K 5/135  
U.S. Cl. 327—31 8 Claims

1. A timer which provides both surveying and counting functions comprising:  
a counter, a multiplexer, an edge-triggered controller, a time-base latching circuit and a pulse-detecting circuit;

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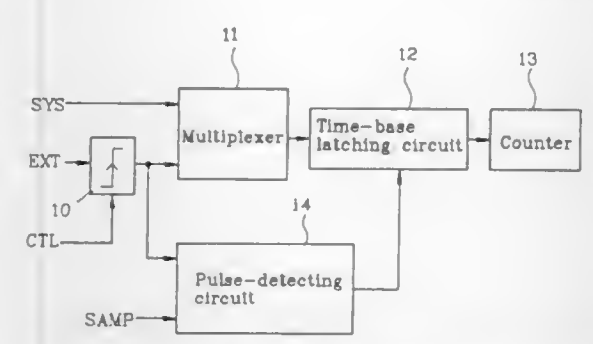
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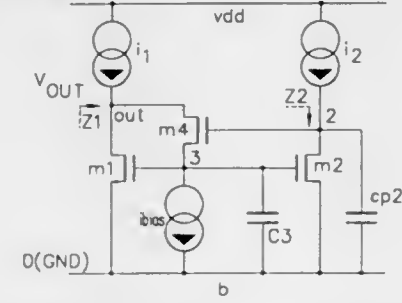
1998

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said multiplexer being provided with input terminals to receive signal from a system clock and output triggering signal from said edge-triggered controller;  
said pulse-detecting circuit being provided with input terminals to receive a sampling signal and said output triggering signal from said edge triggered controller;  
said pulse-detecting circuit being provided with an output terminal for sending out an enabling signal to be transmitted to said time-base latching circuit; said multiplexer also being provided with an output terminal for sending a clock signal to said time-base latching circuit;  
said time-base latching circuit being connected with said counter to generate an output required.

5,770,954  
CURRENT COMPARATOR WITH INTRINSIC LIMITATION OF ABSORPTION TO THE LOWEST CURRENT LEVEL  
Alfredo Tomasini, Acquiterme; Gianluca Colli, Sannazzaro de' Burgondi, and Ernestina Chioffi, Pavia, all of Italy, assignors to SGS-Thomson Microelectronics, S.r.l., Agrate Brianza, Italy  
Filed Oct. 9, 1996, Ser. No. 728,396  
Claims priority, application European Pat. Off., Oct. 19, 1995, 95830420  
Int. Cl.<sup>6</sup> H03K 5/22  
U.S. Cl. 327-63 25 Claims







VOL

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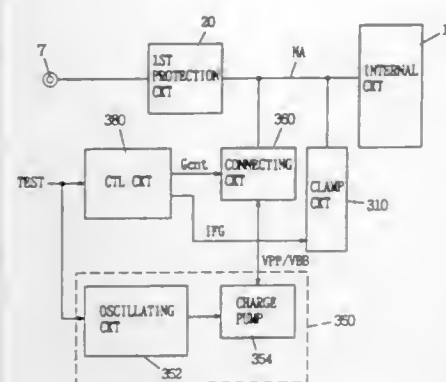
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node, for clamping potential at said internal node at a first prescribed potential level; and control means responsive to a test mode designating signal for generating and applying to said first clamping means, a control signal for inhibiting clamping operation of said first clamping means regardless of the voltage level at said internal node when said test mode designating signal is active.

5,770,965

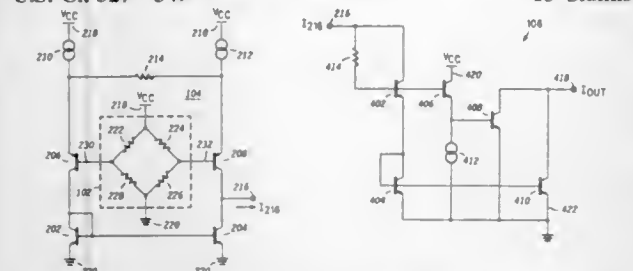
**CIRCUIT AND METHOD OF COMPENSATING FOR NON-LINEARITIES IN A SENSOR SIGNAL**

George B. Gritt, Jr., Mesa, and Ira E. Baskett, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 30, 1996, Ser. No. 722,407

Int. Cl.<sup>6</sup> G06F 7/556

U.S. Cl. 327—349



10. An integrated sensing device, comprising:  
a transducer having an output for providing a transducer signal in response to a physical state where the transducer signal has a non-linear component; and  
a squaring circuit having an input coupled for receiving the non-linear component of the transducer signal and providing a correction signal as a function of a square of the transducer signal to compensate for the non-linear component of the transducer signal to provide a substantially linear output signal of the integrated sensing device.

5,770,966

**AREA-EFFICIENT IMPLICATION CIRCUITS FOR VERY DENSE LUKASIEWICZ LOGIC ARRAYS**

Jonathan W. Mills, Bloomington, Ind., assignor to Indiana University Foundation, Bloomington, Ind.

Continuation of Ser. No. 887,711, May 22, 1992, abandoned.

This application Jan. 15, 1997, Ser. No. 783,196

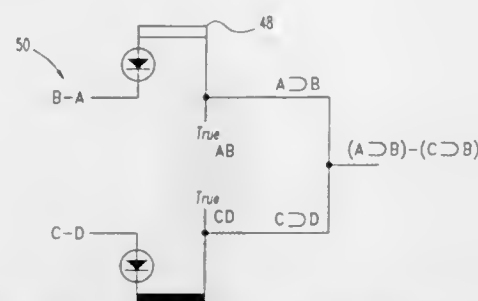
Int. Cl.<sup>6</sup> H03K 3/02

U.S. Cl. 327—355

10 Claims

1. An analog logic circuit for implementing a paired implication logic function wherein an analog output signal is produced for the analog logic equation  $(A \rightarrow B) \cdot (C \rightarrow D)$  wherein A, B, C and D represent analog current signals, said circuit comprising:

a first signal source that produces a first TRUE reference current;  
a second signal source that produces a second TRUE reference current;



a first current mirror having a first input and a first output, wherein the A and the B analog current signals are both supplied to said first input of said first current mirror and said first TRUE reference current is supplied to said first output;  
a second current mirror having a second input and a second output, wherein the C and the D analog current signals are both supplied to said second input of said second current mirror and said second TRUE reference current is supplied to said second output; and  
a third current mirror having a third input and a third output, wherein said third input is connected to said second output and said third output is connected to said first output to provide a circuit output producing the analog output signal corresponding to the equation  $(A \rightarrow B) \cdot (C \rightarrow D)$ .

5,770,967

**DEVICE AND METHOD FOR CONTROLLING A POWER SWITCH**

Angelo Alzati, and Aldo Novelli, both of Milan, Italy, assignors to SGS-Thomson Microelectronics S.r.l., Agrate Brianza, Italy

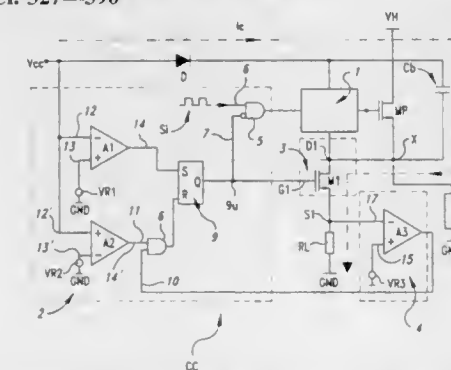
Filed Jan. 31, 1996, Ser. No. 594,707

Claims priority, application European Pat. Off., Jan. 31, 1995, 95830026

Int. Cl.<sup>6</sup> H03K 17/16

U.S. Cl. 327—390

20 Claims



1. A circuit for controlling, with assistance from a boost capacitor, a power transistor having control and drive terminals, said circuit comprising:

a first boost-capacitor terminal coupled to said drive terminal;  
a first current-flow control circuit coupled between a first power supply terminal and a second boost-capacitor terminal;  
a drive circuit having an output coupled to said control terminal, a first supply terminal coupled to said first boost-capacitor terminal, a second supply terminal coupled to said second boost-capacitor terminal, and an input;  
a control logic circuit having an input terminal coupled to receive a control signal, an output coupled to said input of said drive circuit, a control input, and a control output, said control logic circuit operable to disable said drive circuit until said boost capacitor is charged to a desired value;  
a charge circuit having an input coupled to said first boost-capacitor terminal, a sense output, and a control input coupled to said control output of said control logic circuit; and

a charge measuring circuit having an input coupled to said sense output, and having an output coupled to said control input of said control logic circuit.

5,770,968

**DIFFERENTIAL AMPLIFIER WITH PROXY LOAD FOR CONTROL OF OUTPUT COMMON MODE RANGE**

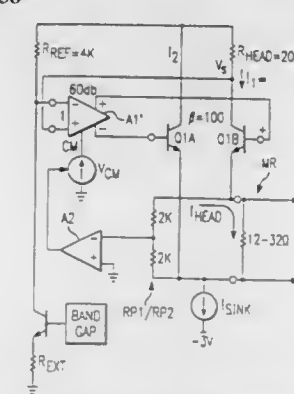
Scott Warren Cameron, Milpitas, Calif., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Filed Dec. 30, 1994, Ser. No. 366,790

Int. Cl.<sup>6</sup> G11B 5/02; H03F 3/45

U.S. Cl. 327—538

5 Claims



1. A integrated control loop circuit, comprising:  
first and second transistors forming first and second regulated current sources, having respective first current-carrying terminals connected to opposite ends of a load element;  
a first differential amplifier connected to apply a differential signal to respective control terminals of said first and second transistors, said differential amplifier being operatively connected to sense and control the current into one end of said load element;  
a second differential amplifier connected to monitor the voltage of at least one point of said load element, and operatively connected to control the common-mode voltage of said first amplifier accordingly; and  
a current generator connected to draw a substantially constant current from the other end of said load element.

5,770,969

**CONTROLLABLE DECOUPLING CAPACITOR**

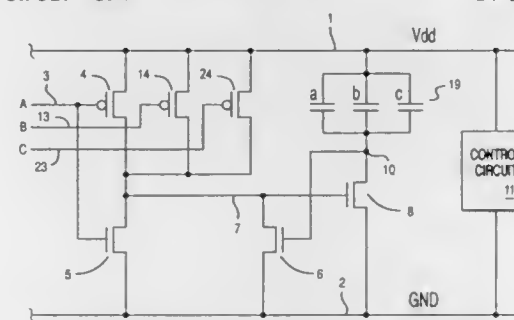
Lloyd Andre Walls; Byron Lee Krauter, both of Austin, Tex., and Stanley Everett Schuster, Granite Springs, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 22, 1995, Ser. No. 518,083

Int. Cl.<sup>6</sup> H03K 17/16

U.S. Cl. 327—594

14 Claims



1. An integrated circuit having a plurality of discrete decoupling capacitors connected in parallel with their input connected to a voltage supply, comprising:  
switching means for connecting an output of said plurality of decoupling capacitors to a reference potential;

feedback means for providing an input, based on a state of said plurality of decoupling capacitors, to said switching means, wherein said switching means disconnects said decoupling capacitors when said input indicates that at least one of said discrete decoupling capacitors has failed by causing an electrical short circuit; and  
means for controlling a voltage level of said input to said switching means in order to selectively connect said decoupling capacitors to said reference potential, and for determining whether said failed one of said discrete decoupling capacitors has changed to an open circuit condition, wherein a remainder of the plurality of discrete decoupling capacitors are reconnected to said reference potential and provide decoupling capacitance to said integrated circuit.

5,770,970

**TRANSMITTER OF WIRELESS SYSTEM AND HIGH FREQUENCY POWER AMPLIFIER USED THEREIN**

Hikaru Ikeda, Yokohama; Hiroaki Kosugi, Hirakata; Kaoru Ishida, Shijonawate; Nobuo Fuse, Moriguchi; Hideki Yagita, Yokohama, and Hiroshi Haruki, Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

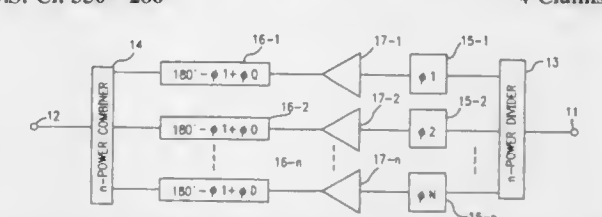
Filed Aug. 30, 1996, Ser. No. 705,244

Claims priority, application Japan, Aug. 30, 1995, 7-221335

Int. Cl.<sup>6</sup> H03F 3/60; 3/68

U.S. Cl. 330—286

4 Claims



1. A high frequency power amplifier of transmitting device of wireless system comprising:  
an n-power divider having n outputs of same phase change amounts for one input,  
n input phase shifters for receiving the outputs of said n-power divider, of which phase change amounts are respectively  $\phi_1, \phi_2, \dots, \phi_n$ ,  
n power amplifiers having same characteristics, for receiving the outputs of said n input phase shifters, n output phase shifters for receiving the corresponding outputs of said n power amplifiers corresponding to said input phase shifters, of which phase change amounts are respectively  $(180^\circ - \phi_1 + \phi_0), (180^\circ - \phi_2 + \phi_0), \dots, (180^\circ - \phi_n + \phi_0)$ , with the fixed phase amount to be  $\phi_0$ , and  
an n-power combiner having same phase change amounts for n inputs from said n output phase shifters, and having one output by synthesizing n inputs.

5,770,971

**DISTORTION COMPENSATION CONTROL FOR A POWER AMPLIFIER**

John Duncan McNicol, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jul. 26, 1996, Ser. No. 690,434

Int. Cl.<sup>6</sup> H03F 3/66; 1/26

U.S. Cl. 330—52

19 Claims

1. A distortion compensation circuit for a power amplifier comprising:  
an input path for forwarding a combined signal to said amplifier to form an amplified signal, said combined signal comprising at least one carrier and a reference signal;  
a compensation path for producing a compensation signal for compensating for the distortion produced by said amplifier;  
a control unit;





(f) an oscillator controlling said source of combine signals and said means providing an IF input.

5,770,978

**CURRENT TYPE RING OSCILLATOR, AND VOLTAGE-CONTROLLED OSCILLATOR HAVING CURRENT TYPE RING OSCILLATOR**

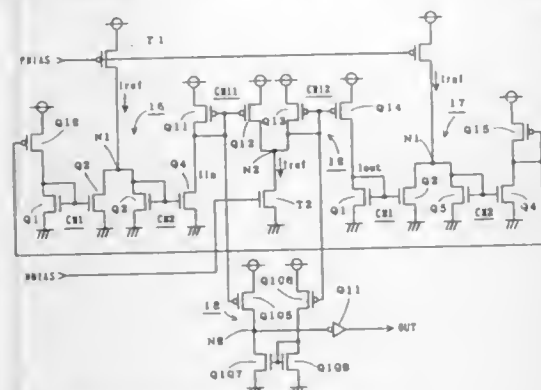
Harufusa Kondoh, and Hiromi Notani, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 544,280, Oct. 17, 1995, Pat. No. 5,656,954. This application Mar. 6, 1997, Ser. No. 812,694

Claims priority, application Japan, Nov. 17, 1994, 6-283841 Int. Cl.<sup>6</sup> H03B 5/02

U.S. Cl. 331—57

2 Claims



1. A current type ring oscillator comprising: a first power source and a second power source; and first to N-th ( $N \geq 3$ , N being an odd number) current type inverter circuits, wherein odd numbered of said current type inverter circuits each include,

first reference current supply means having one end which is connected to said first power source and the other end for supplying a first reference current, said first reference current supply means receiving a first control signal from outside, the current quantity of said first reference current being set based on said first control signal,

a first current mirror circuit having a first input part for receiving an input current and a first output part which is connected to the other end of said first reference current supply means so as to supply a first intermediate output current, whose current quantity is in proportion to that of said input current, between said first output part and said second power source, and

a second current mirror circuit having a second input part which is connected to the other end of said first reference current supply means and a second output part for carrying an output current so as to supply said output current, whose current quantity is in proportion to that of a first intermediate input current which flows between said second input part and said second power source, between said second output part and said second power source,

wherein even numbered of said current type inverter circuits each include,

second reference current supply means having one end which is connected to said second power source and the other end for supplying a second reference current, said second reference current supply means receiving a second control signal from outside, the current quantity of said second reference current being set based on said second control signal, a third current mirror circuit having a first input part for receiving an input current and a first output part which is connected to the other end of said second reference current supply means so as to supply a second intermediate output current, whose current quantity is in proportion to that of said input current, between said first output part and said first power source, and

a fourth current mirror circuit having a second input part which is connected to the other end of said second reference current supply means and a second output part for carrying an output current so as to supply said output current between said second output part and said first power source, the current quantity of said output current is in proportion to that of a second intermediate input current which flows between said second input part and said first power source,

wherein in said first to said N-th current type inverter circuits, a second output part of said i-th ( $1 \leq i \leq (N-1)$ ) current type inverter circuit is connected to a first input part of said (i+1)-th current type inverter circuit,

and said current type ring oscillator further comprises,

a connection circuit having a first connection part and a second connection part, said first connection part being connected to said second output part of said N-th current type inverter circuit, said second connection part being connected to said first input part of said first current type inverter circuit, said connection circuit supplying a current between said first power source and said first input part of said first current type inverter circuit as said input current to said first current type inverter circuit, the current quantity of said input current is in proportion to that of said output current from said N-th current type inverter circuit; and voltage output means for receiving said output current from said second output part of one of said first to said N-th current type inverter circuits, said voltage output means performing current/voltage conversion on said output current to output a voltage output signal.

5,770,979

**PROGRAMMABLE OSCILLATOR USING ONE CAPACITOR**

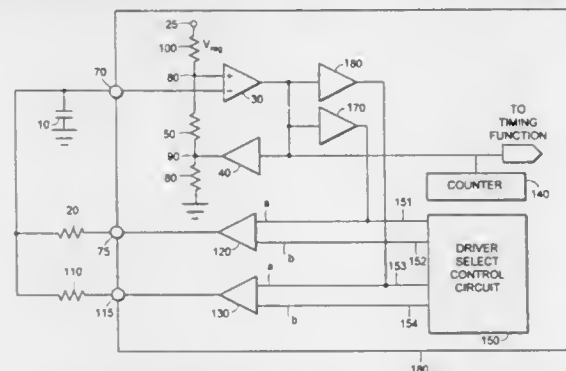
Frank J. Kolanko, Greenville, R.I., and Donald R. Laybourn, Novi, Mich., assignors to Cherry Semiconductor Corporation, East Greenwich, R.I.

Filed Nov. 13, 1996, Ser. No. 748,337

Int. Cl.<sup>6</sup> H03B 5/24

U.S. Cl. 331—111

19 Claims



1. A programmable oscillator with first and second switching frequencies, the programmable oscillator comprising:

a first resistor terminal for coupling to a first resistor; a second resistor terminal for coupling to a second resistor; a capacitor terminal for coupling to a capacitor; a switching circuit, coupled to the capacitor terminal to be responsive to a capacitor voltage at the capacitor terminal, the switching circuit having first and second stable states; a first driver circuit, having a first input coupled to the switching circuit and having a second input, to provide at the first resistor terminal: a first drive voltage only when the switching circuit is in the first state and when a high control impedance path is provided between the second input of the first driver circuit and a ground; a first low impedance path to the ground only when the switching circuit is in the second state and when the high control impedance path is provided between the second input of the first driver circuit and the ground; and a first high impedance path to the ground when the first and

second inputs of the first driver circuit are at a low voltage with respect to the ground; and a second driver circuit, having a first input coupled to the switching circuit and having a second input, to provide at the second resistor terminal: a second drive voltage only when the switching circuit is in the first state and when the high control impedance path is provided between the second input of the second driver circuit and the ground; a second low impedance path to the ground only when the switching circuit is in the second state and when the high control impedance path is provided between the second input of the second driver circuit and the ground; and a second high impedance path to the ground when the first and second inputs of the second driver circuit are at a low voltage with respect to the ground.

5,770,980

**FAST STARTING OSCILLATOR**

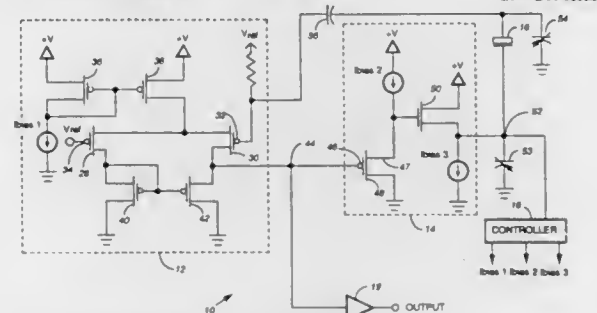
Raymond Louis Barrett, Jr., Ft. Lauderdale; John Wayne Simmons, Tamarac; Barry Herold, Boca Raton, and Grazyna A. Pajunen, Delray Beach, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 23, 1996, Ser. No. 773,244

Int. Cl.<sup>6</sup> H03B 5/06; 5/36

U.S. Cl. 331—116 FE

19 Claims



1. A fast starting oscillator, comprising: an amplifier having an input, an output, and a voltage gain; a source follower circuit having an input, an output and an output impedance that is selectable substantially independently of the gain of the amplifier, the output of the amplifier being coupled to the input of the source follower circuit; and an electro-mechanical resonator tuned to resonate at a selected frequency and coupled between the input of the amplifier and the output of the source follower circuit, wherein the combination of the voltage gain of the amplifier and the output impedance of the source follower circuit is selected to provide fast start-up of oscillations at the selected frequency.

5,770,981

**COMPOSITE MICROWAVE CIRCUIT MODULE HAVING A PSEUDO-WAVEGUIDE STRUCTURE**

Takao Koizumi, and Yuhei Kosugi, both of Tokyo, Japan, assignors to NEC Corporation, Japan

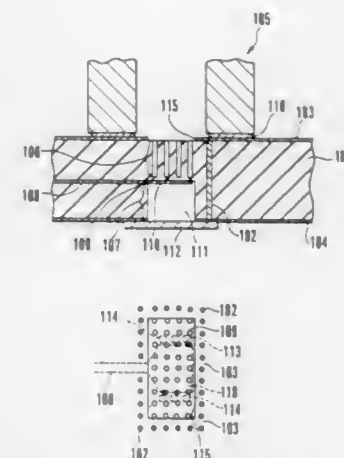
Filed Mar. 28, 1996, Ser. No. 625,715

Claims priority, application Japan, Mar. 31, 1995, 7-075098 Int. Cl.<sup>6</sup> H01P 5/107

U.S. Cl. 333—26

8 Claims

8. A composite microwave circuit module comprising: a multilayer dielectric substrate; upper- and lower-surface grounds provided on upper and lower surfaces of said multilayer dielectric substrate, respectively, said upper-surface ground having an opening portion for waveguide coupling; an antenna pattern disposed on an interlayer of said multilayer dielectric substrate comprised of a high-frequency signal line in correspondence with the opening portion;



a plurality of shield via holes provided surrounding said antenna pattern, the shield via holes including a filling of a filler material to define a pseudo waveguide structure; a large number of first holes having cavities provided in said multilayer dielectric substrate in correspondence with said pseudo waveguide structure between said antenna pattern and the opening portion of said upper-surface ground; a waveguide electrically and physically connected to the opening portion of said upper-surface ground and coupled to said pseudo waveguide structure; and a pressurized anisotropic conductive film electrically connecting the opening portion of said upper-surface ground to said waveguide.

5,770,982

**SELF ISOLATING HIGH FREQUENCY SATURABLE REACTOR**

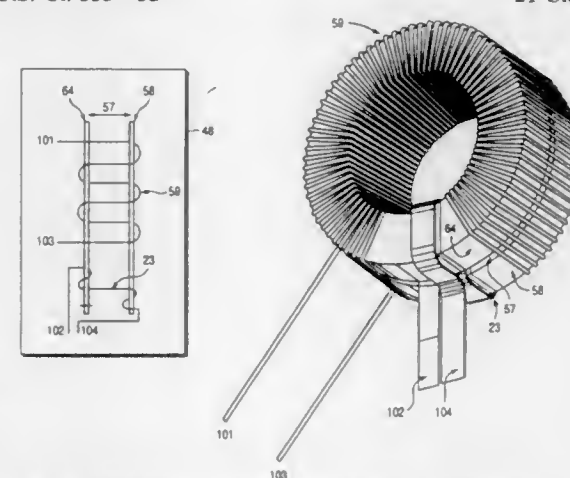
James A. Moore, Powell, Tenn., assignor to Sematech, Inc., Austin, Tex.

Filed Oct. 29, 1996, Ser. No. 739,340

Int. Cl.<sup>6</sup> K03H 7/38; H01F 21/00

U.S. Cl. 333—32

21 Claims



10. An apparatus for impedance matching, comprising: an impedance transformer for matching a resistance; and a saturable reactor for matching a reactive impedance coupled to said impedance transformer, said saturable reactor further comprises: a plurality of magnetic cores where each core has a physical symmetry and a closed magnetic path; a control winding, said control winding is wired in an aiding configuration around said plurality of magnetic cores; and a RF winding, said RF winding is wired in an opposing configuration through said plurality of magnetic cores.



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**5,770,983**  
**REDUCED LENGTH TUNED FILTER HAVING**  
**TRANSVERSE ORIENTED COILS**Joseph A. Zennaro, Jr., Skaneateles, and Joseph N. Maguire,  
Syracuse, both of N.Y., assignors to Eagle Comtronics, Inc.,  
Clay, N.Y.

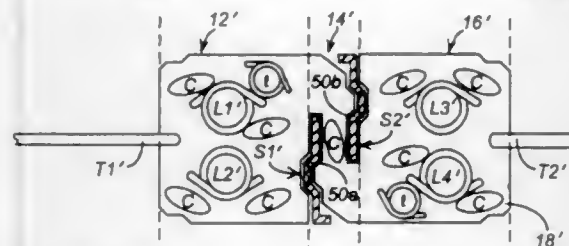
Continuation of Ser. No. 948,417, Sep. 22, 1992, abandoned.

This application Dec. 12, 1996, Ser. No. 764,507

Int. Cl.<sup>6</sup> H03H 7/01

U.S. Cl. 333—168

6 Claims



1. A tuned filter, comprising: a single circuit board having a defined length and width and first and second opposed major surfaces both being substantially parallel to a single plane; an input terminal and an output terminal connected to first and second ends of said single circuit board, respectively, wherein said input and output terminals are located on a centerline passing through a longitudinal direction aligned along the length of said single circuit board, said centerline having a direction that is parallel to said plane; a first filter section comprising a first pair of tunable coils mounted on one of said first and second opposed major surfaces of said single circuit board along a first line transverse and substantially perpendicular to the centerline in a central region of the first filter section; a second filter section comprising a second pair of tunable coils mounted on said one of said first and second opposed major surfaces of said single circuit board along a second line transverse and substantially perpendicular to the centerline in a central region of the second filter section wherein said first and second pairs of tunable coils are mounted on opposite sides of said centerline and substantially perpendicular to said plane in a common direction extending away from said plane and wherein all of said tunable coils are tuned to substantially the same frequency to effect a notch at said frequency.

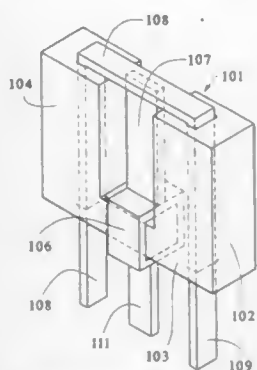
**5,770,984**  
**FILTER FORMED WITH A ONE PIECE U-SHAPE**  
**FERRITE CORE**Michael P. Raleigh, Buffalo Grove, and Thomas McCartney,  
Lake Bluff, both of Ill., assignors to Corcom, Inc., Liber-  
tyville, Ill.

Filed Aug. 23, 1996, Ser. No. 701,843

Int. Cl.<sup>6</sup> H03H 7/09

U.S. Cl. 333—185

6 Claims



1. An EMI filter comprising:

a U-shaped core formed of magnetic material having high permeability, said U-shaped core formed with first and second legs which are parallel and are joined at only one end by a third leg;

a grounding and shorting means formed about said third leg between said first and second legs;  
an electrical conductor with a first portion which extends through said first leg and has a second portion which extends between the second ends of said first and second legs and has a third portion which extends through said second leg; and  
a capacitor connected between said grounding and shorting means and said second portion of said electrical conductor.

**5,770,985**  
**SURFACE ACOUSTIC WAVE FILTER**Tadamasa Ushiroku, and Hideharu Ieki, both of Nagaokakyo,  
Japan, assignors to Murata Manufacturing Co., Ltd., Japan  
Continuation of Ser. No. 272,151, Jul. 8, 1994, abandoned.

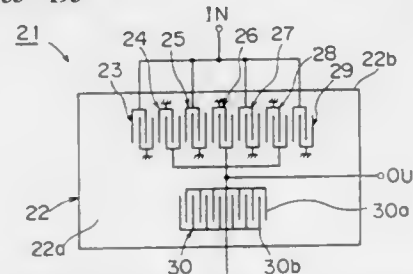
This application Jun. 27, 1996, Ser. No. 671,086

Claims priority, application Japan, Jul. 8, 1993, 5-169001

Int. Cl.<sup>6</sup> H03H 9/64

U.S. Cl. 333—193

10 Claims



1. A surface acoustic wave filter having an input end and an output end, said filter comprising:

a piezoelectric substrate;

a plurality of interdigital transducers located on said piezoelectric substrate and arranged along a surface wave propagation direction in a surface wave propagating region, said plurality of interdigital transducers forming a surface acoustic wave filter part having a pass band and having input and output sides directly coupled to said input and output ends of said surface acoustic wave filter, respectively; and

a one-port SAW resonator, having at least one interdigital transducer and being connected at least between one of said input and output sides of said surface acoustic wave filter part and a ground potential, said one-port SAW resonator being located in a region of the piezoelectric substrate other than said surface wave propagating region.

a resonance frequency of said one-port SAW resonator being set at a frequency region lower than the pass band of said surface acoustic wave filter part.

**5,770,986**  
**STRIPLINE FILTER WITH A STRIPLINE-FORMED**  
**PARALLEL CAPACITOR**Ken Tonegawa, Kyoto; Harufumi Mandai, Takatsuki, and  
Teruhisa Tsuru, Kameoka, all of Japan, assignors to Murata  
Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Jun. 7, 1995, Ser. No. 478,388

Claims priority, application Japan, Jun. 14, 1994, 6-132039

Int. Cl.<sup>6</sup> H01P 1/203

U.S. Cl. 333—204

17 Claims

10. Apparatus for filtering a signal comprising:

a first dielectric substrate having first and second opposing surfaces;

an input electrode and an output electrode formed on said first dielectric substrate; and

**5,770,988**  
**THIN-FILM MULTILAYERED ELECTRODE AND**  
**METHOD OF FABRICATING SAME**Yoshihiko Goto, Shiga-ken; Masato Kobayashi, Ohmihachi-  
man; Yukio Yoshino, Yokohama, and Yuzo Katayama, Ohmi-  
hachiman, all of Japan, assignors to Murata Manufacturing  
Co., Ltd., Japan

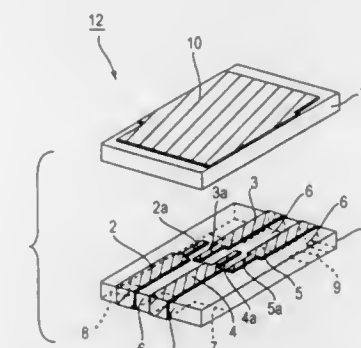
Filed Aug. 22, 1996, Ser. No. 701,384

Claims priority, application Japan, Aug. 23, 1995, 7-239125

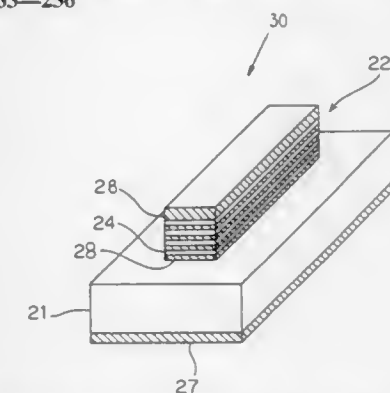
Int. Cl.<sup>6</sup> H01P 3/18

U.S. Cl. 333—236

6 Claims



a plurality of parallel conductive strip lines alternately connected to said input electrode and said output electrode, each of said plurality of conductive strips having a first open end formed on said first surface of said first dielectric substrate and extending to a second end formed on said second surface of said first dielectric substrate, such that each of said plurality of conductive strips establishes an inductance and establishes a capacitor between said first open end and said second end, in parallel with said inductance, said capacitor being formed with a first portion of a conductive strip line located on said first surface of said dielectric substrate, a second portion of said conductive strip line located on said second surface of said dielectric substrate opposite said first portion, and a portion of said dielectric substrate located between said first and second portions of said conductive strip line; wherein a parallel resonance frequency due to said inductance and said capacitor coincides with a harmonic resonance frequency of said apparatus.



1. A thin-film multilayered electrode of a high frequency electromagnetic field coupled type, comprising:

a plurality of thin-film conductors and dielectric thin films alternately stacked on a dielectric substrate so as to form a plurality of TEM mode transmission lines, each pair of thin-film conductors and the dielectric thin film sandwiched therebetween constituting a TEM mode transmission line;

wherein each of the dielectric thin films has a predetermined film thickness based on a number of layers of the thin-film conductors and the dielectric thin films, so that phase velocities of TEM waves which propagate through at least two of the plurality of TEM mode transmission lines are made substantially equal to each other;

wherein each of the thin-film conductors has a predetermined film thickness based on the number of layers of the thin-film conductors and the dielectric thin films, such that said predetermined film thickness is smaller than a skin depth of a predetermined frequency which is to be used, so that electromagnetic fields of at least two of the plurality of TEM mode transmission lines are coupled with each other;

wherein at least one of the thin-film conductors further includes at least one adhesive layer having a large adhesion strength at one or more of the interfaces between the dielectric substrate and the thin-film conductor and the interfaces between the thin film conductors and the dielectric thin films; and

wherein the adhesive layer is made of at least one kind of material selected from the group consisting of Ti, Cr, Ni, and alloys containing at least one of them.

**5,770,989**  
**NONRADIATIVE DIELECTRIC LINE APPARATUS AND**  
**INSTRUMENT FOR MEASURING CHARACTERISTICS**  
**OF A CIRCUIT BOARD**Yohei Ishikawa; Toru Tanizaki, both of Kyoto; Hiroshi  
Nishida, Kawanishi; Sadao Yamashita, Kyoto, and Atsushi  
Saitoh, Nagaokakyo, all of Japan, assignors to Murata  
Manufacturing Co., Ltd., Japan

Filed Jul. 3, 1996, Ser. No. 674,799

Claims priority, application Japan, Jul. 5, 1995, 7-169949

Int. Cl.<sup>6</sup> H01P 3/16; H03B 7/14; G01R 31/02

U.S. Cl. 333—248

5 Claims

1. A nonradiative dielectric line apparatus which is an integrated circuit having nonradiative dielectric lines positioned in parallel to each other in which a dielectric strip is provided between two conductors, wherein a circuit board having a conductor film or a circuit element together with a conductor film provided thereon is

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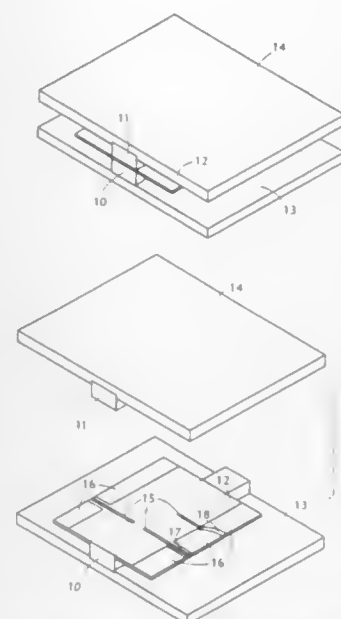
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disposed between said two conductors and substantially in parallel to the conductors, and the conductor film or the circuit element provided on said circuit board is brought close to or is made to penetrate into said dielectric strip in order to couple said conductor film or said circuit element to said nonradiative dielectric line.

5,770,990

## MICROWAVE WINDOW

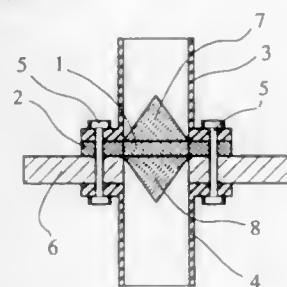
Wilhelm Lubbers, Duisburg, Germany, assignor to Krohne Messtechnik GmbH & Co. KG, Duisburg, Germany  
Filed Nov. 15, 1996, Ser. No. 749,658

Claims priority, application Germany, Nov. 15, 1995, 195 42 525.1

Int. Cl.<sup>6</sup> H01P 1/08

U.S. Cl. 333—252

8 Claims



1. A microwave window for spatial separation and microwave connection of a first hollow microwave conductor (3) from or to a second hollow microwave conductor (4), said conductors attached to opposite sides of opening in a (6) a glass transparent disk (1) transparent to microwaves and a metallic means of attachment (2) serving to attach the transparent disk (1) to said wall (6), wherein the outer diameter of the transparent disk (1) corresponds to the inner diameter of the microwave conductors (3, 4) that receive the microwave window and the means of attachment (2) are made in a ring shape and the glass transparent disk (1) is melted into the means of attachment (2).

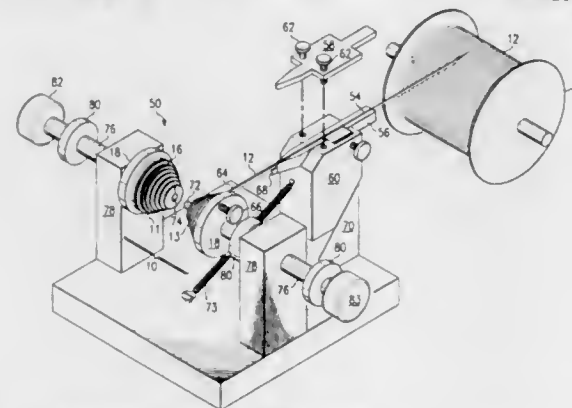
5,770,991  
INDUCTOR WINDING WITH CONDUCTIVE RIBBON  
Donald R. Baird, Sherman, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 160,760, Dec. 3, 1993, Pat. No. 5,481,792, which is a division of Ser. No. 496,180, Nov. 22, 1991, Pat. No. 5,321,965. This application Jun. 7, 1995, Ser. No. 485,257

Int. Cl.<sup>6</sup> H01F 22/30

U.S. Cl. 336—83

20 Claims



1. An inductor winding, comprising:

- (a) a sheet of dielectric material having first and second opposed sides and an orifice formed to extend between the first and second sides;
- (b) a single continuous elongate conductive ribbon having first and second ends and a point substantially remote from the first and second ends, the ribbon having a width substantially greater than its thickness, the ribbon forming first and second flat spirals from said point to respective ones of said first and second ends, each flat spiral substantially disposed in a plane, each spiral having at least one coil, the first spiral being disposed on the first side of the sheet of dielectric material, the second spiral being disposed on the second side thereof, and said point substantially remote from the first and second ends disposed proximate the orifice, the width of the ribbon being substantially disposed in the planes of the spirals, and the thickness of the ribbon being disposed perpendicular to the planes of the spirals.

5,770,992

## TRANSFORMER WITH OVERSHOOT COMPENSATION COIL

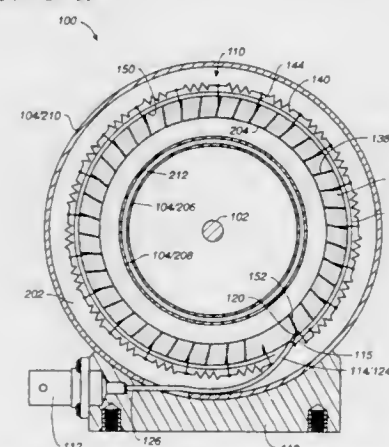
Christopher A. Waters, Redwood City, Calif., assignor to Pearson Electronics, Inc., Palo Alto, Calif.

Filed Jun. 7, 1994, Ser. No. 255,054

Int. Cl.<sup>6</sup> H01F 27/36; 21/08

U.S. Cl. 336—84 R

12 Claims



1. A current transformer for monitoring a current in a monitored conductor, said current transformer comprising:

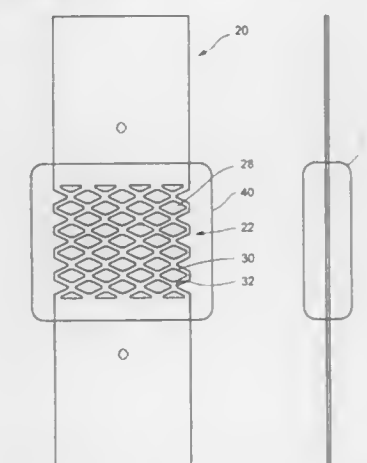
5,770,994  
FUSE ELEMENT FOR AN OVERCURRENT PROTECTION DEVICE  
Terence John Evans, Ballwin, Mo., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Nov. 2, 1995, Ser. No. 552,087

Int. Cl.<sup>6</sup> H01H 85/04

U.S. Cl. 337—295

16 Claims



1. A fuse element for an overcurrent protection device, comprising:

- a metallic strip element having a central portion and opposite end portions, said central portion having a plurality of perforations arranged in a plurality of rows defining a grid pattern of a plurality of metallic branches interconnected to provide a plurality of weak spots across said central portion, wherein branches connecting across the central portion provide a plurality of electrically conductive pathways across said center portion, each pathway having a length greater than an axial length of said center portion and wherein a total area of the branches and weak spots is less than a total area of the perforations; and, a heat absorbing coating encasing said central portion.

5,770,993

## THERMAL FUSE

Kazuhiro Miyazawa, Anjo; Shinji Iwama, Nagoya; Masaki Sanji, Kariya, and Yasufumi Kojima, Gifu, all of Japan, assignors to Nippondenso Co., Ltd, Japan

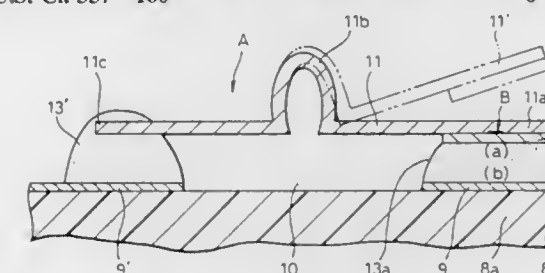
Filed Sep. 25, 1996, Ser. No. 719,208

Claims priority, application Japan, Sep. 26, 1995, 7-247935

Int. Cl.<sup>6</sup> H01H 85/04

U.S. Cl. 337—160

6 Claims



1. A thermal fuse comprising:

- a substrate consisting of an insulating material;
- a wire pattern formed on a surface of the substrate;
- a gap for electrically cutting off the wire pattern;
- a plate spring consisting of an electrically conductive material arranged across the gap;
- an electrically conductive member fixed to one end of the plate spring on a side of the wire pattern and having approximately the same linear expansion coefficient as that of the substrate;
- a first low melting point alloy for welding the electrically conductive material and the wire pattern provided on one side of the gap;
- a second low melting point alloy for welding the other end of the plate spring and the wire pattern provided on the other side of the gap;
- wherein, when the first low melting point alloy is melted, the electrically conductive member is released from the first low melting point alloy so that the plate spring is also released from the wire pattern.

5,770,995

## DETECTOR FOR MASK ALIGNMENT

Masayuki Kamiya, Kanagawa, Japan, assignor to Sony Corporation, Japan

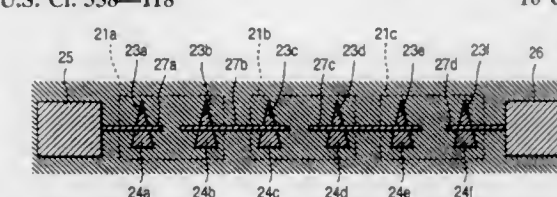
Filed Jul. 1, 1996, Ser. No. 674,158

Claims priority, application Japan, Jul. 12, 1995, 7-200506

Int. Cl.<sup>6</sup> H01C 10/30; H01L 21/70

U.S. Cl. 338—118

10 Claims



1. A semiconductor device for detection of alignment, comprising:

- a lower wiring layer formed at a given position on a scribing line for separating an actual circuit pattern formed on a substrate;
- an interlayer insulating film formed on said lower wiring layer;
- a pair of first output terminals formed on said interlayer insulating film and used for measurement of misalignment of a resist pattern in a first direction;
- a first window formed through said interlayer insulating film, for partially exposing said lower wiring layer at a position between said first output terminals, and used for detection of the misalignment of said resist pattern in said first direction;



a first upper wiring layer electrically connected to said first output terminals and said lower wiring layer exposed to said first window to form a first resistance circuit between said first output terminals, so as to measure the misalignment of said resist pattern in said first direction as a change in electric resistance between said first output terminals;

a pair of second output terminals formed on said interlayer insulating film and used for measurement of misalignment of said resist pattern in a second direction pointed at a given angle to said first direction;

a second window formed through said interlayer insulating film, for partially exposing said lower wiring layer at a position between said second output terminals and used for detection of the misalignment of said resist pattern in said second direction; and

a second upper wiring layer electrically connected to said second output terminals and said lower wiring layer exposed to said second window to form a second resistance circuit between said second output terminals, so as to measure the misalignment of said resist pattern in said second direction as a change in electric resistance between said second output terminals.

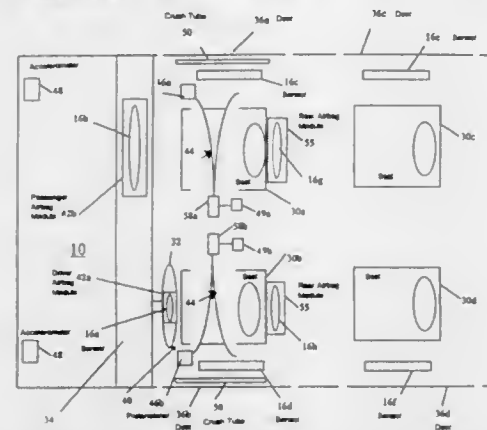
5,770,997

**VEHICLE OCCUPANT SENSING SYSTEM**

Raymond Kleinberg, Sterling Heights; Stanford D. Hanson, Farmington, both of Mich.; John C. Thompson, Chattanooga, Tenn.; Steven K. Underwood, Chattanooga, Tenn.; Eldon L. Cooper, Jr., Chattanooga, Tenn., and Craig T. Harston, Signal Mountain, Tenn., assignors to AlliedSignal Inc., Morristown, N.J.

U.S. Cl. 340—438 13 Claims

U.S. Cl. 340—438 13 Claims



1. A system for sensing the presence of an abnormally seated vehicle occupant, which is also known as an out-of-position occupant within a vehicle's passenger compartment comprising:  
 safety restraint means for protecting the occupant during a crash including an air bag module comprising a deployment door which is opened on deployment of an air bag;  
 actuating means for activating the safety restraint means during a collision;  
 first occupant sensing means, fixedly positioned in the vehicle, for generating a first capacitive electric field within the passenger compartment such field having a predetermined, fixed depth and oriented toward a seating location of the occupant and for generating an output signal indicative of the presence of the out-of-position occupant, wherein such output signal is generated only in response to the occupant interacting with the first electric field, the first sensing means being mounted proximate the air bag module and wherein the depth of the first electric field is chosen sufficiently short so that it cannot be interfered with by a normally seated occupant, however such first electric field being sufficiently deep to be interfered with when such occupant is out of position.

5,770,998

DEVICE AND CONTROLLING METHOD FOR  
DISPLAYING STATIONARY/DYNAMIC STATUS OF CAR

Jae-Hwan Choi, 2042 Hwanghak-Dong, Chung-ku, and Ho-Sik  
Choi, 144-487, Pukkaajwa 1-dong, Sodeamun-ku, both of  
Seoul, Rep. of Korea

Filed Dec. 9, 1996, Ser. No. 764,118  
Claims priority, application Rep. of Korea, Dec. 11, 1995,  
48264/1995

Int. Cl.<sup>6</sup> B60Q 1/00

U.S. Cl. 340—463 17 Claims

1. A device for displaying stationary/dynamic status of a car comprising:

a car stationary/dynamic state sensing part for detecting a change of speed for a period of time sensed by a rotating slit plate mounted on a speed meter cable connecting device and a photo interrupter, such that as the speed meter cable connecting device operates, the rotating slit plate is rotated and the photo interrupter detects an analog signal corresponding to a number of slits passed through the photo interrupter;

a pulse generating part for converting the analog signal from the state sensing part into digital pulses;

5,770,996

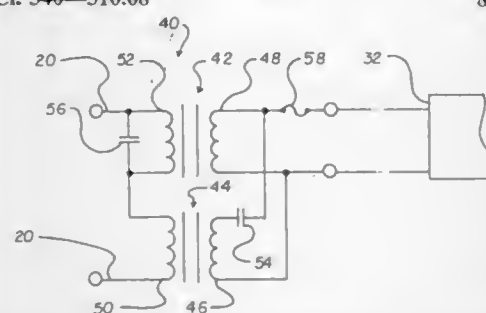
TRANSFORMER SYSTEM FOR POWER LINE COMMUNICATIONS

Paul K. Severson, Hampton, and Richard M. Meidl, Grove Heights, both of Minn., assignors to Interactive Technologies, Inc., North Saint Paul, Minn.

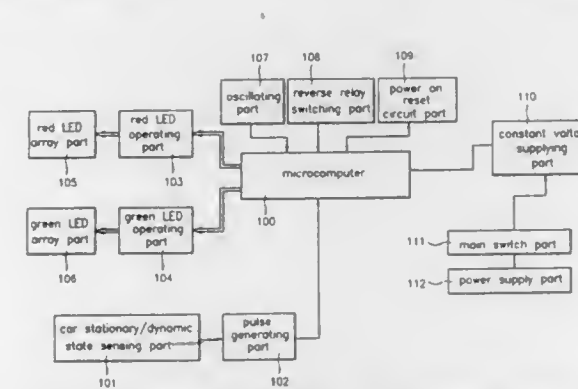
Filed Aug. 30, 1996, Ser. No. 705.802

Int. Cl.<sup>6</sup> H04B 1/00

U.S. Cl. 340—310.08 8 Claims



1. A system for coupling a communication device with a power line, comprising:
  - a first transformer having a primary winding connected with the power line and a secondary winding connected with the communication device;
  - a second transformer having a primary winding connected in series with the primary winding of the first transformer and a secondary winding connected in parallel with the secondary winding of the first transformer;
  - a first capacitor connected in series with the secondary winding of the second transformer and in parallel with the secondary winding of the first transformer; and
  - a second capacitor connected in series with the primary winding of the second transformer and in parallel with the primary winding of the first transformer.



- a reverse switching part connected to a positive terminal on a reversing lamp for switching an interrupt signal when a transmission lever is put to a reversing position;
- a microcomputer for reading in a driving data programmed in a ROM in response to pulses from the pulse generating part and applying driving pulses to a relevant output terminal;
- a power on reset circuit part for applying a reset signal to a reset terminal for initializing the microcomputer;
- an oscillating part for providing a system clock signal to the microcomputer;
- a car stationary/dynamic state displaying part having a red LED operating part and a green LED operating part for turning on relevant LEDs in a red LED array part and a green LED array part in response to the microcomputer operation output;
- the red LED array part and the green LED array part being turned on by the operating output from the operating parts;
- a constant voltage supplying device for supplying a constant voltage according to a switching operation; and,
- a connecting part for connecting a power supplying part which supplies car battery power to a main switch part and a reverse lamp voltage reception terminal for operating the reverse switching part wherein running states of the car can be displayed in stationary/dynamic states of stop, slow running, acceleration, equal speed running, deceleration and reversing.

5,770,999

**VEHICLE LIGHT CONTROL SYSTEM**

Michael E. Rhodes, Rte. 3, Box 930, Big Fork, Minn. 56628

Continuation-in-part of Ser. No. 498,433, Jul. 5, 1995, Pat. No. 5,644,290, which is a continuation-in-part of Ser. No. 77,094, Jun. 16, 1993, Pat. No. 5,434,553. This application

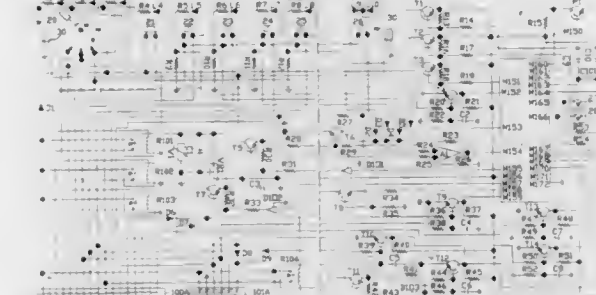
Jul. 1, 1997. Ser. No. 886,530

Int. Cl.<sup>6</sup> B60Q 1/00

U.S. Cl. 340—468 29 Claims

U.S. CI. 540-486

RED 3	RED 2	RED 3	RESET	BRAKE	TAB.	SW.	MICH	ITEM	LBO
(R)	(R)	(R)	(R)				SHE. AX	SHE. AX	



1. An improved blackout control system for use in an emergency vehicle having emergency lights including, high and low beam headlights, running lights, front lights selected from red grill lights and turn signal lights, a rear window brake light, brake lights, and backup lights controlled by a backup switch for supplying power to backup lights of the vehicle when the vehicle is placed in reverse, a manually activated running light switch to provide power to running lights of the vehicle, an interior dome light activated by opening doors, and a brake switch for supplying power to brake lights of the vehicle when a brake pedal within the vehicle is engaged, a vehicle speed sensor used to supply vehicle computer

5,771,000  
METHOD OF RELEASING A STUCK AIR VALVE AND  
STICKING RELEASE APPARATUS

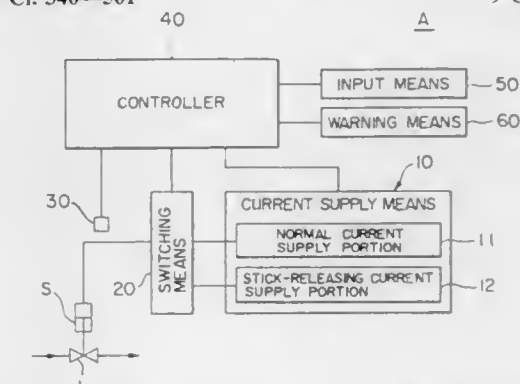
Kobji Matsumoto; Rikuo Urata, both of Akashi; Takao Wada Takasago, and Gohel Iijima, Kakogawa, all of Japan, assign ors to Kawasaki Inokubo Kabushiki Kaisha, Kobe, Japan

Filed Nov. 1, 1996, Ser. No. 742,949

Claims priority, application Japan, Nov. 9, 1995, 7-317217

Int. Cl.<sup>6</sup> G08B 23/00

U.S. Cl. 340-501 9 Claim



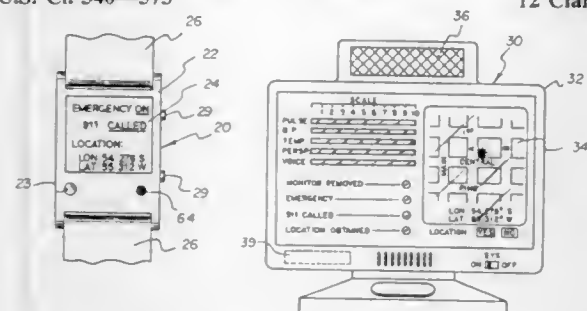
5. An apparatus for releasing a stuck air valve when said air valve, driven by a DC solenoid, is stuck said apparatus comprising:  
a DC solenoid for driving said air valve during normal operation;  
a sticking detection means for detecting that said air valve is stuck from an irregular pattern of an excitation current induced in said DC solenoid and providing a sticking detection signal when said air valve is stuck;

sticking release means for supplying a sticking release current for a predetermined period of time to said DC solenoid in response to said sticking detection signal to excite said DC solenoid and drive said air valve, thereby releasing said air valve; and  
alarm means for issuing an alarm if said stuck air valve is not released by said sticking release current.

5,771,001  
PERSONAL ALARM SYSTEM  
Marlon J. Cobb, 16332 Oxford Dr., Markham, Ill. 60426  
Filed Nov. 18, 1996, Ser. No. 749,518  
Int. Cl.<sup>6</sup> G08B 23/00

U.S. Cl. 340—573

12 Claims



1. A personal alarm system comprising:  
a portable transmitter which sends a signal to a cellular relay station, where the signal includes latitude and longitudinal position, pulse, blood pressure, voice, and temperature of the user;  
wherein the portable transmitter includes  
a transmitter encasement,  
a global positioning receiver positioned within the transmitter encasement which determines the position of the user from the signals from a plurality of global positioning satellites,  
an electronic transmitter positioned within the transmitter encasement and electronically connected to the global positioning receiver, thereby transmitting the signal to the cellular relay station, and  
a display screen secured to the cornice of the transmitter encasement and electronically connected to the global positioning receiver thereby displaying the latitude and longitudinal information; and  
a receiver which receives the relayed signal from the cellular relay station, thereafter displaying the contents of the signal.

5,771,002  
TRACKING SYSTEM USING RADIO FREQUENCY SIGNALS

William R. Creek, Fremont; Marvin L. Wahl, Sunnyvale; Bryan L. Clausen, Sr., San Jose; Mery Clausen, San Jose, and Bryan Clausen, Jr., Menlo Park, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Palo Alto, Calif.

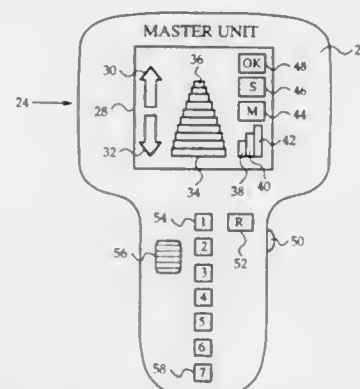
Filed Mar. 21, 1997, Ser. No. 822,111

Int. Cl.<sup>6</sup> G08B 1/08

U.S. Cl. 340—539

31 Claims

1. A tracking system comprising:  
a) a satellite unit having:  
i) first memory means for storing a unique identity code of the satellite unit;  
ii) first receiving means for receiving a coded radio frequency search signal;  
iii) first transmitting means for transmitting a coded radio frequency response signal, wherein the search signal includes a search identity code and a pseudo-random delay code, and wherein the response signal includes the unique identity code of the satellite unit;



- iv) first control means connected to the first memory means, the first receiving means, and the first transmitting means for decoding the search signal, for determining whether the search identity code matches the unique identity code, for calculating a delay period from the delay code, and for controlling the first transmitting means such that the first transmitting means transmits the response signal at the end of the delay period only when the search identity code matches the unique identity code; and  
b) a master unit having:  
i) user controls for selecting the satellite unit to be located;  
ii) second memory means for storing the unique identity code of the satellite unit and a series of numbers from which to select the delay code;  
iii) second transmitting means for transmitting the search signal;  
iv) second receiving means for receiving the response signal, wherein the second receiving means includes signal strength means for determining a strength of the response signal;  
v) second control means connected to the user controls, the second memory means, the second transmitting means, and the second receiving means for selecting the delay code from the series of numbers and for controlling the second transmitting means such that when a user of the master unit selects the satellite unit to be located, the second transmitting means transmits the search signal with the selected delay code and with the search identity code matching the unique identity code of the satellite unit; and  
vi) indicator means connected to the signal strength means for indicating to the user the strength of the response signal, wherein the second receiving means comprises a directional antenna oriented in the master unit such that the response signal received by the master unit is strongest when the master unit is pointed directly at the satellite unit.

5,771,003  
LOCATING SYSTEM AND PROCESS

Arthur F. Seymour, Deerfield, Ill., assignor to Elenco Electronics, Inc., Wheeling, Ill.

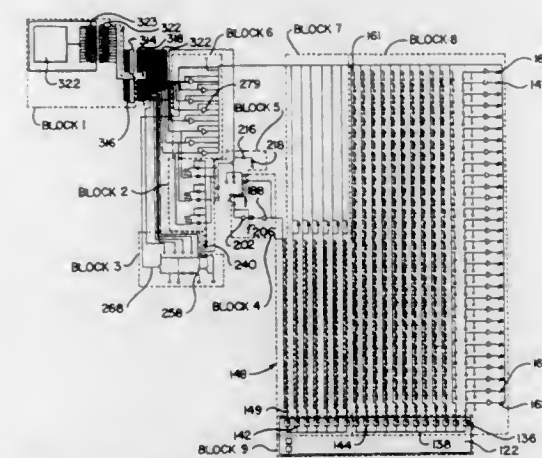
Filed Sep. 24, 1996, Ser. No. 719,954

Int. Cl.<sup>6</sup> G09B 13/14

U.S. Cl. 340—568

21 Claims

1. A system for locating items, comprising:  
a multitude of items comprising products selected from the group consisting of computer disks, software diskettes, video tapes, video tape cases, audio tapes, audio tape cases, compact discs, compact disc cases, computer tape, tape reels, tape cases, software boxes, books, magazines, storage bins, file folders, files, boxes, cartons, and containers;  
each of said items having an electrically conductive label, each label being differently coded for designating an item code specifying the item or its contents and a section code specifying the location where said item is normally stored;  
an array of signals positioned in proximity to said items, said signals being normally in electrical contact with said electri-



cally conductive labels so that each item is operatively connected to a corresponding signal;  
each of said labels having electrically conductive circuitry normally in electrical contact with said signals and having a shunt to short said signal in response to shut-off pulses;  
equipment for generating said shut-off pulses to said electrically conductive labels;  
a control circuit operatively connecting said equipment to said signals and said labels, and said control circuit includes said shunt in said label and comprises low power fail-safe electronic circuitry for shorting all of said signals except a signal comprising the corresponding signal of the selected item to be retrieved.

5,771,004  
GAS DETECTION SYSTEM FOR A PORTABLE COMMUNICATION

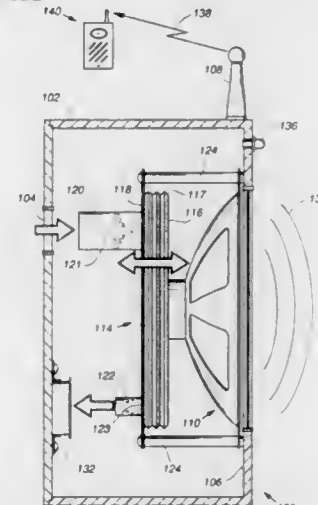
Anthony J. Suppelsa, Coral Springs; Michael F. Shaw, Sunrise, and Anthony B. Suppelsa, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 6, 1997, Ser. No. 870,222

Int. Cl.<sup>6</sup> G08B 17/10

U.S. Cl. 340—632

9 Claims



1. A gas detection system for a wireless communication device, the device having an integral audio speaker, the gas detection system comprising:  
a device housing having a passageway formed therethrough;  
a gas sensor fixedly attached to an internal surface of said device housing;  
a bellows having first and second sides, the second side fixedly attached to the internal surface of the device housing, said bellows further having first and second ports extending from the bellows second side, the first port for drawing air into said bellows and the second port for directing air out of said bellows toward said gas sensor; and

at least one rigid interconnect element having first and second ends, the first end attached to the first side of said bellows and the second end attached to a vibrating portion of the audio speaker, wherein vibrations imparted from the vibrating portion of the audio speaker, through said at least one rigid interconnect element, to the bellows first side, effect alternating contraction and expansion of the bellows, resulting in air movement directed toward said gas sensor.

5,771,005  
AUXILIARY DISPLAY FOR AN ELECTRONIC PRICE LABEL

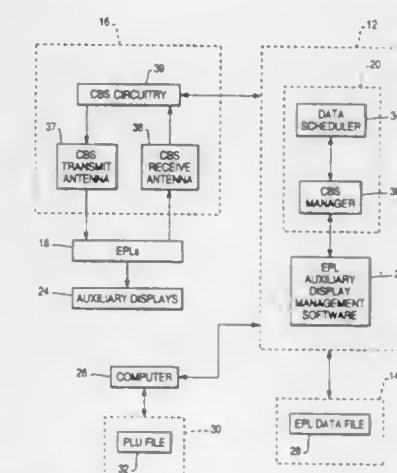
John C. Goodwin, III, Suwanee, Ga., assignor to NCR Corporation, Dayton, Ohio

Filed Feb. 16, 1996, Ser. No. 603,006

Int. Cl.<sup>6</sup> G06F 7/12

U.S. Cl. 340—825.35

17 Claims



1. An auxiliary display assembly for electronically communicating with and receiving information to be displayed from an electronic price label comprising:  
a display;  
an electrical connector coupled to the display which couples to another electrical connector on the electronic price label; and  
circuitry for receiving information to be displayed from the electronic price label and driving the display to display the received information.

5,771,006

Patent Not Issued For This Number

5,771,007  
AUTO-CRUISE SYSTEM FOR VEHICLE

Toshiaki Araki, and Yasuhiko Fujita, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 22, 1996, Ser. No. 755,469

Claims priority, application Japan, Nov. 24, 1995, 7-305522

Int. Cl.<sup>6</sup> G08G 1/16

U.S. Cl. 340—903

2 Claims

1. An auto-cruise system for a vehicle, comprising: a vehicle speed detecting means for detecting a vehicle speed of a subject vehicle; an actuator adapted to change the subject vehicle speed; a speed setting means for setting the vehicle speed at a desired value; a distance detecting means for detecting a distance between the





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5,771,014

## RADAR APPARATUS

Mitsuyoshi Shinonaga, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

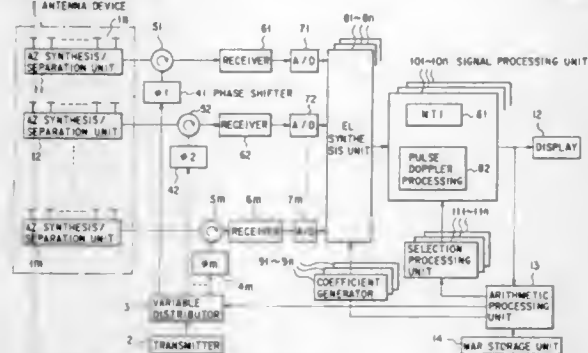
Filed Oct. 29, 1996, Ser. No. 741,203

Claims priority, application Japan, Oct. 31, 1995, 7-284043

Int. Cl.<sup>6</sup> G01S 7/02

U.S. Cl. 342-140

17 Claims



1. A radar apparatus comprising: transmission means for forming a transmission beam and repeatedly transmitting a transmission pulse to a predetermined coverage;

reception means having a plurality of reception channels to form reception beams having arbitrary independent elevation or inclination angles in an arbitrary direction, and to receive a reflected signal of the transmission pulse from a beam formation region; and

reception channel control means for selectively assigning the plurality of reception channels in accordance with a range, such that when the range is shifted from a short range to a long range, the number of reception channels assigned to the plurality of reception beams having a larger elevation or inclination angle region is reduced, and the number of reception channels assigned to the plurality of reception beams smaller elevation or inclination angle region is increased.

5,771,015

## CONTROLLABLE ANTENNA SYSTEM

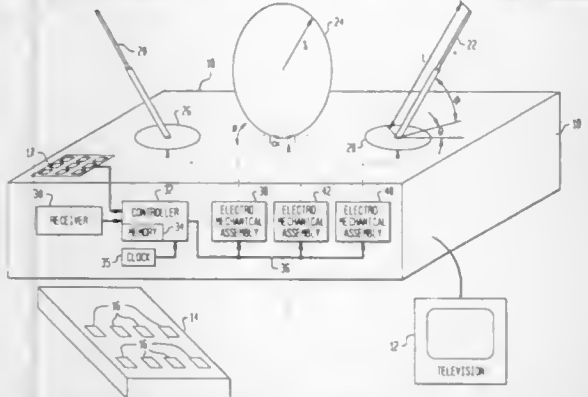
Stuart E. Kirtman, and David A. Kirtman, both of 14 Poets La., Metuchen, N.J. 08840

Filed Nov. 20, 1995, Ser. No. 560,860

Int. Cl.<sup>6</sup> H04B 7/185; G01S 5/02

U.S. Cl. 342-359

60 Claims



1. A system for configuring an antenna having at least two receiving elements mounted to a base, said at least two receiving elements being movable relative to said base, the system comprising:

controllable electro-mechanical means coupled between said base and said at least two receiving elements for selectively moving each of said at least two receiving elements independently of each other relative to said base;

control unit means responsive to operator manipulation thereof for selectively transmitting a control signal;

receiver means for receiving said control signal; and control means coupled to said receiver means and to said electro-mechanical means for responding to a received control signal and controlling said electro-mechanical means in accordance with said received control signal to selectively and independently move each of said at least two receiving elements so as to effect a desired configuration of said antenna; wherein said antenna is associated with a receiver tunable to a selected one of a plurality of frequencies;

wherein said control means includes addressable memory means for storing a plurality of sets of configuration parameters for said at least two receiving elements, each of said sets of configuration parameters being stored in a respective addressable location of said memory means, and each memory means address corresponds to a respective frequency;

wherein said control unit means is effective for transmitting a control signal which corresponds to a designated frequency; and

wherein said control means is responsive to a received control signal corresponding to said designated frequency for retrieving from said memory means the set of configuration parameters stored at the memory means address corresponding to said designated frequency and controlling said electro-mechanical means to move at least one of said at least two receiving elements so as to configure said antenna in accordance with said retrieved set of configuration parameters.

5,771,016

## PHASED ARRAY RADAR WITH SIMULTANEOUS BEAM-STEERING AND SINGLE-SIDEBAND MODULATION

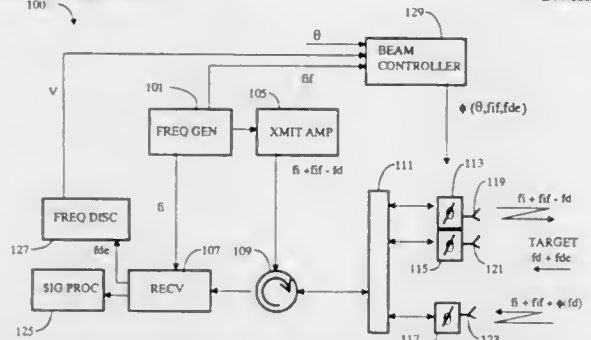
James H. Mullins; Ralph H. Halladay, both of Huntsville, and Michael R. Christian, Owens Cross Rd., all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 5, 1997, Ser. No. 986,202

Int. Cl.<sup>6</sup> H01Q 3/22; 3/24; 3/26

U.S. Cl. 342-372

2 Claims



1. In a passive phased array radar having a receiver for producing frequency error signal; a beam-steering controller for producing phase control signals in response to a pre-selected beam steering angle; a plurality of phase shifters, each of the shifters being coupled to the controller to receive therefrom the phase control signals and adjust the phase of transmit and received energy in response to the phase control signals; and a plurality of radiating elements, one of the elements being coupled to one of the phase shifters, the elements being suitable for transmitting and receiving energy; the improvement for enabling simultaneous performance of single-sideband modulation and beam steering, said improvement comprising: a frequency generator coupled simultaneously to the beam-steering controller and to the receiver, said generator being suitable for generating a first signal at a pre-selected radar reference frequency and a second signal at a pre-selected radar intermediate frequency and providing said first signal to the receiver and said second signal to the beam-steering controller; and a frequency discriminator coupled simultaneously to the receiver and the beam-steering controller, said discriminator being suitable for receiving the frequency error signal from the receiver and, in response to the frequency error signal, producing and transmitting to the beam-steering controller a voltage, said

5,771,018

## HAND-HELD NAVIGATION RADIO WITH CDI FOR VOR AND LOCALIZER

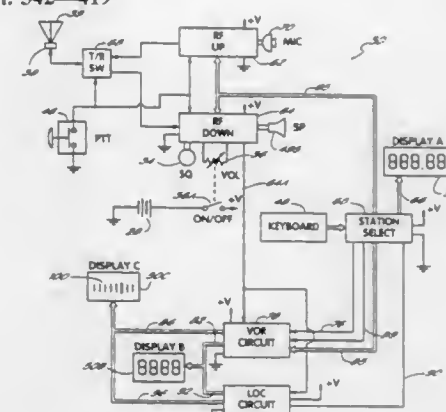
Stuart B. Kennedy, Batavia, Ohio, assignor to Sportman's Market, Inc., Batavia, Ohio

Filed Dec. 18, 1996, Ser. No. 768,531

Int. Cl.<sup>6</sup> G01S 5/02

U.S. Cl. 342-419

12 Claims



1. A hand-held aviation airband navigation radio having a housing sized to be held in one hand while in use, a battery pack associated with the housing, a keyboard associated with the housing to facilitate tuning the radio to an RF frequency in the aviation airband, and circuitry associated with the housing and operatively coupled to the keyboard and the battery pack to facilitate electronic communication on the tuned RF frequency, the circuitry including circuit means for determining one of (a) degrees off a radial when the radio is tuned to an aviation airband frequency corresponding to a VOR frequency, and (b) deviation from a localizer track when the radio is tuned to an aviation airband frequency corresponding to a localizer frequency, the radio further including display means carried by the housing and coupled to the circuit means for digitally displaying in a graphical manner a course deviation indicator (CDI) corresponding to one of the degrees off a radial and deviation from a localizer track responsive to when the radio is tuned to one of the VOR frequency and the localizer frequency, respectively.

5,771,017

## BASE STATION ANTENNA ARRANGEMENT

Stuart James Dean, Nepean, Canada; Keith Roy Broome, Torquay, and Peter John Chrystie, Brixham, both of United Kingdom, assignors to Northern Telecom Limited, Montreal, Canada

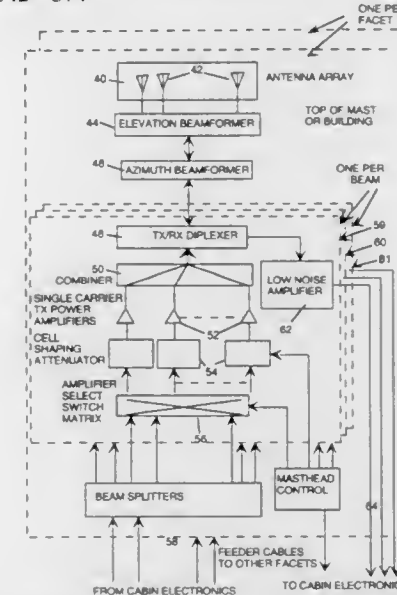
Continuation of Ser. No. 441,757, May 16, 1995, abandoned, which is a division of Ser. No. 289,920, Aug. 12, 1994, Pat. No. 5,596,329. This application Jan. 31, 1997, Ser. No. 792,537

Claims priority, application United Kingdom, Aug. 12, 1993, 9316832

Int. Cl.<sup>6</sup> H01Q 3/02

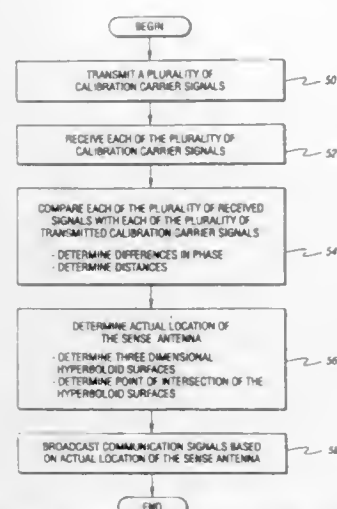
U.S. Cl. 342-374

10 Claims



1. A telecommunications antenna arrangement comprising: a plurality of layered antenna arrays each having a plurality of radiating elements for forming a multiplicity of separate narrow overlapping beams in azimuth, the arrays being positioned such that the beams provide a coverage in azimuth wider than each array, wherein the antenna further includes: a plurality of receive amplifiers for amplifying receive signals for each beam of an antenna array; means for combining the outputs of the plurality of receive amplifiers; switching means for applying the combined receive signals to the r.f. transceiver handling the given call; and a single power amplifier for amplifying transmit signals for a given call of each beam of an antenna array; wherein there is further provided means for operating the antenna arrays whereby individual narrow overlapping beams are utilized for exchange of r.f. signals with individual remote stations in the areas covered by the respective narrow beams.





determining the actual location of the sense antenna relative to the phased array antenna based on the comparison between the predetermined frequency of each of the transmitted signals and the second frequency of each of the received signals utilizing triangulation techniques.

5,771,020

## LIGHTNING LOCATING SYSTEM

Ralph J. Markson, Weston, Mass., and Lothar H. Rubnke, Reston, Va., assignors to Airborne Research Associates, Inc., Weston, Mass.

Filed Jul. 25, 1996, Ser. No. 687,751

Int. Cl.<sup>6</sup> G01S 3/02

U.S. Cl. 342—460

19 Claims



1. A lightning location detection system, comprising:
  - at least one system of radio-frequency (RF) energy sensors providing an output signal indicative of detected RF energy;
  - a filter in electrical communication with said at least one system of RF energy sensors, said filter receiving the output signal from said sensors and blocking low-frequency components of the output signal; and
  - a signal processor in electrical communication with said filter, said signal processor determining the location of an initial lightning breakdown process responsive to the unblocked components of the sensor output signal corresponding to at least one of only a predetermined number of initial microsecond or shorter pulses produced by initial lightning breakdown processes of initial leader strokes of lightning flashes.

5,771,021  
TRANSPONDER EMPLOYING MODULATED BACKSCATTER MICROSTRIP DOUBLE PATCH ANTENNA

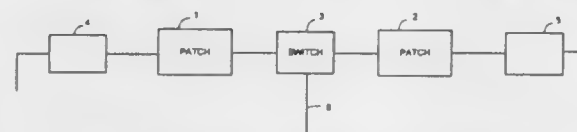
Richard L. Veghte, Jacksonville, Oreg.; Curtis L. Carrender, Placitas, N. Mex.; Alfred R. Koelle, and Jeremy A. Landt, both of Santa Fe, N. Mex., assignors to Amtech Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 395,641, Feb. 28, 1995, abandoned, which is a continuation of Ser. No. 134,862, Oct. 4, 1993, abandoned. This application Oct. 31, 1995, Ser. No. 550,628

Int. Cl.<sup>6</sup> H01Q 1/38

U.S. Cl. 343—700 MS

5 Claims



1. A system including a reader and a transponder displaced from the reader for identifying an object associated with the transponder, said system comprising:
  - interrogating means at the reader for transmitting interrogating signals at an RF frequency to the transponder;
  - a microstrip patch antenna at the transponder for receiving the interrogating signals and for transmitting backscatter-modulated signals in response to the interrogating signals in accordance with a modulating signal produced by modulating means at the transponder, the modulating signal identifying the object associated with the transponder, the antenna comprising two one-half wavelength segments, at least one of which has an input line for receiving an external signal, connected together by a switch having a closed position and an open position, the antenna being full wavelength at the RF frequency, the two segments of the antenna being out-of-phase with each other when the switch is in the closed position, whereby a backscatter signal is reflected back to the reader, and the two segments of the antenna acting in concert when the switch is in the open position, whereby a minimum backscatter signal is reflected back to the reader;
  - and a switching circuit for actuating the switch between the open position and the closed position in response to the external signal.

5,771,022

## COMPOSITE ANTENNA FOR HAND HELD OR PORTABLE COMMUNICATIONS

Rodney Vaughan, and Neil Scott, both of Wellington, New Zealand, assignors to Industrial Research Limited, Wellington, New Zealand

PCT No. PCT/NZ94/00077, § 371 Date Apr. 25, 1996, § 102(e) Date Apr. 25, 1996, PCT Pub. No. WO95/04386, PCT Pub. Date May 9, 1995

PCT Filed Jul. 29, 1994, Ser. No. 586,707

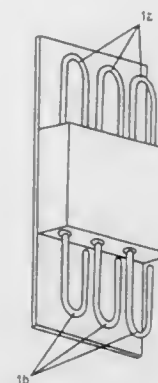
Claims priority, application New Zealand, Jul. 29, 1993, 248283

Int. Cl.<sup>6</sup> H01Q 1/24;21/06

U.S. Cl. 343—702

10 Claims

1. A composite antenna comprising at least three individual antennas spaced from each other at less than 0.2 wavelengths relative to the frequency to be received and an associated combining stage which combines uncorrelated signals from each of the



antennas using an antenna diversity combining technique, on a hand held or portable communications terminal.

5,771,023

## BROAD BAND HELICAL ANTENNA

Gunnar Engblom, Åkersberga, Sweden, assignor to Allgon AB, Åkersberga, Sweden

PCT No. PCT/SE94/01008, § 371 Date Apr. 26, 1996, § 102(e) Date Apr. 26, 1996, PCT Pub. No. WO95/12224, PCT Pub. Date May 4, 1995

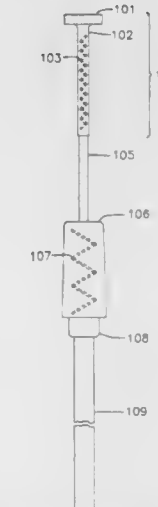
PCT Filed Oct. 26, 1994, Ser. No. 637,743

Claims priority, application Sweden, Oct. 29, 1993, 9303570

Int. Cl.<sup>6</sup> H01Q 1/24

U.S. Cl. 343—702

15 Claims



1. A broadband antenna means for equipment carried in a case and intended to transmit and/or receive radio signals, said antenna means including a first helical antenna which is comprised of a first coil, and a second helical antenna which is comprised of a second coil, said coils having mutually different lengths which impart to respective helical antennas different resonance frequencies, said first coil and said second coil being conductively separated except for one end of each of the coils and being disposed coaxially so as to form in coaction in essentially the same axial positions an antenna of essentially larger bandwidth than each of the helical antennas per se and being placed adjacent one another so that geometry thereof will generally coincide, with the exception of a section which generally corresponds to a difference between lengths of said coils; wherein an antenna rod is arranged to be axially extendable through the two coaxially arranged coils to reach a first position in which said antenna rod extends outside the case and has a conductive portion which is free from both of the coils, and a second position in which said conductive portion is inserted in the case and is free from said two coils and wherein the conductive portion of the antenna rod and the helical antennas are connectable mutually in a combined form.

5,771,024

## FOLDED MONO-BOW ANTENNAS AND ANTENNA SYSTEMS FOR USE IN CELLULAR AND OTHER WIRELESS COMMUNICATIONS SYSTEMS

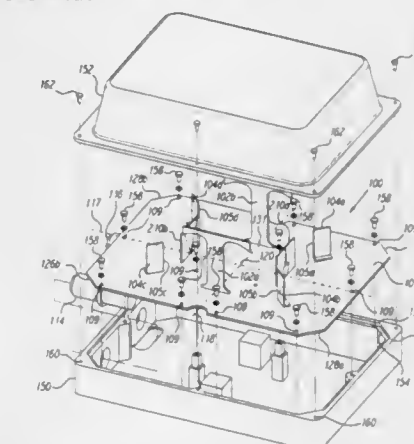
John Kenneth Reece, and John L. Aden, both of Colorado Springs, Colo., assignors to Omnipoint Corporation, Colorado Springs, Colo.

Continuation-in-part of Ser. No. 673,871, Jul. 2, 1996. This application Sep. 6, 1996, Ser. No. 709,275

Int. Cl.<sup>6</sup> H01Q 21/08

U.S. Cl. 343—725

6 Claims



1. An antenna array for use in cellular and other wireless communications systems, said antenna array comprising:
  - a pair of folded mono-bow antenna elements, each having a main radiating bowtie element and a parasitic element, said parasitic elements being mounted to a common ground plane, said main radiating bowtie elements being mounted respectively to first and second feed pins extending through a first pair of holes formed in said common ground plane;
  - a pair of "T" shaped antenna elements, each having a main radiating "T" element and a feed strip element, said main radiating "T" elements being mounted to said common ground plane, and said feed strip elements being mounted respectively to third and fourth feed pins extending through a second pair of holes formed in said common ground plane;
  - a first summing circuit coupled to said first and second feed pins;
  - a second summing circuit coupled to said third and fourth feed pins; and
  - two pairs of director elements coupled to said common ground plane, said first pair of director elements being positioned within a first plane passing through a first pair of opposing corners of said common ground plane, and said second pair of director elements being positioned within a second plane passing through a second pair of opposing corners of said common ground plane.

5,771,025

## FOLDED MONO-BOW ANTENNAS AND ANTENNA SYSTEMS FOR USE IN CELLULAR AND OTHER WIRELESS COMMUNICATIONS SYSTEMS

John Kenneth Reece, and John L. Aden, both of Colorado Springs, Colo., assignors to Omnipoint Corporation, Colorado Springs, Colo.

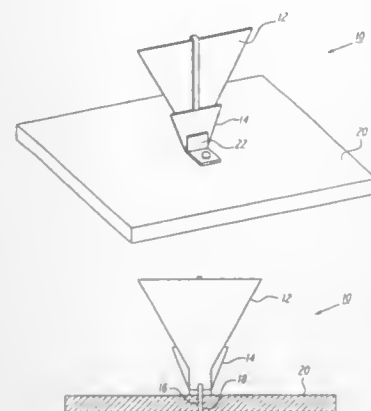
Filed Jul. 2, 1996, Ser. No. 673,871

Int. Cl.<sup>6</sup> H01Q 1/38;9/38

U.S. Cl. 343—828

46 Claims

14. An antenna for use in cellular or other wireless communications systems, comprising:
  - a dielectric substrate having a first side and a second side;
  - a radiating bowtie element formed on said first side of said dielectric substrate;
  - a parasitic element formed on said second side of said dielectric substrate; and



a shorting element formed on said second side and extending over a third side of said dielectric substrate, said shorting element providing an electrical connection between said radiating bowtie element and said parasitic element.

5,771,026

**DISGUISED BROADBAND ANTENNA SYSTEM FOR VEHICLES**

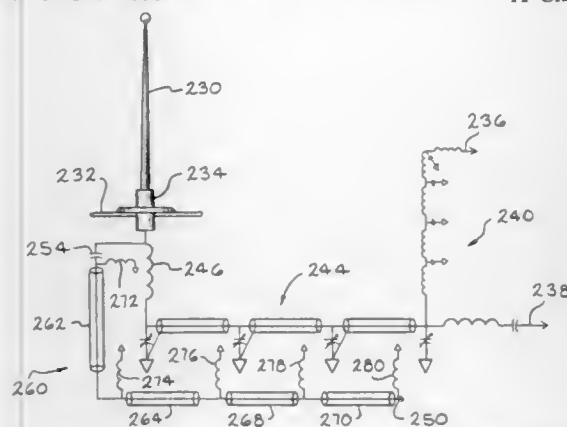
Francis A. Stengel, Jr., Lancaster, N.Y., assignor to Sti-Co Industries, Inc., Orchard Park, N.Y.

Filed Mar. 28, 1996, Ser. No. 626,623

Int. Cl.<sup>6</sup> H01Q 1/50

U.S. Cl. 343-858

11 Claims



1. A broadband multiband antenna system for use with a broadcast radio receiver and a high and low frequency communications apparatus in a vehicle, said antenna system comprising:

- a broadcast antenna mounted to the vehicle by means of a base;
- a first distributed matching network for coupling said antenna to the broadcast receiver and to the low frequency communications equipment in the vehicle, said distributed matching network including a low pass series reactive element connected directly to said antenna at said base, transmission lines means connected to said low pass series reactive element and matching means operating associated with said transmission lines means to provide characteristics of said distributed matching network resulting in broad bandwidth, low standing wave ratio and low power loss operation of said low frequency communications equipment from said antenna so that said antenna and said base maintain the outer visible appearance of an OEM-supplied vehicle antenna;
- a broadcast coupler connected between said distributed matching network and said broadcast receiver and low frequency communications equipment for providing isolation between said broadcast receiver and said low frequency communications equipment; and
- a second distributed matching network for coupling said antenna to the high frequency communications equipment in the vehicle, said distributed matching network including a

high pass series reactive element connected directly to said antenna at said base, transmission line means connected to said high pass series reactive element and matching means operatively associated with said transmission line means to provide characteristics of said distributed matching network resulting in broad bandwidth, low standing wave ratio and low power loss operation of said high frequency communications equipment from said antenna so that said antenna and said base maintain the outer visible appearance of an OEM-supplied vehicle antenna.

5,771,027

**COMPOSITE ANTENNA**

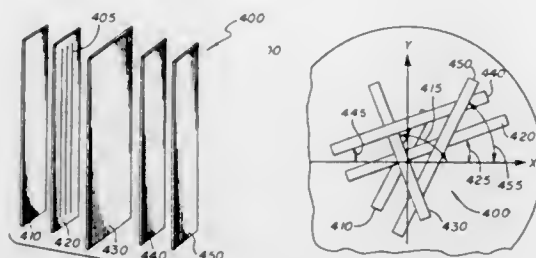
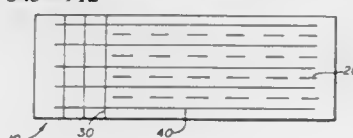
John Marks, Escondido, and George Pyncheon, Poway, both of Calif., assignors to Composite Optics, Inc., San Diego, Calif.

Continuation of Ser. No. 487,486, Jun. 7, 1995, abandoned, which is a division of Ser. No. 205,879, Mar. 3, 1994, Pat. No. 5,440,801. This application Apr. 28, 1997, Ser. No. 847,864

Int. Cl.<sup>6</sup> H01Q 1/38; 15/14

U.S. Cl. 343-912

14 Claims



1. A composite antenna, comprising:
- a rigid shell forming an antenna aperture and having a plurality of layers of resin reinforced cloth, the cloth having a plurality of warp fibers interwoven with a plurality of fill fibers; and
  - a plurality of electrical conductors woven into the warp of at least one of said layers of resin reinforced cloth, the conductors being separated from each adjacent conductor, the number of the plurality of electrical conductors woven into the warp of the at least one said layer of resin reinforced cloth being less than the number of warp fibers in the cloth.

5,771,028

**IDENTIFICATION OF LIQUID CRYSTAL DISPLAY PANELS**

Scott W. Dalton, and Doyné L. Metz, both of Cypress, Tex., assignors to Compaq Computer Corporation, Houston, Tex.

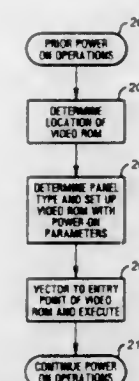
Continuation of Ser. No. 188,522, Jan. 28, 1994, Pat. No. 5,495,263. This application Sep. 7, 1995, Ser. No. 525,338

Int. Cl.<sup>6</sup> G09G 5/00

U.S. Cl. 345-3

12 Claims

1. A method of identifying the type of a liquid crystal display panel for use in a computer system, wherein the liquid crystal display panel receives a plurality of video signals including a pixel clock and pixel data, the method comprising the steps of:
- providing an oscillating signal having a period and which is generated in the liquid crystal display panel, said oscillating signal being other than said plurality of video signals;
  - determining a value that represents the relation between said oscillating signal period and the period of a computer system clock signal; and



comparing said value with the entries of a table to determine the type of the liquid crystal display panel.

5,771,029

**SIDE PINCUSHION CONTROL APPARATUS**

Won Gu Park, Kyungsangbuk-Do, Rep. of Korea, assignor to LG Electronics, Inc., Seoul, Rep. of Korea

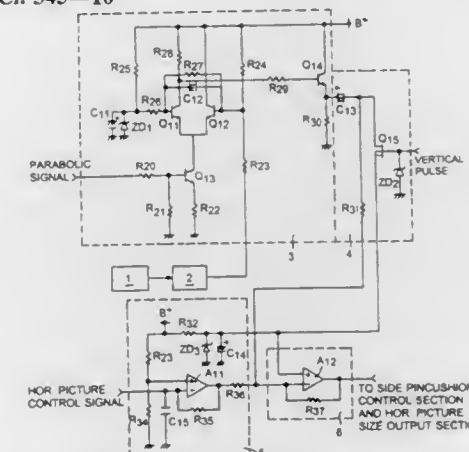
Filed Aug. 7, 1995, Ser. No. 512,047

Claims priority, application Rep. of Korea, Aug. 10, 1994, 94-19738

Int. Cl.<sup>6</sup> G09G 1/06; 1/04; H04N 3/223

U.S. Cl. 345-10

4 Claims



1. A side pincushion control apparatus for a monitor having horizontal picture size output means for controlling a horizontal size of a picture according to a horizontal picture size control signal and side pincushion control means for controlling side pincushion of said picture according to a prescribed parabolic signal and a vertical pulse signal, the said pincushion control apparatus comprising:

- microcomputer means for providing a digital control signal for controlling the size of said parabolic signal;
- digital-to-analog conversion means for converting said digital control signal into an analog signal of a DC voltage;
- first amplifying means for inverse-amplifying said parabolic signal by said DC voltage provided from said digital-to-analog conversion means;
- clamping means for clamping the maximum voltage of said parabolic signal provided from said first amplifying means within a predetermined voltage level;
- second amplifying means for amplifying said horizontal picture size control signal; and
- third amplifying means for inverse-amplifying said parabolic signal provided from said clamping means and said DC voltage provided from said second amplifying means to provide its output to said side pincushion control means.

5,771,030

**APPARATUS AND METHOD FOR DRIVING LIQUID CRYSTAL**

Hidefumi Suzuki, Kawasaki; Akihiro Funakoshi, Kamakura, and Isamu Miwa, Fujisawa, all of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

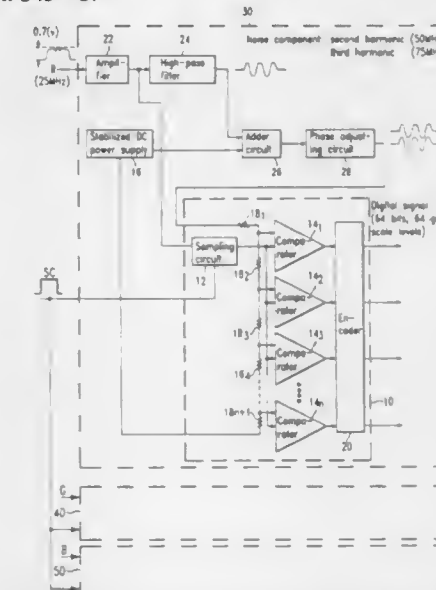
Filed Jan. 30, 1995, Ser. No. 380,534

Claims priority, application Japan, Jan. 28, 1994, 6-008740

Int. Cl.<sup>6</sup> H04N 7/00

U.S. Cl. 345-87

6 Claims



1. A method for driving liquid crystal comprising the steps of: extracting a noise component from an input analog signal representing an image by a voltage waveform, generating a constant voltage, adding said extracted noise component to said constant voltage to produce a threshold reference voltage, applying said threshold reference voltage and said input analog signal to an analog-to-digital converter to convert said analog signal to a digital signal, and applying said digital signal to the corresponding electrode of a liquid crystal panel to drive said liquid crystal panel.

5,771,031

**FLAT-PANEL DISPLAY DEVICE AND DRIVING METHOD OF THE SAME**

Kohei Kinoshita, Hyogo-ken; Tooru Aral, Yokohama, and Kan Shimizu, Urawa, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 26, 1995, Ser. No. 548,615

Claims priority, application Japan, Oct. 26, 1994, 6-262122

Int. Cl.<sup>6</sup> G09G 3/36

U.S. Cl. 345-98

20 Claims

1. A flat-panel display device comprising:
- a display panel having a plurality of pixels arrayed in a matrix, the pixels in each row forming one horizontal pixel array;
  - a plurality of block driving circuits arranged in series to divide pixels in each horizontal pixel array to a plurality of pixel blocks, for driving the pixel blocks, respectively;
  - M data supply buses each connected to at least one of block driving circuits; and
  - control means for distributing pixel data sequentially supplied from outside to said data supply buses; wherein the control means includes:
- a distributing circuit having a plurality of memory sections each of which stores items of pixel data for one pixel block and is capable of reading from one area while writing to another area, a total memory capacity of said memory





5,771,037

## COMPUTER DISPLAY CURSOR CONTROLLER

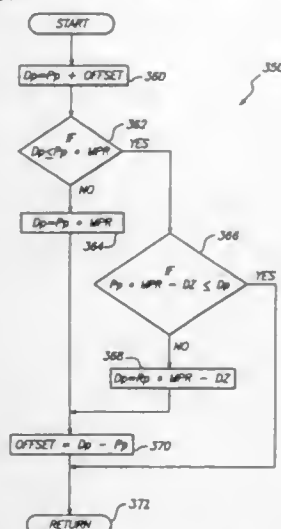
Robert E. Jackson, Rolling Hills Estates, Calif., assignor to Altra, Rawlins, Wyo.

Filed Jul. 24, 1995, Ser. No. 505,916

Int. Cl.<sup>6</sup> G09G 5/08

U.S. Cl. 345—157

30 Claims



18. A method of controlling a cursor on a computer display, comprising the steps of:

- setting a display position as a controller structure position plus an offset;
- when the display position is greater than the controller structure position times a multiplier, setting the display position to the controller structure position times the multiplier and setting the offset to the display position minus the controller structure position;
- when the display position is less than or equal to the controller structure position times the multiplier and the controller structure position times the multiplier minus a differential zero is greater than the display position, setting the display position to a rough position times the multiplier minus the differential zero and setting the offset to the display position minus the controller structure position; and
- repeating steps (a) to (c).

5,771,038

## CONTROL DEVICE FOR DISPLAY STATE CHANGE ON MONITOR

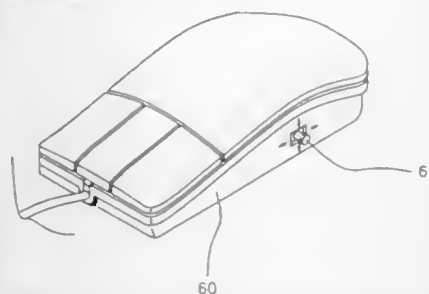
David Wang, Hsi Chih Town, Taiwan, assignor to Primax Electronics Ltd., Taipei, Taiwan

Filed Aug. 9, 1995, Ser. No. 512,995

Int. Cl.<sup>6</sup> G09G 5/08

U.S. Cl. 345—163

17 Claims



1. A control device for making a display state change on a monitor, said device comprising:

- a first input device mounted in said housing for determining a movement of a cursor on said monitor in an X- and a Y-directions;

a second input device for giving two-dimensional control, said second input device being mounted in said housing and having a stick element partly protruding from a side surface of said housing for enabling said stick element to be manipulated by a thumb of a user wherein the two dimensions of said second two-dimensional input device respectively control two kinds of display state changes which include a movement of said cursor in a Z-direction, a rotation operation and a picture change on said monitor; and

a control circuit mounted in said housing for executing said display state change responsive to control by said stick element.

5,771,039

## DIRECT VIEW DISPLAY DEVICE INTEGRATION TECHNIQUES

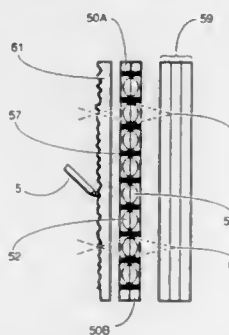
Richard J. Ditzik, 307 Surrey Dr., Bonita, Calif. 91902

Filed Jun. 6, 1994, Ser. No. 254,169

Int. Cl.<sup>6</sup> G09G 5/00

U.S. Cl. 345—178

13 Claims



1. An optical micro lens array sheet for use with a display device, wherein the micro lens array sheet provides improved viewing characteristics and wherein the display device defines a multiplicity of pixels and viewing screen, the optical micro lens array sheet comprising:

- a first planar micro lens array layer made of a multiplicity of transparent micro lenses fabricated into a substrate;
- a second planar micro lens array layer made of a multiplicity of transparent micro lenses fabricated into a substrate, wherein each micro lens of the first and second array layers are placed adjacent with their plane surfaces facing each other roughly aligned, such that each micro lens pair acts as an equivalent convex-convex converging micro lens;
- said micro lenses pairs are adapted so that the second array layer has a focal length on the image side defining an image distance, and the first array layer has a focal length on the object side, defining an object distance that is greater than the thickness of the first array layer; and
- said first and second planar micro lens array layers together act as an equivalent single micro lens array sheet to be placed over the display viewing screen with its object distance defined by the focal lengths of the micro lens pairs on the object side adapted to be roughly equal to the distance to the pixels of the display device.

5,771,040

## DEVICE AND METHOD FOR DISPLAY CENTERING OF THE EFFECTIVE SCREEN OF LCD

Tae-Sung Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyonggi-do, Rep. of Korea

Filed Jan. 29, 1996, Ser. No. 593,247

Claims priority, application Rep. of Korea, Jan. 27, 1995, 1533/1995

Int. Cl.<sup>6</sup> G09G 3/36

U.S. Cl. 345—213

16 Claims



Center deflection

1. A display driving device which positions an image on a liquid crystal display having a number of screen lines, said display driving device comprising:

- a horizontal pulse generator which receives a data enable signal and outputs a gate clock signal having a pulse frequency according to a logic state of said data enable signal, said gate clock signal controlling a start time of each of said screen lines of data displayed on said liquid crystal display; and
- a start pulse generator which receives said gate clock signal and a vertical synchronizing pulse and outputs a gate start pulse based on said gate clock signal and said vertical synchronizing pulse, said gate start pulse controlling a starting line among said screen lines to begin displaying said image on said liquid crystal display.

5,771,041

## SYSTEM FOR PRODUCING DIRECTIONAL SOUND IN COMPUTER BASED VIRTUAL ENVIRONMENT

Ian S. Small, Cupertino, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

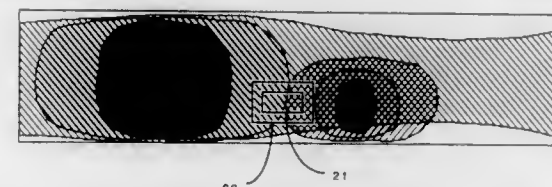
Continuation of Ser. No. 253,298, Jun. 3, 1994, abandoned.

This application Dec. 3, 1996, Ser. No. 763,144

Int. Cl.<sup>6</sup> G06F 3/16

U.S. Cl. 345—326

19 Claims



1. A method for producing sounds corresponding to different views in a computer-generated environment, comprising the steps of:

- establishing a visual scene for the environment;
- establishing a viewing area which encompasses at least a portion of said visual scene;
- generating an array of sound intensities corresponding to a sound source associated with said visual scene;
- defining a hearing area from said viewing area which encompasses at least a portion of said array;
- processing the sound intensities contained within the portion of said array that is encompassed by said hearing area to determine an average sound level; and
- reproducing a predetermined sound at said sound level.

5,771,042

## MULTI-SIZE CONTROL FOR MULTIPLE ADJACENT WORKSPACES

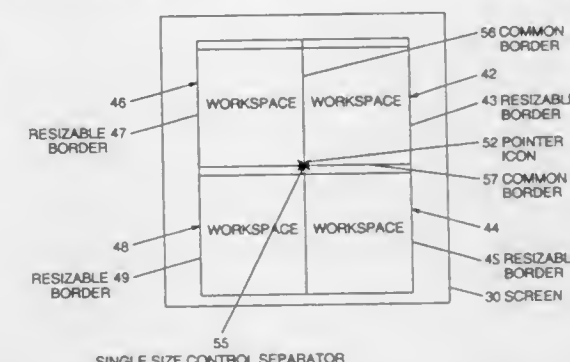
Lucinio Santos-Gomez, Durham, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 17, 1996, Ser. No. 682,454

Int. Cl.<sup>6</sup> G06F 3/00

U.S. Cl. 345—342

30 Claims



1. A method of controlling size of multiple workspaces in a user interface environment, the method comprising the steps of:

- connecting workspaces to create a single size control separator for borders of workspaces which are aligned with the border of an adjacent workspace by snapping the border of a workspace to the border of an adjacent workspace to connect the workspaces and create a single size control separator for the borders of the adjacent workspace when the border of a workspace is moved to within a predetermined distance from the border of an adjacent workspace; and
- resizing connected workspaces utilizing the single size control separator for the connected workspace based upon translation of the size control separator.

5,771,043

## METHOD AND APPARATUS FOR DISPLAYING OPERATING PROCEDURE

Seitsu Nigawara, Takehiko Ikematsu, and Hiroshi Kohmoto, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

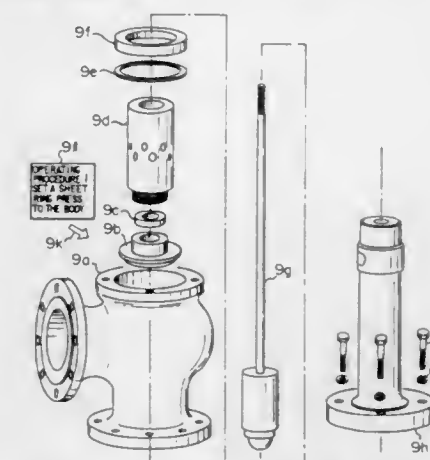
Continuation of Ser. No. 181,889, Jan. 14, 1994, abandoned, which is a continuation of Ser. No. 742,607, Aug. 8, 1991, abandoned. This application Aug. 22, 1994, Ser. No. 293,420

Claims priority, application Japan, Aug. 22, 1990, 2-218920

Int. Cl.<sup>6</sup> G06T 15/70; G06F 3/14

U.S. Cl. 345—419

87 Claims



72. A display system for displaying an operating procedure having a plurality of mono-elements, wherein in a time continuous three-dimensional dynamic scene, sequential images of said operating procedure are displayed in a display device based on three-dimensional dynamic scene information of said operating procedure.





timekeeping means for measuring an elapsed time from an end of ink ejection by said fluid-jet head; wherein said temperature maintaining means holds the temperature of the fluid-jet head within the predetermined range after an end of recording by the fluid-jet head, and stops the heating of the fluid-jet head by said heating means when the elapsed time is not less than a predetermined period of time.

5,771,050

## PRINTER WITH MOVABLE PRINT HEAD

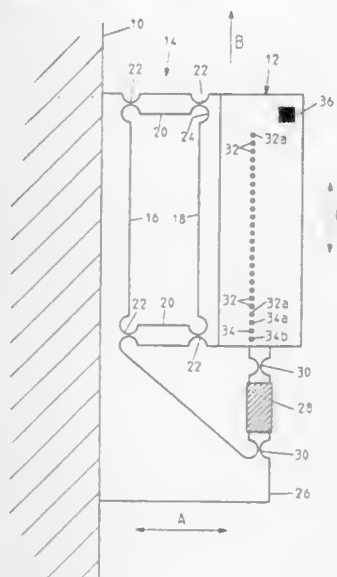
Godefridus Gerardus Hubertus Gielen, Beringe, Netherlands, assignor to Océ-Nederland, B.V., Ma Venlo, Netherlands  
Filed Jun. 28, 1995, Ser. No. 495,975

Claims priority, application European Pat. Off., Jul. 18, 1994, 94202084

Int. Cl.<sup>6</sup> B41J 29/42

U.S. Cl. 347—19

17 Claims



1. A printer comprising:

a carriage;

a print head mounted on said carriage having at least one printing element for successively printing pixels onto a recording medium;

means for moving said carriage and said recording medium relative to one another in a main scanning direction (A) and a subscanning direction (B) perpendicular to said main scanning direction; and

actuator means for dynamically displacing said print head, relative to said carriage, in the subscanning direction,

a sensor provided on said print head for detecting a registration mark on said recording medium and for providing a sensor signal indicative of a position of said print head relative to said registration mark,

said printer also including a control means connected to said sensor for controlling, in response to said sensor signal, said means for dynamically displacing said print head relative to said carriage, thereby adjusting the position of said print head relative to said registration mark.

5,771,051  
ARRANGEMENT FOR MONITORING FUNCTIONING OF AN INK PRINT HEAD

Stephan Guenther, and Wolfgang Pekruhn, both of Berlin, Germany, assignors to Francotyp-Postalia AG & Co., Birkenwerder, Germany

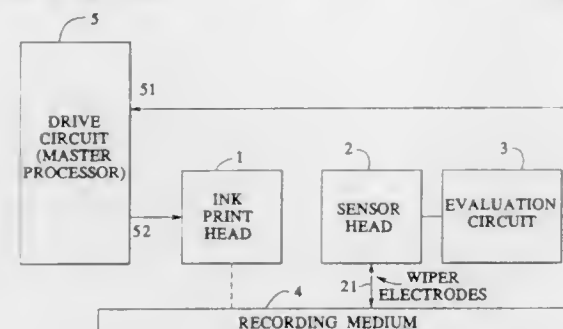
Filed Sep. 26, 1996, Ser. No. 720,287

Claims priority, application Germany, Oct. 6, 1995, 195 37 161.5

Int. Cl.<sup>6</sup> B41J 29/38

U.S. Cl. 347—19

5 Claims



1. An arrangement for monitoring functioning of an ink print head which produces an inked imprint on a recording medium moving past said ink print head, said arrangement comprising: an ink print head;

a sensor head having at least two wiper electrodes disposed in contact with a recording medium following said ink print head, said wiper electrodes obtaining an electrical signal which changes dependent on electrical properties of a recording medium between the wiper electrodes caused by a presence of a just-printed imprint on a recording medium; and evaluation means, supplied with said electrical signal, for determining whether said ink print head is functioning properly dependent on said changes in said electrical signal.

5,771,052  
SINGLE PASS INK JET PRINTER WITH OFFSET INK JET MODULES

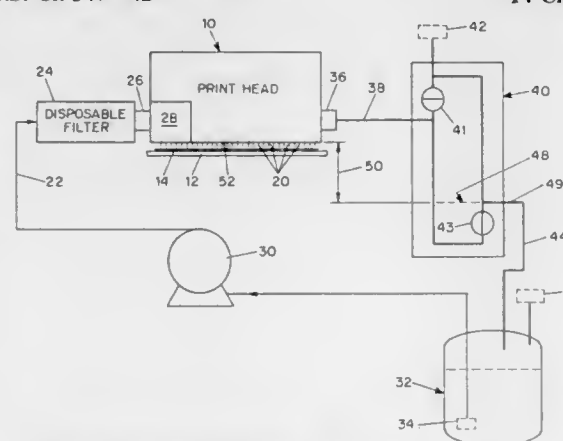
Nathan P. Hine, South Strafford, Vt., and Edward R. Moynihan, Plainfield, N.H., assignors to Spectra, Inc., Hanover, N.H.

Continuation-in-part of Ser. No. 458,738, Jun. 2, 1995, Pat. No. 5,640,184, which is a division of Ser. No. 406,297, Mar. 17, 1995, which is a continuation-in-part of Ser. No. 215,301, Mar. 21, 1994, Pat. No. 5,659,346. This application Nov. 4, 1996, Ser. No. 743,544

Int. Cl.<sup>6</sup> B41J 2/155; 2/14; 2/045

U.S. Cl. 347—42

14 Claims



1. A single pass ink jet printer comprising: drive means for conveying an object having an image-receiving surface in a selected direction; and

an ink jet printhead disposed in closely spaced relation to the object to project ink drops toward the image-receiving surface thereof, the printhead comprising: a support frame having an opening; an orifice plate affixed to the support frame and having at least one row of orifices extending substantially perpendicular to the direction of motion of an image-receiving surface and in a direction across a width of the image-receiving surface; a manifold plate formed with a plurality of passages communicating with the orifices in the orifice plate and having additional passages for conveying ink from an ink inlet to a plurality of ink jet modules; and a plurality of ink jet modules supported within the opening in the support frame and having end faces communicating with passages in the manifold plate to supply ink therethrough to orifices in the orifice plate with which the passages communicate, the ink jet modules extending in the direction across the width of the image-receiving surface and having ink pressure chambers and associated transducers corresponding to the orifices in the orifice plate; and an ink supply reservoir for supplying ink to the printhead.

5,771,053

## ASSEMBLY FOR CONTROLLING INK RELEASE FROM A CONTAINER

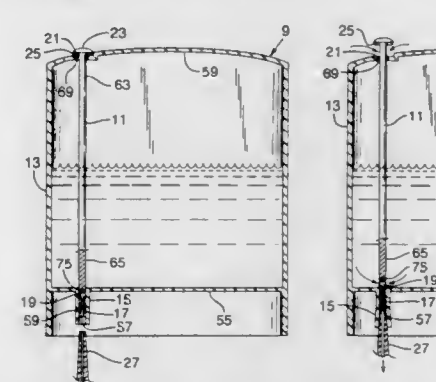
David O. Merrill, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Dec. 4, 1995, Ser. No. 566,643

Int. Cl.<sup>6</sup> B41J 2/175

U.S. Cl. 347—86

22 Claims



1. An assembly for controlling the release of ink from an ink container, the assembly comprising:

an ink container for containing the ink, the ink container including an opening; and

a valve member slidably mounted within the opening, the valve member having one end movable without rotation into a first position for occluding the opening to prevent the flow of the ink from the ink container and into a second position for allowing the flow out of the ink container.

5,771,054

## HEATED DRUM FOR INK JET PRINTING

Lesley P. Dudek, Webster, N.Y.; Vaughan Louis Dewar, Bartlett, Tenn.; Dale R. Ims, Webster, and Michael C. Ferringer, Ontario, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

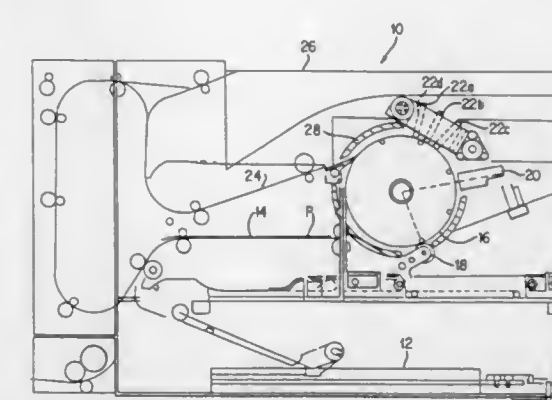
Filed May 30, 1995, Ser. No. 452,770

Int. Cl.<sup>6</sup> B41J 2/01

U.S. Cl. 347—102

27 Claims

1. A high-speed inkjet printer comprising: a sheet input tray for storing a sheet prior to printing, the sheet having a predetermined length; a sheet output tray for storing printed sheets; a heated rotary printing drum provided downstream from said sheet input tray;



a sheet input path located between said sheet input tray and said heated rotary printing drum for transporting the sheet from said sheet input tray to said heated rotary printing drum, said heated rotary printing drum acquiring and precisely registering the sheet from said sheet input path such that the sheet is in contact with an outer surface of said heated rotary printing drum, a circumferential length of said heated rotary printing drum being greater than the length of the sheet;

at least one ink jet printhead located for printing an image onto the sheet while the sheet is registered on said heated rotary printing drum; and

an exit sheet path located downstream of the heated rotary printing drum for receiving the sheet from the heated rotary printing drum and transporting the sheet from said heated rotary printing drum to said sheet output tray,

wherein said heated rotary printing drum is rotated a plurality of complete revolutions to transport the sheet a plurality of times past said at least one ink jet printhead for printing the image onto the sheet, said heated rotary printing drum being provided with a heat source that transfers heat energy to the sheet acquired on said heated rotary printing drum as the sheet is rotated past said printhead, at least one complete revolution of said heated rotary printing drum being provided after printings thereby sufficiently drying the sheet and ink printed on the sheet prior to transfer of said sheet from said drum to said exit sheet path.

5,771,055

## LASER PRINTER CAPABLE OF COOLING HEAT GENERATING PARTS AS WELL AS REDUCING NOISE

Masahiko Aiba; Ken-ichi Morimoto, both of Nara; Kouichi Moriyama, Ikoma; Yuhl Yui, Nabari; Tokio Awata, Ikoma, and Satoshi Murakami, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

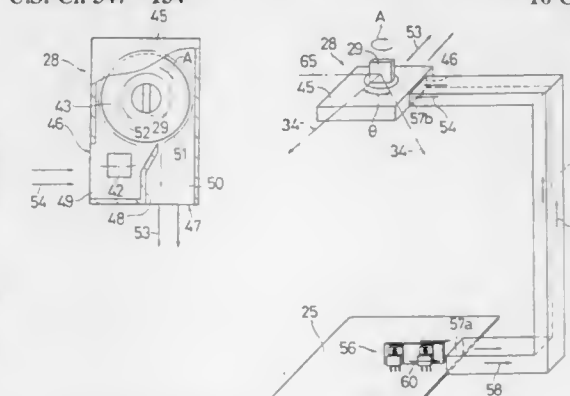
Filed Mar. 28, 1996, Ser. No. 625,020

Claims priority, application Japan, Mar. 28, 1995, 7-070070

Int. Cl.<sup>6</sup> B41J 2/385; G03G 13/04

U.S. Cl. 347—134

16 Claims



1. A laser printer comprising: a photosensitive member;





# UMI

1. A dental video camera comprising:
  - a. a housing having an elongated cavity with a distal end and a proximal end;
  - b. a CCD camera disposed in said elongated cavity of said housing at said proximal end;
  - c. a mechanically adjustably focusing lens system optically coupled to said CCD camera and disposed in said elongated cavity of said housing adjacent to said distal end thereof whereby said adjustably focusing lens and CCD camera system includes:
    - a. a CCD camera disposed within and slidably coupled to said elongated cavity of said housing at said proximal end thereof;
    - b. a spring resiliently coupling said CCD camera to said to said elongated cavity of said housing;
    - c. a first sleeve having a longitudinal axis, said first sleeve being axially aligned along said longitudinal axis and being disposed within said elongated cavity of said housing, said first sleeve being able to rotate about said longitudinal axis and being restrained from moving laterally back and forth along said longitudinal axis;
    - d. a first lens carrier with a first achromatic lens disposed within said first sleeve and fixedly coupled to said first sleeve;
    - e. a second sleeve telescopically and slidably coupled to said first sleeve, said second sleeve being able to move laterally back and forth along said longitudinal axis and being restrained from rotating about said longitudinal axis;
    - f. a second lens carrier with a second achromatic lens disposed within said first sleeve and fixedly coupled to said first sleeve whereby said second sleeve engages said CCD camera so that said second sleeve laterally moves said CCD camera back and forth in order to change the position of said CCD camera with respect to said first and second achromatic lenses thereby changing the field of focus; and
    - g. a mechanism for bi-directionally driving said second sleeve laterally to produce back and forth lateral movements along said longitudinal axis whereby said back and forth lateral movements of said second sleeve generates clockwise and counter-clockwise rotations, respectively, of said first sleeve thereby rotatably adjusting said adjustable iris between said nearly closed opening thereof and said wide open opening thereof; and
  - d. an electrically adjustable iris optically coupled to said mechanically adjustably focusing lens system whereby said electrically adjustable iris is adjusted between a nearly closed opening and a wide open opening, said electrically adjustable iris including:
    - a. a liquid crystal assembly consisting of a plurality of liquid crystals having a refractive index anisotropy and having different response frequencies of molecule orientation; and
    - b. an apparatus for varying the frequency of a driving signal applied to said liquid crystal assembly so that the transmittivity



ity and refractive index of said plurality of liquid crystals may be independently controlled with few signal lines.

control means for operating said locking means in response to the velocity state detected by said detection means.

5,771,068

**APPARATUS AND METHOD FOR DISPLAY PANEL INSPECTION**

Erez Sali, Yehud; Yigal Katzir, Rishon Lezion; Noam Dotan, Givatayim, and Abraham Gross, Rehovot, all of Israel, assignors to Orbotech Ltd., Yavne, Israel

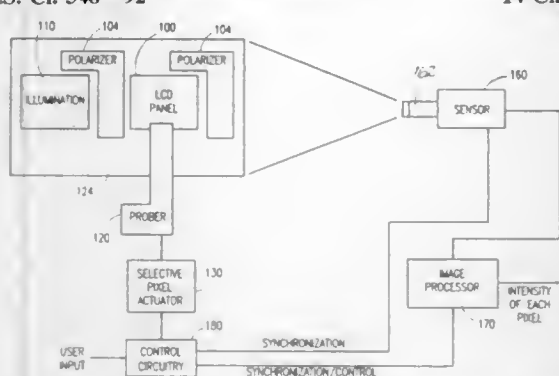
Filed Mar. 10, 1995, Ser. No. 402,141

Claims priority, application Israel, Mar. 14, 1994, 108974

Int. Cl.<sup>6</sup> G09G 3/36

U.S. Cl. 348—92

14 Claims



1. A system for inspecting a display panel comprising a plurality of pixels, the system comprising:
- a selective pixel actuator which causes only some of the plurality of pixels to be actuated;
  - a sensor for acquiring an image of a pattern which is generated on the panel; and
  - an image processor operative to identify nonuniformities in the intensities of pixels of the panel,
- wherein the selective pixel actuator is operative to sequentially actuate a sequence of pixel subsets, wherein each pixel subset includes only a single pixel within each of a plurality of pixel vicinities of predetermined size within the display panel.

5,771,069

**IMAGE STABILIZING DEVICE**

Takashi Kobayashi, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 882,041, May 13, 1992, abandoned.

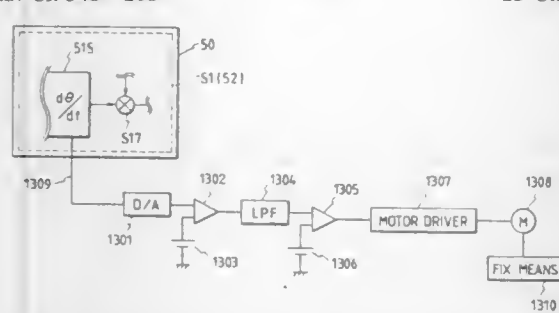
This application Apr. 25, 1994, Ser. No. 232,860

Claims priority, application Japan, May 17, 1991, 3-140602

Int. Cl.<sup>6</sup> H04N 5/228

U.S. Cl. 348—208

23 Claims



1. An image blur prevention apparatus comprising:
- movable image blur prevention means for preventing an image blur by moving;
  - locking means for fixing said image blur prevention means by contacting with at least a portion of said image blur prevention means;
  - detection means for detecting a velocity state of said image blur prevention means; and

5,771,070

**SOLID STATE IMAGE PICKUP APPARATUS REMOVING NOISE FROM THE PHOTOELECTRIC CONVERTED SIGNAL**

Hayao Ohzu, Fuchu; Toshiji Suzuki, Machida; Akira Ishizaki; Seiji Hashimoto, both of Yokohama; Tadanori Harada, and Tsuneo Suzuki, both of Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

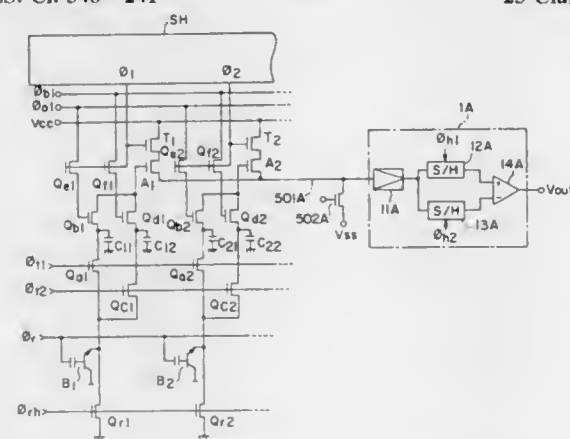
Continuation of Ser. No. 237,046, Jul. 15, 1994, abandoned, which is a continuation-in-part of Ser. No. 547,996, Jun. 13, 1990, Pat. No. 5,331,421, which is a continuation-in-part of Ser. No. 314,275, Feb. 23, 1989, abandoned, and Ser. No. 460,012, Jan. 2, 1990, abandoned, which is a continuation of Ser. No. 96,534, Sep. 14, 1987, Pat. No. 4,914,519, said Ser. No. 314,275 is a continuation of Ser. No. 929,892, Nov. 13, 1986, abandoned. This application Aug. 29, 1996, Ser. No. 705,002

Claims priority, application Japan, Nov. 15, 1985, 60-255027; Nov. 29, 1985, 60-269882; Sep. 19, 1986, 61-219666; Sep. 20, 1986, 61-229625; Oct. 8, 1986, 61-238017; Dec. 16, 1986, 61-300802; Dec. 16, 1986, 61-300803

Int. Cl.<sup>6</sup> H04N 3/14

U.S. Cl. 348—241

23 Claims



1. A photoelectric transducer apparatus comprising:
- a plurality of photoelectric transducer cells;
  - signal readout lines for reading out signals from said plurality of photoelectric transducer cells;
  - first and second switch means;
  - a plurality of first capacitors, each connected to one of said signal readout lines through said first switch means, for selectively storing first signals read out through said signal readout lines and said first switch means after a predetermined accumulation period;
  - a plurality of second capacitors, each connected to one of said signal readout lines through said second switch means, for selectively storing second signals corresponding to dark current signals readout through said signal readout lines and said second switch means; and
  - output means for cancelling dark current signals included in the first signals by subtracting each second signal from a corresponding first signal, and for outputting the first signals from which the dark current signals are cancelled.

5,771,071

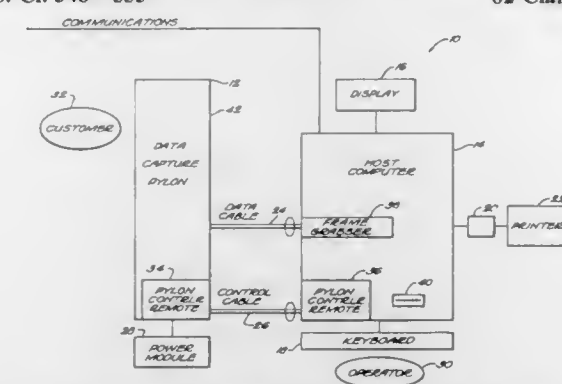
**APPARATUS FOR COUPLING MULTIPLE DATA SOURCES ONTO A PRINTED DOCUMENT**

William C. Bradley, Sudbury, and Mark L. Mesher, Wenham, both of Mass., assignors to LAU Technologies, Acton, Mass. Continuation-in-part of Ser. No. 262,552, Jun. 20, 1994, and Ser. No. 316,041, Sep. 30, 1994, Pat. No. 5,646,388. This application Jun. 7, 1995, Ser. No. 486,958

Int. Cl.<sup>6</sup> H04N 5/225

U.S. Cl. 348—335

62 Claims



1. Signal generating apparatus for generating at its output a sequence of electrical data signals each representative of a plurality of spatially separated object sources, comprising
- a. a housing having said plurality of object sources disposed thereon,
  - b. an image plane supported at a spatially fixed position relative to said housing,
  - c. at least one image path optically coupling said plurality of object sources and said image plane,
  - d. an optical conversion element positioned relative to said housing for acquiring visual images of said plurality of object sources from said image plane and generating said sequence of electrical data signals each representative of said visual images,
  - e. selection means for selectively and alternatively coupling visual images from each of said object sources along one of said image paths onto said image plane wherein said selection means comprises a flip-mirror disposed within one of said image paths and being pivotally mounted to said housing for pivoting said image plane into optical engagement with a first object source or a second object source,
  - f. an optical bench sized for disposition within said housing for mounting said selection means, and
  - g. a signal processor associated with said housing for storing said sequence of electrical data signals representative of said visual images.

5,771,072

**VIDEO SIGNAL PROCESSING APPARATUS AND SYNTHESIZED-PICTURE PROJECTING APPARATUS FOR SYNTHESIZING A PLURALITY OF VIDEO SIGNALS**

Tomio Tokoro, and Masaaki Mitani, both of Tokyo, Japan, assignors to Sony Corporation, and Chromatek Inc., both of Tokyo, Japan

Filed Apr. 18, 1996, Ser. No. 634,357

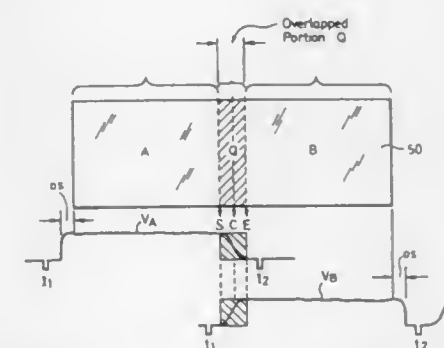
Claims priority, application Japan, Apr. 21, 1995, 7-119048

Int. Cl.<sup>6</sup> H04N 5/66

U.S. Cl. 348—383

3 Claims

1. A video signal processing apparatus comprising:
- a synchronizing signal separation means for extracting a synchronization information of an input video signal;
  - a reference clock signal source for generating a signal having a constant period;
  - a phase synchronization control means which is input with a clock signal output from the said reference clock signal



source and which outputs a phase-locked clock signal at a timing of outputting said synchronization information; and a memory means for storing a correction data used for correcting a video signal of at least one scanning line amount, wherein said correction data is a data used for correcting a signal corresponding to an overlapped portion produced when pictures obtained from said input video signals are synthesized to form a synthesized picture, and wherein said correction data is read out from said memory means based on said clock signal output from said chase synchronization control means to process said input video signal.

5,771,073

**ADVANCED TELEVISION SYSTEM USING A DIFFERENT ENCODING TECHNIQUE FOR NON-IMAGE AREAS**

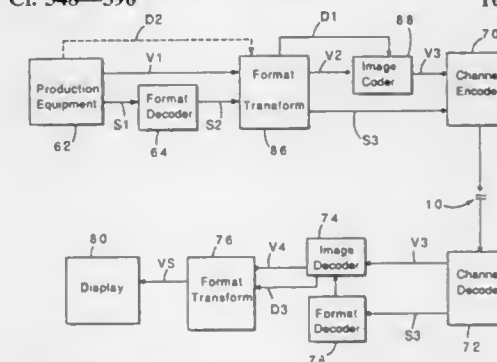
Jae S. Lim, Winchester, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 7, 1995, Ser. No. 478,746

Int. Cl.<sup>6</sup> H04N 7/12

U.S. Cl. 348—390

16 Claims



14. A method for encoding, transmitting, decoding, and displaying a video frame, comprising:
- producing a video image;
  - processing the video image to produce a formatted video frame by adding a blank region to the video image;
  - generating identification data descriptive of the location of the blank region;
  - encoding only the video image portion of the formatted video frame to produce an encoded image;
  - transmitting the identification data and the encoded image to a display device;
  - using the identification information to reconstruct the blank region;
  - decoding the encoded image to produce a decoded video image;
  - reconstructing the formatted video frame by combining the reconstructed blank region with the decoded video image; and
  - displaying the reconstructed formatted video frame.

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5,771,074

**METHOD OF INTERFRAME INTERPOLATION OF COLOR DIFFERENCE SIGNALS, AND CIRCUIT ARRANGEMENT FOR PERFORMING SAID METHOD**  
Achim Ibenthal, Elmshorn, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

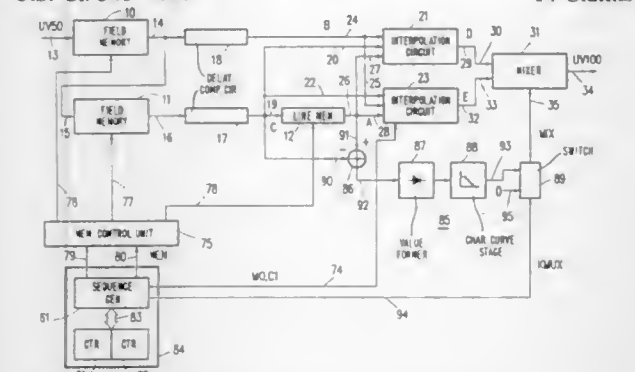
Filed Jul. 10, 1996, Ser. No. 700,703

Claims priority, application Germany, Jul. 13, 1995, 195 25 531.3

Int. Cl.<sup>6</sup> H04N 7/01

U.S. Cl. 348—444

14 Claims



1. A method of interpolating interlaced color difference signals, characterized by the steps of:

- generating a second color difference signal from a first color difference signal supplied at a first field repetition frequency by way of field repetition, the second color difference signal having a second field repetition frequency which is doubled with respect to the first field repetition frequency;
- generating a third, time-averaged color difference signal from the second color difference signal by time-averaging of two consecutive fields;
- generating a fourth, spatially high-resolution color difference signal by a spatially high-resolution interpolation of two consecutive fields from the second color difference signal;
- forming a fifth color difference signal to be supplied as a linear combination of the third and the fourth color difference signals by means of coefficients which are complementary with respect to a constant; and
- determining, in accordance with a vertical spatial frequency, which can be derived from picture contents representable by the color difference signals, or in accordance with a local rate of motion, the coefficients in such a way that substantially the third color difference signal, and in the reverse case substantially the fourth color difference signal, are used for forming the fifth color difference signal in the linear combination in the case of rapid motion or low spatial frequencies.

5,771,075

**AUDIO/VIDEO SYNCHRONIZER**

Chai Yeol Rim, and Yong Hoon Kim, both of Seoul, Rep. of Korea, assignors to LG Electronics Inc., Seoul, Rep. of Korea

Filed Dec. 5, 1995, Ser. No. 567,689

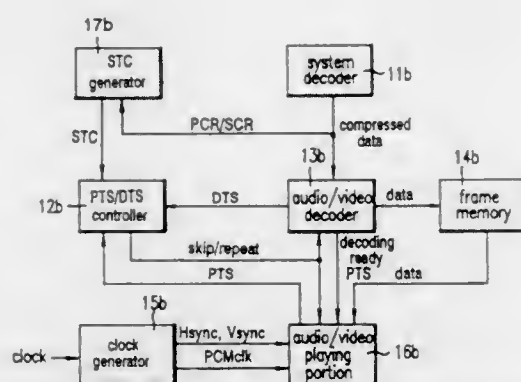
Claims priority, application Rep. of Korea, Dec. 8, 1994, 33332/1994; Jul. 14, 1995, 20847/1995

Int. Cl.<sup>6</sup> H04N 9/475

U.S. Cl. 348—512

4 Claims

1. An audio/video synchronizer for a digital TV comprising:
- a system decoder for parsing an input data packet and outputting compressed data of audio and video signals and PTS/DTS and PCR or SCR;
  - an STC generator for receiving and counting PCR or SCR from said system decoder to thereby output an STC value;
  - an audio/video decoder for decoding the compressed data output from said system decoder, outputting a DTS for the video or audio frame to be decoded, and outputting a decoding ready



signal indicating that decoding of the video or audio frame is finished, and a PTS of corresponding data;

- a frame memory for storing the audio/video data from said audio/video decoder;
- a clock generator for dividing an input clock according to a division value to generate horizontal and vertical sync signals and a PCM clock of the audio signal;
- an audio/video playing portion for laying the data decoded in said audio/video decoder according to the decoding ready signal in synchronization with the vertical and horizontal sync signals from said clock generator and the audio PCM clock, and outputting the PTS of a picture played and the audio frame to said PTS/DTS controller; and
- a PTS/DTS controller for comparing the PTS input from said audio/video playing portion or the DTS from said audio/video decoder with the STC input from said STC generator, thereby controlling said audio/video decoder and audio/video playing portion according to their difference.

5,771,076

**DEVICE FOR GENERATING A VERTICAL SYNCHRONIZING SIGNAL**

Young-Chul Kim, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

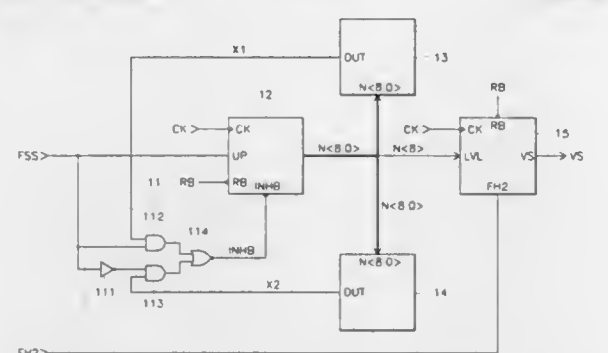
Filed Oct. 9, 1996, Ser. No. 729,233

Claims priority, application Rep. of Korea, Oct. 10, 1995, 95-34694

Int. Cl.<sup>6</sup> H04N 5/06

U.S. Cl. 348—524

17 Claims



1. A device for generating a vertical synchronizing signal comprising

- a counter for receiving a first input signal and a system clock, and for counting a number of cycles of the system clock and producing a 9-bit counting signal in response thereto;
- a first comparator for receiving the 9-bit counting signal, comparing it with an upper limit number, and producing an output signal;
- a second comparator for receiving the 9-bit counting signal, comparing it with a lower limit number, and producing an output signal;
- a feedback loop circuit for receiving the first input signal, the output signal of said first comparator, and the output signal of said second comparator, and producing a feedback signal to

prevent outputs of said counter from exceeding the upper and lower limit numbers; and

a controller for receiving the most significant bit (MSB) of the 9-bit counting signal, the system clock, and a second input signal, and producing a vertical synchronizing signal where the MSB has a low logic value when the counter counts system clocks in the descending direction from the upper limit number.

5,771,077

**VIDEO FRAME GRABBER COMPRISING ANALOG VIDEO SIGNALS ANALYSIS SYSTEM**

Jos Jennes, Ranst; Paul Wouters, Antwerpen; Paul Canters, Turnhout; Herman Van Goubergen, Antwerpen, and Geert Debeerst, Brecht, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

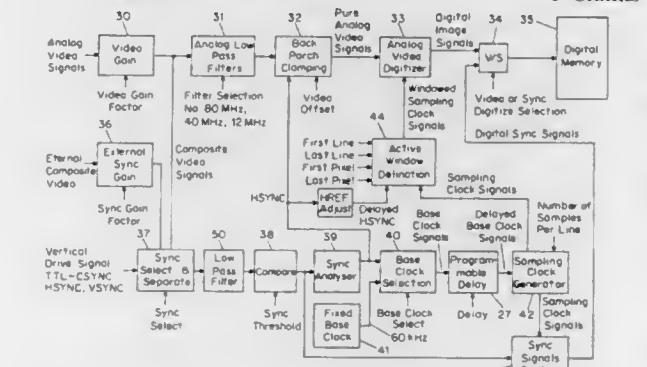
Division of Ser. No. 269,389, Jun. 30, 1994, Pat. No.

5,717,469. This application Feb. 3, 1997, Ser. No. 794,149

Int. Cl.<sup>6</sup> H04N 5/14

U.S. Cl. 348—571

5 Claims



1. A method to determine an optimal sampling frequency in a video frame grabber, comprising the following steps:
- generating video signals having fast transients;
  - sampling said video signals at a predetermined frequency of sampling clock signals to digital image signals;
  - locating within said digital image signals said fast transients;
  - deriving from the location of said transients at least one candidate sampling frequency for said optimal sampling frequency.

5,771,078

**VIDEO FRAME GRABBER COMPRISING ANALOG VIDEO SIGNALS ANALYSIS SYSTEM**

Jos Jennes, Ranst; Paul Wouters, Antwerpen; Paul Canters, Turnhout; Herman Van Goubergen, Antwerpen, and Geert Debeerst, Brecht, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Division of Ser. No. 269,389, Jun. 30, 1994, Pat. No.

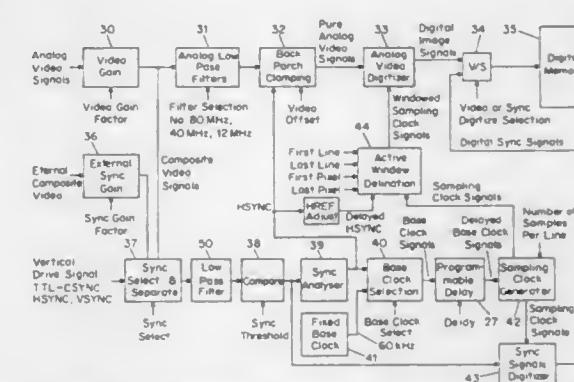
5,717,469. This application Feb. 3, 1997, Ser. No. 794,148

Int. Cl.<sup>6</sup> H04N 5/52

U.S. Cl. 348—678

5 Claims

1. In a system for digitizing video signals, comprising a video gain means for re-sizing said video signals by amplification or reduction with a video gain factor, a method for the determination of an optimal video gain factor, comprising the following steps:
- (a) generating the video signals covering the useful range of analog video signal levels;
  - (b) setting a video gain factor in said video gain means;
  - (c) digitizing said re-sized video signals into digital image signals;
  - (d) finding a digital extreme value—maximum or minimum—of said digital image signals;
  - (e) repeating steps (b) to (d) for at least two different video gain factor settings;
  - (f) selecting the optimal video gain factor larger or equal to a maximum video gain factor corresponding to a digital



extreme situated within the possible range of digital values for said digital image signals.

5,771,079

**APPARATUS AND METHOD FOR PREDICTING PIXEL DATA OF DYNAMIC IMAGE USING A HALF PIXEL PITCH**

Jin-Gyeong Kim, Seoul, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

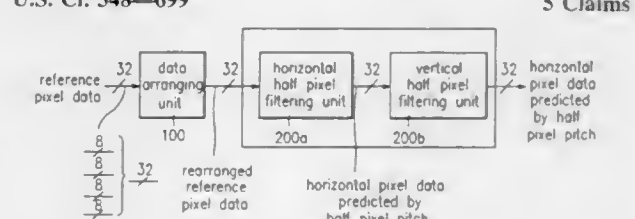
Filed Aug. 23, 1996, Ser. No. 702,098

Claims priority, application Rep. of Korea, Aug. 25, 1995, 1995/26656

Int. Cl.<sup>6</sup> H04N 7/28; 7/50

U.S. Cl. 348—699

5 Claims



1. An apparatus for predicting pixel using a half pixel pitch, comprising:

- a data arranging unit for receiving a plurality of pixel data in parallel compressed with one motion vector, and for rearranging the plurality of the pixel data in parallel according to the motion vector, the data arranging unit including:
- a plurality of first delayers for delaying by one pixel the plurality of the pixel data input in parallel;
- a plurality of second delayers for delaying by one pixel the plurality of pixel data delayed by the first delayers; and
- a plurality of multiplexers for rearranging a plurality of the pixel data by selectively producing outputs from the first and second delayers in response to a shift signal based on the motion vector;
- a first filtering unit for simultaneously producing, in parallel, a plurality of horizontal pixel data predicted using the half pixel pitch by adding each pixel data rearranged in parallel with pixel data adjacent in one direction, the first filtering unit including:
- a plurality of third delayers to delay by one pixel the plurality of data rearranged in parallel by the data arranging unit;
- a plurality of first AND gates for performing an AND operation with respect to a horizontal half pixel signal based on the motion vector and pixel data produced by each delayers; and
- a plurality of first adders for producing a plurality of horizontal pixel data predicted by half pixel pitch by adding up each pixel data produced by each delayers and each output of the AND gates corresponding to the pixel data; and
- a second filtering unit for simultaneously producing, in parallel, a plurality of vertical pixel data predicted using the half pixel pitch by adding each horizontal pixel data produced by the



first filtering unit with the pixel data each delayed by one line from the horizontal pixel data, the second filtering unit including:

- a plurality of fourth delayers for delaying the plurality of horizontal pixel data predicted by half pixel pitch by the first filtering unit;
- a plurality of second AND gates for performing an AND operation with respect to a vertical half pixel signal based on the motion vector and horizontal pixel data delayed by one line by the respective delaying unit; and
- a plurality of second adders for producing in parallel a plurality of vertical pixel data predicted by half pixel pitch by adding up each pixel data produced by each line delaying means and each output of the AND gates corresponding to the pixel data.

5,771,080

## TELEVISION SIGNAL TUNING DEVICE

Shigeto Sakakibara, Daito, Japan, assignor to Funai Electric Co., Ltd., Daito, Japan

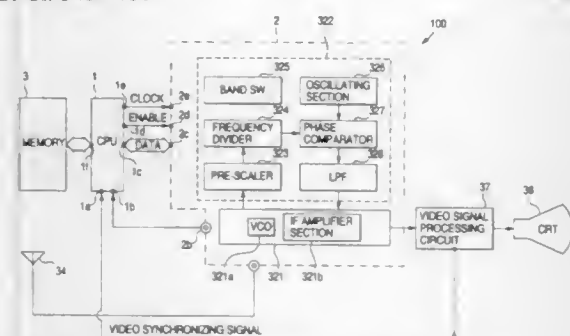
Filed Jan. 19, 1996, Ser. No. 588,706

Claims priority, application Japan, Jan. 19, 1995, 7-000573

Int. Cl.<sup>6</sup> H04N 5/50

U.S. Cl. 348—731

7 Claims



1. A television signal tuning device comprising:

channel selecting means which includes a phase-locked loop circuit and a tuner/IF section, said channel selecting means performing a plurality of channel selecting operations in order to select channels to be stored during a channel setting operation, each channel selecting operation involving selecting one channel from among a plurality of television broadcasting channels;

memory means for storing a data table of central frequency data, said central frequency data being central frequency data of channels selected during said channel setting operation, for starting a plurality of synchronizing-signal detecting operations, the central frequency data being set for each of the television broadcasting channels;

synchronizing-signal detecting means for detecting, during said channel selecting operation, a synchronizing signal from a video signal obtained by detecting and amplifying a signal output of the tuner/IF section; and

control means which, during said channel selecting operation, (a) causes the phase-locked loop circuit to perform a phase-locking operation for every data piece of the central frequency data according to the data table stored in said memory means;

(b) determines whether a broadcast signal is present or absent based solely on said detection of a respective presence or absence of said synchronizing-signal; and

(c) when said synchronizing-signal detecting means detects the synchronizing signal in each phase-locking operation performed during said channel selecting operation to determine that a broadcast signal is present, stores present channel data and tuning data thereof in said memory means to thereby complete said channel setting operation for a selected channel.

wherein the phase-locking operation is performed for every data piece of the central frequency data for a predetermined time.

5,771,081  
BIT SYSTEM FOR TRANSMITTING DIGITAL VIDEO DATA

Sang Hoon Lee, Seoul, Rep. of Korea, assignor to Korea Telecommunication Authority, Seoul, Rep. of Korea

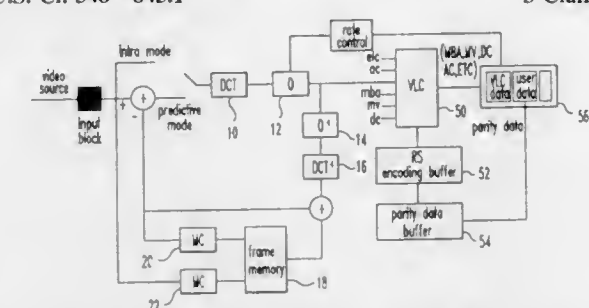
Continuation-in-part of Ser. No. 307,234, Sep. 16, 1994, abandoned. This application Feb. 1, 1996, Ser. No. 595,178

Claims priority, application Rep. of Korea, Feb. 28, 1994, 1994-3768

Int. Cl.<sup>6</sup> H04N 7/64

U.S. Cl. 348—845.1

3 Claims



1. A digital video data transmitting apparatus which is able to make a bit stream of video coding due to MPEG-coding having a plurality of picture groups, each having at least one intra picture and a plurality of predictive pictures, and each of the pictures consisting of at least one slice, the apparatus comprising:

means for generating a first slice of the I-picture comprising a slice start code, a parity code calculated using a DC coefficient, and at least one macro block each having a macro block address, a macro block type, a quantizing scale, a DC coefficient and an AC coefficient, a second slice of the P-picture comprising a slice start code, a parity code calculated using motion vectors, and at least one macro block each having a macro block address, a macro block type, a quantizing scale, a motion vector, an encoded block pattern, and an AC coefficient;

means for selecting the DC coefficient and the motion vector from the first and second slices, and storing them in an RS-encoding buffer;

means for transmitting one of the slices included in a picture into a user data section of an encoder buffer to conform with the MPEG-Standard bit stream; and

means for assigning the parity data to the encoded macro block of corresponding slices so that the parity data are transmitted together with the slice in a user data of the encoder buffer.

5,771,082

## ACTIVE MATRIX DISPLAY UTILIZING AN EMBEDDED GROUND PLANE

René Chaudet, Grenoble, and Jean-Michel Vignolle, Bourg La Reine, both of France, assignors to Thomson-LCD, Paris, France

Continuation of Ser. No. 325,478, Oct. 19, 1994, abandoned, which is a continuation of Ser. No. 211,445, Apr. 11, 1994, abandoned. This application Dec. 12, 1996, Ser. No. 762,693

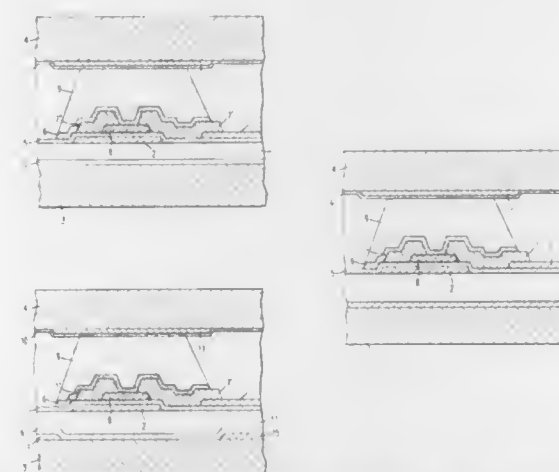
Claims priority, application France, Oct. 11, 1991, 91 12585

Int. Cl.<sup>6</sup> G02F 1/133; 1/136

U.S. Cl. 349—39

11 Claims

1. Active matrix display screen including a substrate plate on one face of which there are deposited electrodes and thin film components controlling these electrodes, and a back plate including one or more back-plate electrodes and covering said face of the substrate plate, a liquid crystal being contained between the electrodes of the plate and the back-plate electrode, or electrodes of the back plate including a ground plane forming an equipotential over the whole surface of the screen between the substrate plate and the thin films of the control components, wherein the ground plane consists of two films superimposed one above the other, one layer



being conducting and transparent and the other being opaque, with openings realized at least in the opaque layer.

5,771,083

## ACTIVE MATRIX SUBSTRATE AND LIQUID CRYSTAL DISPLAY DEVICE

Masaki Fujihara, Tenri; Yuzuru Kaeomori, Nara, and Masaya Okamoto, Soraku-gun, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

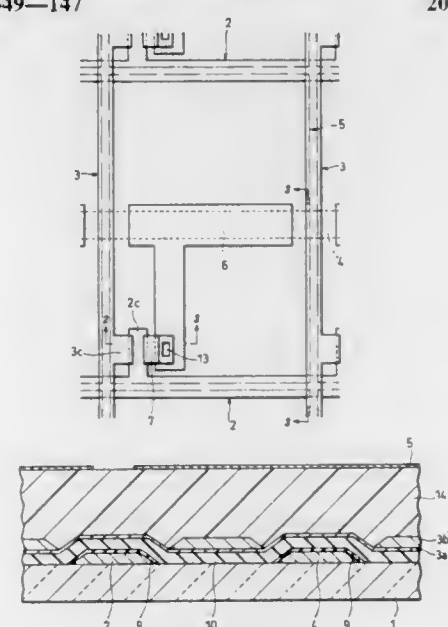
Filed Oct. 1, 1996, Ser. No. 725,663

Claims priority, application Japan, Oct. 16, 1995, 7-267307

Int. Cl.<sup>6</sup> G02F 1/1343

U.S. Cl. 349—147

20 Claims



3. The active matrix substrate comprising:

a scanning line and a signal line arranged to cross each other at an intersection;

a switching element to which a scanning signal and a data signal are supplied by said scanning line and said signal line, respectively;

wherein at least one of said scanning line and said signal line is made of an electrically conductive multi-layer film, and at least one of the layers forming said multi-layer film is eliminated at the intersection;

wherein said electrically conductive multi-layer film is formed by a first layer made of ITO and a second layer made of a

metal having a lower electrical resistance than ITO, and said second layer is eliminated at the intersection.

5,771,084

## LIQUID CRYSTAL DISPLAY DEVICE AND METHOD FOR FABRICATING THE SAME

Kohichi Fujimori, Nabari; Tokihiko Shinomlya, Nara; Shinji Yamagishi, Osaka, and Shuichi Kozaki, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

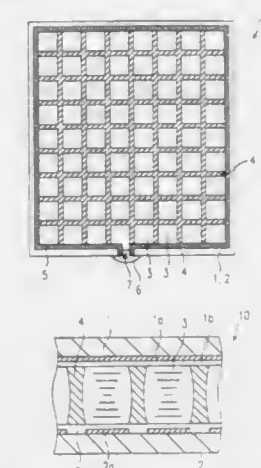
Filed Mar. 3, 1997, Ser. No. 810,383

Claims priority, application Japan, Mar. 5, 1996, 8-047827

Int. Cl.<sup>6</sup> G02F 1/133; 1/139

U.S. Cl. 349—153

9 Claims



1. A liquid crystal display device comprising:

a pair of substrates at least one of which is transparent;

a liquid crystal layer interposed between the pair of substrates and including a plurality of liquid crystal regions substantially surrounded by polymer walls;

a sealing agent surrounding a periphery of the liquid crystal layer except for a portion where an injection hole is formed to seal the liquid crystal layer and secure the pair of substrates together; and

a sealant for sealing the injection hole, wherein the polymer walls include an ultraviolet light curable resin, and the sealant includes a visible light curable resin.

5. A method for fabricating a liquid crystal display device including: a pair of substrates at least one of which is transparent; a liquid crystal layer interposed between the pair of substrates and including a plurality of liquid crystal regions substantially surrounded by polymer walls; a sealing agent surrounding a periphery of the liquid crystal layer except for a portion where an injection hole is formed to seal the liquid crystal layer and secure the pair of substrates together; and a sealant for sealing the injection hole, the method comprising the steps of:

injecting a precursor mixture including an ultraviolet light curable resin and a liquid crystal material into a space formed between the pair of substrates via the injection hole;

applying the sealant including a visible light curable resin to the injection hole;

curing the sealant by irradiating the sealant with visible light; and

forming the liquid crystal layer by irradiating the precursor mixture with ultraviolet light to phase-separate the precursor mixture by photopolymerization.

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OFFICIAL GAZETTE

JUNE 23, 1998

5,771,085

**LCD DEVICE WITH AN ALIGNMENT MARK HAVING SAME MATERIAL AS MICROLENSES**

Tetsuro Ochi; Shizuo Nishihara; Hiroaki Ichikawa; Satofumi Koike, and Yasunori Sato, all of Kanagawa, Japan, assignors to Sony Corporation, Japan

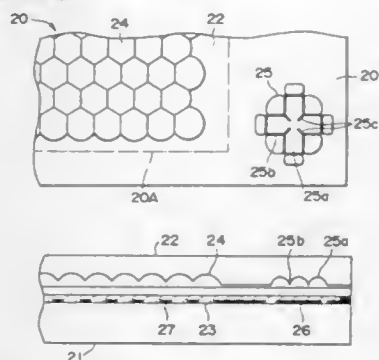
Filed Nov. 4, 1996, Ser. No. 740,903

Claims priority, application Japan, Nov. 6, 1995, 7-287316; Sep. 20, 1996, 8-250649

Int. Cl.<sup>6</sup> G02F 1/335; 1/1333

U.S. Cl. 349—158

11 Claims



1. A liquid crystal display device comprising: a first substrate having a first alignment mark formed in a non-display area, and a display area including a pixel section comprised of a plurality of pixels; and a second substrate having a lens array comprised of micro focus lenses corresponding to said pixel section, and a second alignment mark comprised of transparent material identical to the material for said micro focus lenses, and placed at a specified gap opposite said first substrate.

5,771,086

**EYEGLASS BRIDGE HAVING DEFORMATION PREVENTION MEMBERS**

Kaoru Horikawa, Sabae, Japan, assignor to Horikawa Co., Ltd., Fukui-ken, Japan

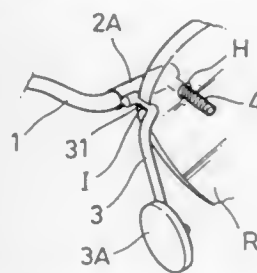
Filed Jun. 13, 1996, Ser. No. 662,708

Claims priority, application Japan, Jun. 16, 1995, 7-174107

Int. Cl.<sup>6</sup> G02C 5/06

U.S. Cl. 351—126

11 Claims



1. Eyeglasses comprising first and second lenses and a bridge joining said two lenses, said bridge having an elongate superelastic metallic member and first and second deformation prevention members, said first and second deformation prevention members being respectively fixed to first and second ends of said superelastic metallic member and respectively secured to said first and second lenses.

5,771,087

**EYEWEAR AND NOSEPAD FOR USE WITH EYEWEAR**

Brent R. Martin, and Sean G. Sullivan, both of North Vancouver, Canada, assignors to Sentinel Importing Corporation, North Vancouver, BC, Canada

Filed Oct. 16, 1996, Ser. No. 730,784

Int. Cl.<sup>6</sup> G02C 5/12

U.S. Cl. 351—136

20 Claims



1. Eyewear comprising a frame for housing a pair of lenses therein, the frame having a bridge portion for bridging a user's nose and a pair of temple members for locating the frame in position on the head of a user, the frame having a nose pad in the form of a projection extending downwardly from the bridge portion for resting by gravity on the frontal part of the bridge of a user's nose at the origin of the nose.

5,771,088

**CONTACT LENS DESIGNED TO ACCOMMODATE AND CORRECT FOR THE EFFECTS OF PRESBYOPIA**

Colin M. Perrott, Portola Valley, Calif., assignor to Pilkington Barnes Hind, Inc., Sunnyvale, Calif.

PCT No. PCT/US94/03042, § 371 Date Sep. 27, 1995, § 102(e) Date Sep. 27, 1995, PCT Pub. No. WO94/23327, PCT Pub. Date Oct. 13, 1994

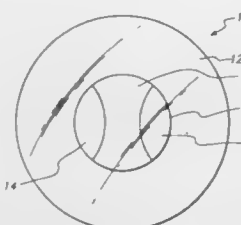
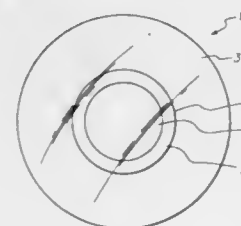
PCT Filed Mar. 22, 1994, Ser. No. 525,779

Claims priority, application United Kingdom, Mar. 27, 1993, 9306424

Int. Cl.<sup>6</sup> G02C 7/04

U.S. Cl. 351—161

18 Claims



1. A contact lens (1) having a front surface having refractive power and a back surface intended in use to fit on the cornea of the eye of the wearer, said lens comprising:

- a first optical zone (2) which is adapted to compensate for spherical aberration of the eye over a portion of the lens wherein the lens has a front surface which is configured to be an aspheric parabolic or hyperbolic surface thereby compensating for spherical aberration in the eye; and
- a second optical zone (3) having a refractive power less than that of the first zone and configured to provide some peripheral vision.

JUNE 23, 1998

ELECTRICAL

4245

5,771,089

**PROGRESSIVE SPECTACLE LENS**

Rudolf Barth, Vierkirchen, Germany, assignor to Optische Werke G. Rodenstock, Germany

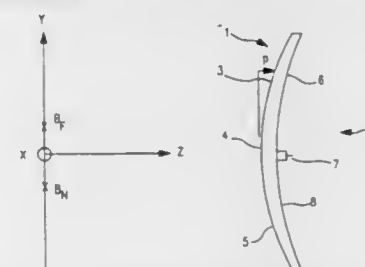
Continuation of Ser. No. 739,608, Oct. 30, 1996, abandoned, which is a continuation of Ser. No. 571,681, Dec. 13, 1995, abandoned, which is a continuation of Ser. No. 363,302, Dec. 21, 1994, abandoned, which is a continuation of Ser. No. 227,909, Apr. 15, 1994, abandoned, which is a continuation of Ser. No. 76,472, Jun. 14, 1993, abandoned, which is a continuation of Ser. No. 965,512, Oct. 23, 1992, abandoned, which is a continuation of Ser. No. 861,176, Mar. 27, 1992, abandoned, which is a continuation of Ser. No. 735,169, Jul. 23, 1991, abandoned, which is a continuation of Ser. No. 596,734, Oct. 10, 1990, abandoned, which is a continuation of Ser. No. 407,685, Sep. 14, 1989, abandoned, which is a continuation of Ser. No. 871,423, Apr. 7, 1986, abandoned. This application May 16, 1997, Ser. No. 857,768

Claims priority, application Germany, Aug. 17, 1984, 34 30 334.0

Int. Cl.<sup>6</sup> G02C 7/06

U.S. Cl. 351—169

8 Claims



1. A progressive ophthalmological multifocal lens, namely a spectacle lens, with a convex, aspherical front surface (1) and a concave back surface (2) having at least aspherical regions, of which at least one of which front and back surfaces contributes to power increase from a distance portion (3) over a progression zone (4) to a reading portion (5), wherein the front surface (1) or the front and the back surfaces (1,2) contributing to the power increase are designed in such a way that a main portion of astigmatism is transposed into an area of said distance portion (3) in which the power practically does not increase and that the surface astigmatism of said front and back surfaces (1,2) being essentially compensated by each other within said area (3) and a corresponding area (6) on said back surface (2).

5,771,090

**IMAGE RECORDING APPARATUS COMPRISING AN IMAGESETTER AND A VERTICAL PROCESSOR**

Bartholomeus Verlinden, Tongeren; Patrick Van den Bergen, Berchem, and Jan Claes, Morsel, all of Belgium, assignors to Agfa-Gevaert N.V., Morsel, Belgium

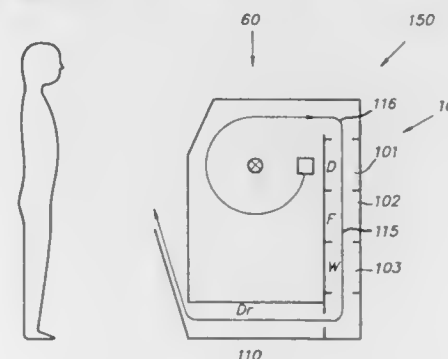
Filed May 7, 1996, Ser. No. 643,797

Claims priority, application European Pat. Off., May 20, 1995, 95201330

Int. Cl.<sup>6</sup> G03B 27/00; G03D 3/08

U.S. Cl. 355—27

12 Claims



5,771,091

**SENSOR AND A METHOD FOR MEASURING DISTANCES TO, AND/OR PHYSICAL PROPERTIES OF, A MEDIUM**

Alexander Paritsky, Jerusalem, and Alexander Kots, Ashdod, both of Israel, assignors to Phone-Or Ltd, Yehud, Israel

Filed Dec. 5, 1995, Ser. No. 567,636

Claims priority, application Israel, Dec. 7, 1994, 111913

Int. Cl.<sup>6</sup> G01C 3/08; G01B 11/24; G01J 1/04

U.S. Cl. 356—4.01

18 Claims



1. A sensor for sensing the distances to a medium and/or the physical properties thereof, comprising:

- a housing;
- at least one pair of optical fibers, each having an input end portion and an output end portion;
- the input end portion of a first fiber being connectable to a source of light and the output end portion of a second fiber being connectable to light intensity measuring means;
- a sensor head, including said input end portion of said second optical fiber and said output end portion of said first optical fiber affixedly located at least in proximity to each other, wherein each of the output end portion of said first fiber and input end portion of said second fiber having an axis and a rim, said rims being cut at an angle  $\theta$  with respect to said axis and said axes forming an angle  $\alpha$  therebetween, the arrangement being such that, upon operation, the light emerging from the output end portion of said first fiber impinges on a surface of a medium, at an angle of incidence  $\beta$ , and wherein  $\beta=f(\alpha, \theta)$ .

5,771,092

**WAVELENGTH AGILE RECEIVER WITH NOISE NEUTRALIZATION AND ANGULAR LOCALIZATION CAPABILITIES (WARNALOC)**

Jacques Dubois, Neufchatel, and Sophie LaRochelle, Cap Rouge, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed May 8, 1997, Ser. No. 848,462

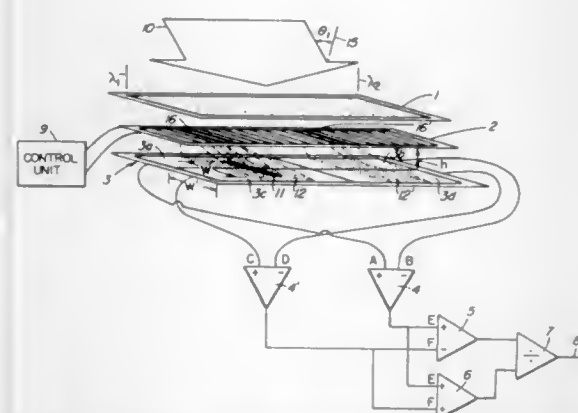
Int. Cl.<sup>6</sup> G01C 1/00

U.S. Cl. 356—147

10 Claims

1. An opto-electronic device for detecting a collimated beam of radiation comprising a linearly variable optical filter superimposed





over but spaced from, an elongated detector having a plurality of radiation detector elements with at least one detector element extending perpendicular to the length of the elongated detector being located in each quadrant of the elongated detector, which elements have a width  $W'$  in a direction perpendicular to the length of the elongated detector, wherein radiation that transverse said filter projects an image of at least a first portion of the filter onto at least two adjacent detector elements, each of which are located in separate ones of two quadrants at one end of the elongated detector, and also projects an image of at least a second portion of the filter onto at least two adjacent detector elements, each of which are located in separate ones of two quadrants at another end of the detector, the width  $W$  of those images at a location where they are projected onto the elongated detector being  $\leq$  the width  $W'$  of each detector element; the first and second portions having substantially the same dimensions with the device having means for subtracting a signal generated by radiation that transverse said filter onto at least one detector in a quadrant at said another end from a signal generated by radiation that transverse said filter onto at least one detector in an aligned quadrant at said one end to provide two difference signals at outputs which are connected to processing electronics, the means for subtracting reducing noise generated by background radiation to enable easier detection of a narrow optical band collimated beam of radiation, the processing electronics having means to determine the direction of arrival in one plane of such a collimated beam of radiation from the difference signals.

5,771,093

## MOUNTING PLATFORM FOR OPTICAL SYSTEM

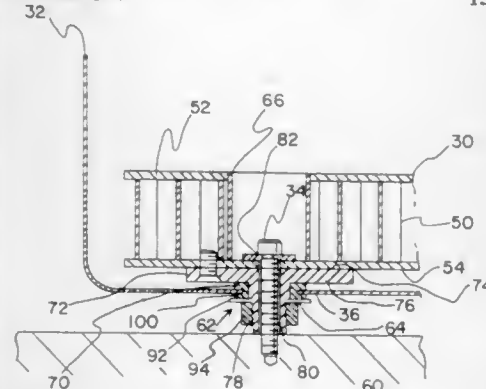
Robert Tinti, Lakewood, and James M. Zamel, Hermosa Beach, both of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Feb. 11, 1997, Ser. No. 799,078

Int. Cl.<sup>6</sup> G01N 21/01

U.S. Cl. 356-244

13 Claims



1. A platform for supporting an optical system requiring precision alignment and operating in a temperature variable environment in which heat is generated, said platform being subject to expansion and contracting due to temperature variations, said optical system aligned with a predetermined target, said platform

comprising a top and bottom plate having a rigid core structure between said platform comprising:

enclosure means enclosing said platform for shielding the optical system against contamination and containing stray radiant energy having top and bottom walls and side walls; anchor means for supporting the enclosure; and a resilient flexure ring disposed on said anchor means between said platform and engaging the bottom wall of said enclosure, whereby the forces of expansion and contraction experienced by the bottom plate of the platform are absorbed by the resilient flexure decoupling the platform from the enclosure.

5,771,094

## FILM MEASUREMENT SYSTEM WITH IMPROVED CALIBRATION

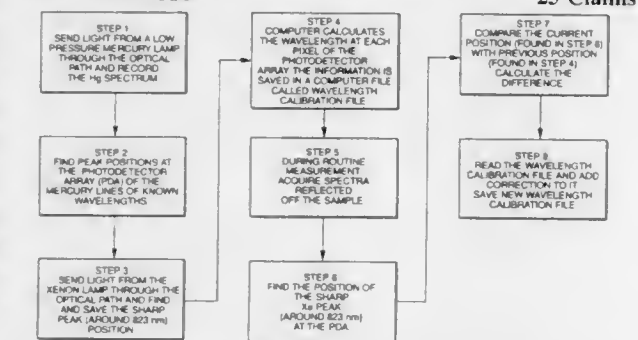
Joseph Carter, San Jose; Jenming Chen, Campbell, and Xing Chen, San Jose, all of Calif., assignors to Kla-Tencor Corporation, San Jose, Calif.

Filed Jan. 29, 1997, Ser. No. 790,090

Int. Cl.<sup>6</sup> G01J 3/36; G01N 21/21

U.S. Cl. 356-326

25 Claims



1. A method for measuring one or more films of a sample, comprising the steps of:

directing a beam of broadband radiation towards the sample such that radiation from the beam modified by the sample includes at least one persistent wavelength marker; detecting intensity of radiation of spectral components from the beam that is modified by the sample to measure the one or more films at a plurality of wavelengths in the broadband simultaneously by means of a first detector array of multiple pixels, said array having been calibrated with respect to a calibration function and having a prior pixel position of the marker associated with the calibration function; determining a current pixel position of the at least one persistent wavelength marker from the beam that is modified by the sample; and correcting said calibration by reference to said prior and current pixel positions of the at least one persistent wavelength marker.

5,771,095

## OPTICAL TEST SYSTEM INCLUDING INTERFEROMETER WITH MICROMIRROR AND PIEZOELECTRIC TRANSLATOR FOR CONTROLLING TEST PATH MIRROR

Ivan Prikrýl, and Hollis O'Neal Hall, both of Colorado Springs, Colo., assignors to Discovision Associates, Irvine, Calif.

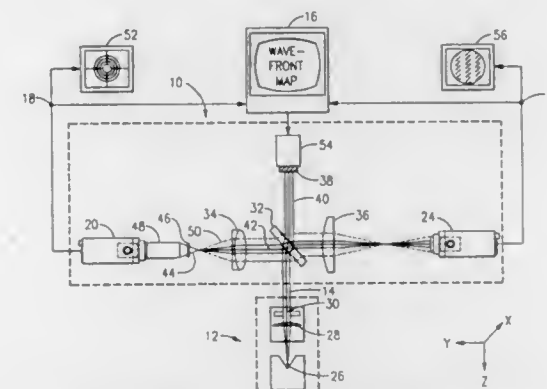
Continuation of Ser. No. 475,261, Jun. 7, 1995, abandoned, which is a division of Ser. No. 418,328, Apr. 7, 1995, abandoned. This application Sep. 20, 1996, Ser. No. 710,617

Int. Cl.<sup>6</sup> G01B 9/02

U.S. Cl. 356-345

5 Claims

1. An optical system for determining aberration in a source beam by comparison of a test beam with a reference beam, said optical system comprising:



a test source for producing a source beam having a spatial intensity distribution including an aberration component; a wavefront analyzer for processing a fringe signal associated with said aberration component; and an interferometer interposed between said test source and wavefront analyzer, said interferometer including: a beamsplitter for splitting said source beam into a test beam traveling along a test beam path and a reference beam traveling along a reference beam path; an imaging device for detecting said test beam and said reference beam; a mirror disposed in said test beam path, said mirror reflecting said test beam toward said imaging device; a micromirror disposed in said reference beam path, said micromirror reflecting a portion of said reference beam toward said imaging device; an alignment detector positioned proximate to said micromirror for detecting said aberration component to optimize an image thereof; a piezoelectric translator operatively linked to said mirror and controlled by said wavefront analyzer, said mirror thereby capable of moving relative to the path of said test beam; and focusing means disposed in said reference beam path between said beamsplitter and said micromirror for focusing said reference beam on said micromirror, said micromirror having a lateral dimension not exceeding the approximate lateral dimension of a central lobe of said reference beam as focused thereon by said focusing means so that when said test beam is reflected by said mirror and said portion of said reference beam is reflected by said micromirror, said reflected test beam and said reflected portion of said reference beam are both incident upon said imaging device forming an interference pattern thereon, said interference pattern including a plurality of fringes which are converted into said fringe signal by said imaging device.

5,771,096

## METHOD OF OBTAINING INFORMATION

Hans Villemoes Andersen, Hillerød, Denmark, assignor to Foss Electric A/S, Hillerød, Denmark

PCT No. PCT/DK95/00492, § 371 Date May 13, 1997, § 102(e) Date May 13, 1997, PCT Pub. No. WO96/18089, PCT Pub. Date Jun. 13, 1996

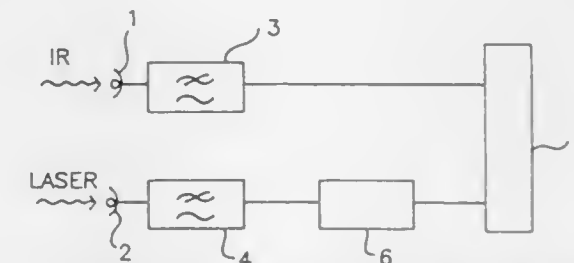
PCT Filed Dec. 7, 1995, Ser. No. 836,609

Claims priority, application Denmark, Dec. 9, 1994, 1417/94 Int. Cl.<sup>6</sup> G01B 9/02

U.S. Cl. 356-346

19 Claims

1. A method for obtaining information on the electromagnetic spectrum of a sample, the method comprising generating a plurality of substantially identical interference signals, determining the shape of a first number of the signals by performing a first number of scans of a first range of signal width,



determining the shape of a second number of the signals by performing a second number of scans of a second range of signal width, the second range being inside the first range and comprising a portion of the first range in which the signals have maximum absolute amplitude, combining data from the first number of scans and the second number of scans so as to obtain data corresponding to the shape of the signals, and performing a mathematical transformation of the combined data so as to obtain the information on the electromagnetic spectrum of the sample.

5,771,097

## MACH-ZEHNDER TYPE INTERFEROMETER

Haruhiko Kusunose, and Naoki Awamura, both of Yokohama, Japan, assignors to Lasertec Corporation, Yokohama, Japan

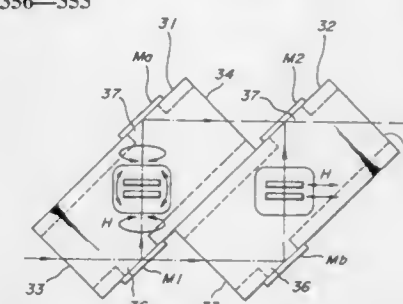
Filed Aug. 9, 1996, Ser. No. 694,522

Claims priority, application Japan, Aug. 15, 1995, 7-208194

Int. Cl.<sup>6</sup> G01B 9/02

U.S. Cl. 356-353

14 Claims



1. An interferometer of Mach-Zehnder type comprising: an optical bench having a surface; an optical system including a first optical element for dividing an input light flux from a light source into first and second light fluxes propagating along first and second optical paths, second and third optical elements for defining said first and second optical paths, respectively, and a fourth optical element for mixing said first and second light fluxes propagating along said first and second optical paths into a single output light flux which generates interference fringes; a supporting means including first and second hollow rectangular supporting blocks, said first supporting block supporting said first and second optical elements and said second supporting block supporting said third and fourth optical elements, with light fluxes propagating through hollow inner spaces of said supporting blocks; and

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a means for mounting said supporting means on said surface of the optical bench.

5,771,098

# **LASER INTERFEROMETRIC LITHOGRAPHIC SYSTEM PROVIDING AUTOMATIC CHANGE OF FRINGE SPACING**

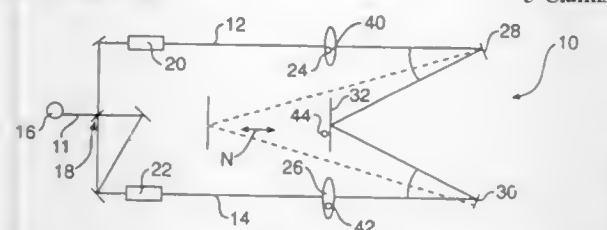
Amalkumar P. Ghosh, Poughkeepsie; Susan K. Schwartz Jones; Gary W. Jones, both of Lagrangeville; Steven M. Zimmerman, Pleasant Valley, and Yachin Liu, Poughkeepsie, all of N.Y., assignors to Fed Corporation, Hopewell Junction, N.Y.

Filed Sep. 27, 1996, Ser. No. 721,460

Int. Cl.<sup>6</sup> G01B 9/02

U.S. Cl. 356—363

3 Claims



1. An interferometric lithographic apparatus comprising: first and second laser beams, the first beam directed along a first path and the second beam directed along a second path;

first and second folding mirrors, respectively, set in first and second adjustable positioning mechanisms, each mechanism adjusting the position of its folding mirror by rotating about a vertical axis and by tilting about a horizontal axis, the first folding mirror reflecting the first laser beam and the second folding mirror reflecting the second laser beam to intersect the reflected first laser beam;

a longitudinally translatable stage having a mirror affixed thereto and arranged for carrying a target device to be exposed to the first and second interfering reflected beams;

an optical quadrant detector positioned along the second path for determining different illumination levels incident thereto by quadrants and generating signals, each signal having a magnitude proportional to the illumination incident upon a different quadrant of the detector;

a diode laser positioned along the first path and transmitting in alignment with the first path to reflect from the first folding mirror to the mirror affixed to the stage, from the mirror affixed to the stage to the second folding mirror, and from the second folding mirror to the detector;

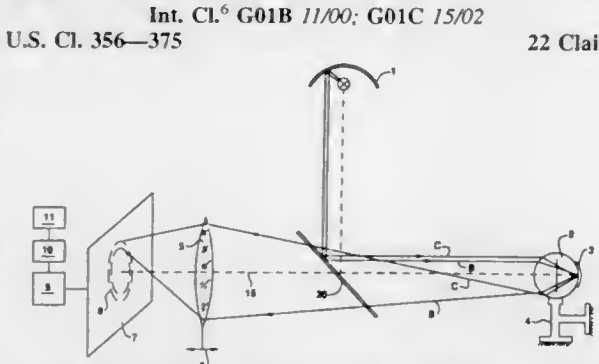
a control circuit arrangement, responsive to the four signals for producing first and second sets of rotating and tilting control signals;

the first positioning mechanism, responsive to the first set of rotating and tilting control signals, for repositioning the first folding mirror;

the second positioning mechanism, responsive to the second set of rotating and tilting control signals, for repositioning the second folding mirror; and

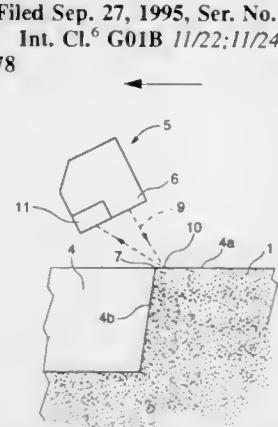
the first and second folding mirrors being repositioned, in response to the first and second sets of rotating and tilting control signals, to reduce the difference between illumination levels incident upon the quadrants of the quadrant detector.

5,771,099  
**OPTICAL DEVICE FOR DETERMINING THE LOCATION OF A REFLECTIVE TARGET**  
Hartmut Ehbets, Platz, Switzerland, assignor to Leica AG, Heerbrugg, Switzerland  
PCT No. PCT/EP95/01781, § 371 Date Dec. 19, 1996, § 102(e)  
Date Dec. 19, 1996, PCT Pub. No. WO95/35480, PCT Pub. Date Dec. 28, 1995  
PCT Filed May 11, 1995, Ser. No. 750,837  
Claims priority, application Germany, Jun. 22, 1994, 44 21 783.8  
Int. Cl.<sup>6</sup> G01B 11/00; G01C 15/02  
U.S. Cl. 356—375 22 Claims



1. An optical device for determining the position of a reflective target (2), having a light projector (1; 30) for illuminating the target (2), an imaging system (5) for imaging the target (2) on a location-resolving detector apparatus (7), and an evaluating apparatus (9) for determining position coordinates of a target image (8), wherein the target (2) includes a ball transparent to the light projector's light with a refractive index  $n$  between  $\sqrt{2}$  and 2 such that upon its illumination by the light projector (1; 30) and its imaging by the imaging system (5), at least a portion of a circular area (8) is formed and is detected by the detector apparatus (7) so that an image evaluation of a center of the circular area (8) is determined and thus the position of the target (2) is given.

5,771,100  
**METHOD OF MEASURING DIMENSION OF MOLD OR MOLD-ASSOCIATED COMPONENT BY LASER MEASURING INSTRUMENT**  
Etsuzo Kawai, and Shigeaki Yamamoto, both of Toyohashi, Japan, assignors to Sintokogio, Ltd., Nagoya, Japan  
PCT No. PCT/JP95/01954, § 371 Date Aug. 4, 1997, § 102(e)  
Date Aug. 4, 1997, PCT Pub. No. WO97/12199, PCT Pub. Date Apr. 3, 1997  
PCT Filed Sep. 27, 1995, Ser. No. 849,559  
Int. Cl.<sup>6</sup> G01B 11/22; 11/24  
U.S. Cl. 356—378 1 Claim



1. A method of measuring an inner dimension of a mold or a distance between a mold and a mold-associated component by a laser measuring instrument disposed above a surface of at least the mold such that the instrument is movable alongside the surface of the mold to direct a laser beam on surfaces of at least the mold, comprising:

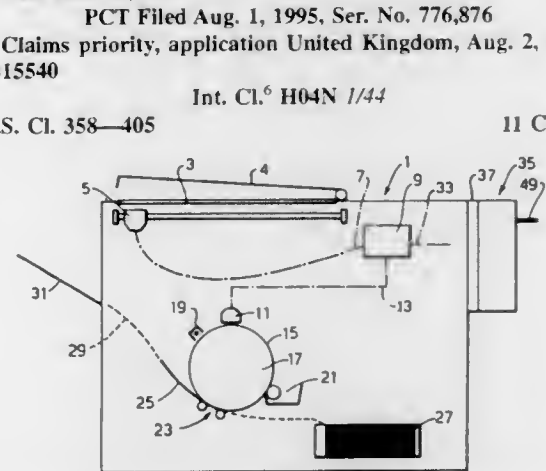
a first step, including the steps of disposing a laser emitting portion of the laser measuring instrument such that the laser

emitting portion inclines toward an inner surface of a first angle portion of opposing angle portions of a mold or mold-associated component to be measured; moving the instrument relative to the mold or mold-associated component in a direction parallel to a surface of the mold to thereby successively measure points on first and second surfaces near the first angle portion, which first and second surfaces define the first angle portion; expressing the measurements on two arbitrary points on the first surface in x-y coordinates and obtaining an equation relating to the x-y coordinates for the two points as a regression line by the method of least squares; similarly obtaining an equation relating to x-y coordinates for two arbitrary points on the second surface; and calculating the intersection of the two regression lines as a position of the first angle portion.

a second step, including disposing the laser emitting portion of the laser emitting instrument such that the laser emitting portion inclines toward an inner surface of a second angle portion of the opposing angle portions of the mold or mold-associated component relative to each other in a direction parallel to a surface of the mold to thereby successively measure points near the second angle portion on third and fourth surfaces which define the second angle portion; expressing the measurements on two arbitrary points on the third surface in x-y coordinates and obtaining an equation relating to the x-y coordinates for the two points as a regression line by the method of least squares; similarly obtaining an equation relating to x-y coordinates for two arbitrary points on the fourth surface, and calculating the intersection of the two regression lines as a position of the second angle portion, and

a third step of calculating the distance between the positions of the first and second portions.

5,771,101  
**DATA SECURITY SYSTEM**  
Roy Bramall, Chesterton, United Kingdom, assignor to Gestetner Management Limited, London, England  
PCT No. PCT/GB95/01821, § 371 Date Mar. 27, 1997, § 102(e)  
Date Mar. 27, 1997, PCT Pub. No. WO96/04746, PCT Pub. Date Feb. 15, 1996  
PCT Filed Aug. 1, 1995, Ser. No. 776,876  
Claims priority, application United Kingdom, Aug. 2, 1994, 9415540  
Int. Cl.<sup>6</sup> H04N 1/44  
U.S. Cl. 358—405 11 Claims



1. A data security system comprising image data handling equipment (1); user identification means (51, 47) for generating information indicative of the unique identity of a pre-authorized user; means for determining whether use of the image data handling equipment (1) is pre-authorized; means for changing the operating state of the image data handling equipment in the event of attempted non pre-authorized use; image data receiving means (48); and data storage means (43) connected to receive image data and to receive user identification information from said user identification means (51, 47), and operative to store in reproducible

form in association with one another the image data of an image being processed and the user identification information of the user processing said image;

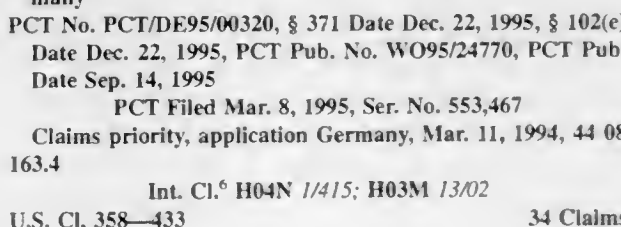
characterised in that the pre-authorization of use is related to the identity of the user;

in that there are means for recording information which is indicative of the identity of users pre-authorized to use said image data handling equipment; in that there are means for comparing the identity-indicating information from said user identification means with the information recorded by said means for recording information which is indicative of pre-authorized users, for establishing pre-authorization of the user to use the equipment;

in that the means for changing the operating state comprise means for disabling the image data handling equipment in the absence of establishing such pre-authorization of the user;

and in that the stored image data is received from said image data receiving means (48) and is data of the image data being handled.

5,771,102  
**PROCESS FOR THE TRANSMISSION OF IMAGES**  
Wilhelm Vogt, Lichtenau; Dirk Lappe, Dinkler; Rodolfo Mann Pelz; Oliver Vogt, both of Hanover; Gunnar Nitsche, Hildesheim, and Frieder Mundt, Neumuenster, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany  
PCT No. PCT/DE95/00320, § 371 Date Dec. 22, 1995, § 102(e)  
Date Dec. 22, 1995, PCT Pub. No. WO95/24770, PCT Pub. Date Sep. 14, 1995  
PCT Filed Mar. 8, 1995, Ser. No. 553,467  
Claims priority, application Germany, Mar. 11, 1994, 44 08 163.4  
Int. Cl.<sup>6</sup> H04N 1/415; H03M 13/02  
U.S. Cl. 358—433 34 Claims



1. A process for transmission of data comprising the steps of:

a) generating said data by at least one data source;

b) inserting said data in a data frame at a channel coder;

c) dividing said data into a plurality of classes of variable length;

d) preparing an information word of fixed length for each of said classes, said information word containing information regarding class type, number of data bits therein and class code rate, wherein said number of said data bits and said class code rate can be different for different ones of said classes;

e) channel-coding said data for each of said classes by first reading said information word with said channel coder to



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obtain said class code rate and then channel-coding at said class code rate obtained from the reading to obtain channel-coded data; and

f) channel-coding said information word for each of said classes at a fixed code rate to obtain a channel-coded information word for each of said classes.

5,771,103

### IMAGE FORMING APPARATUS PERFORMING INTERRUPTION PROCESS IN ELECTRONIC SORTING MODE

Noboru Ogino, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan

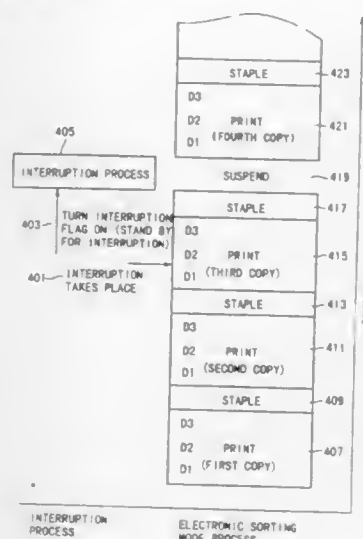
Filed Aug. 23, 1996, Ser. No. 702,255

Claims priority, application Japan, Aug. 31, 1995, 7-223822

Int. Cl.<sup>6</sup> H04N 1/00

U.S. Cl. 358—437

20 Claims



12. An image forming apparatus comprising:  
means for reading and storing a plurality of first images on a plurality of documents;

means for forming images in a sorting mode so that the first images are formed on a plurality of mediums so as to output a plurality of groups, wherein each group comprises a plurality of mediums on which the first images are formed in an order corresponding to the documents read by the reading and storing means, whereby the first images are formed and outputted as images on the mediums for every one of the groups repeatedly;

means for supplying an instruction so that the image forming means performs an interruption process which is a forming of a second image;

means for stapling the plurality of mediums output from the image forming means for each of the groups; and

means for controlling the image forming means corresponding to the instruction so that a standby for the interruption process is performed during output and stapling of one of the plurality of groups, and forming of the plurality of first images is suspended and then forming of the second image is performed after stapling of the one of the groups has been completed.

5,771,104

### IMAGE PROCESSING APPARATUS HAVING FUNCTION OF MAGNIFICATION CHANGING IMAGE DATA

Yukio Sakano, Tokyo, Japan, assignor to Ricoh Company Ltd., Tokyo, Japan

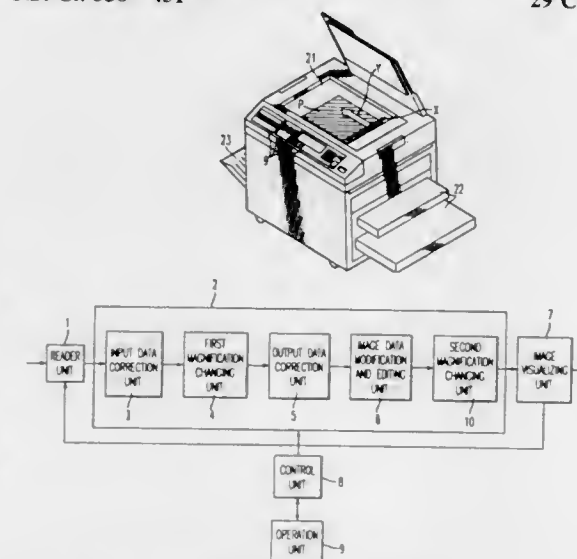
Filed Aug. 9, 1995, Ser. No. 513,002

Claims priority, application Japan, Aug. 9, 1994, 6-208056; Nov. 21, 1994, 6-311113

Int. Cl.<sup>6</sup> H04N 1/393; 1/40

U.S. Cl. 358—451

29 Claims



1. An image processing apparatus comprising:  
means for reading original image data;  
means for converting said original image data to digital image data;  
means for first reducing/magnifying said digital image data to generate first reduced/magnified data by selecting one of reducing or magnifying said digital image data;  
means for modifying said first reduced/magnified data to generate modified data;  
means for second reducing/magnifying said modified data to generate second reduced/magnified data by selecting one of reducing or magnifying said modified data; and  
means for visualizing an output image on the basis of said second reduced/magnified data.

5,771,105

### HIGH SPEED SYSTEM FOR GREY LEVEL IMAGE SCALING, THRESHOLD MATRIX ALIGNMENT AND TILING, AND CREATION OF A BINARY HALF-TONE IMAGE

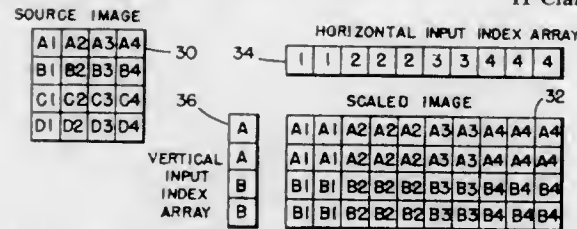
Robert A. Rust, and David B. Fujii, both of Boise, Id., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 4, 1996, Ser. No. 606,468

Int. Cl.<sup>6</sup> G06K 9/36; H04N 1/40

U.S. Cl. 358—458

11 Claims



8. A system for converting a source image including source pixels arranged in a first resolution of rows and columns, each source pixel manifesting a multi-bit grey level value, to a destination image of binary pixels arranged in a second resolution of rows and columns, said system comprising:  
memory for storing at least a portion of a row of said source pixels, a grey level threshold matrix comprising plural grey

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level threshold pixel values and a relative index input array (RIIA) comprising a single index bit for each column of said destination image, each index bit enabling a source pixel value to be identified for scaling of said source image to said second resolution;

an index bit register for receiving plural index bits from said memory;

a threshold register for receiving N threshold pixel values from said memory, where N is an integer >1;

a source register for receiving N source pixels from said memory;

scale logic means coupled to said index bit register and said source register and having N destination image column outputs, said scale logic means responsive to each index bit to output one source pixel on each of said N destination image column outputs;

alignment switch means coupled to said threshold register and responsive to a clock input for providing N threshold pixel value outputs;

comparator means coupled to said scale logic means and said alignment switch means and responsive to a clock input for comparing each said source pixel on each of said N destination image column outputs with a corresponding position one of said N threshold pixel value outputs and for assigning a binary value in accordance with said comparing; and

control means for loading said index bit register, said source register and said threshold register with values from said memory and for thereafter enabling clock signals to synchronously operate said system to output, in parallel, N destination image binary values per clock cycle.

5,771,106

### SHADING CORRECTING MEANS FOR IMAGE FORMING APPARATUS

Kazushige Taguchi, Saitama; Yutaka Hasegawa, Tokyo, and Tsutomu Shouji, Kanagawa, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

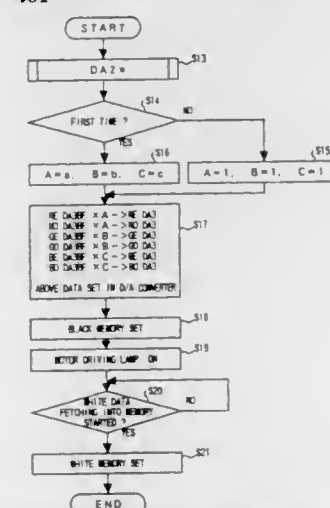
Filed Oct. 13, 1995, Ser. No. 542,504

Claims priority, application Japan, Oct. 13, 1994, 6-247582; Oct. 3, 1995, 7-256234

Int. Cl.<sup>6</sup> H04N 1/407

U.S. Cl. 358—461

7 Claims



1. An image forming apparatus comprising:  
an illuminating means for illuminating a draft image;  
a photoelectric converting means for receiving reflected light from a draft image obtained by illuminating the draft image with said illuminating means and photoelectrically converting the reflected light;  
an amplifying means for amplifying an output signal from said photoelectric converting means;  
a digital converting means for converting an analog signal from said amplifying means to a digital signal;

a shading correcting means for executing shading-correction to said digital signal; and

a scanner control means for providing controls so that white reference data fetching after power turn ON is executed by said shading correcting means in a stable region for said illuminating means, wherein the white reference data, set during initialization, is used when an image is formed a first time, and shading-corrected white data is fetched for a second sheet in a continuously repeated copying operation.

5,771,107

### IMAGE PROCESSOR WITH IMAGE EDGE EMPHASIZING CAPABILITY

Masaya Fujimoto; Tadashi Miyazaki, and Shinji Hayashi, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

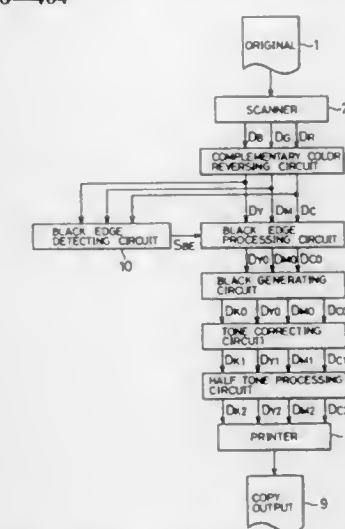
Filed Dec. 29, 1995, Ser. No. 580,930

Claims priority, application Japan, Jan. 11, 1995, 7-002470; Jan. 11, 1995, 7-002471

Int. Cl.<sup>6</sup> H04N 1/38; 1/40; 1/387; G03F 3/08

U.S. Cl. 358—464

22 Claims



5. An image processor for emphasizing a black edge in an image, comprising:

separating means for separating a color image into three images of primary colors;

a black edge detecting circuit for detecting black edges in the color image, the black edge detecting circuit including judging means for judging when a point in the color image is achromatic, the judging means including

maximum and minimum intensity determining means for determining a maximum intensity and a minimum intensity among the three primary colors for a judged point, and

achromatic indication means for indicating that the judged point is achromatic when an absolute value of a difference between the maximum intensity and the minimum intensity is within a predetermined range and when the minimum density is above a predetermined level and

color edge detecting means for detecting points which are associated with an edge in the color image, and

black edge determining means for determining black edges in the color image by identifying which points of the color image are both achromatic and are associated with an edge in the color image; and

a black edge processing circuit for emphasizing the black edges detected by the black edge detecting circuit.

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5,771,108

**COLOR IMAGE PROCESSING APPARATUS CAPABLE OF HANDLING IMAGES READ LOCALLY AND IMAGES RECEIVED FROM AN EXTERNAL APPARATUS**

Yoshinori Ikeda, Kawasaki; Michio Kawase, and Motoaki Tahara, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 691,968, Apr. 26, 1991, abandoned.

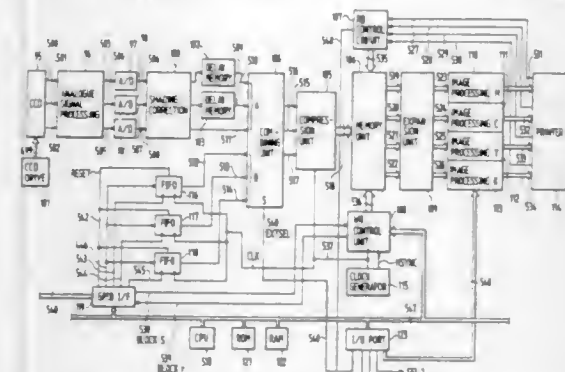
This application Feb. 6, 1995, Ser. No. 384,690

Claims priority, application Japan, Apr. 27, 1990, 2-111974

Int. Cl.<sup>6</sup> H04N 1/46; 1/387

U.S. Cl. 358—500

18 Claims



1. A color image processing system comprising:  
means for generating a first color image data representing an image to be formed;  
compressing means for compressing the first color image data;  
memory means for storing compressed color image data compressed by said color compressing means;  
means for expanding the compressed image data stored in said memory means to produce expanded image data and for supplying the expanded image data to color image forming means;  
means for temporarily storing second image data from an external section according to a first clock signal; and  
means for reading out and supplying the second image data to said compressing means according to a second clock signal different from said first clock signal such that the second image data is synchronized with the compression process.

5,771,109

**METHOD AND APPARATUS FOR DIGITIZING FILMS USING A STROBOSCOPIC SCANNING SYSTEM**

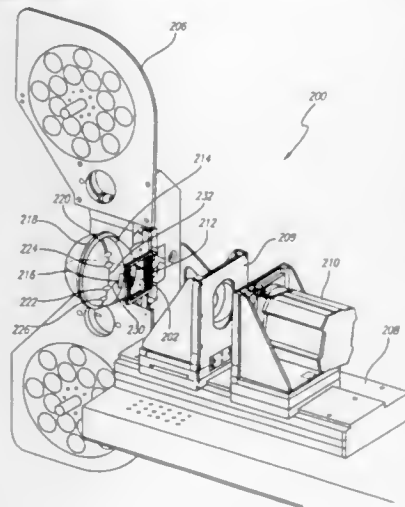
David DiFrancesco, San Francisco, Calif., assignor to Pixar, Richmond, Calif.

Filed May 17, 1996, Ser. No. 651,164

Int. Cl.<sup>6</sup> H04N 1/46

U.S. Cl. 358—507

57 Claims



1. An apparatus for digitizing a film frame comprising:  
an integrating sphere housing a plurality of strobe lights, said strobe lights disposed for generating a plurality of color light flashes;

control means coupled to said plurality of strobe lights, said control means capable of turning on said plurality of strobe lights in sequence;

a film plane for holding a film frame for exposure to a light emanating from said integrating sphere;

a lens for projecting an image of said film frame onto a CCD array, so as to cause said CCD array to digitize said image.

5,771,110

**THIN FILM TRANSISTOR DEVICE, DISPLAY DEVICE AND METHOD OF FABRICATING THE SAME**

Kiichi Hirano; Naoya Sotani, both of Anpachi-gun; Toshifumi Yamaji, Haguri-gun; Yoshihiro Morimoto, Inazawa, and Kiyoshi Yoneda, Motosu-gun, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

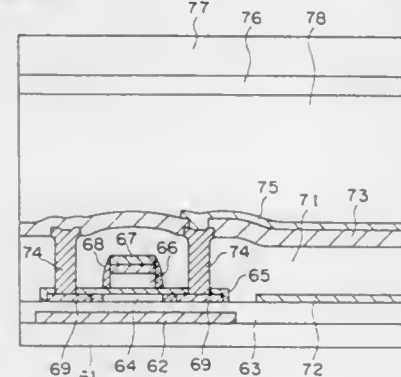
Filed Jul. 2, 1996, Ser. No. 677,424

Claims priority, application Japan, Jul. 3, 1995, 7-167513; Aug. 4, 1995, 7-199979; Aug. 4, 1995, 7-199980; Aug. 4, 1995, 7-199981; Aug. 4, 1995, 7-199982

Int. Cl.<sup>6</sup> H01L 29/786; 27/105

U.S. Cl. 257—72

18 Claims



1. A semiconductor device being formed by integrating a plurality of semiconductor elements and a substrate, said semiconductor device comprising:

each said semiconductor element has a heat absorption film provided between said substrate and said semiconductor elements, and an area or film thickness of said heat absorption film is relatively reduced in a portion where a relatively large number of said semiconductor elements are provided, while an area or film thickness of said heat absorption film is relatively increased in a portion where a relatively small number of said semiconductor elements are provided, in accordance with a distributed state of said semiconductor elements on said substrate.

5,771,111

**OPTICAL NETWORK**

Wataru Domon, and Makoto Shibutani, both of Tokyo, Japan, assignors to NEC Corporation, Japan

Filed Dec. 15, 1995, Ser. No. 573,321

Claims priority, application Japan, Dec. 15, 1994, 6-311691

Int. Cl.<sup>6</sup> H04J 14/02

U.S. Cl. 359—125

3 Claims

1. A repeater node for connecting a subordinate optical network using a sub-carrier multiplexing system for multiplexing signals in the direction of an optical wavelength axis and a main optical network using a wavelength division multiplexing system for multiplexing signals in the direction of the optical wavelength axis, comprising:

an optical receiver for receiving a signal light from said subordinate optical network; and

5,771,113

**METHOD AND APPARATUS FOR OPTICAL WIRELESS COMMUNICATION**

Walter Hirt, Wettswil, Switzerland, assignor to International Business Machines Corporation, Armonk, N.Y.

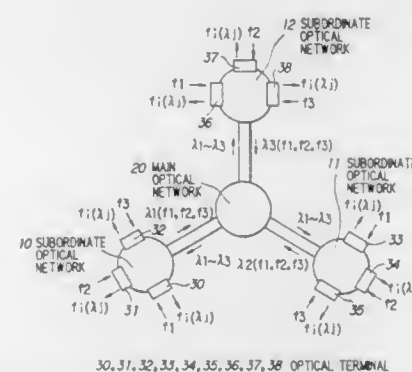
PCT No. PCT/EP94/00577, § 371 Date Aug. 30, 1996, § 102(e) Date Aug. 30, 1996, PCT Pub. No. WO95/23461, PCT Pub. Date Aug. 31, 1995

PCT Filed Feb. 28, 1994, Ser. No. 669,327

Int. Cl.<sup>6</sup> H04B 10/00; 10/04

U.S. Cl. 359—154

21 Claims



an optical transmitter for transmitting a signal light modulated with a high-frequency signal output from said optical receiver to said main optical network;

wherein a wavelength different according to said repeater node is assigned to said signal light transmitted from said optical transmitter.

5,771,112

**RECONFIGURABLE DEVICE FOR INSERTION-EXTRACTION OF WAVELENGTHS**

André Hamel, Lannion, and Daniel Laville, Perros Guirec, both of France, assignors to France Telecom, Paris, France

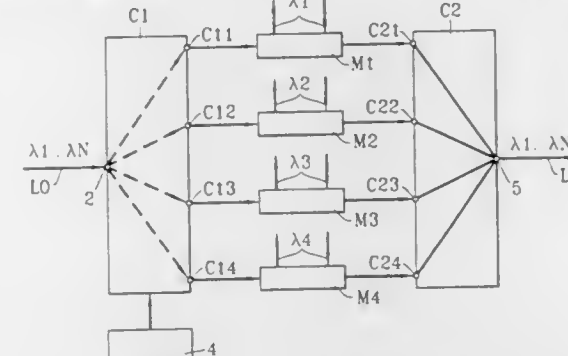
Filed Jun. 17, 1996, Ser. No. 665,798

Claims priority, application France, Jun. 21, 1995, 95 07412

Int. Cl.<sup>6</sup> H04J 14/02

U.S. Cl. 359—128

8 Claims



1. A reconfigurable device for the insertion and extraction of wavelengths, this device being characterized in that it includes:

a plurality of optical add-drop multiplexers (M1, M2, M3, M4) each having an input, an output, an insertion input and an extraction output,

a main optical selector switch (C1, C10) with at least M positions, where M is the number of optical add-drop multiplexers, this main optical switch having an input and a plurality of outputs, each position allowing the connection of one of these outputs to said input of one of the optical add-drop multiplexers,

a means of optical coupling (C2, C8) having an output and a plurality of inputs, respectively connected to said outputs of the optical add-drop multiplexers,

and in that each optical add-drop multiplexer includes:

a first optical means (F1i, 42) forming a band-pass filter, capable of directing, to the extraction output of the multiplexer, an optical signal among a group of optical signals with wavelengths differing from one another, arriving at said multiplexer input, and

a second optical means (F2i, 44) which receives the other signals from the group and which is capable of inserting amongst them an optical signal coming from the insertion input of the multiplexer, these other signals and the inserted signal being sent to said multiplexer output.

5,771,114

**OPTICAL INTERFACE WITH SAFETY SHUTDOWN**

Anders G. Andersson, San Jose, Calif., and Michael J. Smith, Eden Prairie, Minn., assignors to Rosemount Inc., Eden Prairie, Minn.

Filed Sep. 29, 1995, Ser. No. 536,397

Int. Cl.<sup>6</sup> H04B 10/00

U.S. Cl. 359—171

26 Claims

1. A system for transmitting optical power from a first location to a second location, comprising:

a first light source at the first location which generates a first light beam;

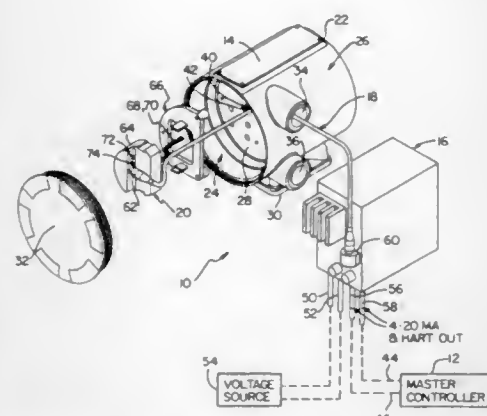
a first optical-to-electrical converter at the second location which receives the first light beam;

an energy storage device electrically coupled to the first optical-to-electrical converter, which develops a level of stored energy;

a second light source at the second location;

first control means comprising a first level detector which has a first response time characteristic, an input coupled to the





energy storage device and an output coupled to the second light source for operating the second light source at the second location to generate a return safety light beam after the level of stored energy reaches a first voltage level, and comprising a second level detector which has a second response time characteristic that is faster than the first response time characteristic, an input coupled to the energy storage device and an output coupled to the first level detector for inhibiting the first level detector when the level of stored energy reaches a second voltage level that is greater than the first voltage level;

a second optical-to-electrical converter which detects the return safety light beam at the first location; and second control means coupled between the second optical-to-electrical converter and the first light source for determining the presence or absence of the return safety light beam and for operating the first light source to generate the first light beam at a first power level prior to determining the presence of the return safety light beam and at a second power level, higher than the first power level, after determining the presence of the return safety light beam.

#### 5,771,115 OPTICAL SCANNER

Kenichi Takanashi, Chiba-ken, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

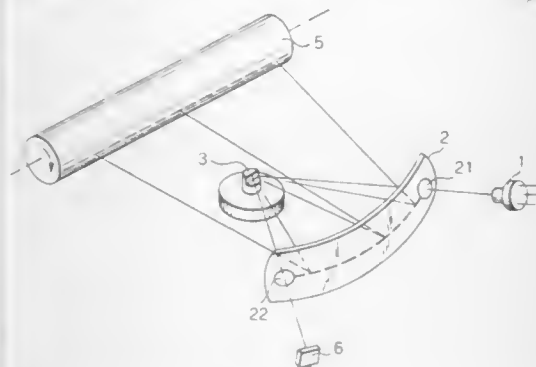
Filed Jun. 11, 1996, Ser. No. 660,594

Claims priority, application Japan, Jun. 20, 1995, 7-153681

Int. Cl.<sup>6</sup> G02B 26/08

U.S. Cl. 359—208

15 Claims



1. An optical scanner comprising:  
a light source for emitting a light beam;  
an optical deflector having a deflecting-reflecting face for deflecting the light beam emitted from said light source at a constant angular speed;  
a scan image forming mirror for reflecting the light beam deflected by said optical deflector to a surface to be scanned at a constant speed;

a light detecting means for detecting a start of the optical scanning and generating a synchronous signal of the optical scanning;

wherein said light source and said light detecting means are opposite to said optical deflector with respect to said scan image forming mirror, said scan image forming mirror is provided with an emitted-light transmitting portion at one end in the longitudinal direction outside of an effective area thereof for transmitting the light beam emitted from said light source toward said deflecting-reflecting face there-through and a received-light transmitting portion at the other end in the longitudinal direction outside of the effective area thereof for transmitting the deflected light beam from said optical deflector toward said light detecting means there-through, and said optical deflector is a rotary single surface mirror having no fall of a surface.

#### 5,771,116 MULTIPLE BIAS LEVEL RESET WAVEFORM FOR ENHANCED DMD CONTROL

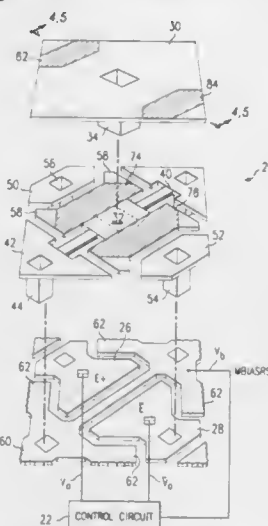
Rodney Miller, Frisco; Richard Gale, Richardson; Harian Paul Cleveland, Garland, and Mark L. Burton, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 21, 1996, Ser. No. 729,664

Int. Cl.<sup>6</sup> G02B 26/00

U.S. Cl. 359—295

8 Claims



1. A method of operating a spatial light modulator comprising the steps of:

- applying a voltage to a first and second address electrode underlying an element deflectable between a first state and second state, wherein a first voltage is applied to said first address electrode and a second voltage is applied to said second address electrode;
- applying a third voltage to said deflectable element to create a voltage differential between said element and said first address electrode and between said element and said second address electrode; and
- applying a fourth voltage to said deflectable element during a reset cycle which is sufficient to retain said element in said first state when said first voltage is maintained to said first address electrode, but which said fourth voltage is insufficient to retain said element in said first state when said voltage differential between said element and said first address electrode is less than said voltage differential between said element and said second address electrode.

#### 5,771,117 METHOD AND APPARATUS FOR NONLINEAR FREQUENCY GENERATION USING A STRONGLY- DRIVEN LOCAL OSCILLATOR

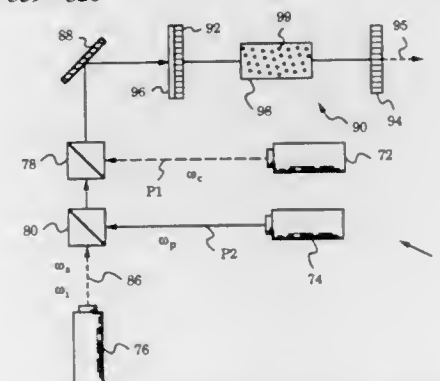
Stephen E. Harris, Palo Alto; Guang-Yu Yin, Mountain View, and Maneesh Jain, Palo Alto, all of Calif., assignors to The Board of Trustees of The Leland Stanford Junior University, Stanford, Calif.

Filed Jun. 17, 1996, Ser. No. 669,028

Int. Cl.<sup>6</sup> G02F 1/39

U.S. Cl. 359—326

55 Claims



45. An apparatus for nonlinear frequency generation using a nonlinear optical medium comprising elementary entities having a ground state  $|1\rangle$  and a second state  $|2\rangle$  such that the transition between said ground state  $|1\rangle$  and said second state  $|2\rangle$  is a dipole forbidden transition, said nonlinear optical medium further having an upper state  $|3\rangle$  selected from the energy states  $|i\rangle$  above said ground state  $|1\rangle$  such that a two-photon transition between said ground state  $|1\rangle$  and said second state  $|2\rangle$  via said upper state  $|3\rangle$  is allowed, said apparatus comprising:

- a first beam source for applying to said nonlinear optical medium a first pump beam P1 at a coupling frequency  $\omega_1$  corresponding to a first transition between said second state  $|2\rangle$  and said upper state  $|3\rangle$ ;
- a second beam source for applying a second pump beam P2 at a probe frequency  $\omega_2$  corresponding to a second transition between said ground state  $|1\rangle$  and said upper state  $|3\rangle$ ;
- a means for adjusting the intensities and the frequencies of said first pump beam P1 and of said second pump beam P2 to produce a strongly-driven coherent superposition state of said ground state  $|1\rangle$  and said second state  $|2\rangle$ ; said strongly-driven coherent superposition state creating a local oscillator at a local oscillator frequency  $\omega_{12}$ ; and
- an input beam source for passing an input beam through said nonlinear optical medium to produce a generated beam having a generated frequency  $\omega_g$ .

#### 5,771,118 BEAM SPLITTER

Hiroaki Matsuda, Sapporo; Hideki Noda, and Nobuhiro Fukushima, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 556,771, Nov. 2, 1995, Pat. No. 5,661,602.

This application Mar. 31, 1997, Ser. No. 829,182

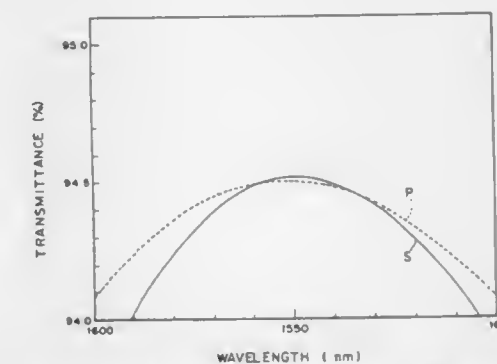
Claims priority, application Japan, Mar. 16, 1995, 7-057154

Int. Cl.<sup>6</sup> G02B 5/08

U.S. Cl. 359—359

12 Claims

1. A light beam splitter formed by laminating a plurality of optical films on a substrate, said beam splitter branching a single light beam into reflected and transmitting beams, wherein:  
said substrate comprises a glass substrate having a refractive index of  $1.51 \pm 0.10$ ; and  
said optical films comprise:  
a first layer formed on said glass substrate, said first layer having a refractive index of  $1.44 \pm 0.10$  and an optical film thickness of  $0.58 - 0.68$ ;



a second layer formed on said first layer, said second layer having a refractive index of  $2.23 \pm 0.10$  and an optical film thickness of  $0.25 - 0.35$ ; and  
a third layer formed on said second layer, said third layer having a refractive index of  $1.44 \pm 0.10$  and an optical film thickness of  $0.18 - 0.28$ .

#### 5,771,119 REAL-IMAGE VARIABLE MAGNIFICATION VIEWFINDER

Hyoung-won Kang, Syeongsangnam-do, Rep. of Korea, assignor to Samsung Aerospace Industries, Ltd., Kyeongsangnam-do, Rep. of Korea

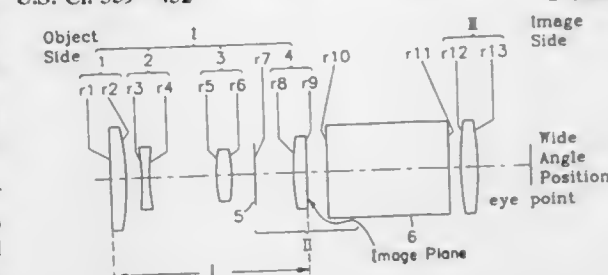
Filed Dec. 27, 1996, Ser. No. 777,325

Claims priority, application Rep. of Korea, Dec. 28, 1995, 95-61842

Int. Cl.<sup>6</sup> G02B 27/02; G03B 13/10

U.S. Cl. 359—432

2 Claims



1. A real-image variable magnification viewfinder comprising:  
an objective lens group having an overall positive power, including, from an object side, a first lens unit of a positive refractive power, a second lens unit of a negative refractive power, a third lens unit of a positive refractive power and a fourth lens unit of a positive refractive power, wherein the objective lens group forms an actual image of an object;  
a reverse lens group for reversing the image formed by the objective lens group; and  
an eyepiece lens group for observing the image reversed by the reverse lens group;  
wherein magnification is changed by moving the second lens unit and the third lens unit along an optical axis of the viewfinder while the first lens unit and fourth lens unit are fixed, and  
wherein the real-image variable magnification viewfinder fulfills the following conditions:

$$0.6 < f_2/f_3 < 1.0;$$

and

$$18 < f_7 < 33,$$

where  $f_2$  represents the focal length of the objective lens group at a wide angle position,  $f_3$  represents the focal length of the third lens unit, and  $f_7$  represents the focal length of the objective lens group at a telephoto position.

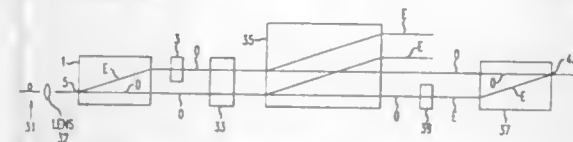
**5,771,120**  
**OPTICAL APPARATUS WITH COMBINED  
POLARIZATION FUNCTIONS**Ernest Eisenhardt Bergmann, Borough of Fountain Hill, Pa.,  
assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 26, 1995, Ser. No. 578,844

Int. Cl.<sup>6</sup> G02B 5/30

U.S. Cl. 359—484

5 Claims



1. Optical apparatus comprising:

- at least a first walk-off device, said walk-off device for separating an incoming unpolarized beam into first and second parallel beams of orthogonal polarization;
- at least a first polarization flipper positioned to change the polarization of one of the first and second beams from the first walk-off device so that the polarizations of both first and second beams are essentially the same;
- a polarization modifier for rotating the polarization of both beams a selected and variable amount;
- at least a second walk-off device for separating each of said first and second pair of parallel beams, thereby producing a first pair of parallel beams of orthogonal polarization associated with said first beam, and a second pair of parallel beams of orthogonal polarization associated with said second beam; and
- at least a first output means for receiving one beam from each of said first and second pair of parallel beams, the received beams being of like polarization, for combining said received beams into a single output beam, the percentage of said unpolarized incoming beam forming said output beam depending upon the rotation present in said polarization modifier.

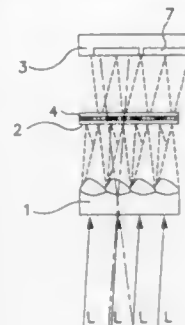
**5,771,121**  
**OBSERVER-ADAPTIVE AUTOSTEREOSCOPIC  
SHUTTER MONITOR**Siegbert Hentschke, Wilhelmsboher Allee 71, D-34121 Kassel,  
Germany

Filed Sep. 8, 1995, Ser. No. 525,208

Claims priority, application Germany, Jan. 7, 1995, 195 00  
315.2Int. Cl.<sup>6</sup> G02B 27/22; H04N 13/04; 9/47

U.S. Cl. 359—463

19 Claims



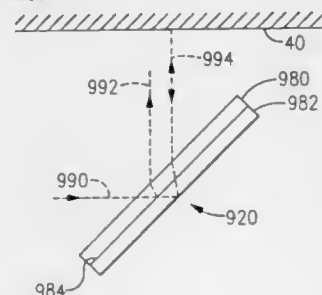
1. An observer-adaptive autostereoscopic shutter-monitor, comprising:

- a monitor having a screen for displaying a picture;
- a cylinder-lens grid-shield having a plurality of cylinder lenses which are disposed at a predetermined pitch-distance; and
- a shadow-line grid-LCD positioned between the cylinder-lens grid-shield and the screen, the shadow-line grid-LCD being electronically controlled to have transparent and non-transparent stripes which alternate time-sequentially in synchronism with the picture about every 8 to 10 milliseconds.

**5,771,122**  
**OPTICAL BEAMSPLITTER**Curtis A. Shuman, Colorado Springs, Colo., assignor to Disco-  
vision Associates, Irvine, Calif.Continuation of Ser. No. 446,967, May 22, 1995, abandoned,  
which is a division of Ser. No. 705,780, May 28, 1991, aban-  
doned. This application Jan. 2, 1997, Ser. No. 775,526Int. Cl.<sup>6</sup> G02B 5/30; 27/28; G11B 7/00

U.S. Cl. 359—487

6 Claims



1. An optical beam splitting assembly for use in an optical system, said assembly comprising:

- a lightsource producing an incident light beam including a first polarization component and a second polarization component;
- a reflective storage medium for receiving said incident light beam after processing thereof and reflecting a corresponding reflected light beam;
- a first thin optical element and a second thin optical element positioned adjacent thereto, said first and second optical elements each having a front surface and a rear surface defining a maximum thickness between respective front and rear surfaces; and
- an optically selective coating positioned between said first thin optical element and said second thin optical element to form a beam splitting interface, said optically selective coating being polarization sensitive, said incident light beam being transmitted through said first thin optical element and directed toward said beam splitting interface to thereby form two portions including a first portion which is reflected from said beam splitting interface to form a first outgoing beam having said first polarization component, and a second portion which is transmitted through said beam splitting interface and thereafter reflected from said rear surface of said second thin optical element to form a second outgoing beam having said second polarization component, said first and second outgoing beams being directed toward said reflective storage medium.

**5,771,123**  
**ZOOM LENS HAVING IMAGE STABILIZING FUNCTION**  
Hiroyuki Hamano, Yamato, Japan, assignor to Canon  
Kabushiki Kaisha, Tokyo, Japan

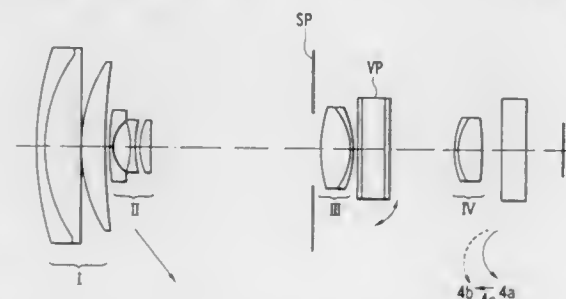
Filed Feb. 24, 1997, Ser. No. 806,233

Claims priority, application Japan, Feb. 27, 1996, 8-039861

Int. Cl.<sup>6</sup> G02B 27/64

U.S. Cl. 359—557

8 Claims



1. A zoom lens having an image stabilizing function, comprising a plurality of lens units, in which at least one of lens unit separations in said plurality of lens units is varied to vary a focal length.

an aperture stop, and a variable angle prism unit disposed on an image side of said aperture stop and having an apex angle varied to refract light, said zoom lens satisfying the following conditions:

$$1.16 < L_v / F_w < 3.90$$

$$6.2 < L_1 / F_w < 17.0$$

where  $L_v$  is a distance between said aperture stop and a driven surface of said variable angle prism unit,  $F_w$  is a focal length in a wide-angle end of said zoom lens, and  $L_1$  is a distance between the driven surface of said variable angle prism unit and a lens surface closest to an object side in said zoom lens.

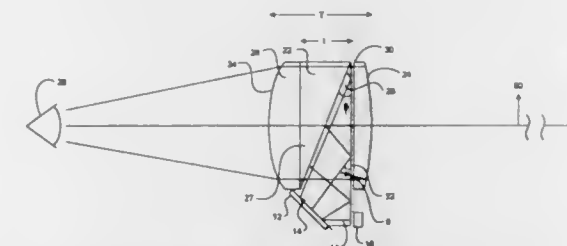
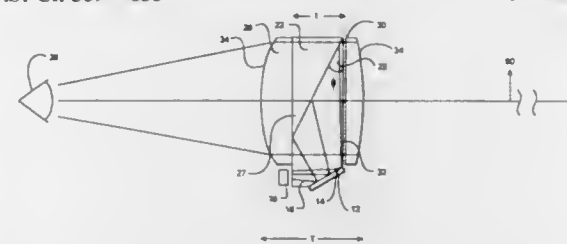
**5,771,124**  
**COMPACT DISPLAY SYSTEM WITH TWO STAGE  
MAGNIFICATION AND IMMERSED BEAM SPLITTER**  
Gregory J. Kintz, Mountain View, and Alfred P. Hildebrand,  
Palo Alto, both of Calif., assignors to Siliscap, Palo Alto,  
Calif.

Filed Jul. 2, 1996, Ser. No. 673,894

Int. Cl.<sup>6</sup> G02B 27/14

U.S. Cl. 359—633

33 Claims



1. A virtual image display system comprising:
- an imaging surface on which a source object is formed;
  - a first optical element having a reflective function and a magnification function;
  - a second optical element having a magnification function;
  - an immersed beam splitting element positioned between the first and second optical elements, the immersed beam splitting element including a beam splitter surrounded by an optically transparent material having a refractive index greater than air; and
  - an illumination source for projecting the source object formed at the imaging surface through the optically transparent material to the beam splitter, the beam splitter reflecting the projected source object to the first optical element, the first optical element magnifying the projected source object and reflecting a magnified virtual image of the projected source object to the beam splitter, the magnified virtual image traversing the beam splitter to the second optical element which magnifies the magnified virtual image to produce a compound magnified virtual image of the source object.

**5,771,125**  
**CATADIOPTRIC SYSTEM FOR PHOTOLITHOGRAPHY**  
Toshiro Ishiyama, Kawasaki, Japan, assignor to Nikon Corpo-  
ration, Tokyo, Japan

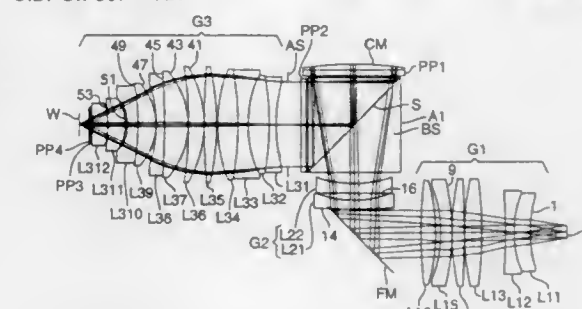
Filed Jun. 13, 1997, Ser. No. 874,920

Claims priority, application Japan, Jun. 14, 1996, 8-175922

Int. Cl.<sup>6</sup> G02B 17/08

U.S. Cl. 359—727

20 Claims



1. A catadioptric system for projecting an image of an object onto a substrate, the system comprising, from objectwise to image-wise along an axis:

- (a) a first lens group having positive power and receiving a light flux from the object;
- (b) a second lens group having negative power that transmits the light flux received from the first lens group;
- (c) a beamsplitter that receives the light flux from the second lens group;
- (d) a concave mirror having a magnification  $\beta_{CM}$  that receives the light flux from the beamsplitter;
- (e) a third lens group with positive power and with a most objectwise principal point that is image-wise of a most objectwise surface of the third lens group, wherein the third lens group receives the light flux reflected by the concave mirror and directed to the third lens group by the beamsplitter and forms the image of the object on the substrate; and
- (f) the catadioptric system satisfying the conditional expression:

$$1.5 < L_1 / f_3$$

wherein  $L_1$  is an axial distance between the most objectwise principal point of the third lens group and a most objectwise surface of the third lens group, and  $f_3$  is a focal length of the third lens group.

**5,771,126**  
**HARD DISK DRIVE WITH REDUCED SIZED SERVO  
SECTORS AND DRIVING METHOD THEREFOR**  
Soo-Il Choi, Suwon, Rep. of Korea, assignor to Samsung Elec-  
tronics Co., Ltd., Suwon, Rep. of Korea

Filed Nov. 8, 1996, Ser. No. 744,873

Claims priority, application Rep. of Korea, Nov. 8, 1995,  
1995/40269Int. Cl.<sup>6</sup> G11B 5/596

U.S. Cl. 360—49

34 Claims

BURST									
SAM	GRAY	P	A	B	SAM	GRAY	P	A	B
SAM	GRAY	P	A	B	SAM	GRAY	P	A	B
SAM	GRAY	P	A	B	SAM	GRAY	P	A	B
SAM	GRAY	P	A	B	SAM	GRAY	P	A	B

GRAY CODE INCLUDED

BURST									
SAM	P	A	B	SAM	P	A	B	SAM	P
SAM	P	A	B	SAM	P	A	B	SAM	P
SAM	P	A	B	SAM	P	A	B	SAM	P
SAM	P	A	B	SAM	P	A	B	SAM	P

GRAY CODE INCLUDED

1. A hard disk, comprising:
- a first recording surface having first servo sectors with first burst regions positioned within each one of said first servo sectors.



each one of said first servo sectors having a first full gray code recorded outside said corresponding first burst regions; and a second recording surface having second servo sectors with second burst regions positioned within each one of said second servo sectors, each one of said second servo sectors having a second full gray code recorded within said corresponding second burst regions and no gray code recorded outside said corresponding second burst regions.

5,771,127

**SAMPLED AMPLITUDE READ CHANNEL EMPLOYING INTERPOLATED TIMING RECOVERY AND A REMOD/DEMODO SEQUENCE DETECTOR**

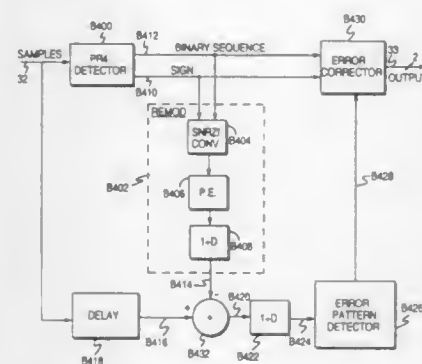
David E. Reed, Westminster; William R. Foland, Jr., Littleton; William G. Bliss, Thornton; Richard T. Behrens, Louisville, and Lisa C. Sundell, Westminster, all of Colo., assignors to Cirrus Logic, Inc., Fremont, Calif.

Filed Jul. 29, 1996, Ser. No. 681,678

Int. Cl.<sup>6</sup> G11B 5/09

U.S. Cl. 360—51

28 Claims



1. A sampled amplitude read channel for reading binary data from a sequence of discrete time sample values generated by sampling pulses in an analog read signal from a read head positioned over a disk storage medium, comprising:

- a sampling device for sampling the analog read signal to generate a sequence of asynchronous sample values;
- an interpolator for interpolating the asynchronous sample values to generate synchronous sample values; and
- a discrete time detector for detecting the binary data from the synchronous sample values, comprising:
  - a demodulator, responsive to the synchronous sample values, for detecting a binary sequence having one or more bit errors;
  - a remodulator for converting the binary sequence into a sequence of estimated sample values;
  - an adder, responsive to the synchronous sample values and the estimated sample values, for generating a sequence of sample error values;
  - an error pattern detector, responsive to the sequence of sample error values, for detecting a magnitude and location of the bit errors in the binary sequence; and
  - an error corrector, responsive to the magnitude and location of the bit errors, for correcting the binary sequence.

**5,771,128  
EDIT RECORDING METHOD AND APPARATUS USING ERASE HEAD CONTROL**

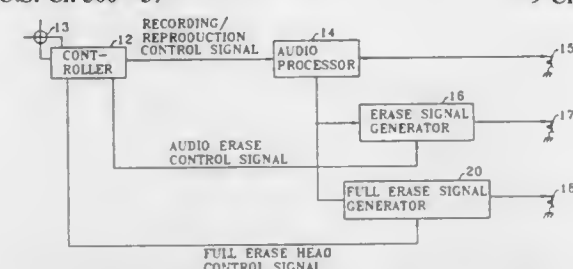
Seung-hong Lee, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea  
Filed Nov. 9, 1995, Ser. No. 556,086

Claims priority, application Rep. of Korea, Nov. 11, 1994, 94-29646

Int. Cl.<sup>6</sup> G11B 5/02; 27/02; 27/00; 5/127

U.S. Cl. 360—57

9 Claims



1. An edit recording apparatus using erase head control for a recording and reproduction system which records/reproduces video and audio signals and performs an erase operation by an audio erase head and a full erase head during an edit recording operation, said edit recording apparatus comprising:

- a controller for outputting, immediately after a recording mode is changed to a stop mode, a full erase head control signal to stop a full erase head operation and then controlling a dubbing operation for a predetermined time on the basis of respective tape speeds, and for outputting a recording/reproduction control signal;
- an audio processor for processing an audio signal and outputting an output signal;
- an erase signal generator for generating an erase signal according to the recording/reproduction control signal from said controller and the output signal output from said audio processor; and
- a switching portion for transmitting the erase signal generated from the erase signal generator to a full erase head and interrupting the erase signal for a predetermined interval.

5,771,129

**METHOD AND APPARATUS FOR DETECTING AND MATCHING THE RECORDED SPEED OF PREVIOUSLY RECORDED TAPE**

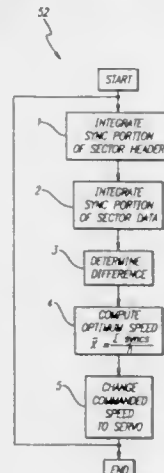
Andrew B. Millard, Jr., San Juan Capistrano, Calif., and Hiroyuki Watanabe, Hiratsuka-Kanagawa, Japan, assignors to Aiwa Co., Ltd., Tokyo, Japan

Filed May 13, 1996, Ser. No. 644,435

Int. Cl.<sup>6</sup> G11B 15/52

U.S. Cl. 360—73.12

24 Claims



1. A program storage device readable by a machine, tangibly embodying a program of instructions executable by the machine to

perform method steps for detecting and matching the recorded speed of tape having sectors including sector headers recorded at a first speed and sector data recorded at a second speed, said method steps comprising:

- integrating a specified portion of a synchronization portion of said sector header and said sector data with respect to time to determine a speed at which said sector header and said sector data was written;
- determining difference between each of said sector header and said sector data measurements with respect to time;
- computing a statistical average based upon said difference to determine an optimum speed; and
- adjusting said commanded speed based on said optimum speed.

5,771,130

**METHOD AND APPARATUS FOR NON-CONTACT SERVO WRITING**

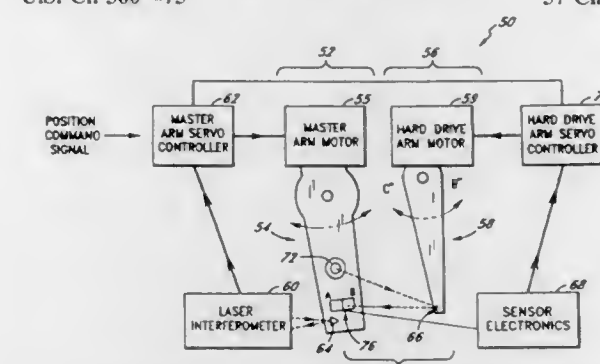
Bill R. Baker, Redwood City, Calif., assignor to Phase Metrics, San Diego, Calif.

Filed Apr. 15, 1996, Ser. No. 631,973

Int. Cl.<sup>6</sup> G11B 21/10

U.S. Cl. 360—75

37 Claims



1. An apparatus for use in positioning a transducer located on a hard drive arm, comprising:

- a light source for providing a light beam;
- a reflector mounted to the hard drive arm for reflecting the light beam;
- a sensor for receiving the reflected light, the sensor generating a signal in response;
- a storage element coupled to said sensor that stores a maximum and a current value of said signal; and
- a servo controller coupled to the sensor and the storage element for controlling the hard drive arm in response to the maximum and the current values of said signal.

5,771,131

**TRACKING IN HARD DISK DRIVE USING MAGNETORESISTIVE HEADS**

Sean Pirzadeh, Menlo Park, Calif., assignor to Quantum Corporation, Milpitas, Calif.

Filed Jul. 18, 1996, Ser. No. 683,830

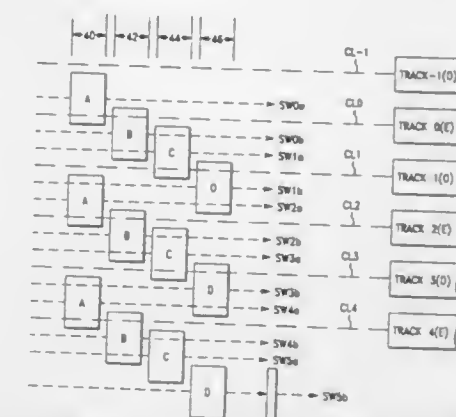
Int. Cl.<sup>6</sup> G11B 5/596

U.S. Cl. 360—77.08

21 Claims

1. A method for improved position error signal (PES) continuity in a disk drive including a magnetic data storage disk rotating relative to a base, a data transducer assembly positioned at concentric data tracks having a substantially uniform track pitch by a rotary actuator referenced to the base and controlled by a digital servo system, the data transducer assembly having a narrow magnetoresistive (MR) read element width relative to a write element width, the digital servo system employing quad servo bursts including A, B, C and D bursts radially and circumferentially spaced apart in servo sectors embedded within the data tracks, the method comprising steps of:

- during servo writing:



- writing the A burst at one-third track pitch while performing a DC erase within time windows for the B and C bursts;
- writing the B burst two-thirds track pitch away from the A burst while performing a DC erase within time windows for the C and D bursts;
- writing the C burst one-third track pitch away from the B burst;
- writing the D burst two-thirds track pitch away from the C burst; and

during servo following:

- measuring burst amplitudes of the quad servo bursts as the data transducer assembly is passed over each track; and
- using selected combinations of the burst amplitudes to obtain a PES profile as the data transducer assembly moves off-track, wherein a quad servo burst pattern is provided in two passes per track, and wherein each DC erase is a complete track away from a corresponding burst written during a previous pass so that the bursts are untrimmed.

5,771,132

**TRACKING ERROR DATA DETECTING APPARATUS AND VTR HAVING THE SAME APPARATUS**

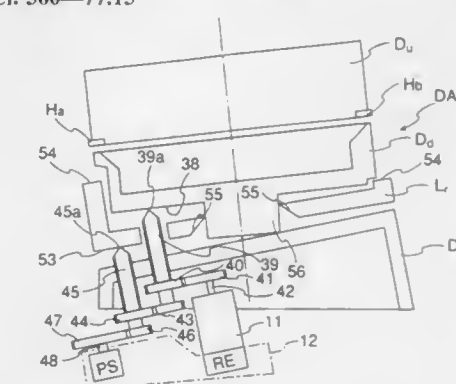
Naoto Hirohata; Yoshio Mizutani; Katsuyuki Shudo, all of Yokosuka, and Yoshio Tokuyama, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jul. 3, 1996, Ser. No. 674,833

Int. Cl.<sup>6</sup> G11B 5/584

U.S. Cl. 360—77.13

15 Claims



- A video tape recorder, comprising:
  - a drum for winding a magnetic tape therearound;
  - a capstan motor and a drum motor linked with the drum, both motors for traveling the magnetic tape;
  - two rotary magnetic heads arranged adjacent to each other relative to the magnetic tape and having two different azimuth angles;
  - detecting means for receiving one reproduced signal of higher signal level selected from two modulated signals reproduced

by the two rotary magnetic heads and for detecting the selected and received signal to output a detected reproduced signal;

signal generating means for generating sampling signals each having a signal level corresponding to a signal level of the detected reproduced signal outputted by the detecting means on the basis of the reproduced signal obtained by the selected rotary magnetic head, only during a period while a predetermined one of the two rotary magnetic heads is being selected in response to a head select signal, at each of time intervals obtained by dividing one vertical scanning period into a two or more natural number N;

inclination driving means for inclining a central axis of the drum in such a way that the respective signal levels of the sampling signals satisfy a predetermined relative relationship with respect to one another, when recorded signal is reproduced by traveling the magnetic tape at a travel speed different from another travel speed of the magnetic tape in recording operation; and

control means for changing rotation phase of the capstan motor relative to a reference drum rotation signal of said drum motor.

5,771,133

## FLOATING MAGNETIC HEAD

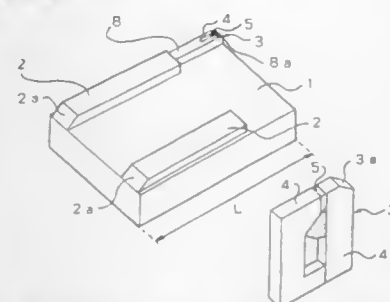
Ryo Goto, Mouka; Masahiro Ao, Kaminokawamachi, and Fumio Nitanda, Fukaya, all of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed May 21, 1996, Ser. No. 652,021

Claims priority, application Japan, May 23, 1995, 7-148105  
Int. Cl.<sup>6</sup> G11B 5/60; 21/21

U.S. Cl. 360—103

10 Claims



1. A floating magnetic head for writing or reading data to a magnetic recording medium, comprising:

a slider having a length, a first surface facing the magnetic recording medium, a leading edge, and a trailing edge;  
first and second floating rails provided on the first surface, said first floating rail having a width and a height;  
an auxiliary rail provided on the first surface and having a height, a length and a width, being aligned with the first floating rail and being positioned at the trailing edge of the slider, the auxiliary rail width being  $\frac{2}{3}$  to  $\frac{4}{5}$  the width of the first floating rail, and the auxiliary rail length being  $\frac{1}{10}$  to  $\frac{3}{5}$  the length of the slider, and the auxiliary rail and the first floating rail having heights approximately the same above the first surface; and

an electromagnetic conversion element having a magnetic gap, provided in the auxiliary rail at the trailing edge; wherein the magnetic gap opposes the magnetic recording medium to effect writing or reading, and

wherein the auxiliary rail and the electromagnetic conversion element have a trailing edge angle to prevent them from contacting the magnetic recording medium.

5,771,134

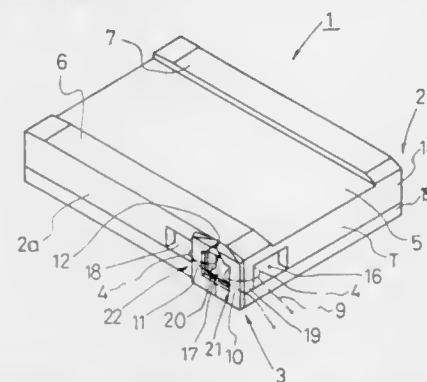
## FLOATING TYPE OF MAGNETIC HEAD USED IN A MAGNETIC RECORDING APPARATUS AND METHOD FOR PRODUCING THE SAME

Kazuyuki Kurita, and Shigeyuki Adachi, both of Shizuoka-ken, Japan, assignors to Minebea Co., Ltd., Nagano-ken, Japan  
Filed Mar. 26, 1997, Ser. No. 824,341

Claims priority, application Japan, Apr. 12, 1996, 8-115456  
Int. Cl.<sup>6</sup> G11B 5/60

U.S. Cl. 360—103

1 Claim



1. A floating type of magnetic head comprising:  
a slider having a pair of rails on which a floating force relative to a magnetic recording medium is to be generated; and  
a magnetic head core for read/write having a pair of leg portions, which is bonded to a side wall of the slider, wherein the slider is composed of a first slider body and a second slider body, in which surfaces of the slider bodies to be bonded with each other are formed in parallel to surfaces of the rails, and grooves are formed on one of the surfaces to be bonded so that at least one pillar portion around which lead lines may be wound around the pillar portion and at least one leg portion of the magnetic head core through the grooves.

5,771,135

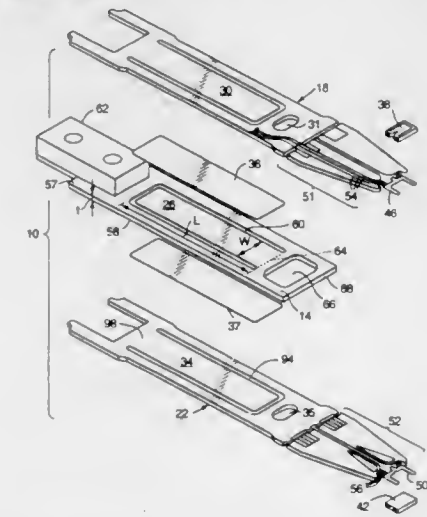
## VIBRATION DAMPING SYSTEM FOR HEAD SUSPENSION ASSEMBLIES

Oscar J. Ruiz; A. David Erpelding, both of San Jose, and Thomas F. Roth, Morgan Hill, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.  
Continuation of Ser. No. 259,055, Jun. 13, 1994, abandoned.  
This application Feb. 1, 1996, Ser. No. 595,518

Int. Cl.<sup>6</sup> G11B 5/48; 21/16; 5/60

U.S. Cl. 360—104

34 Claims



1. A damping system for use with a data transducer comprising:  
an arm adapted for attachment to an actuator, the arm having a thickness "t";

a first arm tongue comprised of a region of the arm that is positioned between at least three channels that extend completely through the arm in the direction of the thickness "t";  
a first suspension means for mechanically supporting a first data transducer, the first suspension means being attached to the arm and including a first overlap section which overlaps the arm; and

a first damping means positioned between the first arm tongue and the first overlap section for damping vibrations transmitted between the arm and the first suspension means, the first damping means being in contact with the first arm tongue and the first overlap section.

5,771,136

## SUSPENSION ASSEMBLY FOR MOUNTING A HEAD SLIDER HAVING A FLEXURE WITH A SHOCK LIMITER

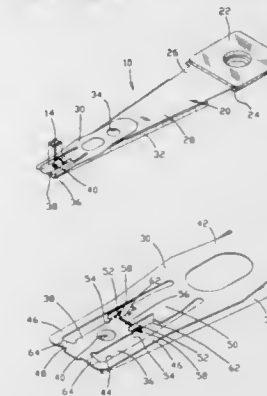
Mark T. Girard, Hutchinson, Minn., assignor to Hutchinson Technology Incorporated, Hutchinson, Minn.

Filed May 23, 1996, Ser. No. 653,937

Int. Cl.<sup>6</sup> G11B 5/48

U.S. Cl. 360—104

18 Claims



1. A suspension assembly for supporting a head slider at a fly height above a disk surface during operation within a rigid disk drive comprising:

a load beam having an actuator mounting region a loading region at a distal end of said load beam a rigid region between said actuator mounting region and said loading region and a spring region between said actuator mounting region and said rigid region for providing a load force to the head slider in use;

a flexure at the distal end of the load beam, the flexure comprising a cantilever portion having a head slider mounting surface facing in a first direction toward the disk surface and a free end that is movable during flexure of said cantilever portion; limiter means for limiting the range of movement of said free end of said cantilever portion in the direction of movement of said slider mounting surface in said first direction away from said load beam, said limiter means comprising a limiter element and a stop surface with one of said limiter element and said stop surface provided at said free end of said cantilever portion and each comprising an integrally formed element of said flexure.

5,771,137

## THERMALLY STABLE MAGNETIC HEAD ASSEMBLY WITH MAGNETIC HEAD LEGS BONDED TO INSULAR PORTIONS CONNECTED TO FLEXIBLE FRAME VIA BRIDGES

Fumio Nagase, Mitaka, Japan, assignor to Teac Corporation, Tokyo, Japan

Continuation of Ser. No. 247,005, May 20, 1994, abandoned.

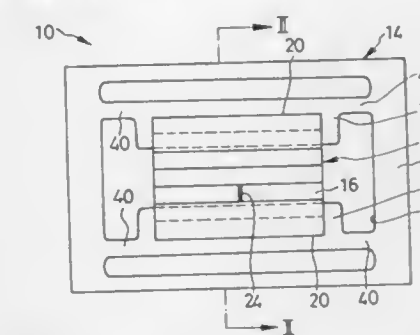
This application Jun. 27, 1996, Ser. No. 671,073

Claims priority, application Japan, May 21, 1993, 5-032011 U; Nov. 26, 1993, 5-068101 U

Int. Cl.<sup>6</sup> G11B 5/48

U.S. Cl. 360—104

14 Claims



1. A magnetic head assembly for data transfer with a flexible magnetic disk, comprising:

(A) a magnetic head unit having a magnetic core, a coil wound on the magnetic core, and a pair of sliders bonded to the opposite sides of the core, the pair of sliders having a pair of spaced apart mounting legs which, if thermally spread apart from each other, would cause the head unit to undergo deformation such that the head unit might fail to make data transfer with the disk; and

(B) a flexure seat for resiliently supporting the head unit, the flexure seat being made from a piece of resilient sheet material and being more thermally expansible than the head unit, the flexure seat comprising:

(a) a frame portion defining at least one opening;  
(b) a pair of spaced apart insular portions disposed in the opening in the frame portion, the head unit being mounted to the flexure seat by having each distal end of the pair of mounting legs thereof bonded to each of the insular portions, respectively; and

(c) a plurality of bridge portions extending from and joining opposite ends of each insular portion to the frame portion, the insular portions being completely separate from each other and the frame portion except for the plurality bridge portions,

whereby, being independently bonded to the pair of insular portions of the flexure seat, the pair of mounting legs of the head unit are not thermally spread apart from each other due to difference between the coefficients of thermal expansion of the head unit and the flexure seat.

5,771,138

## HEAD GIMBAL ASSEMBLY WITH TRANSDUCER WIRES ATTACHED AT TWO POINTS TO SLIDER

Mourad D. Zarouri, San Diego; Navrit Singh, Santa Clara, and Thomas J. Bower, San Luis Obispo, all of Calif., assignors to Read-Rite Corporation, Milpitas, Calif.

Continuation of Ser. No. 404,737, Mar. 15, 1995, abandoned.

This application Jul. 25, 1996, Ser. No. 686,273

Int. Cl.<sup>6</sup> G11B 5/48

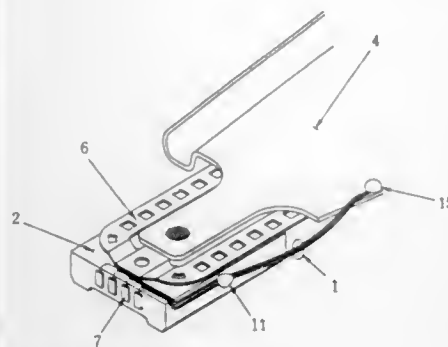
U.S. Cl. 360—104

5 Claims

1. A head gimbal assembly for use in a disk drive having a plurality of magnetic disks comprising:

a load beam;  
a flexure physically connected to said load beam;





an air bearing slider attached to said flexure for movement with said flexure, said slider including a transducer and a plurality of transducer bonding pads for electrical connection to said transducer; and

a plurality of transducer wires, one end portion of each wire being connected by adhesive at a first point to said load beam, the other end portion of each of said transducer wires being connected by adhesive directly to the body of said slider at a first location on said slider other than said transducer bonding pads thereby forming a secondary wire loop, said other end portion of each of said transducer wires being connected at said first location and continuing to connect to respective ones of said plurality of transducer bonding pads on said slider without intermediate connections to form a first wire loop; said flexure, said slider, and a first length of each of said plurality of transducer wires between said first location on said slider and said plurality of transducer bonding pads that form said first wire loop combining as an integral unit which moves as a single unit during operation in a disk drive; said plurality of transducer wires each having a second length between said first point on said load beam and said first location on said slider to form said secondary wire loop with minimal overall length of each transducer wire, said wires being routed along the bottom or the edge of said load beam, so that said integral unit and said secondary wire loop coact to maintain freedom of movement and flying characteristics of said slider, whereby said plurality of transducer wires exerts negligible stress on the electrical connection between said plurality of transducer wires and said plurality of transducer bonding pads.

5,771,139

## INTEGRATED SPRING HEAD/GIMBAL ASSEMBLY HOLDER

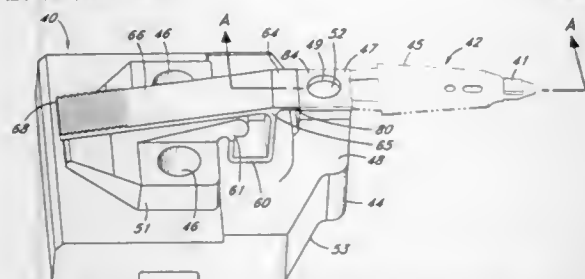
Patrick R. Lee, San Diego, and Arthur J. Cormier, Rancho Santa Fe, both of Calif., assignors to Phase Metrics, San Diego, Calif.

Filed Aug. 3, 1995, Ser. No. 511,075

Int. Cl.<sup>6</sup> G11B 5/48

U.S. Cl. 360—109

23 Claims



1. A device for holding a Head/Gimbal Assembly (HGA), wherein the HGA comprises a slider mounted to a distal end of a support beam, wherein a proximate end of the support beam further includes a substantially planar HGA mounting region, the HGA mounting region further including a boss which extends from a surface of the substantially planar HGA mounting region of the support beam, said device comprising:

a base having a substantially planar support region which is configured to receive the substantially planar HGA mounting region, wherein said substantially planar support region of said base includes a recess formed therein which is configured such that the boss extending from the surface of the substantially planar HGA mounting region is insertable within said recess; and

a cantilevered beam extending from said base and rigidly attached to said base at a first region of said cantilevered beam such that a second region of said cantilevered beam is capable of flexing with respect to said base thereby acting as a spring, wherein said cantilevered beam further comprises a clamping region configured to engage the HGA mounting region when the HGA boss is inserted in said base support region recess thereby securing the HGA mounting region of the HGA to said support region of said base.

5,771,140

## ELECTRO-STATIC DISCHARGE AND LATCH-UP PREVENTION CIRCUIT

Dae Seong Kim, Kyungsangbook-do, Rep. of Korea, assignor to LG Semicon Co., Ltd., Cheongju, Rep. of Korea

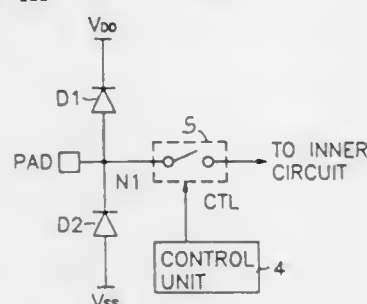
Filed Mar. 28, 1996, Ser. No. 623,032

Claims priority, application Rep. of Korea, Nov. 28, 1995, 1995 44214

Int. Cl.<sup>6</sup> H02H 3/22

U.S. Cl. 361—111

20 Claims



1. An electro-static discharge and latch-up prevention circuit, comprising:

electro-static discharge prevention means provided in the interior of or at the outside of an integrated circuit and connected between a positive voltage and a negative voltage in series for preventing positive and negative electro-static discharges;

switching means connected between said electro-static discharge prevention means and the interior circuit of said integrated chip for switching; and

control means for outputting a control signal so as to control a switching operation of said switching means, wherein said control means includes an inverter that inverts the negative voltage to a positive voltage level and a logic-gate that logically combines the output signal of said inverter and the level of the positive voltage.

5,771,141

## MAGNETORESISTIVE HEAD AND MAGNETIC RECORDING/REPRODUCING APPARATUS

Yoshinori Ohtsuka; Takao Koshikawa; Yoshifumi Mizoshita; Yuji Uehara; Eiichi Kanda; Ken-ichi Aoshima; Hitoshi Kanai, and Junichi Kane, all of Kanagawa, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 13, 1996, Ser. No. 766,511

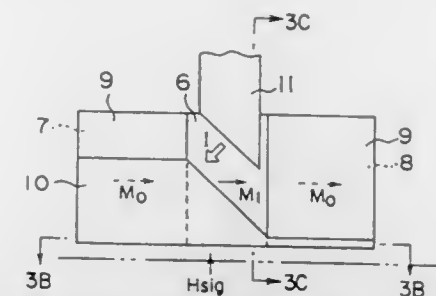
Claims priority, application Japan, Apr. 26, 1996, 8-106933

Int. Cl.<sup>6</sup> G11B 5/39

U.S. Cl. 360—113

12 Claims

1. A magnetoresistive head for reading/writing data on a magnetic recording medium, comprising:  
a magnetoresistive layer;



a pair of magnetization direction controlling layers, arranged on opposite sides of said magnetoresistive layer, said pair of magnetization controlling layers for setting the axis of easy magnetization of said magnetoresistive layer parallel to a magnetic recording surface of said magnetic recording medium, said pair of magnetization controlling layers defining therebetween a sense region for allowing a sense current to flow into said sense region;

a first electrode formed near said sense region, said first electrode including a first edge which is substantially parallel to said magnetic recording surface and an oblique edge which is oblique to said magnetic recording surface; and

a second electrode formed on one end of said magnetoresistive layer, said second electrode having a second edge which is substantially parallel to, and spaced apart from, said oblique edge of said first electrode, wherein said magnetoresistive head is configured and arranged to allow said sense current to only flow substantially between said oblique edge of said first electrode and said second edge of said second electrode.

5,771,142

## MULTITRACK MAGNETIC WRITE/READ HEAD ARRANGEMENT WITH INTEGRAL MULTIPLE HEAD GAP WIDTHS

François Maurice, Verrières le Buisson, and Jean-Marc Coultellier, Maurepas, both of France, assignors to Thomson-CSF, Paris, and Thomson Multimedia, Courbevoie, both of France

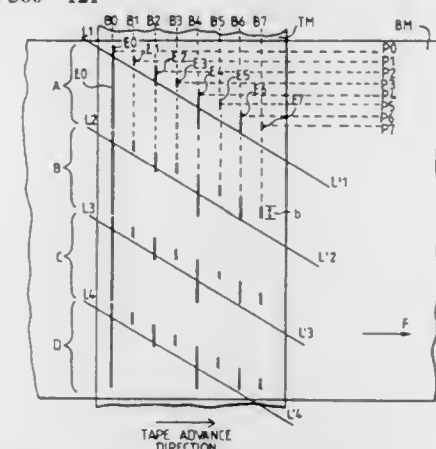
Filed Jun. 29, 1995, Ser. No. 496,325

Claims priority, application France, Jul. 1, 1994, 94 08161

Int. Cl.<sup>6</sup> G11B 5/265

U.S. Cl. 360—121

8 Claims



1. A magnetic write/read head arrangement for writing/reading information on a recording medium passing in front of the head arrangement, comprising:

at least one group of magnetic heads, comprising;

several pairs of poles, each pair of poles being separated by a head gap,

widths of the head gaps being different for each pair of poles so that each head gap is capable of writing/reading portions of various widths on the recording medium according to the widths of the head gaps,

the head gaps being arranged so as to write/read superimposed portions of the recording medium,

a width of the recording medium written/read by the head gaps is divided into tracks of equal widths, each equal width being equal to an elementary track width,

each head gap having a width equal to an integer multiple of the elementary track width,

the width of at least one head gap of the head gaps being equal to the elementary track width, and the width of other head gaps of the head gaps being equal to 2<sup>n</sup> multiples of the elementary track width, where n is an integer number greater than 0.

5,771,143

## DISK CARTRIDGE SYSTEM WITH REMOVABLE MODULES

Goulven Vernois, 78140, Velizy, France

Continuation of Ser. No. 700,199, May 30, 1991, abandoned.

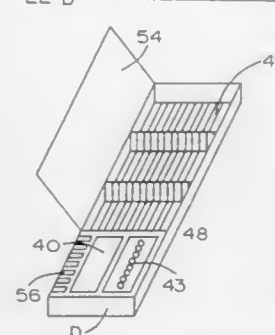
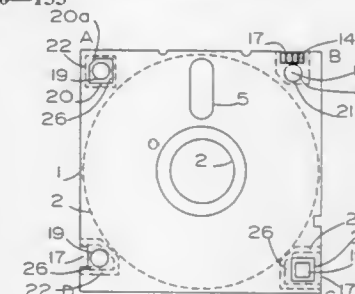
This application Mar. 11, 1994, Ser. No. 208,804

Claims priority, application France, Nov. 30, 1988, 88 15673; May 31, 1989, 89 07151

Int. Cl.<sup>6</sup> G11B 23/03; 23/30

U.S. Cl. 360—133

4 Claims



1. A data processing system comprising:

a) a computer;

b) a disk drive for reading from and/or writing to removable disks and having a connector linked to the computer and accessible through a disk-introduction slot of the disk drive;

c) a removable hybrid memory unit which can be read from or written to by said disk drive, said hybrid memory unit includes a first housing portion which contains a rotary mass storage element and a second housing portion which contains one or more removable electronic modules each provided with a connector; and

d) a group holder having several receptacles, each able to temporarily receive one of said one or more electronic modules and each having an input connector structure which cooperates with the connector of the electronic module received therein, each of the input connectors being linked to an integrated output connector which is able to interface with said connector of said computer disk drive.

5,771,144

## CLEANING DEVICE FOR A CONTACT SURFACE OF A PRINTED CIRCUIT BOARD

Yu-In Kim, Incheon, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

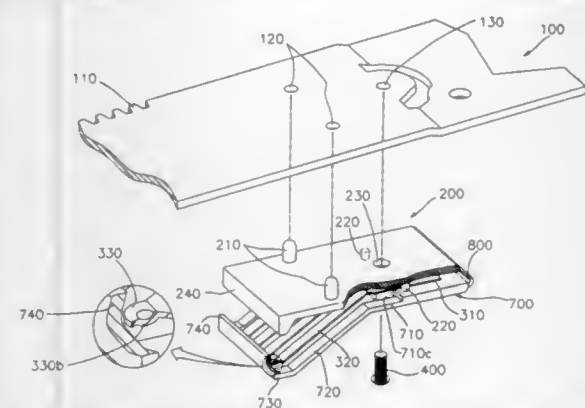
Filed Apr. 1, 1996, Ser. No. 625,297

Claims priority, application Rep. of Korea, Mar. 31, 1995, 1995-7182

Int. Cl.<sup>6</sup> B08B 11/00

U.S. Cl. 360—137

16 Claims



1. A cleaning device for a contact surface on a printed circuit board, comprising:

a loading means for loading said cleaning device, said loading means moving in a horizontal direction according to the driving of a driving motor;

a holding means for retaining a mode detection means, said holding means made of an insulating material and being in contact with the bottom face of said loading means;

said mode detection means sensing a signal provided in the contact surface on the printed circuit board, said mode detection means having a first fixing part being in contact with the bottom face of said holding means and a number of elastic legs connecting with one of the edges of said first fixing part and having a predetermined angle bent against the bottom face of said first fixing part; and

a cleaning means for removing matters attached to the contact surface on the printed circuit board, said cleaning means having a second fixing part being in contact with the bottom face of said first fixing part of said mode detection means, a wiper being in contact with the contact surface on the printed circuit board, and two elastic guards coupled between both ends of one of the edges of said second fixing part and both ends of said wiper, said wiper having a wiper head which protrudes from the top face of said wiper with a predetermined height in order to protect end parts of said number of elastic legs, and wherein said holding means has a protecting part protruding from the bottom of said holding means for protecting said end parts of said number of elastic legs.

5,771,145

## ZERO CURRENT CIRCUIT INTERRUPTION

Raymond K. Seymour, Plainville; Paul H. Singer, West Hartford, and David Arnold, Chester, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Dec. 17, 1996, Ser. No. 767,747

Int. Cl.<sup>6</sup> H02H 3/00

U.S. Cl. 361—93

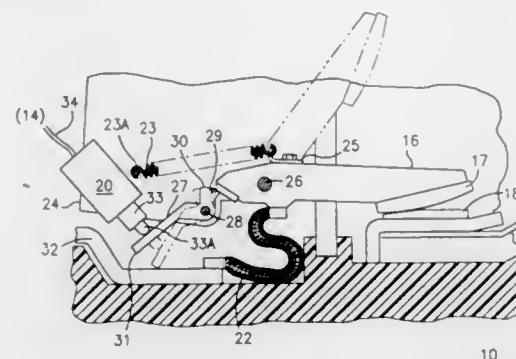
9 Claims

1. A circuit interrupter comprising:

a cover attached to a case;

a contact arm within said case within each separate pole of a multipole electrical connector, said contact arm defining a camming surface on one end thereof;

a contact on an end of said contact arm opposite from said camming surface arranged for connection within each pole of said multipole electrical connector;



an operating spring interacting with said contact arm for rotating said contact arm and said contact to an open position; a pivotal lever interacting with said contact arm camming surface for preventing said contact arm from rotating to said open position;

a flux shifter unit within each pole and interacting with said pivotal lever for releasing said camming surface and allowing rotation of said contact arm and said contact to said open position to interrupt current flow through said contact; and an electronic trip unit connecting with said separating means for actuating said separating means to release said latching means.

5,771,146

## SAFETY CIRCUIT

Michael Schlicker, Reichshof-Denklingen, and Frank Schmitz, Bergisch-Gladbach, both of Germany, assignors to Schneider Electric SA, Boulogne Billancourt, France

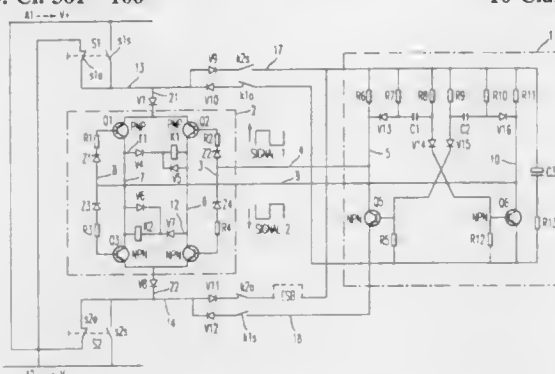
Filed Oct. 4, 1996, Ser. No. 725,715

Claims priority, application European Pat. Off., Oct. 4, 1995, 95115622; Nov. 11, 1995, 95117767

Int. Cl.<sup>6</sup> H01H 47/32

U.S. Cl. 361—166

10 Claims



1. A safety circuit with an actuating device for electrical appliances, whereby the actuation device is capable of being operated by means of two key buttons or switch stacks, wherein the two key buttons each have a break contact (s1ö, s2ö) and a make contact (s1s, s2s) and act in combination with an associated transistor driver stage with transistors (Q1, Q2, Q3, Q4), wherein the driver stage has two relays (K1, K2), and wherein an astable circuit or multivibrator with an elementary frequency of substantially 1000 Hz for the generation of two complementary square wave signals is connected to the relays (K1, K2) via contacts (k1, k2) so that the relays (K1, K2) are dynamically switchable.

5,771,147

## DEFECTIVE EARTH TESTING FOR AN ELECTRIC FENCE ENERGIZER

Lars-Arne Eriksson, Sundsvall, and Göran Karl-Olov Karlsson, Enhörna, both of Sweden, assignors to Alfa Laval Agri AB, Tumba, Sweden

PCT No. PCT/SE94/01268, § 371 Date Aug. 22, 1996, § 102(e) Date Aug. 22, 1996, PCT Pub. No. WO95/18519, PCT Pub. Date Jul. 6, 1995

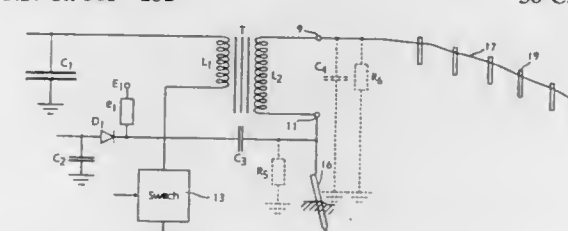
PCT Filed Dec. 29, 1994, Ser. No. 663,108

Claims priority, application Sweden, Dec. 29, 1993, 9304342

Int. Cl.<sup>6</sup> H05C 1/04

U.S. Cl. 361—232

38 Claims



1. A method for determining the quality of a connection to earth by way of an earth connection post of an electric fence energizer delivering high voltage pulses to an electric fence, the energizer including a transformer having a primary winding and a secondary winding, a first exterior terminal of the secondary winding being connected to a conductor of the electric fence and a second exterior terminal thereof being connected to the earth connection, high voltage pulses being induced over the secondary winding when voltage pulses are applied to the primary winding, the method comprising the steps of:

evaluating a voltage between the second exterior terminal of the secondary winding, which is connected to the earth connection, and a ground potential, wherein said voltage used for the evaluation is obtained capacitively from a small portion of the secondary winding.

5,771,148

## INTERCALATION-BASED VOLTAGE VARIABLE CAPACITOR

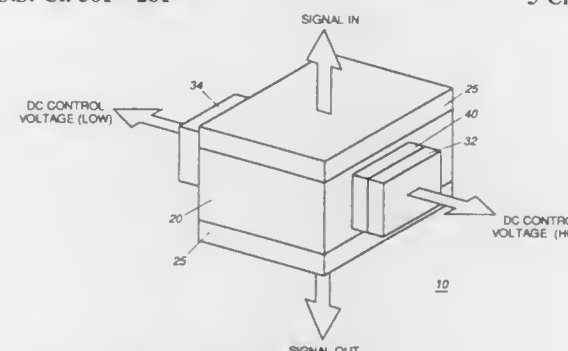
James Lynn Davis, Parkland, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 17, 1995, Ser. No. 560,455

Int. Cl.<sup>6</sup> H01G 7/00; H01L 29/93

U.S. Cl. 361—281

5 Claims



1. A voltage variable capacitor, comprising:

a pair of charge storage members;

a dielectric material having an electrolyte in intimate contact therewith, the dielectric material comprising an intercalation compound and the dielectric material disposed between the pair of charge storage members;

a source electrode for providing a source of ions to intercalate the dielectric material; and

a control electrode for the source electrode.

5,771,149

## CAPACITOR DEVICE

Katsuhiko Osaki, Goutsu; Kenji Yamada, Matsue, and Kazuo Ogawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

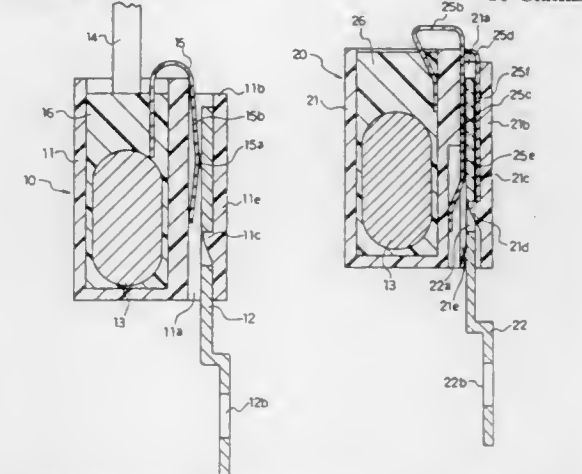
Filed Feb. 26, 1997, Ser. No. 807,860

Claims priority, application Japan, Mar. 1, 1996, 8-044523

Int. Cl.<sup>6</sup> H01G 4/228; 4/236; 4/005; 2/20

U.S. Cl. 361—306.1

10 Claims



1. A capacitor device comprising:

a resinous case of a capacitor unit having an opening at an upper part;

a metal attachment leg to be attached on an outside face of said case for fixing said capacitor unit to an external member;

a capacitor element inserted in said case so that terminals connected to respective electrodes of said capacitor element are led out of said upper opening of said case, and filler resin for filling said case, and

said case being provided with a fixing part having a room to be inserted with said metal attachment leg on a side face of said case to which said metal attachment leg is attached, and an engaging part for engaging with said inserted metal attachment leg, and

one of said terminals of said capacitor element being formed into a plate-shape, and electrically contacting said metal attachment leg in said fixing part by elasticity.

5,771,150

## CAPACITOR CONSTRUCTIONS

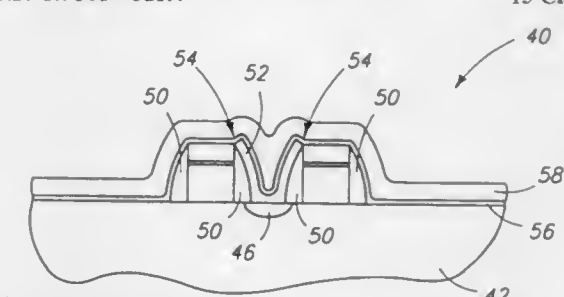
Klaus Florian Schuegraf, and Bob Carstensen, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Jan. 3, 1996, Ser. No. 582,445

Int. Cl.<sup>6</sup> H01G 4/06

U.S. Cl. 361—321.4

15 Claims



1. A capacitor comprising:

a dense mass of electrically insulative oxide;

an electrically conductive inner capacitor plate contacting the electrically insulative oxide mass, the inner capacitor plate comprising polysilicon;

a capacitor dielectric layer overlying the inner capacitor plate and oxide mass, the capacitor dielectric layer comprising a



nitride, the nitride physically contacting the oxide of the dense mass and the polysilicon of the inner capacitor plate; an electrically conductive outer capacitor plate overlying the capacitor dielectric layer; and the dense mass of electrically insulative oxide being characterized by a wet etch rate of less than or equal to about 75 Angstroms/minute in a 100:1 by volume H<sub>2</sub>O:HF solution.

5,771,151

## CENTRAL ELECTRICAL ASSEMBLY

Gheorghe Hotea, Griesheim; Martin Listing, Dreieich, and Josef Woller, Griesheim, all of Germany, assignors to The Whitaker Corporation, Wilmington, Del.

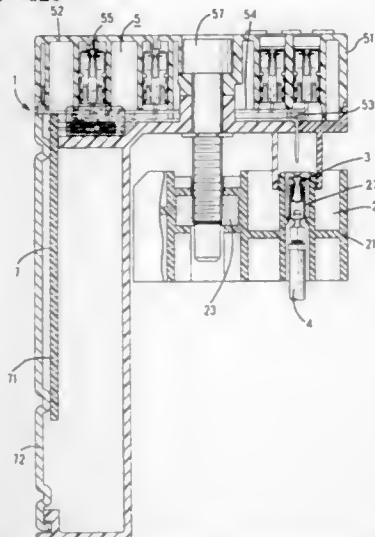
Filed Jun. 13, 1997, Ser. No. 874,488

Claims priority, application European Pat. Off., Jul. 10, 1996, 96111092

Int. Cl.<sup>6</sup> H01R 13/68; 13/207

U.S. Cl. 361—626

11 Claims



1. A modular central electrical assembly for motor vehicles comprising:

a contact supporting body forming one module, the contact supporting body being used to accommodate contacts or plugs with contacts which produce the connection between electrical cables and the central electrical assembly;

a relay and fuse box module having at least one conductor track level contained in a housing having plug-in slots for accommodating electrical devices and a mating side opposite thereto;

the relay and fuse box being connectable to the contact supporting body at the mating face in such a manner that the connections are produced between the electrical cables and the central electrical assembly, in particular the conductor track levels and the plug-in slots, as a result of the modules being connected.

5,771,152

## COMPUTER SYSTEM WITH A TILT ADJUSTMENT MECHANISM

Dennis Crompton, Apex; Richard Hunter Harris, Raleigh; Herbert Gene Leonard, Lousiburg; George Hufford, III, Clayton, and Jeff David Thomas, Raleigh, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 436,941, May 8, 1995, Pat. No. 5,566,424.

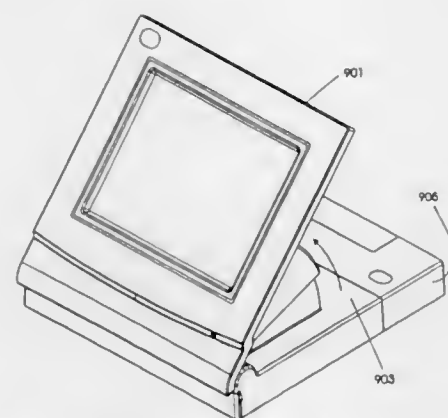
This application Feb. 7, 1996, Ser. No. 597,654

Int. Cl.<sup>6</sup> G06F 1/16; H05K 5/03

U.S. Cl. 361—681

7 Claims

1. A computer system comprising:



a tilt adjustment mechanism having a lower housing having support for seating a shaft assembly, said lower housing having a hinge post receptacle, said assembly having a shaft, a first gear and a second gear, mounted on said shaft, said shaft having a first resistance when rotated in a rotational direction and a second resistance when rotated in the opposite rotational direction; an upper housing having hinge posts for hinging said lower housing to said upper housing, said upper housing having a first internal gear for receiving said first gear and a second internal gear for receiving said second gear, said internal gears activating said gears to rotate said shaft in the rotational direction when a downward force is applied to said upper housing with said upper housing rotating with respect to said lower housing about said hinge posts and to rotate said shaft in the opposite rotational direction when an upward force is applied to said upper housing wherein said downward force must exceed said first resistance and said upward force must exceed said second resistance in order for the upper housing to move;

a display tablet mounted on the upper housing of the tilt adjustment; and  
a system unit connected to the display tablet.

5,771,153

## CPU HEAT DISSIPATING APPARATUS

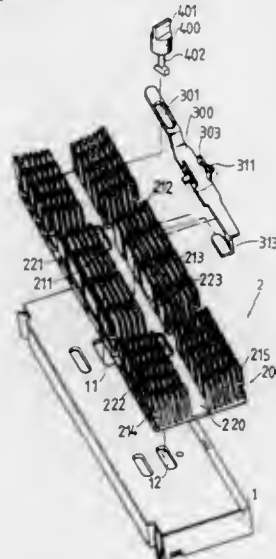
Lin Chun Sheng, 31, Sec. 1, Min-I Rd., Wu-Ku Hsiang, Taipei, Taiwan

Filed May 16, 1997, Ser. No. 857,334

Int. Cl.<sup>6</sup> H05K 7/20

U.S. Cl. 361—697

3 Claims



1. A CPU heat dissipating apparatus comprising a heat sink attached to a CPU shell for dissipating of heat from said CPU shell, an elongated clamping plate fastened to said heat sink and said CPU shell to secure them together, and a lock bolt fastened to

said elongated clamping plate and said heat sink and said CPU shell to lock them together, wherein:

said heat sink comprises a plurality of longitudinally and transversely aligned radiating fins arranged into two separated arrays, a longitudinal passage defined between said two separated arrays of radiating fins, a first oblong mounting hole and a second oblong mounting hole disposed in said longitudinal passage and respectively connected to a respective oblong mounting hole on said CPU shell;

said elongated clamping plate comprises an oblong mounting hole at one end connected to the first oblong mounting hole of said heat sink and the corresponding oblong mounting hole of said CPU shell by said lock bolt, a downward hook at an opposite end hooked in the second oblong mounting hole of said heat sink and the corresponding oblong mounting hole of said CPU shell, and two upright springy frames bilaterally disposed in the middle and respectively stopped at said two arrays of radiating fins at an inner side;

said lock bolt comprises a flat finger plate raised from a top side thereof for the holding of the hand, and a T-rod invertedly raised from a bottom side thereof, said T-rod of said lock bolt being inserted through the oblong mounting hole of said elongated clamping plate and the first oblong mounting hole of said heat sink and the corresponding oblong mounting hole of said CPU shell and turned through 90 degrees to lock said elongated clamping plate and said heat sink and said CPU shell together.

5,771,154

## HEATSINK ASSEMBLY FOR A HIGH-POWER DEVICE

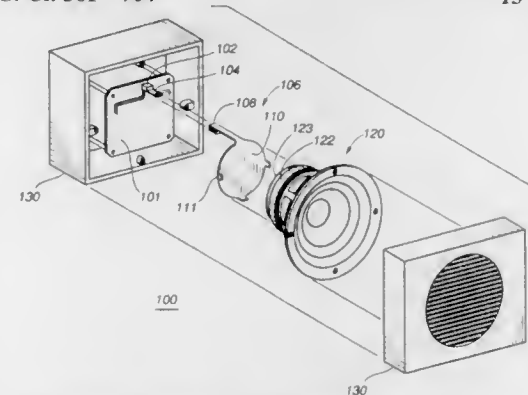
Mitchell E. Goodman, Coral Springs; John C. Barron, Davie, and Robert B. Ford, Tamarac, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 3, 1997, Ser. No. 833,018

Int. Cl.<sup>6</sup> H05H 7/20

U.S. Cl. 361—704

13 Claims



1. A heatsink assembly, comprising:

an electronic component having a heatsink extending therefrom; a thermally conductive interposer having first and second ends, the first end attached to the heatsink; and

a magnet having a thermally-conductive rear surface, the second end of said interposer magnetically coupled to said rear surface such that the second end is in direct and intimate contact with said magnet,

wherein heat generated by said component is transferred from the heatsink, via said thermally conductive interposer, to said magnet such that heat is dissipated away from said electronic component.

5,771,155

## SPRING CLAMP ASSEMBLY FOR IMPROVING THERMAL CONTACT BETWEEN STACKED ELECTRONIC COMPONENTS

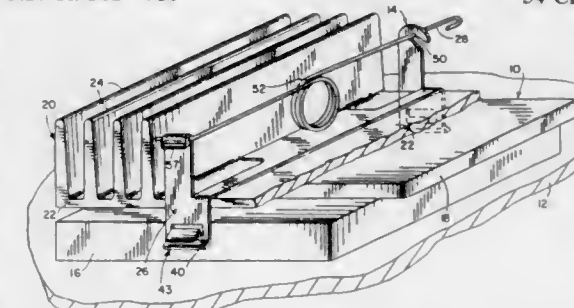
Randolph H. Cook, Gilford, N.H., assignor to Aavid Engineering, Inc., Laconia, N.H.

Filed Sep. 3, 1996, Ser. No. 707,225

Int. Cl.<sup>6</sup> H05K 7/20

U.S. Cl. 361—710

54 Claims



1. A spring clamp device for clamping together a stack of electronic components, comprising:

a spring member including at least one torsion spring coil;

a first component of said stack having peripheral sides;

coupling means including structure for latching to said peripheral sides of said first component of said stack, said spring member further including a first connecting member for operatively connecting said spring coil to said coupling means at one of said peripheral sides and a second connecting member for operatively connecting said spring coil to said coupling means at another of said peripheral sides for tensioning said at least one coil in a clamped configuration such that a peripheral edge of said at least one coil urges a second component of said stack against said first component.

5,771,156

## I/O CARD AND METHOD MAKING THE SAME

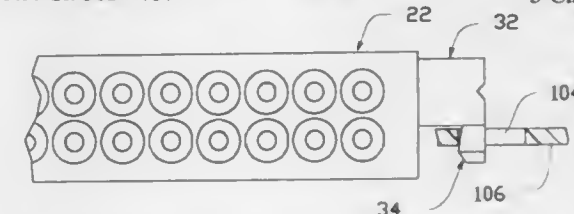
Kuo-Cheng Wang, Taipei Hsien, Taiwan, assignor to Hon Hai Precision Ind. Co., Ltd., Taipei Hsien, Taiwan

Filed Nov. 22, 1995, Ser. No. 561,745

Int. Cl.<sup>6</sup> H05K 1/14

U.S. Cl. 361—737

3 Claims



1. An I/O Card assembly comprising:

cover means;

an insulative frame sandwiched by said cover means;

a PC board plate positioned in said frame and having a plurality of electrical components thereon and a plurality of circuit pads proximate on an edge region thereof;

a connector positioned by the edge region of said PC board, said connector comprising an insulative housing having a plurality of contacts extending in a front-to-end direction wherein tails of the contacts are soldered onto the corresponding circuit pads on the edge region;

a mounting ear outward extending from one lengthwise end of the housing of the connector, said mounting ear having an engaging means for receivably latchable engagement within a corresponding recess in the frame, the engaging means being a notch formed in an end face of the mounting ear, and the frame having a rib protruding into the recess, the rib being engaged with the mounting ear defining the notch; and

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1

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a retention device extending downward from said mounting ear to incorporate a retention hole positioned in said PC board for retaining the connector in position with regard to the PC board.

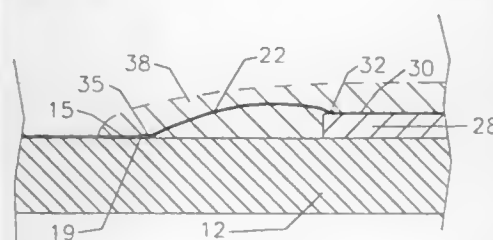
5,771,157  
CHIP-ON-BOARD PRINTED CIRCUIT ASSEMBLY USING  
ALUMINUM WIRE BONDED TO COPPER PADS

Robert L. Zak, St. Paul, Minn., assignor to Honeywell, Inc.,  
Minneapolis, Minn.

Filed Mar. 8, 1996, Ser. No. 611,594  
Int. Cl.<sup>6</sup> H05K 1/18

U.S. Cl. 361—760

8 Claims



1. A circuit board assembly of the type incorporating a cellulose epoxy mat printed circuit board; a bare copper foil attached to a surface of the board; a microcircuit element mounted on the surface of the printed circuit board adjacent to a surface of the bare copper foil; at least one aluminum wire electrically connected to the microcircuit; a wedge bonding site on the copper foil mechanically and electrically connecting the aluminum wire directly to the bare copper foil; and a volume of rigid encapsulant material bonded to the printed circuit board and enveloping the microcircuit element, the aluminum wire, and the bonding site, said aluminum wire, printed circuit board, and encapsulant material all having similar coefficients of thermal expansion.

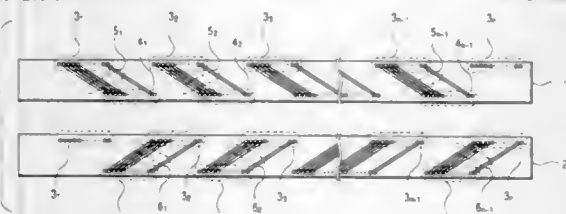
5,771,158  
PRINTED CIRCUIT BOARD, PRINTED CIRCUIT BOARD  
USED FOR FLAT PANEL DISPLAY DRIVE CIRCUIT,  
AND FLAT PANEL DISPLAY DEVICE

Keitarou Yamagishi; Akio Gotob; Akihiro Miura; Eiji Mukai,  
all of Tokyo, and Eishi Gofuku, Kumamoto, all of Japan,  
assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo,  
Japan

Filed Jun. 27, 1996, Ser. No. 673,797  
Claims priority, application Japan, Sep. 21, 1995, 7-243002  
Int. Cl.<sup>6</sup> H05K 7/02

U.S. Cl. 361—777

18 Claims



1. A printed circuit board comprising:  
multilayer having an elongate shape;  
first through vias connected to leads of ICs either directly or indirectly mounted on said printed circuit board, being formed in one edge portion of said printed circuit board in such a manner that said respective first through vias constitute either a single column or plural columns along a direction parallel to the longitudinal direction of said printed circuit board;  
second through vias for connecting signal wirings of a first layer with signal wirings of a second layer which constitute a signal layer of said printed circuit board, being formed in an oppo-

site edge portion of said printed circuit board in such a manner that said respective second through vias constitute either a single column or plural columns along a direction parallel to the longitudinal direction of said printed circuit board,

said first through vias and said second through vias being arranged at positions shifted from the line perpendicular to the longitudinal direction of said printed circuit board; and  
a signal wiring between said first through vias and said second through vias in said first layer and in said second layer being arranged with having an angle with respect to the line perpendicular to the longitudinal direction of said printed circuit board so as to connect the same number leads of said ICs with each other.

5,771,159  
POWER SUPPLY DEVICE

Hiroyuki Sako; Koji Nishiura, and Masahiro Yamanaka, all of  
Kadoma, Japan, assignors to Matsushita Electric Woks,  
Ltd., Osaka, Japan

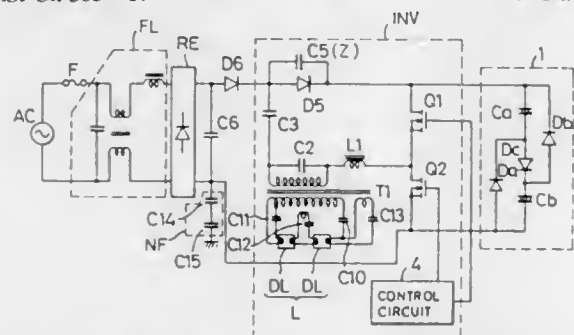
Continuation of Ser. No. 396,433, Feb. 28, 1995, abandoned.  
This application Jul. 10, 1997, Ser. No. 891,060

Claims priority, application Japan, Nov. 25, 1994, 6-291751;  
Nov. 25, 1994, 6-291753; Nov. 25, 1994, 6-291754; Nov. 25,  
1994, 6-291777; Nov. 25, 1994, 6-291853

Int. Cl.<sup>6</sup> H02M 5/44

U.S. Cl. 363—17

9 Claims



1. A power supply device comprising:  
rectifying means for rectifying AC power and providing a pulsating DC output voltage;  
inverter means connected to said rectifying means for converting the pulsating DC output voltage to a high frequency output voltage and supplying the high frequency output voltage to a load, said inverter means including first and second switching elements connected in a first series circuit, one of said first and second switching elements being ON when the other of said first and second switching elements is OFF, an impedance element connected between said rectifying means and said first series circuit, and a resonant circuit including a capacitor and a first inductor for providing a resonant output voltage to the load, said resonant circuit and said impedance element forming a second series circuit connected in parallel with one of said first and second switching elements; and  
valley-filling means for accumulating energy from said inverter means when the pulsating DC output voltage has a relatively high amplitude and for supplying accumulated energy across said first series circuit when the pulsating DC output voltage has a relatively low amplitude, said valley-filling means including:

a third series circuit comprising a first valley-filling capacitor, a second inductor, and a first diode, said third series circuit being connected across said first series circuit;  
a second diode for rectifying the high frequency output voltage of said inverter, charging said first valley-filling capacitor, and connected between said inverter means and a junction of said second diode and said first valley-filling capacitor; and  
a second valley-filling capacitor connected across said first series circuit.

5,771,160  
MULTI-OUTPUT SWITCHING REGULATOR HAVING  
CONTROLLED TIMING OF BOOST CONVERTOR,  
INVERTER AND FLYBACK TYPE OUTPUTS

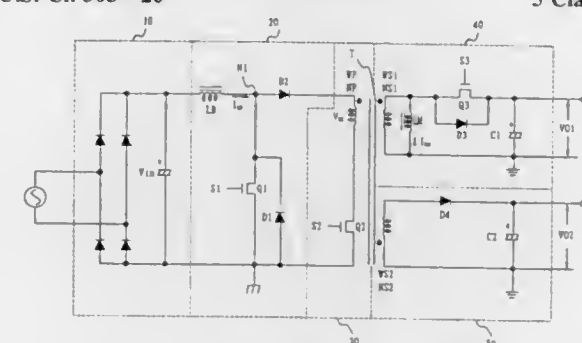
Hwan-Ho Seong, Shiheung-city, Rep. of Korea, assignor to  
Samsung Electronics Co., Ltd., Suwon-city, Rep. of Korea  
Filed Dec. 18, 1996, Ser. No. 768,698

Claims priority, application Rep. of Korea, Dec. 28, 1995,  
95-61332

Int. Cl.<sup>6</sup> H02M 3/335

U.S. Cl. 363—20

5 Claims



1. A multi-output switching regulator comprising:  
a rectifier circuit portion for converting an alternating current into a direct current;  
a boost converter portion for boost-converting the direct current when said boost converter is active, said boost converter including a first switch for activating said boost converter during each boost converter on-interval of each operational cycle and for deactivating said boost converter during each boost converter off-interval of each said operation cycle;  
an inverter portion, including a transformer having a primary winding and at least two secondary windings, for storing an output from said boost converter portion in the primary winding of said transformer and transferring the thus stored energy to at least one secondary winding of said transformer when said inverter portion is active, said inverter portion including a second switch for activating said inverter portion during each inverter portion on-interval of each said operational cycle and for deactivating said inverter portion during each inverter portion off-interval of each said operation cycle;  
a fly-back type first constant voltage output portion for outputting energy transferred to a first secondary winding of said transformer as a first constant voltage, storing the first constant voltage in an equivalent flux inductance of said transformer, and transferring the thus stored energy to a second secondary winding of said transformer when said first constant voltage output portion is active, said first constant voltage output portion including a third switch for activating said first constant voltage output portion during each output portion on-interval of each said operational cycle and for deactivating said first constant voltage output portion during each output portion off-interval of each said operation cycle; and  
a second constant voltage output portion for outputting energy transferred to said second secondary winding of said transformer as a second constant voltage, wherein said boost converter on-interval precedes said boost converter off-interval within each said operation cycle, wherein the output portion on-interval and off-interval are during the boost converter off-interval and on-interval, respectively, and wherein said inverter portion off-interval and said output portion off-interval precede said inverter portion on-interval and said output portion on-interval, respectively, within each said operational cycle, and wherein said boost converter on-interval overlaps said inverter portion on-interval within each said operational cycle.

5,771,161  
UNINTERRUPTABLE CAPABILITY FOR AN ACTIVE  
POWER LINE CONDITIONER

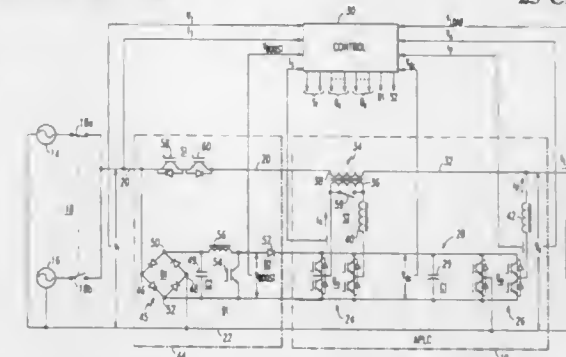
Kenneth R. Jackson, Columbia, and Stephen A. Lane, Cockeysville, both of Md., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Jan. 10, 1997, Ser. No. 782,477

Int. Cl.<sup>6</sup> H02M 1/12:1/14

U.S. Cl. 363—40

23 Claims



1. A circuit for sustaining uninterrupted AC power flow to an electrical load through an active power line conditioner for a predetermined transient time interval between the loss of an AC source applied to a power bus coupled to the load via a circuit breaker and subsequent restoration of AC power to the power bus, and wherein the active power line conditioner includes a series inverter, a parallel inverter, and a DC link circuit having a predetermined DC link voltage and including a DC storage element coupled between said series inverter and said parallel inverter and being operable so that the load receives distortion free sinusoidal current and voltage from an AC power source, said circuit comprising:  
switch means connected in series with said power bus and the active power line conditioner;  
circuit means providing a supplementary source of DC voltage for supplying a DC voltage to the DC link circuit during said transient time interval and having a voltage value below said predetermined DC link voltage during normal operation;  
diode circuit means interconnected between said DC link circuit and said circuit means providing a supplementary source of DC voltage and being poled so as to be back biased and therefore non-conductive during normal operation but becoming conductive during said transient time interval to supply a DC voltage to said link circuit from said supplementary source, and  
control circuit means being operable during said transient time interval for operating said switch means to disconnect said power bus from said switch means thereby isolating the active power line conditioner and load from said AC source, for synchronizing the AC source voltage in both frequency and phase to the voltage appearing across the load, and for operating said switch means at the end of said transient time interval to connect said AC source to said active power line conditioner and load when said AC source is synchronized with the voltage across the load.

5,771,162  
ELECTRIC PROTECTIVE DEVICE USED IN  
SWITCHING MODE POWER SUPPLY SYSTEMS

Joong-Gi Kwon, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea  
Filed Apr. 25, 1997, Ser. No. 840,699

Claims priority, application Rep. of Korea, Apr. 25, 1996,  
1996/12807

Int. Cl.<sup>6</sup> H02H 7/122

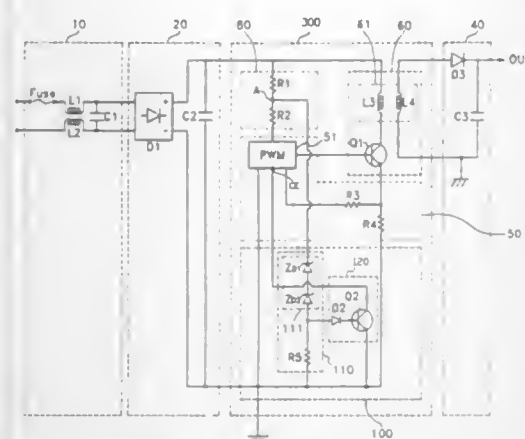
U.S. Cl. 363—56

10 Claims

1. An electric protective device used in switching mode power supply system which rectifies an AC voltage into a DC voltage and

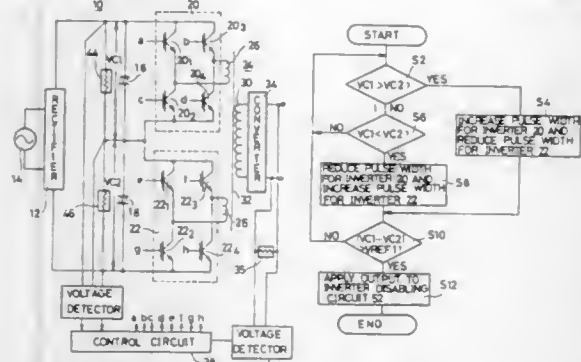


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performs a switching operation to supply power to electric equipment, the electric protective device comprising:  
a pulse-width modulator for switching the DC voltage resulting from rectification on and off, in response to a pulse width modulated signal; and  
an interrupt generator for generating an interrupt signal interrupting operation of said pulse width modulator when said DC voltage is higher than a reference voltage;  
said interrupt generator comprising:  
an abnormal voltage detector for detecting whether said DC voltage is higher than the reference voltage and for outputting a signal in response thereto; and a switching means for generating said interrupt signal so as to interrupt the operation of said pulse width modulator when on in response to said signal outputted from said abnormal voltage detector; and  
said abnormal voltage detector comprising:  
a Zener diode part including at least one Zener diode for determining said reference voltage; and a resistance, having one terminal connected to said Zener diode and having another terminal connected to ground, for dividing a voltage supplied to said switching means.

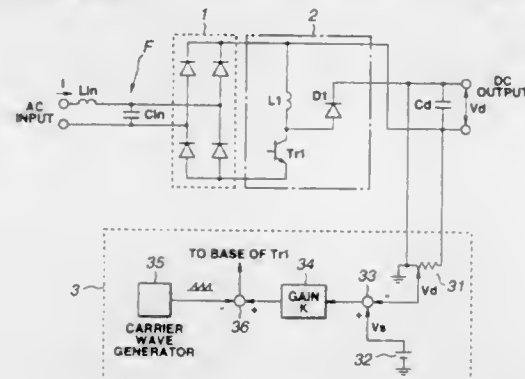
5,771,163  
AC-DC CONVERTER APPARATUS  
Haruo Moriguchi, Itami; Kenzo Danjo, Soraku-gun; Shigeru Okamoto, Hirakata; Takashi Hashimoto, Kobe, and Kunio Karino, Suita, all of Japan, assignors to Sansha Electric Manufacturing Company, Limited, Osaka, Japan  
Filed Nov. 19, 1996, Ser. No. 752,302  
Int. Cl.<sup>6</sup> H02M 7/00; 3/24; 3/35  
U.S. Cl. 363—71 4 Claims



1. A DC power supply apparatus comprising:  
rectifying means for rectifying an input AC voltage to develop a rectified voltage between two output terminals thereof;  
first and second smoothing capacitors connected in series between said output terminals of said rectifying means;  
first inverter means receiving a first voltage developed across said first smoothing capacitor, and second inverter means receiving a second voltage developed across said second

smoothing capacitor, said first and second inverter means converting said first and second voltages into high-frequency voltages;  
voltage transforming means receiving said high-frequency voltages from said first and second inverter means and developing a voltage-transformed high-frequency voltage;  
converting means for converting the voltage-transformed high-frequency voltage into a DC voltage;  
voltage detecting means for detecting respective ones of said first and second voltages;  
comparing means for comparing the absolute value of the difference between said first and second voltages as detected by said detecting means with a reference voltage, and developing an output corresponding to the result of comparison, said reference voltage being the difference between the voltages developed across respective ones of said first and second smoothing capacitors when the voltage across one of said first and second smoothing capacitors is the rated voltage of said one smoothing capacitor; and  
disabling means responsive to the output of said comparing means developed when the absolute value of the difference between said first and second voltages is larger than said reference voltage, for disabling said first and second inverter means, said disabling means having a slow response to the output of said comparing means.

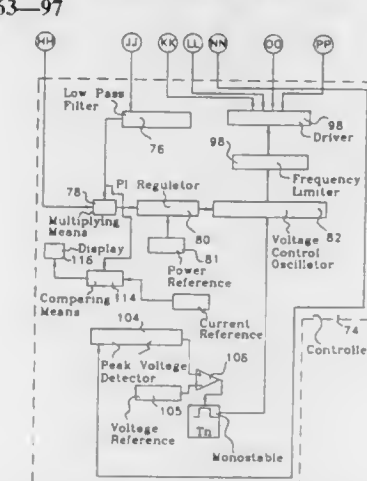
5,771,164  
POWER SUPPLY CONVERTER FOR SUPPRESSING HIGHER HARMONICS TO OUTPUT A STABLE VOLTAGE  
Yoshihiro Murai, Seki, and Junichi Takayama, Saya, both of Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan  
PCT No. PCT/JP96/01879, § 371 Date Jan. 6, 1997, § 102(e) Date Jan. 6, 1997, PCT Pub. No. WO97/03494, PCT Pub. Date Mar. 1, 1997  
PCT Filed Jul. 5, 1996, Ser. No. 750,861  
Claims priority, application Japan, Jul. 11, 1995, 7-173827; Oct. 20, 1995, 7-272339; Feb. 14, 1996, 8-026457  
Int. Cl.<sup>6</sup> H02M 7/155; G05F 1/613  
U.S. Cl. 363—89 16 Claims



1. A single-phase sinusoidal wave inputted converter comprising:  
a full-wave rectifier of a diode bridge; a single-phase sinusoidal wave AC power supply; an input filter including an inductor connected between one input end of the single-phase sinusoidal wave AC power supply and one input end of the full-wave rectifier diode bridge and a capacitor connected between the one input end of the full wave rectifier diode bridge and the other input end of the full wave rectifier diode bridge; a transistor circuit having a switching element and a reactor connected in series with the switching element, one end of the reactor being connected to one output end of the full-wave rectifier of the diode bridge and one end of the switching element being connected to the other output end of said full-wave rectifier of the diode bridge; a reverse current flow blocking diode arranged for passing only an energy stored in said reactor; a smoothing capacitor across of which the energy stored in said reactor is charged via said reverse current flow blocking

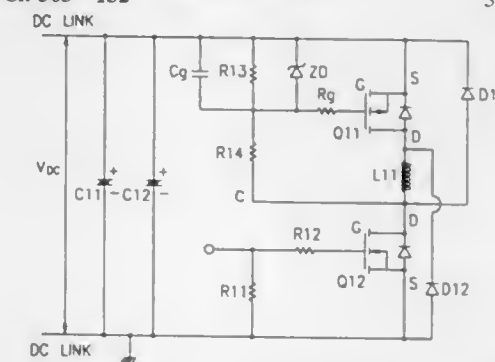
diode; a control circuit having a reference voltage power supply, an amplifier arranged for amplifying a deviation between a voltage across the smoothing capacitor and the reference voltage, a carrier wave generator for independently generating a triangular carrier wave, and a comparator arranged for comparing the amplified deviation with the triangular carrier wave so that a turn on or off of said switching element is controlled according to a result of the comparison by the comparator.

5,771,165  
APPARATUS AND METHOD FOR CHARGING A DC BATTERY  
Pierre Couture, Boucherville; Karim Slimani, Longueuil, and Bruno Francoeur, Beloeil, all of Canada, assignors to Hydro-Quebec, Montreal, Canada  
Division of Ser. No. 659,159, Jun. 5, 1996. This application Aug. 6, 1997, Ser. No. 904,583  
Int. Cl.<sup>6</sup> H02M 3/35  
U.S. Cl. 363—97 44 Claims



1. A separable two-part battery charger for supplying a direct current signal to battery connect terminals, comprising a first part and a second part, wherein:  
the first part includes:  
a secondary winding of an impedance matching transformer, having an output for delivering a transformed alternating current signal;  
a first magnetic core part of the impedance matching transformer, which is magnetically coupled to the secondary winding;  
a current rectifier for rectifying the transformed alternating current signal and delivering a rectified current signal; and  
a low pass filter means for low pass filtering the rectified current signal to supply the direct current signal to the battery connect terminals; and  
the second part includes:  
a power supply means for producing a DC output voltage signal;  
an inverter resonant circuit means for inverting the DC output voltage signal and delivering an alternating current signal;  
a primary winding of the impedance matching transformer, having an input for receiving the alternating current signal;  
a second magnetic core part of the impedance matching transformer, which is magnetically coupled to the first primary winding, the second magnetic core part being mechanically connectable to the first magnetic core part;  
a current detector for detecting a current flowing through the inverter resonant circuit means and delivering a current signal indicative of the current flowing through the inverter resonant circuit means;  
a current averaging means for averaging the current signal delivered by the current detector and delivering an average current signal;  
a comparing means for comparing the average current signal to a current reference signal and delivering a signal indicative of a difference between the average current signal and the cur-

5,771,166  
ASYMMETRICAL BRIDGE INVERTER CIRCUIT FOR DRIVING A SWITCHED RELUCTANCE MOTOR  
Jun Young Lim, Seoul, Rep. of Korea, assignor to LG Electronics Inc., Rep. of Korea  
Filed Jan. 27, 1997, Ser. No. 789,022  
Claims priority, application Rep. of Korea, Jan. 29, 1996, 1908/1996  
Int. Cl.<sup>6</sup> H02M 7/5387  
U.S. Cl. 363—132 5 Claims

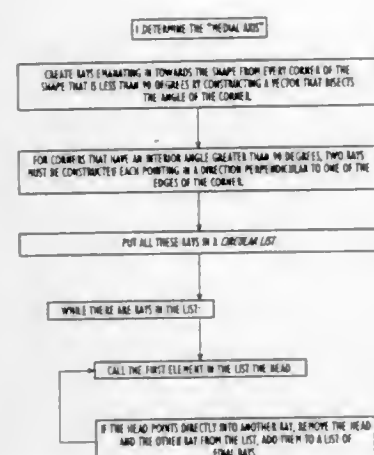


1. An inverter circuit for a switched reluctance motor (SRM), comprising:  
a lower switching transistor connected to a corresponding lower negative pole of a filter condenser, the lower switching transistor being switched in accordance with a commutation control signal;  
an upper switching transistor connected to a corresponding upper positive pole of the filter condenser and the upper switching transistor being switched in accordance with a switching operation of the lower switching transistor;  
a voltage divider for dividing a voltage of a DC link applied to a gate of the upper switching transistor when the lower switching transistor is turned on;  
a capacitor connected between a positive arm of the DC link and the voltage divider for controlling a gate voltage of the upper switching transistor in accordance with the voltage divided by the voltage divider; and  
an inductor in series between the upper and lower switching transistors and energized in accordance with a switching operation of the upper and lower switching transistors.

5,771,167  
SYNCHRONOUS CONTROL METHOD AND APPARATUS THEREFOR  
Toshiaki Gomi, and Masatomo Yazaki, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan  
Filed Mar. 17, 1995, Ser. No. 405,894  
Claims priority, application Japan, Mar. 18, 1994, 6-048469; Feb. 15, 1995, 7-026978  
Int. Cl.<sup>6</sup> G05B 11/01  
U.S. Cl. 364—140 13 Claims  
1. A synchronous control apparatus, comprising:  
a trigger signal generating unit for periodically generating a trigger signal;  
plural action generating modules for executing different action generating processes which are to be synchronized for displaying on a screen;







selected embroidery stitch pattern having an associated polygon type shape having an outer edge;  
constructing a plurality of spaced apart polygon type shapes in said computer means which are concentric to said selected polygon type shape, said computer constructed polygon type shapes being spaced apart from an adjacent concentric polygon type shape by a predetermined distance comprising a determinant of the fill density associated with said selected polygon type shape;  
sorting said constructed concentric polygon type shapes in said computer means in order for providing for proper sequencing and minimal jumping of said selected stitch pattern in said embroidery machine from one part of said associated shape to another part of said associated shape;  
generating a plurality of spirals of varying size in said computer means and placing said computer generated plurality of spirals of varying size in said embroidery machine along said computer constructed concentric polygon type shapes for maintaining a consistent filling of the area contained within said associated shape of said selected pattern, the spirals having an associated size and distance in said embroidery machine between the focal points from one spiral to the next comprising another determinant of said fill density associated with said selected polygon type shape; and  
stitching along said plurality of placed spirals in said embroidery machine for creating thread loops for providing a chenille type stitching for filling said selected polygon type shape; whereby a chenille filled embroidery pattern is automatically generated for said embroidery machine under control of said computer means in said computer aided design system.

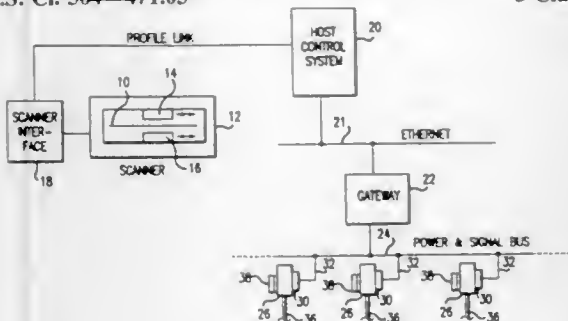
#### 5,771,174 DISTRIBUTED INTELLIGENCE ACTUATOR CONTROLLER WITH PEER-TO-PEER ACTUATOR COMMUNICATION

Robert E. Spinner, North Vancouver; Ian C. Baron, Vancouver; Keith T. McCormick, Burnaby, and J. Todd Sankey, Vancouver, all of Canada, assignors to Measurix Corporation, Cupertino, Calif.

Filed Dec. 13, 1996, Ser. No. 766,758  
Int. Cl.<sup>6</sup> G06F 19/00; G06G 7/64; 7/66

U.S. Cl. 364—471.03

3 Claims



1. A distributed intelligence control system for controlling a cross direction profile characteristic of a traveling sheet during production, the control system including:  
means for measuring a property of the sheet at a plurality of cross direction locations, the measuring means producing output signals indicative of the cross direction profile characteristic;  
a host controller system coupled to receive the output signals from the measuring means and adapted to produce signals representing desired profile information, based on the output signals from the measuring means;  
a plurality of actuators positioned at spaced apart locations across the width of the sheet, each actuator being individually adjustable in response to a control signal to adjust the profile characteristic of the sheet at the location of the actuator, each actuator having an actual adjustment state;  
a plurality of intelligent actuator controllers, each controller being operatively associated with a corresponding one of the plurality of actuators and providing the control signal to said actuator; and  
a local area network providing a bidirectional communication link (1) between the host controller system and the intelligent actuator controllers and (2) between adjacent actuator controllers, the network transmitting to said intelligent actuator controllers the desired profile information from the host controller system and transmitting between adjacent intelligent actuator controllers actual adjustment state information, each intelligent actuator controller calculating a target actuator adjustment state for the corresponding actuator based upon the transmitted information.

5,771,175

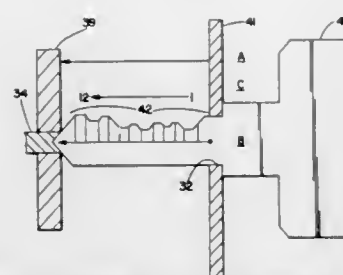
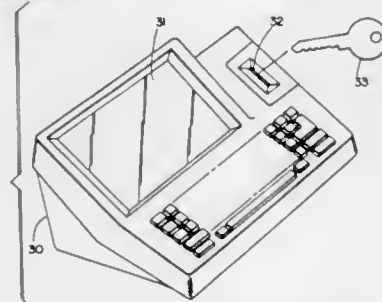
Patent Not Issued For This Number

#### 5,771,176 PROCESS AND APPARATUS FOR ENHANCEMENT FOR SECURITY IN A MECHANICAL LOCK ENVIRONMENT (DPN-1)

Phillip E. Froehlich, 1373 Bay St., San Francisco, Calif. 94123;  
Edward E. Barker, III, 1531 Custis Ct., Atlanta, Ga. 30338,  
and David R. Ross, P.O. Box 552, Stratford, Conn. 06497  
Filed Sep. 3, 1996, Ser. No. 708,082  
Int. Cl.<sup>6</sup> G06K 9/78; 9/00

U.S. Cl. 364—505

11 Claims



1. An electromechanical device constituting a key identifying scheme for identifying and inventorying unmarked keys, so that

they can be used in a continual unmarked condition with the objective that one finding a missing key will not know which lock it will open, comprising in combination the following elements:  
a key recognizing device, which identifies keys by the irregularities at their edges or pattern of orifices therein and transmits an electronic signal specific for any key identified;  
means for collecting electronic signals from such device;  
means for identifying keys generating such signals; and  
means for inventorying keys based solely on said signals and without any aid from markings on said keys.

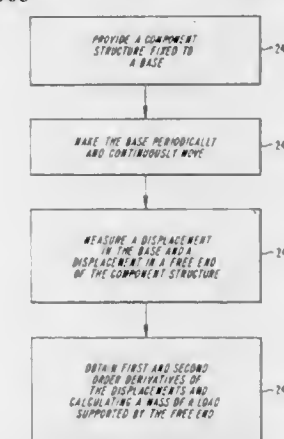
#### 5,771,177 METHOD AND APPARATUS FOR MEASURING DYNAMIC LOAD

Eiichi Tada, Osaka, and Kazuo Watanabe, Amagasaki, both of Japan, assignors to Kyoei Automatic Control Technology Co., Ltd., Hyogo, Japan  
PCT No. PCT/JP94/00790, § 371 Date Jan. 13, 1995, § 102(c)  
Date Jan. 13, 1995, PCT Pub. No. WO94/27122, PCT Pub. Date Nov. 24, 1994

PCT Filed May 16, 1994, Ser. No. 373,201  
Claims priority, application Japan, May 17, 1993, 5-139531  
Int. Cl.<sup>6</sup> G01G 9/00; G06F 19/00

U.S. Cl. 364—506

6 Claims



1. A method for measuring the mass of a dynamic load, the method comprising the steps of:  
providing a component structure fixed to a base, said base being comprised of a non-spring mass system, said component structure comprising a spring mass system having one end that is fixed to said base and a free end for receiving a working load;  
making said base periodically and continuously move thereby providing resultant motion within said component structure and said spring mass system;  
continuously measuring a displacement  $y_1$  of said base and a displacement  $y_2$  of said free end of said spring mass system; obtaining the first-order derivatives  $\dot{y}_1$  and  $\dot{y}_2$  and the second-order derivatives  $\ddot{y}_1$  and  $\ddot{y}_2$  from said displacements  $y_1$  and  $y_2$  with respect to time; and  
calculating the mass  $m$  of said load according to the equation:

$$m[\ddot{y}] = mg - [(mg + kf_2(y - y_1 + y_2)) - f_3(\ddot{y} - \ddot{y}_1 + \ddot{y}_2) + f_1(m\ddot{y}_1, m\ddot{y}_2)]$$

where the symbol  $[ ]$  represents a matrix whose determinant is (a number of degree of member freedom  $\times$  a number of data measurements),  
 $g$  is gravitational acceleration,  
 $kf_2(y - y_1 + y_2)$  is a material term of the component structure of the spring mass system,  
 $k$  is a spring constant,  
 $f_3(\ddot{y} - \ddot{y}_1 + \ddot{y}_2)$  is a damping term selected from the group consisting of: viscous friction, coulomb, hysteresis, fluid drag and fluid mass drag damping, and  
 $f_1(m\ddot{y}_1, m\ddot{y}_2)$  is a resultant time-varying forces term acting on the object having the mass  $m$ .

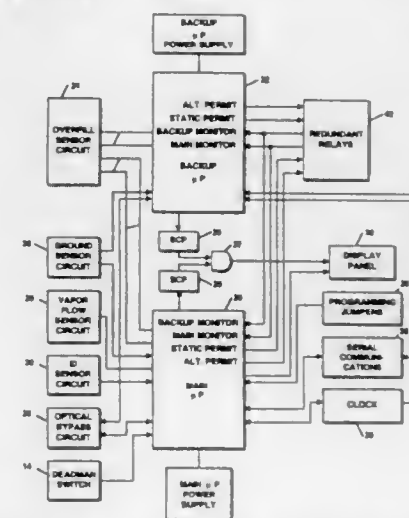
5,771,178

#### FAIL-SAFE FLUID TRANSFER CONTROLLER

Francis V. Stemporzewski, Jr., Salem, N.H.; Arthur W. Shea, W. Somerville; Gary R. Cadman, Norwell, both of Mass.; Richard O. Beaulieu, Danville, N.H., and Stephen F. Tougas, Framingham, Mass., assignors to Scully Signal Company, Wilmington, Mass.

Filed Jun. 12, 1995, Ser. No. 489,220  
Int. Cl.<sup>6</sup> G06F 11/16; B67D 5/32; H03K 19/14; H04B 10/00  
U.S. Cl. 364—510

42 Claims



1. A fluid transfer control apparatus for controlling a transfer of fluid from a fluid source to a receiving container and for detecting and responding to an input signal which indicates whether fluid transfer should occur, the apparatus comprising:

a first switch responsive to a first control signal which switches to a first switch position when the first control signal is received;  
a second switch responsive to a second control signal which switches to a first switch position when the second control signal is received, and which is arranged in conjunction with the first switch such that fluid transfer to said container is prevented unless the first switch is in its first switch position and the second switch is in its first switch position;  
a first controller which is responsive to the input signal and which outputs the first control signal when the input signal indicates that fluid transfer should occur; and  
a second controller responsive to the input signal which outputs the second control signal when the input signal indicates that fluid transfer should occur.

#### 5,771,179 MEASUREMENT ANALYSIS SOFTWARE SYSTEM AND METHOD

Leonard R. White, and Caroline K. White, both of 178 Fox-hunt La., East Amherst, N.Y. 14051  
Continuation of Ser. No. 220,939, Mar. 31, 1994, Pat. No. 5,446,895, which is a continuation of Ser. No. 808,020, Dec. 13, 1991, abandoned. This application Aug. 24, 1995, Ser. No. 518,989

Int. Cl.<sup>6</sup> G06F 15/21

U.S. Cl. 364—551.01

30 Claims

1. A measurement analysis computer software method for supporting a direct relationship between information stored at the project level and information stored at the application level, wherein a project comprises a collection of work tasks with a time frame and a work product to be delivered and an application comprises a cohesive collection of automated procedures and data supporting an objective and one or more components, modules or sub-systems, said method comprising the steps of:

a) directly relating application function point component information to function point component information of a project



related to an application, said component comprising a unique process or data requirement of the project or application; and b) directly relating functional characteristic information of an application to functional characteristic information of a project related to said application wherein steps (a) and (b) are initiated by user.

5,771,180

**REAL TIME CLOCK AND METHOD FOR PROVIDING SAME**

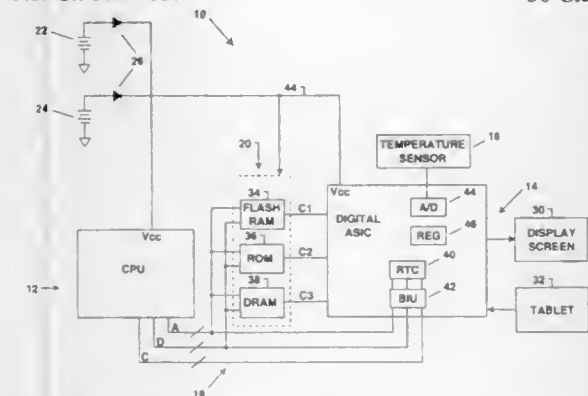
Michael F. Culbert, San Jose, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Sep. 30, 1994, Ser. No. 315,938

Int. Cl.<sup>6</sup> G01K 15/00

U.S. Cl. 364-557

30 Claims



1. A real time clock comprising:
  - a) an oscillator developing an oscillator signal;
  - b) a digital counter having an oscillator input coupled to said oscillator signal, a counter adjustment input, and a real time counter register which provides a count value that can represent a current time;
  - c) a temperature measurement circuit operative to measure an ambient temperature and provide a digital temperature value; and
  - d) a digital processor operative to use said temperature value to provide a counter adjustment signal, said digital processor being further operative to read said real time counter register and providing said current time.

**5,771,181  
GENERATION FOR VIRTUAL REALITY SIMULATOR SYSTEMS**

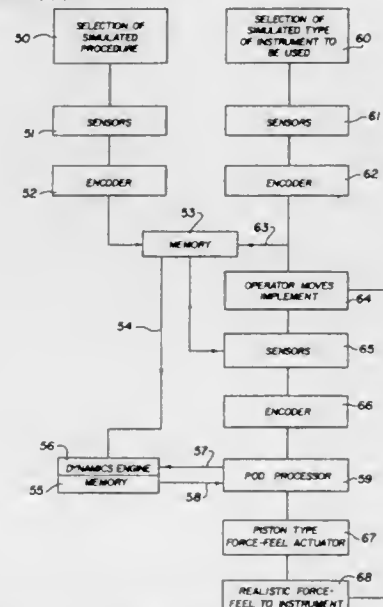
Robert S. Moore, 7313 16th N.W., Seattle, Wash. 98117; Lewis John Harthan, III, 830 Kirkland Way, #204, Kirkland, Wash. 98033, and Darrell L. Livezey, 2901 4th Ave. West, Seattle, Wash. 98119

Filed Dec. 14, 1994, Ser. No. 355,612

Int. Cl.<sup>6</sup> G06G 7/48; B25J 9/18

U.S. Cl. 364-578

22 Claims



1. A method of producing realistic tactile feedback forces in a tool operation simulator comprising:
  - (a) selecting a predetermined simulated operational environment;
  - (b) defining said predetermined simulated operational environment by defining electrical signals;
  - (c) providing a simulator implement simulating a selected tool;
  - (d) manually controlling movement of said implement relative to said simulated operational environment;
  - (e) positioning a plurality of sensors in sensing relation to said implement, said sensors being responsive to movement of said implement to produce electrical signals representative of movements of an actual tool of the type simulated in an actual environment of the type being simulated;
  - (f) providing a plurality of force creating members in force-imparting relation to said implement;
  - (g) interconnecting said representative electrical signals and said defining electrical signals with said force-creating members; and
  - (h) conditioning said force-creating members to respond to said representative and defining electrical signals to impart proportioned forces to said implement.

5,771,182

**BIT-SERIAL DIGITAL COMPRESSOR**

James Clark Baker, Crystal Lake, and John Paul Oliver, Chicago, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

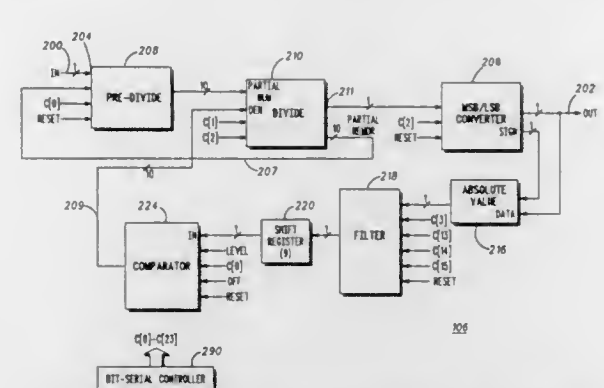
Filed May 31, 1996, Ser. No. 659,104

Int. Cl.<sup>6</sup> G06F 7/00; 15/00; 7/52; G06M 3/00

U.S. Cl. 364-715.02

20 Claims

12. A bit-serial digital compressor comprising:
  - a) a bit-serial pre-divisor circuit for generating a digital word representing a partial numerator from a digital word representing a numerator;
  - b) a divider circuit connected to the bit-serial pre-divisor circuit for dividing the digital word representing the partial numerator by



- a) a digital word representing a denominator and generating a digital word representing a quotient;
- b) a bit-serial absolute value circuit connected to an output of the divider circuit;
- c) a bit-serial filter connected to the bit-serial absolute value circuit for generating an averaged signal; and
- d) a comparator circuit connected to the bit-serial filter for comparing the averaged signal to a threshold signal and generating a digital word representing a denominator equivalent to the greater of either the averaged signal or the threshold signal.

5,771,183

**APPARATUS AND METHOD FOR COMPUTATION OF STICKY BIT IN A MULTI-STAGE SHIFTER USED FOR FLOATING POINT ARITHMETIC**

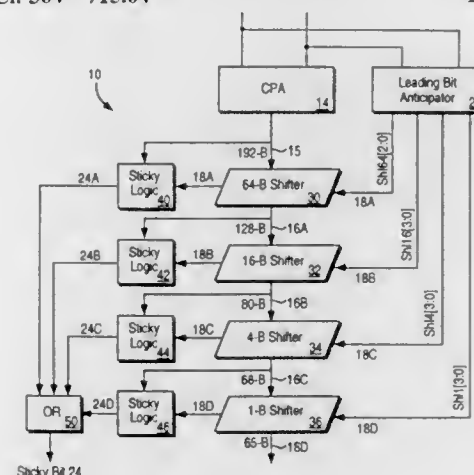
Sivakumar Makineni, Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jun. 28, 1996, Ser. No. 672,678

Int. Cl.<sup>6</sup> G06F 7/00; 7/38

U.S. Cl. 364-715.04

18 Claims



1. A number normalizer comprising:
  - a) a first input;
  - b) a multistage normalization shifter coupled to the first input to receive an unnormalized number, each stage of the multistage normalization shifter including a binary shifter and a sticky bit logic circuit;
  - c) a shift controller circuit coupled to each binary shifter; and
  - d) a logic ORing circuit having a plurality of inputs, each input coupled to at least one of the sticky bit logic circuits of the normalization shifter to logically OR outputs of the sticky bit logic circuits to produce a final sticky bit output.

**5,771,184  
SYSTEM AND METHOD FOR SOLVING QUADRATIC EQUATION IN GALOIS FIELDS**

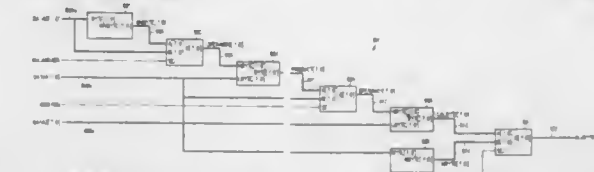
Steven Lan, Fremont; David H. Miller, Sacramento, and Richard W. Koralek, Palo Alto, all of Calif., assignors to Adaptec, Inc., Milpitas, Calif.

Filed Oct. 12, 1995, Ser. No. 542,198

Int. Cl.<sup>6</sup> G06F 7/00; 15/00; H03M 13/00

U.S. Cl. 364-746.1

1 Claim



1. A quadratic equation solver for a quadratic equation  $y+ay+b=0$  in a  $GF(q^n)$  finite Galois field, where  $q$  can be expressed as  $2^n$ , where  $n \geq 1$ ,  $n$  being an integer which is a power of 2, where  $a$  and  $b$  are elements of said  $GF(q^n)$  finite Galois field, said quadratic equation solver comprises:
  - a) a first logic circuit, said first logic circuit calculating a characteristic value equal to  $b/a^2$ , said first logic circuit performing arithmetic operations over said  $GF(q^n)$  finite Galois field using logic circuits for arithmetic operations over a  $GF(q^2)$  finite Galois field, said  $GF(q^2)$  finite Galois field being related to said  $GF(q^n)$  finite Galois field by the relation  $GF(q^n) = \{x|x=c+y+d, c, d \in GF(q^2)\}$ ,  $y$  being a basis element of the finite Galois field  $GF(q^n)$ , said arithmetic operations over said  $GF(q^2)$  finite Galois field being performed using logic circuits for arithmetic operations over a  $GF(q)$  finite Galois field, said  $GF(q)$  finite Galois field being related to said  $GF(q^2)$  finite Galois field by the relation  $GF(q^2) = \{x|x=c+y+d, c, d \in GF(q)\}$ ;
  - b) a second logic circuit, receiving said characteristic value, said second logic circuit mapping said characteristic value to provide, as an output value of said second logic circuit,  $x_0$ , wherein  $x_0$  and  $x_0+a$  are roots of said quadratic equation and
  - c) a third circuit for testing the most significant bit of said characteristic value, said third circuit asserting a signal to indicate that a solution for said quadratic equation does not exist when the most significant bit of said characteristic value is non-zero.

5,771,185

**SIGNAL PROCESSOR CAPABLE OF SHARING COMMON HARDWARE IN A PLURAL PROCESSING SYSTEM**

Jiro Miyake; Tamotsu Nishiyama; Katsuya Hasegawa, and Kazuki Ninomiya, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

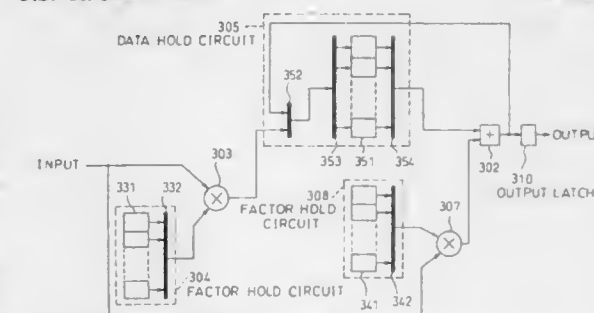
Division of Ser. No. 299,598, Sep. 1, 1994, abandoned. This application Dec. 16, 1996, Ser. No. 768,085

Claims priority, application Japan, Sep. 2, 1993, 5-218553; Dec. 14, 1993, 5-312933

Int. Cl.<sup>6</sup> G06F 7/00; 17/00; 7/38

U.S. Cl. 364-750.5

10 Claims



1. A signal processor comprising:
  - (a) first factor hold means to hold at least one factor;





VOL

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2  
1  
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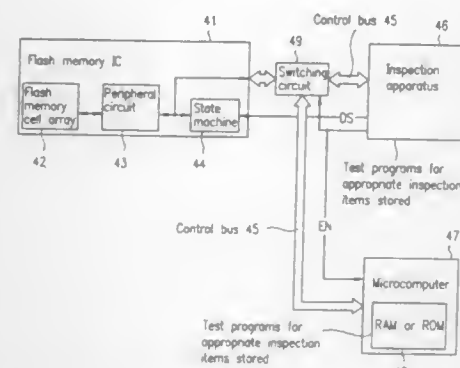
1998

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4280

OFFICIAL GAZETTE

JUNE 23, 1998



from the non-volatile memory area via the peripheral circuit, and a control bus for connecting the control circuit and the peripheral circuit, the method including the steps of:

- deactivating the control circuit;
- connecting the inspection microcomputer and the memory to the control bus; and
- inspecting the peripheral circuit and the non-volatile memory area by the inspection microcomputer.

5,771,192

**BIT LINE REFERENCE CIRCUIT FOR A NONVOLATILE SEMICONDUCTOR MEMORY DEVICE**

Myong-Jae Kim, and Tae-Sung Jung, both of Kyungki-do, Rep. of Korea, assignors to Samsung Electronics, Co., Ltd., Suwon, Rep. of Korea

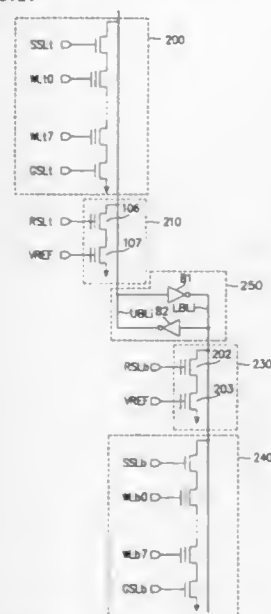
Filed Jul. 26, 1996, Ser. No. 686,423

Claims priority, application Rep. of Korea, Jul. 28, 1995, 1995/22905

Int. Cl.<sup>6</sup> G11C 11/34

U.S. Cl. 365—185.17

20 Claims



1. A bit line reference circuit for a nonvolatile semiconductor memory device comprising:

- a bit line having a first portion and a second portion;
- a page buffer electrically connected between the first and second portions of the bit line;
- a first reference cell string connected to the first portion of the bit line for providing a reference potential to the first portion of the bit line responsive to a first control signal;
- a second reference cell string connected to the second portion of the bit line for providing a second reference potential to the second portion of the bit line responsive to a second control signal;

a first memory cell string connected to the first portion of the bit line; and  
a second memory cell string connected to the second portion of the bit line.

5,771,193

Patent Not Issued For This Number

5,771,194

**MEMORY CIRCUIT, DATA CONTROL CIRCUIT OF MEMORY CIRCUIT AND ADDRESS ASSIGNING CIRCUIT OF MEMORY CIRCUIT**

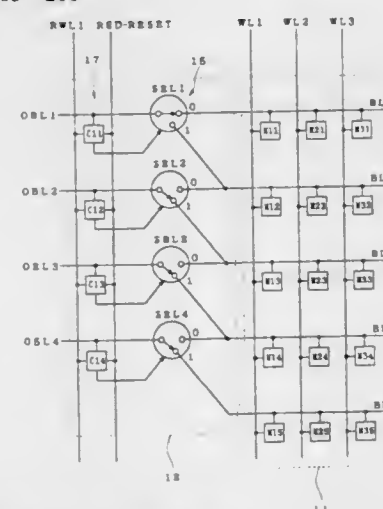
Hideshi Maeno, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1995, Ser. No. 550,740

Claims priority, application Japan, Jun. 7, 1995, 7-140605 Int. Cl.<sup>6</sup> G11C 29/00

U.S. Cl. 365—200

27 Claims



1. A memory circuit comprising:

- a memory cell array composed of a plural number of memory cells arranged in a matrix form and comprising a plural number of internal connecting lines;
- a plural number of external connecting lines, connected to the plural number of internal connecting lines at least in one of a row direction and a column direction of said memory cell array for exchanging data externally to said memory cell array; and
- a redundancy control circuit, inserted between said internal connecting lines of said memory cell array and said external connecting lines, for controlling respective connections between said external connecting lines and said internal connecting lines in a way to compensate for at least one of any failure in said memory cell array,

wherein the plural number of external connecting lines is set smaller than the plural number of internal connecting lines, and  
wherein said redundancy control circuit includes:

- a group of control memory cells corresponding in number to said plural number of external connecting lines, respective of said group of control memory cells configured to selectively hold at any given time either a first binary value or a second binary value;
- a group of selectors corresponding in number to said plural number of external connecting lines, each of said group of selectors connected to a corresponding control memory cell of said group of control memory cells and configured to connect one of said external connecting lines to one internal line of a corresponding respective pair of said internal connecting lines when said corresponding control memory

cell holds said first binary value, and configured to connect said one of said external connecting lines to the other internal line of said corresponding pair of internal connecting lines when said corresponding control memory cell holds said second binary value.

JUNE 23, 1998

ELECTRICAL

4281

5,771,197

**SENSE AMPLIFIER OF SEMICONDUCTOR MEMORY DEVICE**

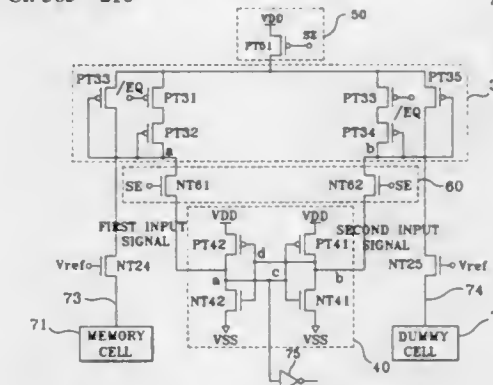
Jae-Hyeoung Kim, Seoul, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyungki-do, Rep. of Korea Filed Jun. 25, 1997, Ser. No. 882,310

Claims priority, application Rep. of Korea, Jun. 29, 1996, 96-26331

Int. Cl.<sup>6</sup> G11C 7/00

U.S. Cl. 365—210

7 Claims



1. A sense amplifier of a semiconductor memory device which senses voltage difference between a dummy line connected to a dummy cell and a bit line connected to a memory cell, the sense amplifier comprising:

- a precharge section for precharging the dummy line and the bit line with a required voltage by means of an equalizer signal transferred from an external;
- a data sensing section for receiving and latching voltage of the bit line and voltage of the dummy line as first and second input signals, respectively, by means of a sense amplifier enable signal transferred from the external, thereby sensing data from the memory cell and generating an output signal;
- a precharge enable section for disabling the precharge section by means of the sense amplifier enable signal transferred from the external when in a data sensing operation or for enabling the precharge section when not in the data sensing operation; and
- a data sensing enable section for transmitting the voltage of the bit line and the voltage of the dummy line as the first and second input signals, respectively, to the data sensing section according to the sense amplifier enable signal from the external depending on the data from the memory cell.

5,771,196

**SENSE AMPLIFIER CIRCUITRY**

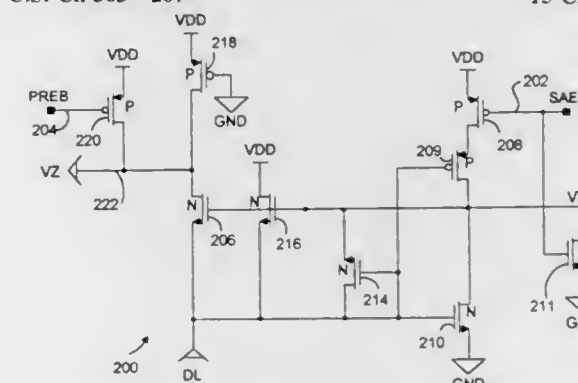
Nien-Chao Yang, Hsinchu, Taiwan, assignor to Macronix International Co., Ltd., Hsinchu, Taiwan

Filed Nov. 19, 1996, Ser. No. 751,823

Int. Cl.<sup>6</sup> G11C 7/02

U.S. Cl. 365—207

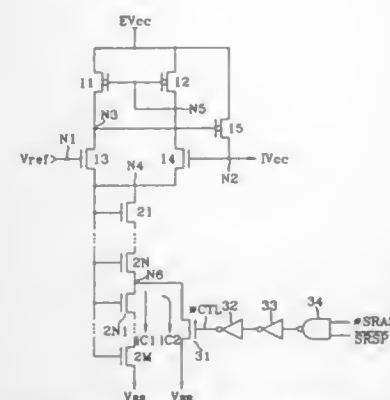
15 Claims



1. A sense amplifier having an input connected to a bit line of a memory array, comprising:

- a first circuit that sets its output to a first value at a first time period; and
- a second circuit coupled to said first circuit for setting said output to a second value at a second time period in response to a state in said bit line.





wherein said current source is in said first state during a refresh operation; and

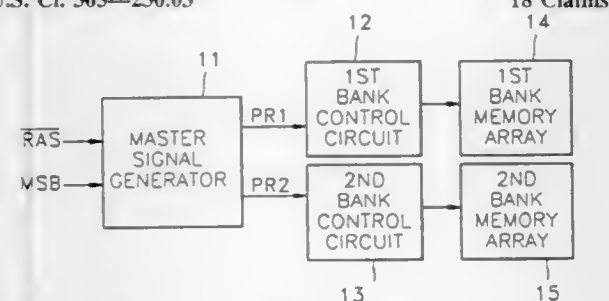
wherein said current source is in said second state during a precharge operation.

5,771,199

**INTEGRATED CIRCUIT MEMORY DEVICES HAVING  
IMPROVED DUAL MEMORY BANK CONTROL  
CAPABILITY AND METHODS OF OPERATING SAME**  
Si-yeol Lee, Kyungki-do, Rep. of Korea, assignor to Samsung  
Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 20, 1996, Ser. No. 770,846  
Claims priority, application Rep. of Korea, Dec. 29, 1995,  
1995-66882

Int. Cl.<sup>6</sup> G11C 8/00  
U.S. Cl. 365—230.03



1. An integrated circuit memory device, comprising:  
first and second banks of memory cells;  
memory bank control means, coupled to said first and second banks of memory cells, for selectively disposing said first and second banks of memory cells in active modes of operation during respective nonoverlapping time intervals in response to first and second master clock signals having amplitudes which alternate between first and second binary logic potentials;  
strobe buffer means, responsive to a row address strobe signal having an amplitude which alternates between first and second binary logic potentials, for generating first and second control signals; and  
bank select buffer means, responsive to the first and second control signals and a bank select signal having an amplitude which alternates between first and second binary logic potentials, for generating the first and second master clock signals at the first binary logic potential during nonoverlapping time intervals and at the second binary logic potential during overlapping time intervals;  
wherein said memory bank control means comprises means for disposing said first and second banks of memory cells in precharge modes of operation during overlapping time intervals when the amplitudes of the first and second master clock signals are at the second binary logic potentials.

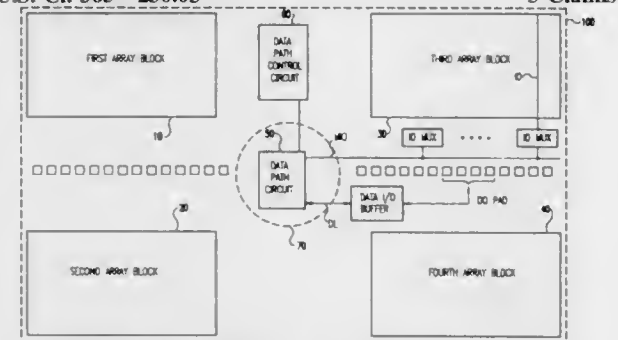
5,771,200

## SEMICONDUCTOR MEMORY DEVICE

Il-Jae Cho, Suwon, and Hyun-Soon Jang, Seoul, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Dec. 20, 1996, Ser. No. 771,776  
Claims priority, application Rep. of Korea, Dec. 21, 1995,  
1995-53542

Int. Cl.<sup>6</sup> G11C 8/00;7/00;5/02;5/06  
U.S. Cl. 365—230.03



1. A semiconductor memory device, comprising:
- a memory array having four spaced apart and discrete array blocks, including a first array block located in an upper left quadrant of said memory array, a second array block located in a lower left quadrant of said memory array, a third array block located in an upper right quadrant of said memory array, and a fourth array block located in a lower right quadrant of said memory array;
  - a plurality of pads disposed in at least one of a first middle area extending between said first and third array blocks and a second middle area extending between said second and fourth array blocks;
  - a data pad control circuit disposed in at least one of a first center area extending between said first and third array blocks and a second center area extending between said second and fourth array blocks;
  - a data path circuit disposed in a middle center area of said memory array, said middle center area extending between the first and second middle areas and between the first and second center areas;
  - a plurality of data lines connecting said pads to said data path circuit; and
  - a plurality of main input/output lines connecting said memory array to said data path circuit.

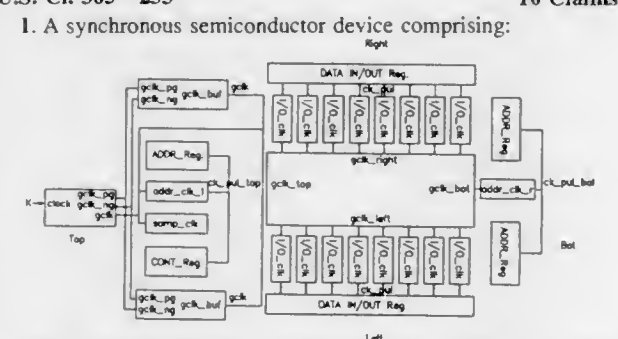
5,771,201

**SYNCHRONOUS SEMICONDUCTOR DEVICE HAVING  
AN APPARATUS FOR PRODUCING STROBE CLOCK  
SIGNALS**

**Yong Deok Cho, Kyoungkido, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Rep. of Korea**

Filed Jun. 26, 1997, Ser. No. 882,864  
Claims priority, application Rep. of Korea, Jun. 29, 1997,  
1996-26535

U.S. Cl. 365—233      Int. Cl.<sup>6</sup> G11C 8/00



- a first means for dividing a frequency of an input clock signal;

a second means for buffering and distributing a divided clock signal outputted from said frequency dividing means to necessary parts of a chip; and

frequency multiply means, receiving said divided clock signal outputted from said second means, for adjusting a pulse width thereof with a frequency identical to that of said input clock signal, wherein said frequency of said clock signal is divided by said first means, said divided clock signal is distributed from a top portion of said chip to left, right, and bottom portions of said chip, then said divided and distributed clock signal is multiplied by said frequency multiply means to use said multiplied clock signal as a strobe input signal for registers provided in said device.

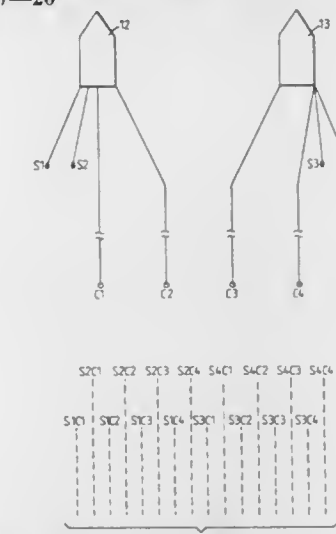
5.771.202

# METHOD FOR ACQUISITION OF SEISMIC DATA AT SEA

Richard Bale, Stavanger, Norway, and Ian McMillan, Houston,  
Tex., assignors to Geco A.S., Stavanger, Norway  
PCT No. PCT/NO91/00071, § 371 Date Jun. 30, 1993, § 102(e)  
Date Jun. 30, 1993, PCT Pub. No. WO91/18302, PCT Pub.  
Date Nov. 28, 1991

PCT Filed May 16, 1991, Ser. No. 952,827  
Claims priority, application Norway, May 22, 1990, 902258

U.S. Cl. 367—20



1. A method for acquisition of seismic data from a marine area being surveyed by using a group of seismic energy sources and a group of seismic streamer cables comprising:
- towing at least two seismic energy sources and at least two seismic streamer cables in a direction of travel over said area;
  - forming a first group A comprising at least two elements selected from the group of first and second types of elements consisting of said seismic energy sources and seismic streamer cables respectively, said group A comprising only one of said types of elements;
  - arranging said at least two elements of said group A in a linear array substantially transversely to said direction of travel with a spacing X between adjacent elements;
  - forming a second group B comprising at least two of the other type of said elements;
  - arranging said at least two elements of said group B in a linear array substantially transversely to said direction of travel with a spacing between adjacent elements in said second group B equal to X multiplied by the number of elements in said group A;
  - forming an Nth group, where N is greater than 2, of elements of said first type of element when N is an odd number and of said second type of element when said N is an even number;
  - arranging said Nth group of elements in a linear array substantially transversely to said direction of travel;

providing at least two subgroups in adjacent spaced relationship with mid-points between said subgroups, each subgroup comprising an N-2 group with the spacing between mid-points of adjacent subgroups being equal to the distance between adjacent mid-points of subgroups of the N-1 group multiplied by the number of elements in the N-1 group; and  
arranging said seismic energy sources and seismic streamer cables in accordance with positions determined by at least a Jth and a J+1 group, where J is a number between 1 and N-1.

5,771,203

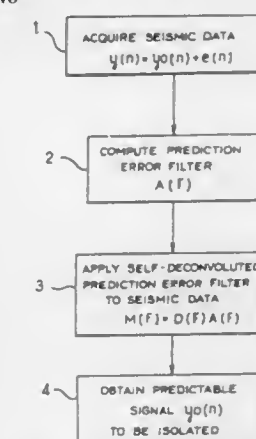
# SEISMIC PROSPECTION METHOD WITH APPLICATION OF A SELF-DECONVOLUTED PREDICTION ERROR FILTER

Robert Soubaras, Orsay, France, assignor to Compagnie Generale de Geophysique, Massy, France

PCT No. PCT/FR95/01231, § 371 Date May 22, 1996, § 102(e)  
Date May 22, 1996, PCT Pub. No. WO96/09562, PCT Pub.  
Date Mar. 28, 1996

PCT Filed Sep. 25, 1995, Ser. No. 649,694  
Claims priority, application France, Sep. 23, 1994, 94 11398  
Int. Cl.<sup>6</sup> G01V 1/36

U.S. Cl. 367—46



1. A seismic prospecting method in which:  
 a seismic disturbance is caused to take place in the sub-soil;  
 sensors are used to receive sampled seismic data  $y=[y(0), \dots, y(N)]^T$  where  $N$  is an integer, said data containing a signal  $y_0$  that is to be isolated and that is embedded in additive noise;  
 the seismic data is subjected to filtering in the time domain or the frequency domain to obtain filtered data in which the signal to be isolated is absent;  
 the filter data is subtracted from the initial seismic data to obtain processed data  $y_0(0), \dots, y_0(N)$  corresponding to the signal  $y_0$  without additive noise;  
 the filter used for filtering the seismic data being at least one of a frequency or a time domain filter corresponding to a self-deconvoluted prediction error frequency filter  $M(f)$  such that:

$$M(f) = |A(f)|^2 / R(f)$$

A(f) being the spectrum of a prediction error filter  $a$  having  $p+1$  coefficients  $a(0), \dots, a(p)$  where  $p$  is an integer smaller than  $N$ ,  $\alpha$  being previously selected for best canceling by convolution of the signal  $y_n$  that is to be isolated.

$R(f)$  being a precolorized self-correlation of said prediction filter  $\alpha$  satisfying:

$$R(f) = |A(f)|^2 + \epsilon^2 |B(f)|^2$$

where  $\epsilon$  and  $B(f)$  are respectively a precolorization factor and a precolorization filter previously selected as a function of the selectivity desired for the filtering.







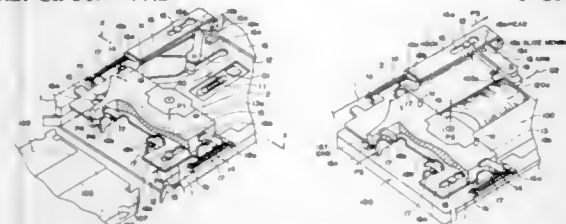
5,771,217

**MAGNETO-OPTICAL DISK APPARATUS HAVING A  
EJECTOR ARM AND MAGNETIC FIELD GENERATING  
MEANS MOUNTED ON A STATIONARY BASE**

Mitsuo Takahashi; Koji Asako, both of Tokyo; Kazuhiko Kageyama, Kawasaki; Yoshihiro Sato, Kawasaki, and Shigeru Arai, Kawasaki, all of Japan, assignors to Copal Company Limited, and Fujitsu Limited, both of Japan  
Continuation of Ser. No. 67,867, May 27, 1993, abandoned.  
This application Mar. 3, 1995, Ser. No. 400,389  
Int. Cl.<sup>6</sup> G11B 13/04; 17/04

U.S. Cl. 369—77.2

5 Claims



1. A disk apparatus for recording information to a magneto-optic disk medium, comprising:

- a stationary base having a stationary surface facing to a first surface of the magneto-optic disk medium, said stationary base mounting an arm for ejecting the magneto-optic disk medium such that the arm moves along the stationary surface;
- an optical system for impinging a light beam on a second surface of the magneto-optic disk medium;
- a flat coil, unmovably fixed to the stationary surface of said stationary base and faced to the first surface of the magneto-optic disk medium, for generating a magnetic field to an area where the light beam is impinged by said optical system for recording the information to the magneto-optic disk medium;
- carrying means for carrying said optical system along the second surface of the magneto-optic disk medium;
- containing means for containing the disk medium, said containing means being fixed with respect to the stationary surface to be unmovable with respect to said stationary base, and having portions for guiding the disk medium only along a straight translational path during insertion or ejection with respect to the containing means;
- engaging means for engaging with the disk medium contained in said containing means, said engaging means facing to the second surface of the disk medium;
- a motor for rotating said engaging means with the magneto-optic disk medium; and
- moving means for moving said motor with said engaging means between an engaging position where said engaging means engages with the disk medium and a waiting position permitting the disk medium to be inserted or ejected with respect to said containing means.

5,771,218

**PASSIVELY ALIGNED INTEGRATED OPTICAL HEAD  
INCLUDING LIGHT SOURCE, DETECTOR, AND  
OPTICAL ELEMENT AND METHODS OF FORMING  
SAME**

Michael R. Feldman, and Alan D. Kathman, both of Charlotte, N.C., assignors to Digital Optics Corporation, Charlotte, N.C.

Filed Sep. 27, 1996, Ser. No. 727,837

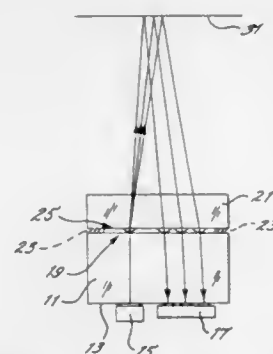
Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369—112

64 Claims

60. An apparatus for use with data storage media and comprising:

- an integrated optical head comprising
  - a first substrate being optically transparent and having opposing first and second faces,
  - a light source positioned on the first face of said first substrate for emitting light through said first substrate and toward the data storage media,



an optical detector on the first face of said first substrate for detecting light reflected from the data storage media and through said substrate,

at least one first optical element on said first substrate and positioned in an optical path between said light source and said optical detector, and

first passive alignment means for passively aligning said first substrate and at least one of either said light source or said optical detector, said first passive alignment means comprising mechanical mating means between the first face of said first substrate and at least one of said light source and said optical detector; and

head positioning means for positioning said integrated optical head relative to the data storage media.

5,771,219

**OPTICAL INFORMATION RECORDING AND/OR  
REPRODUCING APPARATUS**

Moritoshi Miyamoto, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 239,260, Apr. 20, 1994, abandoned.

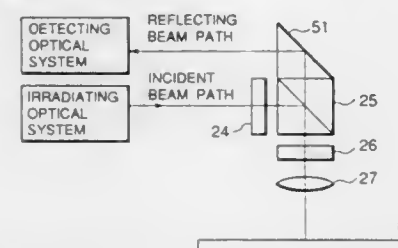
This application Jun. 12, 1997, Ser. No. 873,724

Claims priority, application Japan, Apr. 23, 1993, 5-119291; Dec. 14, 1993, 5-313237; Apr. 6, 1994, 6-068261

Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369—112

8 Claims



1. An optical information recording and/or reproducing apparatus comprising:

- a stationary portion having an irradiation optical system for generating a beam for recording information in an optical information recording medium and/or for reproducing recorded information from the recording medium, and a detection optical system for detecting a beam from the recording medium; and
- a movable portion being movable relative to said stationary portion and having beam splitting means for splitting the beam from said irradiation optical system into a plurality of beams, an objective lens for irradiating the beam from said irradiation optical system onto the recording medium, and optical path dividing means for guiding the beam from said irradiation optical system to the recording medium and for guiding the beam from the recording medium to said detection optical system,

wherein the beam from said irradiation optical system is guided to said optical path dividing means by way of a first optical path, and the beam from said optical path dividing means is guided to said detection optical system by way of a second

5,771,223

**METHOD OF RECEIVING ORTHOGONAL FREQUENCY  
DIVISION MULTIPLEXING SIGNAL AND RECEIVER  
THEREOF**

Tomohiro Kimura, Kawachinagano; Yasuo Harada, Kobe; Hiroshi Hayashino, Takarazuka, and Yasuhiro Uno, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

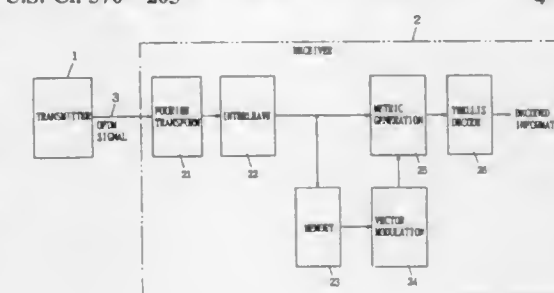
Filed Mar. 25, 1996, Ser. No. 621,338

Claims priority, application Japan, Mar. 27, 1995, 7-067771

Int. Cl.<sup>6</sup> H04B 7/204; H04J 11/00

U.S. Cl. 370—203

4 Claims



5,771,220

**OUTPUT CONTROL APPARATUS OF SEMICONDUCTOR  
LASER DEVICE**

Masami Yuasa, and Yoshiki Takemoto, both of Chiba, Japan, assignors to Sony Corporation, Tokyo, Japan

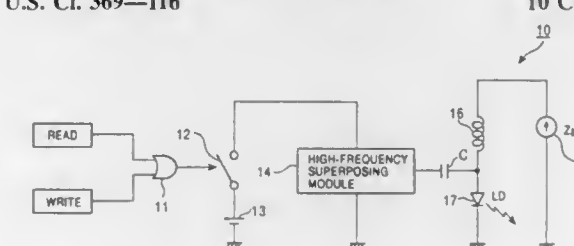
Filed Oct. 15, 1996, Ser. No. 732,786

Claims priority, application Japan, Oct. 16, 1995, 7-293724

Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369—116

10 Claims



1. A recording and reproducing apparatus of a magneto-optical recording medium, comprising:

- a semiconductor laser device for irradiating a light beam to a magneto-optical recording medium;
- a driving circuit for supplying a driving signal to said semiconductor laser device; and
- a single oscillation means for generating a high-frequency signal to be superposed onto a driving signal from said driving circuit,

wherein a signal such that a high-frequency signal from said oscillation means is superposed onto a driving signal from said driving circuit is supplied to said semiconductor laser device during recording and reproduction, a vertical magnetic field modulated on the basis of recording data is applied to said magneto-optical recording medium during recording and data is recorded on said magneto-optical recording medium by irradiating a light beam, and a light beam is irradiated onto said magneto-optical recording medium during reproduction and data recorded on said magneto-optical recording medium is read on the basis of return light from said magneto-optical recording medium.

5,771,221

Patent Not Issued For This Number

5,771,222

Patent Not Issued For This Number

Fourier transforming the orthogonal frequency division multiplexed signal obtained from the transmission channel for each of the at least one precedent symbol so as to produce a received vector sequence and a received reference vector sequence in frequency domains which correspond to those of the transmission vector sequence and the transmission reference vector sequence, respectively;

storing the received reference vector sequence produced by said Fourier transforming step;

modulating the received reference vector sequence stored by said storing step with respective signal point vectors which represent each of the signal points to thereby generate a modulation vector sequence for each of the at least one precedent symbol;

generating a branch metric sequence by obtaining a difference between the received vector sequence generated by said Fourier-transforming step and the modulation vector sequence generated by said modulating step; and

trellis decoding the branch metric sequence generated by said generating step so as to reproduce the data sequence.



# UMI

```

graph TD
    Start([Start]) --> Init["Set  $\text{max\_value} = \text{max}$  value and  $i = 0$ "]
    Init --> LoopCond{"Loop until  $i = n$ "}
    LoopCond -- Y --> LoopBody["Schedule and traverse one cell @ SCR"]
    LoopBody --> DecCount["Decrement loop count"]
    DecCount --> SetI["Set  $i = i + 1$ "]
    SetI --> LoopCond
    LoopCond -- N --> EndCond{"Is loop count  $< \text{max}$ ?"}
    EndCond -- Y --> SetMax["Set  $\text{max\_value} = \text{max}$ "]
    SetMax --> End([End])
    EndCond -- N --> End
  
```

The flowchart illustrates the algorithm for finding the maximum value in an array. It begins with a 'Start' terminal, followed by an initialization step: 'Set  $\text{max\_value} = \text{max}$  value and  $i = 0$ '. A decision diamond asks 'Loop until  $i = n$ '. If 'Y' (Yes), it proceeds to a process box 'Schedule and traverse one cell @ SCR', then to 'Decrement loop count', then to 'Set  $i = i + 1$ ', and loops back to the 'Loop until  $i = n$ ' decision. If 'N' (No), it proceeds to another decision diamond: 'Is loop count  $< \text{max}$ ?'. If 'Y' (Yes), it goes to 'Set  $\text{max\_value} = \text{max}$ ' and then to the 'End' terminal. If 'N' (No), it proceeds directly to the 'End' terminal.

1. A method for transmitting data cells in a network having a plurality of connections, the method comprising the steps of:  
allocating a first number of tokens to a selected one of the plurality of connections;  
transmitting data cells from the selected connection at a peak cell rate while the first number of tokens is greater than zero;  
decrementing the first number of tokens by one for each data cell transmitted by the selected connection at the peak cell rate;

transmitting data cells from the selected connection at a sustainable cell rate while the first number of tokens is zero, the sustainable cell rate being less than the peak cell rate; and incrementing the first number of tokens by a variable increment during an idle period in which the selected connection does not transmit data cells, the variable increment increasing in value as the idle period increases in duration.

5,771,229

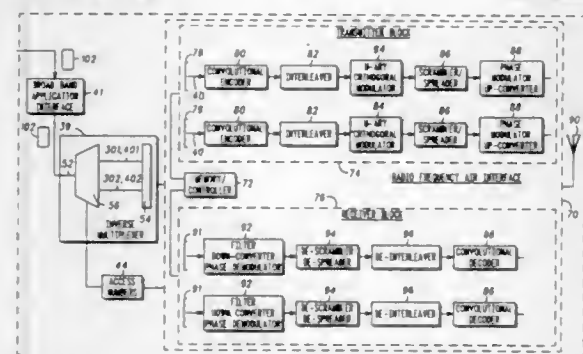
# METHOD, SYSTEM AND MOBILE COMMUNICATION UNIT FOR COMMUNICATING OVER MULTIPLE CHANNELS IN A WIRELESS COMMUNICATION SYSTEM

Charles D. Gavrilovich, Naperville, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 31, 1997, Ser. No. 792,557  
Int. Cl.<sup>6</sup> H04B 7/00

U.S. Cl. 370—342

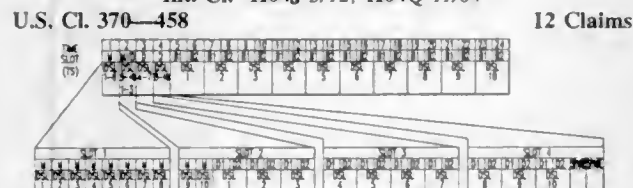
14 Claims





ports in the set of ports to resolve the collision, the commands indicating to the ports in the set of ports to retry sending of a packet.

**5,771,236**  
**METHOD FOR INCREASING ISDN CHANNEL CAPACITY OF TDM SERIAL COMMUNICATION LINK FOR DIGITAL SUBSCRIBER LINE CHANNELS**  
Michael Scott Sansom, and Robert James Toth, both of Huntsville, Ala., assignors to ADTRAN, Inc., Huntsville, Ala.  
Filed Sep. 10, 1996, Ser. No. 711,811  
Int. Cl.<sup>6</sup> H04J 3/12; H04Q 11/04  
U.S. Cl. 370—458 12 Claims

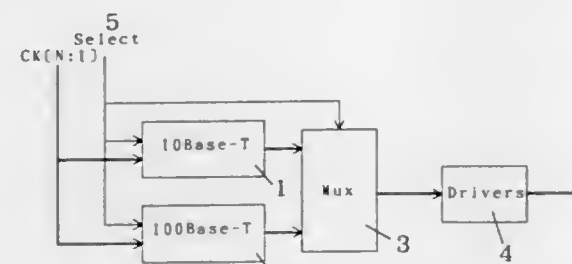


1. For use with a digital communication network having a serial communication link over which a multiplicity J of basic time division multiplexed (TDM) digital subscriber line (DSL) channels are normally conveyed within a plurality P of time division multiplexed time slots, each basic TDM DSL channel having first and second multibit bearer (B) information signal time slots and a multibit data (D) information signal time slot, said multibit (D) information signal time slot containing signalling information for said bearer (B) information signal time slots, a maintenance channel bit provided for each DSL channel, and a plurality of auxiliary overhead bits, said serial communication link being coupled to a multiple channel bank that is interfaced with a multiplicity M of integrated services digital network (ISDN) channels, a method of controlling the time division multiplexing of TDM DSL channels conveyed by said serial communication link so as to increase the number of TDM DSL channels that may be conveyed thereby and interfaced via said channel bank for an increased number of J+N ISDN channels within said P time slots, comprising the steps of:

- providing an additional number N of TDM DSL channels, each additional TDM DSL channel containing first and second multibit B information signal time slots, and a multibit D channel information signal time slot containing signalling information bits for said first and second B information signal time slots, and a maintenance channel bit; and
- combining first and second multibit B information signal time slots, D channel signalling information bits and the maintenance bits of said multiplicity J of basic TDM DSL channels with first and second multibit B information signal time slots, D channel signalling information bits and the maintenance channel bit of said additional number N of DSL channels into an increased number K of condensed TDM DSL channels, wherein  $K=J+N$ , that are contained within said plurality P of time division multiplexed time slots conveyed over said serial communication link.

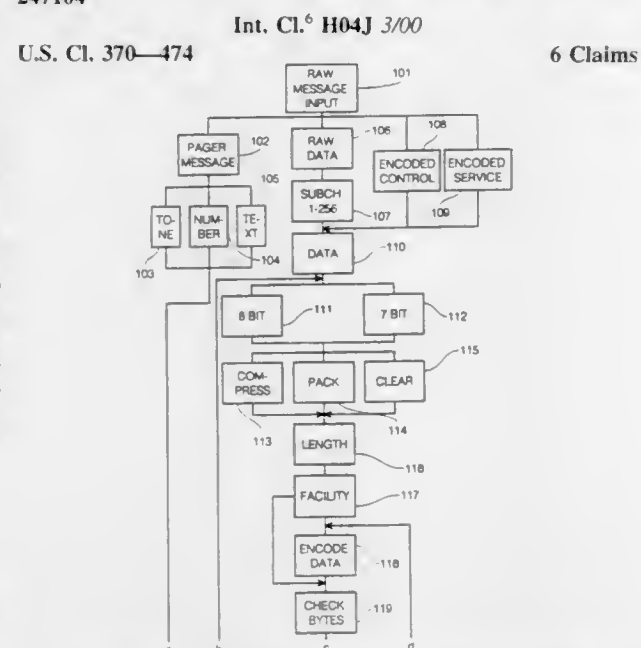
**5,771,237**  
**MULTIPLE RATE WAVESHAPING TECHNIQUE FOR FAST ETHERNET MEDIA DRIVER**  
Ron Kao, Saratoga, Calif., assignor to Lite-On Communications Corp., Taipei, Taiwan  
Filed Jan. 23, 1996, Ser. No. 590,428  
Int. Cl.<sup>6</sup> H04B 3/00 15 Claims

1. A method of multiple rate waveshaping for fast Ethernet media drivers, comprising the steps of:  
converting first transmission data into signals having waveforms suitable for transmission at a first frequency over an Ethernet twisted pair cable by selecting from among a plurality of predetermined waveshape signals corresponding to the transmission data having the first frequency;



converting second transmission data signals having waveforms suitable for transmission at a second frequency over said Ethernet twisted pair cable by selecting from among a second plurality of predetermined waveshape signals corresponding to the transmission data having the second frequency;  
multiplexing waveforms resulting from said selection and supplying the multiplexed signals to a set of differential current source drivers, said differential current source drivers thereby commonly supplying signals corresponding to said first and second transmission data to said Ethernet twisted pair cable.

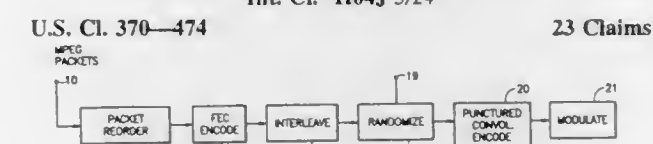
**5,771,238**  
**ENHANCED ONE WAY RADIO SEVEN BIT DATA NETWORK**  
Michael Seward Sutton, 1A Glasgow Street, Kelburn, Wellington, New Zealand  
PCT No. PCT/NZ94/00019, § 371 Date Jan. 2, 1996, § 102(e)  
Date Jan. 2, 1996, PCT Pub. No. WO94/21051, PCT Pub. Date Sep. 15, 1994  
PCT Filed Sep. 10, 1994, Ser. No. 513,971  
Claims priority, application New Zealand, Mar. 10, 1993, 247104  
Int. Cl.<sup>6</sup> H04J 3/00 6 Claims



1. A method of preparing a message packet for digital data transmission which enables eight bit data, binary data and control messages to be encapsulated in a 7 bit character packet where one or more of the 7 bit characters are prohibited comprising the steps of:  
(1) analysing a message to be transmitted to ascertain if it is a control message or a data message.  
(2) if a data message,  
(a) analysing it to determine if it can be compressed according to a known compression technique and if so compressing the data by that technique.

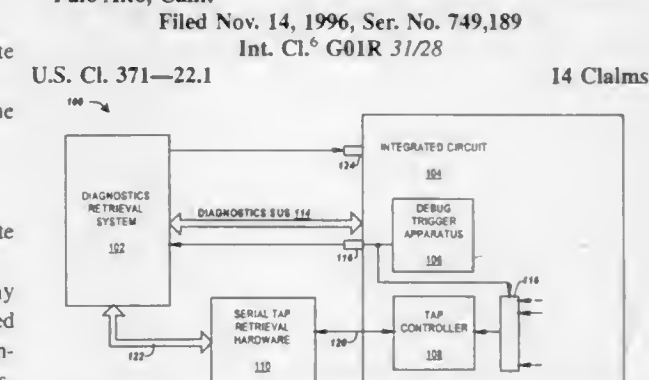
- if compression was not possible, and if the data consists of characters which are uniquely determined by 7 bits, treating the data as a 7 bit character string and stuffing the 7 bit character string into an 8 bit string.
- assigning a sub-channel number to data which is processed according to steps 2(a) or (b) or which has not been so processed.
- assembling the message packet which incorporates  
(a) framing information which includes bits which indicate whether the packet is control data or message data,  
(b) information indicative of assigned sub-channel where the message is a data message, and  
(c) the control data or  
(d) the compressed, stuffed or unoptimised message data.
- unpacking the packet from 8 bit bytes to form a 7 bit byte packet.
- analysing the 7 bit byte packet to ascertain if it contains any prohibited characters and if so substituting such prohibited characters with a suitable escape character and a complementary check character to produce the message packet for transmission.

**5,771,239**  
**METHOD AND APPARATUS FOR MODIFYING A TRANSPORT PACKET STREAM TO PROVIDE CONCATENATED SYNCHRONIZATION BYTES AT INTERLEAVER OUTPUT**  
Paul Moroney, Olivenhain, and Mark S. Schmidt, San Diego, both of Calif., assignors to General Instrument Corporation of Delaware, Chicago, Ill.  
Filed Nov. 17, 1995, Ser. No. 560,008  
Int. Cl.<sup>6</sup> H04J 3/24 23 Claims



1. A method for modifying a transport packet stream to provide concatenated synchronization bytes at an output of an interleaver receiving the modified transport packet stream, comprising the steps of:  
replacing a conventional sync byte located in a first transport packet of said transport packet stream with a first substitute sync byte;  
deleting a conventional sync byte located in a conventional sync byte position of a second transport packet of said transport packet stream, and moving another byte from said second transport packet to said conventional sync byte position, thereby opening a desired byte position in the second transport packet;  
inserting a second substitute sync byte into said desired byte position; and  
selecting said first and second transport packets and said desired byte position to provide said first and second substitute sync bytes at locations in the modified transport packet stream where said first substitute sync byte will be concatenated with said second substitute sync byte at the output of said interleaver.

**5,771,240**  
**TEST SYSTEMS FOR OBTAINING A SAMPLE-ON-THE-FLY EVENT TRACE FOR AN INTEGRATED CIRCUIT WITH AN INTEGRATED DEBUG TRIGGER APPARATUS AND AN EXTERNAL PULSE PIN**  
Paul G. Tobin, Fort Collins, and Hoseln Naaseh-Shahry, Windsor, both of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.  
Filed Nov. 14, 1996, Ser. No. 749,189  
Int. Cl.<sup>6</sup> G01R 31/28 14 Claims



1. A test system for debugging functional and electrical failures of an integrated circuit, comprising:  
a programmable debug trigger apparatus disposed internal and integral to said integrated circuit for generating a trigger capture signal a programmed time delay after a plurality of integrated circuit signals satisfy a predetermined relationship to a programmed trigger event;  
a test access port (TAP) disposed internal and integral to said integrated circuit comprising a TAP latch, said TAP latch coupled to a plurality of test nodes internal to said integrated circuit and responsive to said trigger capture signal for latching a plurality of test node signals present on said plurality of test nodes when said trigger capture signal is received;  
an external output of said integrated circuit coupled to said TAP and responsive to said trigger capture signal for outputting an external output signal to indicate that said TAP latch has been latched;  
a reset input of said integrated circuit for resetting said integrated circuit to an initial state;  
a test access port retrieval system coupled to said TAP; and  
a diagnostics retrieval system coupled to said integrated circuit and configured to reset said integrated circuit to said initial state, to program said programmed trigger event to a predetermined trigger capture event and said programmed time delay to a first delay value, to receive said external output signal, and to retrieve said plurality of test node signals from said TAP latch when said external output signal indicates that said TAP latch has been latched.

**5,771,241**  
**METHOD AND APPARATUS FOR EMBEDDING OPERAND SYNTHESIZING SEQUENCES IN RANDOMLY GENERATED TESTS**  
Karl Brummel, Fort Collins, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.  
Filed Oct. 30, 1996, Ser. No. 741,483  
Int. Cl.<sup>6</sup> G06F 11/00 21 Claims

1. Apparatus for embedding synthesizing sequences in randomly generated tests, wherein the randomly generated tests may be executed within a device under test, the apparatus comprising:  
a) one or more computer readable storage mediums; and  
b) computer readable program code stored in the one or more computer readable storage mediums, the computer readable program code comprising:  
i) code for generating and associating a delay for/with each instruction of a randomly generated test;  
ii) code for pushing each instruction of the randomly generated test, along with its associated delay, onto a queue;

# UMI





change of cavity phase error with wavelength substantially close to zero about said center wavelength within said tunable bandwidth.

5,771,253

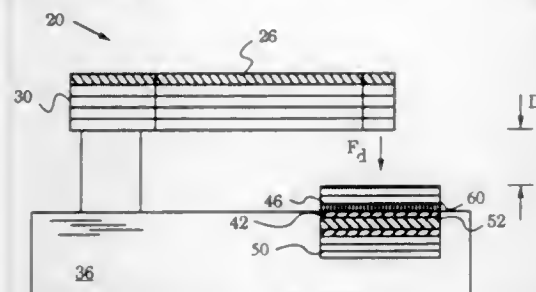
**HIGH PERFORMANCE MICROMECHANICAL TUNABLE VERTICLE CAVITY SURFACE EMITTING LASER**

Constance J. Chang-Hasnain, Union City; Edward C. Vail, Palo Alto, and Marianne S. Wu, Stanford, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University

Continuation-in-part of Ser. No. 542,057, Oct. 13, 1995, Pat. No. 5,629,951. This application Jan. 29, 1997, Ser. No. 791,762 Int. Cl.<sup>6</sup> G02B 6/26; 6/42

U.S. Cl. 372—20

7 Claims



1. A cantilever apparatus for tuning the resonance wavelength of a Fabry-Perot cavity, said Fabry-Perot cavity comprising a bottom reflecting means and a top reflecting means, said cantilever apparatus comprising:

- a) an electrically responsive substrate;
- b) a support block positioned on said electrically responsive substrate;
- c) a cantilever structure comprising a base section resting on said support block, a deformable section extending above said electrically responsive substrate and creating an air gap between said deformable section and said electrically responsive substrate, and an active head positioned at a predetermined location on said deformable section and comprising at least a portion of said top reflecting means;
- d) an electrical tuning contact disposed on said cantilever structure for applying a tuning voltage  $V_d$  to produce a downward electrostatic force  $F_d$  between said electrical tuning contact and said electrically responsive substrate, thereby altering the size of said air gap and tuning said resonant wavelength;
- e) an oxidation layer disposed within one of said reflecting means, said oxidation layer having been partially oxidized so that a small aperture of unoxidized area remains thereby providing optical and current confinement.

5,771,254

**INTEGRATED CONTROLLED INTENSITY LASER-BASED LIGHT SOURCE**

Richard R. Baldwin, Saratoga; Scott W. Corzine, Sunnyvale; John P. Ertel, Portola Valley; William D. Holland, Mountain View; Leif Eric Larson, San Jose; David M. Sears, Los Gatos; Michael R. T. Tan, Menlo Park; Shih-Yuan Wang, Palo Alto; Albert T. Yuen, Cupertino, and Tao Zhang, Mountain View, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

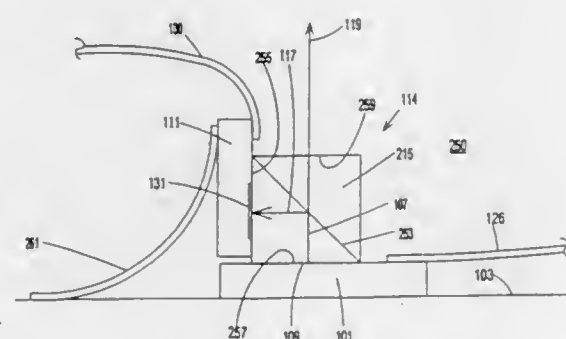
Continuation-in-part of Ser. No. 591,849, Jan. 25, 1996. This application Jun. 3, 1996, Ser. No. 660,230 Int. Cl.<sup>6</sup> H01S 3/10

U.S. Cl. 372—31

24 Claims

1. An integrated laser-based light source generating an output light beam having a controlled intensity, the light source comprising:

a package;



a laser having one and only one light-emitting face from which a light beam is radiated as a radiated light beam;

light sensor that generates an electrical signal representing an intensity of light energy falling thereon, the light sensor having a light receiving face, and being mounted with the light receiving face non-parallel to the light-emitting face of the laser; and

a coupler including:

a substrate supporting a beam-splitting surface that partially reflects a fraction of the radiated light beam to the light sensor, and that provides a remainder of the radiated light beam as the output light beam, and

a first surface substantially perpendicular to a second surface, the beam-splitting surface connecting the first surface to the second surface, the coupler being mounted in the package, together with the laser and the light sensor, with the first surface perpendicular to the radiated light beam, and with the second surface in contact with the light-receiving face of the light sensor.

5,771,255

**LASER LIGHT GENERATOR**

Yukio Horiuchi; Shu Yamamoto, and Shigeyuki Akiba, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

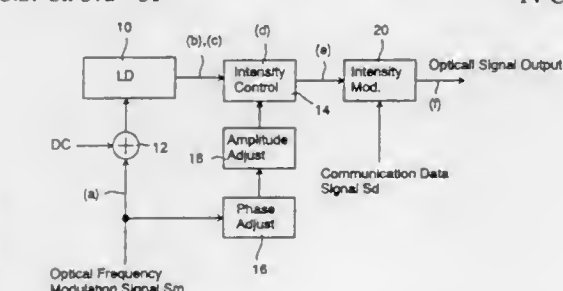
Filed Feb. 11, 1997, Ser. No. 799,119

Claims priority, application Japan, Feb. 22, 1996, 8-035190

Int. Cl.<sup>6</sup> H01S 3/13

U.S. Cl. 372—31

14 Claims



1. A laser light generator comprising:

a laser source driven for continuous laser oscillation by a drive signal superposed with an optical frequency modulation signal Sm; and

optical intensity fluctuation suppressing means substantially responsive to said optical frequency modulation signal Sm for suppressing optical intensity fluctuation contained in an light output from said laser source.

5,771,256

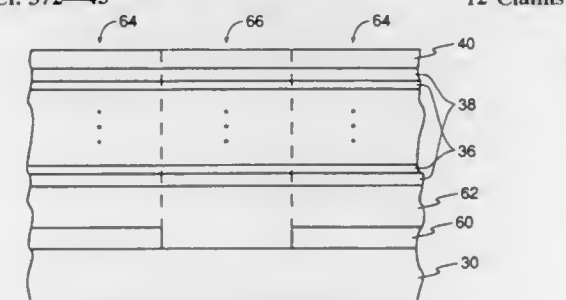
**INP-BASED LASERS WITH REDUCED BLUE SHIFTS**  
Rajaram Bhat, Middletown, N.J., assignor to Bell Communications Research, Inc., Morristown, N.J.

Filed Jun. 3, 1996, Ser. No. 660,330

Int. Cl.<sup>6</sup> H01S 3/19

U.S. Cl. 372—45

12 Claims



1. A quantum well device comprising:
- a substrate comprising indium and phosphorous;
- an InP-based quantum-well structure epitaxially formed on said substrate; and
- means for preventing a blue shift in the quantum-well electronic states due to the diffusion of species from the substrate into the quantum-well structure, said means comprising at least one barrier layer comprising aluminum, indium, and arsenic epitaxially formed on said substrate in cooperation with said quantum-well structure.

5,771,257

**LIGHT ABSORPTION MODULATOR AND INTEGRATED SEMICONDUCTOR LASER AND MODULATOR**

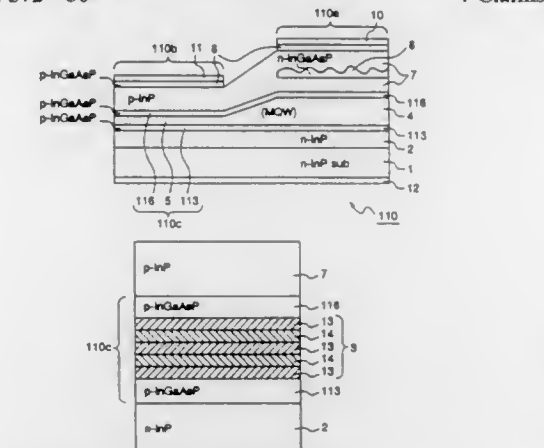
Tohru Takiguchi, and Eitaro Ishimura, both of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 26, 1996, Ser. No. 774,018

Int. Cl.<sup>6</sup> H01S 3/19; 3/10; G02F 1/03; 1/01

U.S. Cl. 372—50

4 Claims



1. A light absorption modulator comprising:
- a semiconductor substrate of a first conductivity type;
- a first cladding layer of the first conductivity type disposed on the substrate;
- an optical waveguide disposed on the first cladding layer and comprising a multiple quantum well optical waveguide layer through which light travels and first and second light confinement layers respectively disposed on opposed first and second surfaces of the optical waveguide layer for confining light in the optical waveguide layer; and
- a second cladding layer of a second conductivity type, opposite the first conductivity type, disposed on the optical waveguide wherein one of the first and second cladding layers is n type, the one of the first and second light confinement layers that contacts the n type cladding layer is p type, and light traveling

through the optical waveguide layer is modulated by applying an electric field to the optical waveguide layer.

5,771,258

**AERODYNAMIC CHAMBER DESIGN FOR HIGH PULSE REPETITION RATE EXCIMER LASERS**

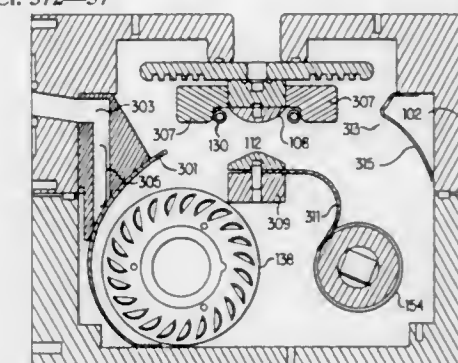
Richard George Morton; Igor Vladimirovich Fomenkov, and William Norman Partlo, all of San Diego, Calif., assignors to Cymer, Inc., San Diego, Calif.

Filed May 16, 1997, Ser. No. 857,608

Int. Cl.<sup>6</sup> H01S 3/22

U.S. Cl. 372—57

14 Claims



1. An excimer laser, comprising:
- a housing structure defining a laser cavity for containing a gas capable of lasing;
- a first electrode and a second electrode disposed in spaced relationship within the housing and defining a discharge region;
- a fan for circulating said gas through said laser cavity;
- a heat exchanger disposed within said housing for cooling said gas;
- a first insulating member disposed in proximity to said first electrode, wherein said gas passes said first insulating member prior to entering said discharge region, wherein said first insulating member reduces gas turbulence in said discharge region; and
- a second insulating member disposed in proximity to said first electrode, wherein said gas passes said second insulating member after passing through said discharge region, wherein said second insulating member reduces gas turbulence in said discharge region.

5,771,259

**LASER ELECTRODE COATING**

Lev P. Dvorkin, Ben-Gurion 452/4, Akko 24000, Israel, Akko, Italy, 4244

Filed Nov. 8, 1996, Ser. No. 745,777

Int. Cl.<sup>6</sup> H01S 3/097

U.S. Cl. 372—87

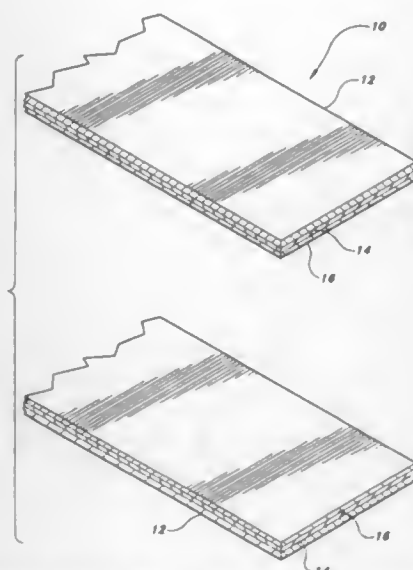
10 Claims

1. A coating for the electrodes of a CO<sub>2</sub> laser apparatus having a closed envelope containing a CO<sub>2</sub> laser gas mixture, and a laser amplification volume, said amplification volume including an electrical discharge through said CO<sub>2</sub> laser gas mixture, said discharge resulting in an electron energy distribution function having a predetermined range of average electron energy, the coating comprising:

a layer of dielectric material disposed on at least one surface of said electrode;

said layer of dielectric material being disposed so as to at least partially cover said at least one surface of said electrode, thereby decreasing the electric field intensity in the amplification volume and correspondingly decreasing the average electron energy in the discharge so as to effectively excite the upper laser level 001 of CO<sub>2</sub> molecules; and





a layer of catalyst disposed on said layer of dielectric material, said layer of catalyst being capable of reducing the disassociation of CO<sub>2</sub> molecules in said discharge.

5,771,261  
TELETHERMOMETRIC PSYCHOLOGICAL  
EVALUATION BY MONITORING OF CHANGES IN SKIN  
PERFUSION INDUCED BY THE AUTONOMIC NERVOUS  
SYSTEM

Michael Anbar, 145 Deer Run Rd., Amherst, N.Y. 14221-1823  
Filed Sep. 13, 1995, Ser. No. 527,522  
Int. Cl.<sup>6</sup> G01K 13/00; A61B 5/02

U.S. Cl. 374-45 8 Claims

1. A non-contact method for detecting a response involving the autonomic nervous system caused by mental stress in humans comprising the steps of:

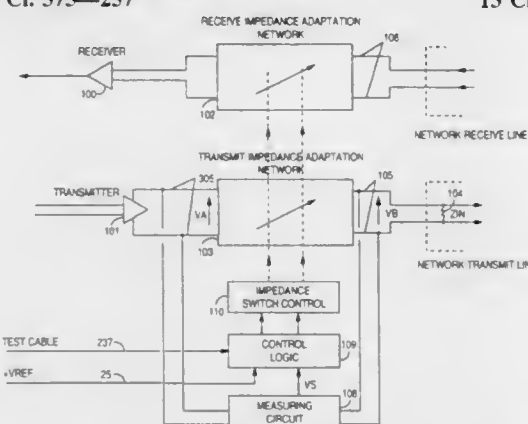
- providing a means for measuring changes in periodic modulation of skin perfusion;
- measuring said changes in periodic modulation of skin perfusion;
- providing a means for detecting statistically significant changes in periodic modulation of skin perfusion;
- detecting said statistically significant changes in periodic modulation of skin perfusion; and
- identifying as a said response, each occurrence of said statistically significant changes in periodic modulation of skin perfusion.

5,771,262  
IMPEDANCE ADAPTER FOR NETWORK COUPLER  
CABLE

Alain Benayoun, Cagnes Sur Mer; Jean-Francois Le Pennec, Nice; Patrick Michel, La Gaude, and Henri Giuliano, Vence, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 19, 1996, Ser. No. 716,077  
Claims priority, application European Pat. Off., Sep. 22, 1995, 95480134

U.S. Cl. 375-257 13 Claims



1. An apparatus in a data telecommunication network using a network couple cable for adapting an impedance of a device attached thereto by a receiver (100) and a transmitter (101) to the impedance of network transmitter and receiver lines (105,106) of a connected network among a number N of predetermined impedances; said apparatus characterized in that it comprises:

means (108) for measuring a first signal VA of upward transmitter lines (305) and a second signal VB of downward transmitter lines (105), and for amplifying said second signal VB by 2 in order to generate an output signal VS (26) defined by  $VS=VA-2*VB$ ;

means (109) for comparing said output signal VS (26) to a reference signal Vref (25) and generating an "equal" signal or "not equal" signal in order to activate one of N control signals (Z1on, . . . ZNon); and

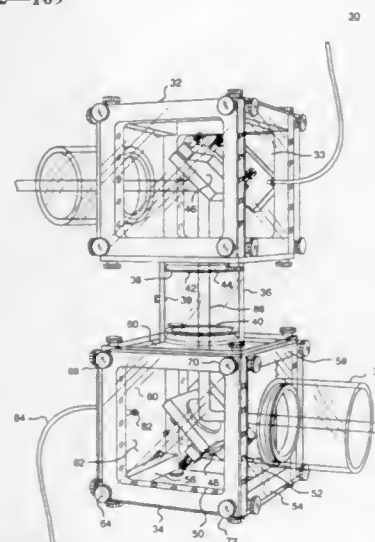
an impedance switching control (110) comprising N magnetic coils responsive to said control signals (Z1on, . . . ZNon) for activating corresponding switches of a transmit and receive switching means (102,103) to switch to the correct impedance.

5,771,260  
ENCLOSURE SYSTEM FOR LASER OPTICAL SYSTEMS  
AND DEVICES

David J. Elliott, Wayland; Jonathan C. Camp, Bedford, and Warren C. Harlow, Franklin, all of Mass., assignors to Excimer Laser Systems, Inc., Wayland, Mass.

Filed Oct. 4, 1996, Ser. No. 725,878  
Int. Cl.<sup>6</sup> H01S 3/08

U.S. Cl. 372-109 34 Claims

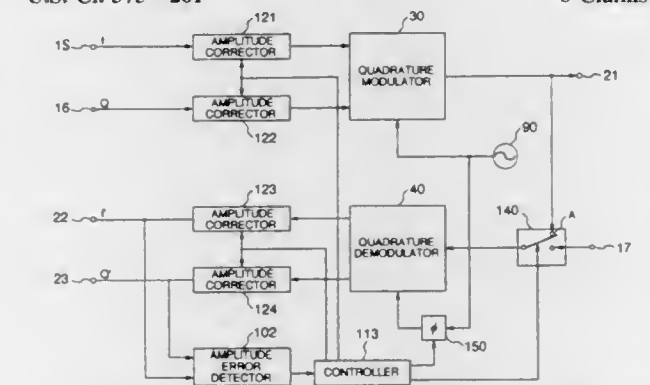


1. An enclosure system for optical laser devices comprising: a set of sealable modules each said module including: at least one port; means for mounting an optical device within said module, and at least one window for viewing said optical device; and a set of module connecting devices sealable with respect to the ports of the modules for sealingly interconnecting said modules.

5,771,263  
COMMUNICATION SYSTEM CONTROL METHOD AND  
COMMUNICATION SYSTEM USING THE METHOD  
Masayuki Kanazawa, Kodaira, and Yukinari Fujiwara, Musashimurayama, both of Japan, assignors to Hitachi Den-shi Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 2, 1997, Ser. No. 778,099  
Claims priority, application Japan, Jan. 8, 1996, 8-000424  
Int. Cl.<sup>6</sup> H04L 5/12

U.S. Cl. 375-261 8 Claims



1. A method of controlling a communication system comprising a carrier oscillator for generating a carrier of a predetermined frequency, a quadrature modulator for orthogonally modulating said carrier by a baseband I signal and a baseband Q signal input thereto and outputting a quadrature modulation wave, and a quadrature demodulator for orthogonally demodulating said quadrature modulation wave using said carrier and outputting a demodulation baseband I signal and a demodulation baseband Q signal, said method comprising the steps of:

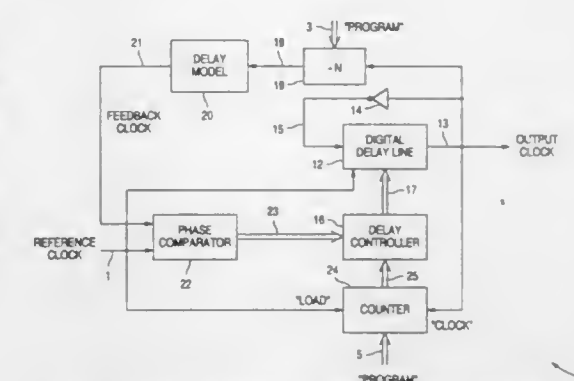
- detecting an amplitude error signal between said baseband I signal and said baseband Q signal outputted from said quadrature demodulator;
- generating a control signal on the basis of said amplitude error signal in such a manner that the baseband I signal and the baseband Q signal outputted from said quadrature modulator coincide in amplitude with each other, and the demodulation I signal and the demodulation Q signal outputted from said quadrature demodulator coincide in amplitude with each other;
- shifting the phase of the carrier applied to said quadrature demodulator by a predetermined amount on the basis of a phase shift signal produced from said control signal;
- correcting the amplitude of the demodulation baseband I signal and the demodulation baseband Q signal outputted from said quadrature demodulator on the basis of said control signal and outputting a demodulation baseband I signal and a demodulation baseband Q signal corrected in amplitude; and
- correcting the amplitude of said input baseband I signal and said input baseband Q signal on the basis of said control signal and supplying said quadrature modulator with the baseband I signal and the baseband Q signal corrected in amplitude.

5,771,264  
DIGITAL DELAY LOCK LOOP FOR CLOCK SIGNAL  
FREQUENCY MULTIPLICATION  
Chris Lane, Campbell, Calif., assignor to Altera Corporation, San Jose, Calif.

Filed Jan. 7, 1997, Ser. No. 779,897  
Int. Cl.<sup>6</sup> H03D 3/24

U.S. Cl. 375-376 24 Claims

1. An apparatus including a digital delay lock loop for generating frequency multiples of an input clock signal, comprising: a programmable digital delay oscillator circuit configured to receive at least one delay control signal and a reference clock signal and in accordance therewith provide an output clock signal, wherein said reference clock signal includes a refer-



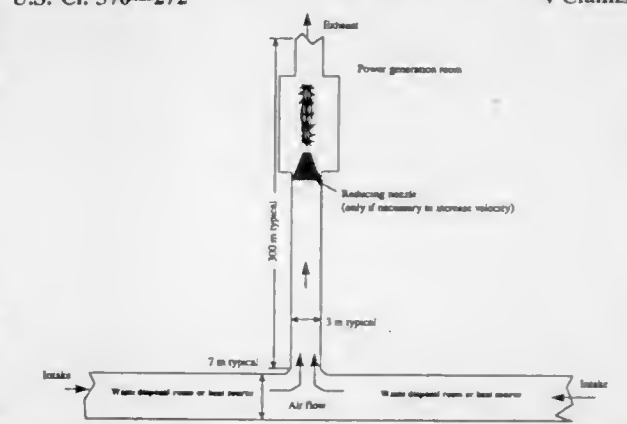
ence clock signal frequency, said output clock signal includes an output clock signal frequency, said programmable digital delay oscillator circuit includes an internal signal delay which is controlled by said at least one delay control signal and said output clock signal frequency is controlled by said internal signal delay;

- a phase comparison circuit, coupled to said programmable digital delay oscillator circuit, configured to receive said reference clock signal and said output clock signal and in accordance therewith provide at least one phase comparison result signal, wherein said reference clock signal phase, said output clock signal further includes an output clock signal phase and said at least one phase comparison result signal represents a difference between said reference clock signal phase and said output clock signal phase;
- a digital counter, coupled to said programmable digital delay oscillator circuit, configured to receive said reference clock signal and said output clock signal and in accordance therewith provide at least one digital count signal; and
- a delay controller, coupled to said programmable digital delay oscillator circuit, said phase comparison circuit and said digital counter, configured to receive said at least one phase comparison result signal and said at least one digital count signal and in accordance therewith provide said at least one delay control signal.

5,771,265  
METHOD AND APPARATUS FOR GENERATING  
ELECTRICAL ENERGY FROM NUCLEAR WASTE  
WHILE ENHANCING SAFETY

Parviz Montazer, 4622 Green Tree La., Irvine, Calif. 92615  
Filed Dec. 19, 1996, Ser. No. 769,868  
Int. Cl.<sup>6</sup> G21C 19/00; G01J 19/00

U.S. Cl. 376-272 4 Claims



1. In a repository of nuclear waste material that is capable of generating thermal energy in excess of one kilowatt per meter of length, a structure for generating electrical energy therefrom; the structure comprising: a ventilation shaft for channeling heat-induced air flow through a confined chamber;

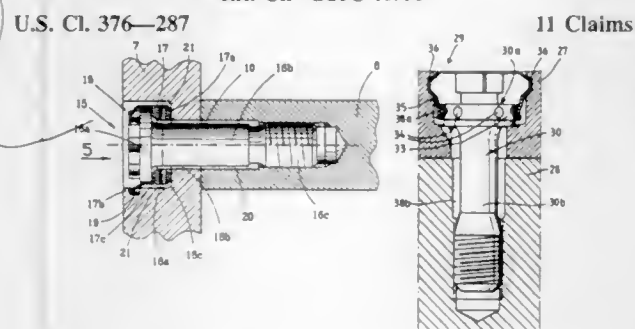
an electrical generator positioned within said air flow for generating electrical energy therefrom; and wherein said electrical generator comprises a plurality of fan blades mounted on a rotatable shaft, said blades being sequentially positioned in the path of said air flow during rotation of said rotatable shaft.

5,771,266  
DEVICE FOR JOINING TOGETHER TWO PLATES OF THE BAFFLE ASSEMBLY OF THE CORE OF A NUCLEAR REACTOR

Mirco Fabris, Jouy le Moutier, France, assignor to Framatome, Courbevoie, France

Filed Mar. 21, 1996, Ser. No. 619,355

Claims priority, application France, Mar. 22, 1995, 95 03365  
Int. Cl.<sup>6</sup> G21C 15/10



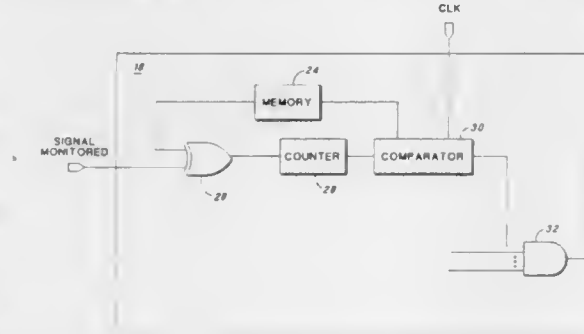
1. In a baffle assembly surrounding the core of a nuclear reactor cooled by pressurized water, a sub-assembly comprising a first metal plate and a second metal plate of the baffle which are located substantially at right angles and in contact with each other and a device for joining said first and second plates including a screw, said screw having a shank which is threaded over at least part of its length and a screw head having a diameter greater than a diameter of said shank, an opening passing through said first metal plate and comprising an entry part having a diameter greater than said diameter of said screw head, an exit part having a diameter between said diameter of said screw head and said diameter of said shank and an annular bearing surface between said entry part and said exit part, and a tapped blind opening in said second metal plate, wherein said joining device further comprises communication means including at least one part for placing a first annular space around said screw head inside said entry part of said opening in communication with a second annular space around said shank of said screw inside said exit part of said opening, and wherein said communication means of said joining device includes a cup adapted to be housed in said entry part of said opening in said first metal plate with a diametral clearance bearing by an end surface of said annular bearing surface between said entry part and said exit part of said opening in said first plate, said cup having an internal bore with an entry section greater in diameter than said screw head and an exit section greater in diameter than said shank of said screw and less than said screw head, said entry and exit sections of said cup being separated by a bearing shoulder against which said screw head bears, said cup having at least one radial through opening between the internal bore and an external surface of a portion of said cup comprised between the bearing shoulder and the end surface, said through-opening constituting the communication part between said first and second annular spaces.

5,771,267  
BURN-IN ACTIVITY MONITOR  
Stefan Graef, Milpitas, and Ludger Johanterwage, San Jose, both of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Filed Oct. 8, 1996, Ser. No. 727,257  
Int. Cl.<sup>6</sup> G07C 3/02

U.S. Cl. 377—16

14 Claims



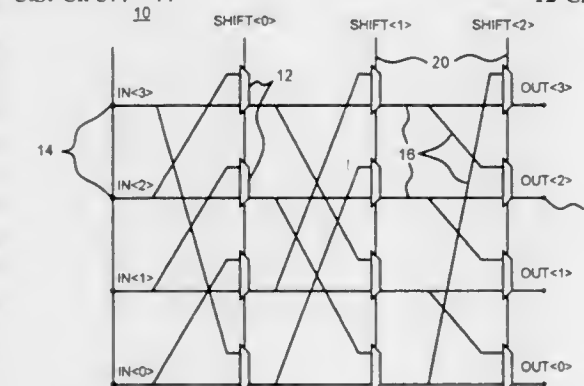
1. A semiconductor device having an activity monitor circuit formed thereon for monitoring the switching activity of signals generated by other circuits on the device during burn-in testing, the activity monitor circuit comprising:  
means for detecting a present state of a signal;  
means for comparing the present state with a previous state of the signal;  
means for determining whether the state of the signal has switched a requisite number of times in a predetermined time period;  
means for displaying the results of the determination.

5,771,268  
HIGH SPEED ROTATOR WITH ARRAY METHOD  
Naoki Aoki, Austin; Osamu Takahashi, Round Rock; Joel Abraham Silberman, and Sang Hoo Dhong, both of Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1996, Ser. No. 762,910  
Int. Cl.<sup>6</sup> G11C 19/00

U.S. Cl. 377—77

12 Claims



1. A rotator array comprising:  
a plurality of straight shift control lines extending across the array for receiving shift data representative of shift values, the straight shift control lines forming rows of the rotator array;  
a plurality of input terminals for receiving input data to be shifted, the input terminals corresponding to column locations in the array;  
a plurality of data lines coupled to the plurality of input terminals that extend diagonally and horizontally across the array;  
a plurality of primary transistors each located at a row and column intersection, and coupled to the straight shift control line in the corresponding row;  
a pair of bit-lines coupled to each of the primary transistors in a respective column; and

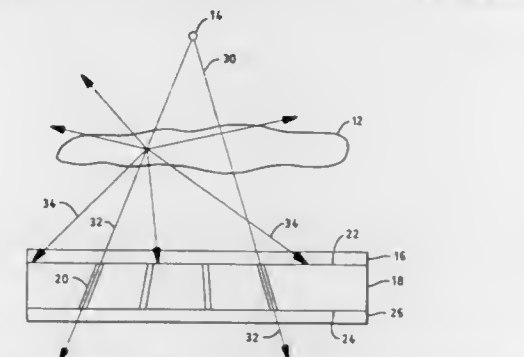
a sense amplifier coupled between each pair of bit-lines for providing shifted output data in response to receiving the shift data and the input data.

5,771,269  
APPARATUS AND METHOD FOR REMOVING SCATTER FROM AN X-RAY IMAGE

Yong-Sheng Chao, Storrs, Conn., assignor to Advanced Optical Technologies, Inc., E. Hartford, Conn.  
Continuation-in-part of Ser. No. 580,602, Dec. 29, 1995, Pat. No. 5,648,997. This application Oct. 3, 1996, Ser. No. 725,375  
Int. Cl.<sup>6</sup> G21K 1/12; 5/10

U.S. Cl. 378—5

41 Claims



1. A two-dimensional x-ray imaging system for taking images of a subject, said system comprising:  
(a) in physical sequence from front to back, an x-ray source, a front two-dimensional x-ray detector assembly, a beam selection means, and a rear two-dimensional x-ray detector assembly, said subject being located between said x-ray source and said front detector assembly;  
(b) said x-ray source being adapted to emit x-rays for passage through said subject, said x-rays including primary x-rays having their direction of travel unaltered by interaction with said subject and said x-rays including scatter x-rays having their direction of travel altered by interaction with said subject;  
(c) said front detector assembly receiving said primary x-rays and said scatter x-rays;  
(d) said beam selection means permitting said rear detector assembly to receive said primary x-rays and preventing said rear detector assembly from receiving substantially all of said scatter x-rays; and  
(e) said rear detector assembly receiving substantially only said primary x-rays passing through said beam selection means.

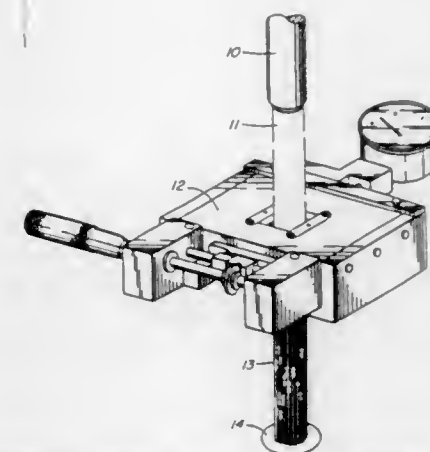
5,771,270  
COLLIMATOR FOR PRODUCING AN ARRAY OF MICROBEAMS  
David W. Archer, 486 Penhill Avenue, Ottawa, Ontario, Canada, K1G 4E1

Filed Mar. 7, 1997, Ser. No. 813,547  
Int. Cl.<sup>6</sup> A61N 5/10

U.S. Cl. 378—65

24 Claims

1. An adjustable collimator for producing non-overlapping parallel microbeams of radiation from a single wide beam of radiation comprising:  
a) first and second grid assemblies arranged in juxtaposition with each other, each comprising a plurality of alternating parallel leaves of low and high X-ray permeability, each leaf of said first grid assembly being of the same thickness as the corresponding leaf of said second grid assembly;  
b) supporting means by which each of said grid assemblies is rigidly supported such that the leaves of each grid assembly are held parallel to one another, and the leaves of the first grid assembly remains parallel to the leaves of the second grid assembly; and



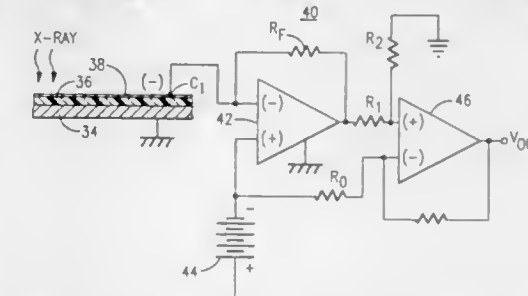
c) adjustment means by which the grid assemblies may be precisely mutually displaced in a linear direction perpendicular to the leaves of the grid assemblies, whereby the leaves of low X-ray permeability substantially block the passage of X-rays while the leaves of high X-ray permeability substantially allow the X-rays to pass through resulting in a plurality of non-overlapping parallel microbeams whose widths may be adjusted by the adjustment means.

5,771,271  
PHOTOTIMER FOR RADIOLOGY IMAGING  
Robert M. Iodice, Syracuse, N.Y., assignor to Infimed, Inc., Liverpool, N.Y.

Filed Apr. 16, 1997, Ser. No. 842,802  
Int. Cl.<sup>6</sup> H05G 1/30

U.S. Cl. 378—96

19 Claims



1. Phototimer for x-rays or gamma rays, comprising a film of a radiosensitive dielectric material sandwiched between a first radiolucent metal layer and a second radiolucent metal layer; said dielectric material being sufficiently thin so as to be substantially radiolucent but producing charge carriers under exposure to a flux of x-ray or gamma ray radiation; and phototimer circuit means having inputs operatively coupled to said first and second metal layers and producing an output which represents spatial integration of the flux of said radiation through said film.

5,771,272  
X-RAY DENSITOMETER DETECTOR CALIBRATION BY BEAM FLATTENING AND CONTINUOUS DARK SCANNING

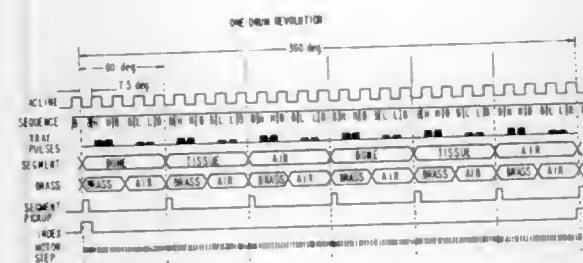
Noah Berger, Waltham; Tom Richardson, Winchester; Eric von Stetten, Sudbury, and Howard P. Weiss, Newton, all of Mass., assignors to Hologic, Inc., Waltham, Mass.  
Continuation of Ser. No. 345,069, Nov. 25, 1994, which is a continuation-in-part of Ser. No. 156,287, Nov. 22, 1993, Pat. No. 5,432,834. This application Jun. 7, 1995, Ser. No. 484,568  
Int. Cl.<sup>6</sup> G01D 18/00

U.S. Cl. 378—207

22 Claims

1. A x-ray densitometry apparatus, comprising:





- a patient table for support of a patient, having a length extending along a Y-axis and a width extending along an X-axis;
- an x-ray source at one side of the patient table, the source, when selectively energized, emitting a beam of x-rays which conforms to a beam plane which is transverse to both the X-axis and the Y-axis, to scan selectively selected regions of a patient on the table with the beam of x-rays;
- an x-ray detector at an opposite side of the table and aligned with the x-ray source along a source-detector axis, the detector having detector elements which provide respective detector element outputs related to the x-rays received at respective angular positions within the x-ray beam;
- a detector response flattener coupled to and responsive to the detector element outputs to process said outputs to account for at least one of: (i) nonuniformities in the x-ray beam; and (ii) non-uniformities in the response of detector elements;
- a dark current system for interleaving the detector outputs with dark current responses of the detector elements on a substantially continuous basis; and
- a dark current corrector responsive to the detector outputs and the dark current responses to account for dark current characteristics of the respective detector elements.

5,771,273

## NETWORK ACCESSED PERSONAL SECRETARY

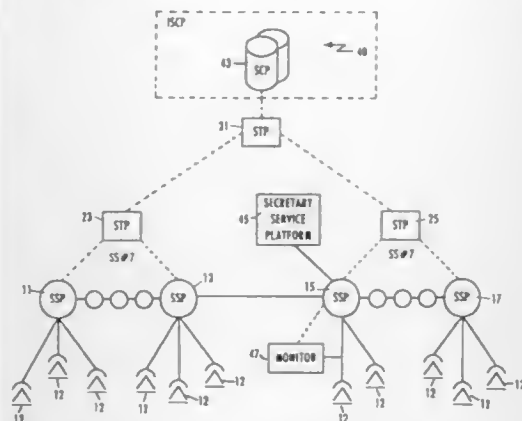
Alexander I. McAllister, Kensington; Laird Wise, Ellicott City, both of Md.; James E. Curry, Herndon, and Robert D. Farris, Sterling, both of Va., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.

Filed Feb. 5, 1996, Ser. No. 596,657

Int. Cl. H04M 3/44

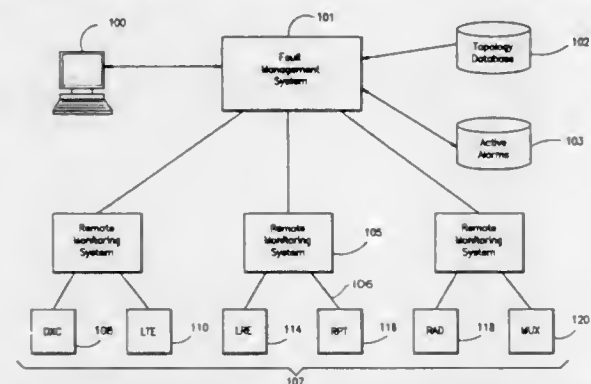
U.S. Cl. 379-67

34 Claims



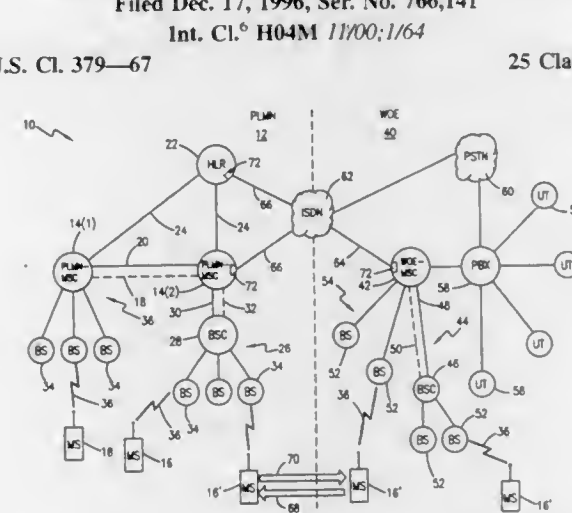
1. In a public switched telephone network comprising a plurality of subscriber telephone lines, each coupled to an associated telephone switching facility, the improvement comprising:
- a processor coupled to said network;
- a voice recognition monitor coupled to one of said subscriber telephone lines for signaling to the telephone switching facility in response to recognition of a predetermined utterance whenever said one subscriber line is in an off-hook state; and
- bridging means in said telephone switching facility for bridging said one subscriber line to said processor in response to receipt of signals from said voice recognition monitor.

5,771,274  
TOPOLOGY-BASED FAULT ANALYSIS IN  
TELECOMMUNICATIONS NETWORKS  
Roger D. Harris, Colorado Spring, Colo., assignor to MCI  
Communications Corporation, Washington, D.C.  
Filed Jun. 21, 1996, Ser. No. 669,259  
Int. Cl. H04M 1/24; 3/08; 3/22  
U.S. Cl. 379-26 6 Claims



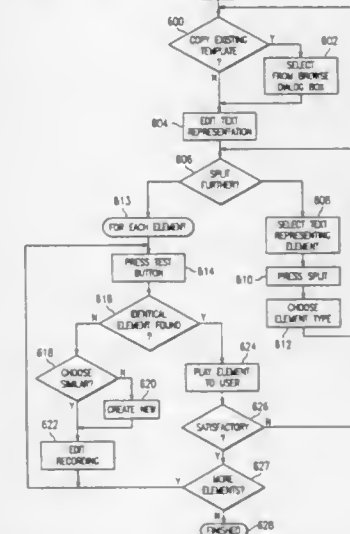
1. A fault detection method for a telephone network having multiplexer and transmission equipments, comprising the steps:
- sensing faults occurring in particular components of the network and generating fault alarm data therefrom;
- propagating the alarm data downstream through the network for collection at an end point;
- positioning a database at the end point;
- loading entries in the database that characterize the topology of the network and contain entries relating to routing of circuits and trunks through the network, and more particularly define
- (a) which trunk or ordered sequence of trunks contain a given circuit;
- (b) which circuits are contained within a given trunk; and
- (c) the topological route through the network for any given circuit or trunk;
- subjecting the database to the collected alarm data;
- correlating the collected alarm data with the database for producing information regarding
- (d) significant fault alarm events distinguished from sympathetic events, to determine the topographic point of failure;
- (e) inference of an outage on a trunk, where no fault alarms are directly received from trunk equipment, but where correlated alarms on multiple circuits contained within the same trunk are detected; and
- (f) confirmation of an outage, where direct alarms have been reported on a trunk;
- wherein the step of correlating the collected alarm data with the database further includes the steps of
- resetting a previously set circuit alarm counter to zero for all upstream trunks extracted from the topology database;
- determining whether a detected circuit alarm is the first to be counted on an upstream trunk;
- in the event it is the first to be counted, storing an alarm time stamp and a set of all upstream trunks for the circuit for which an alarm is detected;
- in the event it is not the first to be counted, determining whether the alarm has been received within a pre-selected time window relative to a previous count of a corresponding circuit alarm counter;
- in the event that it is within the window, incrementing the circuit alarm counter and determining a common path set;
- in the event that it is not within the window, determining whether the fault has been explicitly reported or inferred for the affected trunk;
- in the event that it has been explicitly reported, ignoring the alarm as spurious;
- in the event that it has not been explicitly reported, resetting the circuit alarm counter to 1 and storing as new alarm data
- (a) a reset circuit alarm time and;
- (b) a list of upstream trunks.

5,771,275  
USE OF ISDN TO PROVIDE WIRELESS OFFICE  
ENVIRONMENT CONNECTION TO THE PUBLIC LAND  
MOBILE NETWORK  
Richard Brunner, and Roch Glitho, both of Montreal, Canada, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden  
Filed Dec. 17, 1996, Ser. No. 766,141  
Int. Cl. H04M 11/00; 1/64  
U.S. Cl. 379-67 25 Claims



1. A wireless communications system comprising:
- a private cellular telephone system providing service only to first mobile stations, the private cellular telephone system including a first switching node connected to a plurality of first base stations in radio frequency communication with the first mobile stations;
- a public cellular telephone system providing service to second mobile stations, the second mobile stations including at least one first mobile station, the public cellular telephone system including a second switching node connected to a plurality of second base stations in radio frequency communication with the second mobile stations and the at least one first mobile station, the second switching node further connected to a home location register;
- an integrated services digital network interconnecting the first switching node, the second switching node and the home location register for carrying reformatting signaling system no. 7 message communication including:
- a first mB+D connection with the first mobile switching center;
- a second mB+D connection with the second mobile switching center; and
- a third mB+D connection with the home location register;
- a first protocol converter for the first switching node connected to the first mB+D connection to provide a Signaling Connection Control Part (SCCP) emulation functionality for formatting signaling system no. 7 messages for communication to and from the second switching node and home location register over the integrated services digital network;
- a second protocol converter for the second switching node connected to the second mB+D connection to provide an SCCP emulation functionality for formatting signaling system no. 7 messages for communication to and from the first switching node and home location register over the integrated services digital network; and
- a third protocol converter for the home location register connected to the third mB+D connection to provide an SCCP emulation functionality for formatting signaling system no. 7 messages for communication to and from the first and second switching nodes over the integrated services digital network.

5,771,276  
VOICE TEMPLATES FOR INTERACTIVE VOICE MAIL  
AND VOICE RESPONSE SYSTEM  
Richard J. Wolf, Crowley, Tex., assignor to AST Research, Inc., Irvine, Calif.  
Filed Oct. 10, 1995, Ser. No. 541,494  
Int. Cl. H04M 1/64  
U.S. Cl. 379-88 30 Claims



9. A method of implementing an interactive voice mail/voice response (IVR) system on a personal computer ("PC") connected to a telephone line, the method comprising the steps of:
- creating a script for implementing a user-specified set of IVR functions, said script comprising a plurality of records each having a template associated therewith;
- for each of said records, automatically splitting a text representation of said associated template into template elements and searching a database to find said template elements;
- for each of said template elements, assigning a type to said template element, said type defining characteristics of said template element; and
- for each of said template elements, storing a text representation of and an audio file associated with said template element in said database;
- testing each of said template elements; and
- responsive to said testing, for each of said tested template elements, displaying a list of template elements similar to said tested template element and responsive to user selection of one of said displayed template elements, substituting said selected template element for said tested template element in said script.

5,771,277

## ELEVATOR CAR MODEM WITH TRANSHYBRID REJECTION

Bertram F. Kupersmith, Avon, and Julian H. Shull, Jr., Southington, both of Conn., assignors to Otis Elevator Company, Farmington, Conn.

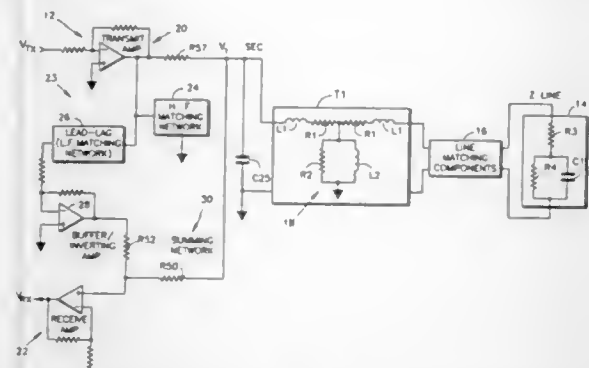
Filed Aug. 25, 1995, Ser. No. 519,214

Int. Cl. H04M 11/00

U.S. Cl. 379-93.05

9 Claims

1. A modem for connection to a telephone line comprising:
- a transmit circuit connected through a resistor to a junction;
- a receive circuit;
- a telephone line interface circuit connecting said junction to a telephone line, said interface circuit comprising first and second groups of reactive circuit components;
- a transhybrid cancellation circuit having
- a first high frequency matching circuit connected to said transmit circuit and configured to simulate said first group of reactive components of said interface circuit over a predeter-



mined high frequency range to provide transhybrid rejection over said high frequency range,  
a second low frequency matching circuit connected to said first high frequency matching circuit and configured to simulate said second group of reactive components of said interface circuit and a connected telephone line over a predetermined low frequency range to provide transhybrid rejection over said low frequency range,  
an inverting amplifier connected to said second low frequency matching circuit, and  
a summing circuit responsive to the output of said inverting amplifier and to said junction, said summing circuit connected to the input of said receive circuit.

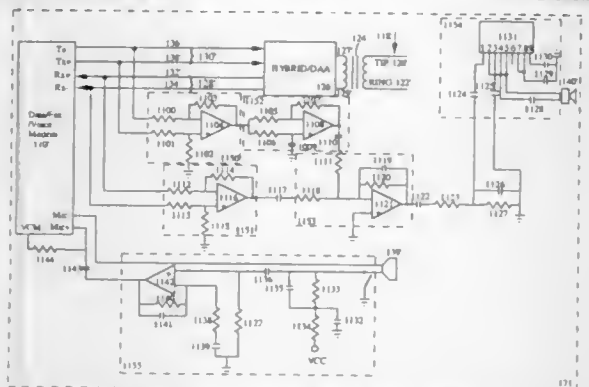
5,771,278  
**METHOD AND APPARATUS FOR MINIMIZING SYSTEM OSCILLATIONS CAUSED BY ACOUSTICAL COUPLING**  
Paul M. Brown, Pleasanton, Calif., assignor to Cirrus Logic, Inc., Fremont, Calif.

Continuation-in-part of Ser. No. 173,761, Dec. 27, 1993. This application Nov. 22, 1995, Ser. No. 561,903

Int. Cl.<sup>6</sup> H04M 11/00

U.S. Cl. 379—93.05

21 Claims



1. A system oscillation canceling apparatus comprising:  
a modem having a receive line coupled to a communication device for receiving information from said communication device and a transmit line coupled to said communication device, said receive and transmit lines each having a pair of signal wires of opposite polarity, said modem having receive, transmit, and microphone terminals of positive and negative polarity, said receive signal wires are coupled to said receive terminals, said transmit signal wires are coupled to said transmit terminals, said microphone terminals coupled to a microphone; and  
a cancellation circuit coupled to said modem and a speaker for canceling acoustical induced system oscillation; said cancellation circuit including:  
a first amplifier connected to said pair of transmit signal wires for detecting and scaling transmit signals from said pair of transmit signal wires, said first amplifier comprising:

an operational amplifier having an inverting input terminal, a non-inverting input terminal, and an output terminal;  
a first resistor connected to said inverting input terminal;  
a second resistor connected between said inverting input terminal and said output terminal;  
a third resistor connected to said non-inverting input terminal; and  
a fourth resistor connected to said non-inverting input terminal and in parallel to said third resistor;  
wherein said transmit signal wires are connected to said first and third resistors; said first amplifier outputting scaled transmit signals;

a phase shifting circuit receiving as input said scaled transmit signals for changing a phase of said transmit signals, said phase shifting circuit comprising:

an operational amplifier having an inverting input terminal, a non-inverting input terminal, and an output terminal;  
a first resistor connected to said inverting input terminal;  
a second resistor connected between said inverting input terminal and said output terminal;  
a third resistor connected to said non-inverting input terminal; and  
a capacitor connected to said non-inverting input terminal and in parallel to said third resistor;

wherein said first and third resistors connected together to form an input terminal of said phase shifting circuit, said phase shifting circuit outputting phase shifted transmit signals;

a second amplifier connected to said pair of receive signal wires for detecting and scaling receive signals from said pair of receive signal wires, said second amplifier comprising:

an operational amplifier having an inverting input terminal, a non-inverting input terminal, and an output terminal;  
a first resistor connected to said inverting input terminal;  
a second resistor connected between said first input terminal and said output terminal;  
a third resistor connected to said non-inverting input terminal; and  
a fourth resistor connected to said non-inverting input terminal and in parallel to said third resistor;

wherein said transmit signal wires are connected to said first and third resistors; said first amplifier outputting scaled receive signals; and

a summing amplifier receiving said phase shifted transmit signals and said scaled receive signals as inputs, said summing amplifier comprising:

an operational amplifier having an inverting input terminal, a non-inverting input terminal, and an output terminal;  
wherein said non-inverting input terminal of said summing amplifier is connected to ground;

a first resistor connected to said inverting input terminal thereby forming a first input terminal of said summing amplifier;

a second resistor connected to said inverting input terminal in parallel with said first resistor thereby forming a second input terminal of said summing amplifier;

a third resistor connected between said inverting input terminal and said output terminal; and

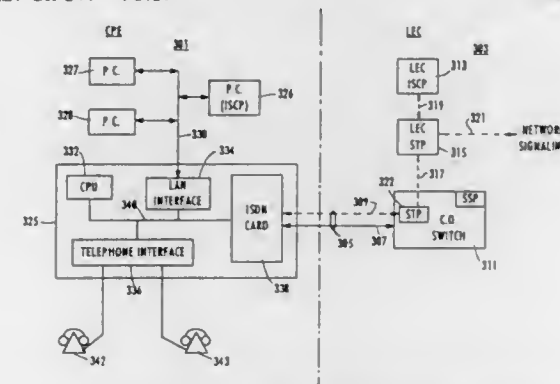
a capacitor connected between said inverting input terminal and said output terminal and in parallel to said third capacitor;

said summing amplifier outputting signals which are a sum of scaled signals of said phase shifted transmit signals and scaled signals of said scaled receive signals; said output signals are sent to said speaker.

5,771,279  
**ADVANCED INTELLIGENT NETWORK INTERACTING WITH CUSTOMER PREMISES EQUIPMENT**  
Frank C. Cheston, III, Potomac, Md.; James E. Curry, Herndon, and Robert D. Farris, Sterling, both of Va., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.  
Filed Jul. 31, 1995, Ser. No. 508,428  
Int. Cl.<sup>6</sup> H04M 11/00

U.S. Cl. 379—93.17

18 Claims



1. A telecommunications network with customer premise equipment deployed to exchange telecommunications calls with a public switched telephone network having a common channel signaling system and an integrated services control point operative to perform network service logic programs to facilitate the provision of telecommunications services, said network comprising:

a programmable database within the customer premises equipment for controlling communications between said customer premises equipment and the public switched telephone network, storing service logic programs and providing results from the performance of any one of said service logic programs in a response signal;

call control circuitry for processing the telecommunications calls within the customer premises equipment, detecting at least one processing condition that requires performance of one of said service logic programs in order to continue processing for the call, and generating a request signal calling for performance of said service logic programs;

a customer signaling system by which signals are conveyed within the customer premises equipment; and  
a signaling interface for providing a connection between the customer signaling system and the signaling system of the public switched telephone network whereby control signals for coordinating and integrating operations are transmitted between said customer premises equipment and the public switched telephone network;

said signaling information exchanged over the signaling interface providing for a look ahead busy determination between the customer premises equipment and the public switched telephone network, including inquiring via said common channel signaling system whether a called terminal device in the customer premises equipment is busy, the public switched telephone network connecting the voice portion of the call to the customer premises equipment only upon learning that the called terminal device is not busy.

5,771,280  
**METHOD OF AND APPARATUS FOR PROVIDING ARBITRARILY DEFINED HIERARCHY MAPS DEPICTING RELATIVE GEOGRAPHICAL INFORMATION**

William J. Johnson, Flower Mound, Tex., assignor to MCI Communication Corporation, Washington, D.C.

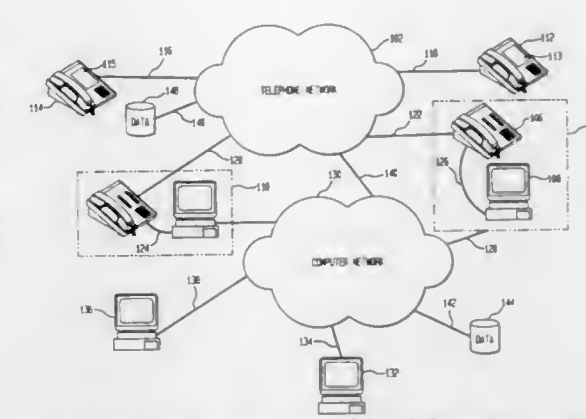
Filed May 7, 1996, Ser. No. 646,068

Int. Cl.<sup>6</sup> H04M 11/00

U.S. Cl. 379—93.23

23 Claims

1. An apparatus coupled with a communications system for presenting graphical data to a first party, depicting a location of a second party, said apparatus comprising:



an address-book database comprising information associated with the first party and the second party including a current location for the first party and the second party;  
a map database coupled with said address-book database comprising a plurality of geographical maps;  
a processor coupled with said address-book database and said map database, wherein said processor selects a set of associated maps pertaining to said current location for each party, said set of associated maps comprising at least one map from among said plurality of geographical maps; and  
a display, coupled with said geographical database, used to display at least one map within said set of associated maps.

5,771,281  
**SERIAL-PORT POWERED CALLER IDENTIFICATION COMPUTER INTERFACE**  
George Washington Batten, Jr., 3646 Aberdeen Way, Houston, Tex. 77025

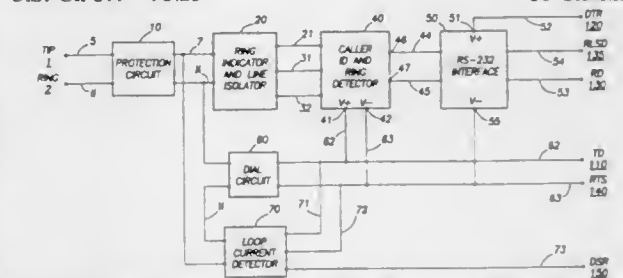
Continuation of Ser. No. 434,043, May 2, 1995, abandoned.

This application Aug. 26, 1997, Ser. No. 918,926

Int. Cl.<sup>6</sup> H04M 11/00

U.S. Cl. 379—93.23

16 Claims



1. A computer interface device for connecting a telephone line to a computer serial RS-232 interface port, said computer and said computer interface device comprising:

a power supply circuit that derives operational power exclusively from a constant voltage level from said serial interface port;

a telephone interface circuit for isolating and protecting said computer interface device;

a ring indicator and line isolator circuit for further isolating said telephone line from said computer interface and for detecting the presence of a telephone ring signal on said telephone line, said ring detector circuit generating a ring detection signal indicative of said telephone ring signal;

a caller identification and ring detector circuit for generating output signals indicative of the presence of said telephone ring signal and also indicative of information encoded on said telephone line;

an RS-232 interface circuit for providing compatibility between said computer interface device signals and said serial RS-232 interface port, said serial RS-232 interface port includes a received line signal detect (RLSD) input pin and said interface device provides an output signal indicative of said telephone ring signal to said RLSD input pin;





software in the computer which generates a table of randomly generated numbers called secret keys which are correlated to a set of unique serial numbers that is stored in the database; software in the programming device and in the programmable device which includes a secure cryptographic algorithm and which generates an authentication code based on the secret key of a programmable device and an operation mode code from which the programmable device operates a certain feature set;

so that each programmable device is correlated to a unique serial number, the secret key correlated to each programmable device is stored in the secure ROM, an authorization code is stored in the EEPROM; and each time the programmable device is turned on, a present authentication code is calculated and compared to the authentication code to verify that no tampering with the authorized feature set instruction has occurred.

5,771,288  
MULTIPLE ACCESS CODING FOR RADIO COMMUNICATIONS

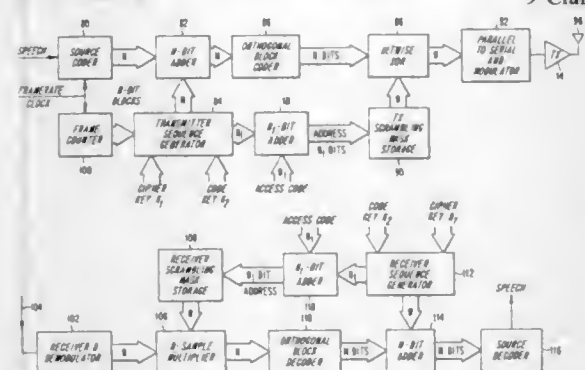
Paul W. Dent, Pittsboro, and Gregory E. Bottomley, Cary, both of N.C., assignors to Ericsson, Inc., Research Triangle Park, N.C.

Continuation of Ser. No. 647,187, May 9, 1996, Pat. No. 5,742,678, which is a continuation of Ser. No. 291,693, Aug. 16, 1994, Pat. No. 5,550,809, which is a continuation-in-part of Ser. No. 866,865, Apr. 10, 1992, Pat. No. 5,353,352. This application Feb. 10, 1997, Ser. No. 799,590

Int. Cl. 6 H04L 9/00; H04B 1/707

U.S. Cl. 380—6

9 Claims



4. In a mobile communications system using direct sequence spread spectrum multiple access for communication between a communications network and a plurality of mobile terminals, a receiver in the network for signals transmitted by a mobile terminal, comprising:

- a radio receiver that produces a stream of baseband digital samples;
- a sequence generator that supplies a spread spectrum sequence and a cipher sequence, the cipher sequence being dependent on a first bit pattern that is known only to the network and the mobile terminal and the spread spectrum sequence being dependent on only a second bit pattern;
- a spread spectrum decoder that combines the stream of digital samples with the spread spectrum sequence to produce sample groups, each sample group including a first number of decoded digital samples;
- a decipherer that combines sample groups with the cipher sequence to produce deciphered words, each deciphered word having a second number of bits; and
- a decoder that converts deciphered words to a speech signal for transmission over the communications network.

5,771,289  
METHOD AND APPARATUS FOR TRANSMITTING ELECTRONIC DATA USING ATTACHED ELECTRONIC CREDITS TO PAY FOR THE TRANSMISSION

Andrew Kuzma, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

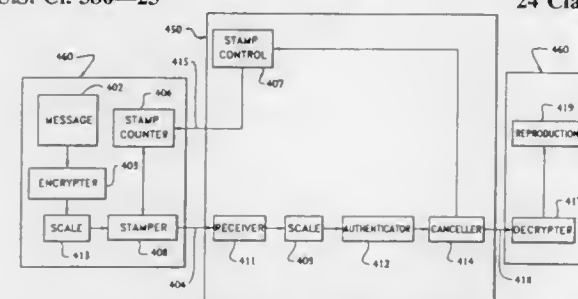
Continuation of Ser. No. 468,346, Jun. 6, 1995, abandoned.

This application May 19, 1997, Ser. No. 858,329

Int. Cl. 6 H04L 9/00

U.S. Cl. 380—23

24 Claims



1. A method for routing an electronic message from a sender terminal to an addressee terminal, comprising the steps of:

- (a) receiving the electronic message from the sender terminal at a routing terminal, wherein the routing terminal verifies and accepts a prepaid electronic stamp attached to the electronic message by the sender terminal as payment by the sender terminal for the transmission; and
- (b) transmitting the electronic message from the routing terminal for delivery to the addressee terminal.

5,771,290

Patent Not Issued For This Number

5,771,291  
USER IDENTIFICATION AND AUTHENTICATION SYSTEM USING ULTRA LONG IDENTIFICATION KEYS AND ULTRA LARGE DATABASES OF IDENTIFICATION KEYS FOR SECURE REMOTE TERMINAL ACCESS TO A HOST COMPUTER

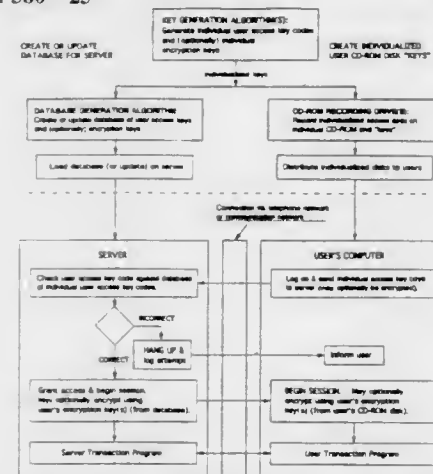
Farrell Newton, 8 Brighton 10th Path, Brooklyn, N.Y. 11235, and Gareth Williams, 35-11 85th St., Jackson Hts., N.Y. 11372

Filed Dec. 11, 1995, Ser. No. 570,318

Int. Cl. 6 H04L 9/32

U.S. Cl. 380—25

4 Claims



2. A user identification authentication system using ultra long identification keys and/or ultra large databases of identification keys for secure remote computer terminal access to a host computer comprising:

- (a) a host computer having a compiled database of pre-authorized user access key codes of ultra long length;
- (b) a series of individual portable storage media directly compatible with and readily insertable and removable from said remote computer terminal, each containing a unique or class unique access key code distributed among authorized users of a server transaction program;
- (c) a server with programming to compare received access key codes with stored authorized access key codes and to deny access to the server transaction program to any user transmitting an unauthorized key code but to permit access to any user transmitting an authorized access key code;
- (d) each of said access key codes being ultra long and comprising at least 25 characters or 25 bytes.

5,771,292  
DEVICE AND METHOD FOR DATA INTEGRITY AND AUTHENTICATION

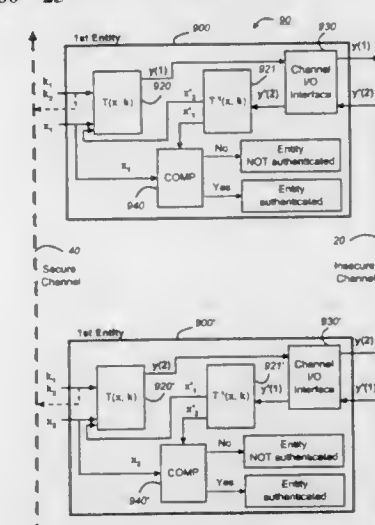
Liu Zunquan, 3500 Pennsylvania Ave. #107, Fremont, Calif. 94536

Filed Apr. 25, 1997, Ser. No. 845,803

Int. Cl. 6 H04L 9/32; 9/30; 9/00

U.S. Cl. 380—25

9 Claims



9. In a system for a first entity to authenticate a second entity via a communication link, said second entity having previously been certified by issuance of a first private key thereto, the system including an authentication device said first entity and a transponder device of said second entity, wherein said authentication device of said first entity comprises:

- means for receiving an interrogating document among a plurality thereof;
  - means for transmitting said interrogating document to said second entity via the communication link;
  - means for receiving said first private key;
  - a first mapping means definable by said first private key for mapping said interrogating document to a first authentication code; and
  - means for storing said first authentication code;
- wherein said transponder device of said second entity comprises:
- means for receiving said interrogating document from said first entity via the communication link;
  - means for receiving a second private key;
  - a second mapping means definable by said second private key for mapping said interrogating document to a second authentication code; and
  - means for transmitting said second authentication code to said first entity via the communication link; and
- wherein said authentication device of said first entity further comprises:
- means for receiving said second authentication code via the communication link; and
  - means for comparing said first and second authentication codes, thereby determining the authenticity of said second entity by

whether or not said second mapping means is identical to said first mapping means and therefore whether or not said second private key of said second entity is identical to said first private key.

5,771,293  
SWITCHING ARRANGEMENT FOR MOBILE RADIO RECEIVERS

Steffen Schneider, Munich, Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Germany

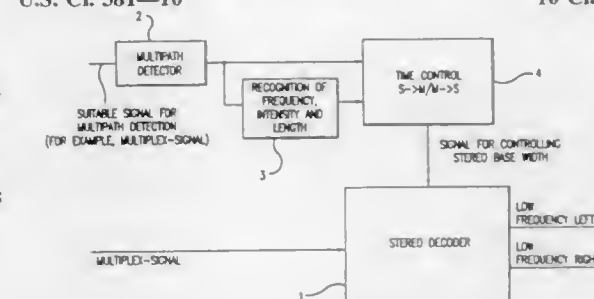
Filed Nov. 18, 1996, Ser. No. 752,262

Claims priority, application Germany, Nov. 16, 1995, 195 42 737.8

Int. Cl. 6 H04H 5/00

U.S. Cl. 381—10

10 Claims



1. A switching arrangement for a mobile radio receiver having a device for setting a stereo playback portion relative to a mono playback portion as a function of multipath effects, wherein a resetting time from a mono playback portion to a stereo playback portion is varied as a function of the detected value of at least one of a relative frequency, or length of the multipath effects.

5,771,294  
ACOUSTIC IMAGE LOCALIZATION APPARATUS FOR DISTRIBUTING TONE COLOR GROUPS THROUGHOUT SOUND FIELD

Toshihiro Inoue, and Hiroyuki Torimura, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Division of Ser. No. 302,112, Sep. 7, 1994, Pat. No. 5,585,587.

This application Oct. 3, 1996, Ser. No. 725,544

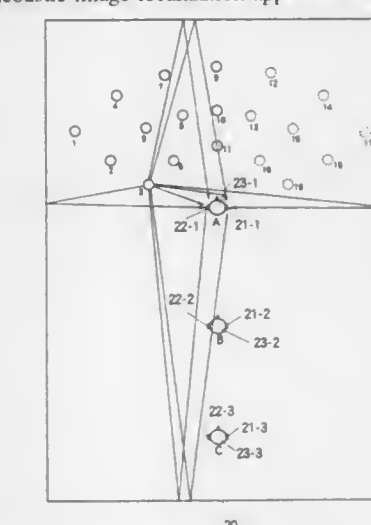
Claims priority, application Japan, Sep. 24, 1993, 5-258862

Int. Cl. 6 H04S 5/00

U.S. Cl. 381—17

9 Claims

1. An acoustic image localization apparatus comprising:



a generator that generates a sound signal;

a memory device that stores a plurality of impulse response data;



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- a first designator circuit that designates one of separate listening points that are predetermined separately from each other in a sound field;
- a second designator circuit that designates one of separate source points that are predetermined separately from each other in a sound field; and
- a sound localizer that localizes an acoustic image of the sound signal to a sound point by filtering the sound signal based on impulse response data read out from the memory in accordance with the listening point designated by the first designator circuit and the source point designated by the second designator circuit, wherein the acoustic image of the sound signal is localized to the designated source point as if the acoustic image is directed to the designated listening point.

5,771,295

## 5-2-5 MATRIX SYSTEM

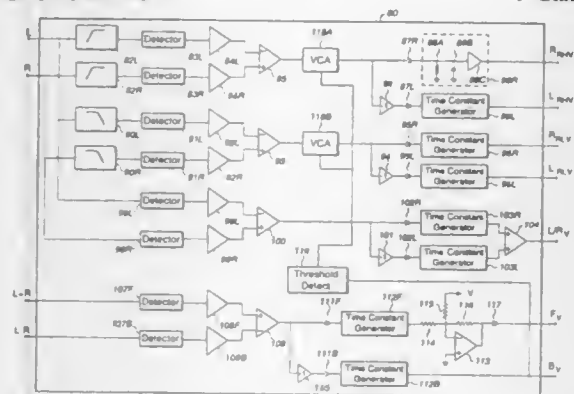
James K. Waller, Jr., Clarkston, Mich., assignor to Rocktron Corporation, Rochester Hills, Mich.

Filed Dec. 18, 1996, Ser. No. 769,452

Int. Cl.<sup>6</sup> H04S 3/00

U.S. Cl. 381—18

9 Claims

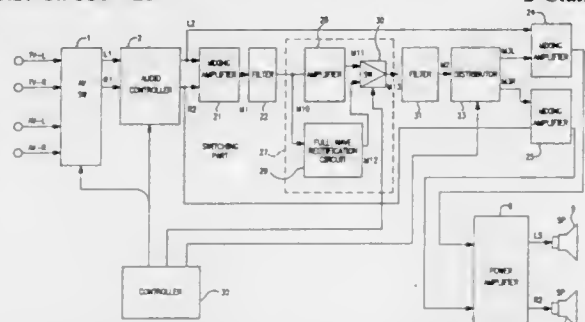


1. For use in an audio system decoding two-channel stereo into multi-channel sound, a process comprising the steps of:
- deriving a first dc signal from a first input signal;
- deriving a second dc signal from a second input signal;
- differencing said first and second dc signals;
- passing said differenced signal through a variable multiplier at a preselected gain to a first output terminal when said differenced signal is positive and to a second output terminal when said differenced signal is negative;
- summing said first and second input signals;
- deriving a third dc signal from said summed first and second input signals;
- differencing said first and second input signals;
- deriving a fourth dc signal from said differenced first and second input signals;
- differencing said third and fourth dc signals to produce a threshold dc signal;
- detecting the level of said threshold dc signal to produce a control signal which increases and decreases as said threshold dc signal increases and decreases when said fourth dc signal is greater than said third dc signal; and
- applying said control signal to said variable multiplier to vary the gain applied to said differenced first and second dc signals.

5,771,296  
AUDIO CIRCUIT  
Toyooki Unemura, Itami, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan  
Filed Nov. 16, 1995, Ser. No. 559,578  
Claims priority, application Japan, Nov. 17, 1994, 6-283423  
Int. Cl.<sup>6</sup> H03G 5/00

U.S. Cl. 381—28

2 Claims



1. An audio circuit for use with a speaker comprising:
- mix means for mixing a first audio signal and a second audio signal to generate a third audio signal;
- a first filter for extracting a predetermined low frequency band signal from the third audio signal, wherein said predetermined low frequency band signal is a fourth audio signal having a frequency;
- full-wave rectification means for one of a) rectifying and b) amplifying said fourth audio signal to generate a fifth audio signal having a frequency double the frequency of said fourth audio signal, wherein said full-wave rectification means is switchable to a simple amplifier through one of shortening and opening a specified portion of said full-wave rectification means;
- a second filter for extracting, based upon sound frequency characteristics of said speaker, a signal in a low frequency band from said fifth audio signal, wherein said extracted signal is a sixth audio signal;
- distribution means for distributing said sixth audio signal into two further audio signals; and
- add means for adding said further audio signals to said first audio signal and said second audio signal respectively.

5,771,297

## ELECTRONIC AUDIO DEVICE AND METHOD OF OPERATION

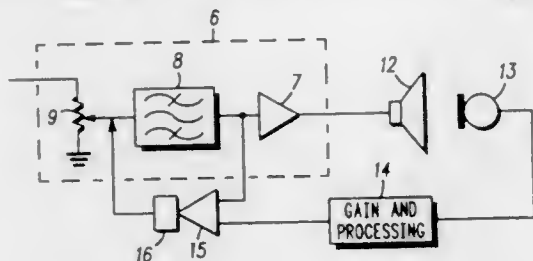
Julian Howard Richardson, Hants, England, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 14, 1995, Ser. No. 514,546

Int. Cl.<sup>6</sup> H03G 3/20

U.S. Cl. 381—57

10 Claims



1. An electronic audio device comprising:
- an audio stage having an audio output for providing an audio output signal;
- an acoustic transducer coupled to the audio output for outputting an acoustic signal;
- a microphone element with selectable gain, acoustically coupled to the acoustic transducer to provide a feedback signal representative of the output of the acoustic transducer;

- a comparator coupled to the audio stage and the microphone element for comparing parameters of the audio output signal and parameters of the feedback signal;
- a control circuit responsive to the comparator for controlling the audio stage when a parameter of the feedback signal differs from that parameter of the audio output signal by a predetermined amount;
- a microphone gain switching element for increasing the gain of the microphone element for monitoring of ambient noise and decreasing the gain for provision of the feedback signal; and
- a volume control element for controlling the audio output signal responsive to the control circuit to reduce the volume of the acoustic signal when the difference between the feedback signal parameter and the audio output signal parameter indicates distortion in the audio output signal.

5,771,298

## APPARATUS AND METHOD FOR SIMULATING A HUMAN MASTOID

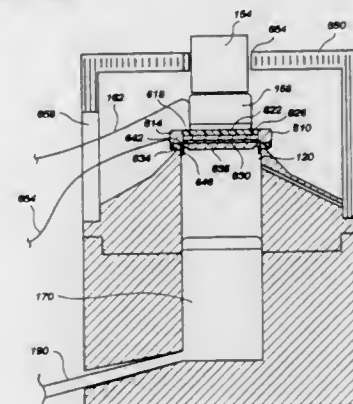
Larry J. Davis, Highland, and Robert Chanaud, Orem, both of Utah, assignors to Larson-Davis, Inc., Provo, Utah

Filed Jan. 13, 1997, Ser. No. 782,150

Int. Cl.<sup>6</sup> H04R 29/00

U.S. Cl. 381—60

46 Claims



1. A diaphragm for simulating a human mastoid when used with an artificial ear, the diaphragm comprising:
- a stiffening plate formed from a metal material, the stiffening plate having a void formed therein; and
- first damping means attached to the stiffening plate and disposed within the void of the stiffening plate;
- wherein damping means and the stiffening plate are configured to respond to vibratory force so as to simulate the response of a human mastoid to the vibratory force.

5,771,299

## SPECTRAL TRANSPOSITION OF A DIGITAL AUDIO SIGNAL

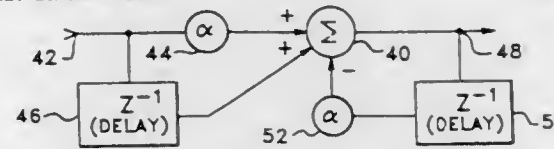
John Laurence Melanson, Boulder, Colo., assignor to Audio Logic, Inc., Boulder, Colo.

Filed Jun. 20, 1996, Ser. No. 667,149

Int. Cl.<sup>6</sup> H04R 25/00

U.S. Cl. 381—68.2

15 Claims



1. Apparatus for transposing to a new frequency range formants of a digital audio signal, said apparatus comprising:
- an adaptive analysis filter analyzing the digital audio signal and producing a whitened residual signal and formant coefficients

- of a polynomial expression indicative of the formants in a frequency spectrum of the digital audio signal;
- a synthesis filter, responsive to the whitened residual signal and the formant coefficients, for generating resynthesized the digital audio signal;
- said analysis filter and said synthesis filter having different group delay characteristics in order to warp the spectral envelope of the resynthesized digital audio signal from said synthesis filter whereby the formants of the digital audio signal are transposed to the new frequency range.

5,771,300

## LOUDSPEAKER PHASE DISTORTION CONTROL USING VELOCITY FEEDBACK

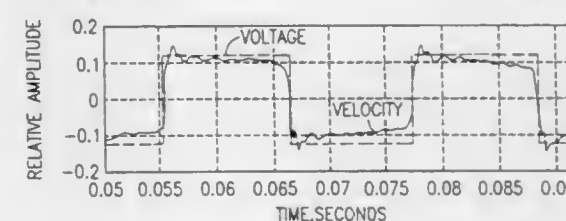
Mark A. Daniels, Manlius, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 25, 1996, Ser. No. 723,160

Int. Cl.<sup>6</sup> G10K 11/16; H04R 3/00

U.S. Cl. 381—71.5

8 Claims



1. A duct active noise cancellation circuit having a noise canceling loudspeaker having a coil for driving said loudspeaker and means for supplying a driving signal to said coil for causing said loudspeaker to produce a noise canceling signal, a closed-loop velocity servo for said loudspeaker comprising:
- a resistor in series with said coil and located intermediate said means for supplying a driving signal and said coil;
- means located across said resistor for determining the voltage drop across said resistor and the current in said resistor and for producing a voltage output proportional to said determined current;
- a circuit receiving said voltage output and producing a signal representative of the velocity of said coil; and
- means for adjusting said means for supplying a driving signal responsive to said signal representative of the velocity of said coil.

5,771,301

## SOUND LEVELING SYSTEM USING OUTPUT SLOPE CONTROL

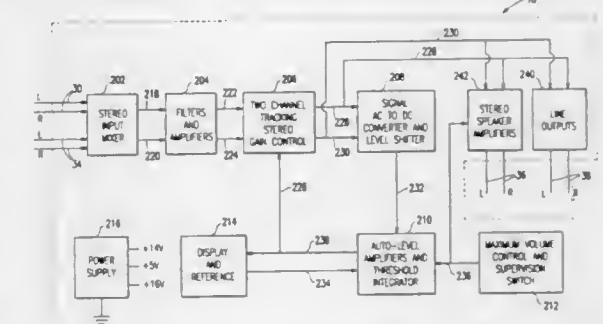
Charles H. Fuller, Oceanside, Calif., and John D. Winslett, 1024 Granvia Altamira, Palos Verdes, Calif. 92058-6197, assignors to John D. Winslett, Palos Verdes, Calif.

Filed Sep. 15, 1994, Ser. No. 306,697

Int. Cl.<sup>6</sup> H03G 3/00

U.S. Cl. 381—107

2 Claims



1. A sound leveling system for receiving an input signal, wherein when a maximum amplitude of the input signal equals or exceeds

a control threshold the sound leveling system maintains an output signal at or below a slope defining a plurality of predetermined maximum output levels for a set level of output control, wherein the slope represents a ratio of the output signal to the input signal, the system comprising:

an signal adjusting circuit for receiving the input signal and a control signal to produce the output signal that is output by the system;

an integrator circuit coupled to the signal adjusting circuit to receive and sample the output signal from the signal adjusting circuit, the integrator circuit determining a maximum amplitude of the output signal and using the maximum amplitude to produce the control signal that determines a rate of response of the system and further determines the control threshold in accordance with the set level of output control applied to the output signal; and

a peak rate limiter circuit coupled to the integrator circuit to limit the rate of response of the integrator circuit during large changes in the amplitude of the output signal to substantially eliminate loss of the output signal during the large changes in the amplitude of the output signal,

wherein the signal adjusting circuit uses the control signal from the integrator circuit to produce a gain that adjusts the amplitude of the output signal in accordance with the control signal such that the maximum amplitude of the output signal is maintained at or below the slope defining the plurality of predetermined maximum output levels for the set level of output control, wherein the output signal is comprised of two output channel signals, wherein each channel may be the sum of more than one input, wherein the input signal is comprised of two input channel signals, and wherein the signal adjusting circuit tracks the gain for each input channel signal and adjusts the gain for each output channel signal and the system further including an inverting circuit for inverting the phase of one input channel signal and a voice nulling circuit, wherein the input signal contains voice energy portions, and wherein the voice nulling circuit uses the inverted and the non-inverted input channel signals to substantially cancel the voice energy portions in the two output channel signals.

5,771,302

## SUBWOOFER-LOUDSPEAKER BOX

Peter Schindler, Straubing, Germany, assignor to Nokai Technology GmbH, Pforzheim, Germany

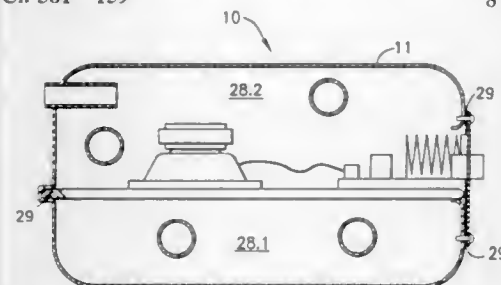
Filed May 6, 1997, Ser. No. 852,261

Claims priority, application Germany, May 9, 1996, 296 08 421 U

Int. Cl.<sup>6</sup> H04R 25/00

U.S. Cl. 381-159

8 Claims



1. A subwoofer-loudspeaker box with an outer box housing (10), with a separation wall (20) which divides the volume surrounded by the box housing (10) into two volumes (28.1, 28.2), and where at least one of the two volumes exchanges air with the outside air surrounding the box housing (10) through a port (13), and with at least one loudspeaker (23) which is connected to the separation wall (20), characterized in that the outer box housing (10) is made in one piece, that the box housing (10) has an insertion frame (16) on its inside wall (15), that the box housing (10) has an installation opening (12) which lies crosswise to the plane of the insertion frame (16), and that the separation wall (20) is equipped with a

cover plate (21) which closes the installation opening (12) at least partially when the separation wall (20) has been inserted through the installation opening (12) into the insertion frame (16).

5,771,303

## MICROPHONE MOUNTING AND CONTROL SYSTEM

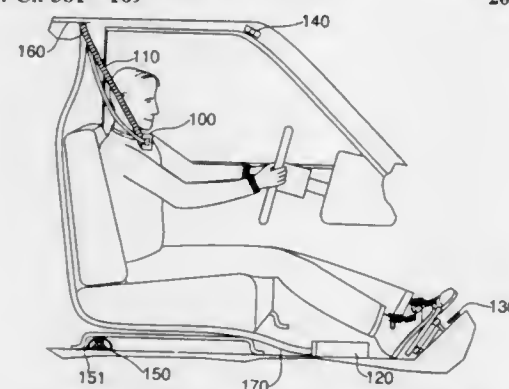
Charles W. Mazzarella, 84 E. Garfield Ave., and Frederick J. Rast, III, 49 Eighth Ave., both of Atlantic Highlands, N.J. 07716

Filed May 25, 1995, Ser. No. 450,103

Int. Cl.<sup>6</sup> H04R 25/00

U.S. Cl. 381-169

20 Claims



1. A microphone mounting and control system for use in a vehicle having a passenger compartment, said system comprising: holding means for holding a microphone having a trigger; supporting means, coupled to said holding means, for supporting said holding means; electrical actuator means, coupled to said holding means, for activating said trigger of said microphone, wherein said electrical actuator means comprises a solenoid and a cable, coupled between said solenoid and said holding means; and electrical switching means, coupled to said electrical actuator means, for activating said electrical actuator means.

5,771,304

## APPARATUS INCLUDING A LOUDSPEAKER UNIT, LOUDSPEAKER UNIT, AND HOUSING FOR A LOUDSPEAKER UNIT

Martinus P. M. Van Den Thillart; Wilhelmus H. M. M. Evers; Johannes A. A. Das, all of Eindhoven, Netherlands; Dirk De Boe, and Raoul E. M. Keereman, both of Dendermonde, Belgium, assignors to U.S. Philips Corporation, New York, N.Y.

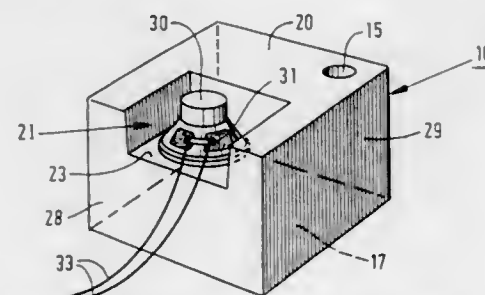
Filed Aug. 2, 1995, Ser. No. 510,398

Claims priority, application European Pat. Off., Aug. 2, 1994, 94202232

Int. Cl.<sup>6</sup> H04R 25/00; H05K 5/00; A47B 81/06

U.S. Cl. 381-188

6 Claims



1. A housing for a loudspeaker unit, said housing having a plurality of outer walls enclosing a continuous space, a first of said walls having an opening therethrough and a loudspeaker mounting surface around the opening; and wherein:

said first wall has a projection portion which projects towards the continuous space and forms a chamber wherein a loudspeaker is mounted on said mounting surface facing the continuous space;

said loudspeaker mounting surface is situated in said chamber on an outer side of said first wall remote from said continuous space;

said plurality of walls includes a second wall which adjoins said first wall, and the mounting surface adjoins said second wall; and

said first wall further includes a bass reflex port.

5,771,305

## REMOVABLE BAG FOR MOUNTING OF STEREO SYSTEM ON TWO-WHEELED VEHICLE

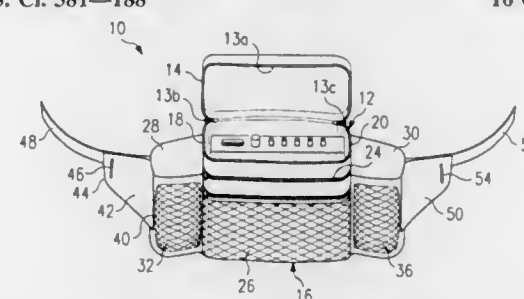
Robert A. Davis, 917 East St., Lemont, Ill. 60439, assignor to Robert A. Davis, and Dawn L. Davis, both of Lemont, Ill.

Filed Jun. 27, 1996, Ser. No. 673,801

Int. Cl.<sup>6</sup> H04R 25/00

U.S. Cl. 381-188

10 Claims



1. A bag for removably mounting any one of a plurality of commercially available stereo audio systems preselected by a rider of a handlebar-steered vehicle to handlebars of the handlebar-steered vehicle, comprising:

a main compartment formed of a flexible material and sized to receive at least a preselected one of a plurality of main audio units therein, a closeable orifice in said main compartment for receiving the preselected main audio unit, said main compartment having left and right sidewalls;

a left speaker compartment formed of a flexible material and adjoining said left sidewall of said main compartment, a closeable orifice of said left speaker compartment sized to receive a preselected one of a plurality of speakers, said left speaker compartment sized to house said preselected speaker, a front, vertically disposed panel of said left speaker compartment formed of a material which readily permits the transmission of sound therethrough;

a flexible right speaker compartment formed of a flexible material and adjoining said right sidewall of said main compartment, a closeable orifice of said right speaker compartment sized to receive a preselected one of a plurality of speakers, said right speaker compartment sized to house said preselected speaker, a front, vertically disposed panel of said right speaker compartment formed of a material which readily permits the transmission of sound therethrough; and

means for releasably attaching said main compartment, said left speaker compartment and said right speaker compartment to left and right handlebars of the two-wheeled vehicle in such a manner as to permit the quick removal of the bag and the components housed therein as a single unit.

5,771,306  
METHOD AND APPARATUS FOR EXTRACTING  
SPEECH RELATED FACIAL FEATURES FOR USE IN  
SPEECH RECOGNITION SYSTEMS

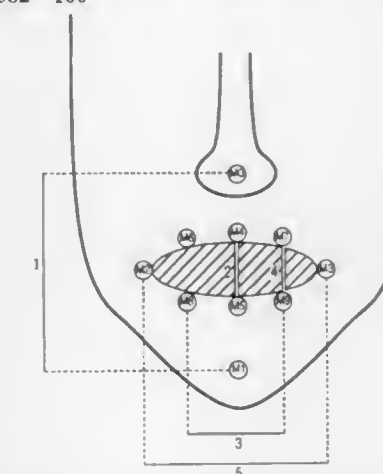
David G. Stork, Stanford; Gregory Joseph Wolff, Mountain View, both of Calif., and Earl Isaac Levine, Dallas, Tex., assignors to Ricoh Corporation, Menlo Park, Calif., and Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 889,619, May 26, 1992. This application Oct. 22, 1993, Ser. No. 142,168

Int. Cl.<sup>6</sup> G06T 7/60

U.S. Cl. 382-100

10 Claims



5. A method for extracting a visual feature vector from a sequence of video camera images of frontal views of a speaker's face in a speech classification system, the method comprising the following steps:

- placing a set of fiducial markers on a speaker's face in the vicinity of the lips, nose, and chin so that the fiducial markers are readily identifiable in a video camera image of the speaker's face, and the movement and position of the set of fiducial markers are representative of physiological facial phenomena associated with speech generation;
- producing a sequence of raster scanned electrical video images of the speaker's face in the vicinity of the fiducial markers;
- sampling and quantizing each raster scanned video image so as to produce a grid of digitized pixels representative of each raster scanned video image;
- detecting a set of pixels representative of each fiducial marker;
- computing a location for each fiducial marker from each set of detected pixels associated with each fiducial marker;
- establishing a reference axis corresponding to a straight line passing through the location of the nose and chin fiducial markers; and
- rotating all fiducial marker positions by the angle required to rotate the reference axis to a true vertical orientation.

5,771,307

AUDIENCE MEASUREMENT SYSTEM AND METHOD  
Daosheng Lu, Buffalo Grove, Ill.; Ceril T. Shagrin, Palm Harbor; William L. Thomas, Clearwater, both of Fla.; Morris Lee, Buffalo Grove, Ill.; Bruce Bernard, Mundelein, Ill., and Jia Zhang, Mundelein, Ill., assignors to Nielsen Media Research, Inc., New York, N.Y.

Division of Ser. No. 992,383, Dec. 15, 1992, Pat. No. 5,550,928. This application Dec. 21, 1995, Ser. No. 576,467

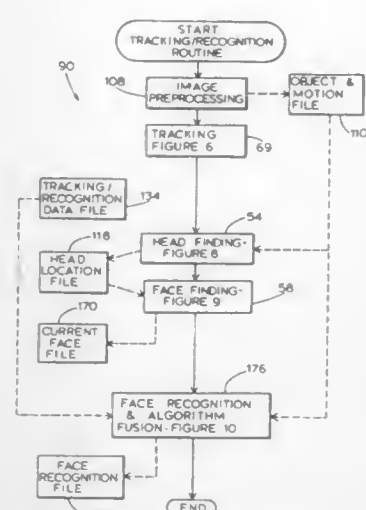
Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382-116

28 Claims

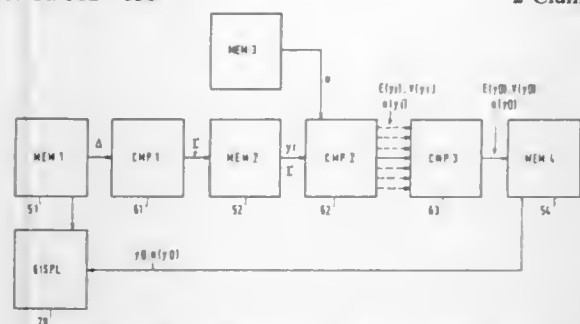
1. An apparatus for passively identifying a person in a monitored area comprising:  
image capturing means for capturing video images of the monitored area;





first means for processing the video images in order to provide therefrom a first identity-indicating score relative to a person in the video images, wherein the first identity-indicating score distinguishes the person from other persons in the monitored area, and wherein the first means relies upon a first recognition methodology to derive the first identity-indicating score; second means for processing the video images in order to provide therefrom a second identity-indicating score relative to the person in the video images, wherein the second identity-indicating score distinguishes the person from other persons in the monitored area, wherein the second means relies upon a second recognition methodology to derive the second identity-indicating score, and wherein the second recognition methodology is different from the first recognition methodology; and, fusing means for fusing the first and second identity-indicating scores to form a composite identification record from which the person in the video image may be identified.

**5,771,308**  
**IMAGE PROCESSING APPARATUS AND METHOD FOR DETERMINING LOCALLY THE CENTER AND SEMI-WIDTH OF OBJECTS CONTRASTED AGAINST A BACKGROUND**  
Raoul Florent, Valenton, France, assignor to U.S. Philips Corporation, New York, N.Y.  
Filed Feb. 15, 1995, Ser. No. 388,864  
Claims priority, application France, Feb. 16, 1994, 94 01770  
Int. Cl. G06K 9/00; 9/46; 9/50  
U.S. Cl. 382—130 2 Claims



1. An arrangement for processing an image including the representation of at least one object (OBJ) consisting of pixels of substantially uniform intensity contrasted against a background (BG) consisting of pixels of substantially uniform intensity, this arrangement comprising:

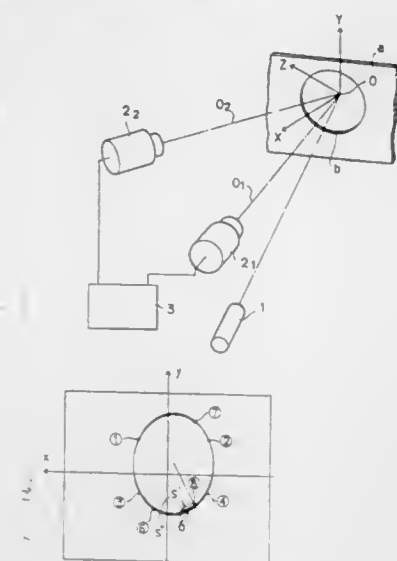
storage means (51) labeled first storage means (MEM1) for storing image data of said image and for providing a trace ( $\Delta$ ) scanning said image, said scan trace being formed by a set of adjacent pixels and cutting said object (OBJ) represented in the image in a segment (I);

computing means (61) labeled first computing means (CMP1) for computing cumulated sums ( $\Sigma$ ) of intensities, and squared intensities of adjacent pixels in all intervals of said scan trace ( $\Delta$ ), these intervals being delimited by a first pixel labeled origin pixel ( $y_l$ ) on one side, and by respectively each one of the pixels of said set of pixels, labeled the end pixels on the other side;

storage means (52) labeled second storage means (MEM2) for storing the output data of said first computing means (61); computing means (63) labeled third computing means (CMP3) for constructing, on said pixels of the scan trace ( $\Delta$ ), a function of said cumulated sums labeled second function [ $E(y_i)$ ,  $V(y_i)$ ] and for further estimating an optimal value [ $E(y_o)$ ,  $V(y_o)$ ] of said second function constructed relative to said set of pixels of the trace;

storage means (54) labeled fourth storage means (MEM4) for storing a value of the abscissa ( $y_o$ ) of a pixel of the scan trace ( $\Delta$ ), and a value [ $a(y_o)$ ] of a parameter (a) labeled semi-width parameter, to constitute the abscissa of the center ( $y_o$ ), and the semi-width [ $a(y_o)$ ] of said segment (I) determined by said trace ( $\Delta$ ) cutting said object (OBJ) of the image, as, respectively, its values which yield said optimal value [ $E(y_o)$ ,  $V(y_o)$ ] of the said second function of the cumulated sums, constructed by said third computing means; and display means for displaying said image, having a two-dimensional matrix of pixels.

**5,771,309**  
**METHOD FOR MEASURING POSITION OF HOLE**  
Naoki Yamaoka, and Koji Oda, both of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 165,825, Dec. 14, 1993, abandoned.  
This application Mar. 16, 1995, Ser. No. 405,450  
Claims priority, application Japan, Mar. 26, 1993, 5-067977; Mar. 26, 1993, 5-067978  
Int. Cl. G06K 9/00; 9/36  
U.S. Cl. 382—152 5 Claims



1. A method of measuring a position of a hole by image-sensing a holed portion formed in a workpiece and then measuring a central position of the holed portion based on an image of the holed portion on a screen of image sensing means, said method comprising the steps of:

picking up a plurality of hole edge points which coincide with a hole edge of the image of the holed portion; obtaining an ellipse in a regression processing by using coordinates of the plurality of hole edge points such that the total of deviation amounts relative to each of the hole edge points become minimum, said ellipse thereby representing the image of the holed portion;

obtaining the central position of the holed portion from coordinates of the center of the ellipse; wherein the steps of obtaining said ellipse in a regression processing comprises:

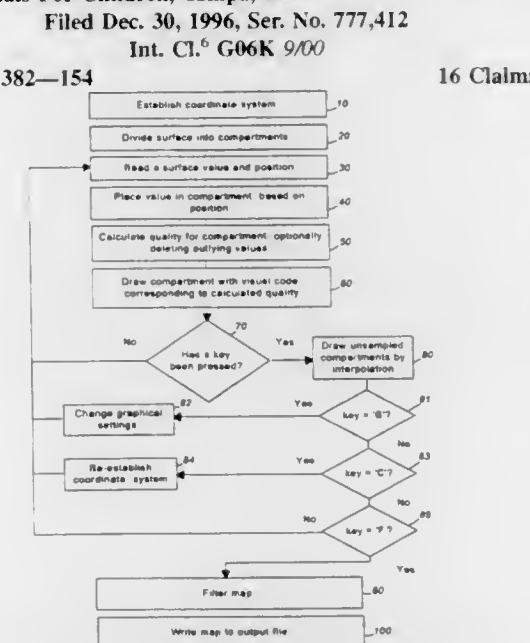
obtaining coordinates of a center of gravity of the image of the holed portion;

judging whether each of the hole edge points is present within a predetermined annular area which is set on the screen based on the center of gravity, wherein said ellipse is obtained from coordinates of remaining hole edge points after deleting a hole edge point which is present outside the annular area;

calculating an amount of deviation off the ellipse of each of the hole edge points which are made the basis of obtaining the ellipse;

said ellipse being obtained when a maximum amount of deviation among all amounts of deviation is above a predetermined value, from coordinates of remaining hole edge points after deleting a point of maximum amount of deviation, said step of obtaining the ellipse being repeated until the maximum amount of deviation becomes smaller than a predetermined value.

**5,771,310**  
**METHOD AND APPARATUS FOR RECORDING THREE-DIMENSIONAL TOPOGRAPHIES**  
William M. Vannah, Granville, Mass., assignor to Shriners Hospitals For Children, Tampa, Fla.  
Filed Dec. 30, 1996, Ser. No. 777,412  
Int. Cl. G06K 9/00  
U.S. Cl. 382—154 16 Claims



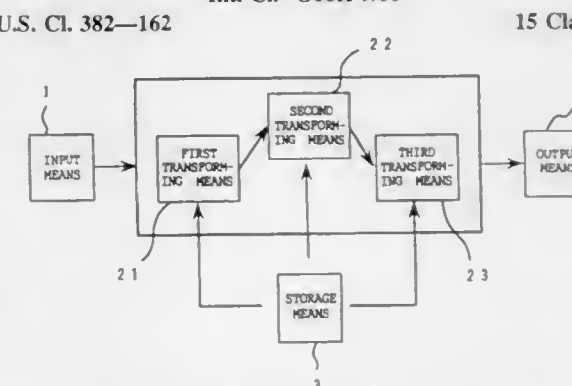
1. A method of generating a three-dimensional topography of a property of an object, said method comprising

- generating digital data points at a plurality of sample points on the surface of the object, each digital data point comprising a property value and a position value corresponding to a particular sample point;
- assigning each digital data point to one of a plurality of discrete compartments based on the position value of the data point, each compartment corresponding to a unique location on the object and comprising zero, one, or more digital data points;
- determining a quality value for each of said compartments based on the quality of the digital data points assigned to that compartment and assigning to each compartment a code representing said quality value;
- generating and assigning new digital data points to each compartment comprising a code indicating an unacceptable

quality value, said new data points corresponding to sample points on the object at a location corresponding to said compartment;

- determining a new quality value for each compartment to which new digital data points have been assigned and assigning to each compartment a code representing said new quality value;
- repeating steps (d) and (e) until all compartments are assigned a code indicating an acceptable quality value; and
- generating from said digital data points and new digital data points a three-dimensional topography representing the property of the object.

**5,771,311**  
**METHOD AND APPARATUS FOR CORRECTION OF COLOR SHIFTS DUE TO ILLUMINANT CHANGES**  
Yoshifumi Aral, Tokyo, Japan, assignor to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan  
Filed Dec. 27, 1995, Ser. No. 579,549  
Claims priority, application Japan, May 17, 1995, 7-118791  
Int. Cl. G06K 9/00  
U.S. Cl. 382—162 15 Claims



1. A color reproduction method for effecting color matching for a plurality of different color reproduction devices for reproducing the color of an original color image, comprising the steps of:

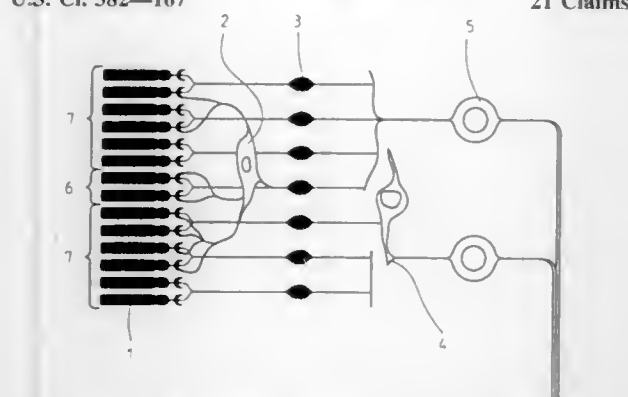
setting an intermediate color representation system which is represented by at least three characteristic parameter values obtained by multivariate analysis of a spectral reflectance or a spectral transmittance which is not dependent on an illuminant;

learning a first neural network such that, when at least three color information values peculiar to each of said color reproduction devices are inputted, said at least three characteristic parameter values of said intermediate color representation system corresponding to said inputted color information values are outputted, and learning a second neural network such that, when said at least three characteristic parameter values of said intermediate color representation system are inputted, color information values corresponding to said inputted characteristic parameter values are outputted;

transforming said at least three color information values peculiar to a first color reproduction device into said at least three characteristic parameter values of said intermediate color representation system by using said first neural network which has been learned;

transforming said at least three characteristic parameter values under a constraint concerning colorimetric values of colors reproduced by said first color reproduction device and a second color reproduction device different therefrom; and transforming said at least three characteristic parameter values transformed under the constraint, into color information values of said second color reproduction device by using said second neural network which has been learned, so as to effect color matching for said plurality of different color reproduction devices.

5,771,312  
METHOD FOR AUTOMATIC PARTIAL WHITE  
BALANCE CORRECTION  
Hedva Spitzer, Tel Aviv, Israel, assignor to Ramot University  
Authority For Applied Research & Industrial Development  
Ltd., Tel Aviv, Israel  
Filed Jul. 1, 1996, Ser. No. 674,034  
Int. Cl.<sup>6</sup> G06K 9/00  
U.S. Cl. 382-167 21 Claims



1. A method for partially correcting a scene for illumination color, the scene including an intensity spectrum at each of plurality of pixels arranged in a rectangular grid, the method comprising, the steps of:

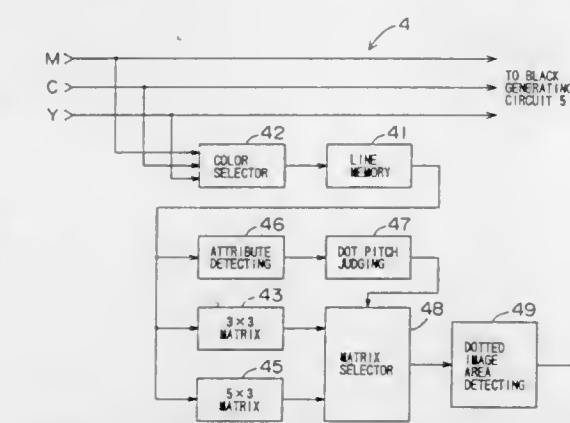
- (a) at each pixel:
- (i) multiplying the intensity spectrum by a spectral response function of a red photoreceptor, thereby providing a red spectral product,
  - (ii) multiplying the intensity spectrum by a spectral response function of a green photoreceptor, thereby providing a green spectral product,
  - (iii) multiplying the intensity spectrum by a spectral response function of a blue photoreceptor, thereby providing a blue spectral product,
  - (iv) integrating said red spectral product,
  - (v) integrating said green spectral product, and
  - (vi) integrating said blue spectral product, thereby providing a red image, a green image, and a blue image, each image having a pixel value at each of the plurality of pixels,
- (b) for each image:
- (i) transforming the image to a center remote image, and
  - (ii) combining the image with said center remote image to produce, at each pixel, a center response,  $R_c$ , thereby producing, at each pixel, a center red response, a center green response, and a center blue response; and
- (c) for each image: for each pixel: correcting said center response for non-whiteness of said center remote images.

5,771,313  
APPARATUS FOR AND METHOD OF DETECTING  
DOTTED IMAGE AREA USING TWO TYPES OF  
JUDGING AREAS  
Shinji Hayashi, Masaya Fujimoto, and Hidechika Kumamoto,  
all of Osaka, Japan, assignors to Mita Industrial Co., Ltd.,  
Osaka, Japan  
Filed Nov. 2, 1995, Ser. No. 556,840  
Claims priority, application Japan, Nov. 16, 1994, 6-282228;  
Nov. 16, 1994, 6-282229  
Int. Cl.<sup>6</sup> G06K 9/34

U.S. Cl. 382-176 12 Claims

1. A dotted image area detecting apparatus for successively processing pixels constituting an image as a target pixel on the basis of image data representing densities of the pixels to detect a dotted image area in the image, the apparatus comprising:

first judging means including means for setting a first judging area which has a predetermined number of pixels including a target pixel, and means for judging whether or not the target



pixel is a peculiar point pixel on the basis of image data corresponding to pixels in the first judging area;

second judging means including means for setting a second judging area which has a predetermined number of pixels including a target pixel and is larger than the first judging area, and means for judging whether or not the target pixel is a peculiar point pixel on the basis of image data corresponding to pixels in the second judging area; and

dotted image area detecting means for detecting a dotted image area in the image on the basis of a result of judgment by the first judging means and a result of judgment by the second judging means, wherein

the dotted image area detecting means includes

coarseness detecting means for detecting a coarseness of a dotted image area,

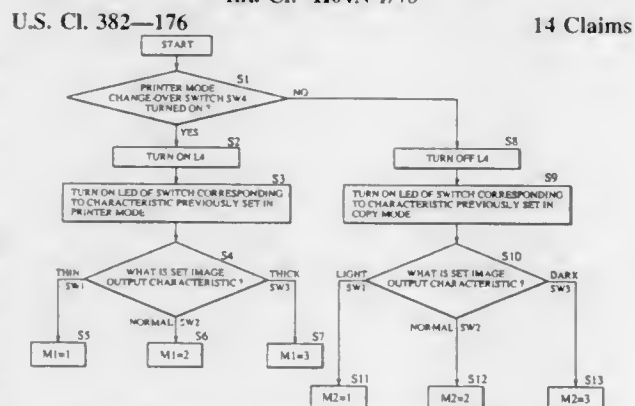
selecting means, to which the result of judgment by the first judging means and the result of judgment by the second judging means are given, for selecting either one of the two results of judgment and outputting the selected result of judgment depending on the coarseness of the dotted image area detected by the coarseness detecting means, and

means for detecting a dotted image area in the image on the basis of the result of judgment selected by the selecting means.

5,771,314  
IMAGE PROCESSING APPARATUS FOR INPUTTING  
AND PROCESSING PLURAL TYPES OF IMAGE  
SIGNALS  
Tsuyoshi Kunishi, Yokohama; Yoshihiko Suzuki, Tokyo; Satoru  
Kutsuwada, Kawasaki, and Keizo Isemura, Kokubunji, all  
of Japan, assignors to Canon Kabushiki Kaisha, Tokyo,  
Japan  
Division of Ser. No. 275,253, Jul. 15, 1994, Pat. No. 5,677,774.  
This application Feb. 7, 1997, Ser. No. 797,602  
Claims priority, application Japan, Jul. 23, 1993, 5-182476  
Int. Cl.<sup>6</sup> H04N 1/40

U.S. Cl. 382-176 14 Claims

1. An image processing method comprising the steps of:



1. An image processing method comprising the steps of:

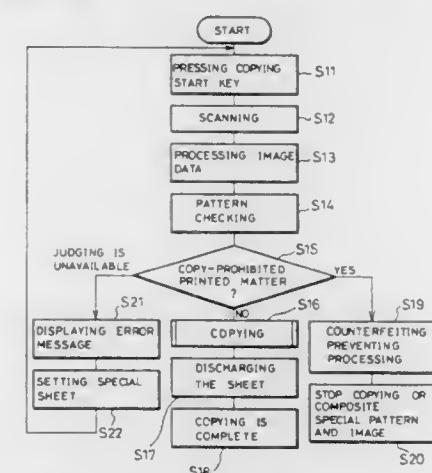
- a) selecting an image output characteristic with respect to the density of an image formed by an image forming means for each of a plurality of types of image signals input by an input means;
- b) storing the latest image output characteristic selected in said step a) for each of said plurality of types of image signals;
- c) inputting an image signal;
- d) deciding the type of the image signal input in said step c);
- e) outputting a control signal for setting the image output characteristic stored in said step b) in accordance with a decision result in said step d);
- f) outputting a signal for indicating the image output characteristic set in said step e) to a display device; and
- g) causing the image forming means to form the image on the basis of the image signal input in said step c) in accordance with the image output characteristic set in said step e).

5,771,315  
IMAGE READING APPARATUS AND IMAGE  
PROCESSOR INCORPORATING THE SAME FOR  
COMPARING READ PATTERNS CORRESPONDING TO  
VISIBLE AND INFRARED LIGHT WITH REGISTERED  
PATTERNS TO IDENTIFY COPY-PROHIBITED PRINTED  
MATTER

Kazuhiro Matsuyama, Ikoma, Japan, assignor to Sharp  
Kabushiki Kaisha, Osaka, Japan  
Filed Jun. 14, 1994, Ser. No. 259,958

Claims priority, application Japan, Jun. 15, 1993, 5-143680;  
Jun. 16, 1993, 5-145246

Int. Cl.<sup>6</sup> G06K 9/46; G03G 21/04  
U.S. Cl. 382-191 11 Claims



10. An image processor comprising:  
an image reading apparatus including

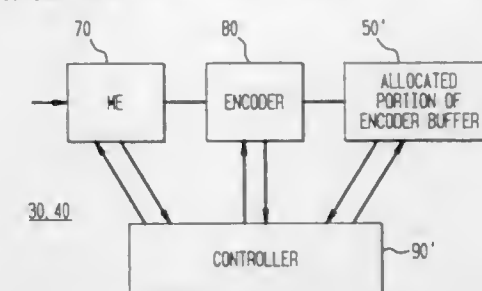
first photoelectric converting means for receiving visible light in reflected light from a color document and reading a first image pattern, corresponding to the visible light, as electrical signals, and

second photoelectric converting means for receiving infrared light in the reflected light from the color document and reading a second image pattern, corresponding to the infrared light, as electrical signals;

comparing means for comparing the first image pattern and the second image pattern with stored registered patterns of copy-prohibited printed matter, and for judging the color document is copy-prohibited Printed matter if the first image pattern and second image pattern resemble the stored registered patterns.

5,771,316  
FADE DETECTION  
K. Metin Uz, Mountain View, Calif., assignor to C-Cube  
Microsystems, Milpitas, Calif.  
Filed Dec. 26, 1995, Ser. No. 578,228  
Int. Cl.<sup>6</sup> G06K 9/36

U.S. Cl. 382-239 4 Claims

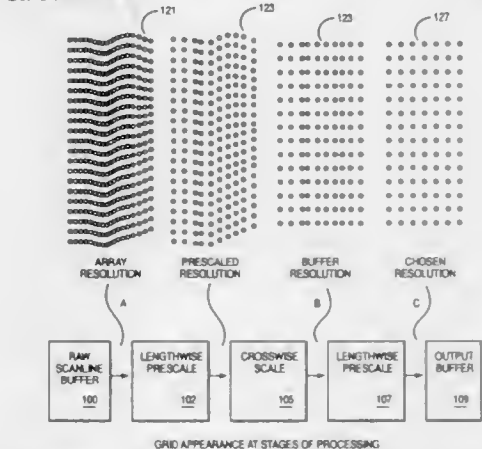


1. In an encoder for encoding a sequence of video frames to generate a compressed bitstream, a method for performing rate control when a fade is detected in said input sequence of video frames, said method comprising the steps of:

- (1) detecting by said encoder the fade by detecting that a DC luminance value of a set of said frames is smoothly approaching a DC luminance value representative of white or a DC luminance value representative of black,
- (2) when a fade is detected, coding and allocating bit budgets by said encoder said frames as I frames or P frames but not B frames, and
- (3) utilizing said bit budgets allocated in accordance with step (2) to code said frames in said fade to generate said compressed bitstream.

5,771,317  
IMAGE RESIZE USING SINC FILTER IN LINEAR  
LUMEN SPACE  
Albert Durr Edgar, Austin, Tex., assignor to International  
Business Machines Corporation, Armonk, N.Y.  
Continuation of Ser. No. 295,317, Aug. 24, 1994, Pat. No.  
5,572,608. This application Jun. 10, 1996, Ser. No. 661,287  
Int. Cl.<sup>6</sup> G06K 9/40

U.S. Cl. 382-260 18 Claims



1. An apparatus for resizing a first image contained in a first array of digital pixels of a first sampling frequency to a second image contained in a second array of digital pixels of a second sampling frequency, comprising:

means for receiving the first array of digital pixels;

a sinc digital filter for converting digital pixel values contained in the first array of digital pixels wherein the first digital pixel values are linearly representative of the brightness of light of the image as it is intended to be finally displayed to digital pixel values stored in the second array of digital pixels; and

means for outputting from the resizing apparatus the digital pixel values contained in pixels of the second array.



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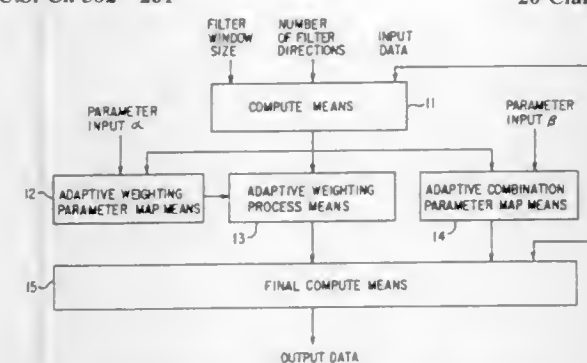
**ADAPTIVE EDGE-PRESERVING SMOOTHING FILTER**  
Ming Fang, Cranbury, and Jianzhong Qian, Princeton Junction, both of N.J., assignors to Siemens Corporate Research, Inc., Princeton, N.J.

Filed Jun. 27, 1996, Ser. No. 672,194

Int. Cl.<sup>6</sup> G06T 5/00

U.S. Cl. 382—261

20 Claims



1. An adaptive edge-preserving smoothing filter comprising: compute means for receiving filter window size, number of filter directions and input data; adaptive weighting parameter map means connected to said compute means; adaptive weighting process means connected to said compute means and said adaptive weighting parameter map means; and, final compute means connected to said adaptive weighting process means for providing filtered output data.

5,771,319

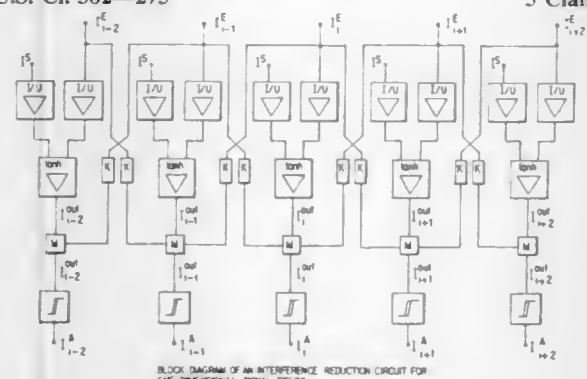
**NETWORK FOR INFLUENCING SIGNAL FIELDS**  
Willy Platz, Munich; Helmut Riedel, Fuerstfeldbruck, and Gerald Sobotta, Sauerlach, all of Germany, assignors to Daimler-Benz Aerospace, Germany

Filed Aug. 30, 1996, Ser. No. 705,716

Int. Cl.<sup>6</sup> H04N 1/409; H03F 1/26; 1/34

U.S. Cl. 382—275

5 Claims



1. Network for influencing signals fields, particularly for the application in electronic image processing, consisting of a plurality of amplifier circuits regularly arranged in an area-type manner, a respective separate amplifier circuit with a signal input ( $I^s$ ) receiving the signal and a signal output ( $I^{out}$ ) being assigned to each signal of the signal field, and, in addition, each signal output by way of coupling elements with an adjustable degree of coupling ( $k$ ) being fed back to the inputs of the respective adjacent amplifier circuits.

5,771,320

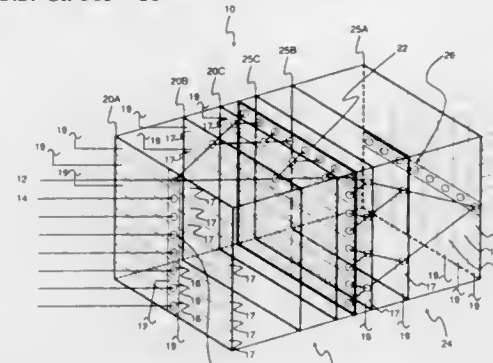
**OPTICAL SWITCHING AND ROUTING SYSTEM**  
Thomas W. Stone, Bethlehem, Pa., assignor to Wavefront Research, Inc., Bethlehem, Pa.

Continuation-in-part of Ser. No. 640,187, Apr. 30, 1996, and Ser. No. 641,195, Apr. 30, 1996. This application Oct. 21, 1996, Ser. No. 734,139

Int. Cl.<sup>6</sup> G02B 6/26; 6/42

U.S. Cl. 385—16

34 Claims



1. An optical switching and routing system comprising: a first router assembly, a second router assembly optically aligned with said first router assembly, and a central plane having an optical redirecting component therein interposed between said first router assembly and second router assembly; said first router assembly being capable of receiving a plurality of individual beams of electromagnetic radiation and having a predetermined orientation, said first router assembly including means defining a plurality of independently controlled segments for directing said plurality of individual beams of electromagnetic radiation from preselected locations along said segments to preselected locations on said optical redirecting component in said central plane; and said second router assembly being different in orientation from said predetermined orientation of said first router assembly, said second router assembly including means defining a plurality of independently controlled segments for receiving each of said individual beams from said optical redirecting component and directing said individual beams for output from said second router assembly.

5,771,321

**MICROMECHANICAL OPTICAL SWITCH AND FLAT PANEL DISPLAY**

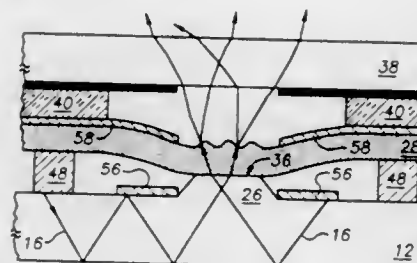
Ernest Stern, Concord, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 4, 1996, Ser. No. 582,790

Int. Cl.<sup>6</sup> G02B 6/26

U.S. Cl. 385—31

63 Claims



1. An optical coupling switch comprising: a light storage plate having a coupling surface, the light storage plate being adapted to internally reflect light injected into the plate; a light tap disposed in a selected spaced relationship with the light storage plate coupling surface for coupling internally reflected light out of the light storage plate and into the light

tap when the light tap is brought into coupling proximity with the light storage plate coupling surface, the light tap including actuation means responsive to an applied electric field for causing the light tap to move to positions toward and away from the light storage plate coupling surface, and the light tap being configured with a stress condition that is selected to constrain movement of the tap in response to an applied electric field to only designated stable positions; and scattering means configured to enable coupled light to penetrate the light tap, for scattering light that is coupled into the light tap.

5,771,322

**LIGHT-RECEIVING STRUCTURE FOR WAVE-GUIDE TYPE OPTICAL DEVICES**

Kiyoto Matsumoto, and Yasuhisa Tanisawa, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 361,560, Dec. 22, 1994, abandoned.

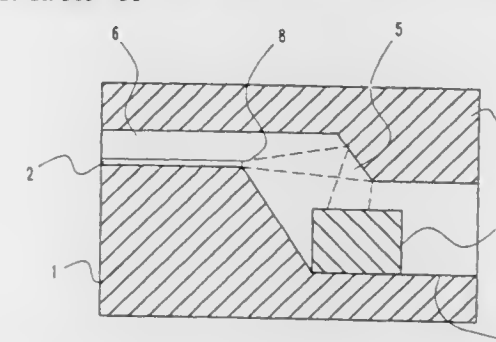
This application Feb. 20, 1997, Ser. No. 803,068

Claims priority, application Japan, Dec. 27, 1993, 5-329290

Int. Cl.<sup>6</sup> G02B 6/42

U.S. Cl. 385—31

13 Claims



1. A light receiving structure for waveguide type optical devices, comprising: a waveguide substrate having a top surface and having a recess lower than said top surface; an optical waveguide formed directly on said waveguide substrate, said optical waveguide having an end face proximate to said recess; a light-receiving element having a receiving face arranged within said recess proximate to said end face of said optical waveguide, said receiving face being lower than said top surface of said waveguide substrate; and a reflector, having a reflective surface above said top surface of said waveguide substrate and a reflective surface below said top surface, arranged near the end face of said optical waveguide on said waveguide substrate, for reflecting light emitted from said end face to a light-receiving face of said light receiving element.

5,771,323

**MICRO-PHOTONICS MODULE**

Gary R. Trott, San Mateo, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

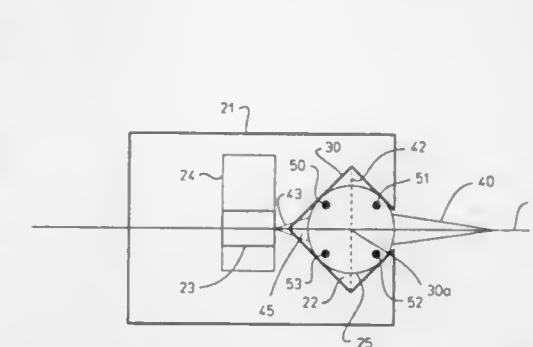
Filed Aug. 28, 1996, Ser. No. 705,867

Int. Cl.<sup>6</sup> G02B 6/36

U.S. Cl. 385—35

20 Claims

1. An optical device, comprising: (A) a substrate; (B) a precision-formed cavity with sloping side walls in the substrate, wherein the cavity is a substantially pyramidal cavity; (C) a photonics device mounted on the substrate at a predefined distance from the cavity with its optical axis aligned with a diagonal of the cavity;



- (D) a spherical lens confined by the side walls of the cavity in a predefined relationship with the photonics device without light beam obstruction.

5,771,324

**POLARIZATION-PRESERVING FIBER OPTIC ASSEMBLY**

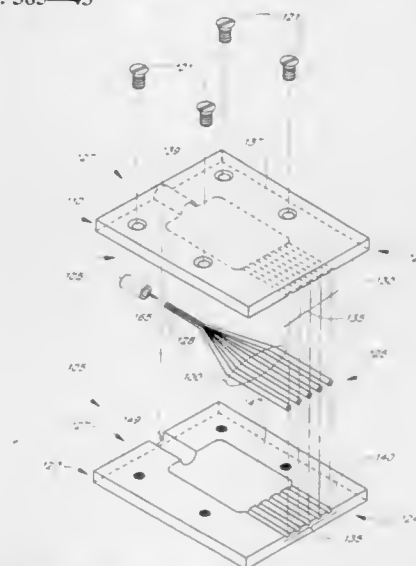
David E. Hargis, La Jolla, Calif., assignor to Laser Power Corporation, San Diego, Calif.

Continuation-in-part of Ser. No. 642,305, May 3, 1996, and Ser. No. 676,821, Jul. 8, 1996. This application Jan. 30, 1997, Ser. No. 791,248

Int. Cl.<sup>6</sup> G02B 6/26

U.S. Cl. 385—43

25 Claims

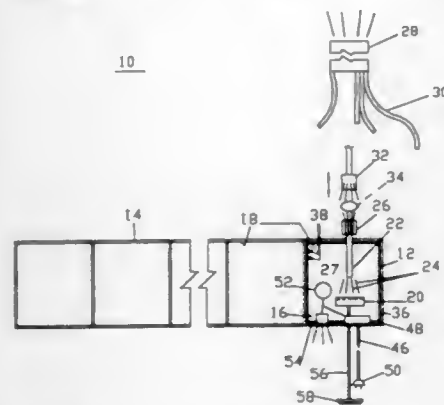


12. An optical fiber coupling assembly for transmitting optical radiation from a plurality of sources having a predetermined polarization, comprising: a plurality of multimode optical fibers each having a first end for receiving said optical radiation with the predetermined polarization and a second end for outputting said optical radiation; and a housing having a first side and a second side, and also including a plurality of channels each having a first end opening on said first side and a second end within said housing; a cavity formed within said housing, said cavity connected to said second ends of said plurality of channels; at least one aperture for connecting said cavity and said second side; said plurality of channels, said cavity, and said at least one aperture providing a passageway for said plurality of optical fibers from said first side of the housing to said second side of the housing; and whereby the polarization of optical radiation transmitted through said plurality of optical fibers is substantially preserved.

5,771,325  
**MODULAR LASER SYSTEM**  
Wolfgang Neuberger, F. T. Labuan, Malaysia, assignor to  
Ceram Uptec Industries, Inc., East Longmeadow, Mass.  
Filed Sep. 30, 1996, Ser. No. 724,082  
Int. Cl. <sup>6</sup> C02B 6/36

U.S. Cl. 385—89

19 Claims



1. A modular laser system comprising:  
a plurality of laser modules, each including at least one laser source for emitting laser radiation;  
an output port coupled to said at least one laser source for transmitting radiation emitted by said at least one laser source;  
means for interchangeably mounting a laser module within said modular laser system;  
means for collecting radiation emitted by said plurality of laser modules and generating a combined beam of radiation; and  
means for interchangeably connecting each module port to said means for collecting radiation emitted by said plurality of laser modules.

5,771,326

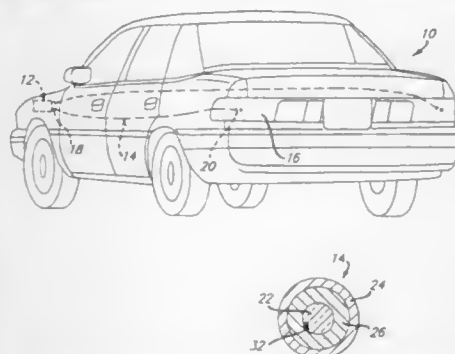
**VISCOUS LIGHT TRAP FOR A LASER-BASED FIBER  
OPTIC VEHICLE LIGHTING SYSTEM**

Timothy Fohl, Carlisle, Mass.; Michael Anthony Marinelli,  
Northville, and Jeffrey Thomas Remillard, Ypsilanti, both of  
Mich., assignors to Ford Global Technologies, Inc., Dear-  
born, Mich.

Filed Jul. 2, 1997, Ser. No. 886,885  
Int. Cl.<sup>6</sup> G02B 6/02

U.S. Cl. 385—123

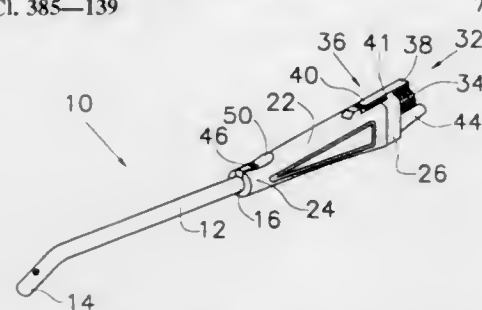
14 Claims



1. A fiber optic light guide for a vehicle lighting system, comprising:

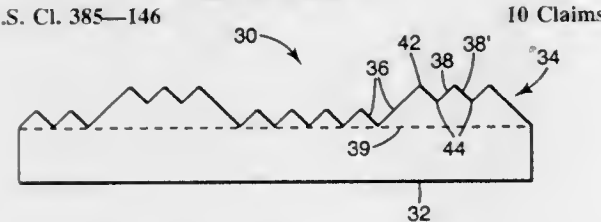
- a light transmissive core having a longitudinal axis;
- a cladding provided circumferentially about and longitudinally cextensive with the light transmissive core; and
- an optically absorptive viscous fluid disposed intermediate the light transmissive core and the cladding, so that if the fiber optic light guide is severed and the light transmissive core is exposed the viscous fluid will flow over and cover the exposed light transmissive core.

5,771,327  
OPTICAL FIBER PROBE PROTECTOR  
David Bar-Or, Englewood; James S. Kimmel, Littleton, and  
Francis A. Roth, Arvada, all of Colo., assignors to Optical  
Biopsy, Knoxville, Tenn.  
Filed Nov. 18, 1996, Ser. No. 749,957  
Int. Cl.<sup>6</sup> G02B 6/36  
U.S. Cl. 385—139  
7 Claims



1. A fiber optic probe protector comprising:  
a sheath defining a tubular configuration, a first end, and a second end;  
a window mounted in said first end of said sheath;  
a handle defining a first end, a second end, an interior cavity and a locking means, said second end of said sheath being mounted to said first end of said handle, said interior cavity and said tubular configuration of said sheath providing a passage for a fiber optic probe therethrough such that the face of the probe abuts against said window, said locking means for locking the fiber optic probe in position; and,  
a vacuum assembly for removing fluid from a surface to be analyzed with the fiber optic probe, said vacuum assembly being configured to provide suction at said first end of said sheath.

5,771,328  
LIGHT DIRECTING FILM HAVING VARIABLE HEIGHT  
STRUCTURED SURFACE AND LIGHT DIRECTING  
ARTICLE CONSTRUCTED THEREFROM  
David L. Wortman, St. Paul; Sanford Cobb, Jr., St. Mary's  
Point, both of Minn., and Mark E. Gardiner, Santa Rosa,  
Calif., assignors to Minnesota Mining and Manufacturing  
Company, St. Paul, Minn.  
Continuation of Ser. No. 400,052, Mar. 3, 1995, abandoned.  
This application Apr. 3, 1997, Ser. No. 832,132  
Int. Cl.<sup>6</sup> G02B 6/10



1. A light directing film comprising a first surface;
  - a structured surface opposite said first surface and having an array of prism elements, each prism element having opposing facets which intersect at a peak, said array including a repeating pattern of prism zones, the pattern including at least:
    - a first zone that measures less than about 300 microns in width and comprising a first prism element having a peak defining a first dihedral angle and disposed at a first distance from a reference plane disposed between the structured surface and the first surface; and
    - a second zone that measures between 200 and 4000 microns in width adjacent said first zone and comprising a second prism element having a peak defining a second dihedral angle substantially equal to the first dihedral angle and disposed at a second distance from the reference plane, said second distance being less than said first distance, whereby, when the

JUNE 23, 1998

structured surface of said light directing film is placed adjacent a planar surface, optical coupling occurs primarily in said first zone.

7) automatically recording said broadcasting signal of said specific channel again if it is determined that said further new channel selection data coincides with said specific channel data stored in step 6.

5,771,329

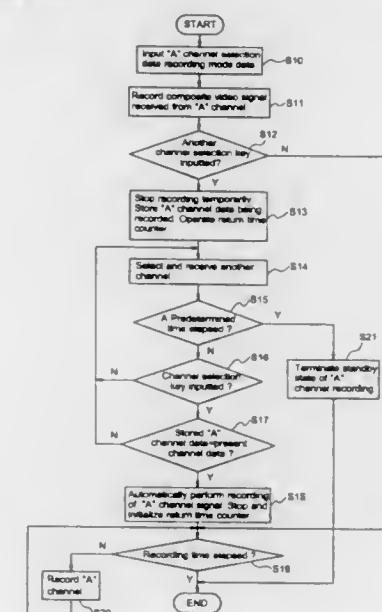
**RECORDING MODE CONTROL METHOD FOR  
COMBINED VIDEO APPLIANCES**

Seok-Ho Yun, Kyungki-do, Rep. of Korea, assignor to Samsung  
Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Oct. 17, 1996, Ser. No. 729,383

Claims priority, application Rep. of Korea, Feb. 27, 1996,  
96-4936

U.S. Cl. 386—46



1. A recording mode control method for combined video appliances comprising the steps of:

- 1) recording a broadcasting signal of a specific channel selected and received in response to input of channel selection and recording mode data;
- 2) determining whether or not data for selecting a new channel is inputted during recording of said specific channel broadcasting signal in step 1;
- 3) switching a recording mode for recording said specific channel broadcasting signal to a stop mode or a still mode, storing said specific channel data, and performing a time-counting operation, if it is determined that said data for selecting a new channel is inputted in step 2;
- 4) determining whether or not a predetermined time has elapsed and displaying a broadcasting signal of said new channel which is tuned according to said data for selecting a new channel inputted in step 2;
- 5) determining whether or not further new channel selection data is inputted before said predetermined time has elapsed as a result of determination in step 4;
- 6) determining whether or not said further new channel selection data coincides with said stored specific channel data if it is determined that said further new channel selection data is inputted in step 5; and

5,771,330

PORTABLE AV EDITING APPARATUS

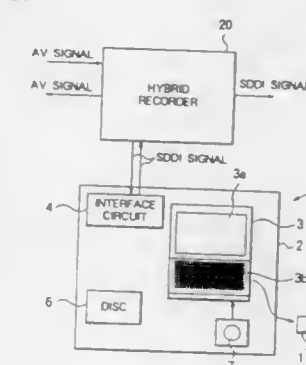
Masayuki Takano, Tokyo; Yoshimori Horiuchi, Kanagawa;  
Ichitaro Sato, Kanagawa; Kazumasa Yamamura, Kanagawa,  
and Noboru Yanagita, Kanagawa, all of Japan, assignors to  
Sony Corporation, Tokyo, Japan

PCT No. PCT/JP95/01617, § 371 Date Aug. 6, 1996, § 102(e)  
Date Aug. 6, 1996, PCT Pub. No. WO96/05695, PCT Pub.  
Date Feb. 22, 1996

PCT Filed Aug. 14, 1995, Ser. No. 624,555

Claims priority, application Japan, Dec. 8, 1994, 6-190748

Int. Cl.<sup>6</sup> H04N 5/93; G11B 27/02



1. A system for editing a video signal, comprising:  
a recording/on-line editing device for recording said video signal  
on a recording medium, and for selectively performing an  
on-line editing operation on said video signal reproduced  
from said recording medium; and

a portable editing device including an interface circuit for selectively connecting said recording/on-line editing device to said portable editing device for providing communication therebetween, including a storage medium for storing said video signal received from said recording/on-line editing device, including a display having a first, a second and a third display portion for displaying said video signal received from said recording/on-line editing device, including an input unit for manipulating said video signal displayed on said display, and including a programmable processor for controlling editing operations;

wherein said portable editing device is operative to record said video signal on said storage medium when said portable editing device is selectively connected to said recording/on-line editing device that performs said on-line editing operation such that a first display portion shows said video signal represented by picture units while receiving said video signal from said recording/on-line editing device, such that a second display portion shows a first picture and a last picture selected from a group of pictures displayed in said first display portion as designated by said input unit, and such that a third display portion shows said group of pictures after said on-line editing operation as controlled by said programmable processor; and wherein when said portable editing device is not connected to said recording/on-line editing device, said portable editing device is operative to perform an off-line editing operation on the reproduced video signal that has been previously transferred to said storage means.



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5,771,331

REPRODUCTION OF INFORMATION USING A RING BUFFER WITH READ AND WRITE POINTERS SEPARATED FROM EACH OTHER BY SUBSTANTIALLY HALF OF THE TOTAL RING BUFFER CAPACITY

Nobuyuki Aoki, Kanagawa; Daisuke Hiranaka, Tokyo; Hajime Nitta, Kanagawa, and Kiyoshi Ota, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

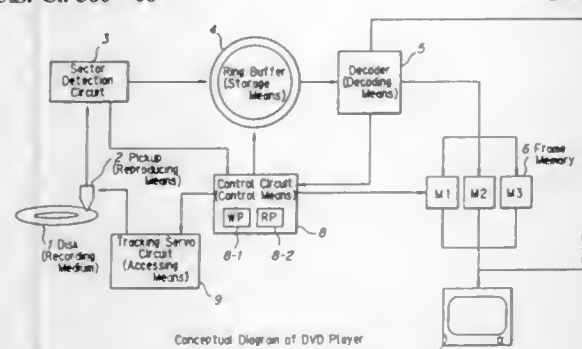
Filed Aug. 29, 1995, Ser. No. 520,837

Claims priority, application Japan, Sep. 5, 1994, 6-234524; Sep. 5, 1994, 6-234527

Int. Cl.<sup>6</sup> H04N 5/783

U.S. Cl. 386—68

8 Claims



1. A method for reproducing information represented by data recorded on a disk, the recorded data being reproduced from said disk and being stored in storage means, said method comprising the steps of:

retrieving the stored data from said storage means, wherein the stored data already retrieved from said storage means and the stored data yet unretrieved from said storage means each occupy substantially half of a total storage capacity of said storage means, the stored data being composed of a plurality of sectors in said storage means, each sector in said plurality of sectors containing a fixed amount of data, and wherein said storage means includes a starting address position at which the recorded data is stored during a current storage operation, the starting address position advanced for each successive storage operation by a value representing a sum of a number of said sectors stored during a preceding storage operation and a number of said sectors stored during the current storage operation, when the information is reproduced in reverse; and decoding the retrieved data.

5,771,332

8 MM VIDEO TAPE RECORDING/REPRODUCING APPARATUS CAPABLE OF PERFORMING A HIGH-SPEED SEARCH OPERATION

Jin-kyu Jeon, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Nov. 27, 1995, Ser. No. 563,017

Claims priority, application Rep. of Korea, Nov. 25, 1994, 92-31288

Int. Cl.<sup>6</sup> H04N 5/91

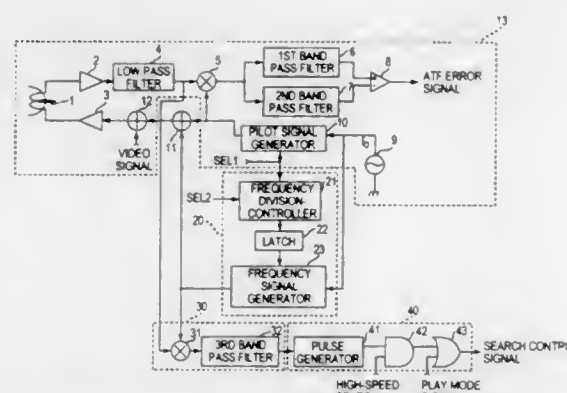
U.S. Cl. 386—69

23 Claims

1. An image recording/reproducing apparatus, which is capable of searching for information recorded on a video tape based on signals recorded on a track of said video tape and which is capable of performing tracking control in accordance with reference pilot signals, the apparatus comprising:

control means for generating a mode selection signal and a pilot selection signal, wherein said mode selection signal indicates whether said apparatus is operating in an index signal record mode or an index signal separation mode;

pilot signal generating means for sequentially and cyclically generating said reference pilot signals;



search reference signal generating means for generating an index signal and an index separation reference signal based on at least one of said mode selection signal and said pilot selection signal;

recording/reproducing means for recording said reference pilot signals output from said pilot signal generating means and said index signal on said video tape and for reproducing a previously recorded index signal and at least a second signal from said video tape; and

index signal separation means for separating said previously recorded index signal from said at least a second signal, wherein said at least a second signal reproduced by said recording/reproducing means comprises reproduced pilot signals which were previously recorded on said video tape, wherein said index signal has a frequency value which is different from frequency values of frequency difference signals, wherein said frequency values of said frequency difference signals respectively correspond to differences between frequencies of said reproduced pilot signals and a frequency of one of said reference pilot signals, and wherein said frequency difference signals are used for said tracking control.

5,771,333

VIDEO SIGNAL EMPHASIS AND DEEMPHASIS METHOD AND APPARATUS

Ryo Hirayama, Kamakura, and Kaoru Kobayashi, Yokohama, both of Japan, assignors to Victor Company of Japan, Yokohama, Japan

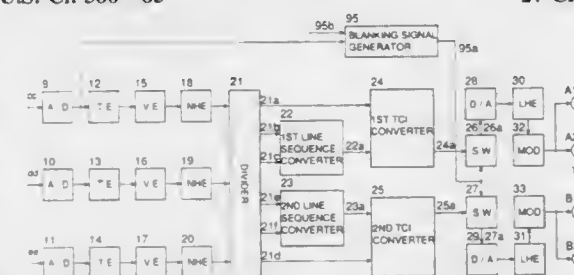
Continuation of Ser. No. 172,226, Dec. 23, 1993, abandoned. This application Aug. 29, 1996, Ser. No. 705,004

Claims priority, application Japan, Dec. 24, 1992, 4-359260

Int. Cl.<sup>6</sup> H04N 5/923

U.S. Cl. 386—85

27 Claims



1. A video signal emphasis method used for obtaining a plurality of groups of time compensated integration (TCI) signals by dividing a plurality of video signals into a plurality of groups, and compressing and multiplexing the divided video signals of groups per line, the method comprising the steps of:

emphasizing levels of high frequency components of the video signals of the groups in a time direction except during a blanking signal period, relative to low frequency components thereof;

emphasizing levels of high frequency components of the time-direction emphasized video signals of the groups in a vertical

direction except during the blanking signal period, relative to low frequency components thereof;

emphasizing levels of high frequency components of the vertical-direction emphasized video signals of the groups in a horizontal direction using non-linear horizontal emphasis for varying emphasis of the high frequency components in accordance with the levels of the vertical-direction emphasized video signals of the groups, relative to low frequency components thereof;

dividing the non-linearly horizontal-direction emphasized video signals into a plurality of groups;

obtaining a plurality of groups of TCI signals by compressing and multiplexing the divided video signals of groups per line; and

emphasizing levels of high frequency components of the TCI signals of groups in the horizontal direction using linear horizontal emphasis, relative to low frequency components thereof.

5,771,334

MULTIMEDIA OPTICAL DISC STORING BOTH VIDEO TITLES PROVIDED WITH AV FUNCTIONS AND VIDEO TITLES WITH NO SUCH FUNCTIONS WHICH CAN INSTANTLY DISTINGUISH BETWEEN SUCH KINDS OF TITLES, AND A REPRODUCTION APPARATUS AND REPRODUCTION METHOD FOR SUCH DISC

Kazuhiko Yamauchi, Neyagawa; Shinichi Saeki, Sennan-gun; Katsuhiko Miwa, Osaka; Masayuki Kozuka, Neyagawa, and Kaoru Murase, Nara-ken, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

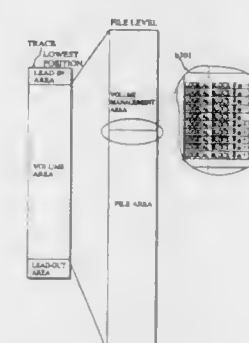
Filed Apr. 11, 1997, Ser. No. 837,271

Claims priority, application Japan, Apr. 12, 1996, 8-090891

Int. Cl.<sup>6</sup> H04N 5/781; 5/85; 5/92

U.S. Cl. 386—95

26 Claims



VIDEO MANAGER INTERNAL TITLE SEARCH POINTER TABLE			
SEARCHED TITLE	SEARCHED TRACK	SEARCHED FRAME	SEARCHED VIDEO
TITLE SEARCH POINTER #1	ON	ON	ON
TITLE SEARCH POINTER #2	ON	ON	ON
TITLE SEARCH POINTER #3	ON	ON	ON
TITLE SEARCH POINTER #4	ON	ON	ON
TITLE SEARCH POINTER #5	ON	ON	ON
TITLE SEARCH POINTER #6	ON	ON	ON
TITLE SEARCH POINTER #7	ON	ON	ON
TITLE SEARCH POINTER #8	ON	ON	ON
TITLE SEARCH POINTER #9	ON	ON	ON
TITLE SEARCH POINTER #10	ON	ON	ON

1. A multimedia optical disc comprising a title area and a manager area, wherein

the title area stores a plurality of video titles, each of which is a video production and which each include route information and a plurality of pieces of video information retrieved according to the route information,

wherein there are three types of video titles which are a first type, a second type, and a third type, with video titles of the first type being retrieved according to only a piece of route information, video titles of the second type being retrieved according to a plurality of pieces of route information and branch information, and video titles of the third type being retrieved according to a plurality of pieces of route information without the branch information,

and wherein the manager area includes:

an address management information area for storing a plurality of pieces of address management information which each include an address of one of the plurality of video titles; and

a playback type information area for storing a plurality of pieces of playback type information, wherein the plurality of pieces of playback type information correspond to the plurality of pieces of address management information, each of the plurality of pieces of playback type information including a first flag and a second flag, of which the first flag indicates whether a corresponding video title is retrieved according to a piece of route information or according to a plurality of pieces of route information, and the second flag indicates whether the route information of the corresponding video title includes the branch information.

5,771,335

FAST FORWARD/REVERSE TRAVEL CONTROLLING METHOD FOR VIDEO ON DEMAND SYSTEM

Seung Hwan Lee, Seoul, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

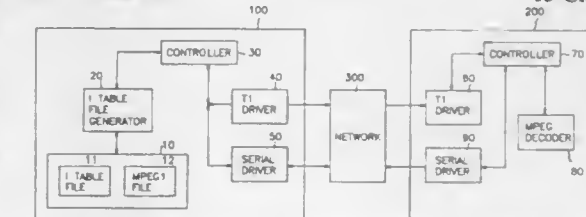
Filed Dec. 22, 1995, Ser. No. 577,219

Claims priority, application Rep. of Korea, Jan. 25, 1995, 1995/1273

Int. Cl.<sup>6</sup> H04N 5/76

U.S. Cl. 386—111

15 Claims



1. A fast forward/reverse travelling controlling method comprising the steps of:

preparing an I table using a packet from a moving picture expert group (MPEG) file during a normal play mode;

increasing an I table pointer by an I table size based on said I table, and determining a size of a video packet to be transmitted using said I table, during a conversion from said normal play mode to a fast forward play mode, so that the video packet to be transmitted during the fast forward play mode always contains an I-frame; and

decreasing said I table pointer by the I table size based on said I table, and determining a size of a video packet to be transmitted using said I table, during a conversion from said normal play mode to a fast reverse travelling mode, so that the video packet to be transmitted during the fast reverse travelling mode always contains an I-frame.

5,771,336

ELECTRICALLY STABLE METHODS AND APPARATUS FOR CONTINUOUSLY ELECTROHEATING FOOD

Thaddeus J. Polny, Jr., 705 Suburban Rd., Union, N.J. 07083

Division of Ser. No. 470,020, Jun. 6, 1995, which is a division of Ser. No. 71,572, Jun. 3, 1993, which is a continuation-in-part of Ser. No. 7,553, Jan. 22, 1993, abandoned. This application Mar. 18, 1996, Ser. No. 617,110

Int. Cl.<sup>6</sup> H05B 3/60

U.S. Cl. 392—321

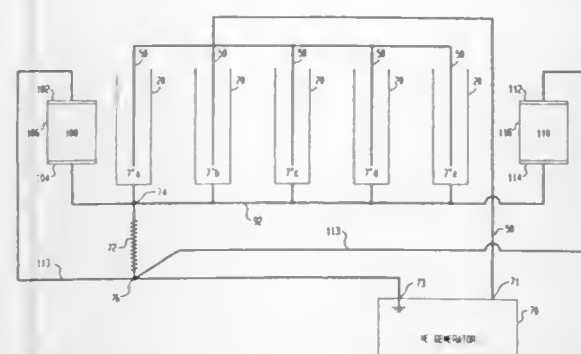
13 Claims

1. An electrically stable electroheater for continuously treating pumpable food comprising:

a source of AC electric current;

a food inlet;

at least one first electroheating cell in fluid communication with said inlet, said cell including a first electrically conductive



electrode and a second electrically conductive electrode, said first and said second electrodes being separated by a first gap such that said food can flow through said first gap, said electrodes being linked to said source of AC electric current such that said current flows through said food in said first gap; at least one resistor electrically connected in parallel to said electroheating cell for reducing arcing in and fouling of said food; and  
a food outlet in fluid communication with said electroheating cell.

5,771,337

**CELL FOR ELECTRONIC DIFFUSION NETWORK  
MAKING IT POSSIBLE TO CREATE RECEPTIVE  
FIELDS IN PSEUDO-AXONAL NETWORKS AND  
NETWORK APPLYING SAME**

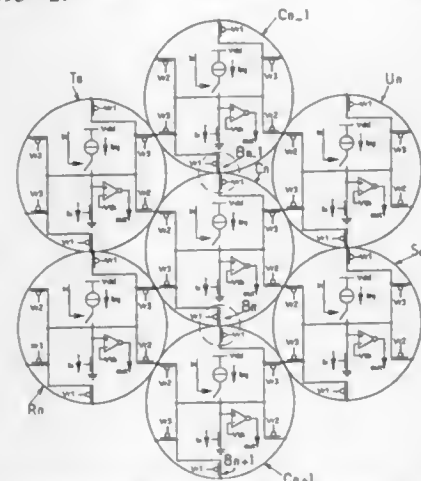
Philippe Venier, Grenchen, Switzerland, assignor to Centre Suisse D'Electronique et de Microtechnique SA, Neuchatel, Switzerland

Filed Jun. 20, 1996, Ser. No. 667,822

Claims priority, application France, Jun. 23, 1995, 95 07578  
Int. Cl.<sup>6</sup> G06F 15/18

U.S. Cl. 395—27

11 Claims



1. A pseudo-axonal information diffusion network comprising a plurality of interconnected cells, each of said cells including at least one linking element having a nonlinear conduction characteristic, each for connecting the cell to an adjacent cell of the network, each linking element having a control input for individually varying the conductance of the linking element in response to an applied signal that is independent of the state of any other cell of said network;

- a connection node whose potential is representative of the excited state of said cell, said at least one linking element being connected to said node;
- a constant current source and a current consuming element connected in a series circuit with said node on either side thereof so as to fix said potential of said node;
- a switch connected in series between said current source and said node and being individually controlled by activation pulses.

**5,771,338  
ERROR DIFFUSION ARCHITECTURE WITH  
SIMULTANEOUS PRINT AND STORE DATA PATHS FOR  
CONVERTING A SCANNED IMAGE INTO MULTIPLE  
COPIES OF A PRINTED IMAGE**

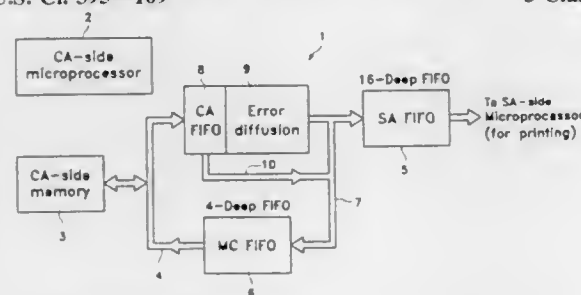
Hoang Nhu, Irvine, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 26, 1996, Ser. No. 721,285

Int. Cl.<sup>6</sup> H04N 1/00; 1/40; G06F 15/00

U.S. Cl. 395—109

5 Claims



1. Copy apparatus comprising:

- a dedicated half-tone processor for converting a scanned image data with many intensity levels into printed image data having only a few intensity levels;
  - a scanned image processor operable independently of the dedicated half-tone processor for inputting the scanned image data from a scanning mechanism;
  - an addressable image memory associated with the scanned image processor;
  - a scanned image buffer for coupling an input of the dedicated half-tone processor to the addressable memory;
  - a multicopy buffer for coupling an output of the dedicated half-tone processor to the addressable memory;
  - a printed image processor operable independently of the dedicated half-tone processor and the scanned image processor for outputting the printed image data to an ink jet printing mechanism; and
  - a printed image buffer for coupling said dedicated half-tone processor output to the printed image processor;
- wherein at least in a multicopy black mode, a second copy of the scanned image is output from the addressable memory to the printed image buffer, bypassing the dedicated half-tone processor.

5,771,339

**METHOD FOR AUTOMATICALLY DERIVING PRINT  
ENGINE CAPABILITIES FOR INCREMENTAL  
SCHEDULING FROM COMPOSITIONAL PRINT ENGINE  
MODELS**

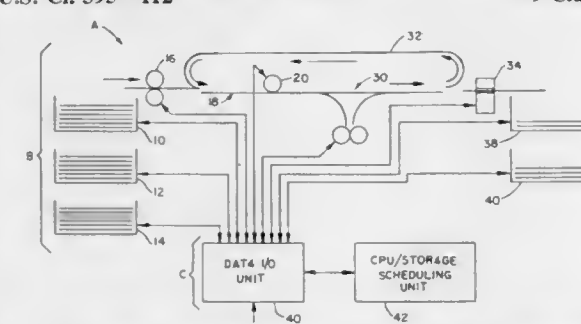
Markus P. J. Fromherz, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Jun. 7, 1995, Ser. No. 485,848

Int. Cl.<sup>6</sup> G06K 15/00

U.S. Cl. 395—112

9 Claims



1. In a print engine apparatus, a method of determining a capability of the print engine apparatus to assemble a first product described by a first product specification, the method comprising the steps of:

providing a model for a print engine apparatus configuration, the model including an interconnected set of transfer functions characterizing the print engine apparatus configuration, each transfer function among said set of transfer functions describing a capability of at least one of print engine components of the print engine apparatus configuration to generate an input part from an output part, at least one of the print engine components being a physical element of the print engine apparatus, and each print engine component being described independent of any reference to or interaction with other components;

performing an event-based backwards simulation of said model by applying said first product specification to at least one output port of the model; and

determining a capability of the print engine apparatus to assemble said first product described by the first product specification based on a result of said event-based backwards simulation, said event-based backwards simulation acting to compose the capabilities of each of the print engine components by accumulating, attribute constraints; resource allocations and timing constraints; and, names and arguments of an executed capabilities stored in an itinerary list, whereby said capability of the print engine apparatus is realized based on an existence of a posting of a transformed work unit from a first one of the print engine components to an exit port of a second one of the print engine components when said exit port of said second one of the print engine components is said output port of said model of said print engine apparatus.

5,771,340

**DATA COMPRESSION METHOD AND PRINT  
PROCESSING DEVICE UTILIZING THE SAME**

Hirohiko Nakazato, and Hideo Sutoh, both of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan  
Continuation of Ser. No. 371,681, Jan. 12, 1995, abandoned.

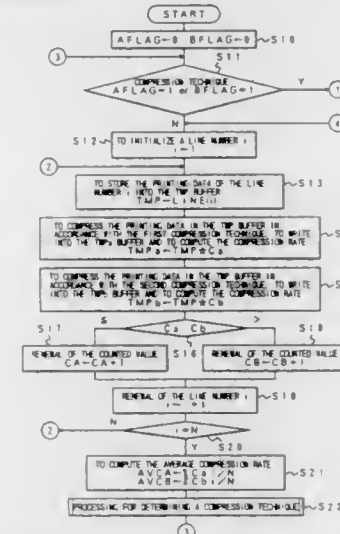
This application Dec. 18, 1996, Ser. No. 770,472

Claims priority, application Japan, Jan. 14, 1994, 6-002370

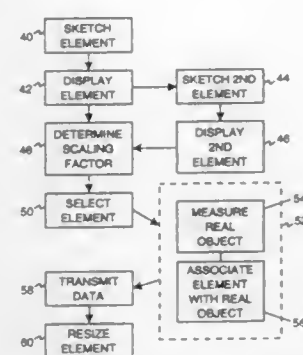
Int. Cl.<sup>6</sup> G06K 15/00

U.S. Cl. 395—114

32 Claims







entering first and second geometric elements on a computer, said first and second geometric element being associated with a geometric figure;  
displaying the first and second geometric elements on a display associated with the computer;  
sizing the first element to a first apparent dimension and the second element to a second apparent dimension respectively which are linked with respective graphical size on the display screen;  
assigning a first real dimension to the first geometric element; associating the first real dimension with a scaling factor of the computer display screen;  
graphically displaying the real dimension on the computer screen;  
assigning a second real dimension to the second geometric element;  
graphically displaying the real dimension on the computer screen; and  
redrawing the second element prior to the figure being maximally dimensioned so that the second element has an apparent dimension approximately equal to a ratio of the second real dimension to the scaling factor.

5,771,343  
SYSTEM AND METHOD FOR FAILURE DETECTION  
AND RECOVERY

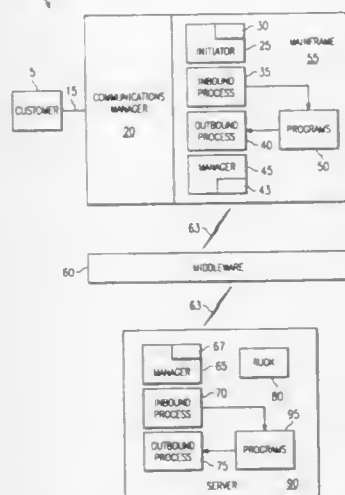
Edward A. Hafner, Dublin; Charles J. Batka, Hilliard, and Elizabeth P. Mellott, Butler, all of Ohio, assignors to Sterling Commerce, Inc., Dublin, Ohio

Filed Feb. 14, 1996, Ser. No. 600,013

Int. Cl. G06F 11/00

U.S. Cl. 395-182.02

23 Claims



13. A transaction processing system for processing individual transactions and batches of transactions and providing failure detection and recovery comprising:  
a main frame computer;

at least one remote server, said at least one server in communication with said mainframe computer;  
said at least one remote server processing transaction batches sent by the mainframe computer;  
manager means running said at least one remote server for managing processing of said transaction batches;  
failure detection means for detecting a failure of batch processing when the processing of said batch requires longer than predetermined amount of time on said at least one remote server, said failure detection means notifying said manager means in the event of a failure; and  
said manager means further comprising startup means responsive to said failure detection means for starting said failed batch on said mainframe computer.

5,771,344  
COMPUTER SYSTEM WITH REMOTELY DUPLICATED  
AND DYNAMICALLY RECONFIGURABLE MEMORY

Wing Ming Chan, Pleasanton, Calif.; Wouter Senf, Blaricum, Netherlands; Timothy C. K. Chou, Palo Alto, Calif.; Mark H. Roettgering, Sunnyvale, Calif.; Nusret Yurutucu, Gilroy, Calif., and Craig F. Adams, San Jose, Calif., assignors to Tandem Computers Incorporated, Cupertino, Calif.

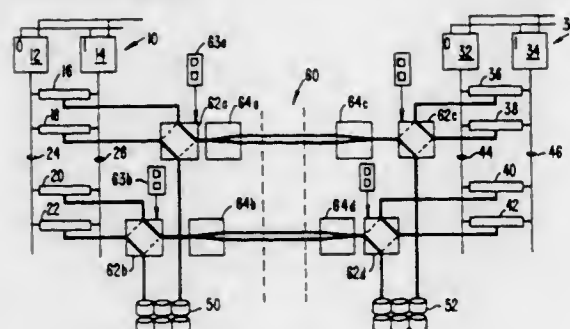
Continuation of Ser. No. 431,330, Apr. 27, 1995, abandoned.

This application Sep. 9, 1996, Ser. No. 709,787

Int. Cl. G06F 13/00

U.S. Cl. 395-182.05

4 Claims



3. A computer network comprising:  
a primary computing system having network input and output ports;  
a secondary computing system having network input and output ports;  
a network input fiber for providing data from said network;  
a network output fiber for providing data to said network;  
first and second fiber optic switches, each having a first terminal, a second terminal, a first contact, and a second contact, with each switch configurable in either a first configuration, where the first terminal is connected to the first contact and the second terminal is connected to the second contact or a second configuration where the first terminal is connected to the second contact and second terminal is connected to the first contact each switch also having a control input for receiving a control signal to control the configuration of the switch;  
said first fiber optic switch having its first terminal coupled to the network input fiber, its second terminal coupled to the network output port of said primary computing system, its first contact coupled to the second contact of said second fiber optic switch, and its second contact coupled to the network input said primary computer system;  
said second fiber optic switch having its first terminal coupled to the network output fiber, its second terminal coupled to the network input port of said secondary computing system, its first contact coupled to the second contact of said first fiber optic switch;

a switch controller, having a local control input port for receiving a command and a control output coupled to the control inputs of said first and second fiber optic switches, for flipping said first and second switches from one configuration to another configuration when a command is received to connect either said first computing system or said second computing system to said network under control of said command.

5,771,345  
INTEGRATED DIGITAL PROCESSING DEVICE AND  
METHOD FOR EXAMINING THE OPERATION  
THEREOF

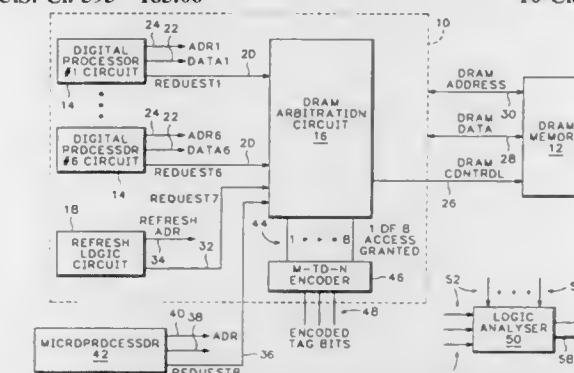
James L. Tallman, and John Dierks, both of Beaverton, Oreg., assignors to Tektronix, Inc., Wilsonville, Oreg.

Filed Apr. 25, 1996, Ser. No. 638,058

Int. Cl. G06F 11/00

U.S. Cl. 395-183.06

10 Claims



1. An integrated digital processing device adapted to communicate with external memory, comprising:  
a plurality of digital processor circuits disposed within said integrated digital processing device; and  
a memory access arbitration circuit for determining which of said plurality of digital processor circuits is to have access to said external memory; wherein,  
said arbitration circuit includes at least one externally-accessible tag line for providing signals representative of which of said plurality of digital processor circuits currently has access to said external memory.

5,771,346  
APPARATUS AND METHOD FOR DETECTING OVER-  
PROGRAMMING CONDITION IN MULTISTATE  
MEMORY DEVICE

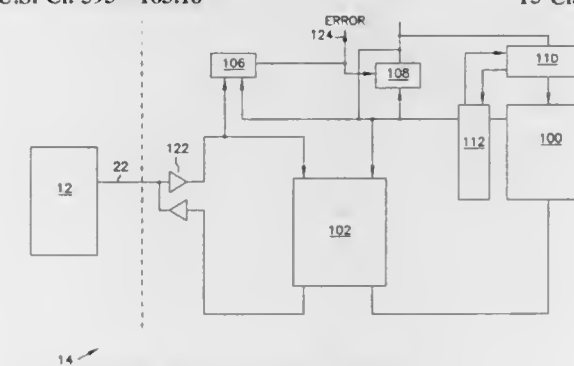
Robert D. Norman, San Jose, and Christophe J. Chevallier, Palo Alto, both of Calif., assignors to Micron Quantum Devices, Inc., Santa Clara, Calif.

Filed Oct. 24, 1996, Ser. No. 736,195

Int. Cl. G11C 29/00; 11/34

U.S. Cl. 395-183.18

13 Claims



1. A multistate memory system comprising:  
an array of multistate memory cells; and

a controller coupled to the array and configured to control data processing operations performed on the memory cells in the array, the controller comprising an over-programming condition detector configured to detect an over-programmed state of a memory cell in the array, wherein the over-programming condition detector comprises an error signal generator having a set of logic gates coupled to receive data programmed into the cell and data intended to be programmed into the cell, said set of logic gates being configured to assert an error signal when the data programmed into the cell is over-programmed relative to the data intended to be programmed into the cell.

5,771,347  
APPARATUS AND METHOD TO ALLOW A USER A  
TRIAL PERIOD BEFORE LICENSING A SOFTWARE  
PROGRAM PRODUCT

Jeffrey A. Grantz, Boca Raton, and J. Robert Ure, Coral Springs, both of Fla., assignors to International Business Machines Corp., Armon, N.Y.

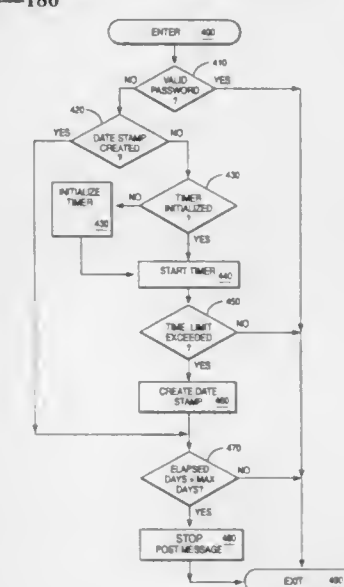
Continuation of Ser. No. 246,648, May 20, 1994, Pat. No.

5,564,038. This application Jun. 27, 1996, Ser. No. 671,228

Int. Cl. G06F 12/14; 1/14

U.S. Cl. 395-186

18 Claims



1. A method for preventing continued use of a protected computer program product in a data processing system beyond a test period, comprising the steps of:  
determining that a predetermined amount of use of the data processing system has occurred, the predetermined amount of use indicating that productive use of the data processing system has begun;  
responsive to the determination of the predetermined amount of use, setting the test period by storing a current date as a beginning of a designated test period;  
periodically determining whether the designated test period has ended by comparison of a current date with the stored date; and  
responsive to the determination that the designated test period has ended, causing the protected computer program product to be disabled.

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5,771,348

**METHOD AND ARRANGEMENT FOR ENHANCING THE SECURITY OF CRITICAL DATA AGAINST MANIPULATION**

Ralf Kubatzki, and Wolfgang Thiel, both of Berlin, Germany, assignors to Francotyp-Postalia AG & Co., Birkenwerder, Germany

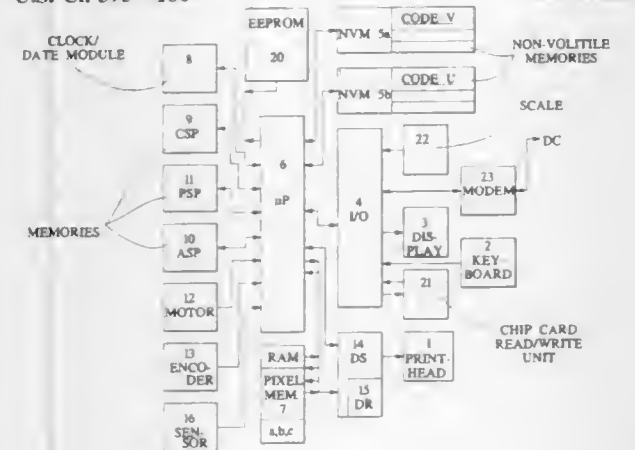
Filed Sep. 9, 1996, Ser. No. 711,091

Claims priority, application Germany, Sep. 8, 1995, 195 34 527.4; Sep. 8, 1995, 195 34 529.0

Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 395—186

46 Claims



1. A method for enhancing security of critical data against manipulation in an information-processing system, comprising the steps of:

- storing a list containing a plurality of code words in an internal processor memory of a processor in a system containing critical data to be protected;
- loading an identifier into a first non-volatile memory in said system, said identifier identifying one of said code words in said list;
- loading said one of code words, as a current code word into a second non-volatile memory of said system, said second non-volatile memory containing the critical data;
- conducting a validity check of said current code word at least at a time said system is turned on by comparing said current code word to the code word in said list identified by said identifier;
- given validity of said current code word as a result of comparison with the code word in said list identified by said identifier, permitting access to said critical data and replacing said current code word with a predetermined, new code word;
- given invalidity of said current code word as a result of comparison with the code word in said list identified by said identifier, blocking said system from further operation after said system is turned on; and
- after each validity check, modifying said identifier to identify a new one of said code words dependent on a last operating condition of said system and replacing said one of said code words in said second memory with said new one of said code words as said current code word.

5,771,349

**NETWORK PACKET SWITCH USING SHARED MEMORY FOR REPEATING AND BRIDGING PACKETS AT MEDIA RATE**

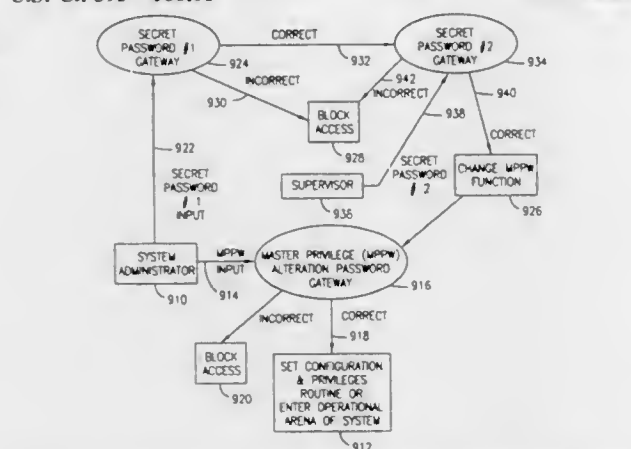
Jose J. Picazo, Jr., San Jose; Paul Kakul Lee, Union City, and Robert P. Zager, San Jose, all of Calif., assignors to Compaq Computer Corp., Houston, Tex.

Division of Ser. No. 694,491, Aug. 7, 1996, which is a continuation of Ser. No. 498,116, Jul. 5, 1995, which is a continuation-in-part of Ser. No. 881,931, May 12, 1992, Pat. No. 5,432,907. This application Jan. 28, 1997, Ser. No. 788,433

Int. Cl.<sup>6</sup> G06F 12/14; H04L 9/00

U.S. Cl. 395—188.01

10 Claims



1. A process for providing security against unauthorized alteration of a master password, comprising the steps of:
  - using a computer to receive a request for access to some function said computer is programmed to perform which is gated by a master password gateway;
  - using the display of said computer to request entry of a master password and using said computer to receive whatever password(s) is/are entered by said user in response to said request and compare said entered password(s) to said master password;
  - if all said password(s) entered in response to said request to enter a master password does/do not match said master password, blocking access to said function desired by the user;
  - if at least one of said password(s) entered in response to said request to enter a master password does match said master password, allowing said user to access the function guarded by said master password gateway; and
  - using said computer to receive a request to change said master password, and, in response to said request, displaying on a display of said computer a request to enter a first secret password;
  - using said computer to receive whatever password(s) is/are entered in response to said request said first secret password and compare whatever password(s) was/were entered to said first secret password;
  - if the password(s) entered in response to the request to enter said first secret password is/are all incorrect, blocking access to said function to change said master password;
  - if at least one of the password(s) entered in response to the request to enter said first secret password is correct, displaying a request on a display of said computer to enter a second secret password;
  - using said computer to receive whatever password(s) is/are entered in response to the request to enter said second secret password and comparing the entered password(s) to said second secret password;
  - if all said password(s) entered in response to said request to enter said second secret password are incorrect, blocking access to said function to change said master password;
  - if at least one of said password(s) entered in response to said request to enter said second secret password is correct, allowing access to said function to change said master password.

5,771,350

**ASYNCHRONOUS TRANSFER MODE(ATM) NETWORK ADAPTOR FOR THE SIMULTANEOUS PROCESSING OF THE MULTI-CHANNEL TRAFFIC**

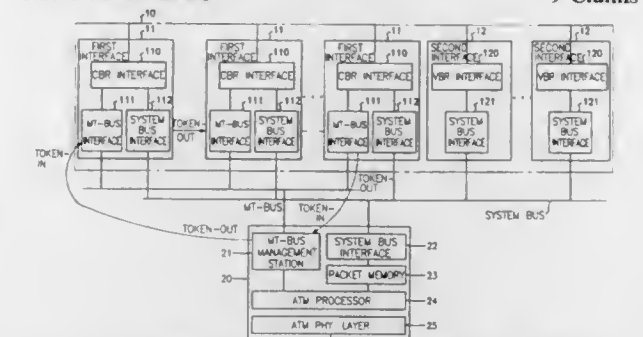
Dong Won Kim, Daejeon, Rep. of Korea, assignor to Electronics and Telecommunications Research Institute, Daejeon, and Korea Telecommunication Authority, Seoul, both of Rep. of Korea

Filed Apr. 9, 1996, Ser. No. 630,100

Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395—200.8

9 Claims



1. An Asynchronous Transfer Mode(ATM) network adaptor for the simultaneous processing of the multi-channel traffic, comprising:

- a R-interface(RIF) means composed of a plurality of first interface means, which output the CBR traffic according to their token signal indicating a point of time occupying the bus or in the case of having the same header address as its own, after receiving the external CBR traffic, and composed of a plurality of second interface means which receive external VBR traffic and also output it to the external;
- a Multiplexed Traffic Bus(MT-bus) means, connected to said first interface means, being used for transmitting multiplexed channels by providing constant bandwidth necessary for the CBR traffic transmission;
- a system bus means, connected to said first and second interface means, and used for transmitting not only the VBR traffic of said second interface means but also the resource control signal of the system; and
- an ATM Network Interface(ANI) means used for transmitting the CBR traffic from said first interface means to the ATM network over said MT-bus means after receiving a token signal from said first interface means and also contrariwise, and for transmitting the VBR traffic from said second interface means to the ATM network and also contrariwise.

5,771,351

Patent Not Issued For This Number

5,771,352

**COMMUNICATION CONTROL APPARATUS AND METHOD**

Makoto Nakamura, Yosuke Tajika, both of Hyogo-ken; Akihiko Sugikawa, Osaka-fu; Masako Sato, Tokyo; Kazuaki Iwamura, and Teruhiko Ukita, both of Hyogo-ken, all of Japan, assignors to Kabushiki Kaisha Toshiba, Japan

Filed Apr. 12, 1995, Ser. No. 420,851

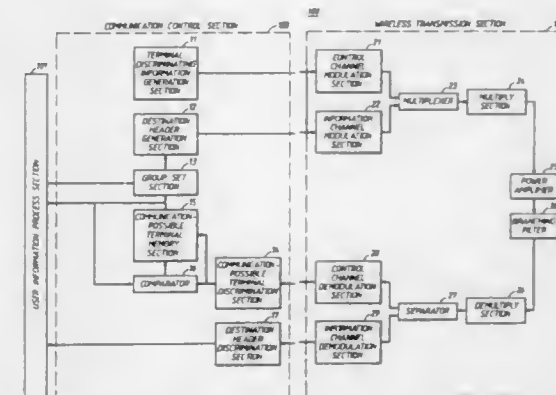
Claims priority, application Japan, Apr. 14, 1994, 6-075757; Apr. 28, 1994, 6-091599; Apr. 28, 1994, 6-091600

Int. Cl.<sup>6</sup> H04B 1/00

U.S. Cl. 395—200.57

35 Claims

1. Communication control apparatus for use in a particular terminal which can communicate with other terminals, comprising:
  - transmission means for transmitting terminal discriminating information to discriminate the particular terminal;



receiving means for receiving terminal discriminating information transmitted by other terminals;  
discrimination means for discriminating at least one other terminal capable of communicating with the particular terminal in accordance with the terminal discriminating information received by said receiving means;  
group-setting means for setting the particular terminal and at least one other terminal discriminated by said discrimination means as member terminals of a group; and  
information sending means for sending information to at least one member terminal of the group.

5,771,353

**SYSTEM HAVING VIRTUAL SESSION MANAGER USED SESSIONLESS-ORIENTED PROTOCOL TO COMMUNICATE WITH USER DEVICE VIA WIRELESS CHANNEL AND SESSION-ORIENTED PROTOCOL TO COMMUNICATE WITH HOST SERVER**

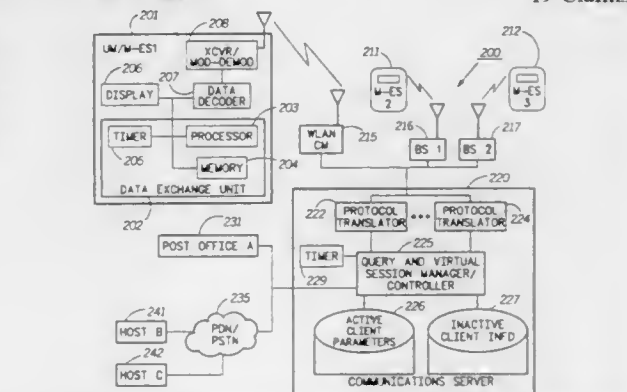
Gene Eggleston, Cary, and Mitch Hansen, Fox River Grove, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.

Filed Nov. 13, 1995, Ser. No. 557,657

Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395—200.57

19 Claims



1. A system for communicating data with a user device comprising:
  - a host server for which the user device is a client;
  - a communications server, in communication with the host server, comprising a virtual session manager adapted to control communication of data between the user device and host server by communicating the data via a sessionless-oriented communication protocol over a first communication channel between the virtual session manager and the user device, and by sending a registration message from the communications server to the host server registering the user device with the host server as a client of the host server, and thereby establishing a session between the virtual session manager and the host server and communicating the data via a session-oriented communication protocol between the virtual session manager and the host server; and
  - a base station, in communication with the communications server via a first portion of the first communication channel



and in communication with the user device via a wireless communication channel portion of the first communication channel.

**5,771,354**  
**INTERNET ONLINE BACKUP SYSTEM PROVIDES REMOTE STORAGE FOR CUSTOMERS USING IDS AND PASSWORDS WHICH WERE INTERACTIVELY ESTABLISHED WHEN SIGNING UP FOR BACKUP SERVICES**

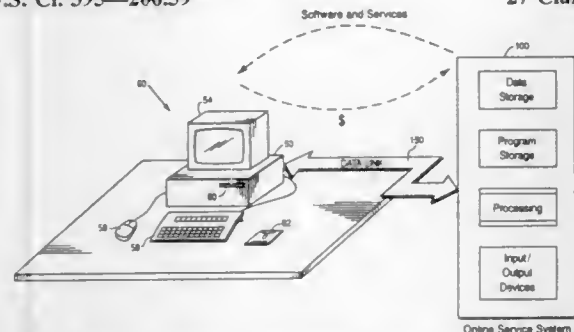
Christopher M. Crawford, 3010 Wisconsin Ave., NW, Apt. C-8, Washington, D.C. 20016

Filed Nov. 4, 1993, Ser. No. 145,825

Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395—200.59

27 Claims



1. An online computer system providing commercial backup services to remote customer computers over the Internet by performing the following steps:

- providing at least one remote storage area for use in storing customer backup information;
- establishing a first online Internet session with a customer's computer;
- allowing the customer to sign up for backup services over the first online Internet session, including the step of establishing a customer identifier and associated password for the customer;
- establishing a second online Internet session with the customer's computer;
- requesting the customer to input the customer identifier and associated password established by step (c);
- validating the customer identifier and password requested by step (e);
- conditioned at least in part on validating step (f), allowing the customer to access the remote storage area over the second Internet session substantially as if the remote storage area was a backup storage device physically and/or locally attached to the customer's computer, including the steps of:
  - encrypting backup data provided by the customer's computer,
  - transmitting the encrypted backup data to the online backup service provider over the second online Internet session, and
  - storing the backup data in the remote storage area provided by the online backup service provider.

**5,771,355**  
**TRANSMITTING ELECTRONIC MAIL BY EITHER REFERENCE OR VALUE AT FILE-REPLICATION POINTS TO MINIMIZE COSTS**

Andrew J. Kuzma, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

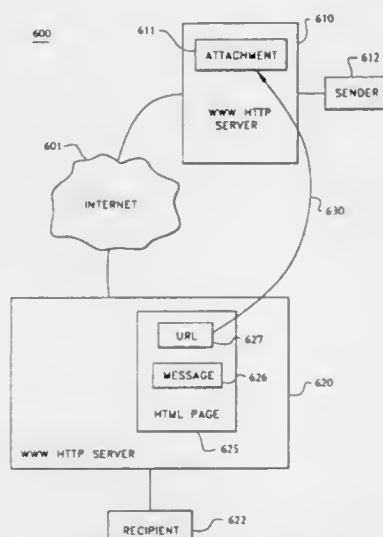
Filed Dec. 21, 1995, Ser. No. 576,006

Int. Cl.<sup>6</sup> G06F 15/163

U.S. Cl. 395—200.62

44 Claims

1. A method for transmitting e-mail over a network, comprising the steps of:



(a) receiving at a current node in the network an e-mail message to be distributed to at least one recipient, the e-mail message comprising an attachment reference comprising the network address of an attachment stored locally to a previous node of the network;

(b) comparing the expected costs of moving the attachment from the previous node to the at least one recipient by use of the attachment reference, to the costs of moving the attachment locally to the current node plus the expected costs of moving the attachment from the current node to the at least one recipient by use of the attachment reference; and

(c) retrieving a copy of the attachment, storing the attachment locally to the current node, and updating the attachment reference, in accordance with the comparison.

**5,771,356**  
**APPARATUS FOR CONTROLLING FIFO BUFFER DATA TRANSFER BY MONITORING BUS STATUS AND FIFO BUFFER THRESHOLDS**

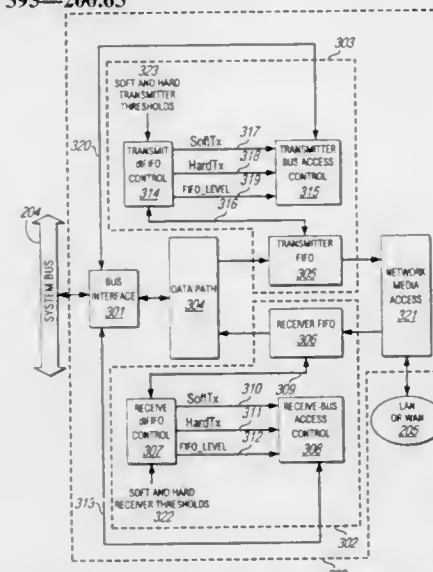
Geary Leger, and Sriraman Chari, both of Fremont, Calif., assignors to Cirrus Logic, Inc., Fremont, Calif.

Filed Jan. 4, 1995, Ser. No. 368,562

Int. Cl.<sup>6</sup> G06F 13/00; 13/14

U.S. Cl. 395—200.63

37 Claims



27. An apparatus for controlling data transfer by a FIFO buffer coupled between a system bus and an external interface, comprising:

- first means for monitoring quantity of data stored in said FIFO buffer;

second means for monitoring a status of said system bus by determining whether said system bus is idle, busy, or being requested by another device coupled to said system bus; means for establishing first and second data thresholds associated with said FIFO buffer; means for comparing data stored in said FIFO buffer to said first and second data thresholds; means response to said first monitoring means, said second monitoring means, and said comparing means for casually or more aggressively acquiring the control of said system bus, selectively, for transferring data depending on the state of said FIFO buffer and the state of said system bus; and means for dynamically adjusting at least one of said first and second data thresholds depending on the fluctuating amount of activities on said bus.

**5,771,357**  
**ENCODING/DECODING FIELDS OF PREDETERMINED FIELD POLARITY APPARATUS AND METHOD**  
Motoki Kato; Hideki Koyanagi, both of Kanagawa, and Toru Wada, Saitama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

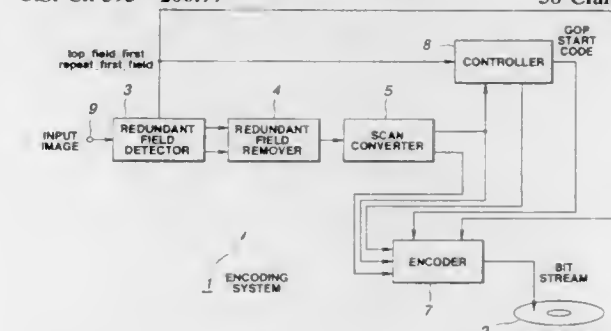
Filed Aug. 22, 1996, Ser. No. 701,754

Claims priority, application Japan, Aug. 23, 1995, 7-214675

Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395—200.77

58 Claims



1. A moving picture encoding apparatus for encoding frames of a moving picture into groups of video image pictures including an intra-frame image picture, said frames being composed of a plurality of fields of different field polarities including a predetermined field polarity, comprising:

- forming means for forming series of frames to be encoded into respective groups of image pictures such that a first field to be encoded in each of the respective groups of image pictures is a field of said predetermined field polarity; and
- encoding means for encoding each series of frames formed by said forming means into said respective group of image pictures.

**5,771,358**  
**METHOD AND SYSTEM FOR APPORTIONING COMPUTER BUS BANDWIDTH**  
Paul A. LaBerge, Shoreview, Minn., assignor to Micron Electronics, Inc., Nampa, Id.

Filed Jul. 15, 1996, Ser. No. 680,446

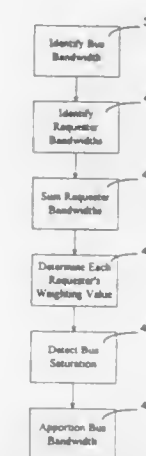
Int. Cl.<sup>6</sup> G06F 13/14

U.S. Cl. 395—287

23 Claims

1. In a computer system, a method of interfacing a plurality of bus requesters with a bus having a bus bandwidth, the method comprising:

- identifying a requester bandwidth for each of the plurality of bus requesters;
- summing the requester bandwidths to obtain a total bandwidth for the plurality of bus requesters;
- determining, for each of the plurality of bus requesters, a weighting value representative of the ratio of the bus requester's requester bandwidth to the total bandwidth; and



apportioning the bus bandwidth among the plurality of bus requesters by assigning to each of the plurality of bus requesters a portion of the bus bandwidth based on the bus requester's weighting value.

**5,771,359**  
**BRIDGE HAVING A DATA BUFFER FOR EACH BUS MASTER**

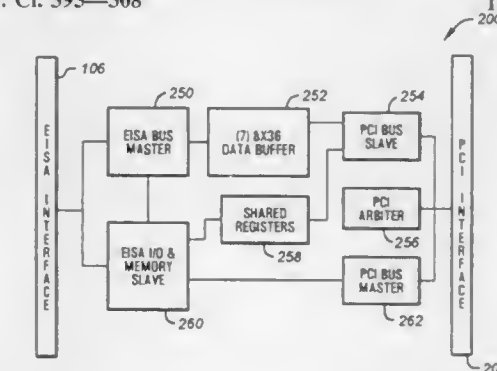
William C. Galloway, Houston; Ryan A. Callison, Spring, and Gregory T. Chandler, Houston, all of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Oct. 13, 1995, Ser. No. 542,708

Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395—308

16 Claims



1. A bridge for coupling a first bus to a second bus, the first bus capable of having a plurality of bus masters for performing read and write operations to devices on the second bus, each bus master providing a bus access request to access the first bus, the bridge comprising:

- a first bus interface;
- a second bus interface;
- a plurality of data buffers coupled to said first and second bus interfaces, said plurality of data buffers for storing data transferred between the buses, each data buffer of said plurality of data buffers corresponding to a different one of said plurality of bus masters; and
- an arbiter for selecting between the bus access requests received from the bus masters and for providing a bus grant to a selected bus master based on availability of a corresponding data buffer.

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5,771,360

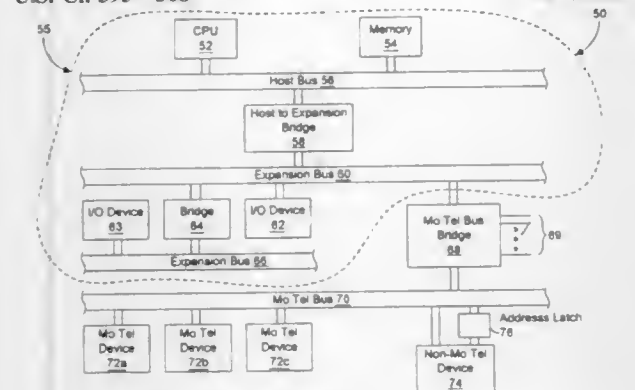
**PCI BUS TO TARGET INTEGRATED CIRCUIT  
INTERCONNECT MECHANISM ALLOWING MULTIPLE  
BUS MASTERS AND TWO DIFFERENT PROTOCOLS ON  
THE SAME BUS**Dale E. Gulick, Austin, Tex., assignor to Advanced Micro  
Devices, Inc., Sunnyvale, Calif.

Filed Oct. 21, 1996, Ser. No. 731,829

Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395—308

26 Claims



1. A computer system, comprising:

a first expansion bus which operates according to a first transfer protocol, wherein the first expansion bus is adapted to couple to one or more peripheral devices;

a central processing unit operatively coupled to the first expansion bus;

a bus bridge coupled to the first expansion bus;

a second bus coupled to the bus bridge, wherein the second bus includes a second transfer protocol;

at least one peripheral device of a first type coupled to the second bus, wherein the at least one peripheral device of the first type is compatible with the second transfer protocol of the second bus; and

at least one peripheral device of a second type coupled to the second bus, wherein the at least one peripheral device of the second type is compatible with a third transfer protocol of a peripheral bus standard, the third transfer protocol of the peripheral bus standard being different from the second transfer protocol of the second bus;

wherein the bus bridge is operable to convert signals between the first expansion bus and the second bus, wherein the bus bridge is operable to implement the second transfer protocol on the second bus, wherein the bus bridge is also operable to implement the third transfer protocol of the peripheral bus standard on the second bus;

wherein the bus bridge is configured to communicate with the at least one peripheral device of the first type using the second transfer protocol of the second bus, and the bus bridge is configured to communicate with the at least one peripheral device of the second type using the third transfer protocol of the peripheral bus standard.

5,771,361

**DATA PROCESSOR HAVING SHARED TERMINAL FOR  
MONITORING INTERNAL AND EXTERNAL MEMORY  
EVENTS**Yusuke Tokieda, and Hiroshi Katsuta, both of Tokyo, Japan,  
assignors to NEC Corporation, Tokyo, Japan

Filed Jun. 14, 1995, Ser. No. 490,447

Claims priority, application Japan, Jun. 15, 1994, 6-155471

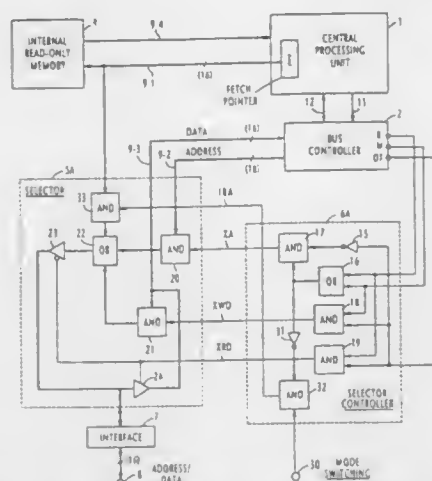
Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395—311

4 Claims

1. A data processor for providing monitoring of an internal bus and an external address bus and data bus at a single external terminal, comprising:

an internal memory for storing instruction codes;



a central processing unit for reading an instruction code from the internal memory and producing an external access request if said instruction code contains an instruction to access an external memory;

a bus controller responsive to said request for producing a data timing signal and one of read and write signals;

an internal address bus for transporting an internal address signal produced by said central processing unit;

an external address bus for transporting an external address signal from said bus controller;

an external data bus for transporting a data signal to and from said bus controller;

an external terminal to which said external memory is connected; and

a selecting circuit responsive to a first mode switching signal for coupling one of said external address bus and said external data bus to said external terminal and determining the direction of the data signal transported by the external data bus when same is coupled to said external terminal in accordance with said data timing signal and one of said read and write signals, and responsive to a second mode switching signal for coupling said internal address bus to said external terminal in the absence of said data timing signal and said read and write signals.

5,771,362

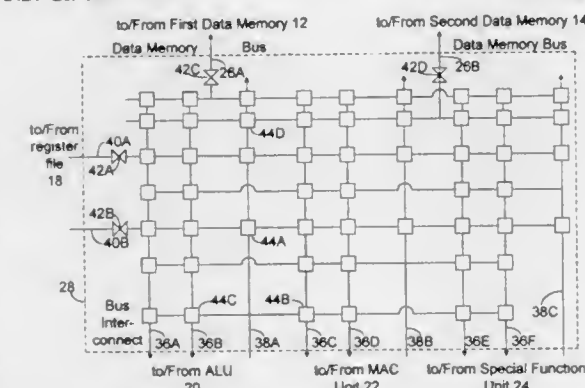
**PROCESSOR HAVING A BUS INTERCONNECT WHICH  
IS DYNAMICALLY RECONFIGURABLE IN RESPONSE  
TO AN INSTRUCTION FIELD**John G. Bartkowiak, and Thomas W. Lynch, both of Austin,  
Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale,  
Calif.

Filed May 17, 1996, Ser. No. 649,810

Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395—312

18 Claims



1. A processor, comprising:

an instruction sequencer configured to execute instructions having an opcode field and a bus configuration field, wherein said

instruction sequencer is configured to produce at least one control signal in response to a first encoding of said bus configuration field; and

a bus interconnect coupled to receive said control signal from said instruction sequencer, said bus interconnect including a first plurality of buses and a second plurality of buses, wherein said bus interconnect is configured to route data from one of said first plurality of buses to one of said second plurality of buses if said control signal is asserted,

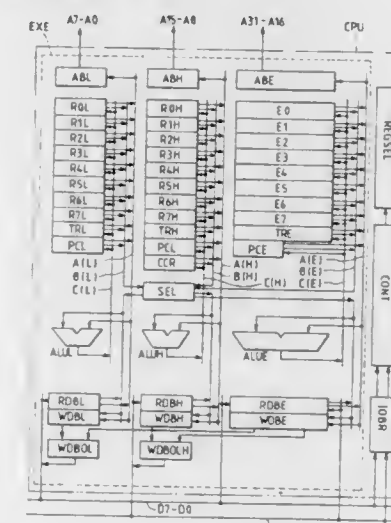
wherein data from said one of said first plurality of buses is prevented from being routed to said one of said second plurality of buses if said control signal is deasserted.

5,771,363

**SINGLE-CHIP MICROCOMPUTER HAVING AN  
EXPANDABLE ADDRESS AREA**Naoki Mitsuishi, Kodaira; Shiro Baba, Higashimurayama;  
Hiromi Nagayama, Kodaira; Tsutomu Hayashi, and Yuki-  
hide Hayakawa, both of Kodaira, all of Japan, assignors to  
Hitachi, Ltd., Tokyo, JapanDivision of Ser. No. 583,763, Jan. 10, 1996, Pat. No. 5,687,344,  
which is a continuation of Ser. No. 877,890, Apr. 28, 1992,  
abandoned. This application Feb. 27, 1996, Ser. No. 607,568Claims priority, application Japan, May 8, 1991, 03-132042;  
Feb. 27, 1992, 04-076151Int. Cl.<sup>6</sup> G06F 15/00

U.S. Cl. 395—376

7 Claims



1. A central processing unit in a single chip data processing device, comprising:

a plurality of general purpose registers (Ei+RiH+RiL, i=7 to 0) each having a first bit length and identical number (i: i=7 to 0), and including a first portion (Ei) which corresponds to a high-order side and a second portion (Ri: RiH+RiL) which corresponds to a low-order side, the first portion and the second portion each having a second bit length, the second portions of the general purpose registers each including a third portion (RiH) which corresponds to a high-order side and a fourth portion (RiL) which corresponds to a low-order side, the third portion and the fourth portion each having a third bit length, the number of the first portions and the second portions being the same as that of the third portions and the fourth portions;

a control unit (CONT) which fetches and decodes an instruction to provide control signals, the instruction including an operation code field and a register designation field of predetermined bits that have register number designation bits and an area designation bit, the operation code field including an operation data size code which designates one of a first bit length, a second bit length and a third bit length as an operation data size;

an arithmetic and logic operation unit (ALUE, ALUH, ALUL) which is coupled to the general purpose registers and which is

responsive to the control signals to execute a designated data operation with designated operation data size which are designated by the contents of the operation code field; and

a selecting unit (REGSEL) which is coupled to the general purpose registers and which is responsive to the control signals to select among the general purpose registers and the portions thereof in accordance with the contents of both the operation data size code and the register designation field such that;

in response to the operation data size code designating the first bit length and the register number designation bits, the selecting unit selects one of the general purpose registers whose number corresponds to the number designated by the register number bits,

in response to the operation data size code designating the second bit length, the register number designation bits and the area designation bit, the selecting unit selects one of the first and second portions whose number corresponds to the number designated by the register number bits and whose portion corresponds to the area designated by the area designation bits, and

in response to the operation data size code designating the third bit length, the register number designation bits and the area designation bit, the selecting unit selects one of the third and fourth portions whose number corresponds to the number designated by the register number bits and whose portion corresponds to the area designated by the area designation bit.

5,771,364

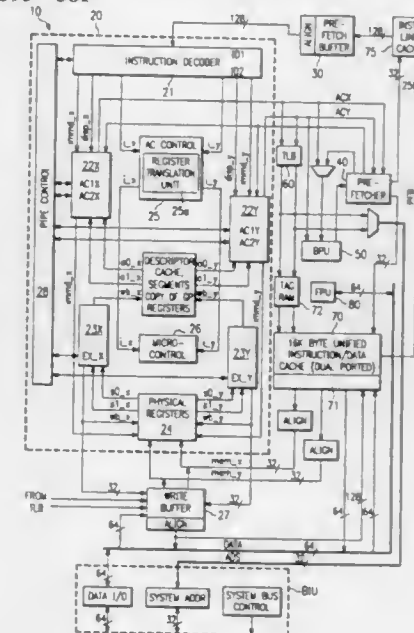
Patent Not Issued For This Number

5,771,365

**CONDENSED MICROADDRESS GENERATION IN A  
COMPLEX INSTRUCTION SET COMPUTER**Steven C. McMahan, Richardson, and Mark W. Bluhm, Plano,  
both of Tex., assignors to Cyrix Corporation, Richardson,  
Tex.Continuation-in-part of Ser. No. 138,855, Oct. 18, 1993, Pat.  
No. 5,644,741, and a continuation-in-part of Ser. No. 138,320,  
Oct. 18, 1993, abandoned, and a continuation-in-part of Ser.  
No. 138,660, Oct. 18, 1993, abandoned. This application Mar.  
1, 1995, Ser. No. 396,857Int. Cl.<sup>6</sup> G06F 12/02

U.S. Cl. 395—381

8 Claims





1. A complex instruction set computer having condensed microaddress generation responsive to execution of a machine instruction, comprising:

- (a) a sparse microROM array having an M-bit noncontiguous address space; and,
- (b) N-bit addressing means for addressing the sparse microROM array responsive to the machine instruction, wherein N is larger than M and wherein the N-bit addressing means forms an entry point microaddress into the sparse microROM array by concatenating a plurality of selected portions of the machine instruction wherein one of the plurality of selected portions of the machine instruction is logically bitwised ANDed with a predetermined mask to collapse like machine instructions into a single entry point microaddress.

5,771,366

#### METHOD AND SYSTEM FOR INTERCHANGING OPERANDS DURING COMPLEX INSTRUCTION EXECUTION IN A DATA PROCESSING SYSTEM

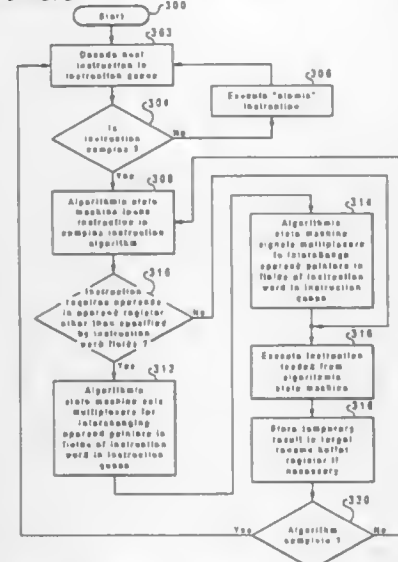
Andrew Augustus Bjorksten; Duc Quang Bul, both of Austin; Richard Edmund Fry, Round Rock, and James Edward Phillips, Austin, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 9, 1995, Ser. No. 489,181

Int. Cl.<sup>6</sup> G06F 9/00

U.S. Cl. 395—393

20 Claims



1. A method in a data processing system for interchanging operands and loading said operands into a plurality of operand registers in an execution unit within said data processing system during execution of a complex instruction, wherein said execution unit includes an instruction queue, and wherein said execution unit executes atomic instructions and complex instructions having a plurality of operand pointers for pointing to said plurality of operands stored in a register file coupled to said operand registers, wherein said plurality of operands includes a first operand and a second operand, said method comprising the steps of:

- loading an instruction into said instruction queue; determining whether said instruction is an atomic instruction or a complex instruction;
- in response to determination that said instruction is a complex instruction, having a plurality of fields, wherein:
- a first field contains a first operand pointer for designating a value stored in said register file for loading into a first operand register; and
- a second field contains a second operand pointer for designating a value stored in said register file for loading into a second operand register;

interchanging said first operand pointer in said first field with said second operand pointer in said second field;

loading into said first operand register a value stored in said register file designated by said second operand pointer stored in said first field; and

loading into said second operand register a value stored in said register file designated by said first operand pointer stored in said second field, wherein values in said register file designated by operand pointers in said fields of said instruction are loaded into different operand registers than originally specified by said instruction during execution of said complex instruction.

5,771,367

#### STORAGE CONTROLLER AND METHOD FOR IMPROVED FAILURE RECOVERY USING CROSS-COUPLED CACHE MEMORIES AND NONVOLATILE STORES

Brent Cameron Beardsley; Lawrence Carter Blount; Gail Andrea Spear, and Vern John Legvold, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

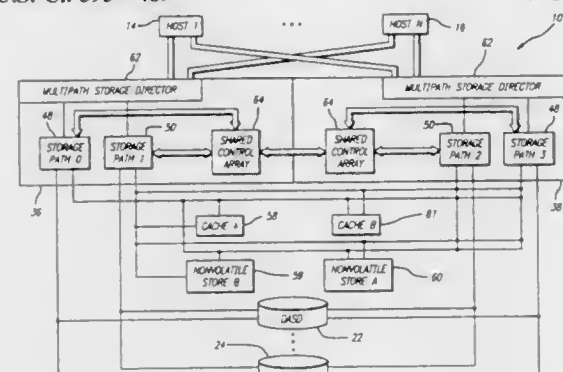
Continuation of Ser. No. 991,812, Dec. 17, 1992, abandoned.

This application Oct. 30, 1995, Ser. No. 550,184

Int. Cl.<sup>6</sup> G06F 12/16; 13/00; 11/08

U.S. Cl. 395—489

9 Claims



1. A storage controller comprising:

- first cluster means for directing data to be stored from a host computer to a direct access storage device;
- second cluster means for directing data to be stored from a host computer to a direct access storage device;
- a first cache memory connected to said first cluster means;
- a second cache memory connected to said second cluster means;
- a first nonvolatile memory connected to said first cluster means;
- a second nonvolatile memory connected to said second cluster means;
- means for directing data to be stored to said first cache memory and backing up that data in said second nonvolatile memory in a first operational mode;
- means for recovering data from said first cache memory in the event of a failure of said second nonvolatile memory, including means for directing the recovered data to said second cache memory and backing up said recovered data in said first nonvolatile memory in a second operational mode; and
- means for allocating the data to be stored between said first cache memory and said second cache memory in the event of the failure of said second nonvolatile memory.

5,771,368

#### MEMORY ADDRESSING SCHEME FOR INCREASING THE NUMBER OF MEMORY LOCATIONS AVAILABLE IN A COMPUTER FOR STORING HIGHER PRECISION NUMBERS

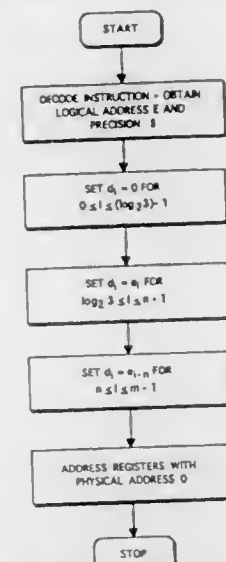
Robert Cmelik, Sunnyvale; Shing Kong, Menlo Park, and Edmund Kelly, San Jose, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Continuation of Ser. No. 114,466, Aug. 31, 1993, abandoned, which is a continuation-in-part of Ser. No. 605,556, Oct. 29, 1990, abandoned. This application May 24, 1995, Ser. No. 449,258

Int. Cl.<sup>6</sup> G06F 12/10

U.S. Cl. 395—410

17 Claims



1. In a computer system including a processor for processing a plurality of numbers having precision S, where S is a power of 2, computer-readable memory locations specified in a computer-readable instruction address field by an n-bit logical address, each computer-readable memory location being adapted to store a single precision number, said computer-readable memory locations being adapted for storing numbers having precision S in a group of S computer-readable memory locations accessed by an m-bit physical address

a backward compatible addressing logic circuit for addressing said computer-readable memory locations with up to 2<sup>n</sup> distinct n-bit logical addresses, said addressing logic circuit comprising:

- alignment logic circuit having an input, for receiving said n-bit logical address, and an output for generating n bits of said physical addresses as a function of precision;
- extension logic circuit having an input, for receiving (m-n) logical address binary bits via a bus coupled to said input of said alignment logic circuit, and an output for generating (m-n) physical address bits as a function of precision.

5,771,369

#### MEMORY ROW REDRIVE

Brian William Curran, Saugerties, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

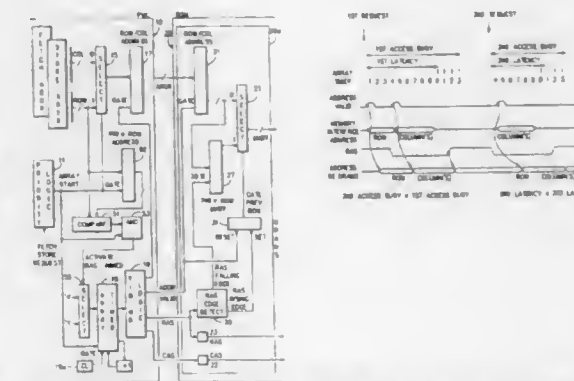
Continuation of Ser. No. 39,549, Mar. 29, 1993, which is a continuation of Ser. No. 576,253, Aug. 31, 1990. This application Jun. 7, 1995, Ser. No. 474,016

Int. Cl.<sup>6</sup> G06F 12/06

U.S. Cl. 395—432

21 Claims

1. A memory access system comprising: memory means for storing data, said memory means having a plurality of storage locations, each of said locations specified by a row address and a column address; and



control means for accessing said data at a specific location by providing to said memory means said row address and a row address strobe (RAS) signal followed by said column address and a column address strobe (CAS) signal, said RAS signal going inactive before each subsequent access before it is judged whether a subsequent row address matches said row address, said control means further providing to said memory means said row address after said provision of said CAS signal.

5,771,370

#### METHOD AND APPARATUS FOR OPTIMIZING HARDWARE AND SOFTWARE CO-SIMULATION

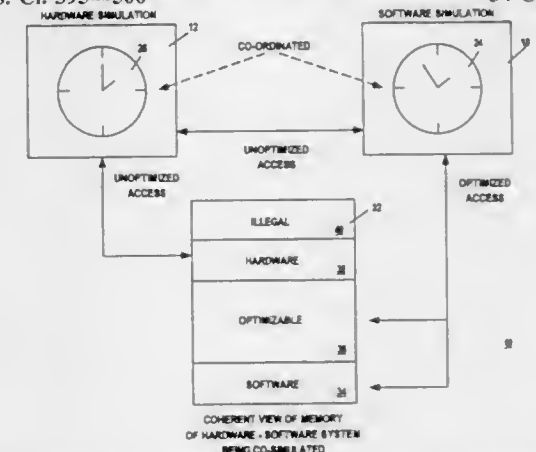
Russell Klein, Wilsonville, Oreg., assignor to Mentor Graphics Corporation, Wilsonville, Oreg.

Filed May 14, 1996, Ser. No. 647,639

Int. Cl.<sup>6</sup> G06F 9/455

U.S. Cl. 395—500

34 Claims



1. A machine implemented method for co-simulating a hardware-software system having memory, the method comprising the steps of:

- interleavingly simulating hardware operations and software execution for the hardware-software system on a machine for one or more co-simulation runs; and
- concurrently facilitating a single coherent view of the memory of the hardware-software system by said simulation of hardware operations and said simulation of software execution during said one or more co-simulation runs, such that selected portions of at least a first memory segment of the memory can be dynamically as well as statically configured/reconfigured for either unoptimized accesses or optimized accesses for all or selected portions of said one or more co-simulation runs, wherein unoptimized accesses are performed through simulated hardware operations, and optimized accesses are performed through an alternate route, without simulating hardware operations.

# UMI

1. A processing device executing an instruction coded in a program, wherein a result of execution of said instruction becomes valid when prediction about true/false of one or more branch conditions is all correct, and said instruction has an operation code identifying said instruction, said device comprising:



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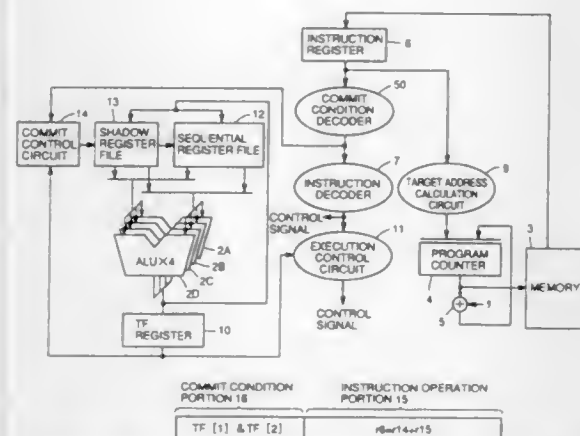
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commit condition decode means for decoding a commit condition code designating the number of said one or more branch conditions to supply one or more instruction decode entries corresponding to said one or more branch conditions, each said instruction decode entry indicating either one of true and false;

an instruction decoder for decoding the operation code of said instruction to output a control signal;

operation means for executing said instruction in response to the control signal output from said instruction decoder, and determining true/false of said branch condition;

data hold means for holding data obtained as a result of execution of said instruction by said operation means;

true/false hold means having one or more determination entries corresponding to said one or more branch conditions, wherein each of said determination entries (i) holds undetermined information if true/false of a corresponding branch condition is not yet determined by said operation means, (ii) holds true information if true/false of a corresponding branch condition is determined by said operation means as true, and (iii) holds false information if true/false of a corresponding branch condition is determined by said operation means as false;

execution control means for correspondingly comparing true/false of the instruction decode entry provided from said commit condition decode means with true/false of the determination entry of said true/false hold means, and (i) controlling said operation means to sequentially execute said instruction and controlling said data hold means to hold data obtained as a result of execution of said instruction if each true/false of said instruction decode entry coincides with true/false of a corresponding determination entry, and (ii) controlling said operation means to execute said instruction and controlling said data hold means to speculatively hold data obtained as a result of execution of said instruction if any of each true/false of said instruction decode entries coincides with true/false of a corresponding determination entry and each determination entry corresponding to the other instruction decode entry holds undetermined information, or if each said determination entry holds undetermined information; and commit control means for correspondingly comparing true/false of the instruction decode entry provided from said commit condition decode means with true/false of the determination entry of said true/false hold means, and controlling said data hold means to sequentially re-hold said speculatively held data when undetermined information held in each entry of said true/false hold means is changed to true or false information by determination of true/false of said branch condition made by said operation means and each true/false of said instruction decode entry coincides with true/false of a corresponding determination entry, wherein

said commit condition code is included in said instruction together with said operation code.

#### 5,771,378 ASSOCIATIVE TEXT SEARCH AND RETRIEVAL SYSTEM HAVING A TABLE INDICATING WORD POSITION IN PHRASES

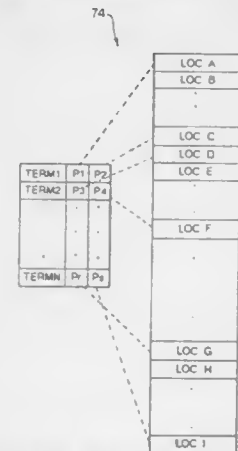
John Holt, Centerville; David James Miller, Spring Valley; X. Allan Lu, Springboro; Ray Daley; Minh Doan, both of Dayton; Richard G. Graham, Beavercreek; Catherine Leininger, Dayton; Darin W. McBeath, Miamisburg; Thomas Pease, Mason; Stephen M. Sever, Kettering; Dale Waddell, and Franz Weckesser, both of Dayton, all of Ohio, assignors to Reed Elsevier, Inc., Newton, Mass.

Continuation of Ser. No. 155,304, Nov. 22, 1993. This application Jun. 7, 1995, Ser. No. 473,824

Int. Cl.<sup>6</sup> G06F 17/30; 17/21

U.S. Cl. 395—605

15 Claims



1. A method of operating an associative text search and retrieval system, comprising the steps of:

allowing a user to provide a plurality of search terms; using a table to detect phrases within the search terms provided by the user, the table containing entries which, for each word that can be part of a phrase, indicate a position that the word can occupy in any phrase; performing a search of text documents using the plurality of search terms provided by the user and the phrases, if any, detected by the table; calculating a score for each of the text documents containing at least one of the search terms; ranking the text documents based on their scores; and providing the user with a predetermined number of retrieved documents that are a subset of the text documents based on the documents' ranks.

#### 5,771,379 FILE SYSTEM AND METHOD FOR FILE SYSTEM OBJECT CUSTOMIZATION WHICH AUTOMATICALLY INVOKES PROCEDURES IN RESPONSE TO ACCESSING AN INODE

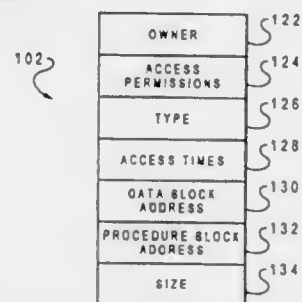
Robert C. Gore, Jr., Pflugerville, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 1, 1995, Ser. No. 548,354

Int. Cl.<sup>6</sup> G06F 17/30

U.S. Cl. 395—612

19 Claims



9. A method for customizing a file system entity stored within a storage media of a data processing system, wherein contents of

said storage media are organized according to a non-object oriented file system, said file system entity including a node and data, wherein said node contains a plurality of attributes of said file system entity, said plurality of attributes including an indication of one or more locations of said data within said storage medium, wherein said data processing system executes an operating system, said method comprising:

attaching a procedure to said node of said file system entity by storing within said node an indication of one or more locations within said storage media of portions of said procedure; in response to initiation of access to said node by said operating system in order to access said data of said file system entity, automatically executing said procedure attached to said node by referencing said indication of one or more locations of portions of said procedure; and providing said data of said file system entity to said operating system as permitted by said procedure.

#### 5,771,380 METHOD FOR INFORMATION RETRIEVAL WITH SCALED DOWN IMAGES

Tetsuo Tanaka, Sagami-hara; Toshiaki Kohno, Machida, and Hiroshi Tomita, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

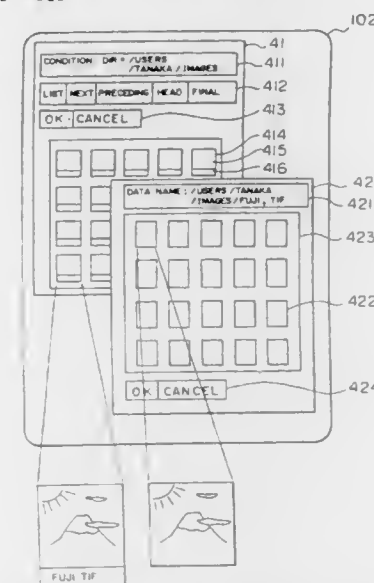
Continuation of Ser. No. 631,438, Apr. 12, 1996, Pat. No. 5,586,316, which is a continuation of Ser. No. 271,923, Jul. 7, 1994, abandoned. This application Oct. 7, 1996, Ser. No. 727,164

Claims priority, application Japan, Feb. 23, 1993, 5-033020; Jul. 9, 1993, 5-170021

Int. Cl.<sup>6</sup> G06F 17/30

U.S. Cl. 395—615

5 Claims



1. A method for browsing a plurality of kinds of media data, by using a processor connected to an input device, a display device and a storage device, comprising the steps of:

- respectively storing in the storage device, image data characterizing media data, said image data being generated by execution of each of a plurality of application programs;
- respectively modifying said image data stored in said storage device such that a display form of said image data is modified according to modifying methods wherein said modifying methods are determined in accordance with the form of each of said image data;
- generating browsing data by arranging a plurality of said modified image data thereon based on an instruction from said input device; and
- outputting said browsing data on said display device.

#### 5,771,381 METHOD AND SYSTEM FOR ADDING CONFIGURATION FILES FOR A USER

Gregory A. Jones, Seattle, and David R. Dickman, Redmond, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

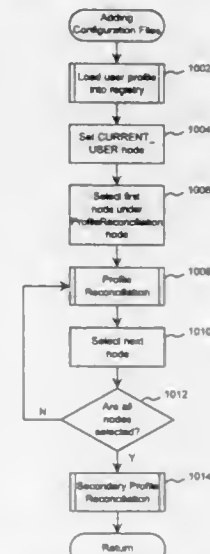
Continuation of Ser. No. 355,999, Dec. 13, 1994, abandoned.

This application May 28, 1997, Ser. No. 864,492

Int. Cl.<sup>6</sup> G06F 9/45

U.S. Cl. 395—653

30 Claims



1. A method in a computer system for providing configuration files for a user for configuration of a plurality of computer programs, the method comprising the steps of:

- receiving an identification of the user; and
  - for each of the plurality of computer programs, locating user profile information of the identified user for the computer program, the user profile information identifying configuration files, identifying a source folder that contains the configuration files, and identifying a destination folder in which to copy the configuration files;
  - deleting each configuration file that is currently in the identified destination folder; and
  - copying each configuration file from the identified source folder to the identified destination folder so that the computer program can access the configuration files in the identified destination folder during configuration of the computer program
- whereby each computer program has its own identified configuration files, identified source folder, and identified destination folder.

#### 5,771,382 SYSTEM AND METHOD FOR SYNCHRONIZING STATIC VARIABLE INITIALIZATION AND REFERENCE UNDER A MULTI-THREADED COMPUTER ENVIRONMENT

I-Shin Andy Wang, San Jose, and Roni Korenshtein, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 464,355, Jun. 5, 1995, abandoned.

This application Aug. 14, 1997, Ser. No. 911,187

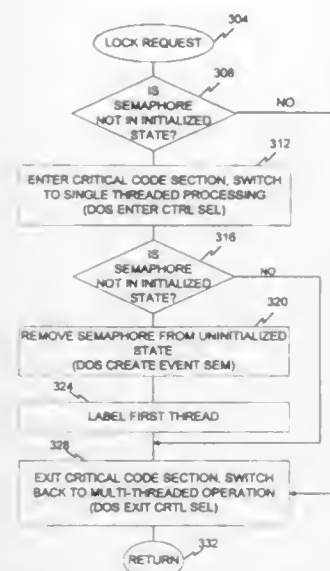
Int. Cl.<sup>6</sup> G06F 9/44; 9/46

U.S. Cl. 395—670

12 Claims

1. In a computer system having a central processing unit (CPU) and an operating system, a computer implemented method for controlling static variable operations including initialization and reference, said method adapted for use in a multi-threaded computer system, the method comprising the steps of:

- receiving a lock request from a first thread, wherein said first thread is the first thread to request CPU processing of at least one static variable operation;



switching said CPU to a single thread mode, wherein only said first thread is processed by said CPU during the single thread mode;  
labeling said first thread after said step of switching said CPU to a single thread mode; and  
switching said CPU to multiple thread mode, wherein multiple threads are processed by said CPU during multiple thread mode.

5,771,383

**SHARED MEMORY SUPPORT METHOD AND APPARATUS FOR A MICROKERNEL DATA PROCESSING SYSTEM**

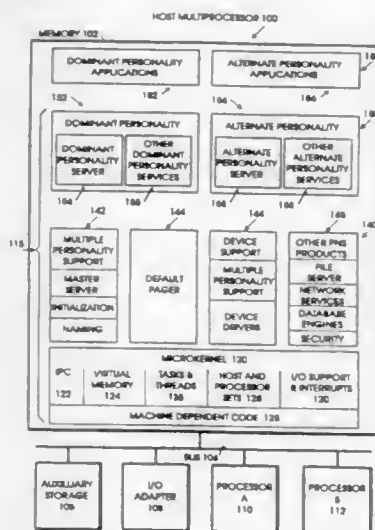
James Michael Magee, Lake Worth; Freeman L. Rawson, III, Boca Raton, both of Fla., and Christopher Dean Youngworth, Savoy, Ill., assignors to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 364,870, Dec. 27, 1994, abandoned. This application Feb. 13, 1997, Ser. No. 800,762

Int. Cl.<sup>6</sup> G06F 9/00

U.S. Cl. 395—680

18 Claims



1. In a data processing system, including a processor for executing stored program instructions and a memory for storing program instructions describing a first task and thread and a second task and thread, a method for sharing a partition of the memory between the first task and the thread and the second task and thread, comprising:

transferring a send call request from the first task and thread to an interprocess communications controller in the memory, to allocate a shared partition of the memory;  
transferring a receive call request from the second task and thread to the interprocess communications controller, to share the shared partition;  
writing data from the first task and thread to the shared partition;  
transferring a control message from the first task and thread to the interprocess communications controller, to give notice of the data transferred to the shared partition;  
first checking in the interprocess communications controller whether the second task and thread are local or remote;  
second checking in the interprocess communications controller whether the second task and thread share the shared partition with the first task and thread;  
writing an address for said shared partition in a look aside buffer; and  
transferring a token message from the interprocess communications controller to the second task and thread to give notice of the data available in the shared partition.

5,771,384

**METHOD AND SYSTEM FOR REPLACEMENT AND EXTENSION OF CONTAINER INTERFACES**

Darren B. Remington, Issaquah; Brian T. Fleming, Seattle; David E. McCauley, III, Seattle; Jan T. Mikovsky, Seattle; John M. Tippet, Seattle; Scott R. Ludwig, Redmond, and Robert F. Day, Bothell, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Continuation of Ser. No. 237,357, May 2, 1994, Pat. No. 5,682,532. This application Feb. 12, 1997, Ser. No. 799,960

Int. Cl.<sup>6</sup> G06F 9/44

U.S. Cl. 395—683

27 Claims

1. A method in a computer system for customizing functionality of a container, the method performed by the container, comprising the steps of:

receiving an indication of an event handler containing code to be executed upon occurrence of an event;  
upon occurrence of the event, invoking the event handler such that the code of the event handler executes and determines whether the event should be canceled;  
receiving a status indication from the event handler, the status indication indicating whether the event should be canceled; and  
when the status indication indicates that the event should be canceled, canceling the event.

5,771,385

**SETTING AND GETTING SYSTEM DEBUG FLAGS BY NAME AT RUNTIME**

James M. Harper, Colorado Springs, Colo., assignor to Sun Microsystems, Inc., Palo Alto, Calif.

Filed Mar. 29, 1996, Ser. No. 623,884

Int. Cl.<sup>6</sup> G06F 9/44

U.S. Cl. 395—704

16 Claims

1. Apparatus for reporting debug value fields in an operating system in a computer, the computer having a processor, an input/output device, and a data storage device, said operation system operating the processor and controlling the data storage device, said processor having a central processing unit, memory and input/output control, said input/output control connected to the input/output device and the data storage device, said apparatus comprising:

parse means for parsing a debugging message from an application program, the debugging message having a name field and a value field;  
a debug symbol table having a plurality of debug symbols with each table entry having a name and a debug symbol address of a storage location for the debug symbol corresponding to the name;

**5,771,387  
METHOD AND APPARATUS FOR INTERRUPTING A PROCESSOR BY A PCI PERIPHERAL ACROSS AN HIERARCHY OF PCI BUSES**

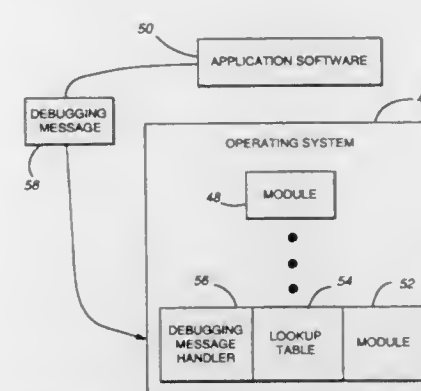
Bruce Young, Tigard; Norm Rasmussen, Hillsboro, and Brad Hosler, Portland, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 21, 1996, Ser. No. 621,128

Int. Cl.<sup>6</sup> G06F 9/46

U.S. Cl. 395—733

27 Claims



search means for searching the debug symbol table for a name matching the name field from the debugging message; and  
write means for writing the value field from the debugging message into the storage location of the debug symbol address whose name matches the name field whereby the value field is reported.

5,771,386

**SOFTWARE CONFIGURATION IN A TELECOMMUNICATION DEVICE**

Lothar Baumbauer, Erlangen, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

PCT No. PCT/IB96/00070, § 371 Date Sep. 26, 1996, § 102(e)

Date Sep. 26, 1996, PCT Pub. No. WO96/23255, PCT Pub. Date Aug. 1, 1996

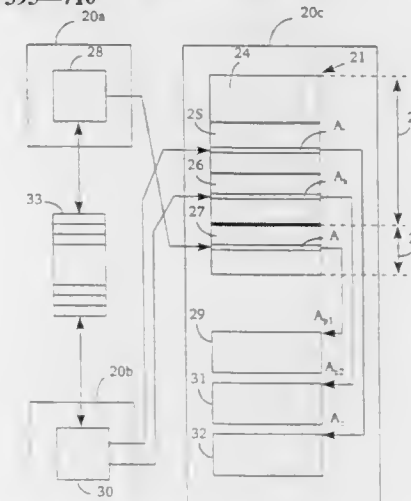
PCT Filed Jan. 26, 1996, Ser. No. 704,764

Claims priority, application Germany, Jan. 28, 1995, 195 02 728.0

Int. Cl.<sup>6</sup> G06F 9/44

U.S. Cl. 395—710

4 Claims

**5,771,388  
SYSTEM AND METHOD FOR MAPPING DRIVER LEVEL EVENT FUNCTION CALLS FROM A PROCESS-BASED DRIVER LEVEL PROGRAM TO A SESSION-BASED INSTRUMENTATION CONTROL DRIVER LEVEL SYSTEM**

Dan Mondrik, Samson DeKey, and Hugo Andrade, all of Austin, Tex., assignors to National Instruments Corporation, Austin, Tex.

Continuation of Ser. No. 432,601, May 1, 1995, Pat. No. 5,640,572, which is a continuation-in-part of Ser. No. 238,480, May 4, 1994. This application May 6, 1997, Ser. No. 851,834

Int. Cl.<sup>6</sup> G06F 3/00

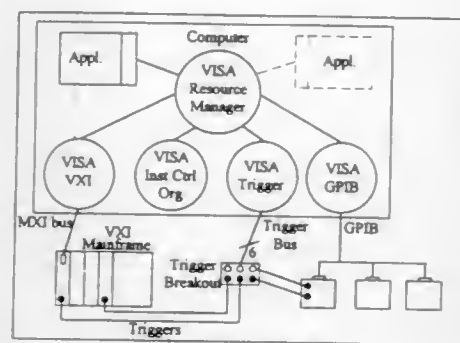
U.S. Cl. 395—735

43 Claims

1. Telecommunication device having software that is used for controlling function routines, which software is comprised of several separately compilable program units such that the program units each have a which contains addresses ( $A_{p1}$ ,  $A_{p2}$ ,  $A_{p3}$ ,  $A_{p4}$ ) used for addressing procedures and/or data combined in the program units and in that a catalogue is available to all the loaded program units, which catalogue contains references for addressing the headers of the program units.

1. A computer-readable storage media which stores program instructions for mapping driver level event function calls from a first driver level library to a second driver level library in an instrumentation system including a computer system, wherein the program instructions implement the steps of:  
receiving a call from an application to a function in said first driver level library which enables interrupts, wherein said function in said first driver level library which enables interrupts includes one or more parameters, including a first





parameter that determines whether interrupts should be enabled or disabled for a session to said first driver level library;

examining said first parameter of said function in said first driver level library which enables interrupts;

invoking an operation in said second driver level library which disables events if said first parameter indicates that interrupts should be disabled; and

invoking an operation in said second driver level library which enables events if said first parameter indicates that interrupts should be enabled.

5,771,389

**LOW SLEW RATE OUTPUT BUFFER WITH STAGED BIASING VOLTAGE**

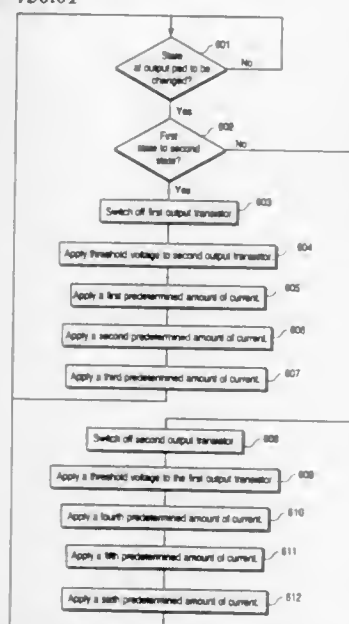
Ronald W. Swartz, Orangevale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Feb. 28, 1996, Ser. No. 608,143

Int. Cl. G06F 1/26

U.S. Cl. 395—750.01

8 Claims



4. A method for driving an output buffer having a first output transistor and a second output transistor, comprising:

switching off the first output transistor; and applying a threshold voltage of the second output transistor at a gate of the second output transistor;

applying a first predetermined amount of current at the second output transistor upon receiving a first signal from a clocking circuit; and

applying a second predetermined amount of current at the gate of the second output transistor upon receiving a second signal from the clocking circuit.

5,771,390

**SYSTEM AND METHOD FOR CASCADING FROM A POWER MANAGED SUSPEND STATE TO A SUSPEND-TO-DISK STATE IN A COMPUTER SYSTEM**

James Walker, Cedar Park, and John Pearce, Del Valle, both of Tex., assignors to Dell USA, L.P., Austin, Tex.

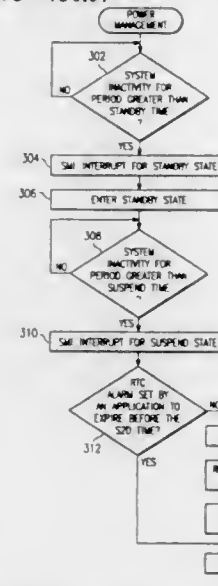
Continuation of Ser. No. 369,017, Jan. 5, 1995, abandoned.

This application Aug. 23, 1996, Ser. No. 697,432

Int. Cl. G06F 1/32

U.S. Cl. 395—750.07

7 Claims



1. A method for performing power management operations in a computer system comprising a CPU, memory coupled to the CPU, one or more timers, and a real time clock coupled to the CPU and the memory, the method comprising the steps of:

setting a flag indicating that an of the real time clock alarm is a suspend-to-disk alarm;

determining whether the real time clock alarm has been set by an application to trigger prior to a first time;

if said real time clock alarm has not been set to trigger prior to said first time:

saving a state of the real time clock alarm; and

setting the real time clock alarm to trigger at said first time;

the computer system entering a low power state, wherein said one or more timers are not operational in said low power state;

checking said flag to determine whether the real time clock alarm is a suspend-to-disk alarm and, if so, cascading the computer system from said low power state to a suspend-to-disk state responsive to triggering of said real time clock alarm, wherein a configuration of said computer system is saved to a hard drive of said computer system and power is off to said computer system in said suspend-to-disk state;

said computer system resuming normal operation after said cascading; and

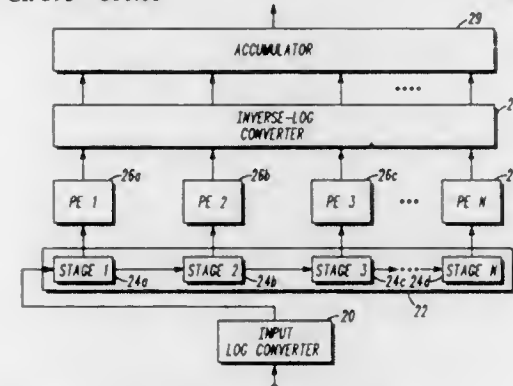
if said step of saving the state of the real time clock alarm has been performed, restoring said saved state of the real time clock alarm after said step of the computer system resuming normal operation.

5,771,391

**COMPUTER PROCESSOR HAVING A PIPELINED ARCHITECTURE AND METHOD OF USING SAME**  
Scott Edward Lloyd, Mesa, Ariz.; Shao Wei Pan, Schaumburg, and Shay-Ping Thomas Wang, Long Grove, both of Ill., assignors to Motorola Inc., Schaumburg, Ill.  
Filed Aug. 28, 1995, Ser. No. 520,666  
Int. Cl. G06F 7/556

U.S. Cl. 395—800.01

27 Claims



23. A digital computer system, which comprises:

an application program;

a computer memory for storing the application program;

a plurality of I/O devices for providing external interfaces to the digital computer system;

an operating system program having a software routine for controlling data transfer;

a microprocessor for executing a sequence of operational instructions included in the application program and the software routine;

a co-processor for generating an output signal in response to execution of the application program, the co-processor comprising:

a log converter for performing a logarithmic conversion on a plurality of input signals to generate a plurality of log signals;

a data pipeline having a plurality of stages, for sequentially providing the log signals at each of the plurality of stages;

a plurality of processing elements for generating a plurality of term signals, each of the plurality of processing elements operatively coupled to a respective stage and generating a term signal in response to each of the plurality of log signals;

an inverse-log converter for performing an inverse-logarithmic conversion on the term signals to generate a plurality of inverse-log signals; and

an accumulator for summing the plurality of inverse-log signals to produce the output signal;

a bus allowing data transfer between the memory, the microprocessor, and the co-processor; and

an I/O controller for coupling the plurality of I/O devices to the bus.

5,771,392

**ENCODING METHOD TO ENABLE VECTORS AND MATRICES TO BE ELEMENTS OF VECTORS AND MATRICES**

Allen M. Razdow, Cambridge, Mass., assignor to Mathsoft, Inc., Cambridge, Mass.

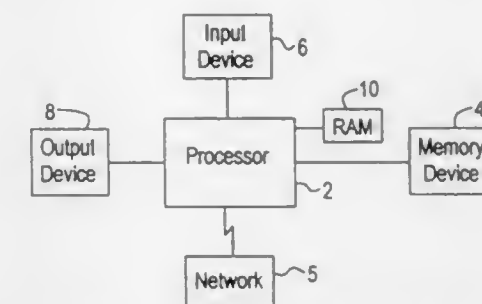
Filed Jun. 20, 1996, Ser. No. 668,174

Int. Cl. G06F 7/544; 9/44

U.S. Cl. 395—800.06

26 Claims

1. For use in a live mathematical document program executed on a computer processor, the mathematical document program storing elements of matrices in contiguous memory locations in a primary memory as floating point numbers, a system for storing and operating on a nested matrix having scalars and matrices as elements, comprising:



means for storing each matrix element as a floating point number;

means for storing each matrix element as a two part combination such that the two part combination occupies no more memory space than each scalar element, the first part of the two part combination including a code to indicate that the entry is a symbolic entity and the second part of the two part combination including a pointer to a memory locating storing elements of the matrix element,

wherein the scalar elements and the two part combinations are stored in contiguous memory locations in primary memory;

means for displaying the nested matrix on an output device;

means for determining whether an element of the nested matrix is a scalar element or a matrix element; and

means for performing mathematical operations designed for non-nested matrices on the nested matrix such that said operations report an error condition without adversely affecting other operations of the live mathematical document program.

5,771,393

**SERVO LOOP CONTROL APPARATUS HAVING MASTER PROCESSOR TO CONTROL THE APPARATUS AND SECOND PROCESSOR DEDICATED TO SPECIFIC PREPROGRAMMED SERVO LOOP CONTROL TASKS**

Saf Asghar, and Brett Stewart, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

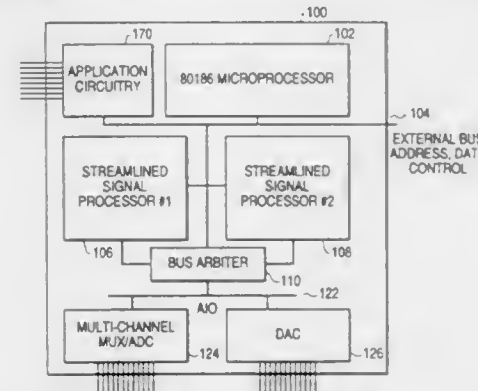
Division of Ser. No. 673,317, Jun. 28, 1996, Pat. No.

5,630,165, which is a continuation of Ser. No. 400,498, Mar. 8, 1995, abandoned, which is a continuation of Ser. No. 983,477, Dec. 3, 1992, abandoned. This application Apr. 24, 1997, Ser. No. 842,323

Int. Cl. G06F 15/40

U.S. Cl. 395—821

22 Claims



1. A servo loop control apparatus comprising: input circuitry arranged to receive signals from a servo loop to be controlled and being connected to an input/output bus arbiter;

output circuitry arranged to provide signals to a servo loop to be controlled and being connected to said input/output bus arbiter;

a master processor to control said apparatus, said master processor being connected to said input/output bus arbiter;

a second processor, said second processor programmed to operate autonomously of said master processor and being dedi-





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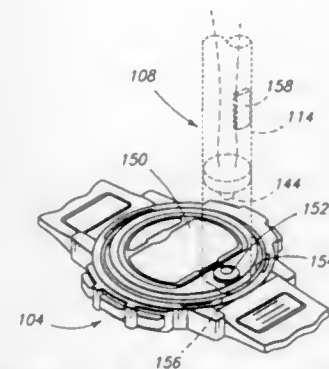
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the second member of the optical element pair being contained within the open distal end of the hand-held housing;  
a flexible cable extending from the hand-held housing for connection to an I/O line of a computer, the flexible cable being operably connected to the second member of the optical element pair;  
the open distal end of the hand-held housing having a shape which is complementary to the surface of the portable information device about the first member of the optical element pair, the distal end of the hand-held housing registering with the surface of portable information device to align the second member of the optical element pair relative to the first member of the optical element pair.

5,771,400

**CAMERA WITH LIGHT-BLOCKING PLUSH TO HOLD FILMSTRIP AGAINST FILM PLATEN**

David Clinton Smart, Rochester, N.Y.; Tetsufumi Takaba, Hachiohji, Japan; Masaru Yamazaki, Hannoh, Japan, and Hiroshi Yamaguchi, Hachiohji, Japan, assignors to Eastman Kodak Company, Rochester, N.Y., and Konica Corporation, Hino, Japan

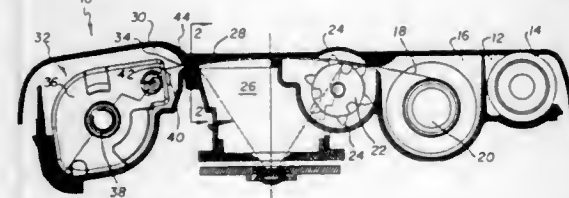
Continuation of Ser. No. 613,731, Feb. 9, 1996, abandoned.

This application May 6, 1997, Ser. No. 852,169

Int. Cl.<sup>6</sup> G03B 17/02

U.S. Cl. 396—6

2 Claims



1. A camera comprising a backframe opening for exposing successive frames of a filmstrip, a film platen for supporting each film frame over said backframe opening, a chamber for a film cassette, and a film egress slot located between said backframe opening and said chamber to permit each exposed frame to be moved from the backframe opening into the cassette, is characterized in that:

said film platen extends to said slot; and  
a light-blocking resilient material is located at least sufficiently across said slot to substantially prevent light at said backframe opening from shining through the slot to the film cassette and is located to adjoin said platen in the absence of the filmstrip within the slot and to urge the filmstrip against the platen in the vicinity of the slot when the filmstrip is present in the slot in order to hold the filmstrip stationary during exposure of each film frame at the backframe opening.

5,771,401  
**ONE-TIME-USE CAMERA WITH TRANSLATION-TO-ROTATION CONVERTER WHICH IS TRANSLATED FIRST TO ROTATE LIGHT LOCK OF FILM CASSETTE CLOSED AND THEN TO EJECT CASSETTE FROM CAMERA**

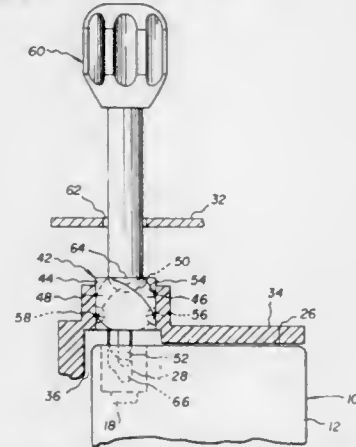
Mark A. Lamphron, Rochester, and David Cipolla, Pittsford, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 12, 1997, Ser. No. 873,659

Int. Cl.<sup>6</sup> G03B 17/02

U.S. Cl. 396—6

9 Claims



1. A one-time-use camera comprising a film cassette with a light lock that is to be rotated closed after an exposed filmstrip is wound into said cassette, and a driver which is rotated to rotate said light lock closed before removing said cassette from said camera, is characterized in that:

said driver is a translation-to-rotation converter which when translated is rotated in response to translation to rotate said light lock closed without translating said cassette.

5,771,402

**OPTICAL APPARATUS EQUIPPED WITH SIGHT LINE DETECTOR**

Akira Yamada; Keiji Nagata; Yoshiaki Irie, all of Yokohama, and Akihiko Nagano, Ichihara, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

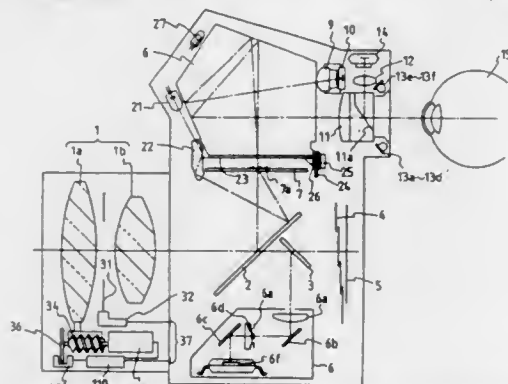
Continuation of Ser. No. 577,213, Dec. 22, 1995, abandoned, which is a division of Ser. No. 425,776, Apr. 20, 1995, abandoned, which is a continuation of Ser. No. 69,828, Jun. 1, 1993, abandoned. This application Jun. 9, 1997, Ser. No. 871,349

Claims priority, application Japan, Jun. 2, 1992, 4-167014; Jul. 16, 1992, 4-213795; Sep. 7, 1992, 4-262478; Sep. 7, 1992, 4-264294

Int. Cl.<sup>6</sup> G03B 13/02

U.S. Cl. 396—51

8 Claims



1. An optical apparatus for detecting rotation of an eyeball of an observer to provide sight line information, said apparatus comprising:

an optical means for imaging light flux from the eye of the observer;  
an image sensor for receiving light flux from said optical means; and  
a control circuit for controlling said image sensor in a first control mode for reading out information from over all the region of said image sensor, and in a second control mode for reading out information from a predetermined smaller region of the image sensor, said predetermined region being set on the basis of the information read-out when the image sensor is in said first control mode.

5,771,403

**IMAGE BLUR DETECTION APPARATUS FOR USE WITH APPARATUS INCLUDING OPERATION PORTION**

Shinji Imada, Musashino, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 364,726, Dec. 27, 1994, abandoned.

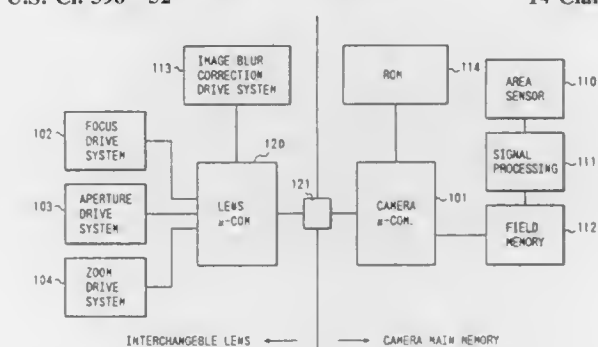
This application Feb. 25, 1997, Ser. No. 804,695

Claims priority, application Japan, Dec. 28, 1993, 5-337197

Int. Cl.<sup>6</sup> G03B 17/00

U.S. Cl. 396—52

14 Claims



1. An optical apparatus adapted to be used with an image blur prevention device, comprising:  
an image blur sensor that detects image blur information for a plurality of detection areas in an image plane;  
an information detection device that detects optical information of an optical lens; and  
a determination device that determines a detection area used for an image blur prevention operation from among said plurality of detection areas based on the optical information detected by said information detection device.

5,771,404

**SHAKE PREVENTING APPARATUS IN CAMERA**

Akira Katayama, Koganei, and Tadao Kai, Kawasaki, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

Division of Ser. No. 741,528, Nov. 1, 1996, which is a continuation of Ser. No. 205,131, Mar. 1, 1994, abandoned, which is a continuation of Ser. No. 2,883, Jan. 11, 1993, abandoned.

This application Apr. 15, 1997, Ser. No. 842,533

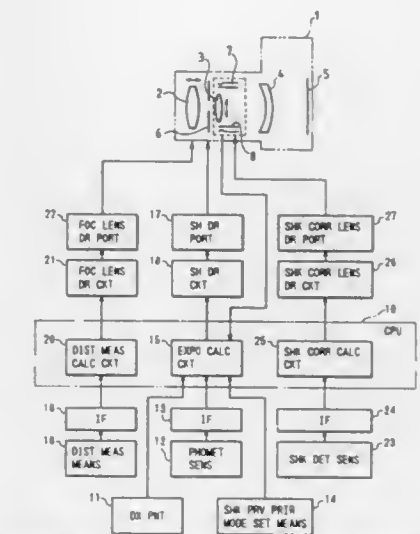
Claims priority, application Japan, Jan. 14, 1992, 4-24769

Int. Cl.<sup>6</sup> G03B 17/00

U.S. Cl. 396—52

2 Claims

1. A camera for preventing a camera shake comprising:  
a selector capable of setting a shake prevention preference mode and an image quality preference mode;



and a terminator capable of terminating an exposure operation, in response to an event where the selector selects the shake prevention preference mode.

5,771,405

**SHAKE CORRECTING APPARATUS**

Shinichi Hirano, Utsunomiya, Japan, assignor to Nikon Corporation, Tokyo, Japan

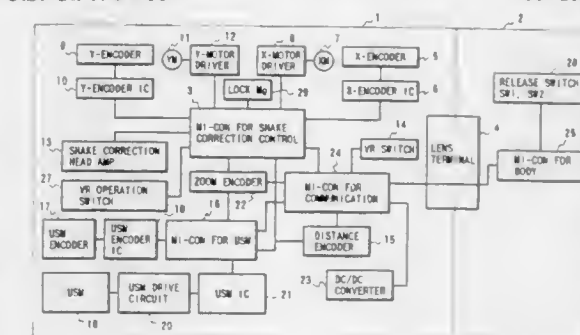
Filed Sep. 3, 1996, Ser. No. 707,013

Claims priority, application Japan, Sep. 7, 1995, 7-230052; Sep. 13, 1995, 7-235668; Sep. 14, 1995, 7-9236973

Int. Cl.<sup>6</sup> G03B 17/00

U.S. Cl. 396—55

33 Claims



1. A shake correcting apparatus to correct shake in a photographing apparatus, comprising:  
a shake detecting device disposed within a lens device for detecting shake of the photographing apparatus and outputting a corresponding signal;  
a shake correcting optical system disposed within the lens device to correct camera shake;  
a shake correction moving device disposed within the lens device and correcting shake of the photographing apparatus by moving the shake correcting optical system in response to the output signal from said shake detecting device;  
a lock device disposed within the lens device for locking said shake correcting optical system in a predetermined position; and  
a control device disposed within a body device for controlling said shake correction moving device and said lock device, wherein said control device inhibits operation of said shake correction moving device by holding transmission of a shake correction drive request until receipt of data indicating that the lock device is unlocked, and thereby prevents damage to the photographing apparatus through movement of said shake correcting optical system during lock by said lock device.

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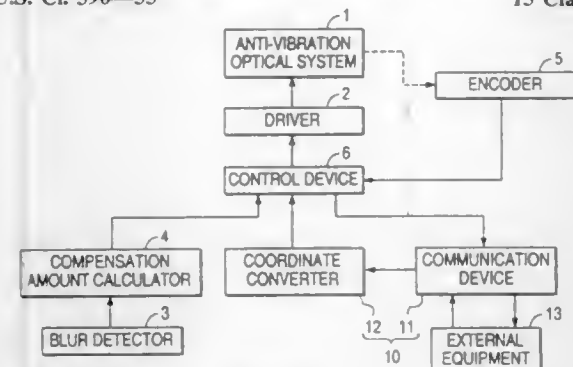
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5,771,406

**CAMERA WITH A SHIFT OPTICAL SYSTEM  
RESPONSIVE TO AN EXTERNAL DEVICE**  
Hiroshi Sakamoto, Kawasaki, and Sueyuki Ohishi, Tokyo, both  
of Japan, assignors to Nikon Corporation, Tokyo, Japan  
Continuation of Ser. No. 354,810, Dec. 8, 1994, abandoned.  
This application Dec. 3, 1996, Ser. No. 760,133  
Claims priority, application Japan, Dec. 10, 1993, 5-341583  
Int. Cl.<sup>6</sup> G03B 17/00

U.S. Cl. 396—55

15 Claims



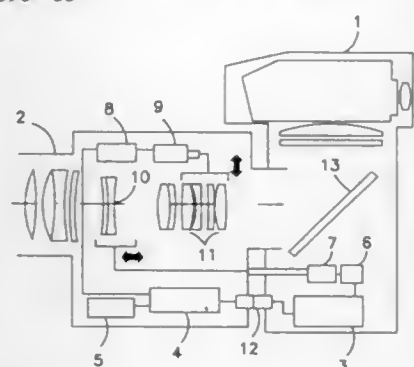
1. An optical system comprising:  
a shift optical system having an optical axis, said shift optical system movable on a plane perpendicular to the optical axis;  
a control device for controlling the movement of said shift optical system; and  
an optical system positioning device adapted to provide said control device with a signal using a first coordinate system indicative of a desired position of said shift optical system in response to a signal using a second coordinate system from a device external of a structure housing the optical system.

5,771,407

**DEVICE AND METHOD FOR PERFORMING  
COMMUNICATION IN A CAMERA BETWEEN A  
CAMERA BODY AND AN OPTICAL SYSTEM**  
Kazuharu Imafuji, Kawasaki, and Nobuhiko Terui, Ichikawa,  
both of Japan, assignors to Nikon Corporation, Tokyo,  
Japan  
Continuation of Ser. No. 566,081, Dec. 1, 1995, abandoned.  
This application Jul. 28, 1997, Ser. No. 901,445  
Claims priority, application Japan, Dec. 14, 1994, 6-310485  
Int. Cl.<sup>6</sup> G03B 17/00

U.S. Cl. 396—55

22 Claims



1. A communication device for an optical device having a body and an optical system with an autofocus device and a motion compensation device, the communication device comprising:  
a main control device that controls the autofocus device and the motion compensation device, said main control device being adapted to issue a first command to request data regarding the optical system from the autofocus device a second command to request data regarding the optical system from the motion compensation device and a third command to request data

regarding the optical system from the autofocus device and the motion compensation device; and  
an optical side control device, provided in the optical system, that controls the autofocus device and the motion compensation device, said optical side control device transmitting data relating to the autofocus device and the motion compensation device to the main control device based on which command is received from the main control device.

5,771,408

**FIXED FOCUS CAMERA SHOOTING HYPERFOCAL  
DISTANCE**

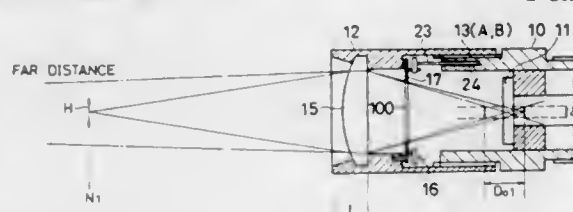
Shigeo Mizukawa, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed May 27, 1997, Ser. No. 863,941

Claims priority, application Japan, May 27, 1996, 8-156001  
Int. Cl.<sup>6</sup> G03B 3/00

U.S. Cl. 396—65

2 Claims



1. A fixed focus camera performing shooting at a hyperfocal distance comprising:  
a lens section formed to provide fixed focus;  
a diaphragm member provided with a rotating member which is rotated to reduce light from the lens section; and  
drive means for extending and retracting the lens section in interlocking with rotation of the rotating member of the diaphragm member to move said lens section forth so that a subject is captured at a hyperfocal distance when the diaphragm opening is reduced.

5,771,409

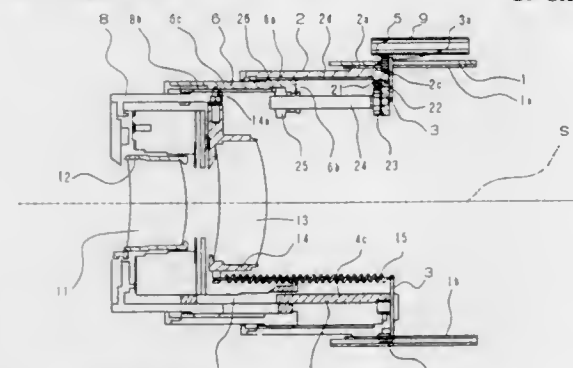
**DRIVING MECHANISM FOR PHOTOGRAPHIC LENS**  
Syunji Nishimura, Ohmiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Japan

Filed Oct. 18, 1996, Ser. No. 733,401

Claims priority, application Japan, Oct. 20, 1995, 7-295942  
Int. Cl.<sup>6</sup> G03B 17/00

U.S. Cl. 396—72

20 Claims



1. A driving mechanism for a photographic lens of a photographic optical system comprising:  
a stationary lens barrel;  
a first driving lens barrel being rotatable and movable back and forth relative to said stationary lens barrel;

a second driving lens barrel adapted to be rotated and moved back and forth relative to said first driving lens barrel so as to move a photographic lens positioned therein back and forth in a direction parallel to an optical axis of the photographic lens for power variation or focusing; and  
rotation transmitting means interlocking said first driving lens barrel with said second driving lens barrel for transmitting a driving force to rotate said second driving lens barrel from said first driving lens barrel to said second driving lens barrel.

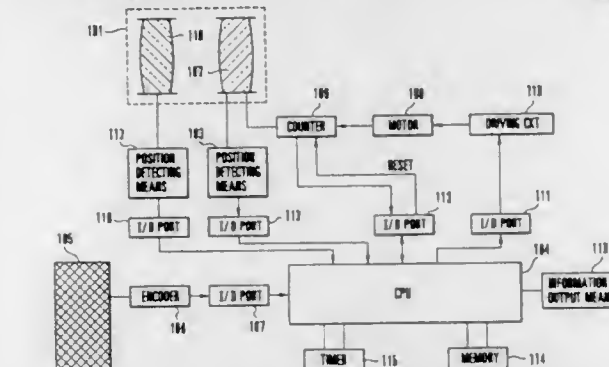
5,771,410

**DRIVING DEVICE HAVING MULTIPLE DRIVING  
MEANS SELECTIVELY OPERATED BASED ON THE  
MOVEMENT OF A MANUALLY OPERATED MEMBER**  
Shigeki Sato, Masaharu Eguchi, both of Kanagawa-ken, and  
Yoshihiko Konno, Tokyo, all of Japan, assignors to Canon  
Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 480,406, Jun. 7, 1995, abandoned,  
which is a division of Ser. No. 196,317, Feb. 14, 1994, Pat. No.  
5,648,836. This application Feb. 10, 1997, Ser. No. 798,319  
Claims priority, application Japan, Feb. 18, 1993, 5-029010;  
Jul. 14, 1993, 5-196907

Int. Cl.<sup>6</sup> G03B 3/10

U.S. Cl. 396—79

5 Claims



1. A driving device for moving an object of driving on the basis of an operation of a manual operation member, comprising:  
a) signal generating means for generating a pulse signal corresponding to an operation amount of said manual operation member;  
b) first driving means for moving said object of driving when an operating speed of said manual operation member detected from the pulse signal is less than a predetermined speed;  
c) second driving means for moving said object of driving when the operating speed of said manual operation member detected from the pulse signal is not less than the predetermined speed, said first driving means is arranged to drive said object of driving on the basis of the pulse signal, and wherein said second driving means is arranged to drive said object of driving to be moved to a predetermined position; and  
d) means for retaining driving by said second driving means even if the operating speed of said manual operation member comes to be less than the predetermined speed after driving by said first driving means shifts to a mode of driving by said second driving means.

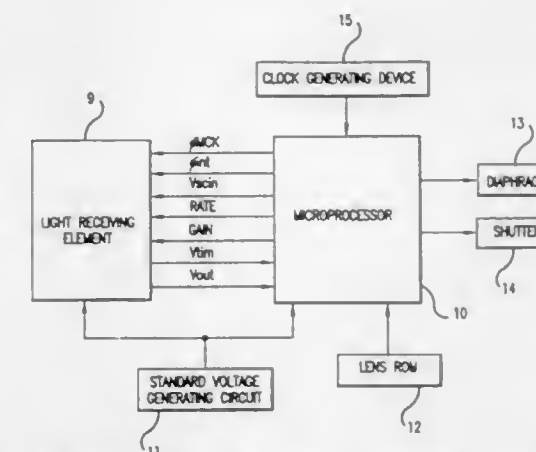
5,771,411

**PHOTOMETRY DEVICE AND METHOD**  
Hiroyuki Iwasaki, Kanagawa-ken, Japan, assignor to Nikon Corporation, Tokyo, Japan  
Continuation of Ser. No. 419,550, Apr. 10, 1995, abandoned.  
This application Dec. 16, 1996, Ser. No. 767,298  
Claims priority, application Japan, Jun. 7, 1994, 6-125378  
Int. Cl.<sup>6</sup> G03B 13/36; 7/08

U.S. Cl. 396—96

21 Claims

1. A photometry device comprising:



- an accumulation type light-receiving element that photoelectrically converts light from a subject field and outputs an electrical signal corresponding to an intensity of the light;  
an accumulation time setting unit, communicating with said light-receiving element, that sets an accumulation time of the light-receiving element received from the electrical signal output, wherein the light-receiving element is provided with at least one light-receiving pixel that is optically shielded from the light, and wherein the accumulation time setting unit computes the accumulation time calculated from a preset saturation output from the at least one shielded light-receiving pixel, and  
a target value setting unit communicating with said light-receiving element that sets a target electrical signal value, wherein the accumulation time setting unit sets the accumulation time so that the electrical signal output from the light-receiving element coincides with the target electrical signal value.

5,771,412

**FOCUS DETECTION DEVICE AND METHOD USING A  
PROJECTION PATTERN MATERIAL**

Hirokazu Kobayashi, Tokyo, and Yosuke Kusaka, Kanagawa-ken, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

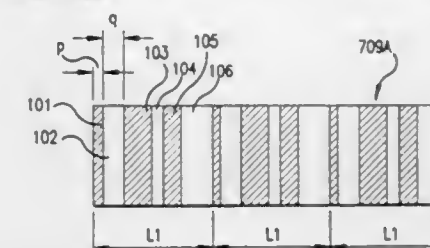
Filed Feb. 15, 1996, Ser. No. 601,847

Claims priority, application Japan, Feb. 15, 1995, 7-027161;  
Apr. 7, 1995, 7-082714

Int. Cl.<sup>6</sup> G03B 3/00

U.S. Cl. 396—106

35 Claims



1. A focus detection device, comprising:  
a projection optical system that projects auxiliary light rays on an object, the projection optical system comprising,  
a projection light source,  
a projection pattern material comprising a plurality of cyclically arranged non-transparent parts and transparent parts, widths of the non-transparent parts and widths of the transparent parts related by a specified rule, and  
a projection lens; and  
a focus detection optical system that composes a pair of object images by guiding a pair of light rays from the object passing through a shooting lens. the focus detection optical system comprising a detector that detects a focus adjustment state of the shooting lens based on a defocus amount of the pair of



object images, the projection pattern material comprising a plurality of sets, wherein the specified rule is such that a sum of the widths of the non-transparent parts in each of said sets is equal to a sum of the widths of the transparent parts in each of said sets.

5,771,413

## FOCUS DETECTING APPARATUS

Yasuo Suda; Keiji Ohtaka; Keiji Nagata, all of Yokohama; Kenichiro Yamashita, Matsudo; Terutake Kadohara, and Hitoshi Onoda, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

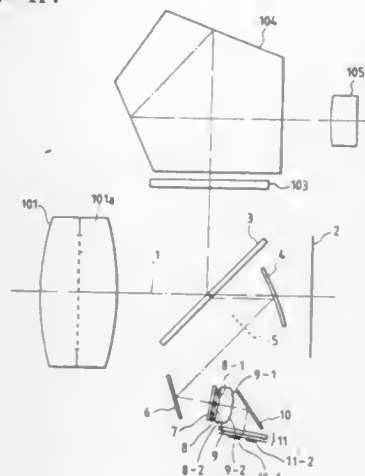
Filed Dec. 24, 1996, Ser. No. 773,009

Claims priority, application Japan, Dec. 28, 1995, 7-354107

Int. Cl.<sup>6</sup> G03B 13/36

U.S. Cl. 396—114

9 Claims



1. A focus detecting apparatus comprising:
- an optical unit provided on an image plane side of an objective lens for detecting a focus state of the objective lens, said optical unit forming a plurality of light quantity distributions regarding an object image by the use of light beams passed through different areas of the pupil of the objective lens;
  - a photoelectrical changing unit having a plurality of elements for outputting a relative positional signal between the plurality of light quantity distributions; and
  - a circuit for detecting a focus state of the objective lens in one or more areas in a phototaking field by using the signal from said photoelectrical changing unit;
- said optical unit comprising a reflecting mirror having a light condensing property for reflecting a light beam from the objective lens to form an object image on a predetermined surface, a secondary imaging lens having at least a pair of lenses for causing the object image formed on the predetermined surface to be reimaged on said photoelectrical changing unit, and a pair of apertures having aperture portions respectively corresponding to the pair of lenses,
- wherein when said photoelectrical changing unit is reversely projected by said secondary imaging lens and said reflecting mirror, the elements corresponding to the direction of arrangement of the pair of apertures of said photoelectrical changing unit are arranged so that a peripheral portion of the elements is not parallel to the center of the arrangement of the elements.

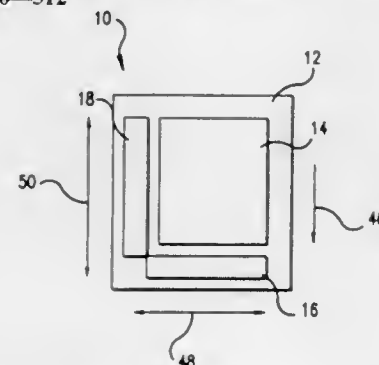
5,771,414  
CAMERA HAVING A RECORDING DEVICE FOR  
RECORDING AN AUDIO MESSAGE ONTO A  
PHOTOGRAPHIC FRAME, AND PHOTOGRAPHIC  
FRAME HAVING A RECORDING STRIP

Paul T. Bowen, 8801 Clifford Ave., Chevy Chase, Md. 20815  
Filed Jan. 29, 1996, Ser. No. 593,368

Int. Cl.<sup>6</sup> G03B 17/24; 17/50

U.S. Cl. 396—312

17 Claims



1. A camera comprising:
- a film exposure section including photographic film frames developable after each of the film frames exits from the film exposure section, each of said film frames having at least one audio recording region; and
  - a recording device for recording an audio signal onto the at least one audio recording region of each of the film frames, wherein said at least one audio recording region includes first and second audio recording strips that are substantially perpendicular to one another, said first audio recording strip being recordable before the selected film frame exits the camera, and the second audio recording strip being recordable upon exiting of the selected film frame from the camera.

5,771,415

## DATA IMPRINTING DEVICE

Koichi Matsumura; Michio Hirohata, and Ichirou Yasumaru, all of Kanagawa-ken, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 15,468, Feb. 9, 1993, abandoned.

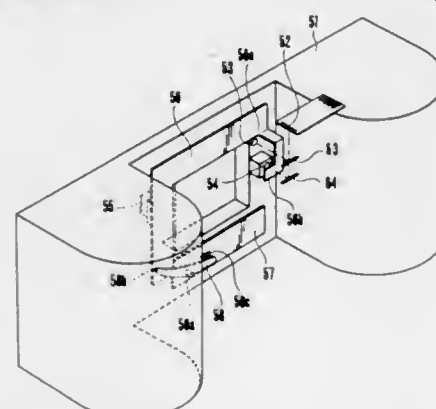
This application Nov. 17, 1994, Ser. No. 341,463

Claims priority, application Japan, Feb. 14, 1992, 4-059140; Jul. 20, 1992, 4-192395

Int. Cl.<sup>6</sup> G03B 17/24; 17/02

U.S. Cl. 396—315

24 Claims



1. A data recording apparatus, comprising:
- a) a light emitting device;
  - b) a first optical system for recording data at a first position by using light from the light emitting device;
  - c) a second optical system, having a different optical axis from the first optical system, for recording data at a second position different from the first position by using light from the light emitting device; and

- d) a light shielding device selectively changeable at least between a first light shielding state to shield the light for forming an image by the first optical system and a second light shielding state to shield light for forming an image by the second optical system.

5,771,416

## CAMERA HAVING SIMPLE AND INEXPENSIVE FINDER FIELD FRAME SWITCHING MECHANISM

Hiromu Mukai, Kawachinagano; Kyoichi Miyazaki, Izumi-otsu, and Hideki Nagata, Sakai, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Jan. 29, 1997, Ser. No. 790,619

Claims priority, application Japan, Jan. 30, 1996, 8-014697;

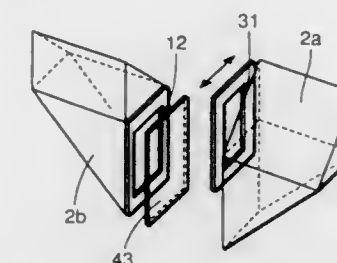
Jan. 30, 1996, 8-014699; Jan. 30, 1996, 8-014700; Jan. 31, 1996,

8-015400; Jan. 31, 1996, 8-015401

Int. Cl.<sup>6</sup> G03B 13/10

U.S. Cl. 396—378

12 Claims



1. A finder capable of switching a field frame between a reference field frame and two field frames, comprising:
- a mechanical type switching mechanism for switching one field frame into and out of an optical path and
  - a liquid crystal switching mechanism for switching another field frame into and out of the optical path.

5,771,417

## PHOTOGRAPHIC PROCESSOR AND METHOD OF OPERATION

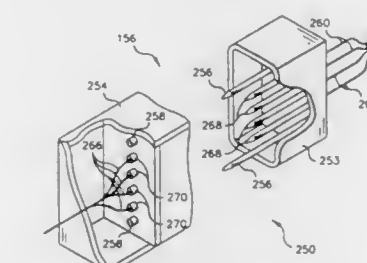
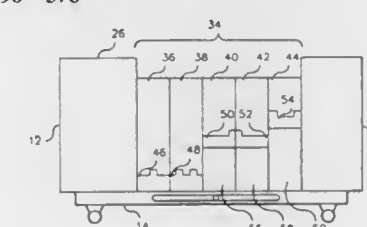
Edgar Preston Gates, Honeoye; John Howard Rosenburgh, Hilton, and David George Foster, West Henrietta, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 30, 1996, Ser. No. 720,401

Int. Cl.<sup>6</sup> G03D 13/00; 13/04

U.S. Cl. 396—578

13 Claims



1. A photographic processor comprising:

- a processing section having a first predetermined location designed to receive a first removable processing tank containing a first predetermined type processing solution designated for said first predetermined location, and a second predetermined location designed to receive a second removable processing tank containing a second type processing solution designated for said second predetermined location, said first type processing solution being different from said second type processing solution, said first and second removable processing tanks each having an access opening, an outlet port and an inlet port;
- a recirculation system connected to said inlet port and said outlet port of each of said first and second removable processing tanks for recirculating the processing solution contained therein; and
- means for preventing placement of a removable processing tank at one of said first and second predetermined locations which contains a processing solution of a different type from which that location is designated.

5,771,418

## PHOTOSENSITIVE MATERIAL PROCESSING APPARATUS

Yorikatsu Miyazawa; Hideo Ishii; Yoshifumi Tsubaki; Toshiyuki Ikariya; Hideo Kobayashi, and Yasuhiro Oka, all of Hino, Japan, assignors to Konica Corporation, Tokyo, Japan

Division of Ser. No. 261,847, Jun. 17, 1994, Pat. No.

5,489,962. This application Jun. 5, 1995, Ser. No. 461,254

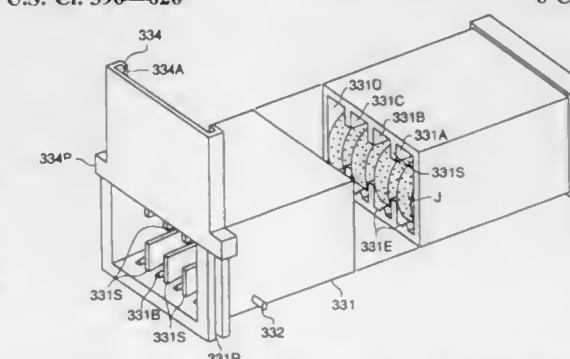
Claims priority, application Japan, Jun. 23, 1993, 5-152127;

Oct. 26, 1993, 5-267512; Dec. 28, 1993, 5-336742; Dec. 28, 1993, 5-336743; Dec. 28, 1993, 5-336744; Mar. 4, 1994, 6-34822

Int. Cl.<sup>6</sup> G03D 3/02

U.S. Cl. 396—626

6 Claims



1. A device for replenishing a solid processing agent to a photosensitive material processing apparatus, said device comprising:
- a container which is capable of being detachably mounted on the photosensitive material processing apparatus, said container storing a plurality of tablets of the solid processing agent and including an opening through which the tablets may be discharged;
  - a cover member movable between: (i) an open position in which the opening in the container is open so that the tablets may be discharged from the container through the opening, and (ii) a closed position in which the opening in the container is closed so that the tablets are retained in the container; and
- wherein each of the tablets has a circular outer circumference, and the container is shaped to hold the tablets such that each tablet contacts an adjacent tablet only along the respective circular outer circumferences thereof.

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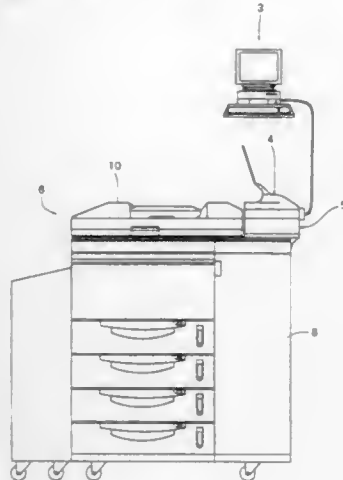
APPARATUS COMPRISING A COMBINATION OF A HOST COMPUTER, A PRINTER, A COPY MACHINE, AND AN AUTOMATIC DOCUMENT FEEDER  
Keiji Kubo; Kenji Yamamura; Motoyuki Fukuda, and Katsumi Fujimoto, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Mar. 5, 1997, Ser. No. 811,840

Claims priority, application Japan, Mar. 13, 1996, 8-083055  
Int. Cl.<sup>6</sup> G03G 15/22

U.S. Cl. 399—2

4 Claims



1. An image forming machine comprising a host computer, a printer for printing the output of said host computer, a copying machine for making a predetermined number of copies of a document which is a printed sheet printed by said printer, said copying machine being equipped with an automatic document feeder, a document supply device including first document conveying means for directly conveying the document printed by said printer to said automatic document feeder, and second document conveying means which has an intermediate tray for temporarily storing the document printed by said printer for conveying this document to said automatic document feeder after temporarily storing it in said intermediate tray, and control means for operatively controlling said copying machine and said document supply device on the basis of a print/copy command from said host computer, wherein when said copying machine is not performing a copy action in a stand-alone manner, said control means exercises control in a first print/copy mode in which said control means actuates said first document conveying means of said document supply device to directly convey the document printed by said printer to said automatic document feeder for performing a copy action; and while said copying machine is performing a copy action in a stand-alone manner, said control means exercises control in a second print/copy mode in which said control means actuates said second document conveying means of said document supply device to temporarily store the document printed by said printer in said intermediate tray, and convey the document temporarily stored in said intermediate tray to said automatic document feeder upon completion of the copy action by said copying machine so as to perform a copy action.

5,771,420

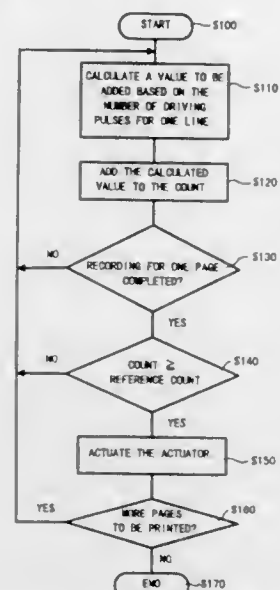
LIFE DETECTING SYSTEM FOR DETECTING THE USEFUL LIFE OF A PROCESS UNIT  
Makoto Suzuki, and Takemi Yamamoto, both of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Mar. 28, 1997, Ser. No. 828,347

Claims priority, application Japan, Apr. 10, 1996, 8-088181  
Int. Cl.<sup>6</sup> G03G 15/00

U.S. Cl. 399—25

27 Claims



1. A life detecting system for a process unit comprising a latent image recording medium recording a latent image and a latent image former forming the latent image on the latent image recording medium and transferring the latent image onto a printing medium, the life detecting system comprising: a driving pulse counter that counts driving pulses generated in the latent image former, the driving pulses used to form portions of the latent image; a first memory that stores a predetermined value corresponding to a useful life of the process unit; a comparator that compares a count of the driving pulse counter with the predetermined value; and a notifier that notifies a user of the end of the useful life of the process unit when the comparator judges that the count exceeds the predetermined value; wherein the notifier comprises: an indicator having an irreversibly changing medium capable of irreversibly changing from a first indication state to a second indication state, and an actuator that changes the irreversibly changing medium from the first indication state to the second indication state when the comparator judges that the count exceeds the predetermined value.

5,771,421

METHOD OF CONTROLLING FUSING OF AN IMAGE FORMING APPARATUS  
Soon-Nam Kim, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

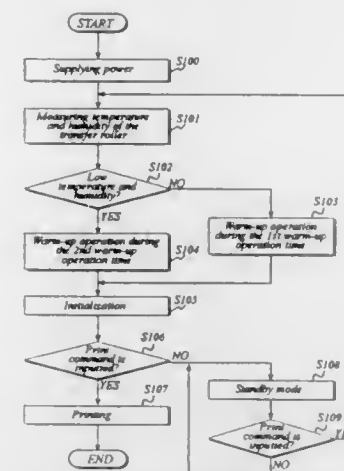
Filed Mar. 31, 1997, Ser. No. 832,618

Claims priority, application Rep. of Korea, Mar. 29, 1996, 96-9191  
Int. Cl.<sup>6</sup> G03G 15/20

U.S. Cl. 399—44

18 Claims

1. A method of fusing image using an image forming apparatus including a paper feeder, a photosensitive device having a drum to form an electrostatic latent image on the peripheral surface of the drum, a transferring device to supply toner powder to the electrostatic latent image and to transfer a toner image on a paper, and a



fusing device for fusing the toner image on the paper, said method comprising the steps of: measuring ambient temperature and humidity of the transferring device when power is supplied and judging whether the transferring device is at below a predetermined temperature and below a predetermined humidity; after said judging, when the transferring device is not below the predetermined time and below a predetermined humidity, heating the fusing device for a first warm-up time; after said judging, when the transferring device is below the predetermined temperature and below the predetermined humidity, heating the fusing device for a second warm-up time; and when a print command is received after heating of the fusing device, completing a print process by controlling the photo-sensitive device and the transferring device and fusing the transferred toner image on the paper.

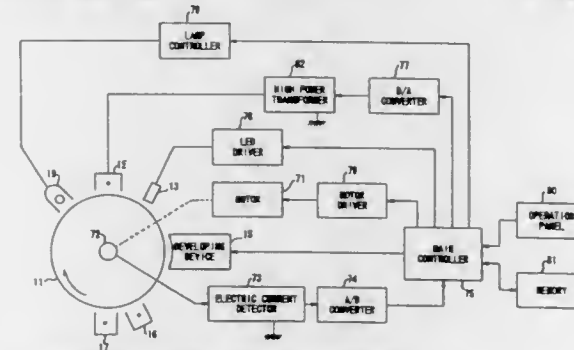
5,771,422

IMAGE FORMING APPARATUS  
Kazushige Morihara, Kanagawa-ken, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa-ken, Japan  
Filed Dec. 13, 1996, Ser. No. 764,860

Claims priority, application Japan, Dec. 28, 1995, 7-352198  
Int. Cl.<sup>6</sup> G03G 15/02

U.S. Cl. 399—50

10 Claims



1. An image forming apparatus comprising: an image carrier on which a static latent image is formed; charging means for charging the image carrier; means for setting an output adjustment mode; means for developing the static latent image formed on the image carrier by applying a developer; charge eliminating means for fully eliminating a charge on the image carrier at a position between the charging means and the developing means along the rotating direction of the image carrier when the output adjustment mode is set by the setting means; current detecting means for detecting a current flowing into the image carrier when the charging means charges the image carrier in the output adjustment mode;

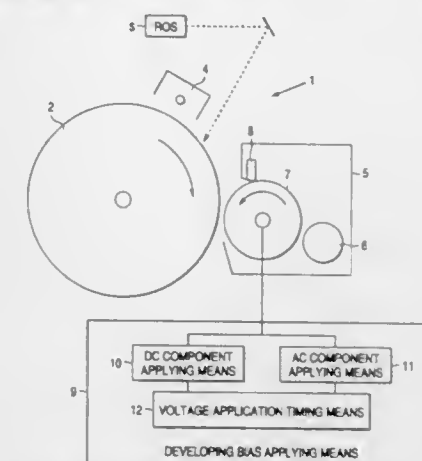
means for generating a control value corresponding to the current detected by the current detecting means; and means for supplying to the charging means a voltage corresponding to the control value.

5,771,423

IMAGE FORMING APPARATUS  
Junichi Hama, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan  
Continuation of Ser. No. 404,769, Mar. 15, 1995, abandoned.  
This application Aug. 21, 1996, Ser. No. 697,254  
Claims priority, application Japan, Mar. 30, 1994, 6-060896  
Int. Cl.<sup>6</sup> G03G 15/08

U.S. Cl. 399—55

4 Claims



1. An image forming apparatus in which, under a developing voltage consisting of an AC voltage and a DC voltage that is applied from a developing voltage applying means, only nonmagnetic toner of two-component developer comprising magnetic carriers and nonmagnetic toner is moved to a photoreceptor, thereby developing a latent electrostatic image formed on said photoreceptor into a visual image, the apparatus comprising: a voltage application timing control means for independently controlling the timings of applying said DC voltage and said AC voltage to a developing element of the apparatus; and wherein when a given image forming operation starts, said voltage application timing control means applies said DC voltage and then applies said AC voltage, and wherein when a given image forming operation ends, said voltage application timing control means stops both the operations of applying said AC voltage and said DC voltage simultaneously.

5,771,424

PRECONDITIONING OF PHOTORECEPTOR AND CLEANER BRUSH  
Nero R. Lindblad, Ontario; Darryl L. Pozzanghera, Rochester; Charles M. Gardiner, Fairport; Larry G. Hogestyn, Ontario; Kenneth L. Timmons, and Clive R. Dauntun, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

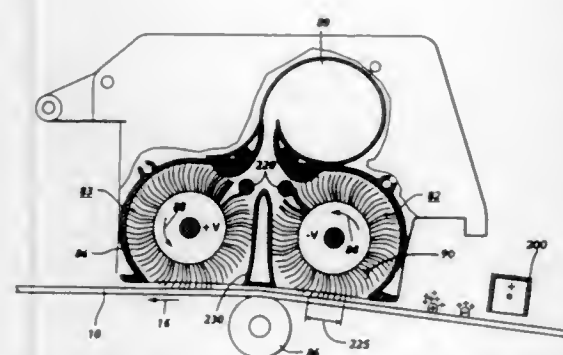
Continuation of Ser. No. 139,689, Oct. 22, 1993, abandoned, and Ser. No. 446,188, May 19, 1995, abandoned. This application Feb. 21, 1997, Ser. No. 804,529  
Int. Cl.<sup>6</sup> G03G 15/00

U.S. Cl. 399—71

19 Claims

1. A method for loading particles on a brush adapted to contact an imaging surface used in a printing machine of the type having successive images developed thereon, comprising the steps of: initializing a conductive cleaning brush once for the life of the brush in the printing machine; forming an image developed with particles on the imaging surface;





removing the particles from the imaging surface with the brush such that the particles adhere to the brush; stopping initialization of the brush; and actuating the printing machine to start the printing process.

5,771,425

#### MECHANICALLY FASTENED CYLINDRICAL ENGAGING MEMBER FOR USE IN AN IMAGE FORMING APPARATUS

Yusuke Yamada; Toshiyuki Yoshihara, both of Tokyo; Tadayuki Tsuda; Isao Ikemoto, both of Kawasaki, and Mitsuru Miyamoto, Kanagawa-ken, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 920,923, Jul. 28, 1992, abandoned.

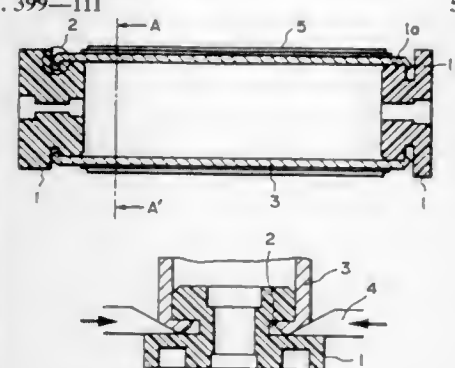
This application Jul. 18, 1994, Ser. No. 276,484

Claims priority, application Japan, Aug. 2, 1991, 3-194117

Int. Cl.<sup>6</sup> G03G 15/06; 21/00

U.S. Cl. 399—111

57 Claims



1. An image-bearing member for use in an electrophotographic image forming apparatus, said image-bearing member comprising: a metallic cylinder having a wall thickness of 0.3–1.5 mm and having an electrophotographic photosensitive layer thereon; and a resinous terminal engaging member, including a head which has a plurality of discrete recesses, each recess having a contour, positioned circumferentially around a periphery of said head,

said terminal engaging member being inserted into, and being fastened to, at least one open end of said cylinder by bending and cutting said at least one open end of said cylinder, at discontinuous plural parts thereof, such that said plural parts project into said recesses and are intimately attached to said recesses so as to conform with said contours of said recesses, each of said plural parts thereby fixing a relative position between said cylinder and said terminal engaging member in both axial and rotational directions.

#### 5,771,426 DEVELOPING DEVICE USING A TONER AND CARRIER MIXTURE

Seiji Oka, Yokohama; Kiyonori Tsuda, Tokyo; Hajime Oyama, Ichikawa; Fumihiko Sasaki, Fujii; Satoshi Mochizuki, Numazu, and Takahisa Kato, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

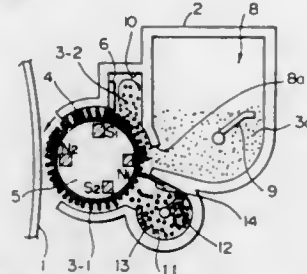
Filed Apr. 19, 1996, Ser. No. 633,687

Claims priority, application Japan, Apr. 20, 1995, 7-119338; Apr. 20, 1995, 7-119339; Apr. 20, 1995, 7-119341; Apr. 28, 1995, 7-129363; May 2, 1995, 7-132687; May 20, 1995, 7-145615; May 18, 1995, 7-144122; Jun. 16, 1995, 7-174420; Mar. 22, 1996, 8-093593

Int. Cl.<sup>6</sup> G03G 15/04

U.S. Cl. 399—119

40 Claims



1. A developing device comprising: a developer carrier conveying a developer consisting of a toner and a magnetic carrier and deposited thereon; magnetic field generating means accommodated in said developer carrier; a regulating member regulating an amount of the developer being conveyed by said developer carrier; a developer storing chamber temporarily storing a part of the developer removed by said regulating member; and a developer holding chamber which holds the developer; a toner storing chamber adjoining said developer storing chamber at an upstream side in a direction in which said developer carrier conveys the developer, and comprising an opening through which a toner stored in said toner storing chamber contacts the developer deposited on said developer carrier from said developer holding chamber and the developer existing in said developer storing chamber; wherein the developer removed from said regulating member moves toward said opening in said developer storing chamber due to an internal pressure thereof and gravity, wherein the toner from said toner storing chamber is mixed with the developer from the developer holding chamber and is conveyed toward said regulating member along a surface of said developer carrier, and wherein the developer regulated to a preselected amount by said regulating member is fed to a developing position where said developer carrier faces an image carrier.

5,771,427

#### BLOW-MOLED TONER FILLABLE CARTRIDGE AND A METHOD FOR FORMING SAME

Kazumasa Makino, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Apr. 29, 1996, Ser. No. 638,780

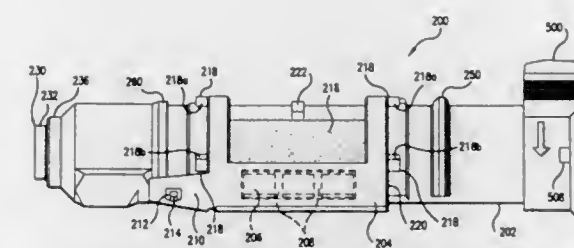
Claims priority, application Japan, Dec. 28, 1995, 7-39458; Apr. 3, 1996, 8-9535

Int. Cl.<sup>6</sup> G03G 15/08

U.S. Cl. 399—120

25 Claims

1. A toner fillable cartridge for use with a development device, comprising: a blow-molded resin body; at least one protrusion integrally formed on the blow-molded resin body; and a toner box shielding member rotatable in relation to the blow-molded resin body to selectively seal a toner exhaust port, said toner box shielding member including at least one lateral



bearing surface slidingly engageable with said at least one protrusion integrally formed on said blow-molded resin body.

5,771,428

#### IMAGE FORMING APPARATUS CAPABLE OF FACILITATING A JAM REMOVAL OPERATION

Takeshi Marumoto, and Toru Nakayama, both of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka-fu, Japan

Filed Jul. 7, 1997, Ser. No. 889,171

Claims priority, application Japan, Jul. 9, 1996, 8-179598

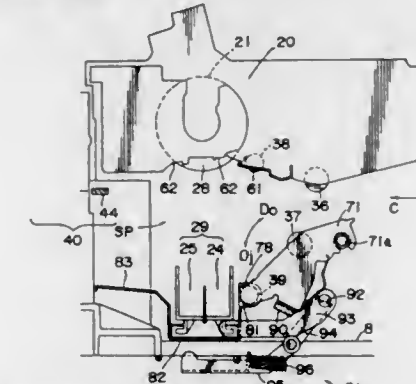
Int. Cl.<sup>6</sup> G03G 15/00

U.S. Cl. 399—124

6 Claims

U.S. Cl. 399—260

30 Claims



1. An apparatus for imaging an image onto a copy sheet, said apparatus comprising: a frame fixedly mounted to an interior of the apparatus, said frame having a first positioning portion and a second positioning portion; a sheet transport unit including a first roller rotatably supported to said frame and a second roller movable toward and away from said first roller to transport a copy sheet along a sheet transport direction while nipping the copy sheet with said first and second rollers; an imaging unit including a photosensitive drum rotatably mounted to said frame and a transfer unit movable between a retracted position away from said photosensitive drum and a transfer position where the copy sheet transported along the sheet transport direction from said sheet transport unit has the image transferable thereon at a transfer region of said photosensitive drum; a fixing unit for performing an image fixation onto the copy sheet transported along the sheet transport direction from said imaging unit; a first linking member pivotally rotatable about one end located upstream with respect to the sheet transport direction thereof between an original posture where an image formation is enabled and a jam removal posture where a jam removal operation is executable, said first linking member being mounted with the second roller rotatable at a portion other than the one end and formed with an engaging portion corresponding to the first positioning portion; and a second linking member having one end portion located upstream with respect to the sheet transport direction, the other end having a guide portion for guiding the copy sheet and a center portion for holding said transfer unit thereon, said one end portion being connected to an opposite end of said first linking member to be pivotally rotatable about the

connecting portion in response to the pivotal rotation of said first linking member, wherein the engaging portion engaging the first positioning portion to allow the second roller to come into contact with the first roller, part of said transfer unit engaging the second positioning portion to position said transfer unit relative to said photosensitive drum, and the guide portion engaging part of the fixing unit to position the guide portion relative to the fixing unit, respectively when said first linking member pivotally shifts to the original posture.

5,771,429

#### DEVELOPING DEVICE CAPABLE OF AUTOMATIC TONER CONTENT CONTROL

Hajime Oyama, Ichikawa; Seiji Oka, Yokohama; Kiyonori Tsuda, and Yasushi Akiba, both of Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

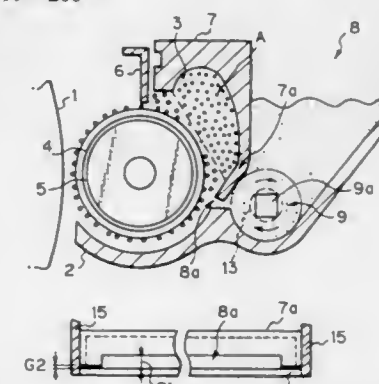
Filed Oct. 30, 1996, Ser. No. 740,560

Claims priority, application Japan, Oct. 31, 1995, 7-306504; Dec. 21, 1995, 7-349820; Sep. 26, 1996, 8-275493; Sep. 27, 1996, 8-277574

Int. Cl.<sup>6</sup> G03G 15/08

U.S. Cl. 399—260

30 Claims



7. A developing device comprising: a developer carrier for conveying a developer consisting of toner and carrier to a developing position where said developer carrier faces an image carrier; and a chamber adjoining said developer carrier, for receiving the developer therein; wherein said device develops a latent image electrostatically formed on the image carrier by holding the developer in contact with a surface of said image carrier, and replenishing toner into the developer deposited on said developer carrier on the basis of a movement of the developer caused by conveyance of the developer; and wherein the developer deposited on said image carrier is so controlled as not to remain at the developing position.

5,771,430

#### IMAGE FORMING APPARATUS WITH TONER TRANSFER

Yoshie Iwakura, Narashino, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jan. 30, 1997, Ser. No. 791,138

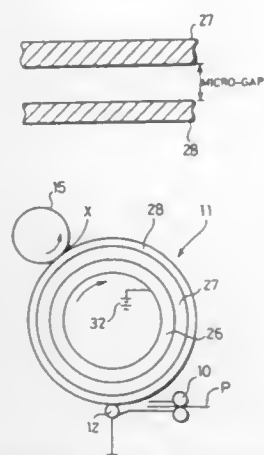
Claims priority, application Japan, Feb. 2, 1996, 8-017891

Int. Cl.<sup>6</sup> G03G 15/16

U.S. Cl. 399—31

19 Claims

1. An image forming apparatus comprising: an image carrier for carrying a toner image formed on a surface thereof, transfer means for transferring the toner image formed on the image carrier onto a transfer paper, by bringing said transfer paper into contact with the image carrier, said transfer means having a dielectric layer, a semiconductive layer and a con-



ductive layer arranged in this order from a side of a surface coming in contact with the transfer paper,

voltage application means connected to the conductive layer, for application of a predetermined voltage to said conductive layer, and

potential difference generating means provided on an upstream side of a transfer position on a surface of the dielectric layer with respect to a carrying direction of the transfer paper, said potential difference generating means coming in contact with the surface of the dielectric layer through the transfer paper and generating a potential difference between the transfer paper and the conductive layer to which the voltage is applied,

wherein the semiconductive layer is made of a foaming body having elastic property, and a diameter of foams in the semiconductive layer is controlled within a predetermined range so that charge is successively supplied from a potential difference generating means side to a transfer means side even after Paschen's discharge of from the transfer means side to the potential difference generating means side.

5,771,431

#### IMAGE-RECEIVING SHEET FOR SUBLIMATION THERMAL TRANSFER RECORDING, AND METHOD FOR PRODUCING THE SAME

Takanori Mitsuhashi; Fumio Matsui, both of Saitama, and Toshio Arai, Hyogo, all of Japan, assignors to Bando Chemical Industries, Ltd., Japan

PCT No. PCT/JP96/02100, § 371 Date Jul. 16, 1997, § 102(e) Date Jul. 16, 1997, PCT Pub. No. WO97/03840, PCT Pub. Date Feb. 6, 1997

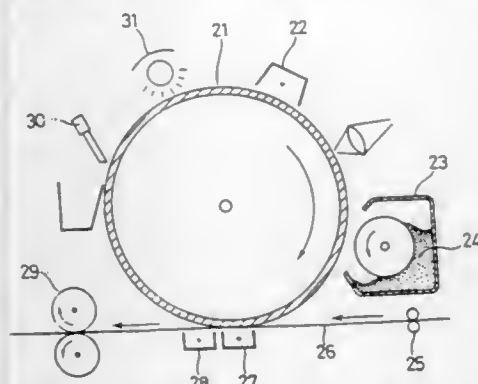
PCT Filed Apr. 22, 1996, Ser. No. 817,042

Claims priority, application Japan, Jul. 20, 1995, 7-184477

Int. Cl.<sup>6</sup> G03G 15/16; 15/20

U.S. Cl. 399—307

12 Claims



1. A white, powdery coating composition for image-receiving sheets for sublimation thermal transfer recording, which comprises a resin component, a white colorant and a cured product of reaction-curable silicone oils and which is characterized in that the

composition comprises, as the resin component, from 70 to 95% by weight of a resin mixture comprising from 50 to 90% by weight of a saturated polyester resin having an acid value of from 1.0 to 20 mg KOH/g and a glass transition point of from 50° to 70° C. And from 10 to 50% by weight of a styrene-acrylic copolymer resin, and from 0.5 to 12% by weight of a cured product of at least two reaction-curable silicone oils having functional groups capable of mutually reacting with each other.

5,771,432

#### IMAGE FORMATION SYSTEM WITH TONER SCATTERING PREVENTION

Nobuyuki Nakayama, Ashigarakami-gun, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

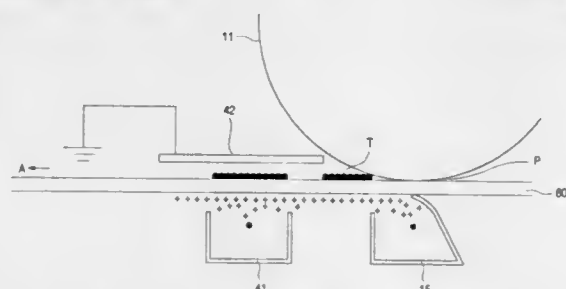
Filed Oct. 4, 1996, Ser. No. 726,854

Claims priority, application Japan, Dec. 19, 1995, 7-330528

Int. Cl.<sup>6</sup> G03G 15/16

U.S. Cl. 399—310

22 Claims



1. An image formation system, comprising:  
an electrostatic latent image support for supporting an electrostatic latent image;  
means for forming an electrostatic latent image on said electrostatic latent image support;  
means for developing the electrostatic latent image formed on said electrostatic latent image support in toner, thereby forming a toner image on said electrostatic latent image support;  
an intermediate transfer medium;  
first transfer means for transferring the toner image formed on said electrostatic latent image support to said intermediate transfer medium at a first transfer location;  
force giving means for causing a force in a direction toward said intermediate transfer medium to act on the toner image transferred onto said intermediate transfer medium, said force acting on the toner image outside of the first transfer location;  
a recording medium; and  
second transfer means for transferring the toner image transferred onto said intermediate transfer medium onto said recording medium.

5,771,433

#### METHOD AND SYSTEMS FOR HOLDING IMAGE CARRYING MEDIA OF VARIOUS SIZES

Masashi Kimijima, Ebina, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 29, 1996, Ser. No. 638,768

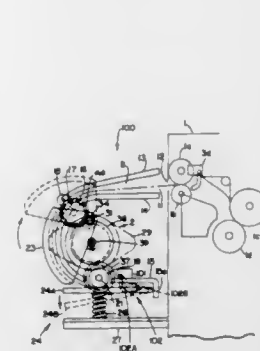
Claims priority, application Japan, Apr. 28, 1995, 7-127584; Feb. 2, 1996, 8-039098

Int. Cl.<sup>6</sup> G03G 15/00

U.S. Cl. 399—369

54 Claims

1. A system for tracking a total output amount of image-carrying medium in various sizes, comprising:  
an output holder having a predetermined capacity equivalent in a predetermined standard size for holding the image-carrying medium of various sizes;  
a converter for converting an output amount of the image-carrying medium to a number of sheets in the predetermined standard size;



a counter connected to said converter for keeping track of the total output amount in the number of the sheets in the predetermined standard size; and  
a comparison unit connected to said counter for comparing the total output amount with the predetermined capacity of said output holder and generating a full capacity signal when the total output amount reaching the predetermined capacity.

5,771,434

#### IMAGE FORMING APPARATUS

Norio Hokari, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

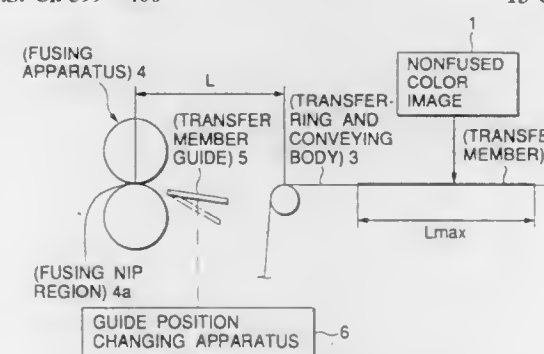
Filed May 5, 1997, Ser. No. 851,030

Claims priority, application Japan, May 8, 1996, 8-137477

Int. Cl.<sup>6</sup> G03G 15/00

U.S. Cl. 399—400

13 Claims



1. An image forming apparatus comprising:

a transferring and conveying body for transferring a nonfused image onto a transfer member and conveying the transfer member;  
a fusing means being arranged so as to be distanced from said transferring and conveying body a distance that is shorter than a maximum transfer member length and fusing an image on the transfer member;  
a transfer member guide being interposed between said transferring and conveying body and said fusing means and guiding the transfer member to thread into a fusing nip region of the fusing means; and  
a guide position changing means being arranged on said transfer member guide, said guide position changing means changing a position of said transfer member guide in a direction that a loop of the transfer member is caused when a head end of the transfer member threads into said fusing nip region of said fusing means.

5,771,435

#### METHOD AND APPARATUS FOR PROCESSING REQUESTS FOR VIDEO PRESENTATIONS OF INTERACTIVE APPLICATIONS IN WHICH VOD FUNCTIONALITY IS PROVIDED DURING NVOD PRESENTATIONS

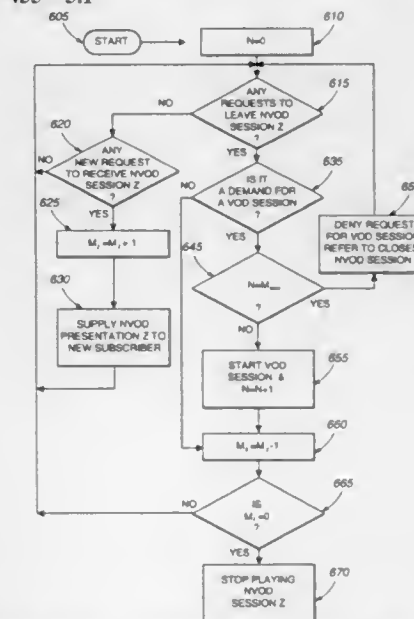
Ralph W. Brown, Boulder, Colo., assignor to Time Warner Entertainment Co. L.P., Stamford, Conn.

Filed Dec. 14, 1995, Ser. No. 572,144

Int. Cl.<sup>6</sup> H04N 7/13; 7/14

U.S. Cl. 455—5.1

24 Claims



1. In an interactive communication system, a method of processing requests for video presentations of interactive applications, said method comprising the steps of:

- (a) receiving a request, from a viewer, for a video presentation of an interactive application;
- (b) presenting to said viewer a near-video-on-demand version of said interactive application;
- (c) receiving a request, from said viewer, for a video-on-demand version of said interactive application;
- (d) determining if said transmission of said video-on-demand version of said interactive application would constrain resources of the interactive communication system; and
- (e) presenting said video-on-demand version of said interactive application to said viewer, if said presentation of said video-on-demand version of said interactive application would not constrain resources of the interactive communication system.

5,771,436

#### SATELLITE COMMUNICATIONS MULTI-POINT VIDEO TRANSMIT SYSTEM

Satoshi Ikehama, Tokyo, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 41,968, Apr. 2, 1993, Pat. No. 5,555,443. This application Jul. 30, 1996, Ser. No. 689,058

Claims priority, application Japan, Apr. 3, 1992, 4-082152

Int. Cl.<sup>6</sup> H04N 7/14

U.S. Cl. 455—12.1

5 Claims

1. A satellite communication multipoint video signal transmission system, comprising:  
a center station;  
a plurality of remote stations;  
means, included in said remote stations, for transmitting request signals to said center station via a terrestrial line from said plurality of remote stations in an arbitrary sequence;  
means for receiving and buffering the request signals received from said remote stations in said center station;



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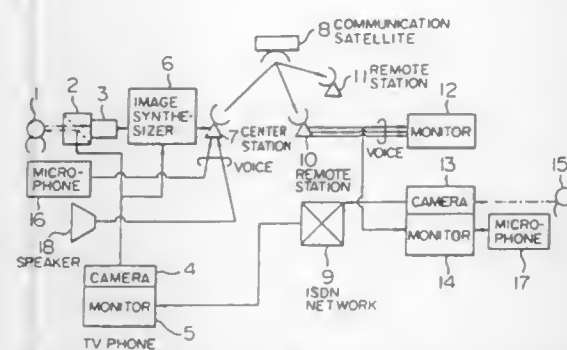
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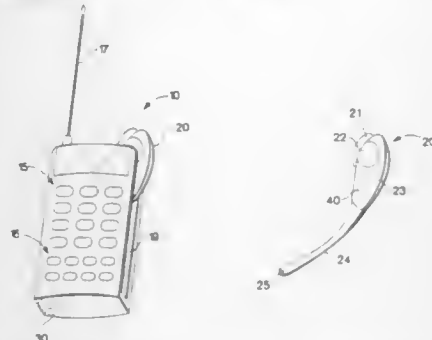
means for selecting one of video signals in said center station in response to said received and buffered request signals to produce a selection signal;  
means for transmitting the selected video signal via a satellite link as a center station video signal; and  
means, included in said remote station, for receiving said select signal from said center station via the terrestrial line to control reception of the video signal transmitted via said satellite link.

5,771,437

Patent Not Issued For This Number

5,771,438  
SHORT-RANGE MAGNETIC COMMUNICATION SYSTEM  
Vincent Palermo, Westford; Patrick J. Cobler, Belmont, and Neal R. Butler, Acton, all of Mass., assignors to Aura Communications, Inc., Wilmington, Mass.  
Continuation of Ser. No. 444,017, May 18, 1995, abandoned.  
This application Mar. 26, 1997, Ser. No. 824,260  
Int. Cl.<sup>6</sup> H04B 5/06

U.S. Cl. 455—41 9 Claims

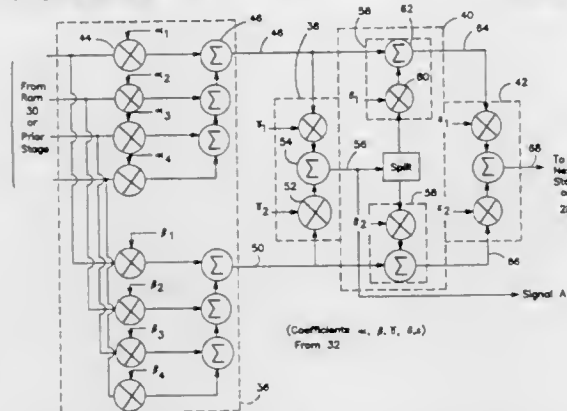


1. A short-range wireless inductive communications system, comprising:
- (A) a base unit, including:
- a base unit input for receiving first signals,
  - a base unit output for outputting second signals, and
  - a base unit transducer system including (i) three orthogonal transducers, (ii) a selector, connected to said input and the three orthogonal transducers, for selectively energizing at least one of the three orthogonal transducers to generate a first inductive field based upon said first signals, and (iii) a receiver, connected to said output and the three orthogonal transducers, for receiving a second inductive field on at least one of the three orthogonal transducers and for converting the second inductive field into said second signals; and
- (B) a portable unit disposed away from the base unit and within the first inductive field generated by the base unit, the portable unit including:
- a portable unit input for receiving third signals,

a portable unit output for outputting fourth signals,  
a portable unit transducer consisting of a single transducer, and  
a portable unit transducer system connected to said single transducer, said portable unit input, and said portable unit output, the portable unit transducer system for generating said second inductive field based upon said third signals so that said base unit is within the second inductive field and for receiving said first inductive field via the single transducer and converting said first inductive field into said fourth signals;  
wherein the base unit and the portable unit operate so that said first and second inductive fields are concurrently generated and converted, and  
wherein said selector of said base unit transducer system operates in connection with said single transducer and said portable unit transducer system to select the at least one orthogonal transducer so that the first and second inductive fields are received regardless of relative positions and orientations of the portable unit and the base unit.

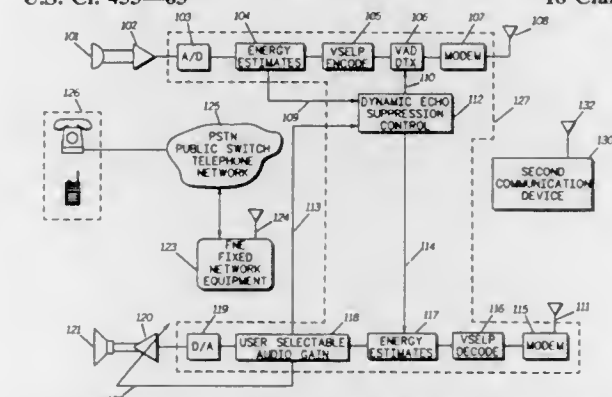
5,771,439  
ADAPTIVE ANTENNA SYSTEM AND METHOD FOR CELLULAR AND PERSONAL COMMUNICATION SYSTEMS  
Joseph Patrick Kennedy, Jr., Great Falls; Phillip Donald Harvey, Herndon, and Mark Cameron Sullivan, Annandale, all of Va., assignors to Raytheon E-Systems, Inc., Dallas, Tex.  
Filed May 20, 1996, Ser. No. 650,354  
Int. Cl.<sup>6</sup> H04B 1/10; 15/00

U.S. Cl. 455—63 24 Claims



1. A method of increasing the carrier-to-interference ratio (C/I) and decreasing signal envelope variance of each of plural signals received at an antenna array in a wireless communication system, the method comprising the steps of:
- (a) providing the received plural signals in digital form to a multistage, constant modulus beamformer; and
- (b) at each of plural stages of the beamformer,
- (i) separating one of the plural signals from a stage input so that a stage output is the remaining ones of the plural signals, and
  - (ii) projecting the stage output onto a subspace of the remaining signals in the next stage,
- whereby variability of the signal envelope of the separated signals is reduced.

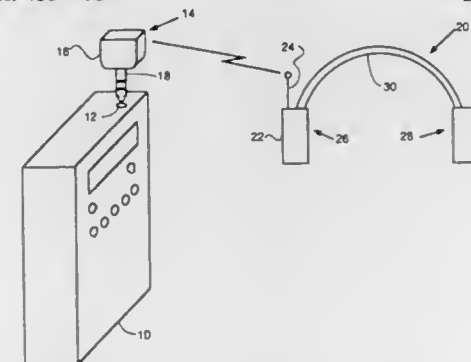
5,771,440  
COMMUNICATION DEVICE WITH DYNAMIC ECHO SUPPRESSION AND BACKGROUND NOISE ESTIMATION  
Anand Sukhu, Sunrise, and Patrick Doran, Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.  
Filed May 31, 1996, Ser. No. 657,837  
Int. Cl.<sup>6</sup> H04B 1/10; H04M 1/00  
U.S. Cl. 455—63 18 Claims



18. In a communication device having an audio output path and an audio input path, a method for minimizing echo that result from the transmission of audio signals coupled from the audio output path to the audio input path, comprising:
- receiving frames of an encoded signal including a noise parameter corresponding to background noise at a second communication device;
  - decoding the encoded signal to produce an audio signal estimating the background noise at the second communication device using the noise parameter;
  - setting a doubletalk threshold based on the audio signal level;
  - altering the threshold commensurate with changes in the background noise; and
  - suppressing echo while distinguishing the background noise from audio signal.

5,771,441  
SMALL BATTERY OPERATED RF TRANSMITTER FOR PORTABLE AUDIO DEVICES FOR USE WITH HEADPHONES WITH RF RECEIVER  
John E. Altstatt, 27801 Baker La., Los Altos Hills, Calif. 94022-2524  
Filed Apr. 10, 1996, Ser. No. 630,502  
Int. Cl.<sup>6</sup> H04B 1/034

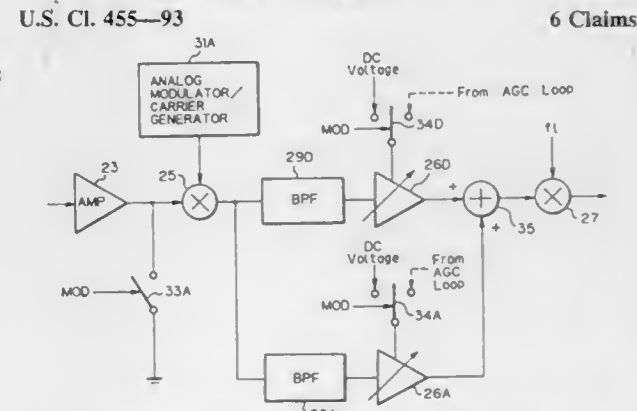
U.S. Cl. 455—66 19 Claims



1. An apparatus, comprising:
- any audio source having an audio output jack and having a signal ground conductor coupled to a first terminal of said audio output jack, said audio source having right and left stereo audio channels which output left and right channel signals and which are coupled to second and third terminals of said audio output jack;
  - an RF stereo transmitter positioned within a housing made of any material and having left and right audio inputs and a

ground conductor all of which are electrically coupled to an audio plug sized to mate with said audio output jack of said audio source and having first, second and third terminals which electrically connect to said first, second and third terminals, respectively, of said output jack when said audio plug is inserted into said audio output jack, said RF transmitter having a signal ground conductor coupled via a first coil of a three coil common mode radio frequency choke to said signal ground conductor of said audio source through said first terminals of said audio output jack and said audio plug when said audio output jack and audio plug are mated, said first coil of said three coil common mode radio frequency choke having a high impedance at the frequency of transmission of said RF stereo transmitter but small enough impedance at audio frequencies to render said signal ground conductors of said RF transmitter and said audio source essentially one conductor at audio frequencies, and wherein the three coil common mode choke includes second and third coils which are wound around the same core of magnetically permeable material as said first coil and have exactly the same impedance as said first coil, and wherein said left and right channel signals from said audio source are coupled to left and right channel audio inputs of said RF stereo transmitter through said second and third coils of said common mode RF choke, said RF stereo transmitter having an RF output comprising an RF ground output terminal coupled to said signal ground conductor of said RF stereo transmitter and an RF output terminal coupled to said first terminal of said audio plug so as to be connected to said signal ground conductor of said audio source when said output jack and audio plug are mated but so as to be electrically isolated at the frequency of said RF stereo transmitter from the signal ground conductor of said RF stereo transmitter by said first coil of said three coil common mode radio frequency choke, whereby said signal ground conductor of said RF transmitter and said signal ground conductor of said audio source act as dipole antenna elements of a radiating antenna.

5,771,442  
DUAL MODE TRANSMITTER  
Hefeng Wang, and Tetsuo Onodera, both of Tokyo, Japan, assignors to OKI Electric Industry Co., Ltd., Tokyo, Japan  
Filed Nov. 13, 1995, Ser. No. 556,001  
Claims priority, application Japan, Nov. 11, 1994, 6-277493  
Int. Cl.<sup>6</sup> H04B 1/02 6 Claims



1. A dual mode transmitter for modulating, in a digital mode, an input digital signal and transmitting a modulated digital signal and modulating, in an analog mode, an input analog signal and transmitting a modulated analog signal, the transmitter comprising:
- digital modulating means for modulating the input digital signal to thereby generate the modulated digital signal, and outputting the modulated digital signal;
  - analog modulating means for modulating the input analog signal to thereby generate the modulated analog signal, and outputting the modulated analog signal;

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carrier generating means for generating a carrier signal for up-converting the modulated digital signal;

a first up-converter for up-converting, in the digital mode, the modulated digital signal by using the carrier signal and receiving, in the analog mode, the modulated analog signal and passing the modulated analog signal therethrough;

a second up-converter following said first up-converter;

a first filter connected between said first up-converter and said second up-converter, and passing the modulated analog signal therethrough;

a second filter connected between said first up-converter and said second up-converter, and passing the modulated digital signal therethrough; and

selecting means for selecting an output signal of said first filter in the analog mode and selecting an output signal of said second filter in the digital mode.

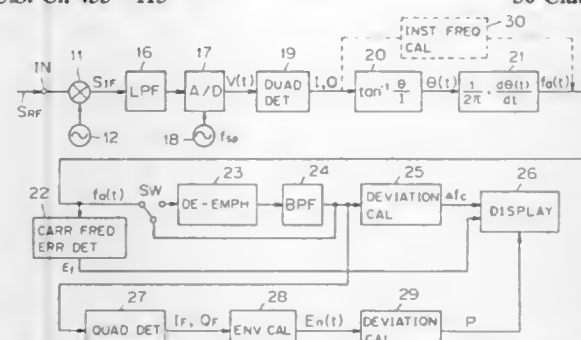
5,771,443

**METHOD AND APPARATUS FOR MEASURING FM FREQUENCY DEVIATION**

Masao Nagano, Saitama, and Hitoshi Takahashi, Gyoda, both of Japan, assignors to Advantest Corporation, Tokyo, Japan  
Filed Sep. 15, 1995, Ser. No. 530,717

Claims priority, application Japan, Sep. 19, 1994, 6-223069  
Int. Cl.<sup>6</sup> H04B 1/700

U.S. Cl. 455-115 30 Claims



29. An FM frequency deviation measuring apparatus comprising:

A/D conversion means for converting an FM input signal to a digital signal;

quadrature detection means for calculating an in-phase component I and a quadrature component Q of the FM input signal from said digital signal;

modulation frequency calculation means for calculating an instantaneous frequency of the modulated signal  $f_c(t)$  of said FM input signal from a Hilbert transformation of the in-phase component I and the quadrature component Q;

deviation calculation means for obtaining frequency deviation width from said instantaneous frequency of the modulated signal to calculate a maximum frequency deviation; and

means for de-emphasizing the instantaneous frequency of the modulated signal of said FM input signal provided between said modulation frequency calculation means and said deviation calculation means.

5,771,444

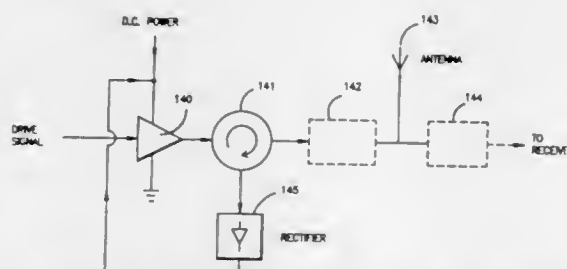
**WASTE ENERGY CONTROL AND MANAGEMENT IN POWER AMPLIFIERS**

Paul W. Dent, Stehag, Sweden, and Ross Warren Lampe, Raleigh, N.C., assignors to Ericsson Inc., Research Triangle Park, N.C.

Division of Ser. No. 179,947, Jan. 11, 1994. This application  
Jun. 7, 1995, Ser. No. 481,868  
Int. Cl.<sup>6</sup> H04B 1/04

U.S. Cl. 455-127 8 Claims

1. An efficient transmitter comprising:  
a direct current power source;



an amplifier for amplifying a drive signal so as to produce a desired signal and a waste energy signal;

an antenna for transmitting said desired signal;

a plurality of rectifier stages connected in a cascade formation for converting said waste energy signal to direct current which is fed to the direct power source, wherein power reflected when a rectifier load deviates from a perfect match in one rectifier stage is sent to a next rectifier stage in said cascade formation, said rectifier stages being efficient at a level of residual power passed to each rectifier stage from a preceding rectifier stage, so that reflected power is transferred to the direct power source.

5,771,445

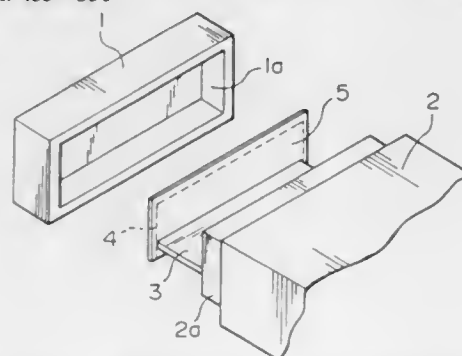
**PORTABLE RADIO RECEIVER WITH BUILT-IN ANTENNA**

Nobuya Harano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 31, 1995, Ser. No. 551,125

Claims priority, application Japan, Oct. 31, 1994, 6-290638  
Int. Cl.<sup>6</sup> H04B 1/08

U.S. Cl. 455-351 4 Claims



1. A portable radio receiver with a built-in antenna, comprising a housing, an antenna conductor disposed in an internal space of said housing, and an apparatus board to be connected to said antenna conductor,

wherein said housing is divided into at least two sections, and said divided housing sections form one integral housing upon being joined together, one divided housing section, of said at least two divided housing sections having a joint surface formed with a recessed portion, and the other divided housing section having a joint surface formed with a projecting portion to fit in said recessed portion, and

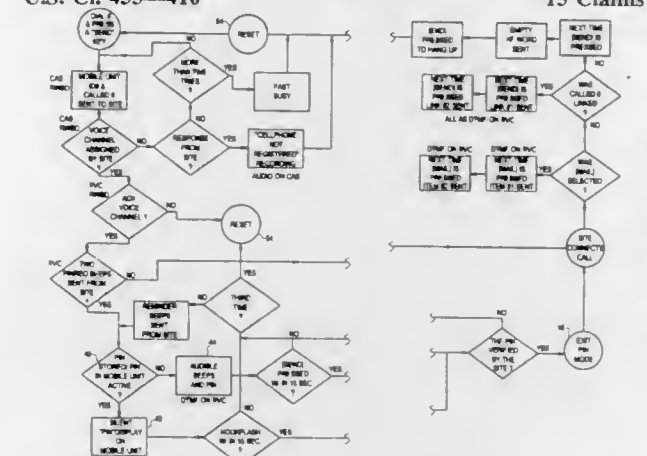
said antenna conductor is interposedly housed between said divided housing sections whereby when said recessed and projecting portions are fitted with each other, said two divided housing sections form one integral body, and said antenna is sandwiched between said recessed and projecting portions.

5,771,446

**ANTI-FRAUD CELLULAR SECURITY SYSTEM**  
Paul Wilkinson, Islip, N.Y., assignor to Audiovox Corporation, Hauppauge, N.Y.

Filed Jun. 23, 1995, Ser. No. 494,317  
Int. Cl.<sup>6</sup> H04Q 7/00

U.S. Cl. 455-410 15 Claims



1. A method for preventing theft of cellular telephone service by using a PIN number to authorize each call, said service being provided by a cell site to a subscriber's mobile unit, said service including data having a digital message format, said method comprising the steps of:

storing the PIN number in the mobile unit;

seizing a voice channel for a call; and

pressing a key to retrieve said stored PIN number and transmit said stored PIN number on said voice channel as digital data having a message format such that said digital data is combined with a group of interactive message format data on a reverse wide band data format to securely transmit the PIN number to the cell site.

5,771,447

Patent Not Issued For This Number

5,771,448

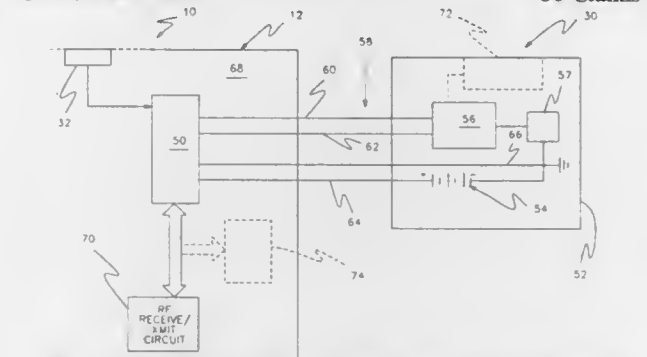
**BATTERY PACK HAVING PERSONALITY DATA STORED THEREIN**

Gerald Meade Cooper, Gretna, Va., assignor to Ericsson Inc., Research Triangle Park, N.C.

Filed Jun. 26, 1995, Ser. No. 494,421

Int. Cl.<sup>6</sup> H04Q 7/32

U.S. Cl. 455-411 30 Claims



26. A system for securing a communication system including a plurality of digitally controlled communication devices, said system comprising a plurality of interchangeable battery packs to power said communication devices, wherein each said battery pack includes a programmable memory device permanently housed

therein having personality data identifying at least one of a communication device and an authorized user of said communication device so as to permit operation of said communication device within said communication system.

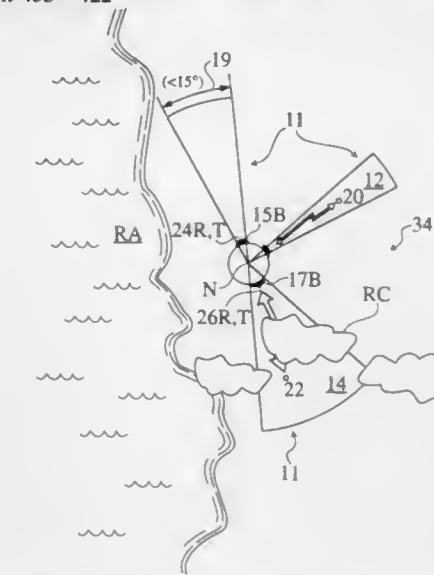
5,771,449

**SECTORIZED MULTI-FUNCTION COMMUNICATION SYSTEM**

Raymond R. Blasing, Clifford A. Mohwinkel, both of San Jose; Douglas G. Lockie, Monte Sereno, all of Calif.; Paul Likins, Southport, Conn., and Edward A. Keible, Palo Alto, Calif., assignors to Endlink, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 210,404, Mar. 17, 1994, abandoned. This application Aug. 25, 1995, Ser. No. 519,476  
Int. Cl.<sup>6</sup> H04Q 7/20

U.S. Cl. 455-422 14 Claims



6. A high-bandwidth communications apparatus for offering communications to fixed sites comprising:

a cell (11); said cell (11) including a plurality of sectors (12, 14);

a first transmitting antenna array (15A); said first transmitting antenna array (15A) including a transmitting antenna (16);

said first transmitting antenna array (15A) being dedicated to serve only one of said sectors (12, 14);

a second transmitting antenna array (17A); said second transmitting antenna array (17A) including a transmitting antenna (18);

each of said transmitting antenna arrays (15A, 17A) each having a beamwidth (19) of a maximum of fifteen degrees;

a plurality of receivers (20, 22); each of said plurality of receivers (20, 22) being located within one of said plurality of sectors (12, 14);

each of said plurality of receivers (20, 22) for receiving only from one of said transmitting antenna arrays (15A, 17A); and

both of said first and said second transmitting antenna arrays (15A, 17A) for forming shaped beams which are alternately polarized to ensure the isolation of beams that serve adjacent sectors; and

both of said first and said second transmitting antennas (16, 18) being low sidelobe antennas to reduce the sidelobe in adjacent sectors.

5,771,450

Patent Not Issued For This Number



5,771,451

**METHOD OF TRANSMISSION POWER CONTROL IN A CELLULAR MOBILE COMMUNICATION SYSTEM AND APPARATUS THEREOF**

Kenichi Takai, and Kyouji Watanabe, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

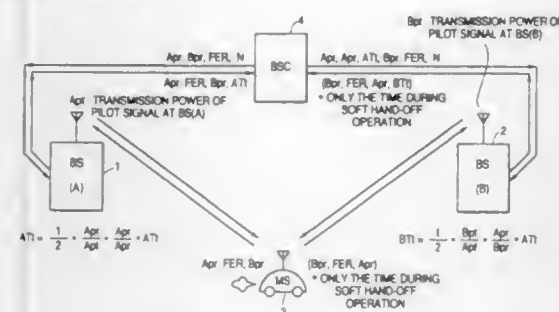
Filed Sep. 4, 1996, Ser. No. 707,442

Claims priority, application Japan, Sep. 4, 1995, 7-226583

Int. Cl.<sup>6</sup> H04Q 7/22

U.S. Cl. 455-442

6 Claims



1. A method of transmission power control in a cellular mobile communication system using a code division multiple access (CDMA) system for radio communication system, including a plurality of base stations each transmitting predetermined level of pilot signal, and a moving mobile station existing at first cell border in vicinity of second cell and activating soft hand-off operation providing the mobile station simultaneous communication with traffic channel of first base station currently being communicating in the first cell and with traffic channel of second base station to be newly communicating in the second cell, the method comprising steps of:

detecting signal level of respective pilot signals transmitted from the first base station and the second base station at the mobile station;

reporting the detected signal level of pilot signals transmitted from the first base station and the second base station to the respective first base station and the second base station from the mobile station;

transferring transmission power level of the pilot signal and the traffic channel, currently being transmitted from the first base station, to the second base station;

decreasing the transmission power level of the traffic channel of the first base station to a half level of currently transmitting level; and

calculating the transmission power level of the traffic channel of the second base station in accordance with information of transmission power level of the traffic channel currently being transmitted from the first base station, ratio of transmission power level of the pilot signals transmitted from the first base station and the second base station, and ratio of signal level of the pilot signals of the first base station and the second base station received at the mobile station.

5,771,452

**SYSTEM AND METHOD FOR PROVIDING CELLULAR COMMUNICATION SERVICES USING A TRANSCODER**

Donald V. Hanley, McKinney, and Jerry J. Parker, Richardson, both of Tex., assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 25, 1995, Ser. No. 547,297

Int. Cl.<sup>6</sup> H04Q 7/22

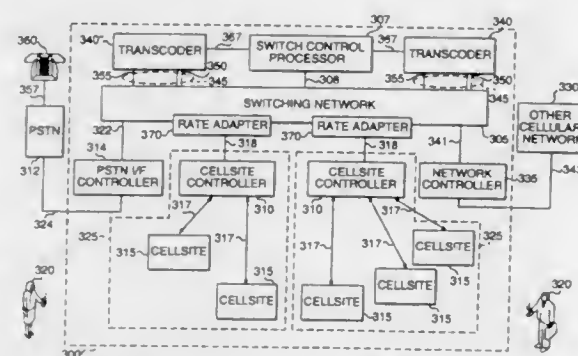
U.S. Cl. 455-445

25 Claims

17. A cellular communication system for communicating information signals between a mobile unit and another unit coupled to said system using an allocated frequency band divided into radio channels, comprising:

a switching network;

a switch control processor connected to said switching network;



a plurality of geographically-spaced cellsites, said cellsites being grouped into a plurality of clusters;

a cellsite controller associated with each of said clusters, each of said cellsite controllers being coupled to each cellsite in the associated cluster, each of said cellsite controllers being coupled to said switching network;

a transcoder connected to said switching network;

wherein said switching network is configured such that said transcoder is accessible to any of said cellsites; and

a rate adapter coupled to said switching network and said cellsite controller.

5,771,453

**MULTIPLE USER BASE STATIONS AND METHODS FOR RADIO PERSONAL COMMUNICATIONS SYSTEMS**

Jacobus Cornelius Haartsen, Staffanstorps, Sweden, assignor to Ericsson Inc., Research Triangle Park, N.C.

Continuation-in-part of Ser. No. 148,828, Nov. 4, 1993, Pat.

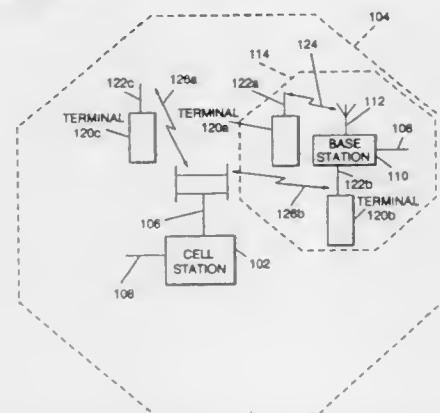
No. 5,428,668. This application Jun. 19, 1995, Ser. No.

492,336

Int. Cl.<sup>6</sup> H04M 11/00

U.S. Cl. 455-449

12 Claims



1. A telephone base station which connects a wire telephone network to a plurality of cellular terminals within a local region in a cell of a wide area cellular network which uses a plurality of channels within a cellular network spectrum, said telephone base station comprising:

a portable housing;

wire telephone network connecting means extending within said portable housing; and

radio transceiving means in said portable housing, said radio transceiving means communicating with said plurality of cellular terminals within said local region using a channel selected from said cellular network spectrum;

terminal identifying means; responsive to receipt of an inbound call to said base station from said wire telephone network connecting means, for identifying a cellular terminal to which the inbound call is directed;

wherein said terminal identifying means comprises:

inbound call accepting means, for accepting an inbound call to said base station from said wire telephone network connecting means;

terminal identification requesting means, responsive to said inbound call accepting means, for requesting via said wire telephone network connecting means, identification of a cellular terminal to which the inbound call is directed;

terminal identification accepting means, responsive to said terminal identification requesting means, for accepting identification of a cellular terminal via said wire telephone network connecting means; and

call placing means, for controlling said transceiving means to communicate with the identified cellular terminal.

5,771,454

**BASE STATION ALLOCATION METHOD FOR MOBILE RADIO COMMUNICATION SYSTEM**

Tomoki Ohsawa, Tokyo, Japan, assignor to NEC Corporation, Japan

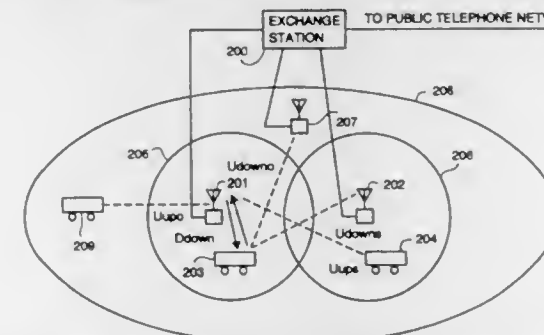
Filed Mar. 6, 1996, Ser. No. 611,563

Claims priority, application Japan, Mar. 10, 1995, 7-079848

Int. Cl.<sup>6</sup> H04Q 7/36

U.S. Cl. 455-452

12 Claims



1. A dynamic channel assignment method for improving the frequency utilization efficiency of a cellular mobile radio communication system including a plurality of cells, each cell including a base station, wherein the cells are divided into a plurality of overlapping hierarchical groups, comprising the steps of:

assigning a predetermined channel selection order to the communication channels, such that an initial value of the selection order for any base station in a particular hierarchical group is different than the initial value for any base station in any other hierarchical group;

selecting a communication channel, from among all communication channels, in response to a request for communication to a base station, in accordance with the selection order and beginning with the initial value assigned to the base station; and

assigning the selected communication channel to the request for communication when the expectation/interface radio power ratio of the communication channel is equal to or higher than a predetermined value.

5,771,455

**DATA MESSAGING IN A COMMUNICATIONS NETWORK USING A FEATURE REQUEST**

William C. Kennedy, III, Dallas, and Kenneth R. Westerlage, Ft. Worth, both of Tex., assignors to Highwaymaster Communications, Inc., Dallas, Tex.

Continuation of Ser. No. 175,256, Dec. 28, 1993, Pat. No.

5,539,810, which is a continuation-in-part of Ser. No. 95,166,

Jul. 20, 1993, abandoned, which is a continuation-in-part of

Ser. No. 826,521, Jan. 27, 1992, abandoned. This application

Dec. 15, 1995, Ser. No. 573,135

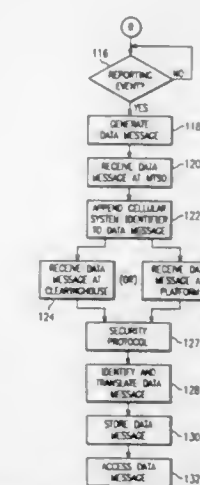
Int. Cl.<sup>6</sup> H04Q 7/22

U.S. Cl. 455-456

43 Claims

1. A method for data messaging using a cellular telephone network by issuing a feature request, comprising:

obtaining information on the status of a mobile item;



generating a feature request having a feature request identification code and data digits that represent information on the mobile item;

communicating the feature request using the cellular telephone network; and

receiving the feature request at a platform operating as an end user of the cellular telephone network.

5,771,456

**ENHANCED SUPPRESSION OF MULTIPATH INTERFERENCE**

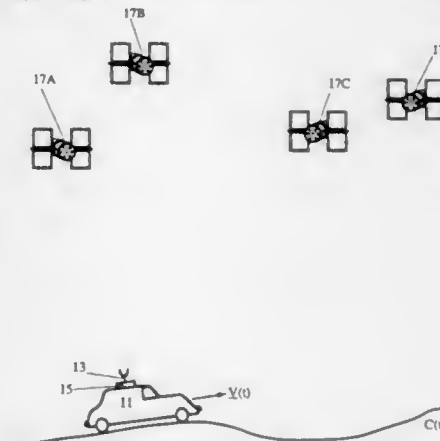
Rayman Pon, Cupertino, Calif., assignor to Trimble Navigation Limited, Sunnyvale, Calif.

Filed Aug. 9, 1996, Ser. No. 694,845

Int. Cl.<sup>6</sup> H04Q 7/20

U.S. Cl. 455-456

19 Claims



1. A method of suppressing the effects of multipath signals in determination of the location of a mobile user, the method comprising the steps of:

determining the location of a location determination (LD) unit, that is transported with a mobile user, that receives and processes LD signals from a plurality of LD signal sources numbered  $j=1, 2, \dots, J$  ( $J \geq 2$ ), and that determines the location coordinates  $x(t)=(x(t), y(t), z(t))$  and the speed or magnitude  $v(t)=|v(t)|$  of the velocity vector  $v(t)$  of the LD unit as a function of time  $t$ , using a measured range  $p(t_j)$  from the LD unit to each of the LD signal sources;

where the speed  $v$  of the LD unit is no greater than a first selected velocity threshold  $v_1$ , determining the ranges  $p=p_1(t_j)$  ( $j=1, 2, \dots, J$ ) by a first method that reduces the effects of presence of multipath signals in the LD signals received by an antenna of the LD unit;

where the speed  $v$  of the LD unit is no less than a second selected velocity threshold  $v_2$  ( $v_2 > v_1$ ), determining the ranges  $p=p_2(t_j)$  ( $j=1, 2, \dots, J$ ) by a second method that reduces the

effects of presence of multipath signals in the LD signals received by the antenna; and  
determining a blended range  $p(t; \text{blend})$  that equals  $p_1(t; j)$  when  $v(t) \leq v_1$ , that equals  $p_2(t; j)$  when  $v(t) \geq v_2$ , and that varies continuously from  $p_1(t; j)$  to  $p_2(t; j)$  for speeds  $v(t)$  satisfying  $v_1 < v(t) < v_2$ .

5,771,457

CONNECTION BETWEEN INTERFACES AND  
TERMINALS IN CORDLESS TELEPHONE SYSTEM

Yuichiro Tsutsui, Ebina, Japan, assignor to Canon Kabushiki  
Kaisha, Tokyo, Japan

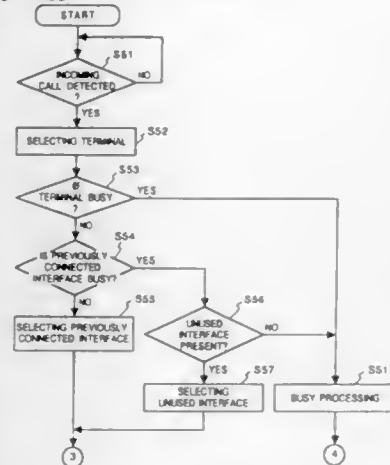
Continuation of Ser. No. 918,009, Jul. 24, 1992, abandoned.

This application Jun. 24, 1994, Ser. No. 265,636

Claims priority, application Japan, Jul. 25, 1991, 3-186384

Int. Cl. <sup>6</sup> H04Q 7/20

U.S. Cl. 455-463 20 Claims



1. A cordless communication apparatus comprising:  
a plurality of reception means, each of the plurality of reception means receiving a radio signal including a terminal identifier from a terminal; and  
limiting means including storage means for storing a class of types of calls permitted or prohibited for a terminal in accordance with a terminal identifier of the terminal, for limiting a class of types of calls permitted with the terminal such that calls from the terminal can be similarly limited regardless of reception means which has received the terminal identifier, depending on the terminal identifier received by any one of the plurality of reception means but independent of the any one of the plurality of reception means which has received the terminal identifier, by referring to the class of types of calls permitted or prohibited for the terminal stored in said storage means.

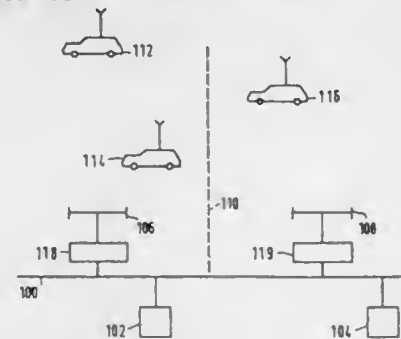
5,771,459

COMMUNICATION SYSTEM FOR USE WITH  
STATIONARY AND SECOND ENTITIES, VIA A  
WIRELESS INTERMEDIATE NETWORK WITH  
GATEWAY DEVICES, A GATEWAY DEVICE FOR USE  
WITH SUCH SYSTEM, AND A MOBILE ENTITY  
PROVIDED WITH SUCH GATEWAY DEVICE

David A. Demery; Frans Zijderhand, and Edwin W. Mulder,  
all of Eindhoven, Netherlands, assignors to U.S. Philips Cor-  
poration, New York, N.Y.

Filed Jun. 16, 1995, Ser. No. 491,190  
Claims priority, application European Pat. Off., Jun. 21,  
1994, 94201763

Int. Cl.<sup>6</sup> H04B 7/00; H04Q 7/20  
U.S. Cl. 455—517 9 Claims



1. A communication system, comprising:  
a primary wireless network;  
at least one stationary first entity, and a plurality of non-stationary second entities, wherein each of the first and second entities includes a respective secondary network that is separate from the primary wireless network and a respective gateway device that interfaces the respective secondary network to the primary wireless network;  
wherein each gateway device includes means for executing a protocol conversion of a received message which includes a message header and a message body without changing in the message header at least one of a set of message header items comprised of a source address, a destination address, a priority level indicator, a reliability level indicator, a delay requirement indicator, an expiration time indicator, and a repetition time indicator, but changing at least one of the set of message header items as required, in dependence upon the content of the message body and/or variable characteristics of a wireless link between a source entity and a destination entity; and,  
control means responsive to at least one of the unchanged message header items for controlling at least one of selective addressing of the destination entity, link operation, or message presentation to the destination entity.

5,771,460  
PROCESSING SIGNALING MESSAGES IN A MOBILE  
COMMUNICATION SYSTEM  
Hannu Vaitovirta, Espoo, and Mika Heiskari, Liminka, both of  
Finland, assignors to Nokia Telecommunications Oy, Espoo,  
Finland  
PCT No. PCT/FI95/00062, § 371 Date Dec. 18, 1995, § 102(e)  
Date Dec. 18, 1995, PCT Pub. No. WO95/22871, PCT Pub.  
Date Aug. 24, 1995

PCT Filed Feb. 13, 1995, Ser. No. 532,632  
Claims priority, application Finland, Feb. 14, 1994, 940687  
Int. Cl.<sup>6</sup> H04G 7/00; H04Q 7/20

U.S. Cl. 455—517 21 Claims  
 1. A method of processing signalling messages in a mobile communication system, comprising the steps of:  
 (a) providing a plurality of base stations, each having at least one receiver unit;  
 (b) tuning at least one receiver unit of each of said base stations to a same channel;

- (c) transmitting a respective signalling message by each of more than one mobile station of said mobile communication system to said base stations on said same channel in such a way that said signalling messages are received at a plurality of said base stations so that said signalling messages overlap at least partly in time;
- (d) storing in a memory said overlapping signalling messages;
- (e) conducting an examination as to whether any respective said signalling message transmitted by a said mobile station has been received in several similar versions at least one of which is a respective said overlapping signalling message, and, if it has, selecting only one of versions for further examination as to urgency and eliminating others of said versions from such further examination;
- (f) examining as to urgency said overlapping signalling messages stored in step (d), minus any eliminated from further examination as to urgency, as a result of conducting step (e), and, based on said examination as to urgency, selecting a most urgent signalling from among those examined as to urgency; and
- (g) performing an operation on the basis of the information included in said most urgent signalling message.

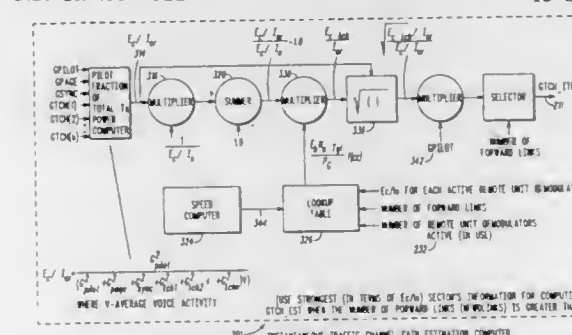
5,771,461  
METHOD AND APPARATUS FOR POWER CONTROL OF  
A FIRST CHANNEL BASED ON A SIGNAL QUALITY OF  
A SECOND CHANNEL

Robert T. Love, Barrington, and Barry J. Menich, Schaumburg, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 28, 1996, Ser. No. 672,703  
Int. Cl.<sup>6</sup> H04B 1/00

U.S. Cl. 455—522

15 Claims

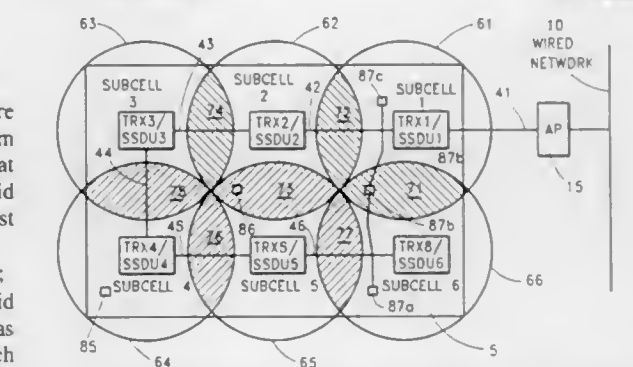


1. A method of power control in a communication system, the method comprising the steps of:

- communicating, via a first base station, to a remote unit on a first channel at a first power level;
- determining a signal quality metric of the first channel, wherein the signal quality metric is based on a ratio of the first channel power to that of a total received power and additionally based on a number of active rays to the remote unit generated by a plurality of base stations due to soft/softer handoff; and
- originating a call, via the first base station, on a second channel at a second power level, said second power level different from said first power level and based on the signal quality metric.

5,771,462  
BUS ARBITRATION INFRASTRUCTURE FOR  
DEPLOYMENT OF WIRELESS NETWORKS  
Claus Michael Olsen, Cortlandt Manor, N.Y., assignor to Inter-  
national Business Machines Corporation, Armonk, N.Y.  
Filed Jul. 7, 1995, Ser. No. 499,534  
Int. Cl.<sup>6</sup> H04B 7/00; 7/20

U.S. Cl. 455-524 18 Claims



1. In a wireless network having a base station which communicates with a plurality of wireless units in a physical coverage area, apparatus for expanding said physical coverage area of said base station, said coverage area having a plurality of subcells, said apparatus comprising:

a. a plurality of transceivers connected in both a downlink direction and an uplink direction to said base station, said transceivers being connected only in the downlink direction through a time delay mechanism for providing respective time delays in the transmission of downlink signals from said base station to said transceivers so that said downlink signals are transmitted from each of said transceivers to said wireless units in phase with each other, each of said transceivers transmitting said downlink signals into a respective one of said subcells and receiving uplink signals from said wireless units located in said respective one subcell, each said transceiver also being connected to a selection unit, said selection units together selecting from among all said wireless units transmitting an uplink signal to said transceivers at any given time a single uplink signal from a single wireless unit in only one subcell so that said selected single uplink and only said selected single uplink signal is received by said base station over an entire duration of said selected single uplink signal irrespective of other uplink signals being transmitted to said transceivers simultaneously by other wireless units.

5,771,463  
METHOD FOR CONTROLLING A SUBSCRIBER  
STATION IN A RADIO SYSTEM

Mika Lehmusto, Kerava, and Mika Heiskari, Espoo, both of Finland, assignors to Nokia Telecommunications Oy, Espoo, Finland

PCT No. PCT/FI94/00546, § 371 Date Nov. 16, 1995, § 102(e) Date Nov. 16, 1995, PCT Pub. No. WO95/15666, PCT Pub. Date Jun. 8, 1995

PCT Filed Dec. 1, 1994, Ser. No. 500,863  
Claims priority, application Finland, Feb. 12, 1993, 935404  
Int. Cl.<sup>6</sup> H04B 1/00;7/00

**U.S. Cl. 455—524** **13 Claims**

1. A method for controlling a subscriber station communicating on a direct mode channel in a radio system, comprising at least one base station communicating via channels and subscriber stations as well as at least one exchange of the radio system connected to the base stations for establishing telecommunication connections between the subscriber stations, wherein

the radio system sends to the subscriber station on the direct mode channel a communication information message determining for the subscriber station on the direct mode channel



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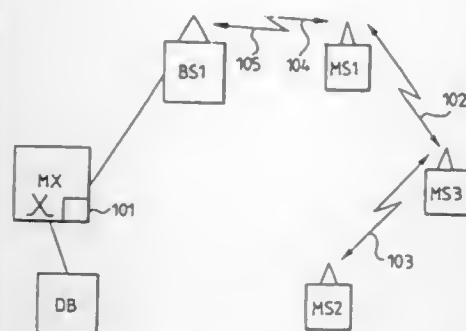
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JUNE 23, 1998



the moments and the identifiers of the channels at and on which the radio system communicates with the subscriber station, said subscriber station stores the information contained in said received communication information message in its memory, the subscriber station communicating on the direct mode channel moves at said moment determined by the communication information message to said channel to be used and communicates with the radio system on said channel.

5,771,464

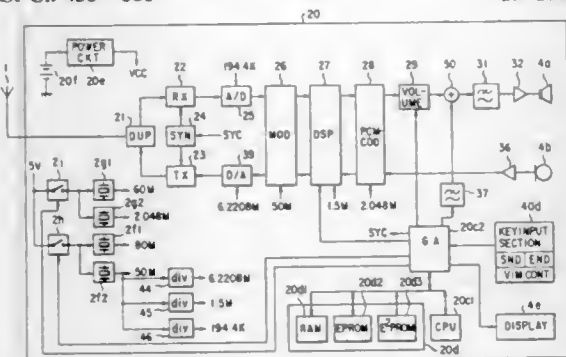
#### RADIO COMMUNICATION APPARATUS FOR USE IN DUAL-MODE RADIO COMMUNICATION SYSTEM AND HAVING GAIN VARIABLE CONTROL MEANS DEPENDENT ON THE SET MODE

Yuji Umemoto, and Yoshio Yoshimura, both of Tokyo, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan  
Filed Sep. 12, 1995, Ser. No. 527,009

Claims priority, application Japan, Sep. 13, 1994, 6-218580  
Int. Cl.<sup>6</sup> H04B 1/40

U.S. Cl. 455—553

19 Claims



1. A radio communication apparatus for use in a dual mode radio communication system which operates in either an analog mode or a digital mode, and communicates with a base station via radio links comprising:

reception speech signal output means for processing an analog demodulation signal in the analog mode and a digital demodulation signal in the digital mode and for outputting the processed demodulation signal as a reception speech signal, respectively;

a speaker for outputting a speech sound corresponding to the reception speech signal output from the reception speech signal output means;

level variable means provided between the reception speech signal output means and the speaker for varying the level of a signal inputted thereto and for outputting a level-varied signal;

mode determination means for determining whether the analog mode or the digital mode is set; and

gain variable control means for setting the gain of the level variable means to a first value when the mode determination means determines that the analog mode is set, and for setting

the gain of the level variable means to a second value when the mode determination means determines that the digital mode is set.

5,771,465

#### APPARATUS FOR PROVIDING A MOBILITY ADJUNCT FOR THE PUBLIC SWITCHED TELEPHONE NETWORK

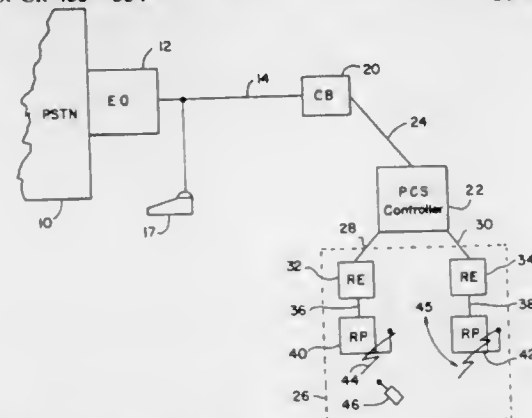
Nils Björjeryd, Richardson, Tex., assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Continuation of Ser. No. 460,851, Jun. 5, 1995, abandoned.  
This application Mar. 14, 1997, Ser. No. 818,244

Int. Cl.<sup>6</sup> H04M 11/00; H04Q 7/00

U.S. Cl. 455—554

18 Claims



1. In a telecommunications network comprising a subscriber line connected to an end office and a given wireline communications terminal, a trunk connection providing one or more timeslots for communications traffic in the forward and reverse direction, a channel bank connected between said subscriber line and said trunk connection, said channel bank providing a communications connection between a call on said subscriber line and a timeslot of said one or more timeslots of said trunk connection dedicated to the subscriber line, a wireless telephone system, a wireless communications terminal operating within said wireless telephone system, and a mobility adjunct controller connected between said trunk connection and said wireless telephone system, a method for providing a mobility adjunct service to said subscriber line, said method comprising the steps of:

receiving a wireline call on said subscriber line;

seizing said dedicated timeslot of said trunk connection in the forward direction at said channel bank;

detecting seizure of said dedicated timeslot in the forward direction at said mobility access controller;

identifying a directory number for the wireless communications terminal associated with said dedicated seized timeslot;

initiating a call setup using the identified directory number from said mobility adjunct controller to said wireless subscriber station through said wireless telephone system; and

connecting for communication, through the channel bank, the seized timeslot of the trunk connection and the mobility adjunct controller, the setup call initiated in said wireless telephone system with said received wireline call on said subscriber line.

5,771,466

#### PORTABLE RADIO TRANSCEIVER HAVING ROTARY ANTENNA

Yoshiyuki Tsugane, and Michio Nagai, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed May 30, 1995, Ser. No. 453,894

Claims priority, application Japan, May 30, 1994, 6-116316  
Int. Cl.<sup>6</sup> H04B 1/38; 1/08

U.S. Cl. 455—90

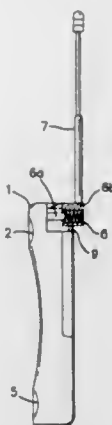
7 Claims

1. A portable transceiver comprising a casing, rotary means carried by and rotatable relative to said casing about an axis and

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having a radially extending portion, means mounting said rotary means for movement relative to said casing along said axis between first and second positions, spring means for biasing said rotary means in one direction along said axis from said first position toward said second position, an antenna mounted on said rotary means for movement with said rotary means between a position in which said antenna is extended relative to said casing and a position in which said antenna is retracted relative to and lies along said casing, and hook means carried by said casing for releasably engaging said radially extending portion so that said rotary means is releasably retained in said first position so that said antenna is in said retracted position and for freeing said radially extending portion to permit movement of said rotary means from said first position to said second position so that said antenna is in said extended position and is free to rotate.

5,771,467

#### MOBILE TERMINAL WHICH HALTS AND RESTARTS DATA TRANSMISSION BASED ON BIT ERROR RATE INDEPENDENTLY OF ANY INSTRUCTION SIGNAL FROM A BASE STATION

Yukio Sato, Yokohama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

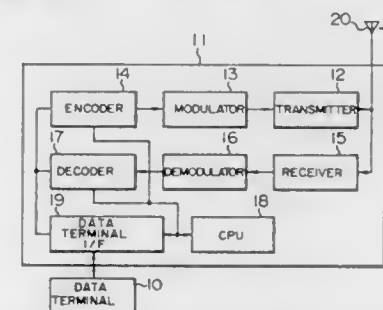
Continuation of Ser. No. 132,892, Oct. 7, 1993, abandoned.

This application Sep. 7, 1995, Ser. No. 525,293

Claims priority, application Japan, Oct. 23, 1992, 4-285766  
Int. Cl.<sup>6</sup> H04B 1/38

U.S. Cl. 455—557

1 Claim



1. A mobile terminal station for use in a digital cellular radio telephone system in which a data terminal is connected to said mobile terminal station to make data communication with a base station of a plurality of base stations, said mobile terminal station comprising:

a decoder which receives an indication of a bit error rate of a non-voice data message signal transmitted on a radio circuit from said data terminal to said base station and compares said bit error rate with a predetermined threshold; and

a central processor unit which generates, without receiving a hand-over command or an instruction signal to halt transmission from any of said base stations, a first instruction signal instructing to halt transmission of said data message signal from said data terminal to said base station in response to said decoder determining that said bit error rate is larger than said

threshold and thereafter generates, without receiving from any of said base stations an instruction signal to restart transmission, a second instruction signal instructing to restart transmission of the data message signal from said data terminal to said base station in response to said decoder determining that said bit error rate is smaller than said threshold, wherein: when transmission of the data message signal from said data terminal to said base station of said plurality of base stations is halted in response to said first instruction signal, said decoder generates dummy data for transmission to said base station of said plurality of base stations to indicate degradation of quality of said radio circuit.

5,771,468

#### MULTI-PURPOSE BASE STATION

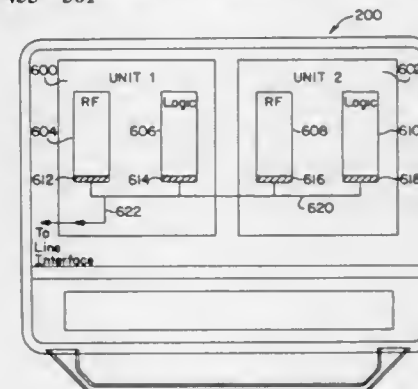
Per Stein, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Jan. 17, 1996, Ser. No. 587,493

Int. Cl.<sup>6</sup> H04Q 7/30

U.S. Cl. 455—561

10 Claims



9. A base station for use in a plurality of telecommunications systems operating according to different system standards, said base station comprising:

a line interface connected to said plurality of communications systems;

first circuitry removably interfaced to the line interface through a PCMCIA card slot for a first system of said plurality of telecommunications systems, said first circuitry for receiving an RF signal transmit at a frequency of said first system;

second RF circuitry removably interfaced to the line interface through a PCMCIA card slot for a second system of said plurality of telecommunications systems, said second circuitry for receiving an RF signal transmit at a frequency of said second system;

first logic circuitry removably interfaced to the line interface through a PCMCIA card slot for receiving an RF signal from said first RF circuitry and determining if said RF signal received from said first RF circuitry is a control signal of said first system; and

second logic circuitry removably interfaced to the line interface through a PCMCIA card slot for receiving an RF signal from said second RF circuitry and determining if said RF signal received from said second RF circuitry is a control signal of said second system.

5,771,469

#### PORTABLE TELEPHONE

Hiroyuki Toba, Saitama, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Apr. 10, 1997, Ser. No. 843,625

Claims priority, application Japan, Apr. 12, 1996, 8-091454  
Int. Cl.<sup>6</sup> H04B 1/06

U.S. Cl. 455—566

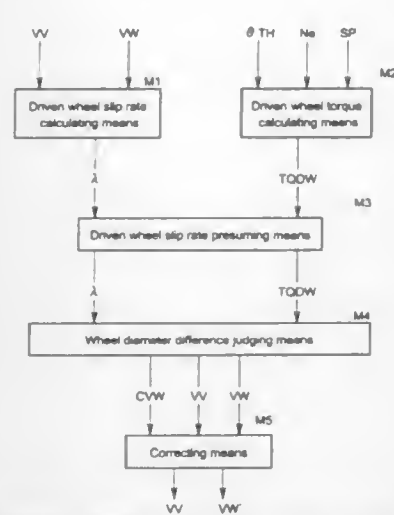
6 Claims

2. A portable telephone provided with an indicator comprising: connecting means for connecting to an on-vehicle equipment;









a wheel diameter difference judging means for judging a difference in diameter between follower and driven wheels based on the driven wheel slip rate when the driven wheel torque is equal to 0 (zero) in said variation characteristic relationship estimated by said driven wheel slip rate presuming means.

5,771,480

**METHOD AND DEVICE FOR IDENTIFYING KIND OF TIRE**

Minao Yanase, Kobe, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo-ken, and Sumitomo Electric Industries, Ltd., Osaka-fu, both of Japan

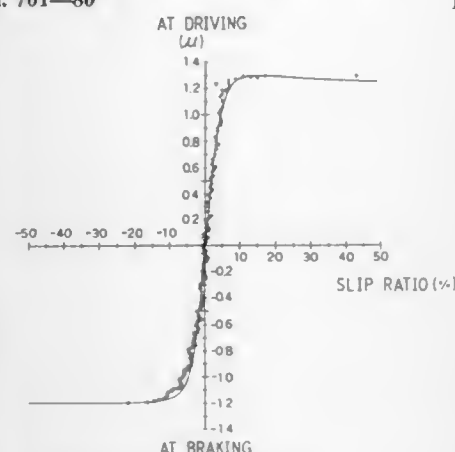
Filed Jan. 8, 1997, Ser. No. 779,080

Claims priority, application Japan, Jan. 12, 1996, 8-003658

Int. Cl.<sup>6</sup> B60C 25/00

U.S. Cl. 701—80

12 Claims



1. A tire identifying method comprising:

- measuring respective rotation speeds of four tires fitted to wheels of a vehicle;
- calculating a ratio of front wheel rotation speed to rear wheel rotation speed using the measured rotation speeds;
- preparing a function of speed and front-rear wheel speed ratio on the basis of data previously measured using a known kind of tire; and
- identifying the kind of tire fitted to the wheels of the vehicle by comparing the calculated ratio with the prepared function.

individual combustion events in an internal combustion engine, the method comprising the steps of:

5,771,481

**APPARATUS AND METHOD FOR CRUISE CONTROL**  
Simon Peter Gilling, Milton Keynes, United Kingdom, assignor to Lucas Industries Public Limited Company, Solihull, England

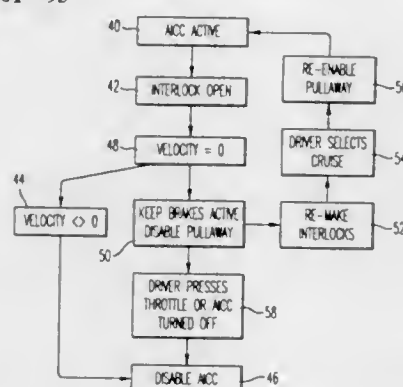
Filed Nov. 29, 1995, Ser. No. 564,472

Claims priority, application United Kingdom, Dec. 1, 1994, 9424252

Int. Cl.<sup>6</sup> B60K 31/00; 28/12

U.S. Cl. 701—93

3 Claims



1. A cruise control system for a road vehicle comprising:
  - a first means for detecting an interlock condition including at least a condition that the driver seat is empty or a condition that a door of the road vehicle is open;
  - a second means for detecting movement of the road vehicle;
  - a third means responsive to the first means and the second means for disabling the cruise control system in response to the detection of an interlock condition by the first means and movement of the road vehicle by the second means;
  - a fourth means responsive to the first means and the second means for inhibiting the cruise control system from initiating road vehicle movement while providing a braking control signal to activate a road vehicle braking system to prevent the road vehicle from initiating any movement when the first means detects the interlock condition and the second means does not detect any road vehicle movement.

5,771,482

**ESTIMATION OF INSTANTANEOUS INDICATED TORQUE IN MULTICYLINDER ENGINES**

Giorgio Rizzoni, Upper Arlington, Ohio, assignor to The Ohio State University, Columbus, Ohio

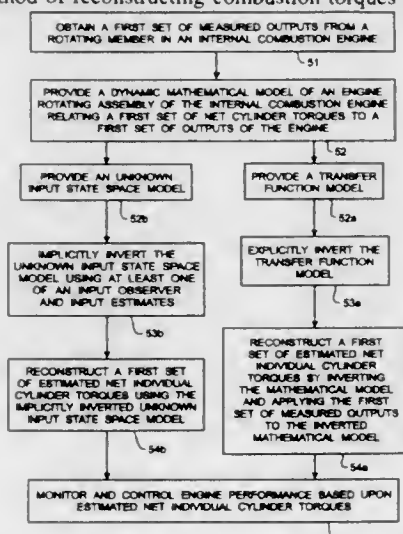
Filed Dec. 15, 1995, Ser. No. 573,327

Int. Cl.<sup>6</sup> G06G 7/70

U.S. Cl. 701—101

17 Claims

1. A method of reconstructing combustion torques produced by



obtaining a first set of measured outputs including a first set  $y$  of measured outputs from at least one of an engine and drivetrain of the internal combustion engine by determining instantaneous angular velocity of the at least one of the engine and drivetrain at a first set of preselected points along the at least one of the engine and drivetrain;

providing a dynamic mathematical model of an engine assembly of the internal combustion engine relating a first set of net individual cylinder torques to a first set of outputs of the internal combustion engine, by providing an unknown-input state space model:

$$\dot{x}(t) = f(x(t), u(t), d(t))$$

$$y(t) = g(x(t), u(t), d(t))$$

relating a first set of unknown combustion torques  $d(t)$  to a first set of measured outputs  $y(t)$ , wherein  $x(t)$  is a state vector and  $u(t)$  is a known input vector;

reconstructing a first set of estimated net individual cylinder torques by inverting said mathematical model and applying said first set of measured outputs to the inverted mathematical model according to an implicit inversion of said unknown-input state space model based on at least one of an input observer and input estimates; and,

performance of the internal combustion engine based upon the estimated net individual cylinder torques.

5,771,483

**INTERNAL COMBUSTION ENGINE TORQUE MEASUREMENT DEVICE AND METHOD**

Xavier Moine, Rueil-Malmaison, and Jean-Marie Taupin, Clamart, both of France, assignors to Renault, Boulogne-Billancourt, France

PCT No. PCT/FR96/00864, § 371 Date May 1, 1997, § 102(e) Date May 1, 1997, PCT Pub. No. WO96/42002, PCT Pub. Date Dec. 27, 1996

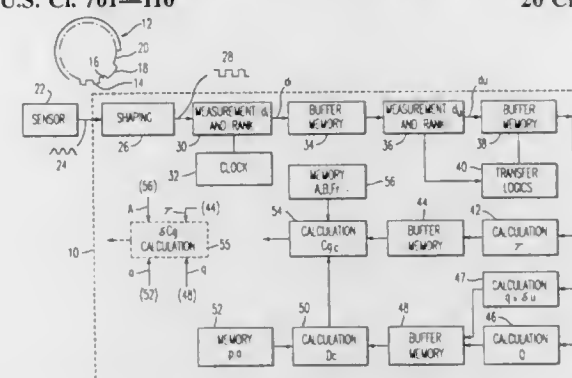
PCT Filed Jun. 7, 1996, Ser. No. 776,587

Claims priority, application France, Jun. 8, 1995, 95 06780; Jun. 8, 1995, 95 06781

Int. Cl.<sup>6</sup> G01L 3/00; G01M 15/00

U.S. Cl. 701—110

20 Claims



1. Method for the production of a digital value  $C_g$  which is representative of the mean gas torque generated by each combustion of the gas mixture in the cylinders of a combustion engine, the combustion engine includes measurement references arranged on a ring gear which is integrally connected to an inertial flywheel of the combustion engine or its crankshaft, means to define at least one reference for indexing the measurement references, a sensor to sense the passage of the measurement references, which is fixedly mounted in a vicinity of the ring gear, said method comprising the steps of:

- producing a primary digital value  $d_i$  which is representative of an instantaneous passage of time sensed by the sensor of each of the measurement references;
- deriving, from the primary digital values  $d_i$ , a first secondary digital value  $T$ , which is representative of the total passage of

time before the sensor of each series of  $n$  references defining an angular range of the combustions in the combustion engine;

deriving a second secondary digital value  $D$ , which is representative of a projection onto a phase reference line of the means to define at least one reference for indexing the measurement references, corresponding to an origin of the angular range of the combustions, of an amplitude of an alternating component of the instantaneous passage times  $d_i$  of the measurement references sensed by the sensor at a frequency of the combustions in the combustion engine;

deriving the desired numerical value  $C_g$  from the relation  $C_g = A \cdot D / T^3 + B / T^2$  in which  $A$  and  $B$  are experimentally determined constants;

establishing a measurement horizon equal to at least the angular range between two consecutive explosions in the combustion engine;

regrouping the instantaneous passage times  $d_i$  of the references within this measurement horizon in a relatively small number of passage times  $du_0, \dots, du_m$  of reference sets and of identifying these times  $du$  by the rank  $0 \dots m$  in each measurement horizon during the course of an analysis;

combining together by addition and subtraction, possibly weighted, a given number of times having determined ranks, so as to produce a magnitude  $Q$  having a mean value which is equal to zero and a frequency response which is nonzero at the analysis frequency of the combustion engine explosions; and

determining the weighting constant  $p$  such that the term  $D = p \cdot Q$  obtained by a simplified calculation has a frequency response, at least for said frequency of analysis and for the combination of the times used to express  $Q$ , which is essentially identical to that obtained by the term:

$$D = \frac{(n-1)}{n} \sum_{i=0}^{n-1} d_i \cdot \cos(i \cdot 2\pi/n).$$

5,771,484

**AUTOMATED POSITIVE CONTROL TRAFFIC SYSTEM FOR WEATHER**

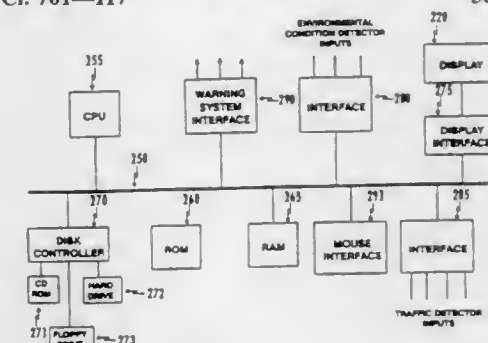
Bruce Tognazzini, Woodside, Calif., assignor to Sun Microsystems, Inc., Palo Alto, Calif.

Filed Feb. 28, 1996, Ser. No. 608,590

Int. Cl.<sup>6</sup> G08G 1/09; G01W 1/00

U.S. Cl. 701—117

30 Claims



1. A traffic control system comprising:

- one or more environmental condition detectors; wherein each detector determines visibility at a plurality of points along a road;
- one or more traffic sensors;
- one or more warning devices; and
- a computer, receiving first information from said one or more environmental condition detectors and second information from said one or more traffic sensors, configure to control said one or more warning devices to provide drivers with information useful to avoid accidents base on said first and second information.



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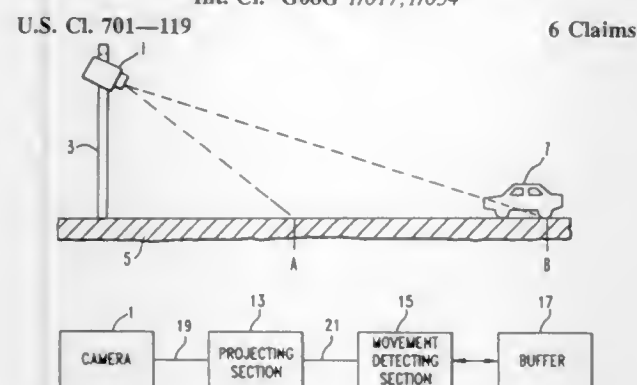
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5,771,485  
APPARATUS AND METHOD FOR DETECTING A  
VELOCITY OF A MOVING OBJECT  
Tomio Echigo, Kanagawa-ken, Japan, assignor to International  
Business Machines Corporation, Armonk, N.Y.  
Filed Apr. 19, 1996, Ser. No. 632,539  
Claims priority, application Japan, Apr. 19, 1995, 7-093833  
Int. Cl.<sup>6</sup> G08G 1/017; 1/054



1. An apparatus for detecting a velocity of a moving object, comprising:

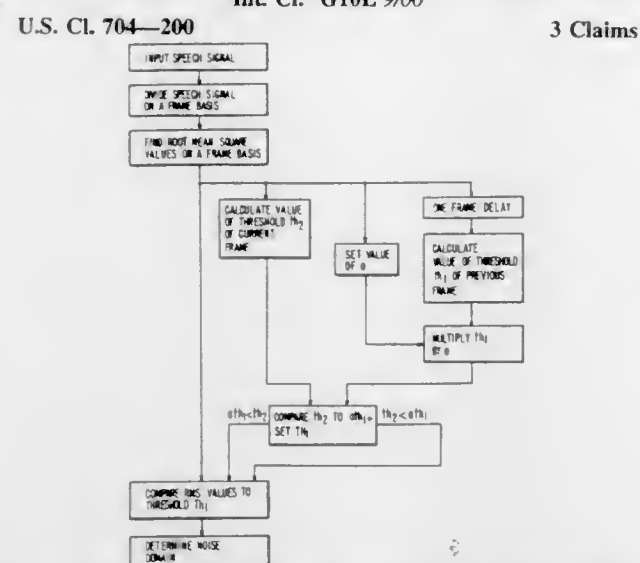
photographing means for photographing a predetermined area in which said object moves, at intervals of time T;

projecting means for projecting brightness information of each pixel in an image photographed at said intervals of time T by said photographing means, onto an axis along a moving direction of said object, and for accumulating each brightness value on said axis to generate one-dimensional projected information;

storage means for storing said one-dimensional projected information from said projecting means; and

detecting means for detecting said velocity of said object moving in said predetermined area by using a plurality of pieces of said one-dimensional projected information stored in said storage means.

5,771,486  
METHOD FOR REDUCING NOISE IN SPEECH SIGNAL  
AND METHOD FOR DETECTING NOISE DOMAIN  
Joseph Chan, Tokyo, and Masayuki Nishiguchi, Kanagawa,  
both of Japan, assignors to Sony Corporation, Tokyo, Japan  
Division of Ser. No. 431,746, May 1, 1995, Pat. No. 5,668,927.  
This application Nov. 7, 1996, Ser. No. 744,915  
Claims priority, application Japan, May 13, 1994, 6-099869  
Int. Cl.<sup>6</sup> G10L 9/00



1. A method for detecting a noise domain by dividing an input speech signal on a frame basis, finding a Root Mean Square (RMS) value on the frame basis and comparing the RMS values to a threshold value  $Th_1$ , wherein the improvement comprises:

calculating a value  $th$  for finding a threshold value  $Th_1$ , using one of an RMS value for a current frame and a value  $th$  of a previous frame multiplied by a coefficient  $\alpha$ , whichever is smaller, and changing over the coefficient  $\alpha$  depending on the RMS value of the current frame.

5,771,487

Patent Not Issued For This Number

## DESIGNS

JUNE 23, 1998

395,335  
GLOVE

Herbert W. Crawford, and Charlotte A. Crawford, both of  
6775 N. Fawn Dr., Lumberton, Tex. 77657  
Filed Dec. 2, 1996, Ser. No. 63,183  
Term of patent 14 years  
LOC (6) Cl. 02 - 06

U.S. Cl. D2-617

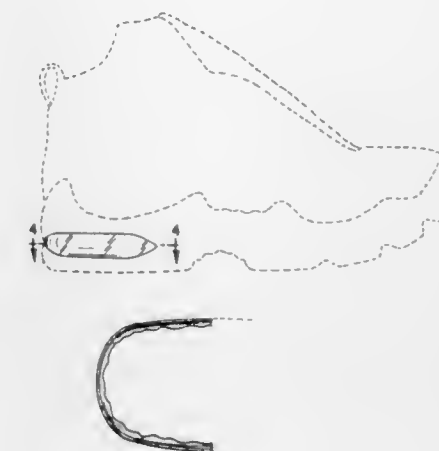


395,337

ELEMENT OF A SHOE SOLE

Pamela S. Greene, Portland, Oreg., assignor to Nike, Inc.,  
Beaverton, Oreg.  
Filed Nov. 6, 1996, Ser. No. 62,041  
Term of patent 14 years  
LOC (6) Cl. 02 - 99

U.S. Cl. D2-947



395,336

OUTSOLE CONTOUR

Kim Alan Ball, Taipei, Taiwan, assignor to Payless ShoeSource,  
Inc., Topeka, Kans.  
Filed Aug. 2, 1995, Ser. No. 42,175  
Term of patent 14 years  
LOC (6) Cl. 02 - 04

U.S. Cl. D2-947



395,338

PORTION OF A SHOE

Tracy L. Teague, Aloha, Oreg., assignor to Nike, Inc., Beaver-  
ton, Oreg.  
Filed Oct. 9, 1997, Ser. No. 77,779  
Term of patent 14 years  
LOC (6) Cl. 02 - 99

U.S. Cl. D2-947



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OFFICIAL GAZETTE

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395,339

## PORTION OF A SHOE OUTSOLE

Thomas J. Gray, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Aug. 18, 1997, Ser. No. 74,990

Term of patent 14 years

LOC (6) Cl. 02 - 04

U.S. Cl. D2—954



395,341

## SHOE OUTSOLE

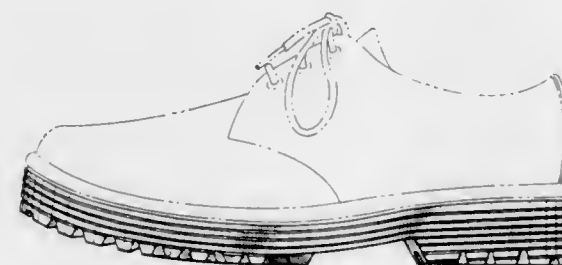
Robert Y. Greenberg, 228 Manhattan Beach Blvd., Ste. 200, Manhattan Beach, Calif. 90266

Filed Jan. 29, 1997, Ser. No. 65,542

Term of patent 14 years

LOC (6) Cl. 02 - 04

U.S. Cl. D2—957



395,340

## PORTION OF A SOLE BOTTOM SURFACE

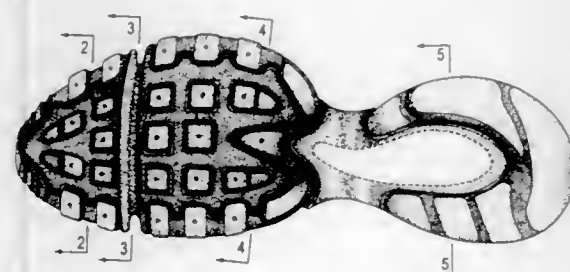
Christian J. Tresser, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Oct. 7, 1996, Ser. No. 60,753

Term of patent 14 years

LOC (6) Cl. 02 - 04

U.S. Cl. D2—957



395,342

## OUTSOLE BOTTOM

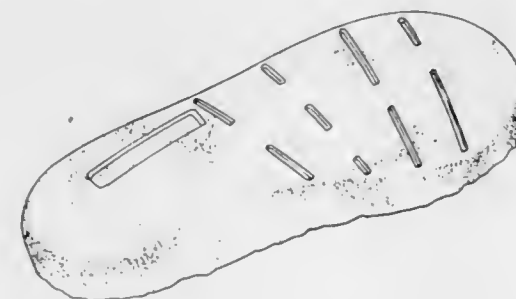
Kim Alan Ball, Taipei, Taiwan, assignor to Payless ShoeSource, Inc., Topeka, Kans.

Filed Jul. 10, 1995, Ser. No. 41,238

Term of patent 14 years

LOC (6) Cl. 02 - 04

U.S. Cl. D2—960



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U.S. PATENT AND TRADEMARK OFFICE

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## BOTTOM PORTION OF A SHOE OUTSOLE

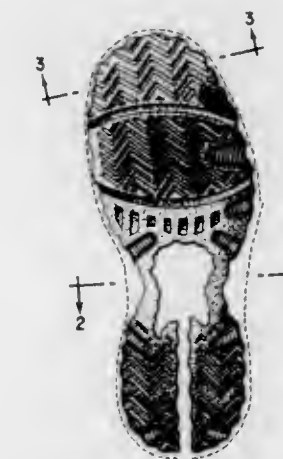
Sergio G. Lozano, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Jun. 4, 1996, Ser. No. 55,435

Term of patent 14 years

LOC (6) Cl. 02 - 04

U.S. Cl. D2—960



395,345

## SIDE PORTION OF A SHOE UPPER

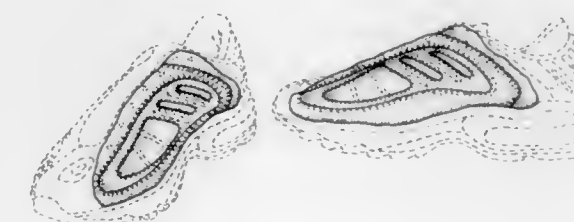
Andre Doxey, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Oct. 3, 1997, Ser. No. 77,531

Term of patent 14 years

LOC (6) Cl. 02 - 99

U.S. Cl. D2—972



395,346

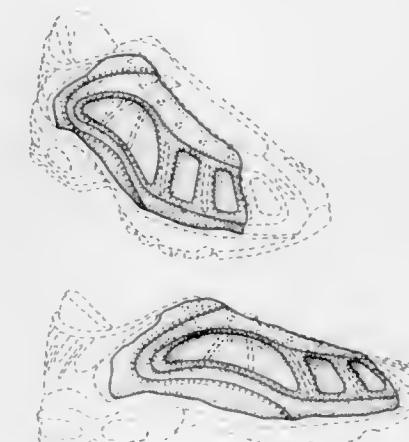
## SIDE PORTION OF A SHOE UPPER

Andre Doxey, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Oct. 3, 1997, Ser. No. 77,536

Term of patent 14 years

LOC (6) Cl. 02 - 99



395,344

## PORTION OF A SHOE UPPER

Bo Lupo, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Mar. 5, 1997, Ser. No. 66,306

Term of patent 14 years

LOC (6) Cl. 02 - 99

U.S. Cl. D2—972





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OFFICIAL GAZETTE

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395,347

## ELEMENT OF A SHOE

Peter von Conta, Newton, and David Pelsue, Boylston, both of Mass., assignors to The Rockport Company, Inc., Marlboro, Mass.

Division of Ser. No. 51,474, Mar. 11, 1996, Pat. No. Des. 380,594. This application Jun. 18, 1997, Ser. No. 72,541

Term of patent 14 years

LOC (6) Cl. 02 - 99

U.S. Cl. D2—972



395,349

## SIDE PORTION OF A SHOE UPPER

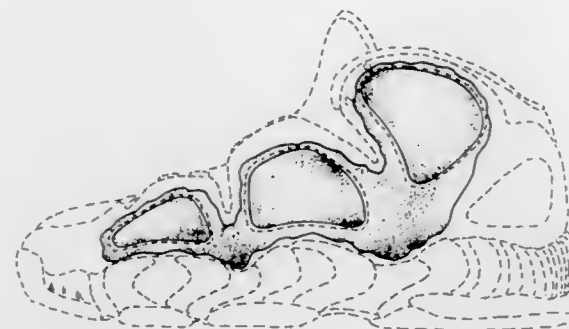
Kenneth Link, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Oct. 6, 1997, Ser. No. 77,567

Term of patent 14 years

LOC (6) Cl. 02 - 99

U.S. Cl. D2—972



395,348

## SIDE PORTION OF A SHOE UPPER

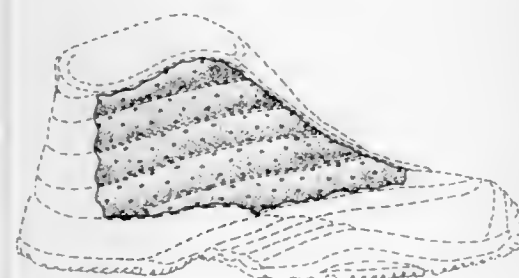
Wilson W. Smith, III, Beaverton, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Oct. 3, 1997, Ser. No. 77,532

Term of patent 14 years

LOC (6) Cl. 02 - 99

U.S. Cl. D2—972



395,350

## SIDE PORTION OF A SHOE UPPER

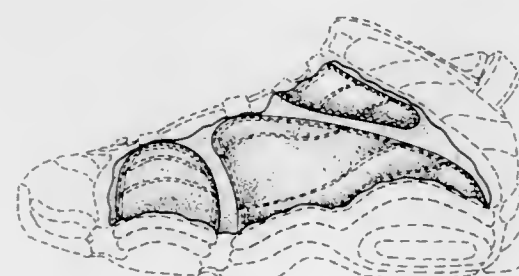
Kenneth Link, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Oct. 7, 1997, Ser. No. 77,602

Term of patent 14 years

LOC (6) Cl. 02 - 99

U.S. Cl. D2—972



JUNE 23, 1998

U.S. PATENT AND TRADEMARK OFFICE

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395,351

## ELEMENT OF A SHOE UPPER

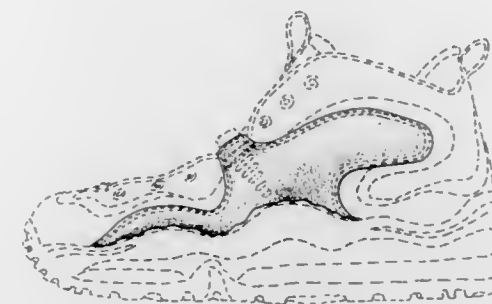
Tracy L. Teague, Aloha, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Oct. 9, 1997, Ser. No. 77,770

Term of patent 14 years

LOC (6) Cl. 02 - 99

U.S. Cl. D2—972



395,353

## PORTION OF A SHOE UPPER

Eric P. Avar, Aloha, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Oct. 10, 1997, Ser. No. 77,871

Term of patent 14 years

LOC (6) Cl. 02 - 99

U.S. Cl. D2—972



395,354

## PORTION OF A SHOE UPPER

Eric P. Avar, Aloha, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Oct. 10, 1997, Ser. No. 77,874

Term of patent 14 years

LOC (6) Cl. 02 - 99

U.S. Cl. D2—972

395,352

## PORTION OF A SHOE UPPER

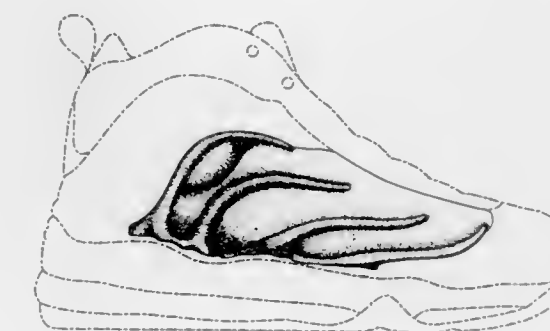
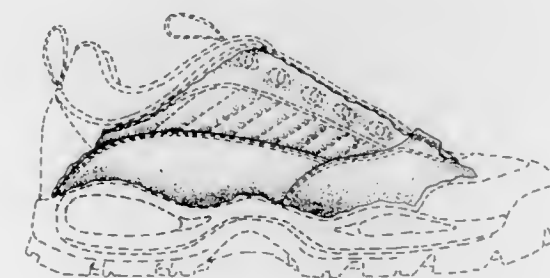
Robert Mervar, Portland, Oreg., assignor to Nike, Inc., Beaverton, Oreg.

Filed Oct. 10, 1997, Ser. No. 77,870

Term of patent 14 years

LOC (6) Cl. 02 - 99

U.S. Cl. D2—972



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JUNE 23, 1998

395,355

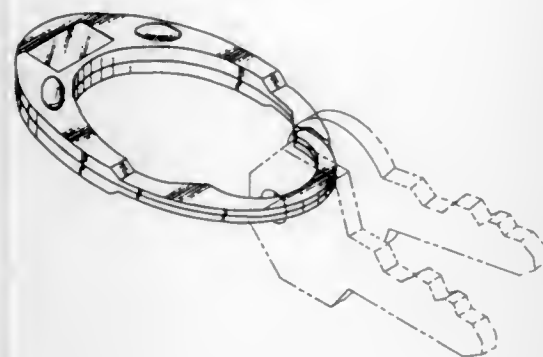
**COMBINED KEY RING AND REMOTE CONTROL TRANSMITTER**Scott von Freiberg, 618 S. 113th Ave., Omaha, Nebr. 68154  
Continuation of Ser. No. 51,482, Mar. 11, 1996, abandoned.

This application Sep. 17, 1996, Ser. No. 59,917

Term of patent 14 years

LOC (6) Cl. 03 - 01

U.S. Cl. D3—203



395,357

**BELT ATTACHED ARTICLE CARRIER**

Monte C. Bader, 1213 Laramie Dr., Bismarck, N. Dak. 58504

Filed Mar. 17, 1995, Ser. No. 36,326

Term of patent 14 years

LOC (6) Cl. 03 - 01

U.S. Cl. D3—215



395,356

**URINE COLLECTION BAG SUPPORT**

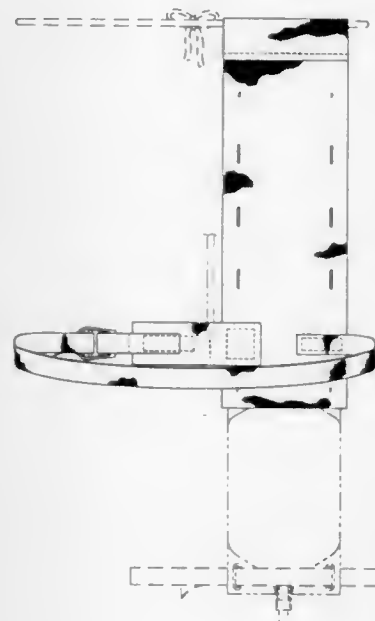
Gordon Tang, 13 Diamond 'S' Ranch, Bellevue, Wash. 98004

Filed Nov. 27, 1996, Ser. No. 63,165

Term of patent 14 years

LOC (6) Cl. 03 - 01

U.S. Cl. D3—203



395,358

**LEG WORN PROTECTIVE MOUTHPIECE CONTAINER**

Eric L. Crooke, 65 Pike St., New York City, N.Y. 10002

Filed Jul. 1, 1996, Ser. No. 56,525

Term of patent 14 years

LOC (6) Cl. 03 - 01

U.S. Cl. D3—215



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U.S. PATENT AND TRADEMARK OFFICE

4385

395,359

**BOLT HOLSTER**

Jan Reidar Olsen, Kinn, N-5520, Sveio, Norway

Filed Dec. 19, 1996, Ser. No. 63,934

Claims priority, application Norway, Aug. 2, 1996, 960545

Term of patent 14 years

LOC (6) Cl. 03 - 01

U.S. Cl. D3—221



395,361

**WHEELED UPRIGHT LUGGAGE CASE**

Andrew Zions, Providence; Mark Salander, Barrington;

Charles E. Waddell, Jr., Bristol; Coryndon M. Luxmoore,

Providence, all of R.I., and Glenn Schmierer, Boulder, Colo.,

assignors to Samsonite Corporation, Denver, Colo.

Filed Mar. 7, 1996, Ser. No. 51,356

Term of patent 14 years

LOC (6) Cl. 03 - 01

U.S. Cl. D3—279



395,360

**FISHING ROD CASE**

William L. Schrader, Jr., 17014 Sandalwood Creek Dr., Wild-

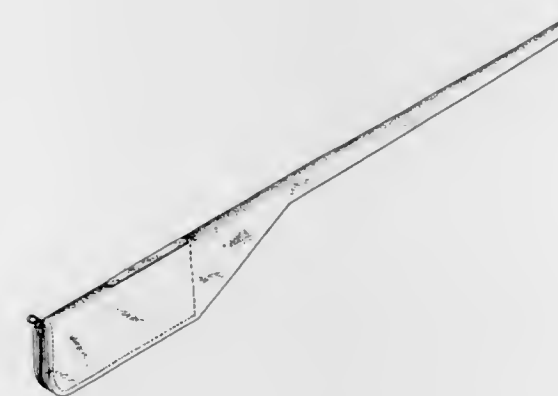
wood, Mo. 63038

Filed Oct. 2, 1996, Ser. No. 60,618

Term of patent 14 years

LOC (6) Cl. 03 - 01

U.S. Cl. D3—260



395,362

**HAND CARRIED SHOPPING BASKET**

Stacey M. Fink, and Karen L. Ketner-Fink, both of 1901

Shadwell Way, Lawrenceville, Ga. 30243

Filed Sep. 27, 1996, Ser. No. 60,390

Term of patent 14 years

LOC (6) Cl. 03 - 01

U.S. Cl. D3—307





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395,363

TOOTHBRUSH

Robert Moskovich, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

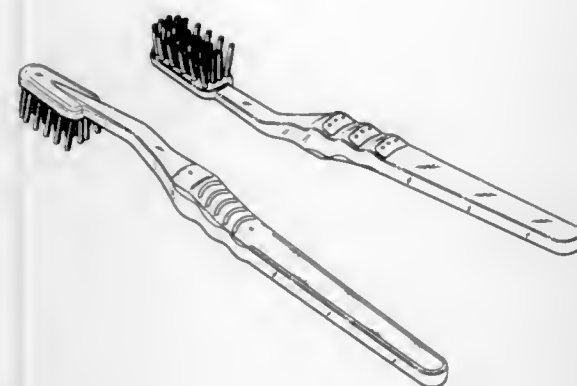
Filed Aug. 2, 1996, Ser. No. 57,888

The portion of the term of this patent subsequent to Dec. 9, 2011, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 04 - 02

U.S. Cl. D4—104



395,364

MIRROR

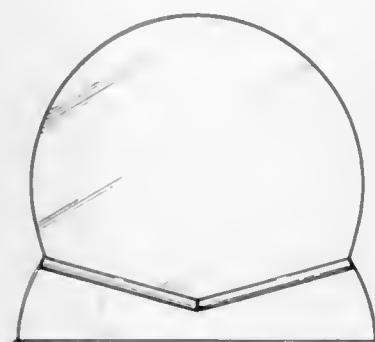
Ronald G. Wanek, Arcadia; Jericho P. Pauer, Onalaska, both of Wis., and Darrin M. Swagel, Winona, Minn., assignors to Ashley Furniture Industries, Inc., Arcadia, Wis.

Division of Ser. No. 35,638, Mar. 3, 1995, Pat. No. Des. 373,917. This application Sep. 13, 1996, Ser. No. 59,621

Term of patent 14 years

LOC (6) Cl. 06 - 07

U.S. Cl. D6—300



395,365

FLAT PRIVACY SCREEN

Steve Verbeek, 55 Stoddart Drive, Aurora, Ontario, Canada, L4G 2G2; Lorie Marangoni, 179 Verobeach Blvd., Weston, Ontario, Canada, M9M 1R4, and Harry Ayzvayan, 216 Pleasant Avenue, Willowdale, Ontario, Canada, M2M 1M5

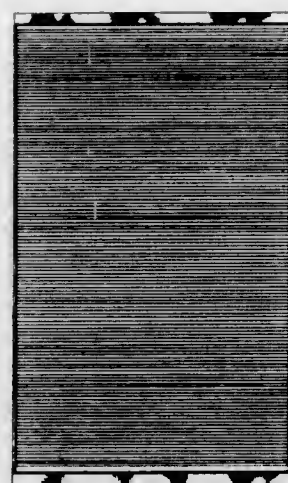
Filed Dec. 2, 1996, Ser. No. 62,893

Claims priority, application Canada, Jun. 7, 1996, 1996-1331

Term of patent 14 years

LOC (6) Cl. 06 - 06

U.S. Cl. D6—332



395,366

CHAIR

Paolo Favaretto, Padova, Italy, assignor to Global Upholstery Company, Downsview, Canada

Filed Jun. 19, 1996, Ser. No. 55,978

Term of patent 14 years

LOC (6) Cl. 06 - 01

U.S. Cl. D6—366



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U.S. PATENT AND TRADEMARK OFFICE

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395,367

FREESTANDING MODULAR DISPLAY/DIVIDER WALL

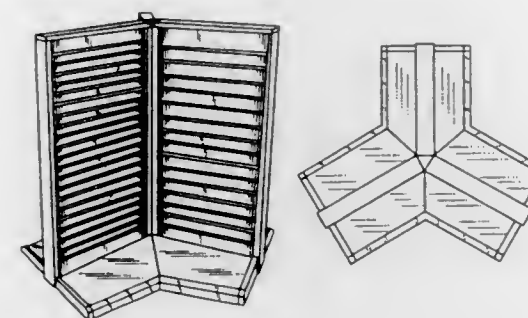
Daniel D. DePottey, Zeeland; Daniel J. Muellerleile, Grand Haven; Ronald J. Friday, Muskegon, and Vaninath Uppalapati, Portland, all of Mich., assignors to Spectra Products Corporation, Grand Haven, Mich.

Filed Jun. 3, 1997, Ser. No. 71,591

Term of patent 14 years

LOC (6) Cl. 06 - 04

U.S. Cl. D6—455



395,369

SHELF

Paul Whittington, Thornhill, Canada, assignor to Gorrie Advertising Management Limited, Mississauga, Canada

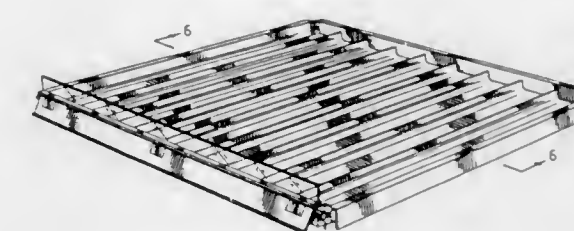
Filed Aug. 20, 1996, Ser. No. 58,672

Claims priority, application Canada, Feb. 20, 1996, 1996-0383

Term of patent 14 years

LOC (6) Cl. 06 - 04

U.S. Cl. D6—511



395,370

BATHROOM FIXTURE

Benjamin E. Gilmore, 638 6th St., Hermosa Beach, Calif. 90254

Filed Jan. 8, 1997, Ser. No. 64,657

Term of patent 14 years

LOC (6) Cl. 07 - 07

U.S. Cl. D6—525



395,368

KIOSK

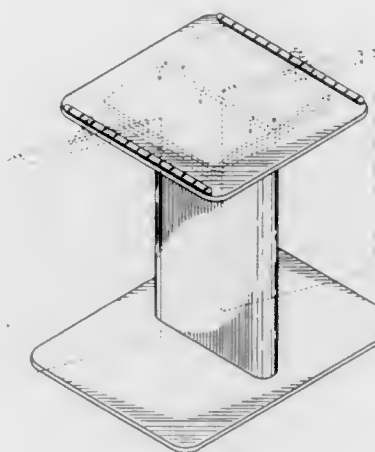
Marvin Adenau, Wadsworth, Ill.; Larry Hunn, Dunwoody, Ga., and William Brice, Jr., Palatine, Ill., assignors to Schutz International, Inc., Morton Grove, Ill.

Filed Oct. 24, 1996, Ser. No. 61,477

Term of patent 14 years

LOC (6) Cl. 20 - 02

U.S. Cl. D6—478



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395,371

## TOOTHBRUSH AND TUMBLER HOLDER

Norton Sharpe, Los Angeles, Calif., assignor to Franklin Brass Manufacturing Company, Rancho Dominguez, Calif.

Continuation of Ser. No. 41,010, Jun. 29, 1995, abandoned.

This application Jun. 25, 1996, Ser. No. 63,599

Term of patent 14 years

LOC (6) Cl. 07 - 07

U.S. Cl. D6—531



395,373

## TEA BREWER

Scott Henderson, Brooklyn, N.Y., assignor to Conair Corporation, Stamford, Conn.

Filed May 6, 1997, Ser. No. 70,895

Term of patent 14 years

LOC (6) Cl. 07 - 01

U.S. Cl. D7—309



395,374

## COOKING PAN

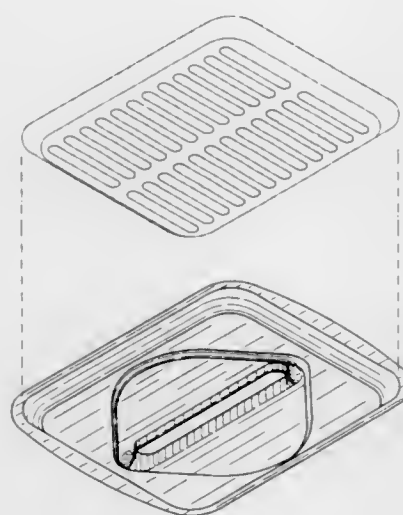
Robert M. Byrne, Lima, Ohio, assignor to American Trim, L.L.C., Lima, Ohio

Filed May 21, 1997, Ser. No. 71,262

Term of patent 14 years

LOC (6) Cl. 07 - 02

U.S. Cl. D7—359



395,372

## FITTED CAR SEAT BLANKET WITH HEAD OPENING AND FLAP

Caren A. Simpson, 715 Anthrium Ave., Perris, Calif. 92571, assignor to Caren A. Simpson, Perris, Calif.

Filed Aug. 21, 1995, Ser. No. 42,938

Term of patent 14 years

LOC (6) Cl. 06 - 13

U.S. Cl. D6—611



U.S. PATENT AND TRADEMARK OFFICE

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395,375

## FOOD PROCESSOR HOUSING

Jan Hippen, Portland, Oreg.; Julius Lucaci, Wheeling, Ill., and

Angelika I. Schubert-Belle, Portland, Oreg., assignors to

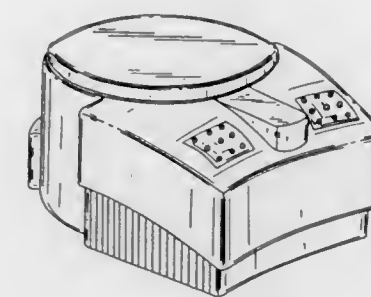
Black &amp; Decker Inc., Newark, Del.

Filed Nov. 29, 1996, Ser. No. 62,859

Term of patent 14 years

LOC (6) Cl. 31 - 00

U.S. Cl. D7—386



395,377

## SALAD BOWL DIVIDER

Nele Wallays, Antwerp, and Victor J. J. Cautereels, Ranst, both

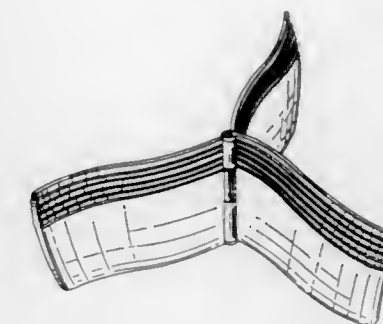
of Belgium, assignors to Dart Industries Inc., Orlando, Fla.

Filed Sep. 30, 1996, Ser. No. 60,490

Term of patent 14 years

LOC (6) Cl. 07 - 99

U.S. Cl. D7—396.1



395,378

## PORTABLE BARBECUE CART WITH SIDE ARMS

Erich J. Schlosser, Barrington; J. Michael Alden, Palatine, and

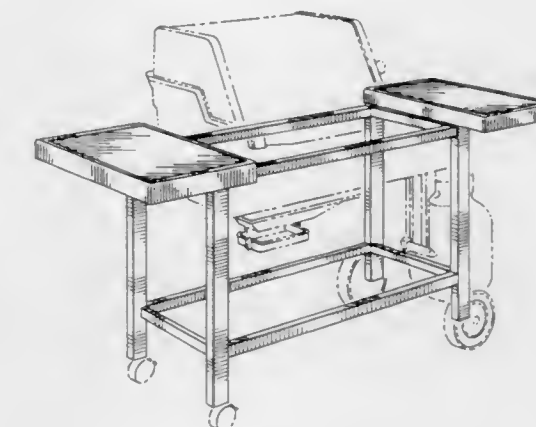
Robert T. Stephen, Barrington, all of Ill., assignors to

Weber-Stephen Products Co., Palatine, Ill.

Filed Aug. 9, 1996, Ser. No. 58,161

Term of patent 14 years

LOC (6) Cl. 07 - 02



395,376

## HANDLE FOR A COOKING UTENSIL

Michel Montgelard, Cran Gevrier, France, assignor to Tefal S.A., Rumilly, France

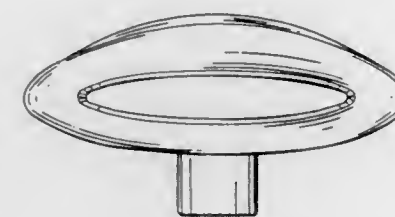
Filed Aug. 28, 1997, Ser. No. 75,322

Claims priority, application France, Feb. 28, 1997, 971258

Term of patent 14 years

LOC (6) Cl. 07 - 02

U.S. Cl. D7—393





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GOBLET

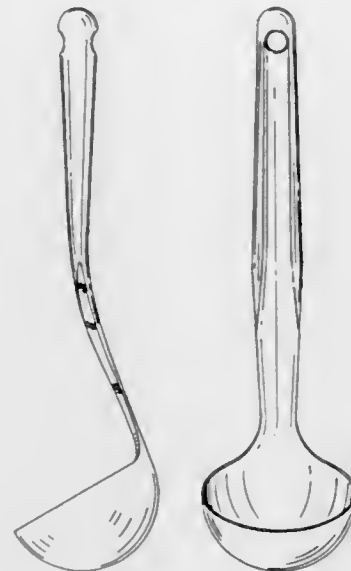
William G. Goodman, 200 E. Jeanine, Tempe, Ariz. 85284  
Division of Ser. No. 51,802, Mar. 18, 1996, Pat. No. Des.  
383,359. This application Feb. 13, 1997, Ser. No. 66,659  
Term of patent 14 years  
LOC (6) Cl. 07 - 01

U.S. Cl. D7—513

395,381  
LADLE

Morison S. Cousins, Winter Park, Fla., assignor to Dart Industries Inc., Orlando, Fla.  
Filed Sep. 8, 1997, Ser. No. 76,343  
Term of patent 14 years  
LOC (6) Cl. 07 - 02

U.S. Cl. D7—691

395,382  
DUAL PRUNING BLADE

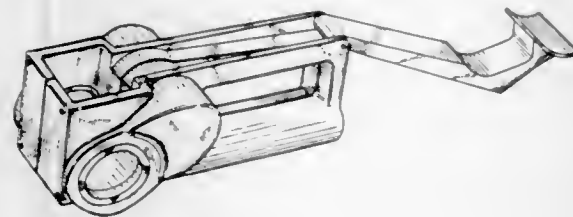
Dick Liao, Bridgewater, Mass., assignor to Greenlife Inc., Bridgewater, Mass.  
Filed Jun. 3, 1997, Ser. No. 71,589  
Term of patent 14 years  
LOC (6) Cl. 08 - 01

U.S. Cl. D8—5

395,380  
ELECTRIC GRATER

Toyomi Arita, Osaka; Shigehiro Uemura, Kyoto, and Kazuo Takada, Nara, all of Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan  
Filed Jul. 8, 1997, Ser. No. 73,410  
Claims priority, application Japan, Jan. 8, 1997, 9-276  
Term of patent 14 years  
LOC (6) Cl. 07 - 04

U.S. Cl. D7—678



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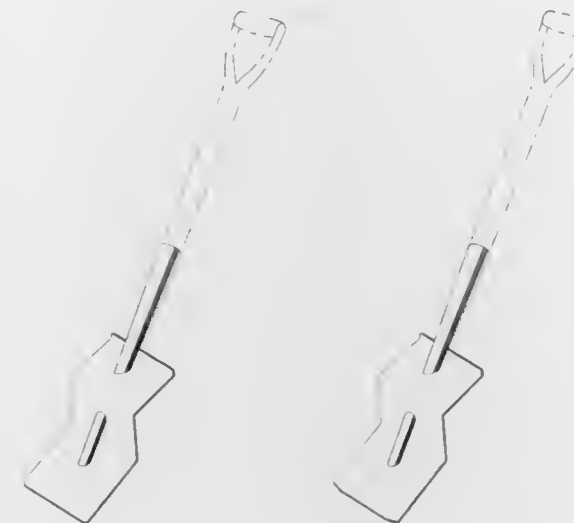
U.S. PATENT AND TRADEMARK OFFICE

4391

395,383  
MULTI ANGULAR SPADE HEAD

Anish Mohindru, 3080 Hamden Ct., Dublin, Ohio 43017  
Filed Dec. 27, 1996, Ser. No. 64,329  
Term of patent 14 years  
LOC (6) Cl. 08 - 01

U.S. Cl. D8—7

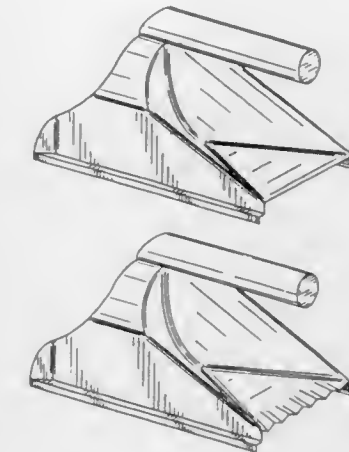


## 395,385

## MASON'S TROWEL

Sulejman Pipic, 66 W. Main St., Norwich, N.Y. 13815  
Filed Sep. 27, 1996, Ser. No. 60,371  
Term of patent 14 years  
LOC (6) Cl. 08 - 05

U.S. Cl. D8—45

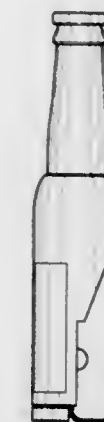


## 395,384

## BOTTLE OPENER

Germano Farfalli, Maniago, Italy, assignor to Marino Farfalli & Figli SNC, Maniago, Italy  
Filed Feb. 20, 1997, Ser. No. 66,730  
Term of patent 14 years  
LOC (6) Cl. 07 - 99

U.S. Cl. D8—38

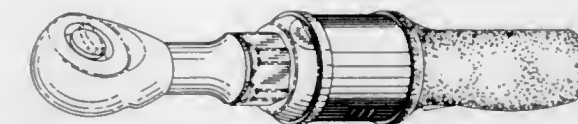


## 395,386

## PNEUMATIC RATCHET

David A. Giardino, Deerfield, N.Y., assignor to Chicago Pneumatic Tool Company, Rock Hill, S.C.  
Filed Nov. 19, 1996, Ser. No. 62,594  
Term of patent 14 years  
LOC (6) Cl. 08 - 01

U.S. Cl. D8—61



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## ERGONOMIC HANDLE FOR A PNEUMATIC DRILL

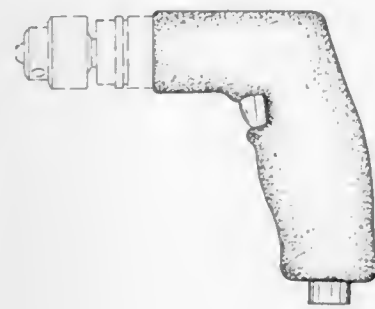
Philip A. Snider, Hicksville, Ohio, assignor to Cooper Industries, Inc., Houston, Tex.

Filed Apr. 15, 1991, Ser. No. 685,701

Term of patent 14 years

LOC (6) Cl. 08 - 01

U.S. Cl. D8—68



395,389

## SPORT CAP HOLDER

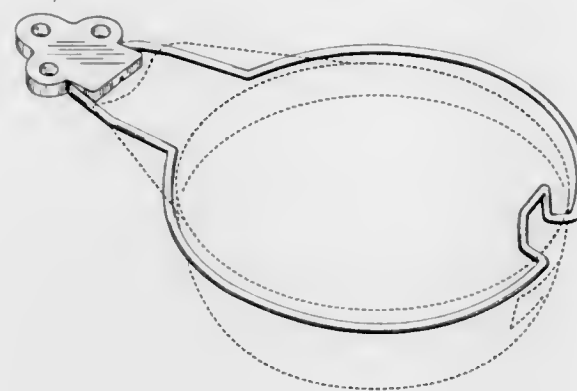
Rupert A. Liddle, Jr., and Rupert A. Liddle, Sr., both of 2327 N. Wygant St., Portland, Oreg. 97217

Filed Mar. 11, 1996, Ser. No. 51,416

Term of patent 14 years

LOC (6) Cl. 08 - 05

U.S. Cl. D8—370



395,388

## QUICK RELEASE LATCH FOR A BUS SEAT OR THE LIKE

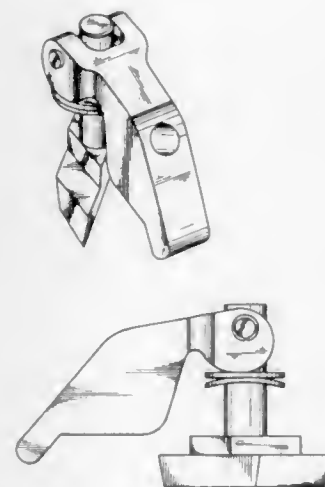
William R. Bourne, Redondo Beach; Frank Thomas Jackson, Corona, and Darrell L. James, Chino, all of Calif., assignors to Hartwell Corporation, Placentia, Calif.

Filed Dec. 6, 1996, Ser. No. 63,359

Term of patent 14 years

LOC (6) Cl. 08 - 07

U.S. Cl. D8—338



395,390

## UTILITY HOOK FOR A FLAT OR CURVED SURFACE MOUNTING

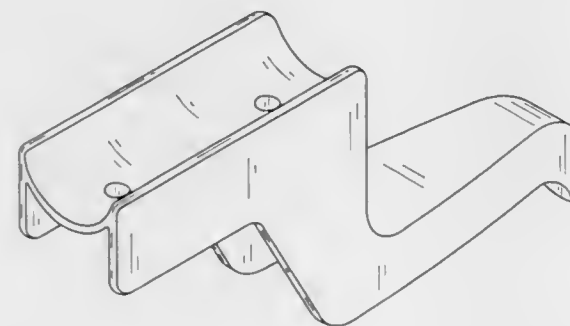
Linda Etherton, and Eric J. Brunton, both of c/o Brunton Products, 1306 N. Benson Ave., Ste. A, Upland, Calif. 91786

Filed Jul. 1, 1996, Ser. No. 56,456

Term of patent 14 years

LOC (6) Cl. 08 - 05

U.S. Cl. D8—367



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U.S. PATENT AND TRADEMARK OFFICE

4393

395,391

## DISPLAY BOX

Kenneth J. Landis, Hudson, and David A. Shack, Beachwood, both of Ohio, assignors to Allied Decals, Inc., Twinsburg, Ohio

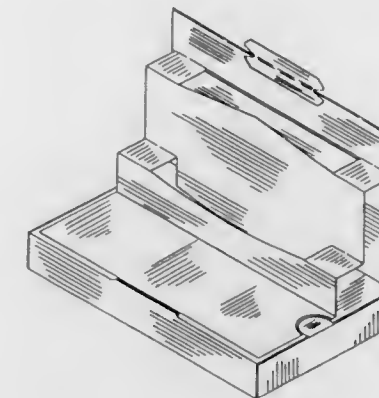
Division of Ser. No. 48,982, Jan. 11, 1996. This application

Aug. 14, 1997, Ser. No. 75,003

Term of patent 14 years

LOC (6) Cl. 09 - 07

U.S. Cl. D9—415



395,393

## CLOSURE CLIP

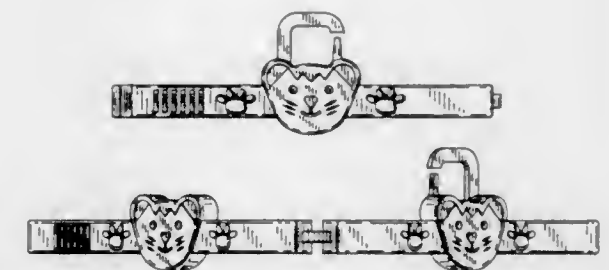
Brenda O'Grady Lüstro, Westport, Conn., and Ursula M. Sättler-Cohen, La Jolla, Calif., assignors to Playtex Products, Inc., Westport, Conn.

Filed Aug. 21, 1995, Ser. No. 42,912

Term of patent 14 years

LOC (6) Cl. 09 - 07

U.S. Cl. D9—434



395,394

## BOTTLE COVER

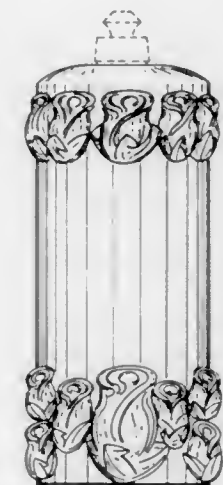
Trudie C. Brykowski, 60 Lake Zurich Dr., Lake Zurich, Ill. 60047

Filed Jan. 25, 1996, Ser. No. 49,466

Term of patent 14 years

LOC (6) Cl. 09 - 01

U.S. Cl. D9—444



395,392

## TRAY PACKAGE

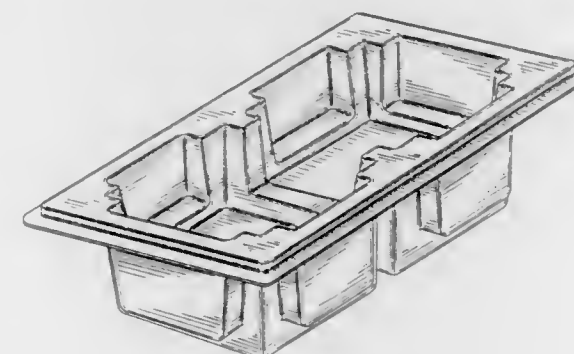
William J. Lahm, Sumter, S.C., and Stephen C. Conley, North Attleboro, Mass., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Sep. 26, 1996, Ser. No. 60,358

Term of patent 14 years

LOC (6) Cl. 09 - 07

U.S. Cl. D9—425





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395,395  
CONTAINERAlexander De Muschamp Payne, 9 Parkville Rd., London SW6  
7DA, England

Filed Nov. 7, 1996, Ser. No. 62,111

Term of patent 14 years

LOC (6) Cl. 09 - 02

U.S. Cl. D9—518

395,397  
PLASTIC BOTTLE

Robert J. Sheffer, Morganville, and Thomas J. Dolan, Flemington, both of N.J., assignors to Brent River Packaging Corp., Flemington, N.J.

Filed Jul. 3, 1997, Ser. No. 73,283

Term of patent 14 years

LOC (6) Cl. 09 - 01

U.S. Cl. D9—542

395,398  
COMBINED FRAGRANCE BOTTLE AND CAP

Bernard Kotyuk, Westbrookville, N.Y., assignor to Amway Corporation, Ada, Mich.

Filed Feb. 4, 1997, Ser. No. 66,312

Term of patent 14 years

LOC (6) Cl. 09 - 01

U.S. Cl. D9—558

395,396  
COMBINED BOTTLE AND CAP

Gene J. Kuzma, and Douglas W. Weaver, both of Columbus, Ohio, assignors to GK Packaging, Inc., Columbus, Ohio

Filed May 20, 1997, Ser. No. 71,094

Term of patent 14 years

LOC (6) Cl. 09 - 01

U.S. Cl. D9—542



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U.S. PATENT AND TRADEMARK OFFICE

4395

395,399  
CONTAINER

John C. Crawford, Mahopac, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 47,781, Dec. 12, 1995, Pat. No. Des. 379,312. This application Mar. 25, 1997, Ser. No. 69,297

Term of patent 14 years

LOC (6) Cl. 09 - 01

U.S. Cl. D9—570

395,401  
CASING FOR A WATCH

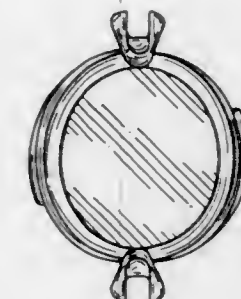
Nimfa Barz Toribio, 203 Rizal Street, Ibabao, Mandaue City, Cebu, Philippines

Filed Feb. 25, 1997, Ser. No. 66,971

Term of patent 14 years

LOC (6) Cl. 10 - 02

U.S. Cl. D10—30

395,400  
CLOCK

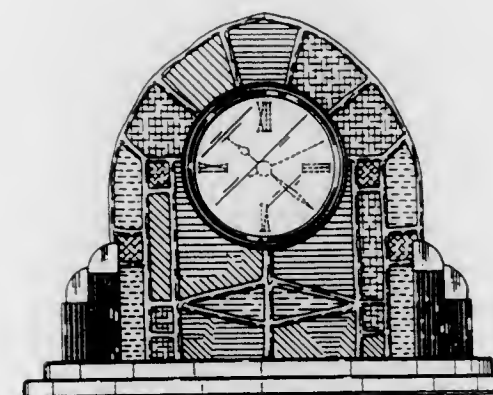
Rosemary Y. Sharp, Bayville, and Brian Labrecque, New York, both of N.Y., assignors to Colibri Corporation, Linden Division, New York, N.Y.

Division of Ser. No. 46,701, Oct. 25, 1995. This application Oct. 3, 1996, Ser. No. 60,684

Term of patent 14 years

LOC (6) Cl. 10 - 01

U.S. Cl. D10—29

395,402  
WATCH CASE

Atsushi Goto, Kunitachi, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Aug. 11, 1997, Ser. No. 74,879

Term of patent 14 years

LOC (6) Cl. 10 - 02

U.S. Cl. D10—30



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WATCH CASE

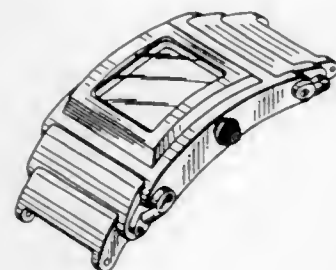
Jörg Hysek, Lussy-sur-Morges, Switzerland, assignor to Seiko Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1997, Ser. No. 76,669

Term of patent 14 years

LOC (6) Cl. 10 - 02

U.S. Cl. D10—30



395,405

WATCH AND BRACELET

Janet G. Brzezinski, Middlebury, Conn., assignor to Timex Corp., Middlebury, Conn.

Filed Jun. 5, 1997, Ser. No. 71,639

Term of patent 14 years

LOC (6) Cl. 10 - 02

U.S. Cl. D10—32



395,406

WALL THERMOMETER OR TABLE THERMOMETER  
HAVING A METAL FRAME

Erich Bartosch, Stadtprozelten, Germany, assignor to Dr. Friedrichs Gruppe Produktions-u. Vertriebs GmbH, Wertheim, Germany

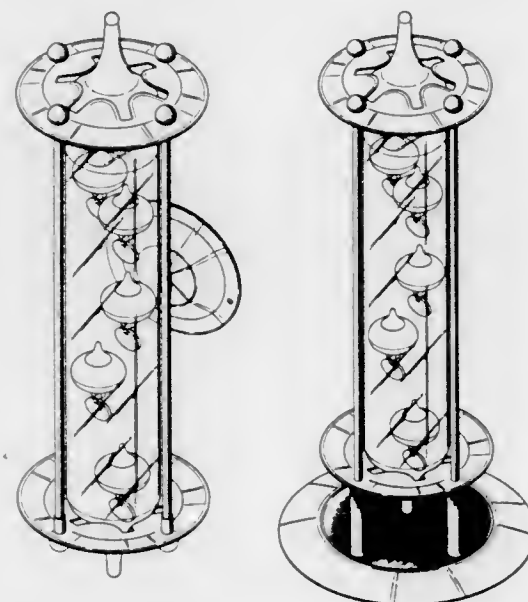
Filed Dec. 13, 1996, Ser. No. 63,692

Claims priority, application Germany, Jul. 24, 1996, M 96 06 433.1

Term of patent 14 years

LOC (6) Cl. 10 - 04

U.S. Cl. D10—57



395,404

WATCH CASE WITH A PROTECTION DEVICE

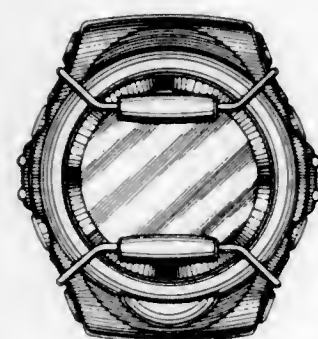
Shigeru Hanagata, Kodaira, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1996, Ser. No. 62,254

Term of patent 14 years

LOC (6) Cl. 10 - 02

U.S. Cl. D10—31



JUNE 23, 1998

U.S. PATENT AND TRADEMARK OFFICE

4397

395,407

SECURITY TAG ADAPTER

Mark M. Dwight, Palo Alto, Calif., assignor to Kensington Microwave Limited, San Mateo, Calif.

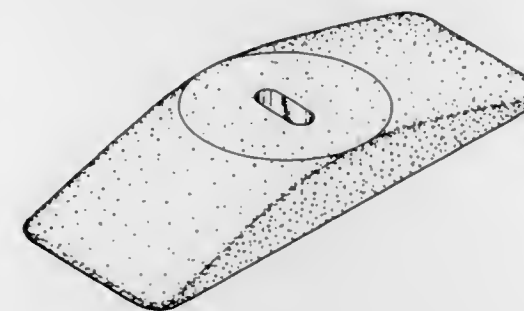
Continuation of Ser. No. 787,619, Feb. 3, 1997. This application

Mar. 27, 1997, Ser. No. 68,697

Term of patent 14 years

LOC (6) Cl. 10 - 05

U.S. Cl. D10—104



395,408

POST LIGHT SENSOR HOUSING

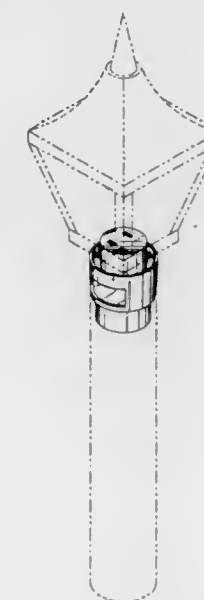
David L. Wiesemann, Pewaukee, Wis., assignor to Heath Company, Benton Harbor, Mich.

Filed May 19, 1997, Ser. No. 69,881

Term of patent 14 years

LOC (6) Cl. 10 - 05

U.S. Cl. D10—106



395,409

VISUAL VEHICLE LOCATING INDICATOR

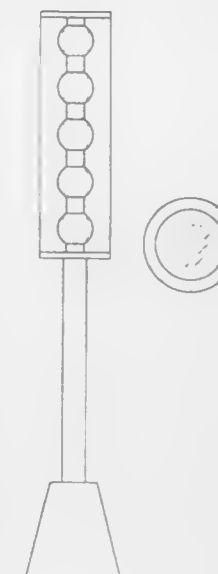
Frank Gironda, and Sharon E. Gironda, both of 77 Coalbrook Crt., Woodbridge, Ontario, Canada, L4L 9B6

Filed Aug. 14, 1997, Ser. No. 75,253

Term of patent 14 years

LOC (6) Cl. 10 - 05

U.S. Cl. D10—109



395,410

TIMEPIECE FACE DISPLAY

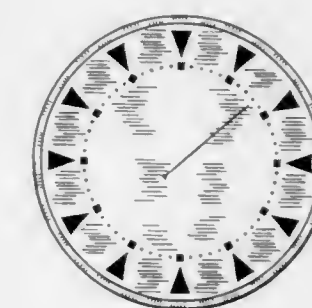
Robert E. Harrison, P.O. Box 1541, Pittsfield, Mass. 01202

Filed Feb. 29, 1996, Ser. No. 50,918

Term of patent 14 years

LOC (6) Cl. 10 - 07

U.S. Cl. D10—126





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OFFICIAL GAZETTE

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395,411

FLOWERPOT

Hans-Jürgen Grebert, Ransbach-Baumbach, Germany,  
assignor to Westerwälder Blumentopf-Fabrik Spang GmbH  
& Co. KG, Ransbach-Baumbach, Germany

Filed Jan. 28, 1997, Ser. No. 65,534

Claims priority, application Germany, Jul. 30, 1996, 96 06  
396.3

Term of patent 14 years

LOC (6) Cl. 11 - 02

U.S. Cl. D11—153



395,413

THREE-WHEELED ELECTRICAL CART

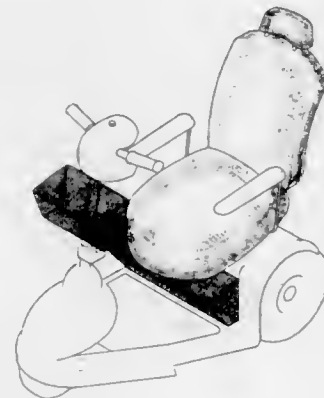
Donald P. H. Wu, No. 169, Ken Tzu Ku, Shang Ken Tsun, Hsin  
Feng Hsiang Hsinchu Hsien, Taiwan

Filed Apr. 29, 1997, Ser. No. 70,925

Term of patent 14 years

LOC (6) Cl. 12 - 14

U.S. Cl. D12—85



395,414

TIRE TREAD

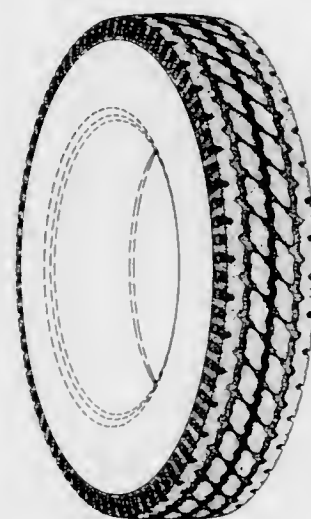
Paul Phillip Grosskopf, Greenville, S.C., and Jean-Jacques  
Motta, Le Cendre, France, assignors to Michelin Recherche  
et Technique S.A., Switzerland

Filed Sep. 13, 1996, Ser. No. 59,594

Term of patent 14 years

LOC (6) Cl. 12 - 15

U.S. Cl. D12—147



395,412

SCARF ACCESSORY

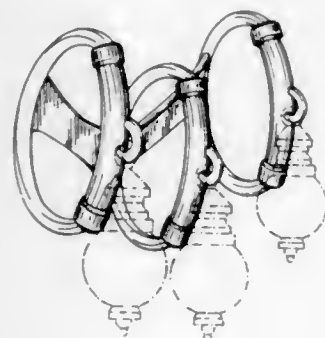
Nancy E. Sullivan, 24 North St., Hingham, Mass. 02043, now  
by change of name from Nancy Cahill

Filed Oct. 19, 1993, Ser. No. 14,335

Term of patent 14 years

LOC (6) Cl. 10 - 07

U.S. Cl. D11—202



JUNE 23, 1998

U.S. PATENT AND TRADEMARK OFFICE

4399

395,415

TIRE TREAD

Maurice Graas, Reichlange, Luxembourg, assignor to The  
Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 21, 1997, Ser. No. 67,843

Term of patent 14 years

LOC (6) Cl. 12 - 15

U.S. Cl. D12—147



395,417

VEHICLE ANTI-THEFT COVER

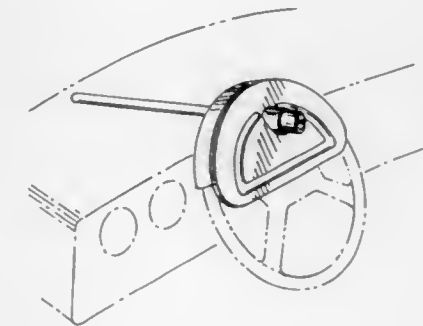
Ki Il Kim, 255 S. Grand Ave., Suite 2004, Los Angeles, Calif.  
90012

Filed Jun. 13, 1997, Ser. No. 72,340

Term of patent 14 years

LOC (6) Cl. 12 - 16

U.S. Cl. D12—177



395,416

PUSH BUMPER FOR MOUNTING TO A BUMPER OF A  
VEHICLE

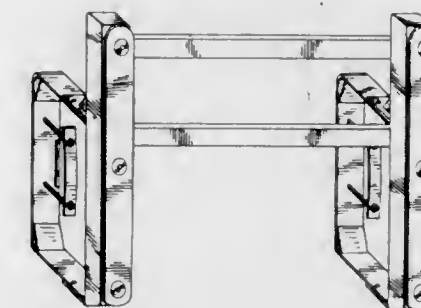
Leo Shklyaver, 840 E. 8th St., Brooklyn, N.Y. 11230

Filed Sep. 13, 1996, Ser. No. 59,573

Term of patent 14 years

LOC (6) Cl. 12 - 16

U.S. Cl. D12—169



395,418

STRESS RELEASE BRAKE PAD

Debbie Darlas, 487 Old Forge Rd., Kent, Ohio 44240

Filed Oct. 25, 1996, Ser. No. 61,553

Term of patent 14 years

LOC (6) Cl. 12 - 16

U.S. Cl. D12—180



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395,419

## SOLAR AND WIND POWERED BOAT

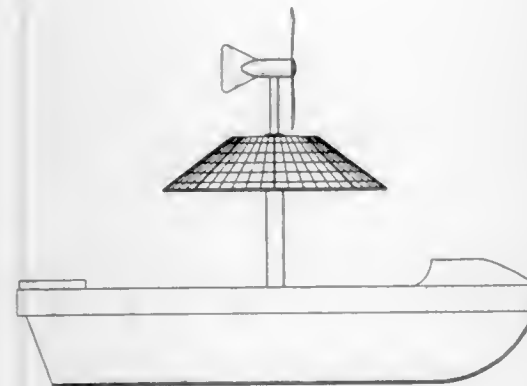
Frank Armano, Sr., 14399 Picea Ct., Fort Pierce, Fla. 34951

Filed Feb. 26, 1997, Ser. No. 66,760

Term of patent 14 years

LOC (6) Cl. 12 - 06

U.S. Cl. D12—300



395,421

## COMBINED CARRIER AND SEAT COVER FOR A BICYCLE

Jack C. Gable; Kenneth C. Smith, and Nicholas W. Markin, all of Kelowna, Canada, assignors to Okanagan Bike Ventures Ltd., Kelowna, Canada

Filed Jan. 10, 1997, Ser. No. 64,842

Term of patent 14 years

LOC (6) Cl. 12 - 16

U.S. Cl. D12—407



395,420

## LUGGAGE RACK

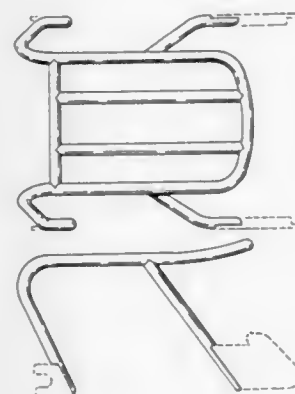
Donald M. Gogan, Brookfield, and Thomas G. Parsons, Dousman, both of Wis., assignors to Harley-Davidson Motor Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 41,653, Jul. 20, 1995, abandoned. This application Oct. 9, 1996, Ser. No. 60,868

Term of patent 14 years

LOC (6) Cl. 12 - 16

U.S. Cl. D12—407



395,422

## BATTERY HOUSING FOR A RADIO TELEPHONE

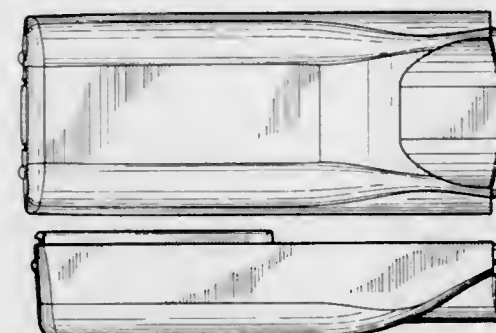
Robert L. Sorensen, and Craig A. Bartling, both of Dacula, Ga., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 3, 1996, Ser. No. 63,264

Term of patent 14 years

LOC (6) Cl. 13 - 02

U.S. Cl. D13—103



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U.S. PATENT AND TRADEMARK OFFICE

4401

395,423

## SEMICONDUCTOR PACKAGE

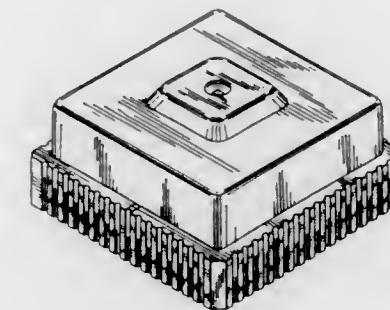
Michio Koyama, and Yukinobu Wataya, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 13, 1997, Ser. No. 68,117

Term of patent 14 years

LOC (6) Cl. 13 - 03

U.S. Cl. D13—182



395,425

## MONITOR STAND WITH INPUT/OUTPUT FUNCTIONS

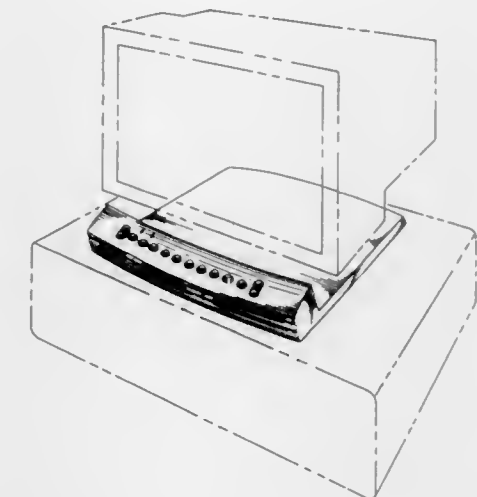
John Vincent Sugita, Anaheim, Calif., assignor to Packard Bell NEC, Inc., Westlake Village, Calif.

Filed Jul. 8, 1996, Ser. No. 56,706

Term of patent 14 years

LOC (6) Cl. 14 - 02

U.S. Cl. D14—114



395,426

## PORTION OF A COMPUTER DISPLAY WITH ICONS FOR AN ELECTRONIC TYPEWRITER

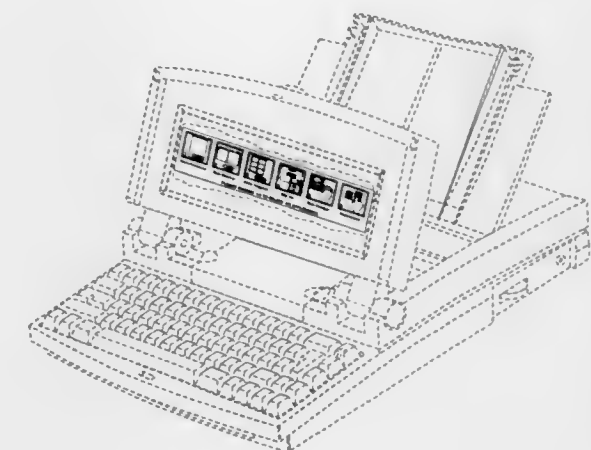
Toshimi Chiba, Irvine, Calif., assignor to Canon Business Machines, Inc., Costa Mesa, Calif.

Filed Dec. 12, 1995, Ser. No. 47,756

Term of patent 14 years

LOC (6) Cl. 14 - 02

U.S. Cl. D14—114.2



395,424

## DATA STORAGE SYSTEM

Morio Nakayama, Tsurugashima, and Kuniaki Edo, Tokyo, both of Japan, assignors to Aiwa Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1996, Ser. No. 52,287

Term of patent 14 years

LOC (6) Cl. 14 - 02

U.S. Cl. D14—107





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395,427

## COMPUTER ICON FOR A DISPLAY SCREEN

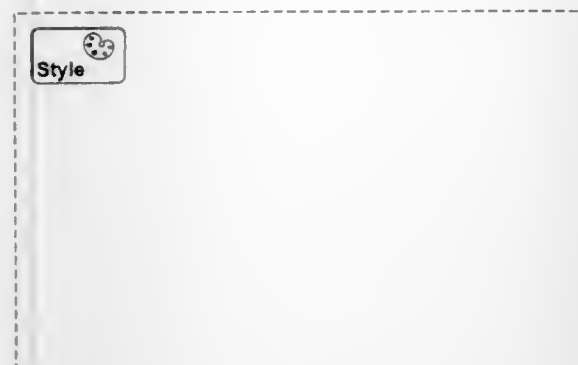
Samir Arora, San Jose; Clement Mok, San Francisco; Victor B. Zauderer, San Francisco, and Susan Kare, San Francisco, all of Calif., assignors to NetObjects, Inc., Redwood City, Calif.

Filed Jul. 29, 1996, Ser. No. 57,656

Term of patent 14 years

LOC (6) Cl. 14 - 02

U.S. Cl. D14—114.4



395,429

## FRONT SURFACE OF A BASE STATION CONTROLLER

Leon Soren, Lincolnwood, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 49,806, Jan. 31, 1996, Pat. No. Des.

379,801. This application Oct. 23, 1996, Ser. No. 61,402

Term of patent 14 years

LOC (6) Cl. 14 - 02

U.S. Cl. D14—115



395,428

## COMPUTER ICON FOR A DISPLAY SCREEN

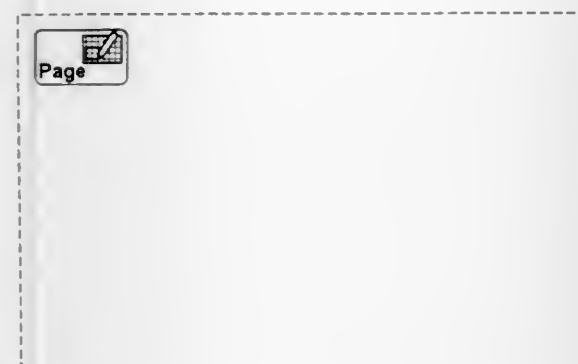
Samir Arora, San Jose; Clement Mok, San Francisco; Victor B. Zauderer, San Francisco, and Susan Kare, San Francisco, all of Calif., assignors to NetObjects, Inc., Redwood City, Calif.

Filed Jul. 29, 1996, Ser. No. 57,657

Term of patent 14 years

LOC (6) Cl. 14 - 02

U.S. Cl. D14—114.4



395,430

## OPTICAL DISK CARTRIDGE

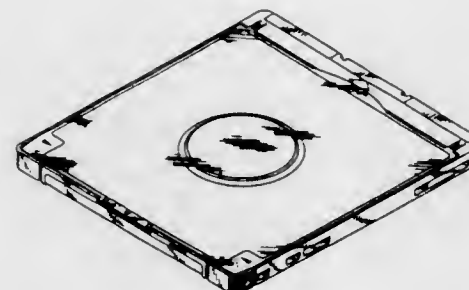
Ikuo Tatenuma, Tochigi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 27, 1995, Ser. No. 47,046

Term of patent 14 years

LOC (6) Cl. 14 - 99

U.S. Cl. D14—121



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U.S. PATENT AND TRADEMARK OFFICE

4403

395,431

## FACEPLATE FOR A PORTABLE TELEPHONE

Daryl R. Harris, Evanston; Daniel L. Williams, Vernon Hills, and Nicholas Mischenko, Mt. Prospect, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

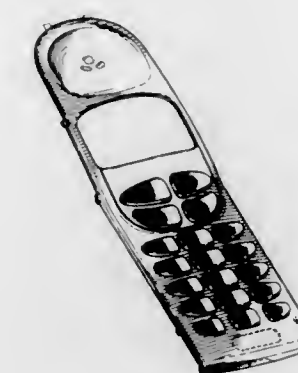
Division of Ser. No. 46,799, Oct. 17, 1995, Pat. No. Des.

388,080. This application Aug. 11, 1997, Ser. No. 78,491

Term of patent 14 years

LOC (6) Cl. 14 - 03

U.S. Cl. D14—138



395,433

## RADIO

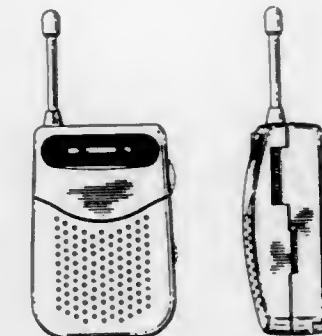
Wong Kam Kee, Kowloon, Hong Kong, assignor to Hanig & Company, Mount Prospect, Ill.

Filed Jul. 23, 1996, Ser. No. 57,325

Term of patent 14 years

LOC (6) Cl. 14 - 03

U.S. Cl. D14—192



395,432

## SOUND SYSTEM COMPRISING SPEAKERS AND MIXER-AMPLIFIER

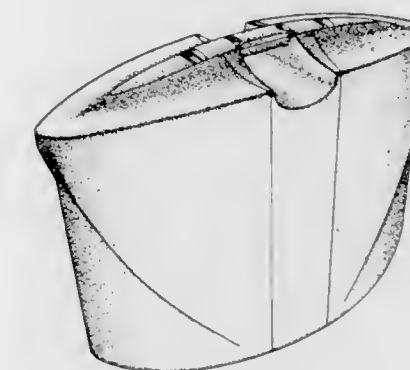
Steve Woolley, Burbank, Calif.; Peter Harries, Cambridge, England, and Roger F. Cox, Chino Hills, Calif., assignors to Fender Musical Instruments Corporation, Scottsdale, Ark.

Filed Nov. 22, 1996, Ser. No. 62,730

Term of patent 14 years

LOC (6) Cl. 14 - 01

U.S. Cl. D14—168



395,434

## CABLE MODEM

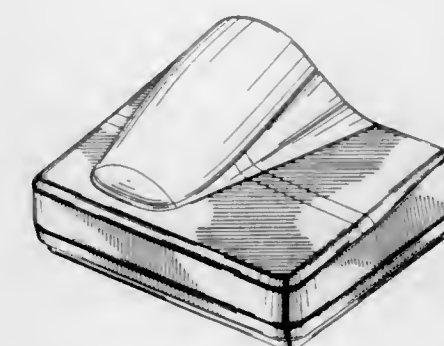
Charles Kenneth Fincher, Jr., Lawrenceville, Ga., assignor to Scientific-Atlanta, Inc., Norcross, Ga.

Filed Oct. 28, 1996, Ser. No. 61,683

Term of patent 14 years

LOC (6) Cl. 14 - 03

U.S. Cl. D14—242



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395,435

## INTERNAL COMBUSTION ENGINE

Yukiteru Yoshida; Yoshio Kobayashi; Tomiya Kato, and Naoki Shibata, all of Nagoya, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1996, Ser. No. 62,233

Claims priority, application Japan, May 13, 1996, 8-13832

Term of patent 14 years

LOC (6) Cl. 15 - 01

U.S. Cl. D15—1



395,437

## UPPER RIB FOR A PLANER

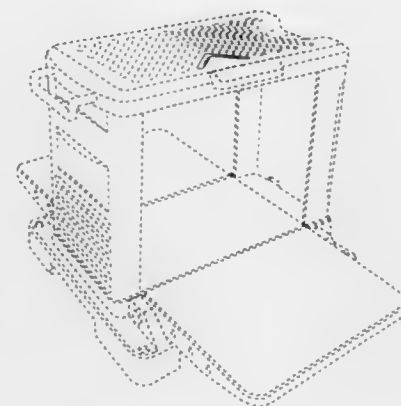
Robert P. Welsh, Hunt Valley, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Jan. 15, 1997, Ser. No. 64,928

Term of patent 14 years

LOC (6) Cl. 15 - 09

U.S. Cl. D15—127



395,438

## BAND SAW

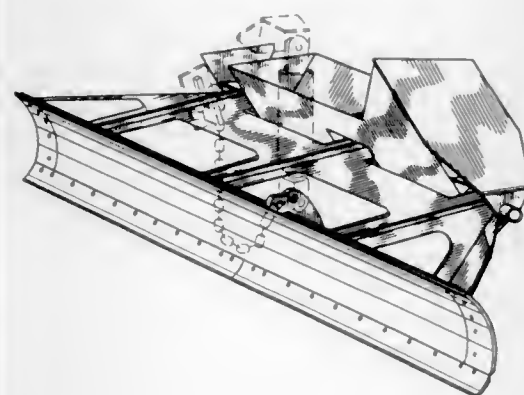
LeRoy G. Hagenbuch, 502 W. Northgate Rd., Peoria, Ill. 61604

Filed Sep. 14, 1994, Ser. No. 28,404

Term of patent 14 years

LOC (6) Cl. 15 - 03

U.S. Cl. D15—32



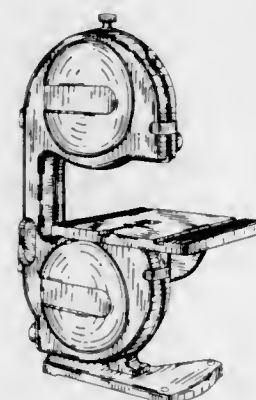
Mark C. Armstrong, Sidney, Australia, assignor to Sales & Marketing Services of WI, Oconomowoc, Wis.

Filed Mar. 21, 1997, Ser. No. 68,489

Term of patent 14 years

LOC (6) Cl. 15 - 09

U.S. Cl. D15—134



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U.S. PATENT AND TRADEMARK OFFICE

4405

395,439

## WASTE OIL RECEPTACLE

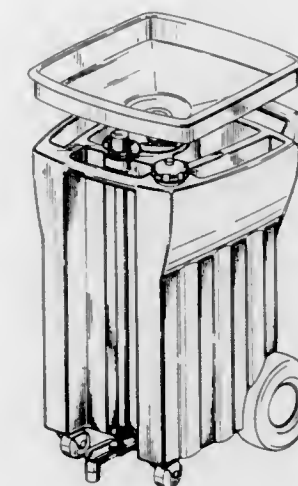
Mark A. King, Blaine; Todd Husom, Golden Valley, and Joseph E. LaBossierre, Lino Lakes, all of Minn., assignors to Graco Inc., Minneapolis, Minn.

Filed Oct. 7, 1996, Ser. No. 60,772

Term of patent 14 years

LOC (6) Cl. 15 - 99

U.S. Cl. D15—150



395,441

## CAMERA

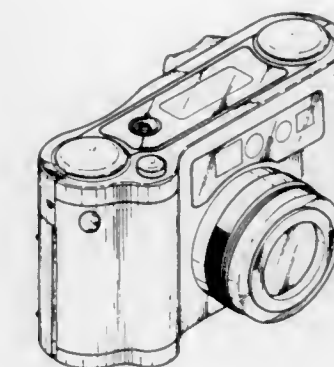
Ji Gang Lee, and Joo Bok Kim, both of Seoul, Rep. of Korea, assignors to Samsung Aerospace Industries, Ltd., Kyeongsangnam-do, Rep. of Korea

Filed Dec. 31, 1996, Ser. No. 64,441

Term of patent 14 years

LOC (6) Cl. 16 - 01

U.S. Cl. D16—217



395,440

## TELESCOPE BODY

Takeo Ogasawara, Tokyo, and Fumihiko Matsubayashi, Gama-goori, both of Japan, assignors to Kowa Company Ltd., Nagoya, Japan

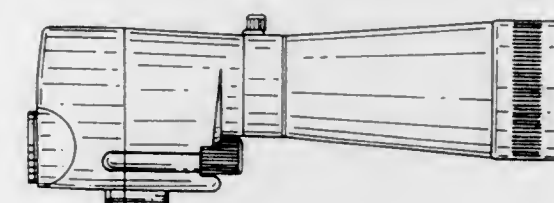
Filed Nov. 26, 1996, Ser. No. 62,829

Claims priority, application Japan, Jun. 4, 1996, 8-16320

Term of patent 14 years

LOC (6) Cl. 16 - 06

U.S. Cl. D16—132



395,442

## SUNGLASSES

Luciano Simioni, Montebelluna, Italy, assignor to Killer Loop Eyewear S.p.A., Pederobba, Italy

Filed May 16, 1997, Ser. No. 70,799

Term of patent 14 years

LOC (6) Cl. 16 - 06

U.S. Cl. D16—327





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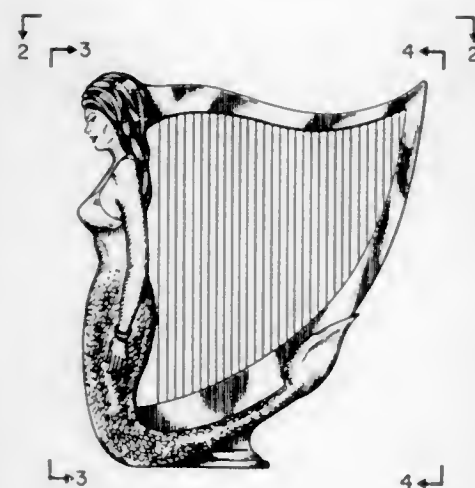
395,443  
HARPSteve Melcher, and Janet Melcher, both of 4239 Yupon Ridge,  
Houston, Tex. 77072

Filed Jan. 16, 1997, Ser. No. 64,987

Term of patent 14 years

LOC (6) Cl. 17 - 03

U.S. Cl. D17—16



395,445

INK TANK FOR PRINTER

Hiroyuki Tokuda; Masanori Takenouchi, both of Yokohama;  
Yasuo Kotaki, Machida, and Yuji Hamasaki, Sagami-hara, all  
of Japan, assignors to Canon Kabushiki Kaisha, Tokyo,  
Japan

Filed Feb. 22, 1995, Ser. No. 35,176

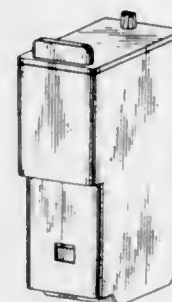
Claims priority, application Japan, Aug. 23, 1994, 6-25187

The portion of the term of this patent subsequent to Jul. 30,  
2010, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 18 - 02

U.S. Cl. D18—56



395,446

INK CARTRIDGE FOR PRINTER

Naoki Tashiro, Kawasaki; Akihiro Yamanaka, Yokohama, and  
Keiichi Tsukuda, Kawasaki, all of Japan, assignors to  
Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 4, 1995, Ser. No. 42,289

Claims priority, application Japan, Feb. 6, 1995, 7-2784

The portion of the term of this patent subsequent to Dec. 10,  
2010, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 18 - 02

U.S. Cl. D18—56

395,444

POT DRUM

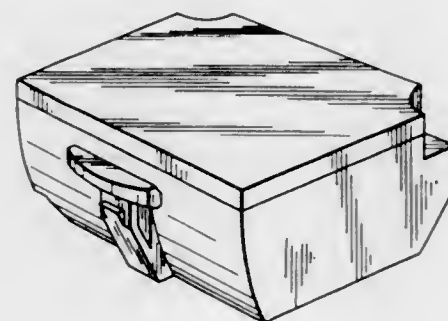
Joseph C. Agu, P. O. Box 70883, Sunnyvale, Calif. 94086

Filed Feb. 20, 1996, Ser. No. 50,620

Term of patent 14 years

LOC (6) Cl. 17 - 04

U.S. Cl. D17—22



JUNE 23, 1998

U.S. PATENT AND TRADEMARK OFFICE

4407

395,447

WRITING INSTRUMENT

Hiromichi Izushima, Kawagoe, Japan, assignor to Kotobuki &  
Co., Inc., Kyoto-Fu, Japan

Filed Aug. 11, 1997, Ser. No. 74,772

Claims priority, application Japan, Feb. 25, 1997, 9-5320

Term of patent 14 years

LOC (6) Cl. 19 - 06

U.S. Cl. D19—49



395,449

CAP FOR WRITING INSTRUMENT

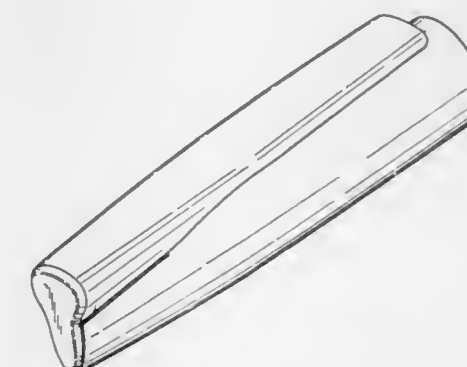
John R. Bussiere, Littleton, Mass., and Geoffrey A. Hollington,  
London, Great Britain, assignors to The Gillette Company,  
Boston, Mass.

Filed Dec. 13, 1996, Ser. No. 63,734

Term of patent 14 years

LOC (6) Cl. 19 - 06

U.S. Cl. D19—57



395,448

WRITING INSTRUMENT

Jean Francois Chevalier, Paris, France, assignor to Societe BIC  
S.A., Clichy Cedex, France

Filed Dec. 13, 1996, Ser. No. 63,701

Term of patent 14 years

LOC (6) Cl. 19 - 06

U.S. Cl. D19—51



395,450

KEYBOARD TRAINING DEVICE

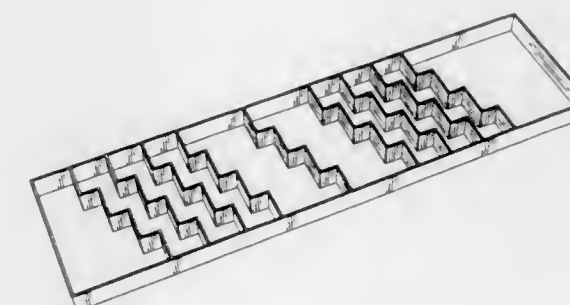
Mitzi Drumm, 10101 S. Virginia St., Reno, Nev. 89511, and  
Patricia Etter, P.O. Box 634, Eureka, Nev. 89316

Filed May 20, 1997, Ser. No. 71,210

Term of patent 14 years

LOC (6) Cl. 19 - 07

U.S. Cl. D19—59



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## HANGING FILE ADAPTER

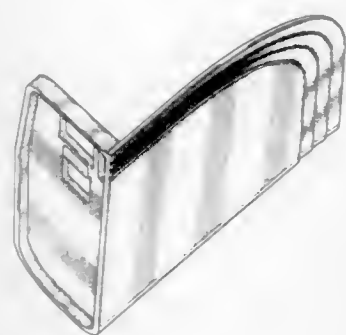
Larry W. Bobik, Knoxville, Tenn.; Patrick M. Green, Cerritos, Calif., and Robert R. Huerto, Farragut, Tenn., assignors to Newell Office Products, Inc., Freeport, Ill.

Filed Nov. 18, 1996, Ser. No. 62,559

Term of patent 14 years

LOC (6) Cl. 19 - 99

U.S. Cl. D19—99



395,453

## DISPLAY DEVICE

Kazuo Kawasaki, Nagoya; Akira Hashimoto, Machida; Katsuhiko Hayashi, Sagami-hara; Akihiko Ishizuka, Narashino; Hidefumi Yamaguchi, Kawasaki, and Takashi Ifuji, Tokyo, all of Japan, assignors to Fujitsu General Limited, and Fujitsu Limited, both of Japan

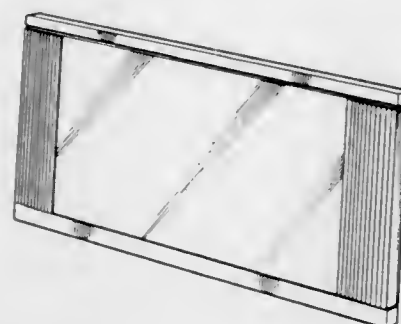
Filed Aug. 16, 1996, Ser. No. 58,529

Claims priority, application Japan, Feb. 19, 1996, 8-4110

Term of patent 14 years

LOC (6) Cl. 20 - 03

U.S. Cl. D20—10



395,454

## DISPLAY DEVICE

Katsuhiko Hayashi, Sagami-hara, Japan, assignor to Fujitsu General Limited, Japan

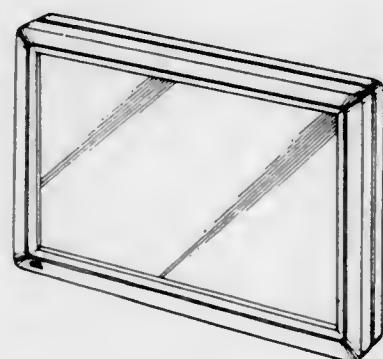
Filed Jan. 30, 1997, Ser. No. 65,618

Claims priority, application Japan, Aug. 9, 1996, 8-24017

Term of patent 14 years

LOC (6) Cl. 14 - 02

U.S. Cl. D20—10



395,452

## GUMBALL DISPENSER

Scott A. August, 1703 Catalpa, Apt. #A, Royal Oak, Mich. 48067

Filed Apr. 7, 1997, Ser. No. 67,858

Term of patent 14 years

LOC (6) Cl. 20 - 01

U.S. Cl. D20—7



JUNE 23, 1998

U.S. PATENT AND TRADEMARK OFFICE

4409

395,455

## SET OF PEEL OFF COUPONS FOR A SECURITY TRACKING SYSTEM

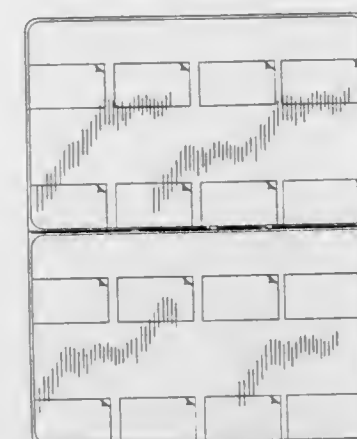
Kenneth Thompson, 2368 Eastman Ave., Suite 3, Ventura, Calif. 93003

Division of Ser. No. 881,542, May 12, 1992, Pat. No. Des. 378,220. This application Feb. 24, 1997, Ser. No. 66,873

Term of patent 14 years

LOC (6) Cl. 19 - 08

U.S. Cl. D20—11



395,457

## GOLF PUTTING AND DRIVING PRACTICE MAT

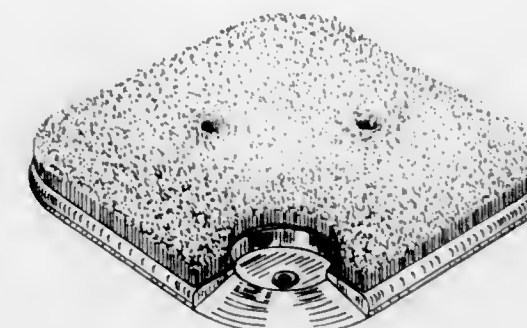
Yeong-Haw Tsou, P.O. Box 2206, Arcadia, Calif. 91077

Filed Aug. 7, 1997, Ser. No. 74,661

Term of patent 14 years

LOC (6) Cl. 21 - 01

U.S. Cl. D21—11



395,458

## GAMING TERMINAL

John C. Smith, North Kingstown; Keith A. Howard, Providence, both of R.I., and Scott D. Hultzman, Putnam, Conn., assignors to GTECH Corporation, West Greenwich, R.I.

Filed Dec. 12, 1996, Ser. No. 64,270

Term of patent 14 years

LOC (6) Cl. 21 - 01

U.S. Cl. D21—13

395,456

## COLOR SAMPLE DISPLAY PANEL

Yukinobu Ito, Tokyo, and Kazuhiro Tanaka, Kanagawa, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

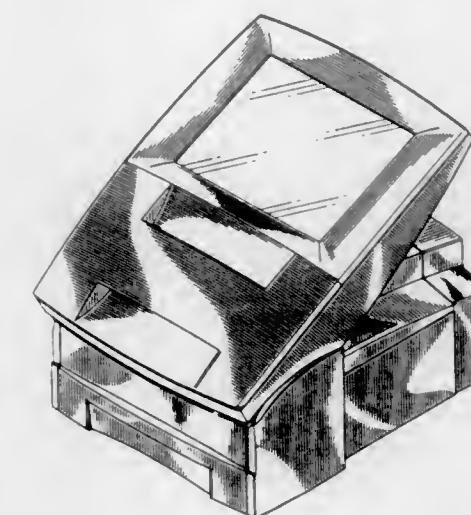
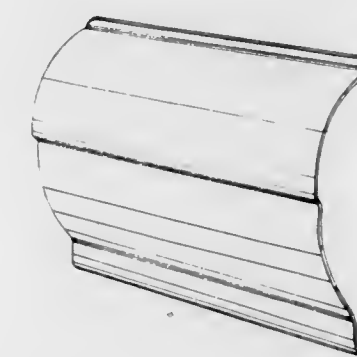
Filed Jan. 31, 1997, Ser. No. 65,274

Claims priority, application Japan, Aug. 1, 1996, 8-23272

Term of patent 14 years

LOC (6) Cl. 20 - 02

U.S. Cl. D20—42





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CHECKER BOARD

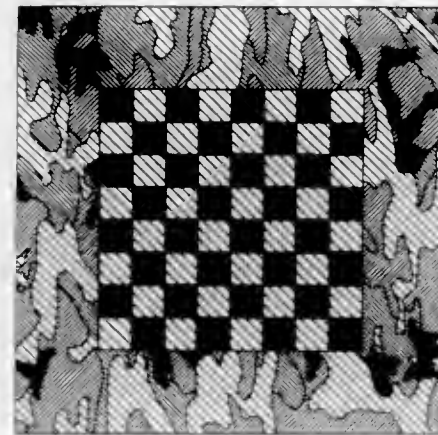
Laura L. DeNardo, 3404 Elliott St., Baltimore, Md. 21224

Filed May 16, 1997, Ser. No. 70,794

Term of patent 14 years

LOC (6) Cl. 21 - 01

U.S. Cl. D21—24



395,461

MINI CRAPS TABLE TOP

Gary J. Serowik, Ocean City, and Thomas Henshaw, Hammon-  
ton, both of N.J., assignors to Tomarry, Inc., Hammonton,  
N.J.

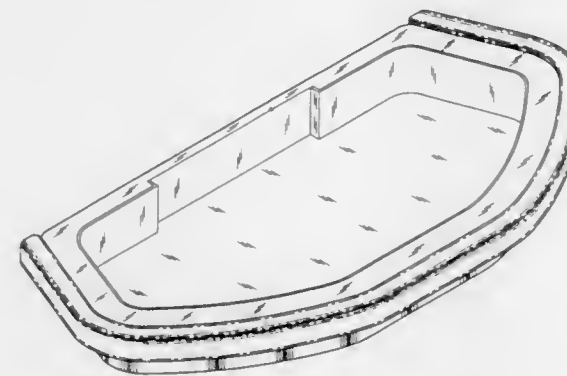
Division of Ser. No. 49,447, Jan. 25, 1996, Pat. No. Des.

382,602. This application Aug. 18, 1997, Ser. No. 75,410

Term of patent 14 years

LOC (6) Cl. 21 - 02

U.S. Cl. D21—37



395,462

MINI CRAPS TABLE TOP

Gary J. Serowik, Ocean City, and Thomas Henshaw, Hammon-  
ton, both of N.J., assignors to Tomarry, Inc., Hammonton,  
N.J.

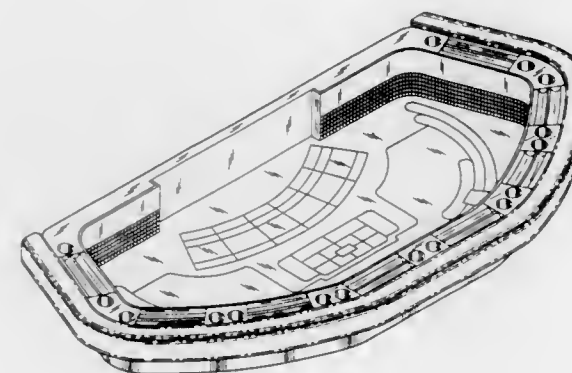
Division of Ser. No. 49,447, Jan. 25, 1996, Pat. No. Des.

382,602. This application Aug. 18, 1997, Ser. No. 75,421

Term of patent 14 years

LOC (6) Cl. 21 - 02

U.S. Cl. D21—37



395,460

GAME BOARD

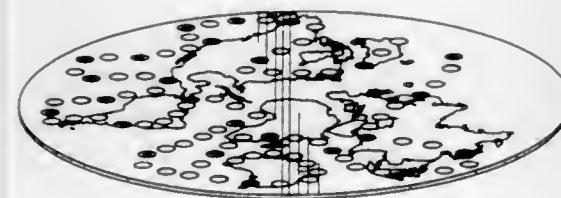
Debra Jorquera, Box 27020 Downtown P.O., Red Deer, AB,  
Canada, T4N 6X8

Filed May 17, 1996, Ser. No. 54,430

Term of patent 14 years

LOC (6) Cl. 21 - 01

U.S. Cl. D21—31



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U.S. PATENT AND TRADEMARK OFFICE

4411

395,463

ELECTRONIC GAMING MACHINE

William A. Scott, Palo Alto, and Allan E. Alcorn, Portola  
Valley, both of Calif., assignors to Silicon Gaming, Inc., Palo  
Alto, Calif.

Filed Apr. 3, 1997, Ser. No. 68,339

Term of patent 14 years

LOC (6) Cl. 21 - 02

U.S. Cl. D21—38



395,465

DART

William A. Smith, Greenfield, Wis., assignor to Great Lakes  
Dart Distributors, Inc., Muskego, Wis.

Filed Apr. 25, 1997, Ser. No. 70,034

Term of patent 14 years

LOC (6) Cl. 21 - 01

U.S. Cl. D21—49



395,466

COMBINED KALEIDOSCOPE AND HOLDER

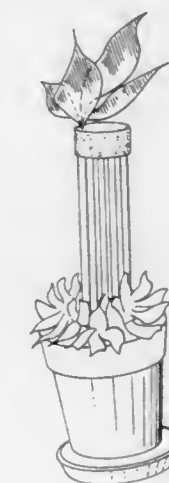
Carol A. Hargreaves, P.O. Box 642, Sandisfield, Mass. 01255

Filed Feb. 26, 1996, Ser. No. 50,797

Term of patent 14 years

LOC (6) Cl. 21 - 01

U.S. Cl. D21—60



395,464

STEERING WHEEL FOR A VIDEO GAME MACHINE

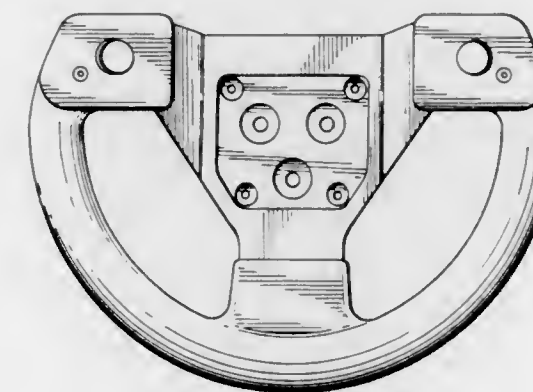
Atsushi Shibashi; Takeshi Fujikawa; Takeyasu Yamamoto,  
and Toru Yano, all of Tokyo, Japan, assignors to Namco,  
Ltd., Tokyo, Japan

Filed Jul. 1, 1996, Ser. No. 56,487

Term of patent 14 years

LOC (6) Cl. 21 - 01

U.S. Cl. D21—48



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## CHILD ENTERTAINMENT DEVICE

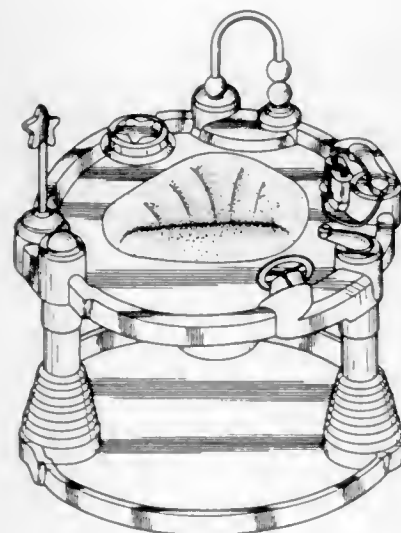
William B. Bellows, Sinking Springs, Pa., assignor to Graco Children's Products Inc., Elverson, Pa.

Filed Nov. 9, 1995, Ser. No. 46,242

Term of patent 14 years

LOC (6) Cl. 21 - 01

U.S. Cl. D21—66



395,469

## RIGHT ANGLE GEAR FOR TOY CONSTRUCTION SET

Joel I. Glickman, Huntingdon Valley, Pa., assignor to Connector Set Limited Partnership, Hatfield, Pa.

Filed Jan. 16, 1997, Ser. No. 64,967

Term of patent 14 years

LOC (6) Cl. 21 - 01

U.S. Cl. D21—108



395,468

## MANIPULABLE PUZZLE

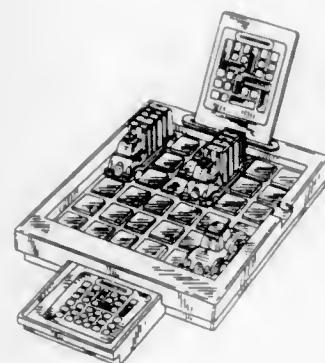
Stephen A. Wagner, Alexandria, Va., assignor to Binary Arts Corp., Alexandria, Va.

Filed Jul. 18, 1996, Ser. No. 57,175

Term of patent 14 years

LOC (6) Cl. 21 - 01

U.S. Cl. D21—104



395,470

## TOY BUILDING ELEMENT

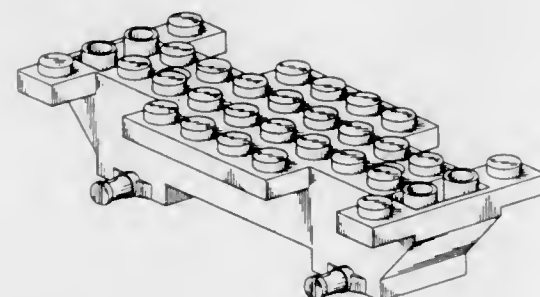
Helle Rahbek, Vildbjerg, Denmark, assignor to INTERLEGO AG, Baar, Switzerland

Filed Sep. 18, 1997, Ser. No. 76,731

Term of patent 14 years

LOC (6) Cl. 21 - 01

U.S. Cl. D21—108



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U.S. PATENT AND TRADEMARK OFFICE

4413

395,471

## TOY CLOCK AND RADIO

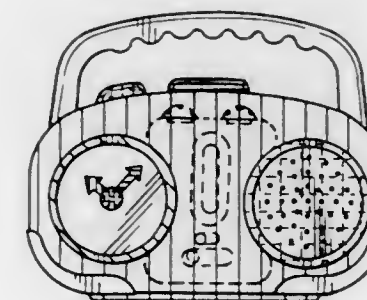
Elizabeth Knight, Westwood, Mass., assignor to The Little Tikes Company, Hudson, Ohio

Filed Jan. 22, 1996, Ser. No. 49,233

Term of patent 14 years

LOC (6) Cl. 21 - 01

U.S. Cl. D21—113



395,473

## TOY POLICE DOG

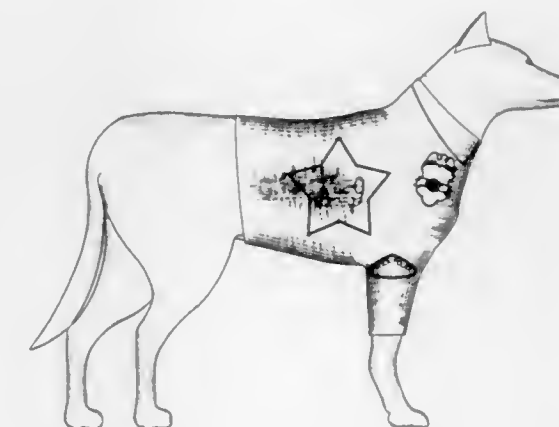
William Wall, 409 S. 9th St. #1-F, Philadelphia, Pa. 19147

Filed Feb. 21, 1997, Ser. No. 67,207

Term of patent 14 years

LOC (6) Cl. 21 - 01

U.S. Cl. D21—161



395,472

## RADIO REMOTE CONTROL UNIT

Nobumitsu Kanetsuna; Kazunori Fujita, and Eiji Jinno, all of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan

Filed Nov. 12, 1996, Ser. No. 62,247

Claims priority, application Japan, May 9, 1996, 8-013167

Term of patent 14 years

LOC (6) Cl. 16 - 06

U.S. Cl. D21—141.1



395,474

## HOCKEY PUCK CHARACTER

Craig Burton, 454 Orton Place, Ancaster Ontario, Canada, L96 4M8, and Graham Nierop, 41 Hughson Dr., Unionville Ontario, Canada, L34-2T7

Filed May 15, 1996, Ser. No. 54,563

Term of patent 14 years

LOC (6) Cl. 21 - 01

U.S. Cl. D21—166





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HOOP TARGET FOR BALL GAMES

Samuel A. Akwei, S.A.A. Company, Ltd., P.O. Box 28608, Philadelphia, Pa. 19151

Filed Apr. 18, 1997, Ser. No. 69,842

Term of patent 14 years

LOC (6) Cl. 21 - 99

U.S. Cl. D21—200



395,477

GOLF GRIP

Al J. Vela, 1441 E. Comstock Ave., Glendora, Calif. 91741

Filed May 3, 1996, Ser. No. 53,988

Term of patent 14 years

LOC (6) Cl. 21 - 02

U.S. Cl. D21—222



395,476

GOLF CLUB HEAD HAVING FACE INSERT

Brian R. Pond, San Marcos; Thomas C. Morris, and Timothy R. Reed, both of Carlsbad, all of Calif., assignors to Odyssey Golf, Carlsbad, Calif.

Filed Jan. 22, 1997, Ser. No. 65,157

Term of patent 14 years

LOC (6) Cl. 21 - 02

U.S. Cl. D21—220



395,478

SKATE BOOT TOE VENT

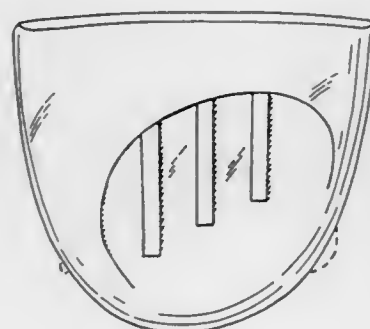
Paul Santarsiero, Avon, Conn., assignor to Brookfield International, Inc., Danvers, Mass.

Filed Apr. 30, 1996, Ser. No. 53,789

Term of patent 14 years

LOC (6) Cl. 21 - 02

U.S. Cl. D21—226



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U.S. PATENT AND TRADEMARK OFFICE

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395,479

FOOT ENGAGABLE MOBILE BOARD

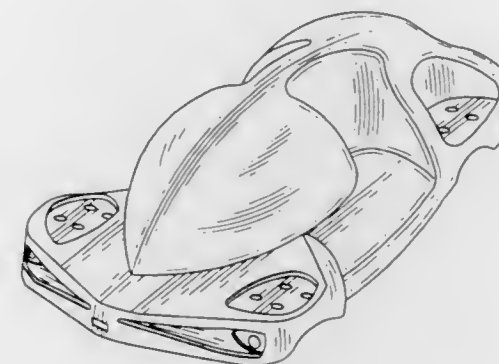
Israel Gamzo, Albany, Calif., assignor to Conceptor Corporation, Albany, Calif.

Filed Aug. 8, 1996, Ser. No. 58,098

Term of patent 14 years

LOC (6) Cl. 21 - 02

U.S. Cl. D21—227



395,481

GOLF PRACTICE SCREEN

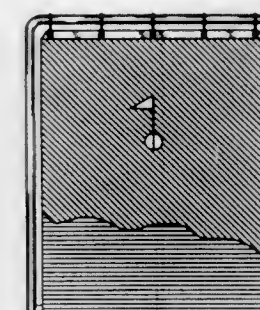
Don P. Corbett, 62 Steeles Cres, Cambridge, Ontario, Canada, N1R 8C3, and Ronald L. Wiseman, 93 Carmine Cres., Cambridge, Ontario, Canada, N3C 3Z4

Filed May 22, 1997, Ser. No. 71,196

Term of patent 14 years

LOC (6) Cl. 21 - 02

U.S. Cl. D21—234



395,482

ARROW LUBRICANT APPLICATOR-CONTAINER

Gary L. Coffey, Glendale, and B. Howard Coffey, LaGrange, both of Ky., assignors to Coffey Marketing Corporation, LaGrange, Ky.

Filed Jan. 16, 1996, Ser. No. 48,936

The portion of the term of this patent subsequent to Jan. 13, 2012, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 22 - 01

U.S. Cl. D22—107

395,480

GOLF BALL CLEANER

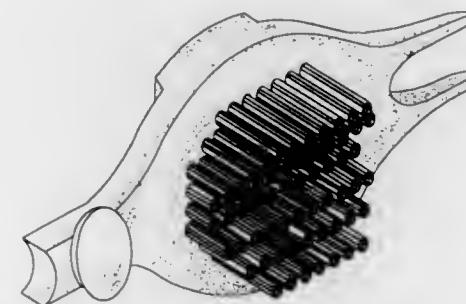
Joseph Chou, 5405 Encinita Ave., Temple City, Calif. 91780

Filed Feb. 10, 1997, Ser. No. 66,277

Term of patent 14 years

LOC (6) Cl. 21 - 02

U.S. Cl. D21—234



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## DESIGN FOR A TARGET

Walter Ludwig Maryska, Harbord, Australia, assignor to Rite-flite Pty Limited, Harbord, Australia

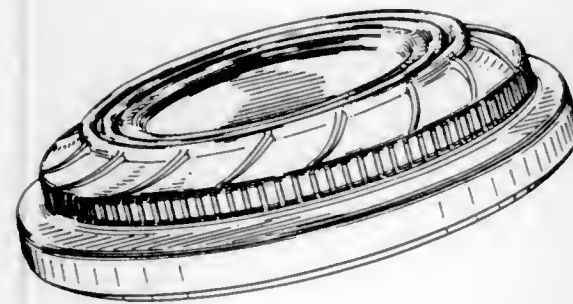
Filed Dec. 6, 1996, Ser. No. 63,388

Claims priority, application Australia, Jun. 7, 1996, 1771/96

Term of patent 14 years

LOC (6) Cl. 22 - 04

U.S. Cl. D22—114



395,485

## WATER BED FILLING APPLIANCE

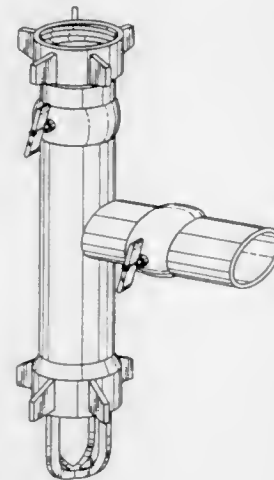
Ronald Edward Deaso, Sr., 516 Moose Hill Rd., Monroe, Conn. 06468

Filed Mar. 26, 1996, Ser. No. 52,228

Term of patent 14 years

LOC (6) Cl. 23 - 01

U.S. Cl. D23—245



395,484

## NOZZLE HEAD

Jens Toft Jepsen, Klarup, Denmark, assignor to Semco Marine, Odense S, Denmark

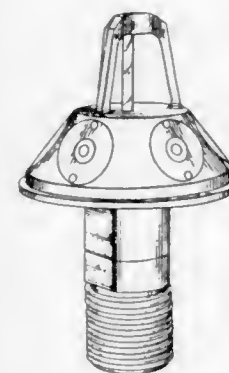
Filed Nov. 8, 1996, Ser. No. 62,146

Claims priority, application Denmark, May 9, 1996, MA04831996

Term of patent 14 years

LOC (6) Cl. 23 - 01

U.S. Cl. D23—213



395,486

## HANDLE

Frederic C. Doughty, S. Pasadena, and Darren M. Mark, Castaic, both of Calif., assignors to Emhart Inc., Newark, Del.

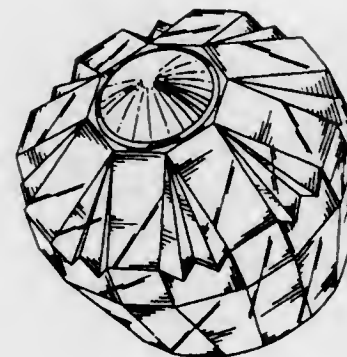
Division of Ser. No. 44,300, Sep. 22, 1995, Pat. No. Des.

383,523. This application Oct. 30, 1996, Ser. No. 61,754

Term of patent 14 years

LOC (6) Cl. 23 - 01

U.S. Cl. D23—250



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U.S. PATENT AND TRADEMARK OFFICE

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Patent Not Issued For This Number

395,488

## TUB SHELF

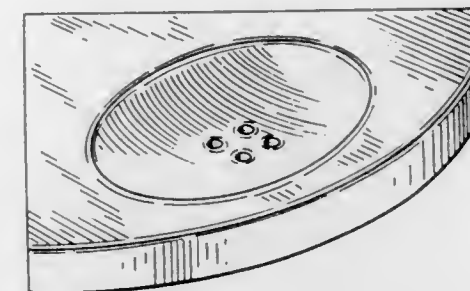
Michael Joss, Chicago, Ill., assignor to Design House, Inc., Germantown, Wis.

Filed Apr. 4, 1997, Ser. No. 68,424

Term of patent 14 years

LOC (6) Cl. 23 - 02

U.S. Cl. D23—304



395,490

## PORTABLE SPACE HEATER

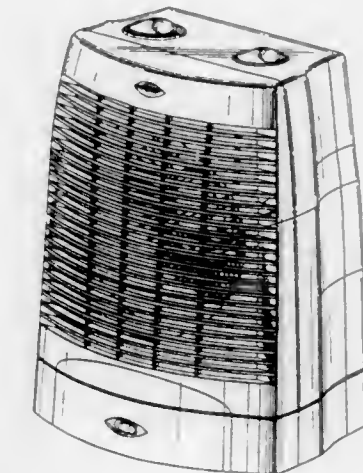
Rodney Jane', Westboro; Stephan Boyle, Belmont; Zhiwei Xu, Marlborough, all of Mass.; Richard O'Grady, Southington, Conn.; Walter Birdsell, Beacon Falls, Conn., and Aaron Szymanski, Bristol, Conn., assignors to Honeywell Consumer Products, Inc., Southborough, Mass.

Filed Jan. 16, 1996, Ser. No. 48,735

Term of patent 14 years

LOC (6) Cl. 23 - 03

U.S. Cl. D23—337



395,491

## HUMIDIFIER WITH OUTLET GRILL AND MEDICINE CUP

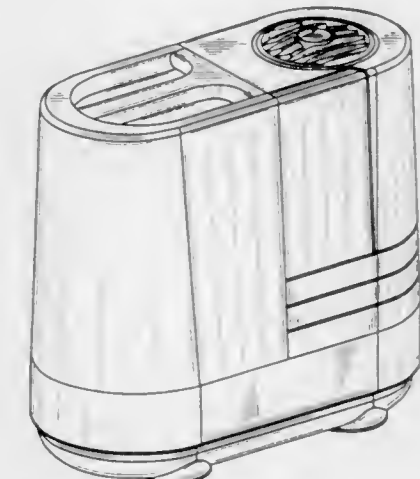
Rodney Jane', Westboro; Diane Allen, Marlborough, both of Mass.; Jui-Shang Wang, Taipei, Taiwan, and Stanley Gressens, Homewood, Ill., assignors to Honeywell Consumer Products, Inc., Southborough, Mass.

Filed Jan. 16, 1996, Ser. No. 48,896

Term of patent 14 years

LOC (6) Cl. 23 - 04

U.S. Cl. D23—356



395,489

## TOILET SEAT LIFTER

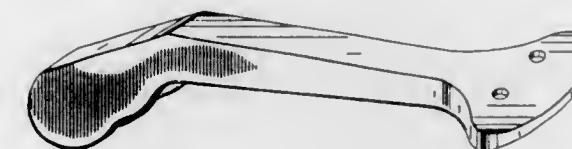
Alak Abusaad, 10979 Yorkspring, Dallas, Tex. 75218

Filed Jul. 14, 1997, Ser. No. 73,490

Term of patent 14 years

LOC (6) Cl. 23 - 02

U.S. Cl. D23—311





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DEHUMIDIFIER

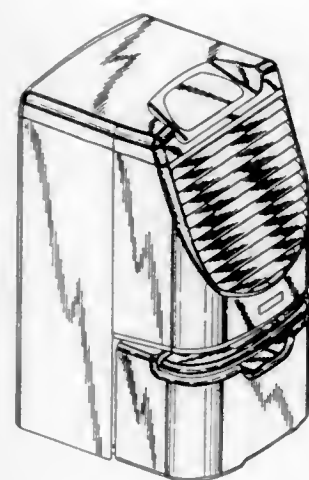
Brian J. Phillips, Smyrna; Christopher M. Thompson; Christopher P. Campbell, both of Nashville, all of Tenn.; Laura A. Billingham, Benton Harbor, Mich.; David M. Jackson, Murfreesboro, Tenn., and James J. Morton, Jr., Eagleville, Tenn., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 24, 1997, Ser. No. 65,520

Term of patent 14 years

LOC (6) Cl. 23 - 04

U.S. Cl. D23—359



395,494

AIR FRESHENER

Egbert Becker, Hamburg-Bahrenfeld, Germany, assignor to Reckitt & Colman AG, Alschwil, Switzerland

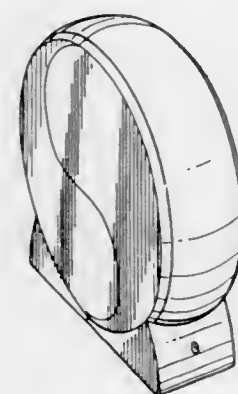
Filed Apr. 15, 1996, Ser. No. 53,161

Claims priority, application Hague Agreement, Oct. 19, 1995, DM/034427

Term of patent 14 years

LOC (6) Cl. 23 - 04

U.S. Cl. D23—369



395,493

AUTOMOTIVE AIR CLEANER HOUSING

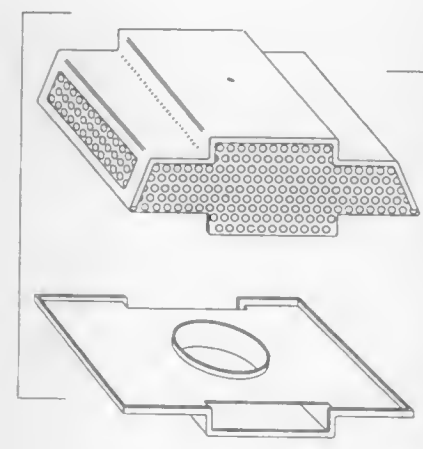
Frank O. Palladini, 358 Blossom Hill Rd., San Jose, Calif. 95123

Filed Mar. 20, 1996, Ser. No. 51,977

Term of patent 14 years

LOC (6) Cl. 23 - 04

U.S. Cl. D23—364



395,495

SMOKE EXHAUSTER

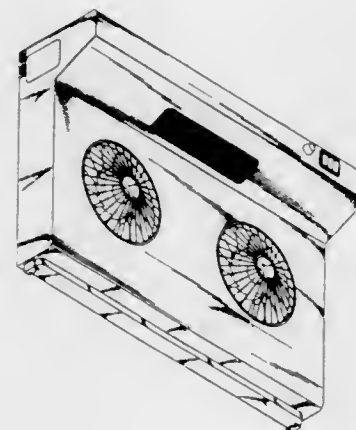
Min Wei Wu, No. 95-10, Chang Ping Rd., Sec. 1, Taichung, Taiwan

Filed Dec. 2, 1996, Ser. No. 63,176

Term of patent 14 years

LOC (6) Cl. 23 - 04

U.S. Cl. D23—372



395,496

FAN SUPPORT ROD

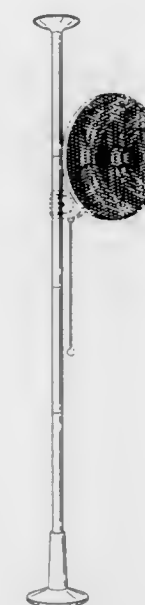
Jui-Shang Wang, Taipei, Taiwan; Rodney Jané, Westboro; John Longan, Natick, both of Mass.; Stanley Gresens, Homewood; Gregory Holderfield, Oak Park, both of Ill.; Donald Hootstein, Cambridge, Mass., and Steven Valentor, Westmont, Ill., assignors to Honeywell Consumer Products, Inc., Sorthborough, Mass.

Filed Mar. 14, 1995, Ser. No. 36,190

Term of patent 14 years

LOC (6) Cl. 23 - 04

U.S. Cl. D23—411



395,498

BLADE IRON FOR A CEILING FAN

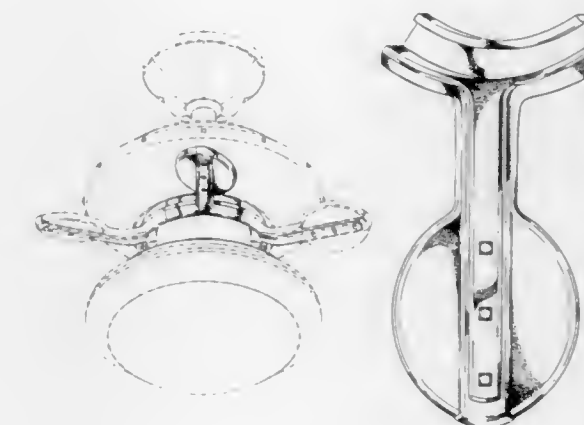
Jack W. Gee, II, Huntsville, Ala., assignor to Hunter Fan Company, Memphis, Tenn.

Filed Aug. 19, 1997, Ser. No. 75,448

Term of patent 14 years

LOC (6) Cl. 23 - 04

U.S. Cl. D23—411



395,497

COMBINED HOUSING, BLADE IRONS AND SWITCH HOUSING UNIT FOR A CEILING FAN

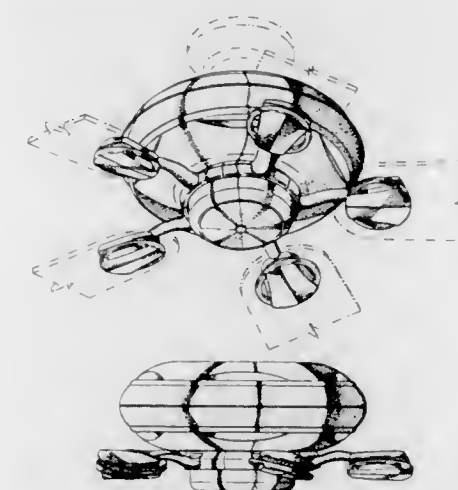
Bradford C. Zuege, Cordova, Tenn., assignor to Hunter Fan Company, Memphis, Tenn.

Filed Aug. 19, 1997, Ser. No. 75,402

Term of patent 14 years

LOC (6) Cl. 23 - 04

U.S. Cl. D23—411



395,499

DRY POWDER INHALER

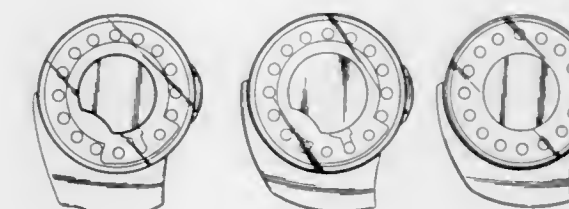
Robert F. Eisele; Karen Davies, both of San Diego; Allan Cameron, Santa Monica; Greg Halus, Woodland Hills, all of Calif.; Nelson Holton, Boulder, Colo.; Tim Kline, Boulder, Colo., and Ian Smith, Boulder, Colo., assignors to Dura Pharmaceuticals, Inc., San Diego, Calif.

Filed Apr. 8, 1996, Ser. No. 52,913

Term of patent 14 years

LOC (6) Cl. 24 - 04

U.S. Cl. D24—110



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395,500

## RESPIRATORY OXYGEN DILUTION VALVE

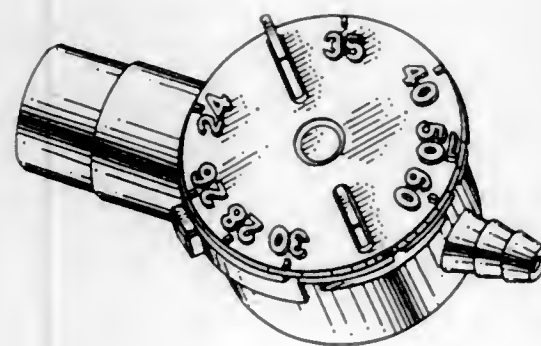
Steven L. Ryder, 1334 W. Woodcrest Ave., Fullerton, Calif. 92633

Filed Feb. 1, 1996, Ser. No. 49,825

Term of patent 14 years

LOC (6) Cl. 29 - 02

U.S. Cl. D24—110.6



395,502

## CATHETER PLUG

Michael Francis Dely, Tustin, and Terry Keneth Prince, Mission Viejo, both of Calif., assignors to McGaw, Inc., Irvine, Calif.

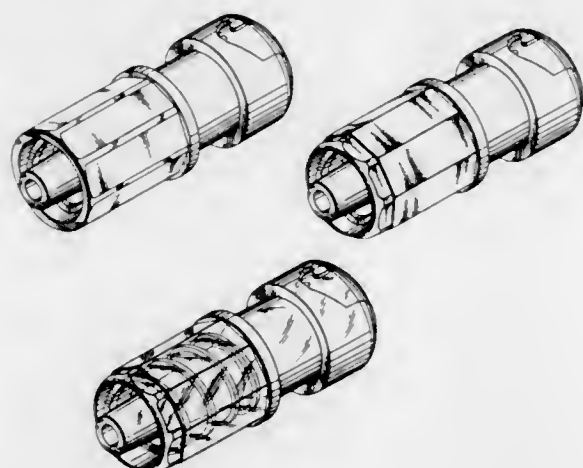
Continuation of Ser. No. 21,738, Apr. 22, 1994, abandoned.

This application Mar. 19, 1996, Ser. No. 53,314

Term of patent 14 years

LOC (6) Cl. 24 - 02

U.S. Cl. D24—112



395,501

## WINGED CATHETER

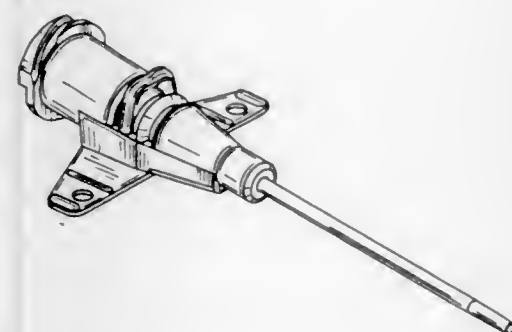
Timothy J. Erskine, Kenneth C. Musgrave, and Glade H. Howell, all of Sandy, Utah, assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Dec. 7, 1995, Ser. No. 47,552

Term of patent 14 years

LOC (6) Cl. 24 - 02

U.S. Cl. D24—112



395,503

## COMBINED MEDICATION AND LIQUID DISPENSING CUP

Michael Kushnir, 6401 W. Capitol Dr., Milwaukee, Wis. 53216

Filed Nov. 8, 1996, Ser. No. 62,145

Term of patent 14 years

LOC (6) Cl. 24 - 04

U.S. Cl. D24—121



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U.S. PATENT AND TRADEMARK OFFICE

4421

395,504

## SHIELD FOR THONG PANTY

Kamela J. Darby, P.O. Box 32096, Palm Beach Gardens, Fla. 33420

Filed Apr. 28, 1997, Ser. No. 69,833

Term of patent 14 years

LOC (6) Cl. 24 - 04

U.S. Cl. D24—125



395,506

## EIGHT-VANED CROWN FOR A SOLID-PHASE CHEMICAL REACTION SUPPORT

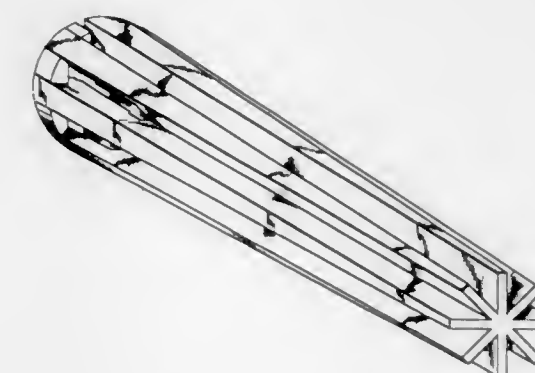
Andrew M. Bray, 48 Western Road, Boronia, Victoria 3155, Australia

Filed Oct. 16, 1996, Ser. No. 61,100

Term of patent 14 years

LOC (6) Cl. 24 - 02

U.S. Cl. D24—130



395,505

## CATHETER HOLDER

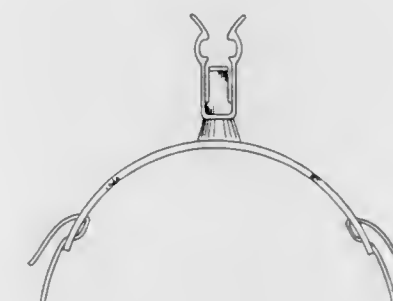
Joseph F. Noonan, 21 Flora Rd., Bolton, and George A. Scoville, Jr., 1094 Fienemann Rd., Farmington, both of Conn. 06032

Filed Feb. 3, 1997, Ser. No. 66,053

Term of patent 14 years

LOC (6) Cl. 24 - 02

U.S. Cl. D24—128



395,507

## COMBINED TWO PIECE NEURODIAGNOSTIC TEST INSTRUMENT WITH DISPOSABLE TEST HEAD AND WEIGHTED REUSABLE HANDLE

Gary L. Cronin, P.O. Box 686, Niwot, Colo. 80544

Continuation-in-part of Ser. No. 431,555, May 1, 1995. This application Oct. 28, 1996, Ser. No. 61,619

Term of patent 14 years

LOC (6) Cl. 24 - 02

U.S. Cl. D24—133





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395,508

SHIELD FOR PANTY

Kamela J. Darby, P.O. Box 32096, Palm Beach Gardens, Fla. 33420

Filed Apr. 18, 1997, Ser. No. 69,832

Term of patent 14 years

LOC (6) Cl. 24 - 04

U.S. Cl. D24—125



395,510

CORONARY STABILIZING RETRACTOR

Greg Furnish, Lawrenceville, Ga., assignor to Genzyme Corporation, Framingham, Mass.

Filed Apr. 26, 1996, Ser. No. 55,732

Term of patent 14 years

LOC (6) Cl. 24 - 02

U.S. Cl. D24—135



395,511

Patent Not Issued For This Number

395,509

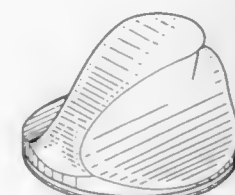
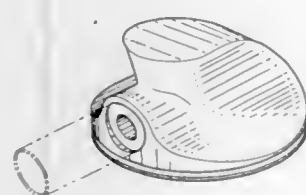
STETHOSCOPE CHESTPIECE

Joy A. Packard, and Thomas J. Packard, both of Somerset, Wis., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Division of Ser. No. 25,229, Aug. 3, 1994. This application Nov. 14, 1995, Ser. No. 46,401

Term of patent 14 years

U.S. Cl. D24—137



395,512

HAPTIC END PORTION OF THE INTROCUAR LENS

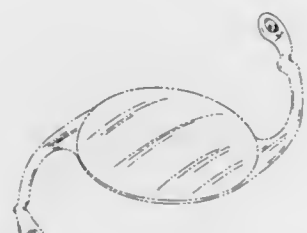
Michael S. Korenfeld, 16681 Clayton Rd., St. Louis, Mo. 63011

Filed Apr. 15, 1996, Ser. No. 53,129

Term of patent 14 years

LOC (6) Cl. 24 - 03

U.S. Cl. D24—157



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U.S. PATENT AND TRADEMARK OFFICE

4423

395,513

PORTABLE MEDICAL MONITOR WITH DISPLAY

Dietrich Rogler, Horb, Germany, assignor to Hewlett-Packard Company, Palo Alto, Calif.

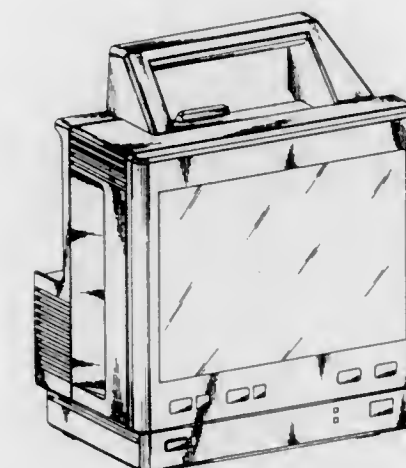
Filed Mar. 3, 1997, Ser. No. 67,766

Claims priority, application Germany, Sep. 10, 1996, 96 07 778.6

Term of patent 14 years

LOC (6) Cl. 24 - 01

U.S. Cl. D24—186



395,515

INFANT CHARM TEETHER

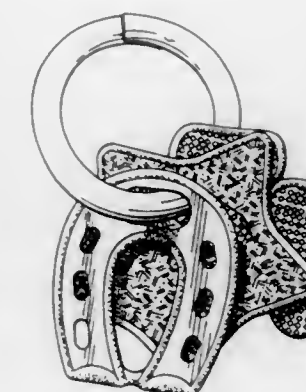
Tim P. Fletcher, Acworth, Ga., assignor to Lisco, Inc., Tampa, Fla.

Filed Aug. 11, 1997, Ser. No. 75,019

Term of patent 14 years

LOC (6) Cl. 24 - 04

U.S. Cl. D24—195



395,514

COMBINED ANKLE AND FOOT ORTHOSIS SPLINT WITH ORTHOWEDGE FOR WEARING AT NIGHT

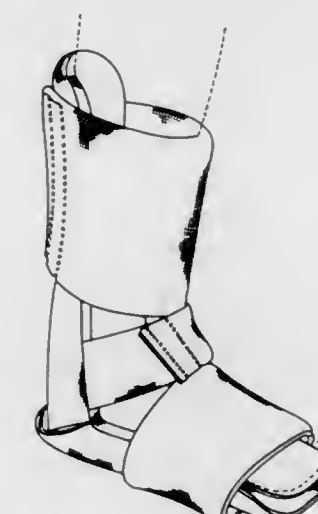
William S. Stano, 220 W. Jefferson St., Boise, Id. 83702

Filed Mar. 27, 1997, Ser. No. 68,704

Term of patent 14 years

LOC (6) Cl. 24 - 04

U.S. Cl. D24—192



395,516

INFANT FOOD CHARM TEETHER

Tim P. Fletcher, Acworth, Ga., assignor to Lisco, Inc., Tampa, Fla.

Filed Aug. 11, 1997, Ser. No. 75,020

Term of patent 14 years

LOC (6) Cl. 24 - 04

U.S. Cl. D24—195



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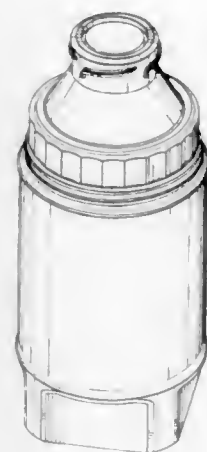
395,517

## CHEMICAL VESSEL

Dennis M. Treu, Gurnee; Dilip H. Shah, Grayslake; Donald C. Walker, Mundelein, and Kenneth E. Pawlak, Vernon Hills, all of Ill., assignors to AKSYS, Ltd., Lincolnshire, Ill. Continuation-in-part of Ser. No. 660,694, Jun. 5, 1996, which is a continuation-in-part of Ser. No. 388,275, Feb. 13, 1995, Pat. No. 5,591,344. This application Jul. 25, 1996, Ser. No. 57,448

Term of patent 14 years  
LOC (6) Cl. 24 - 01

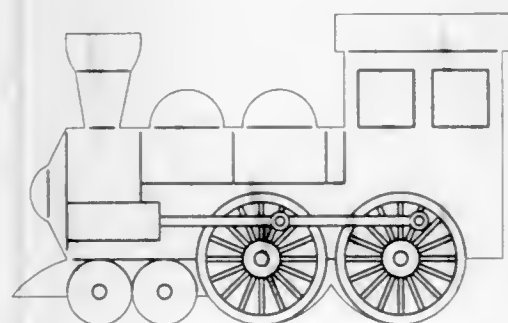
U.S. Cl. D24—224

395,518  
GAZEBO

Joseph A. Matchey, N. 27499 Thompson Valley Rd., Arcadia, Wis. 54612

Filed Aug. 14, 1997, Ser. No. 75,091  
Term of patent 14 years  
LOC (6) Cl. 25 - 03

U.S. Cl. D25—32



395,519

Patent Not Issued For This Number

395,520

Patent Not Issued For This Number

395,521

## BOUTIQUE INTERIOR

Roland De Leu, Issy-Les-Moulineaux, France, assignor to Celine, Paris, France

Filed Jan. 19, 1990, Ser. No. 467,760

Claims priority, application France, Jul. 21, 1989, 89 4710

Term of patent 14 years

LOC (6) Cl. 25 - 02

U.S. Cl. D25—58



395,522

## LADDER CAP

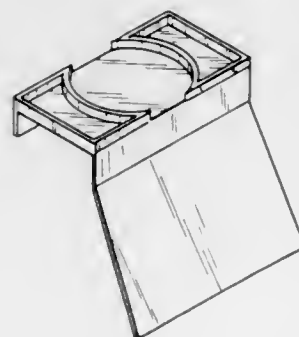
Norris Roberts, 575 Mill Pond Rd., Lamar, Miss. 38642

Filed Aug. 16, 1996, Ser. No. 58,507

Term of patent 14 years

LOC (6) Cl. 25 - 04

U.S. Cl. D25—68



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U.S. PATENT AND TRADEMARK OFFICE

4425

395,523

## LADDER TOP ATTACHABLE TOOLBOX

Richard M. Fine, Box 229, #4 Fairview St., Elrama, Pa. 15038, and Alan D. Steigerwald, 411 Pin Oak Dr., Glenshaw, Pa. 15116

Filed Feb. 21, 1997, Ser. No. 66,849

Term of patent 14 years

LOC (6) Cl. 25 - 04

U.S. Cl. D25—68



395,525

## CONSTRUCTION BEAM EXTRUSION

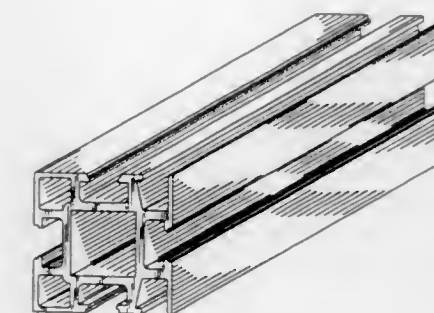
Jacob Rinot, Herzliya, and Uri Rinot, Rishon Le-Zion, both of Israel, assignors to Rinot Planning & Installation Ltd., Rishon Le-Zion, Israel

Filed Apr. 7, 1997, Ser. No. 68,433

Term of patent 14 years

LOC (6) Cl. 25 - 01

U.S. Cl. D25—122



395,524

## WINDOW FRAME MEMBER

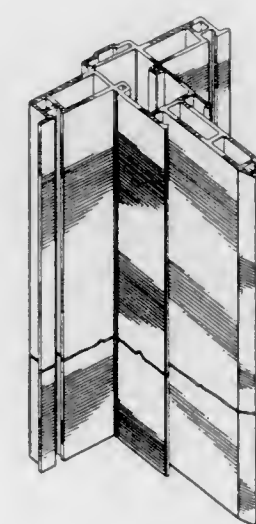
Marcel Daoust, Orangeville, Canada, assignor to Performance Fabrication Systems International Inc., Woodbridge, Canada

Filed Jan. 7, 1997, Ser. No. 64,598

Term of patent 14 years

LOC (6) Cl. 25 - 01

U.S. Cl. D25—122



395,526

## WINDOW COMPONENT EXTRUSION

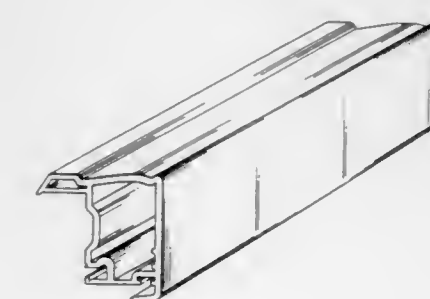
Peggy O. Porter; Michael T. Chaney, both of Monroe, Ohio, and Harold Kuritzky, Hillside, N.J., assignors to Dayton Technologies, Inc., Monroe, Ohio

Filed Nov. 15, 1996, Ser. No. 63,353

Term of patent 14 years

LOC (6) Cl. 25 - 01

U.S. Cl. D25—124





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395,527

Patent Not Issued For This Number

395,528

POST FOR USE IN A PLANT TRELLIS SYSTEM

James D. Mayer, Northbrook, and Laurance C. Martin, III, Northfield, both of Ill., assignors to Jame' Roll Form Products, Inc., Franklin Park, Ill.

Filed Jan. 22, 1997, Ser. No. 65,166

Term of patent 14 years

LOC (6) Cl. 25 - 01

U.S. Cl. D25—131



395,530

MOP BUCKET SIDEWALL

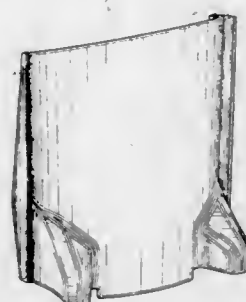
Jon Mandell, Hattiesburg, Miss.; Vicky Michael, Middletown, Va.; Michael Roby, and Glen E. Tomblin, both of Winchester, Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.

Filed Jan. 27, 1997, Ser. No. 65,507

Term of patent 14 years

LOC (6) Cl. 07 - 07

U.S. Cl. D32—53



395,531

MOP BUCKET

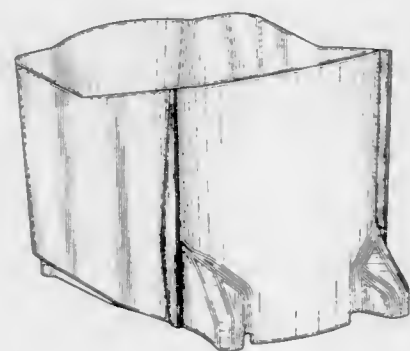
Jon Mandell, Hattiesburg, Miss.; Vicky Michael, Middletown, Va.; Michael Roby, and Glen E. Tomblin, both of Winchester, Va., assignors to Rubbermaid Commercial Products Inc., Winchester, Va.

Filed Jan. 27, 1997, Ser. No. 65,508

Term of patent 14 years

LOC (6) Cl. 07 - 07

U.S. Cl. D32—53



395,529

COMBINED NIGHT LIGHT AND INSECT REPELLER

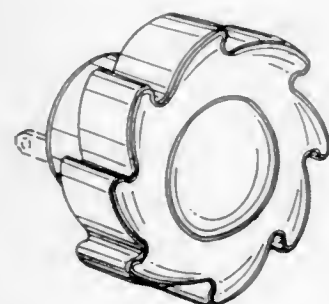
Se Kit Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong

Filed Nov. 6, 1996, Ser. No. 62,072

Term of patent 14 years

LOC (6) Cl. 26 - 05

U.S. Cl. D26—26



U.S. PATENT AND TRADEMARK OFFICE

4427

395,532

FORKLIFT

Jong Hyun Kim, Kyungnam, Rep. of Korea, assignor to Samsung Heavy Industries Co., Ltd., Seoul, Rep. of Korea

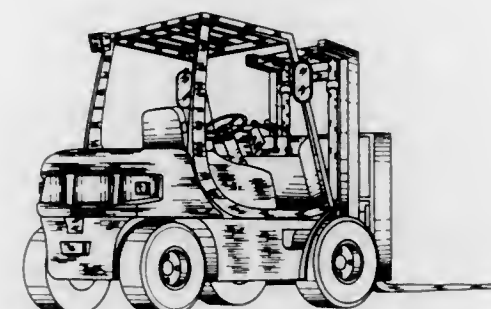
Filed Oct. 20, 1995, Ser. No. 46,655

The portion of the term of this patent subsequent to Nov. 25, 2011, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 12 - 05

U.S. Cl. D34—34



395,534

CORRUGATED PALLET

Larry G. Besaw, Jasper, Ind., assignor to The Servants Inc., Jasper, Ind.

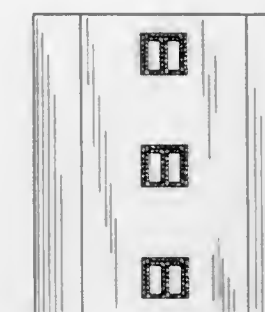
Continuation-in-part of Ser. No. 24,592, Jun. 16, 1994, Pat. No. Des. 374,324, and Ser. No. 218,111, Mar. 25, 1994, Pat. No. 5,603,258. This application Dec. 4, 1995, Ser. No. 47,448

The portion of the term of this patent subsequent to Oct. 1, 2010, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 09 - 08

U.S. Cl. D34—38



395,533

PALLET

Jim Morison, Oshawa, and Paul Whittington, Thornhill, both of Canada, assignors to Gorrie Advertising Management Limited, Mississauga, Canada

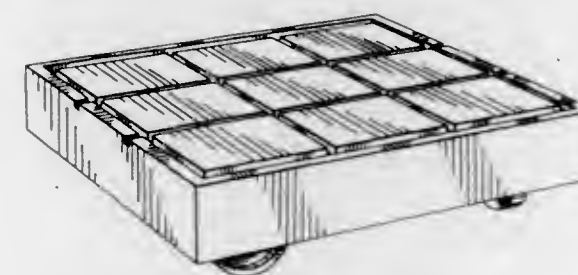
Filed Nov. 24, 1995, Ser. No. 47,112

Claims priority, application Canada, May 30, 1995, 1995-1155; Jun. 23, 1995, 1995-1418

Term of patent 14 years

LOC (6) Cl. 09 - 08

U.S. Cl. D34—38



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## LIST OF PATENTEES

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PATENTS WERE ISSUED ON THE 23rd DAY OF JUNE, 1998

NOTE— Arranged in accordance with the first significant character or word of the name  
(in accordance with city and telephone directory practice).

- A. Friedr. Flender AG: *See—*  
Rypalla, Mark, 5,769,428, Cl. 277-350.000.
- Aælyng, Dorrit A.: *See—*  
Yaver, Debbie Sue; Xu, Feng; Dalbøge, Henrik; Schneider, Palle; and Aælyng, Dorrit A., 5,770,418, Cl. 435-189.000.
- Aavid Engineering, Inc.: *See—*  
Cook, Randolph H., 5,771,155, Cl. 361-710.000.
- ABB Flexible Automation, Inc.: *See—*  
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- ABB Power T&D Company Inc.: *See—*  
Bapat, Vinod N.; Reckleff, John G.; and Danfors, Per A., 5,770,897, Cl. 307-127.000.
- ABB Research Ltd.: *See—*  
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- Abbott Laboratories: *See—*  
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Wang, Jianjun; Bouska, Annette G.; and Drayer, Lonnie R., 5,770,801, Cl. 73-644.000.
- Abe, Kimihiro, to Yazaki Corporation. Connector with rear holder. 5,769,670, Cl. 439-752.000.
- Abe, Manabu: *See—*  
Yashima, Saburoh; Abe, Manabu; Ueta, Katsumi; and Kaneko, Kantaro, 5,769,338, Cl. 241-69.000.
- Abe, Masami, to Oki Electric Industry Co., Ltd. Method and apparatus for distinguishing control channel from traffic channels. 5,770,927, Cl. 375-340.000.
- Abe, Masanao: *See—*  
Kawaguchi, Junichiro; Fujiwara, Akira; Sawai, Shujiro; Abe, Masanao; and Nakamura, Akiko, 5,768,940, Cl. 73-864.410.
- Abe, Shun-ichi: *See—*  
Kido, Takae; Ii, Shigeo; Abe, Shun-ichi; and Yokoyama, Kazumasa, 5,770,233, Cl. 424-641.000.
- Abe, Takao: *See—*  
Suzuki, Mitsuo; Itami, Yukio; Ikeda, Kunio; Kudo, Yuzuru; Abe, Takao; Takahashi, Yoshihiro; and Shibuya, Kiyoshi, 5,769,544, Cl. 384-115.000.
- Abe, Tomohiko: *See—*  
Ooah, Yoshihisa; Abe, Tomohiko; and Yasuda, Hiroshi, 5,770,862, Cl. 250-398.000.
- Abela, George S.; and Bowden, Russell W., to CorMedica. Percutaneous endomyocardial revascularization. 5,769,843, Cl. 606-10.000.
- Abelman, Matthew Mark; Ardecky, Robert John; and Nutt, Ruth Foelsche, to Corvas International, Inc. Methionine sulfone and S-substituted cysteine sulfone derivatives as enzyme inhibitors. 5,770,600, Cl. 514-237.200.
- Abilfida (Chiasso) S.A.: *See—*  
Gobbin, Belindia, 5,769,337, Cl. 241-36.000.
- Abitante, Peter J.: *See—*  
Dong, Nicholas N. G.; and Abitante, Peter J., 5,769,856, Cl. 606-96.000.
- ABL Boat Lifts: *See—*  
Parkins, David G.; and Meehan, John D., 5,769,568, Cl. 405-3.000.
- Abolitz, Sarah; and Koken, Michael Alan, to Silicon Graphics, Inc. Bulkhead gasket assembly. 5,770,822, Cl. 174-35.0GC.
- Abrahamson, Timothy A.; Young, Pauline R.; and Gisselberg, Margo L., to Quinton Instrument Company. Catheter tip retainer. 5,769,821, Cl. 604-104.000.
- Abrams, Frances L.; Hager, Joseph W.; and Hall, Richard B., to United States of America, Air Force. Carbon or graphite foam reinforced composites. 5,770,127, Cl. 264-29.100.
- Abrams, Richard S.; and Swartz, Conrad M., to Somatics, Inc. Medical magnetic non-convulsive stimulation therapy. 5,769,778, Cl. 600-14.000.
- Abromaitis, A. Thomas: *See—*  
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- Acer Advanced Labs, Inc.: *See—*  
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- Acetex Chimie: *See—*  
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- Achuff, Jonathan M. Convertible panel and shelter system. 5,769,106, Cl. 135-95.000.
- Ackley, E. Michael. Method for maximizing loading efficiency of pellet shaped articles. 5,768,996, Cl. 101-483.000.
- Acoff, Marcus La'Roi. Animal training and conditioning apparatus. 5,769,030, Cl. 119-712.000.
- Acosta, Alfredo: *See—*  
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- Actel Corporation: *See—*  
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- Acuson Corporation: *See—*  
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- Bruhne, John D., 5,770,552, Cl. 510-343.000.  
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- Naaseh-Shahry, Hosein: *See—*  
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- NABI: *See—*  
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- Nabisco Technology Company: *See—*  
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- Nadzan, Alex M.: *See—*  
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- Nagai, Kiyofumi: *See—*  
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- Nagai, Michio: *See—*  
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- Nagai, Shuzo: *See—*  
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- Nagai, Yutaka, to Mitsubishi Denki Kabushiki Kaisha. Method of making semiconductor laser with aluminum-free etch stopping layer. 5,770,471, Cl. 438-31.000.
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- Nagata, Atsushi: *See—*  
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- Kanai, Makoto; Nagata, Atsushi; and Sakane, Katsunobu, 5,769,450, Cl. 280-731.000.
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- Nagata, Toshihiro: *See—*  
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- Nagayama, Masatoshi: *See—*  
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- Naggert, Juergen: *See—*  
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- Naito, Kazuo: *See—*  
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- Nakagawa, Eiji: *See—*  
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- Nakajima, Yasuhisa, to Sony Corporation. Input switching control device and communication circuit. 5,770,896, Cl. 307-125.000.
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- Nakamatsu, Yasuhiro; Otsuka, Masao; Hatanaka, Fumio; and Tsunoda, Akihiro, to Mita Industrial Co., Ltd. Paper regulating mechanism and paper cassette. 5,769,409, Cl. 271-171.000.
- Nakamura, Akiko: *See—*  
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- Nakamura, Akira; and Morita, Takemi, to Takara Kosan Co., Ltd. Balloon decoration assembly and balloon units. 5,769,685, Cl. 446-221.000.
- Nakamura, Akiko; and Ushio, Yoshito, to Dow Coming Toray Silicone Co., Ltd. Fixing roll and silicone gel for use therein. 5,770,298, Cl. 428-195.000.
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- Nakamura, Hideo: *See—*  
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- Nakamura, Katsuhiko; and Koga, Nobuyuki, to Hisamitsu Pharmaceutical Co., Inc. Formulation for percutaneous administration for treating disturbance in micturition. 5,770,221, Cl. 424-449.000.
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- Nakamura, Norihiko; and Yanagihara, Hiromichi, to Toyota Jidosha Kabushiki Kaisha. Direct injection type compression ignition engine and method of use. 5,768,887, Cl. 60-274.000.
- Nakamura, Takeshi; and Kaneko, Takayuki, to Murata Manufacturing Co., Ltd. Piezoelectric vibrator and acceleration sensor using the same. 5,770,799, Cl. 73-514.340.
- Nakamura, Teruhisa, to Nisshin Steel Co., Ltd. Sealing apparatus for inlet/outlet of atmosphere heat treatment furnace. 5,769,629, Cl. 432-242.000.
- Nakane, Takayuki, to Mitsubishi Denki Kabushiki Kaisha. Convergence correcting device. 5,770,932, Cl. 313-412.000.
- Nakanishi, Juki Co., Ltd.: *See—*  
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- Nakanishi, Koji; Eldefrawi, Amira T.; Eldefrawi, Mohyee E.; and Usherwood, Peter N. R., to Trustees of Columbia University in the City of New York. The Butyryl-tyrosinyl spermine, analogs thereof and methods of preparing and using same. 5,770,625, Cl. 514-616.000.
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- Nakano, Minoru, to Pegasus Sewing Machine Mfg. Co., Ltd. Loop thread control method and device for a double chainstitch sewing machine. 5,769,018, Cl. 112-475.170.
- Nakao, Masayuki: *See—*  
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- Nakashiba, Yasutaka, to NEC Corporation. Solid-state imaging device having an unwanted charge drain section disposed adjacent to horizontal charge transfer section. 5,770,870, Cl. 257-230.000.
- Nakasugi, Mamoru, to Nikon Corporation. Charged particle beam projection apparatus. 5,770,863, Cl. 250-492.200.
- Nakata, Yoshihiro: *See—*  
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- Nakatsuka, Masakatsu: *See—*  
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- Nakaya, Yuichiro, to Hitachi, Ltd. Method and apparatus for transmitting and receiving data. 5,771,009, Cl. 341-50.000.
- Nakayama, Hiroshi; Ogushi, Koichiro; and Aimori, Tomio, to Nakayama Iron Works, Ltd. Method for operating an eccentric jaw crusher. 5,769,334, Cl. 241-27.000.
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- Nakayama, Nobuyuki, to Fuji Xerox Co., Ltd. Image formation system with toner scattering prevention. 5,771,432, Cl. 399-310.000.
- Nakayama, Takako: *See—*  
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- Nakazato, Shinichi, to Matsushita Electric Industrial Co., Ltd. Mounting apparatus of conductive balls and mounting method thereof. 5,768,775, Cl. 29-843.000.
- Nalagatla, Anil: *See—*  
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- Nalco/Exxon Energy Chemicals, L.P.: *See—*  
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- Nam, Kee-Soo: *See—*  
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- Namba, Takashi: *See—*  
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- Namngani, Abdulatif. Vehicle having two axially spaced relatively movable wheels. 5,769,441, Cl. 280-208.000.
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- Nankou, Takahiko; and Yamashita, Haruo, to Matsushita Electric Industrial Co., Ltd. Font conversion device. 5,771,048, Cl. 345-471.000.
- Nannini, Luciano; and Strazzari, Giulio, to Azionaria Costruzioni Machine Automatiche A.C.M.A. S.P.A. Equipment for packaging products internally of boxes. 5,768,854, Cl. 53-252.000.
- Nappa, Mario Joseph; and Williams, William Robert, to Du Pont de Nemours, E. I., and Company. Process for preparation of fluorinated hydrocarbons. 5,770,779, Cl. 570-166.000.
- Naraki, Akihiro; Mizuide, Fumiyu; and Tatsu, Haruyoshi, to Nippon Mektron, Limited. Process for regenerating cross-linked, vulcanized flourine rubber. 5,770,633, Cl. 521-43.000.
- Narasaki, Tetsuji: *See—*  
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- Nardi, Antonio; and Villa, Marco, to Zambon Group S.p.A. Process for the preparation of 5-amino-1,3-dioxanes. 5,770,773, Cl. 564-487.000.
- Nargessi, Ruhangiz Dokhi, to Chiron Diagnostics Corporation. Assays for functional nuclear receptors. 5,770,176, Cl. 424-1.490.
- Narita, Shoriki: *See—*  
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- Narukawa, Satoshi; Amazutsumi, Tooru; Fukuda, Hideki; and Yamauchi, Yasuhiro, to Sanyo Electric Co., Ltd. Prismatic battery. 5,770,332, Cl. 429-175.000.
- Näslund, Lars-Åke: *See—*  
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- Nastech Pharmaceutical Company, Inc.: *See—*  
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- National Instruments Corporation: *See—*  
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- National Rejectors, Inc., GmbH: *See—*  
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Gualandris, Fabio; and Maggis, Aldo, to SGS-Thomson Microelectronics S.r.l. Surface field effect transistor with depressed source and/or drain areas for ULSI integrated devices. RE. 35,827, Cl. 257-285,000.  
Lee, Ruojia, to Micron Technology, Inc. Anti-fuse circuit and method wherein the read operation and programming operation are reversed. RE. 35,828, Cl. 365-225,700.  
Maggis, Aldo: *See—*  
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Lee, Ruojia, RE. 35,828, Cl. 365-225,700.  
Sanderford, Hugh Britton, Jr., to Axonn Corporation. Binary phase shift keying modulation system and/or frequency multiplier. RE. 35,829, Cl. 375-200,000.  
SGS-Thomson Microelectronics S.r.l.: *See—*  
Gualandris, Fabio; and Maggis, Aldo, RE. 35,827, Cl. 257-285,000.  
Spiegel, Michael S., to Advatech Research & Development, Inc. Method and apparatus for applying magnetic fields to fluids. RE. 35,826, Cl. 210-695,000.

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- Agency of Industrial Science & Technology: *See—*  
Yamanaka, Kazushi, B1 503,010, Cl. 73-105,000.  
Balistreri, Anthony M.: *See—*  
Vogley, Wilbur C.; Balistreri, Anthony M.; Gutttag, Karl M.; Krueger, Steven D.; Le, Duy-Loan T.; Neal, Joseph H.; Poteet, Kenneth A.; Hartigan, Joseph P.; and Norwood, Roger D., B1 587,954, Cl. 365-221,000.  
Behar, Emmanuel: *See—*  
Sugier, André; Bourgmayeur, Paul; Behar, Emmanuel; and Freund, Edouard, B1 915,176, Cl. 166-371,000.  
Bestop, Inc.: *See—*  
Rippberger, Gary R., B1 757,854, Cl. 160-391,000.  
Bourgmayeur, Paul: *See—*  
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Bradford, Linwood E.; Flannagan, Patricia; and Caimi, Ronald J., to National Starch and Chemical Investment Holding Corporation. Use of 1,3-dioxacyclopentane as a solvent for polyester resins. B1 250,659, Cl. 528-494,000.  
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Flannagan, Patricia: *See—*  
Bradford, Linwood E.; Flannagan, Patricia; and Caimi, Ronald J., B1 250,659, Cl. 528-494,000.  
Freund, Edouard: *See—*  
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Hartigan, Joseph P.: *See—*  
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Vogley, Wilbur C.; Balistreri, Anthony M.; Gutttag, Karl M.; Krueger, Steven D.; Le, Duy-Loan T.; Neal, Joseph H.; Poteet, Kenneth A.; Hartigan, Joseph P.; and Norwood, Roger D., B1 587,954, Cl. 365-221,000.  
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Vogley, Wilbur C.; Balistreri, Anthony M.; Gutttag, Karl M.; Krueger, Steven D.; Le, Duy-Loan T.; Neal, Joseph H.; Poteet, Kenneth A.; Hartigan, Joseph P.; and Norwood, Roger D., to Texas Instruments Incorporated. Random access memory arranged for operating synchronously with a multiprocessor and a system including a data processor, a synchronous DRAM, a peripheral device, and a system clock. B1 587,954, Cl. 365-221,000.  
Yamanaka, Kazushi, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Directional atomic force microscope and method of observing a sample with the microscope. B1 503,010, Cl. 73-105,000.

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Avar, Eric P., to Nike, Inc. Portion of a shoe upper. 395,354, Cl. D2-972,000.  
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- Darby, Kamela J. Shield for panty. 395,508, Cl. D24-125.000.
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- Doxey, Andre, to Nike, Inc. Side portion of a shoe upper. 395,346, Cl. D2-972.000.
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673	5,769,083			CLASS 177	316.1	5,769,221	398	5,769,256	CLASS 235
700	5,769,084	417	5,769,079	1	5,770,823	364			375
706	5,769,085	517	5,769,080	CLASS 180	365	5,769,222	38	5,770,095	376
753	5,769,086	544	5,769,081	65.3	5,769,177	5,769,223	38	5,770,096	380
760	5,769,087	546	5,769,082	403	5,769,178	5,769,226	60	5,770,097	
774	5,769,088	555	5,769,083	414	5,769,179	5,769,227	67	5,770,098	382
858	5,769,089		CLASS 156	424	5,769,180	5,769,228	68	5,770,099	440
883	5,769,090	73.1	5,769,084	118	5,769,181	5,769,229	69	5,770,100	462
885	5,769,091	89	5,769,085	CLASS 182		5,769,230			577
898	5,769,092		5,769,086	522	5,769,182	5,769,231	22	5,770,827	492
	5,769,093		5,769,087	523	5,769,183	5,769,232	48	5,770,828	CLASS 236
70	5,769,095	94	5,769,088	CLASS 184	581	5,769,233			44 C
84.4	5,769,096	110.1	5,769,089	6.4	5,769,182	5,769,234			49.3
329	5,769,098	153	5,769,091	CLASS 187	714	5,769,235			5,769,314
		169.92	5,769,092	249	5,769,183	5,769,236	69.12	5,770,830	5,769,315
		244.13	5,769,094	267	5,769,184	5,769,237	109	5,770,832	
73.6	5,769,099	250	5,769,095	CLASS 188	46	5,770,040	121.67	5,770,833	2 B
271	5,769,100	272.4	5,769,096	18 A	5,769,185	5,770,041	130.5	5,770,834	CLASS 237
273	5,769,101	273.1	5,769,097	32	5,769,186	5,770,042	388	5,770,835	CLASS 239
322	5,769,102	343.1	5,769,098	76	5,769,187	5,770,043	481	5,770,836	1
329	5,769,103	385	5,769,099	645	5,770,044	5,770,044	623.7	5,770,837	10
		350	5,770,001	137	5,770,045	5,770,045	645	5,770,838	7.5
1	5,769,953	359	5,769,999	216 R	5,770,046	5,770,046	727	5,770,839	90
6	5,769,954	379.6	5,770,002	254 R	5,770,047	5,770,047	730	5,770,840	92
8	5,769,955	382	5,770,003	321.15	5,770,048	5,770,048			156
10	5,769,956	398	5,770,004	322.15	5,769,192	5,770,049			234
15	5,769,957	442.1	5,770,005	322.22	5,769,193				284.2
22.1	5,769,958	494	5,770,006	CLASS 190		5,769,194	1.5	5,769,257	320
22.11	5,769,960	540	5,770,007	18 A	5,769,194		203.1	5,769,258	337
22.17	5,769,959	579	5,770,008	CLASS 192			284	5,769,259	377
25.1	5,769,961	580.1	5,770,009	3.29	5,769,195	5,769,239	334	5,769,260	428.5
29	5,769,962			46	5,769,196	5,769,240	335	5,769,261	543.5
		107	5,769,142	53.31	5,769,198	5,769,241	426	5,769,262	585.4
69	5,769,104	168.1 R	5,769,140	213.21	5,769,199	5,769,242	522	5,769,263	690.1
90	5,769,105	330	5,769,144	CLASS 194			575	5,769,264	CLASS 241
95	5,769,106	371	5,769,145	86	5,769,200	5,769,243	691	5,769,265	5
		391	B1 757.854	CLASS 198			780	5,769,268	
				94	5,770,051	5,770,051			19
258	5,769,963	6	5,770,010	CLASS 199	86	5,770,052			24.18
262	5,769,964	65	5,770,011	CLASS 200	97	5,770,053	7	5,769,269	27
		72	5,770,012	136	5,770,054	5,770,054	34	5,769,270	36
1	5,769,107	323	5,770,013	136	5,770,056	5,770,056			5,769,337
2	5,769,108	395	5,770,014	154	5,770,057	5,770,057	1	5,769,271	69
764	5,769,109	397	5,770,015	162	5,770,058	5,770,058		5,769,272	175
269	5,769,110	443	5,770,016	167	5,770,059	5,770,059		5,769,273	207
312	5,769,111	475.1	5,770,017	170	5,770,060	5,770,060	95	5,769,274	266
316	5,769,112	396	5,770,018	198.2	5,770,061	5,770,061	136.25	5,769,275	5,769,341
454.6	5,769,113			712	5,769,206		148	5,769,276	CLASS 242
		CLASS 164					157	5,769,277	18
469	5,769,115	122.1	5,769,147	5 A	5,770,824	5,770,063	158	5,769,278	20
514	5,769,116	416	5,769,148	5 R	5,770,825	5,770,064	174	5,769,279	231
516.11	5,769,117	418	5,769,149	43.08	5,770,826	5,770,065	185.1	5,769,280	332.4
553	5,769,118	456	5,769,150	48 R	5,770,827	5,770,066		5,769,281	347
614.2	5,769,119	457	5,769,151	339	5,769,209	5,770,067	386.5	5,769,282	353
624.11	5,769,120	476	5,769,152	344	5,769,210	5,770,069	402.2	5,769,283	385.1
625.23	5,769,121	479	5,769,153	549	5,769,211	5,770,070	464.4	5,769,284	422.4
625.33	5,769,122					5,770,071	481.5	5,769,285	437.3
625.38	5,769,123	104.26	5,769,154	CLASS 165		5,770,072			521
625.47	5,769,124	109.1	5,769,155	25	5,770,017	5,770,073			563
844	5,769,125	145	5,769,156	CLASS 202		5,770,074	75	5,769,286	593.54
856	5,769,126	184	5,769,157	160	5,770,018	5,770,075	83	5,769,287	598.4
						5,770,076	84	5,769,288	615
						5,770,077	112	5,769,289	615.2

CLASS 244	347	5,770,881	208	5,769,441	147	5,770,898	CLASS 330	52	5,770,971	42	5,771,051			
36	5,769,358	417	5,770,883	281.1	5,769,442	149	5,770,972	149	5,770,972	86	5,771,052			
76 R	5,769,359	506	5,770,884	477	5,769,443	12	5,770,899	272	5,770,974	102	5,771,054			
118.6	5,769,360	530	5,770,885	600	5,769,444	49 R	5,770,900	286	5,770,970	134	5,771,055			
129.4	5,769,361	613	5,770,886	610	5,769,445	52	5,770,901	289	5,770,973	153	5,771,056			
197	5,769,362	633	5,770,887	623	5,769,446	44	5,770,903			215	5,771,057			
234	5,769,363	696	5,770,888	642	5,769,447	71	5,770,902			218	5,771,058			
CLASS 246	710	5,770,889	696	5,769,448	75 R	5,770,904	CLASS 331	1 A	5,770,976	239	5,771,060			
34 B	5,769,364	727	5,770,890	731	5,769,450	85	5,770,905	1 R	5,770,975	242	5,771,061			
CLASS 248	903	5,770,892	732	5,769,451	90	5,770,906	40	5,770,977	257	5,771,062				
49	5,769,365	735	5,769,452	735	5,769,452	775	5,770,907	57	5,770,978	260	5,771,063			
102	5,769,367	737	5,769,454	737	5,769,454	113	5,770,909	111	5,770,979					
1	5,769,369	775	5,769,455	775	5,769,455	214	5,770,911	116 FE	5,770,980	CLASS 348				
176.1	5,769,370	808	5,769,456	808	5,769,456	306	5,770,909			CLASS 333	10	5,771,064		
181.1	5,769,370	318	5,770,912	318	5,770,912	26	5,770,912			5,770,981	16	5,771,065		
188.2	5,769,371	1.21	5,770,913	1.21	5,770,913	32	5,770,913			5,770,982	59	5,771,066		
219.4	5,769,372	1.25	5,770,914	1.25	5,770,914	168	5,770,983			5,770,983	66	5,771,067		
220.41	5,769,373	1.27	5,770,912	1.27	5,770,912	339	5,770,915			5,770,984	92	5,771,068		
221.11	5,769,374	1.25	5,770,912	1.25	5,770,912	366	5,770,916			5,770,985	208	5,771,069		
231.1	5,769,375	1.37	5,770,919	1.37	5,770,919					5,770,986	241	5,771,070		
346.01	5,769,376	15	5,770,925	15	5,769,459	CLASS 312	204	5,770,987		5,770,987	335	5,771,071		
429	5,769,377	2.6	5,770,921	18	5,769,460	108	5,769,513			5,770,988	383	5,771,072		
442.2	5,769,378	2.7	5,770,922	29	5,769,461	108	5,769,514			5,770,989	390	5,771,073		
475.19	5,769,379	8	5,770,926	39	5,769,463	223.5	5,769,515			5,770,990	444	5,771,074		
562	5,769,380	39	5,770,927	49	5,769,464	333	5,769,516				512	5,771,075		
618	5,769,381	38	5,770,928	59	5,769,465	333	5,769,517			CLASS 336	33	5,771,076		
638	5,769,382	40.1	5,770,929	328	5,769,465	334.6	5,769,518			5,770,991	571	5,771,077		
682	5,769,383	40.5	5,770,930	332	5,769,466	351.1	5,769,519			84 R	678	5,771,078		
		69	5,770,931	370	5,769,467	408	5,769,520			CLASS 337	699	5,771,079		
CLASS 250	83	5,770,933			CLASS 290					5,770,992	731	5,771,080		
203.1	5,770,850	101	5,770,936		5,770,893	412	5,770,932			160	5,770,993	845.1	5,771,081	
208.1	5,770,851	109	5,770,937	53	5,770,893	495	5,770,935	CLASS 313	295	5,770,994				
208.2	5,770,852	117	5,770,938		CLASS 292	495	5,770,918	CLASS 338	118	5,770,995	39	5,771,082		
214 A	5,769,384	135	5,770,933		5,769,468	506	5,770,920			5,770,995	147	5,771,083		
214 LS	5,770,853	154	5,770,934	201	5,769,468	581	5,770,921				153	5,771,084		
216	5,770,854	230	5,770,939	241	5,769,469			CLASS 340	310.08	5,770,996	158	5,771,085		
	5,770,855	236	5,770,940	327	5,769,470					438	5,770,997			
234	5,770,856	331.12	5,770,942	337	5,769,472	111.21	5,770,922	CLASS 315	438	5,770,999	CLASS 351			
288	5,770,858	404	5,770,943	340	5,769,473	169.3	5,770,923			463	5,770,999	44	5,771,086	
287	5,770,859	504	5,770,944		CLASS 294	175	5,770,924			468	5,770,999	126	5,771,086	
288	5,770,860	621	5,770,945		5,769,474	225	5,770,925			501	5,771,000	136	5,771,087	
310	5,770,861			19.1	5,769,474	225	5,770,925			539	5,771,002	161	5,771,088	
398	5,770,862	252	5,770,946	82.2	5,769,475	362	5,770,926			568	5,771,003	169	5,771,089	
492.2	5,770,863			99.1	5,769,476	362	5,770,927			632	5,771,004			
559.19	5,770,864			138	5,769,477	463	5,770,929			634	5,771,005			
577	5,770,865				CLASS 296	408	5,770,930	CLASS 318	905	5,771,007	27	5,771,090		
CLASS 251	64.16	5,769,400	24.2	5,769,478						903	5,771,008			
7	5,769,385	64.26	5,769,401	39.2	5,769,479					905	5,771,008	CLASS 356		
37	5,769,386	140.11	5,769,399	65.1	5,769,480	254	5,770,933	CLASS 318	50	5,771,009	4.01	5,771,091		
61.4	5,769,387	140.14	5,769,402	97.22	5,769,481	469	5,770,934			51	5,771,010	147	5,771,092	
118	5,769,388			100	5,769,482	480	5,770,935			51	5,771,010	326	5,771,093	
129.06	5,769,389	1.02	5,769,403	107	5,769,483	538	5,770,936			118	5,771,011	345	5,771,095	
129.11	5,769,390	37	5,769,404	151	5,769,484	560	5,770,929				346	5,771,096		
129.21	5,769,391	52.16	5,769,405	171	5,769,485	685	5,770,937				353	5,771,097		
221	5,769,392	58.08	5,769,406	210	5,769,486			CLASS 320	4	5,771,013	363	5,771,098		
CLASS 252	3.03	5,769,407	199	5,769,488						140	5,771,014	375	5,771,099	
62.57	5,770,101	10.03	5,769,408	216.14	5,769,489	148	5,770,938	CLASS 322	372	5,771,016	378	5,771,100		
70	5,770,102				5,769,490					359	5,771,015			
79.1	5,770,103			284.4	5,769,491	28	5,770,939	CLASS 323	374	5,771,017				
174.12	5,770,104	122	5,769,411	314	5,769,492					419	5,771,018	405	5,771,101	
182.27	5,770,106	171	5,769,409	362.12	5,769,493					442	5,771,019	437	5,771,103	
186.25	5,770,105	218	5,769,413	367	5,769,494	282	5,770,940	CLASS 324	460	5,771,020	457	5,771,104		
299.03	5,769,393			411.32	5,769,495						460	5,771,105		
299.6	5,770,107				5,769,496						461	5,771,106		
299.61	5,770,108			411.36	5,769,497						464	5,771,107		
299.65	5,770,109	81 R	5,769,414	440.1	5,769,498	207.21	5,770,941	CLASS 342	700 MS	5,771,021	500	5,771,108		
301.36	5,770,110	108 R	5,769,415	452.18	5,769,499	207.16	5,770,942			702	5,771,022			
301.4 R	5,770,111	121 B	5,769,416	463.2	5,769,500	222	5,770,943				507	5,771,109		
	5,770,112	148 R	5,769,417		5,769,501	229	5,770,944			725	5,771,023			
519.51	5,770,113	157 A	5,769,418		5,769,502	229	5,770,945			828	5,771,025	CLASS 359		
583	5,770,114	247	5,769,419		5,769,503	329	5,770,946			858	5,771,026	125	5,771,111	
586	5,770,115	249	5,769,420	23 R	5,769,501	350	5,770,945			912	5,771,027	128	5,771,112	
700	5,770,116	272	5,769,421	175	5,769,502	752	5,770,946				154	5,771,113		
CLASS 254	274	5,769,422			CLASS 299	765	5,770,947	CLASS 345	3	5,771,028	171	5,771,114		
93 R	5,769,394	352	5,769,424	1.2	5,769,503					10	5,771,029	208	5,771,115	
129	5,769,395	452	5,769,426	11	5,769,504	30	5,770,950	CLASS 326	87	5,771,030	296	5,771,116		
131	5,769,396			102	5,769,505	38	5,770,951			127	5,771,032	326	5,771,117	
134	5,769,397				CLASS 300					132	5,771,033	359	5,771,118	
352	5,769,398	3	5,769,427		5,769,506			CLASS 327	141	5,771,034	422	5,771,119		
CLASS 257	549	5,769,428	2	5,769,507						143	5,771,035	463	5,771,120	
25	5,770,866	549	5,769,429		CLASS 301	63	5,770,952			143	5,771,036	484	5,771,121	
72	5,771,110	592	5,769,430	43	5,769,507	93	5,770,953			146	5,771,037	491	5,771,122	
81	5,770,868				CLASS 303	103	5,770,954			157	5,771,038	527	5,771,123	
190	5,770,869	2.08	5,769,487		5,769,508	109	5,770,955			163	5,771,039	727	5,771,125	
230	5,770,870			116.4	5,769,509	114	5,770,956			178	5,771,040			
237	5,770,871				5,769,510	284	5,770,957			213	5,771,041			
252.971	5,770,872	1.5	5,769,431	188	5,769,511	342	5,770,958			326	5,771,042	49	5,771,126	
280	5,770,873	11.18	5,769,432		5,769,512	342	5,770,959			419	5,771,043	51	5,771,127	
280.873	5,770,874	11.2	5,769,433		5,769,513	306	5,770,960			420	5,771,044	73.12	5,771,129	
285	RE 35.827		5,769,434	51	5,769,514	309	5,770,961			423	5,771,045	75	5,771,130	
296	5,770,874	33.991	5,769,435	199	5,769,512	328	5,770,962			427	5,771,046	77.08	5,771,131	
	5,770,875	47.17	5,769,436		5,769,513	349	5,770,963			443	5,771,047	77.13	5,771,132	
301	5,770,876	47.27	5,769,437		5,769,514	399	5,770,964			471	5,771,048	103	5,771,133	
315	5,770,877	87.041	5,769,438	32	5,769,515			CLASS 347	14	5,771,049				
330	5													



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109	5,771,138	CLASS 368	557	5,771,374	CLASS 406	CLASS 424			
113	5,771,139	10	5,771,207	558	5,771,375	137	5,770,176		
121	5,771,141	281	5,771,209	561	5,771,376	153	5,770,177		
133	5,771,142	CLASS 369	23	5,771,289	566	5,770,572	1.69	5,770,178	
137	5,771,143	25	5,771,291	605	5,771,377	171	5,770,179		
	5,771,144	13	5,771,292	612	5,771,378	CLASS 408	1.81	5,770,180	
		33	5,771,211	615	5,771,379	CLASS 408	9.37	5,770,181	
93	5,771,145	37	5,771,212	653	5,771,380	I R	49	5,770,182	
111	5,771,146	44.29	5,771,213	670	5,771,381	17	5,770,183	59	5,770,184
166	5,771,147	59	5,771,214	680	5,771,382	83.5	5,770,185	61	5,770,186
232	5,771,148	77.2	5,771,215	683	5,771,383	231	5,770,187	65	5,770,188
281	5,771,149	112	5,771,216	704	5,771,384	CLASS 409	5,770,574	5,770,189	5,770,190
306.1	5,771,150	116	5,771,217	706	5,771,385	82	5,770,575	5,770,191	5,770,192
321.4	5,771,151	232	5,771,218	710	5,771,386	203	5,770,576	5,770,193	5,770,194
626	5,771,152	232	5,771,219	733	5,771,387	151	5,770,577	5,770,195	5,770,196
681	5,771,153	232	5,771,220	735	5,771,388	CLASS 410	5,770,580	5,770,197	5,770,198
697	5,771,154	203	5,771,221	750.01	5,771,389	151	5,770,581	5,770,199	5,770,200
704	5,771,155	206	5,771,222	800.01	5,771,390	CLASS 411	5,771,390	5,770,201	5,770,202
710	5,771,156	217	5,771,223	800.06	5,771,391	10	5,770,582	5,770,203	5,770,204
737	5,771,157	217	5,771,224	821	5,771,392	389	5,770,583	5,770,205	5,770,206
760	5,771,158	232	5,771,225	827	5,771,393	427	5,770,584	5,770,207	5,770,208
777		252	5,771,226	836	5,771,394	CLASS 414	5,770,585	5,770,209	5,770,210
		342	5,771,227	840	5,771,395	23	5,770,586	5,770,211	5,770,212
		377	5,771,228	855	5,771,396	24.5	5,770,587	5,770,213	5,770,214
27	5,769,521	384	5,771,229	858	5,771,397	217	5,770,588	5,770,215	5,770,216
31	5,769,522	395	5,771,230	892	5,771,398	268	5,770,589	5,770,217	5,770,218
32	5,769,523	396	5,771,231	5	5,771,400	321	5,770,590	5,770,219	5,770,220
61	5,769,524	446	5,771,232	51	5,771,401	391	5,770,591	5,770,221	5,770,222
66	5,769,525	458	5,771,233	52	5,771,402	408	5,770,592	5,770,223	5,770,224
85	5,769,526	463	5,771,234	55	5,771,403	537	5,770,593	5,770,225	5,770,226
85	5,769,527	474	5,771,235	65	5,771,404	543	5,770,594	5,770,227	5,770,228
96	5,769,528		5,771,236	79	5,771,405	661	5,770,595	5,770,229	5,770,230
133	5,769,529		5,771,237	96	5,771,406	723	5,770,596	5,770,231	5,770,232
216	5,769,530	22.1	5,771,238	106	5,771,407	746.92	5,770,597	5,770,233	5,770,234
233	5,769,531	22.5	5,771,239	114	5,771,408	786	5,770,598	5,770,235	5,770,236
237	5,769,532	27.1	5,771,240	135	5,771,409	791.6	5,770,599	5,770,237	5,770,238
240	5,769,533	37.01	5,771,241	135	5,771,410	794.3	5,770,600	5,770,239	5,770,240
367	5,769,534	39.1	5,771,242	15	5,769,543	799	5,770,601	5,770,241	5,770,242
396	5,769,535	40.1	5,771,243	115	5,769,544	96	5,771,411	5,770,243	5,770,244
		40.11	5,771,244	118	5,769,545	97	5,771,412	5,770,245	5,770,246
17	5,771,159	47.1	5,771,245	273	5,769,546	114	5,771,413	5,770,247	5,770,248
20	5,771,160		5,771,246	16	5,771,320	312	5,771,414	5,770,249	5,770,250
40	5,771,161		5,771,247	31	5,771,321	315	5,771,415	5,770,251	5,770,252
56	5,771,162		5,771,248	35	5,771,322	378	5,771,416	5,770,253	5,770,254
71	5,771,163	6	5,771,249	43	5,771,323	578	5,771,417	5,770,255	5,770,256
89	5,771,164	20	5,771,250	89	5,771,324	626	5,771,418	5,770,257	5,770,258
97	5,771,165	31	5,771,251	123	5,771,325	2	5,771,419	5,770,259	5,770,260
132	5,771,166	45	5,771,252	139	5,771,326	25	5,771,420	5,770,261	5,770,262
143	5,771,168	50	5,771,253	146	5,771,327	31	5,771,421	5,770,263	5,770,264
		57	5,771,254	46	5,771,328	40	5,771,422	5,770,265	5,770,266
140	5,771,167	87	5,771,255	52	5,771,329	55	5,771,423	5,770,267	5,770,268
420	5,771,169	109	5,771,256	56	5,771,330	71	5,771,424	5,770,269	5,770,270
421	5,771,170		5,771,257	68	5,771,331	111	5,771,425	5,770,271	5,770,272
424.08	5,771,171		5,771,258	69	5,771,332	119	5,771,426	5,770,273	5,770,274
468.13	5,771,172		5,771,259	68	5,771,333	120	5,771,427	5,770,275	5,770,276
470.02	5,771,173	16	5,769,539	85	5,771,334	124	5,771,428	5,770,277	5,770,278
471.03	5,771,174	45	5,771,261	95	5,771,335	260	5,771,429	5,770,279	5,770,280
505	5,771,176	127	5,771,262	111	5,771,336	307	5,771,430	5,770,281	5,770,282
506	5,771,177	141	5,771,263	310	5,771,337	310	5,771,431	5,770,283	5,770,284
510	5,771,178	179	5,771,264	321	5,771,338	369	5,771,432	5,770,285	5,770,286
557	5,771,180		5,771,265	CLASS 372	5,771,339	400	5,771,433	5,770,287	5,770,288
578	5,771,181		5,771,266	16	5,771,340	120.01	5,769,547	5,770,289	5,770,290
715.02	5,771,182		5,771,267	27	5,771,341	208	5,769,548	5,770,291	5,770,292
715.04	5,771,183	200	5,771,268	109	5,771,342	279	5,769,549	5,770,293	5,770,294
746.1	5,771,184	257	5,771,269	112	5,771,343	308	5,769,550	5,770,295	5,770,296
750.5	5,771,185	261	5,771,270	114	5,771,344	489	5,769,551	5,770,297	5,770,298
754.01	5,771,186	340	5,771,271	139	5,771,345	CLASS 401	5,769,552	5,770,299	5,770,300
		376	5,771,272	182.05	5,771,346	46	5,769,553	5,770,301	5,770,302
			5,771,273	183.18	5,771,347	66	5,769,554	5,770,303	5,770,304
149	5,771,187		5,771,274	186	5,771,348	73	5,770,152	5,770,305	5,770,306
	5,771,188	272	5,771,275	195	5,771,349	80	5,770,153	5,770,307	5,770,308
	5,771,189	287	5,771,276	188.01	5,771,350	82.05	5,770,154	5,770,309	5,770,310
154	5,771,190		5,771,277	200.57	5,771,351	91	5,770,155	5,770,311	5,770,312
168	5,771,191		5,771,278	5	5,771,352	99	5,770,156	5,770,313	5,770,314
185.09	5,771,192	16	5,771,279	200.59	5,771,353	100	5,770,157	5,770,315	5,770,316
185.17	5,771,193	77	5,771,280	200.62	5,771,354	162	5,769,555	5,770,317	5,770,318
200	5,771,194		5,771,281	200.63	5,771,355	229	5,769,556	5,770,319	5,770,320
	5,771,195		5,771,282	200.77	5,771,356	322	5,769,557	5,770,321	5,770,322
207	5,771,196	5	5,771,283	200.8	5,771,357	325	5,769,558	5,770,323	5,770,324
210	5,771,197	65	5,771,284	308	5,771,358	393	5,769,559	5,770,325	5,770,326
221	5,771,198	96	5,771,285	311	5,771,359	CLASS 403	5,769,560	5,770,327	5,770,328
225.7	5,771,199	207	5,771,286	312	5,771,360	13	5,769,561	5,770,329	5,770,330
229	5,771,200		5,771,287	313	5,771,361	14	5,769,562	5,770,331	5,770,332
230.03	5,771,201	26	5,771,288	314	5,771,362	7	5,769,563	5,770,333	5,770,334
		67	5,771,289	315	5,771,363	25	5,769,564	5,770,335	5,770,336
233		88	5,771,290	316	5,771,364	75	5,769,565	5,770,337	5,770,338
		93.05	5,771,291	317	5,771,365	CLASS 404	5,769,566	5,770,339	5,770,340
136	5,769,536		5,771,292	318	5,771,366	172	5,769,567	5,770,341	5,770,342
163.1	5,769,537		5,771,293	319	5,771,367	186.16		5,770,343	5,770,344
198	5,769,538	93.17	5,771,294	320	5,771,368	297		5,770,345	5,770,346
		93.23	5,771,295	321	5,771,369	CLASS 405		5,770,347	5,770,348
			5,771,296	322	5,771,370	26	5,770,170	5,770,349	5,770,350
20	5,771,202		5,771,297	323	5,771,371	171	5,770,171	5,770,351	5,770,352
46	5,771,203	121	5,771,298	324	5,771,372	352	5,770,172	5,770,353	5,770,354
97	5,771,204	142	5,771,299	325	5,771,373	352	5,770,173	5,770,355	5,770,356
107	5,771,205	377	5,771,300	326	5,771,374	352	5,770,174	5,770,357	5,770,358
118	5,771,206	387	5,771,301	327	5,771,375	352	5,770,175	5,770,359	5,770,360

CLASS 428			CLASS 434			CLASS 436			CLASS 440			CLASS 443			CLASS 463			CLASS 505		
35.7	5,770.283	159	5,769.639	13	5,770.451	752	5,769.669		5,769.670	3	5,769.713	210	5,770.546				5,770.547			
36.1	5,770.284	262	5,769.640	86	5,770.452	851	5,769.671		5,769.672	3	5,769.714	501	5,770.548				5,770.549			
36.8	5,770.285	272	5,769.641	149	5,770.453	852	5,769.672		5,769.673	20	5,769.715		CLASS 510				5,770.550			
36.8	5,770.286	317	5,769.642	164	5,770.454		5,769.673			31	5,769.716						5,770.551			
36.91	5,770.276	350	5,769.643	510	5,770.455					20	5,769.718	181	5,770.548				5,770.548			
40.1	5,770.287			518	5,770.455					37	5,769.719	238	5,770.549				5,770.549			
	5,770.288				5,770.456	38	5,769.674			42	5,770.533		5,770.550				5,770.550			
	5,770.289				5,770.457	83	5,769.675						5,770.551				5,770.551			
43	5,770.290				5,770.458								5,770.552				5,770.552			
43	5,770.291	4	5,770.355	526	5,770.459								5,770.553				5,770.553			
57	5,770.292	5	5,770.356		5,770.461	13	5,769.676			68	5,769.722	426	5,770.554				5,770.554			
64.1	5,770.293	6	5,770.358	527	5,770.462	24	5,769.677			128	5,769.720	435	5,770.555				5,770.555			
	5,770.294		5,770.359							131	5,769.723	447	5,770.556				5,770.556			
68	5,770.295		5,770.360		CLASS 437	59	5,770.528						5,770.557				5,770.557			
80	5,770.296		5,770.361	2	5,770.463	268	5,770.529						5,770.558				5,770.558			
89	5,770.297		5,770.362	44	5,770.464	319	5,770.530						5,770.559				5,770.559			
195	5,770.298		5,770.363	67	5,770.465	361	5,770.531						5,770.560				5,770.560			
	5,770.299		5,770.364	89	5,770.466	408	5,770.532						5,770.561				5,770.561			
209	5,770.299		5,770.366	187	5,770.467								5,770.562				5,770.562			
213	5,770.301		5,770.367	210	5,770.468								5,770.563				5,770.563			
323	5,770.302		5,770.368	240	5,770.469								5,770.564				5,770.564			
326	5,770.303		5,770.369		CLASS 438	25	5,769.678						5,770.565				5,770.565			
334	5,770.304		5,770.370			50	5,769.679						5,770.566				5,770.566			
	5,770.305		5,770.371	2	5,770.470								5,770.567				5,770.567			
	5,770.306		5,770.372	24	5,770.472								5,770.568				5,770.568			
373	5,770.307		5,770.373	26	5,770.473	75	5,769.680						5,770.569				5,770.569			
375	5,770.308		5,770.374	31	5,770.471	120	5,769.681						5,770.570				5,770.570			
398	5,770.309		5,770.375	43	5,770.472	184	5,769.682						5,770.571				5,770.571			
403	5,770.310	7.1	5,770.376	106	5,770.473	219	5,769.683						5,770.572				5,770.572			
411.1	5,770.312		5,770.378	108	5,770.477	221	5,769.685						5,770.573				5,770.573			
	5,770.313		5,770.379	122	5,770.478	250	5,769.686						5,770.574				5,770.574			
412	5,770.314		5,770.380	123	5,770.479	343	5,769.687						5,770.575				5,770.575			
446	5,770.315		5,770.381		5,770.480								5,770.576				5,770.576			
451	5,770.316		5,770.382	129	5,770.481	57	5,769.688						5,770.577				5,770.577			
500	5,770.318	7.23	5,770.386	152	5,770.482								5,770.578				5,770.578			
508	5,770.319	7.24	5,770.387	155	5,770.484								5,770.579				5,770.579			
571	5,770.320	7.25	5,770.388	162	5,770.485	41	5,769.689						5,770.580				5,770.580			
622	5,770.321	7.8	5,770.384	163	5,770.486								5,770.581				5,770.581			
627	5,770.322		5,770.385	164	5,770.487								5,770.582				5,770.582			
643	5,770.323	7.92	5,770.389	167	5,770.489	95	5,769.693						5,770.583				5,770.583			
688	5,770.324	7.95	5,770.390	199	5,770.490	269	5,769.694						5,770.584				5,770.584			
914	5,770.325		5,770.391		5,770.491	287	5,769.696						5,770.585				5,770.585			
		15	5,770.392		5,770.492	288	5,769.697						5,770.586				5,770.586			
		31	5,770.393		5,770.493	290	5,769.698						5,770.587				5,770.587			
30	5,770.326	34	5,770.394	238	5,770.495	386	5,769.699						5,770.588				5,770.588			
32	5,770.327		5,770.395		5,770.496	528	5,769.700						5,770.589				5,770.589			
506	5,770.328	69.1	5,770.396		5,770.497								5,770.590				5,770.590			
112	5,770.329		5,770.397	239	5,770.498								5,770.591				5,770.591			
123	5,770.330		5,770.398	253	5,770.499								5,770.592				5,770.592			
162	5,770.331		5,770.400	255	5,770.500	73	5,769.701						5,770.593				5,770.593			
175	5,770.332	69.2	5,770.401	264	5,770.501								5,770.594				5,770.594			
194	5,770.333	69.5	5,770.402	268	5,770.502								5,770.595				5,770.595			
211	5,770.334	69.6	5,770.403	296	5,770.503	50	5,769.703						5,770.596				5,770.596			
		70.1	5,770.404	296	5,770.504	63	5,769.702						5,770.597				5,770.597			
		74	5,770.405	298	5,770.505	118	5,769.704						5,770.598				5,770.598			
5	5,770.335		5,770.406	303	5,770.506	184	5,769.705						5,770.599				5,770.599			
	5,770.336	89	5,770.407	305	5,770.507	195	5,769.706						5,770.600				5,770.600			
22	5,770.337	91.2	5,770.408		5,770.508	233	5,769.707						5,770.601				5,770.601			
50	5,770.338	115	5,770.409	381	5,770.509	306	5,769.708						5,770.602				5,770.602			
59	5,770.339	136	5,770.410	396	5,770.510	318	5,769.709						5,770.603				5,770.603			
80	5,770.340	148	5,770.411	406	5,770.511	324	5,769.710						5,770.604				5,770.604			
110	5,770.341	172.1	5,770.412	520	5,770.512								5,770.605				5,770.605			
111	5,770.342		5,770.413	587	5,770.513								5,770.606				5,770.606			
170	5,770.343	172.3	5,770.414	589	5,770.514	5.1	5,771.435						5,770.607				5,770.607			
232	5,770.344		5,770.415	592	5,770.515	41.1	5,771.436						5,770.608				5,770.608			
262	5,770.345	176	5,770.416	627	5,770.517	41.38	5,771.438						5,770.609				5,770.609			
270.1	5,770.346	180	5,770.417	631	5,770.518	63	5,771.439						5,770.610				5,770.610			
	5,770.347	189	5,770.418	639	5,770.519								5,770.611				5,770.611			
280.1	5,770.348		5,770.419	653	5,770.520	66	5,771.441						5,770.612				5,770.612			
321	5,770.349	193	5,770.420	625	5,770.521	90	5,771.442						5,770.613				5,770.613			
	5,770.349	194	5,770.421	72	5,770.522	93	5,771.443						5,770.614				5,770.614			
325	5,770.350		5,770.422	725	5,770.523	115	5,771.444						5,770.615				5,770.615			
438	5,770.351	197	5,770.423	745	5,770.525	127	5,771.445						5,770.616				5,770.616			
501	5,770.352	200	5,770.424		CLASS 439	351	5,771.446						5,770.617				5,770.617			
506	5,770.353	226	5,770.425			410	5,771.447						5,770.618				5,770.618			
546	5,770.352		5,770.426	61	5,769.644	411	5,771.448						5,770.619				5,770.619			
		235.1	5,770.427	79	5,769.645	422	5,771.449						5,770.620				5,770.620			
			5,770.428	136	5,769.646	445	5,771.451						5,770.621				5,770.621			
2	5,769.621	240.2	5,770.429	144	5,769.647	445	5,771.452						5,770.622				5,770.622			
8	5,769.622		5,770.430	164	5,769.649	449	5,771.453						5,770.623				5,770.623			
125	5,769.623	252.3	5,770.431	189	5,769.650	452	5,771.454													

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CLASSIFICATION OF PATENTS

116	5,770,638	CLASS 530	191	5,770,735	CLASS 568	64	5,769,808	5,769,866				
132	5,770,639	300	5,770,686	5,770,735	317	5,770,774	65	5,769,810	194	5,769,868		
210	5,770,640	311	5,770,687	268.1	5,770,736	450	5,770,775	CLASS 604	200	5,769,870		
342	5,770,641	324	5,770,688	285	5,770,737	862	5,770,776	4	5,769,811	198	5,769,871	
404	5,770,642		5,770,689	CLASS 548	868	5,770,777		5,769,812	CLASS 607			
429	5,770,706		5,770,690	5,770,778	872			5,769,813	5	5,769,872		
		328	5,770,691	267.8	5,770,741	CLASS 570	11	5,769,813	29	5,769,873		
		333	5,770,692	335.69	5,770,739		80	5,769,815	36	5,769,874		
91	5,770,643		5,770,693	341.5	5,770,740		96	5,769,814	48	5,769,875		
120	5,770,644	350	5,770,694	466	5,770,742	248	5,770,780	5,769,816	60	5,769,876		
419	5,770,645		5,770,695	526	5,770,743			5,769,817	68	5,769,877		
504	5,770,646		5,770,696	CLASS 549	253	5,770,781	103	5,769,818	61	5,769,877		
507	5,770,647	353	5,770,697	233	5,770,744	467	5,770,782	5,769,819	88	5,769,878		
533	5,770,648	379	5,770,698	510	5,770,745	738	5,770,783	104	5,769,820	101	5,769,879	
590	5,770,650	381	5,770,699	534	5,770,746			110	5,769,821	123	5,769,881	
591	5,770,651	383	5,770,700	540	5,770,747	2	5,771,472	143	5,769,823	CLASS 623		
		388.8	5,770,701	CLASS 552		18	5,771,473	191	5,769,825	1	5,769,882	
65	5,770,652	395	5,770,703	531	5,770,748	209	5,770,784	195	5,769,826	5	5,769,883	
168	5,770,653	402	5,770,704	545	5,770,749	252	5,769,777	262	5,769,827	5,769,884		
179	5,770,654	421	5,770,705	CLASS 554		900	5,770,785	280	5,769,828	5,769,885		
310	5,770,655			49	5,770,751	CLASS 600		282	5,769,829	5,769,887		
326.4	5,770,656	581	5,770,708	223	5,770,750	1	5,769,779	332	5,769,830	6	5,769,889	
407	5,770,657	633	5,770,709	CLASS 556		14	5,769,778	359	5,769,832	10	5,769,890	
423	5,770,658	641	5,770,707	11	5,770,752	36	5,769,780	385.1	5,769,833	11	5,769,892	
438	5,770,659			226	5,770,753	202	5,769,781	390	5,769,834	13	5,769,893	
452	5,770,661	CLASS 536		43	5,770,756	414	5,769,782	396	5,769,835	16	5,769,894	
530	5,770,662		18.5	5,770,710	427	5,770,755	300	5,769,783	398	5,769,895		
		CLASS 526	18.6	5,770,711	43	5,770,756	364	5,769,784	408	5,769,896		
66	5,770,660		20	5,770,712	427	5,770,754	372	5,769,785		5,769,897		
127	5,770,663		22.1	5,770,713	CLASS 558		407	5,769,786		5,769,898		
	5,770,664		23.1	5,770,714	43	5,770,756	414	5,769,787		5,769,899		
131	5,770,665			5,770,715	43	5,770,756	414	5,769,788	CLASS 606	CLASS 701		
213	5,770,666			5,770,716	300	5,770,757	439	5,769,789	1	5,769,841	22	5,771,475
233	5,770,667		23.2	5,770,717	422	5,770,758	473	5,769,791	3	5,769,840		5,771,476
273	5,770,668			5,770,718	477		479	5,769,792	10	5,769,843	29	5,771,477
279	5,770,669		24.1	5,770,719	CLASS 560		515	5,769,793	16	5,769,844	51	5,771,478
328	5,770,670		24.5	5,770,720	53	5,770,759	562	5,769,794	41	5,769,846	29	5,771,477
		25.3	5,770,721	221	5,770,760	567	5,769,795	42	5,769,847	68	5,771,478	
		CLASS 528	5,770,722	231	5,770,761	585	5,769,796	46	5,769,848	80	5,771,479	
56	5,770,671		25.4	5,770,723	358	5,770,762	CLASS 601	48	5,769,849	88	5,771,480	
58	5,770,672		26.7	5,770,725	412	5,770,763	53	5,769,850	93	5,771,481		
61	5,770,673		69	5,770,726	CLASS 562		57	5,769,851	101	5,771,482		
73	5,770,674				112	5,770,764	115	5,769,797	110	5,771,483		
170	5,770,675	CLASS 540			115	5,770,765	115	5,769,798	117	5,771,484		
188	5,770,676		145	5,770,727	414	5,770,766	151	5,769,799	119	5,771,485		
227	5,770,677			5,770,728	467	5,770,767	152	5,769,800				
233	5,770,678			5,770,729	506	5,770,768	160	5,769,801				
310	5,770,679		353	5,770,730	519	5,770,769		5,769,802				
	5,770,680		472	5,770,731	608	5,770,770	CLASS 602	108	5,769,803	200	5,771,486	
		509					119	5,769,804	130	5,769,861		
322	5,770,681						128	5,769,805	140	5,769,862		
354	5,770,682						138	5,769,806	150	5,769,863		
361	5,770,683						143	5,769,807	160	5,769,864		
392	5,770,684		141	5,770,732	14	5,770,771	21	5,769,808	170	5,769,865		
422	5,770,685		181	5,770,733	218	5,770,772	32	5,769,809	180	5,769,866		
494	B1 250,659	363	5,770,734	487	5,770,773	252	5,769,808	167	5,769,867	250	5,770,787	



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PATENTS

01 :	5,768,736	5,769,079	5,769,748	5,770,104	5,770,518	5,770,950
	5,769,310	5,769,086	5,769,756	5,770,117	5,770,519	5,770,951
	5,769,593	5,769,092	5,769,768	5,770,122	5,770,520	5,770,968
	5,770,702	5,769,111	5,769,779	5,770,125	5,770,561	5,770,972
	5,770,769	5,769,140	5,769,780	5,770,149	5,770,564	5,770,987
	5,771,016	5,769,191	5,769,782	5,770,151	5,770,565	5,770,992
	5,771,236	5,769,221	5,769,785	5,770,152	5,770,567	5,771,002
02 :	5,768,891	5,769,223	5,769,791	5,770,157	5,770,573	5,771,019
	5,768,928	5,769,228	5,769,792	5,770,160	5,770,577	5,771,027
	5,769,955	5,769,230	5,769,796	5,770,164	5,770,600	5,771,037
04 :	5,768,749	5,769,237	5,769,805	5,770,165	5,770,613	5,771,039
	5,768,818	5,769,285	5,769,812	5,770,175	5,770,620	5,771,041
	5,768,885	5,769,288	5,769,819	5,770,176	5,770,627	5,771,067
	5,768,923	5,769,291	5,769,820	5,770,181	5,770,689	5,771,088
	5,769,080	5,769,295	5,769,839	5,770,196	5,770,690	5,771,093
	5,769,419	5,769,297	5,769,846	5,770,203	5,770,694	5,771,094
	5,769,686	5,769,318	5,769,847	5,770,207	5,770,695	5,771,109
	5,769,691	5,769,359	5,769,850	5,770,219	5,770,697	5,771,114
	5,769,808	5,769,364	5,769,863	5,770,227	5,770,699	5,771,117
	5,769,879	5,769,369	5,769,865	5,770,259	5,770,704	5,771,124
	5,769,941	5,769,370	5,769,866	5,770,267	5,770,705	5,771,129
	5,770,168	5,769,371	5,769,868	5,770,269	5,770,706	5,771,130
	5,770,222	5,769,384	5,769,870	5,770,273	5,770,714	5,771,131
	5,770,849	5,769,407	5,769,873	5,770,331	5,770,716	5,771,135
	5,770,886	5,769,418	5,769,876	5,770,356	5,770,719	5,771,138
	5,770,920	5,769,424	5,769,880	5,770,357	5,770,722	5,771,139
	5,770,965	5,769,426	5,769,882	5,770,358	5,770,723	5,771,176
	5,771,367	5,769,472	5,769,885	5,770,368	5,770,781	5,771,180
	5,771,391	5,769,500	5,769,887	5,770,369	5,770,784	5,771,183
05 :	5,768,852	5,769,516	5,769,890	5,770,371	5,770,809	5,771,184
06 :	5,768,702	5,769,551	5,769,901	5,770,387	5,770,810	5,771,187
	5,768,703	5,769,569	5,769,908	5,770,817	5,770,817	5,771,235
	5,768,724	5,769,588	5,769,917	5,770,407	5,770,819	5,771,237
	5,768,726	5,769,594	5,769,926	5,770,414	5,770,822	5,771,239
	5,768,768	5,769,600	5,769,927	5,770,418	5,770,846	5,771,244
	5,768,776	5,769,602	5,769,943	5,770,419	5,770,857	5,771,245
	5,768,830	5,769,610	5,769,951	5,770,422	5,770,871	5,771,252
	5,768,841	5,769,634	5,769,972	5,770,425	5,770,885	5,771,253
	5,768,842	5,769,638	5,769,973	5,770,429	5,770,889	5,771,254
	5,768,853	5,769,669	5,769,984	5,770,430	5,770,890	5,771,258
	5,768,920	5,769,671	5,770,009	5,770,431	5,770,898	5,771,264
	5,768,936	5,769,674	5,770,029	5,770,434	5,770,909	5,771,265
	5,768,953	5,769,692	5,770,032	5,770,443	5,770,911	5,771,267
	5,768,956	5,769,696	5,770,059	5,770,455	5,770,923	5,771,278
	5,768,960	5,769,725	5,770,065	5,770,456	5,770,928	5,771,292
	5,769,005	5,769,726	5,770,070	5,770,460	5,770,933	5,771,301
	5,769,030	5,769,731	5,770,075	5,770,469	5,770,940	5,771,306
	5,769,026	5,769,743	5,770,076	5,770,492	5,770,945	5,771,316
	5,769,027	5,769,745	5,770,099	5,770,503	5,770,946	5,771,323

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5,771,324	5,768,764	5,770,498	5,770,610	5,770,186	5,770,139
5,771,338	5,768,790	5,770,500	5,770,612	5,770,193	5,770,158
5,771,339	5,768,791	5,770,919	5,770,790	5,770,324	5,770,283
5,771,344	5,768,792	5,771,105	5,770,820	5,770,384	5,770,288
5,771,346	5,768,812	5,771,150	5,770,966	5,770,405	5,770,521
5,771,349	5,768,816	5,768,721	5,771,285	5,770,417	5,770,691
5,771,356	5,768,824	5,768,771	5,770,562	5,770,842	5,770,842
5,771,368	5,768,833	5,768,794	5,768,729	5,770,720	5,770,996
5,771,382	5,768,935	5,768,829	5,768,811	5,770,736	5,770,999
5,771,389	5,769,040	5,768,892	5,770,802	5,771,136	5,771,188
5,771,397	5,769,051	5,768,904	5,769,239	5,770,829	5,771,157
5,771,441	5,769,066	5,768,947	5,769,439	5,770,858	5,771,328
5,771,449	5,769,093	5,768,955	5,769,501	5,770,955	5,771,358
5,771,456	5,769,105	5,768,968	5,769,526	5,771,020	5,768,869
5,771,484	5,769,213	5,768,991	5,769,733	5,771,047	5,769,171
5,768,784	5,769,224	5,769,019	5,769,900	5,771,057	5,769,631
5,768,817	5,769,256	5,769,112	5,770,094	5,771,071	5,769,249
5,768,931	5,769,269	5,769,168	5,770,150	5,771,073	5,768,888
5,768,932	5,769,284	5,769,225	5,770,211	5,771,246	5,768,977
5,769,011	5,769,367	5,769,235	5,768,733	5,771,260	5,769,529
5,769,106	5,769,378	5,769,279	5,768,973	5,771,272	5,769,705
5,769,201	5,769,437	5,769,287	5,771,310	5,769,712	5,768,740
5,769,219	5,769,478	5,769,408	5,769,232	5,771,321	5,770,522
5,769,282	5,769,568	5,769,427	5,769,363	5,771,326	5,770,585
5,769,385	5,769,574	5,769,429	5,770,217	5,771,392	5,770,910
5,769,422	5,769,635	5,769,474	5,769,204	5,771,438	5,770,994
5,769,431	5,769,641	5,769,496	5,769,668	5,769,045	5,770,789
5,769,577	5,769,701	5,769,512	5,770,545	5,770,854	5,771,336
5,769,595	5,769,724	5,769,548	RE 35,829	5,768,767	5,770,284
5,769,681	5,769,737	5,769,557	5,769,524	5,768,838	5,770,451
5,769,727	5,769,740	5,769,590	5,769,630	5,768,840	5,770,570
5,769,728	5,769,777	5,769,596	5,769,656	5,768,890	5,770,840
5,769,795	5,769,884	5,769,598	5,769,684	5,769,045	5,771,287
5,769,841	5,769,912	5,769,683	5,770,084	5,769,064	5,768,907
5,770,270	5,769,986	5,769,718	5,770,660	5,769,187	5,768,915
5,770,378	5,770,048	5,769,773	5,770,771	5,769,197	5,768,994
5,770,382	5,770,077	5,769,778	5,770,961	5,769,198	5,769,264
5,770,383	5,770,119	5,769,809	5,769,000	5,769,222	5,769,545
5,770,559	5,770,183	5,769,827	5,769,608	5,769,289	5,769,637
5,770,636	5,770,191	5,769,891	5,770,205	5,769,292	5,769,716
5,770,834	5,770,204	5,769,933	5,770,432	5,769,320	5,769,787
5,770,953	5,770,209	5,769,949	5,770,814	5,769,377	5,770,018
5,771,024	5,770,330	5,769,961	5,768,803	5,769,403	5,770,914
5,771,025	5,770,637	5,769,966	5,768,971	5,769,444	5,770,941
5,771,045	5,770,775	5,770,022	5,769,089	5,769,473	5,768,990
5,771,095	5,770,878	5,770,042	5,769,155	5,769,481	5,769,010
5,771,122	5,770,880	5,770,045	5,769,208	5,769,493	5,769,102
5,771,127	5,770,980	5,770,078	5,769,329	5,769,498	5,769,122
5,771,240	5,771,004	5,770,232	5,769,368	5,769,499	5,769,184
5,771,241	5,771,012	5,770,290	5,769,477	5,769,542	5,769,554
5,771,274	5,771,148	5,770,327	5,769,762	5,769,612	5,770,179
5,771,299	5,771,154	5,770,379	5,769,800	5,769,640	5,770,252
5,771,327	5,771,232	5,770,389	5,770,069	5,769,678	5,770,272
5,771,385	5,771,284	5,770,435	5,770,083	5,769,828	5,770,700
5,771,396	5,771,347	5,770,441	5,770,208	5,769,843	5,770,852
5,771,435	5,771,371	5,770,448	5,770,210	5,769,967	5,771,155
5,768,789	5,771,854	5,771,383	5,770,581	5,769,995	5,771,178
5,768,808	5,768,808	5,770,406	5,770,395	5,770,016	5,768,801
5,768,860	5,768,826	5,770,623	5,770,396	5,770,058	5,768,996
5,768,896	5,768,906	5,770,764	5,770,442	5,770,106	5,769,107
5,768,959	5,768,965	5,770,783	5,770,444	5,769,145	5,769,764
5,769,084	5,769,012	5,770,865	5,770,459	5,769,169	5,769,767
5,769,098	5,769,074	5,770,903	5,770,563	5,769,257	5,769,772
5,769,217	5,769,119	5,770,925	5,770,572	5,769,309	5,769,790
5,769,247	5,769,244	5,770,939	5,770,582	5,770,250	5,769,489
5,769,475	5,769,293	5,770,959	5,770,703	5,770,321	5,769,563
5,769,517	5,769,312	5,770,984	5,770,868	5,770,420	5,769,565
5,769,550	5,769,440	5,771,001	5,771,161	5,770,447	5,769,759
5,769,552	5,769,458	5,771,003	5,771,228	5,770,538	5,769,804
5,769,611	5,769,467	5,771,169	5,771,273	5,770,635	5,769,807
5,769,647	5,769,580	5,771,182	5,771,279	5,770,650	5,769,831
5,769,652	5,769,665	5,771,229	5,771,414	5,770,743	5,769,837
5,769,774	5,769,781	5,771,283	5,768,719	5,770,763	5,769,854
5,769,793	5,770,014	5,771,305	5,768,723	5,770,997	5,769,856
5,769,949	5,770,129	5,771,307	5,768,809	5,771,013	5,769,862
5,770,131	5,770,171	5,771,353	5,768,883	5,771,044	5,770,065
5,770,155	5,770,328	5,771,461	5,768,894	5,771,295	5,770,043
5,770,289	5,770,529	5,771,471	5,768,963	5,771,477	5,770,044
5,770,325	5,770,531	5,768,735	5,769,083	5,770,144	5,770,144
5,770,590	5,770,669	5,768,800	5,769,091	5,768,863	5,770,190
5,770,594	5,770,711	5,768,828	5,769,108	5,768,867	5,770,206
5,770,864	5,770,750	5,768,895	5,769,144	5,769,099	5,770,248
5,771,145	5,770,751	5,768,946	5,769,214	5,769,138	5,770,251
5,771,269	5,770,841	5,768,983	5,769,227	5,769,321	5,770,254
5,771,277	5,770,974	5,769,143	5,769,231	5,769,469	5,770,291
5,769,689	5,771,005	5,769,263	5,769,301	5,769,480	5,770,318
5,769,703	5,771,064	5,769,276	5,769,346	5,769,492	5,770,370
5,770,103	5,769,089	5,769,319	5,769,395	5,769,560	5,770,403
5,770,145	5,769,203	5,769,417	5,769,432	5,769,562	5,770,426
5,770,654	5,769,802	5,769,463	5,769,538	5,769,615	5,770,458
5,770,675	5,769,813	5,769,485	5,769,566	5,769,769	5,770,472
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Patent Cooperation Treaty (PCT) Information

For information concerning PCT member countries, see the notice appearing in the *Official Gazette* at 1205 O.G. 4, on December 2, 1997.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52, on September 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2, on July 7, 1987, and at 1091 O.G. 2, on June 7, 1988. There is no longer a limit on the number of such international applications accepted for international preliminary examination by the European Patent Office; see the notice appearing at 1116 O.G. 32, on July 17, 1990.

The search fee of the European Patent Office was increased, effective January 1, 1998, and was announced in the *Official Gazette* at 1205 O.G. 3, on December 2, 1997.

International fees were changed, effective on May 1, 1997, due to a change in the exchange rate of the U.S. dollar with regard to the Swiss franc, and were announced in the *Official Gazette* at 1197 O.G. 69, on April 22, 1997. The basic fee and the designation fee were further changed effective January 1, 1998 and were announced in the *Official Gazette* at 1205 O.G. 3, on December 2, 1997.

Certain domestic PCT fees and charges for International Search and Preliminary Examination were changed, effective October 1, 1997, and were announced in the *Official Gazette* at 1201 O.G. 63, on August 19, 1997.

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— Confirmation fee.....	52.50
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Commissioner of Patents and Trademarks

Notice of Maintenance Fees Payable

Title 37 Code of Federal Regulations (CFR), Section 1.362(d) provides that maintenance fees may be paid without surcharge for the six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(h), as amended effective Dec. 16, 1991. If the maintenance fee is not paid in the patent requiring such payment the patent will expire on the 4th, 8th, or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on June 27, 1995 for which maintenance fees due at 3 years and six



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months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,426,786 through 5,428,840  
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on June 25, 1991 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 5,025,501 through 5,027,436  
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on June 23, 1987 for which maintenance fees due at 11 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,674,130 through 4,675,911  
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

For patents based on applications filed on or after Dec. 12, 1980, but before Aug. 27, 1982, patent owners must establish small entity status according to 37 CFR 1.27 if they have not done so and if they wish to pay the small entity amount.

The current amounts of the maintenance fees due at 3 years and six months, 7 years and six months, and 11 years and six months are set forth in 37 CFR 1.20(e)-(g), as amended Oct. 1, 1997, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$525.00  
By other than a small entity .....\$1,050.00

(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$1,050.00  
By other than a small entity .....\$2,100.00

(g) For maintaining an original or reissue patent, except a design or plant patent, based on applications filed on or after Dec. 12, 1980 in force beyond 12 years; the fee is due by eleven years and six months after the original grant:

By a small entity (§ 1.9(f)) .....\$1,580.00  
By other than a small entity .....\$3,160.00

The amount of the surcharge for paying the maintenance fee during the grace period or after expiration of the patent are set forth in 37 CFR 1.20(h), and (i) which are reproduced below:

(h) Surcharge for paying a maintenance fee during the 6 month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980:

By a small entity (§ 1.9(f)) .....\$65.00  
By other than a small entity .....\$130.00

(i) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been:

(1) unavoidable .....\$700.00  
(2) unintentional .....\$1,640.00

Notice of Expiration of Patents  
Due to Failure to Pay Maintenance Fee

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED April 22, 1998  
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
Re. 33,072 (4,584,131)	07/219,699 (06/746,904)	09/26/89 (04/22/86)
Re. 34,223 (4,917,669)	07/857,086 (07/308,137)	04/13/93 (04/17/90)
4,583,246	06/562,792	04/22/86
4,583,252	06/705,814	04/22/86
4,583,253	06/701,989	04/22/86
4,583,257	06/701,832	04/22/86
4,583,266	06/774,852	04/22/86
4,583,270	06/485,368	04/22/86
4,583,271	06/489,646	04/22/86
4,583,275	06/770,972	04/22/86
4,583,278	06/686,277	04/22/86
4,583,283	06/693,695	04/22/86
4,583,289	06/687,621	04/22/86
4,583,297	06/678,520	04/22/86
4,583,301	06/618,802	04/22/86
4,583,305	06/711,218	04/22/86
4,583,306	06/662,500	04/22/86
4,583,307	06/593,122	04/22/86
4,583,310	06/603,390	04/22/86
4,583,313	06/607,788	04/22/86
4,583,318	06/493,263	04/22/86
4,583,321	06/599,704	04/22/86
4,583,327	06/555,275	04/22/86
4,583,333	06/448,634	04/22/86
4,583,337	06/737,610	04/22/86
4,583,339	06/449,027	04/22/86
4,583,351	06/591,732	04/22/86
4,583,354	06/692,512	04/22/86
4,583,361	06/557,556	04/22/86
4,583,369	06/732,297	04/22/86
4,583,378	06/708,942	04/22/86
4,583,379	06/661,241	04/22/86
4,583,380	06/765,484	04/22/86
4,583,394	06/638,421	04/22/86
4,583,406	06/615,194	04/22/86
4,583,411	06/583,930	04/22/86
4,583,416	06/495,418	04/22/86
4,583,422	06/420,695	04/22/86
4,583,424	06/587,510	04/22/86
4,583,428	06/547,900	04/22/86
4,583,431	06/438,684	04/22/86
4,583,440	06/699,941	04/22/86
4,583,444	06/558,134	04/22/86
4,583,446	06/706,927	04/22/86
4,583,449	06/605,111	04/22/86
4,583,453	06/588,524	04/22/86
4,583,457	06/703,927	04/22/86
4,583,459	06/612,042	04/22/86
4,583,462	06/514,051	04/22/86
4,583,468	06/518,219	04/22/86
4,583,470	06/689,210	04/22/86
4,583,473	06/674,020	04/22/86
4,583,481	06/660,736	04/22/86
4,583,492	06/562,625	04/22/86
4,583,500	06/695,225	04/22/86
4,583,508	06/689,359	04/22/86
4,583,510	06/689,126	04/22/86
4,583,514	06/568,164	04/22/86
4,583,515	06/705,411	04/22/86

Patent Number	Serial Number	Issue Date	4,584,024	06/556,477	04/22/86
4,583,529	06/496,838	04/22/86	4,584,025	06/674,831	04/22/86
4,583,530	06/605,823	04/22/86	4,584,035	06/590,049	04/22/86
4,583,540	06/249,331	04/22/86	4,584,041	06/487,225	04/22/86
4,583,541	06/607,639	04/22/86	4,584,049	06/649,774	04/22/86
4,583,546	06/553,291	04/22/86	4,584,051	06/701,114	04/22/86
4,583,547	06/517,810	04/22/86	4,584,053	06/623,115	04/22/86
4,583,557	06/608,026	04/22/86	4,584,063	06/393,071	04/22/86
4,583,568	06/671,659	04/22/86	4,584,067	06/706,816	04/22/86
4,583,578	06/713,994	04/22/86	4,584,073	06/564,060	04/22/86
4,583,595	06/684,422	04/22/86	4,584,075	06/675,057	04/22/86
4,583,603	06/758,258	04/22/86	4,584,076	06/665,882	04/22/86
4,583,607	06/618,275	04/22/86	4,584,077	06/639,769	04/22/86
4,583,613	06/583,027	04/22/86	4,584,082	06/659,525	04/22/86
4,583,615	06/582,770	04/22/86	4,584,091	06/687,853	04/22/86
4,583,622	06/670,299	04/22/86	4,584,092	06/687,303	04/22/86
4,583,623	06/662,107	04/22/86	4,584,096	06/347,693	04/22/86
4,583,625	06/655,615	04/22/86	4,584,100	06/572,468	04/22/86
4,583,628	06/566,491	04/22/86	4,584,102	06/772,847	04/22/86
4,583,641	06/652,579	04/22/86	4,584,103	06/445,529	04/22/86
4,583,650	06/710,462	04/22/86	4,584,105	06/707,921	04/22/86
4,583,651	06/716,261	04/22/86	4,584,106	06/639,718	04/22/86
4,583,659	06/494,814	04/22/86	4,584,133	06/549,535	04/22/86
4,583,693	06/651,521	04/22/86	4,584,136	06/707,219	04/22/86
4,583,698	06/610,088	04/22/86	4,584,137	06/597,930	04/22/86
4,583,699	06/601,196	04/22/86	4,584,143	06/655,835	04/22/86
4,583,704	06/565,433	04/22/86	4,584,144	06/330,628	04/22/86
4,583,706	06/396,873	04/22/86	4,584,151	06/754,995	04/22/86
4,583,710	06/376,811	04/22/86	4,584,154	06/707,348	04/22/86
4,583,714	06/462,647	04/22/86	4,584,156	06/737,995	04/22/86
4,583,719	06/600,487	04/22/86	4,584,158	06/587,232	04/22/86
4,583,720	06/664,389	04/22/86	4,584,159	06/434,597	04/22/86
4,583,728	06/646,694	04/22/86	4,584,160	06/423,293	04/22/86
4,583,748	06/634,083	04/22/86	4,584,164	06/384,456	04/22/86
4,583,754	06/656,923	04/22/86	4,584,170	06/668,295	04/22/86
4,583,761	06/669,231	04/22/86	4,584,171	06/653,012	04/22/86
4,583,764	06/607,942	04/22/86	4,584,175	06/609,636	04/22/86
4,583,768	06/569,491	04/22/86	4,584,178	06/672,141	04/22/86
4,583,770	06/629,790	04/22/86	4,584,179	06/611,619	04/22/86
4,583,774	06/647,097	04/22/86	4,584,180	06/612,549	04/22/86
4,583,789	06/686,359	04/22/86	4,584,183	06/564,055	04/22/86
4,583,791	06/588,841	04/22/86	4,584,185	06/768,252	04/22/86
4,583,796	06/545,341	04/22/86	4,584,193	06/716,798	04/22/86
4,583,800	06/642,202	04/22/86	4,584,196	06/473,639	04/22/86
4,583,815	06/509,964	04/22/86	4,584,204	06/455,008	04/22/86
4,583,817	06/536,441	04/22/86	4,584,206	06/636,039	04/22/86
4,583,821	06/651,031	04/22/86	4,584,218	06/663,714	04/22/86
4,583,835	06/558,747	04/22/86	4,584,248	06/657,439	04/22/86
4,583,838	06/620,115	04/22/86	4,584,249	06/625,077	04/22/86
4,583,842	06/661,562	04/22/86	4,584,253	06/686,046	04/22/86
4,583,846	06/673,523	04/22/86	4,584,255	06/746,946	04/22/86
4,583,848	06/637,656	04/22/86	4,584,261	06/635,346	04/22/86
4,583,850	06/586,833	04/22/86	4,584,268	06/583,456	04/22/86
4,583,855	06/581,185	04/22/86	4,584,272	06/309,346	04/22/86
4,583,859	06/595,205	04/22/86	4,584,274	06/465,082	04/22/86
4,583,862	06/562,622	04/22/86	4,584,275	06/403,380	04/22/86
4,583,865	06/682,646	04/22/86	4,584,279	06/673,317	04/22/86
4,583,870	06/654,826	04/22/86	4,584,280	06/609,389	04/22/86
4,583,886	06/485,270	04/22/86	4,584,285	06/651,378	04/22/86
4,583,894	06/627,323	04/22/86	4,584,290	06/556,413	04/22/86
4,583,900	06/697,798	04/22/86	4,584,292	06/662,840	04/22/86
4,583,901	06/617,933	04/22/86	4,584,297	06/721,773	04/22/86
4,583,907	06/611,732	04/22/86	4,584,304	06/705,247	04/22/86
4,583,912	06/590,413	04/22/86	4,584,322	06/597,984	04/22/86
4,583,920	06/566,363	04/22/86	4,584,324	06/782,650	04/22/86
4,583,940	06/626,857	04/22/86	4,584,332	06/651,543	04/22/86
4,583,950	06/646,322	04/22/86	4,584,338	06/477,740	04/22/86
4,583,967	06/579,347	04/22/86	4,584,342	06/705,566	04/22/86
4,583,975	06/717,487	04/22/86	4,584,352	06/697,299	04/22/86
4,583,982	06/643,912	04/22/86	4,584,364	06/673,229	04/22/86
4,583,983	06/545,088	04/22/86	4,584,366	06/683,963	04/22/86
4,583,984	06/552,050	04/22/86	4,584,393	06/691,293	04/22/86
4,584,000	06/669,498	04/22/86	4,584,400	06/678,809	04/22/86
4,584,002	06/276,218	04/22/86	4,584,402	06/665,804	04/22/86
4,584,004	06/536,723	04/22/86	4,584,403	06/584,181	04/22/86
4,584,014	06/626,945	04/22/86	4,584,410	06/670,847	04/22/86
4,584,018	06/702,087	04/22/86	4,584,413	06/531,979	04/22/86
4,584,020	06/557,936	04/22/86	4,584,415	06/685,017	04/22/86
				06/742,989	04/22/86

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Patent Number	Serial Number	Issue Date	4,916,768	07/346,567	04/17/90
4,584,418	06/712,227	04/22/86	4,916,769	07/319,185	04/17/90
4,584,427	06/663,648	04/22/86	4,916,774	07/337,405	04/17/90
4,584,430	06/720,888	04/22/86	4,916,780	07/354,176	04/17/90
4,584,454	06/604,562	04/22/86	4,916,781	07/241,583	04/17/90
4,584,462	06/671,343	04/22/86	4,916,785	07/215,391	04/17/90
4,584,464	06/627,146	04/22/86	4,916,792	07/190,870	04/17/90
4,584,465	06/479,944	04/22/86	4,916,795	07/299,033	04/17/90
4,584,466	06/688,257	04/22/86	4,916,798	07/391,739	04/17/90
4,584,468	06/633,373	04/22/86	4,916,801	07/374,630	04/17/90
4,584,473	06/523,762	04/22/86	4,916,805	07/317,671	04/17/90
4,584,475	06/614,584	04/22/86	4,916,807	07/293,639	04/17/90
4,584,485	06/524,994	04/22/86	4,916,815	06/522,263	04/17/90
4,584,490	06/595,061	04/22/86	4,916,821	07/164,091	04/17/90
4,584,495	06/682,659	04/22/86	4,916,822	07/278,587	04/17/90
4,584,500	06/518,507	04/22/86	4,916,823	07/302,548	04/17/90
4,584,505	06/620,586	04/22/86	4,916,831	07/265,701	04/17/90
4,584,506	06/674,429	04/22/86	4,916,835	07/215,157	04/17/90
4,584,509	06/634,109	04/22/86	4,916,836	07/277,076	04/17/90
4,584,511	06/629,008	04/22/86	4,916,839	07/210,760	04/17/90
4,584,522	06/522,027	04/22/86	4,916,840	07/151,561	04/17/90
4,584,523	06/538,548	04/22/86	4,916,849	07/300,950	04/17/90
4,584,524	06/520,386	04/22/86	4,916,860	07/185,444	04/17/90
4,584,526	06/461,735	04/22/86	4,916,862	07/281,539	04/17/90
4,584,530	06/494,068	04/22/86	4,916,873	07/307,345	04/17/90
4,584,534	06/529,632	04/22/86	4,916,874	07/381,783	04/17/90
4,584,535	06/622,349	04/22/86	4,916,890	07/357,339	04/17/90
4,584,537	06/724,248	04/22/86	4,916,894	07/294,091	04/17/90
4,584,539	06/675,903	04/22/86	4,916,897	07/291,273	04/17/90
4,584,543	06/586,621	04/22/86	4,916,902	07/086,135	04/17/90
4,584,548	06/722,782	04/22/86	4,916,909	07/291,734	04/17/90
4,584,552	06/478,123	04/22/86	4,916,911	07/271,163	04/17/90
4,584,561	06/653,402	04/22/86	4,916,913	07/225,913	04/17/90
4,584,562	06/653,410	04/22/86	4,916,916	07/270,211	04/17/90
4,584,563	06/653,412	04/22/86	4,916,917	07/400,793	04/17/90
4,584,564	06/653,422	04/22/86	4,916,919	07/381,261	04/17/90
4,584,568	06/623,889	04/22/86	4,916,926	07/211,718	04/17/90
4,584,574	06/532,112	04/22/86	4,916,929	07/152,252	04/17/90
4,584,576	06/545,793	04/22/86	4,916,939	07/124,817	04/17/90
4,584,584	06/477,034	04/22/86	4,916,941	07/420,116	04/17/90
4,584,586	06/552,304	04/22/86	4,916,943	07/379,070	04/17/90
4,584,589	06/688,481	04/22/86	4,916,950	07/309,660	04/17/90
4,584,598	06/500,822	04/22/86	4,916,951	07/11,748	04/17/90
4,584,599	06/683,680	04/22/86	4,916,970	07/369,722	04/17/90
4,584,602	06/549,519	04/22/86	4,916,973	07/196,444	04/17/90
4,584,609	06/723,148	04/22/86	4,916,974	07/155,489	04/17/90
4,584,612	06/582,072	04/22/86	4,916,980	07/220,801	04/17/90
4,584,614	06/522,704	04/22/86	4,916,983	07/268,827	04/17/90
4,584,619	06/584,107	04/22/86	4,916,985	07/401,186	04/17/90
4,584,622	06/629,288	04/22/86	4,916,988	07/286,807	04/17/90
4,584,633	06/652,100	04/22/86	4,916,991	07/292,146	04/17/90
4,584,635	06/584,195	04/22/86	4,916,992	07/067,225	04/17/90
4,584,647	06/542,830	04/22/86	4,916,994	07/354,510	04/17/90
4,584,648	06/531,974	04/22/86	4,917,000	07/235,417	04/17/90
4,584,651	06/528,311	04/22/86	4,917,001	07/168,037	04/17/90
4,584,654	06/435,648	04/22/86	4,917,004	07/257,544	04/17/90
4,584,657	06/548,067	04/22/86	4,917,007	07/311,914	04/17/90
4,584,658	06/504,118	04/22/86	4,917,024	07/403,603	04/17/90
4,584,659	06/510,810	04/22/86	4,917,026	07/356,754	04/17/90
4,584,664	06/542,324	04/22/86	4,917,030	07/329,512	04/17/90
4,584,684	06/554,486	04/22/86	4,917,034	07/360,123	04/17/90
4,584,686	06/564,273	04/22/86	4,917,035	07/254,692	04/17/90
4,584,690	06/607,998	04/22/86	4,917,036	07/217,708	04/17/90
4,584,696	06/664,621	04/22/86	4,917,040	07/386,444	04/17/90
4,584,700	06/420,280	04/22/86	4,917,042	07/282,060	04/17/90
4,584,701	06/565,555	04/22/86	4,917,048	07/239,613	04/17/90
4,584,702	06/562,930	04/22/86	4,917,051	07/244,143	04/17/90
4,584,703	06/450,163	04/22/86	4,917,062	07/319,158	04/17/90
4,584,714	06/621,931	04/22/86	4,917,063	07/339,213	04/17/90
4,584,716	06/670,100	04/22/86	4,917,069	07/199,638	04/17/90
4,584,718	06/482,233	04/22/86	4,917,070	07/307,419	04/17/90
4,916,755	07/259,973	04/17/90	4,917,077	07/312,808	04/17/90
4,916,756	07/367,793	04/17/90	4,917,079	07/178,921	04/17/90
4,916,757	07/176,714	04/17/90	4,917,081	07/234,511	04/17/90
4,916,761	07/348,289	04/17/90	4,917,087	07/099,650	04/17/90
4,916,765	07/380,383	04/17/90	4,917,100	07/238,730	04/17/90
4,916,766	07/395,541	04/17/90	4,917,101	07/341,558	04/17/90
4,916,767	07/157,030	04/17/90	4,917,129	07/133,878	04/17/90
			4,917,141	07/314,225	04/17/90
				07/190,763	04/17/90
				07/278,948	04/17/90

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Patent Number	Serial Number	Issue Date	4,917,417	07/315,081	04/17/90
			4,917,418	07/283,462	04/17/90
4,917,145	07/306,291	04/17/90	4,917,420	07/312,269	04/17/90
4,917,146	07/248,667	04/17/90	4,917,425	07/288,774	04/17/90
4,917,147	07/369,530	04/17/90	4,917,426	07/338,666	04/17/90
4,917,148	07/278,387	04/17/90	4,917,436	07/337,748	04/17/90
4,917,153	07/199,007	04/17/90	4,917,438	07/197,954	04/17/90
4,917,158	07/168,870	04/17/90	4,917,443	07/345,252	04/17/90
4,917,161	07/105,275	04/17/90	4,917,447	07/306,358	04/17/90
4,917,162	07/195,714	04/17/90	4,917,451	07/145,852	04/17/90
4,917,168	07/410,264	04/17/90	4,917,453	07/251,975	04/17/90
4,917,169	07/232,172	04/17/90	4,917,454	07/322,627	04/17/90
4,917,170	07/246,845	04/17/90	4,917,474	07/198,699	04/17/90
4,917,171	06/728,193	04/17/90	4,917,484	06/610,379	04/17/90
4,917,172	07/184,231	04/17/90	4,917,486	07/196,320	04/17/90
4,917,180	07/329,172	04/17/90	4,917,487	07/234,275	04/17/90
4,917,181	07/228,340	04/17/90	4,917,498	07/313,288	04/17/90
4,917,184	07/310,439	04/17/90	4,917,500	07/278,092	04/17/90
4,917,192	07/230,611	04/17/90	4,917,507	07/312,440	04/17/90
4,917,193	07/208,878	04/17/90	4,917,511	07/222,768	04/17/90
4,917,194	07/324,566	04/17/90	4,917,524	07/306,723	04/17/90
4,917,200	07/230,719	04/17/90	4,917,525	07/319,974	04/17/90
4,917,201	07/109,523	04/17/90	4,917,533	07/230,029	04/17/90
4,917,203	07/270,690	04/17/90	4,917,535	07/340,324	04/17/90
4,917,208	07/243,593	04/17/90	4,917,537	07/336,897	04/17/90
4,917,209	07/219,508	04/17/90	4,917,538	07/333,583	04/17/90
4,917,224	07/282,261	04/17/90	4,917,544	07/013,532	04/17/90
4,917,226	07/237,800	04/17/90	4,917,552	07/402,646	04/17/90
4,917,233	07/315,765	04/17/90	4,917,553	07/334,433	04/17/90
4,917,242	07/233,389	04/17/90	4,917,555	07/384,864	04/17/90
4,917,243	07/232,921	04/17/90	4,917,557	07/110,692	04/17/90
4,917,245	07/409,107	04/17/90	4,917,558	07/295,486	04/17/90
4,917,246	07/041,337	04/17/90	4,917,559	07/270,590	04/17/90
4,917,247	07/180,101	04/17/90	4,917,563	07/250,286	04/17/90
4,917,249	07/340,045	04/17/90	4,917,565	07/242,165	04/17/90
4,917,256	07/217,990	04/17/90	4,917,568	07/150,128	04/17/90
4,917,258	07/279,344	04/17/90	4,917,571	07/215,352	04/17/90
4,917,259	07/310,608	04/17/90	4,917,583	07/194,252	04/17/90
4,917,260	07/378,211	04/17/90	4,917,588	07/191,289	04/17/90
4,917,262	07/291,783	04/17/90	4,917,595	07/278,845	04/17/90
4,917,276	07/217,500	04/17/90	4,917,597	07/315,995	04/17/90
4,917,279	07/308,669	04/17/90	4,917,599	07/292,477	04/17/90
4,917,285	07/375,127	04/17/90	4,917,600	07/407,230	04/17/90
4,917,287	07/343,629	04/17/90	4,917,601	07/305,284	04/17/90
4,917,288	07/113,866	04/17/90	4,917,610	07/287,446	04/17/90
4,917,296	07/328,164	04/17/90	4,917,612	07/301,584	04/17/90
4,917,297	07/335,859	04/17/90	4,917,623	07/242,018	04/17/90
4,917,298	07/280,456	04/17/90	4,917,624	07/329,548	04/17/90
4,917,302	07/292,146	04/17/90	4,917,627	07/344,924	04/17/90
4,917,305	07/240,479	04/17/90	4,917,628	07/298,871	04/17/90
4,917,307	07/306,708	04/17/90	4,917,633	07/244,884	04/17/90
4,917,314	07/173,443	04/17/90	4,917,634	07/065,922	04/17/90
4,917,315	06/908,166	04/17/90	4,917,644	07/395,682	04/17/90
4,917,318	07/197,061	04/17/90	4,917,645	07/385,191	04/17/90
4,917,319	07/374,963	04/17/90	4,917,648	07/230,045	04/17/90
4,917,324	07/265,823	04/17/90	4,917,654	07/191,217	04/17/90
4,917,325	07/137,962	04/17/90	4,917,655	07/517,516	04/17/90
4,917,326	07/180,909	04/17/90	4,917,659	07/040,906	04/17/90
4,917,333	07/192,563	04/17/90	4,917,660	07/275,835	04/17/90
4,917,339	07/267,875	04/17/90	4,917,661	07/210,338	04/17/90
4,917,340	07/264,728	04/17/90	4,917,677	07/330,264	04/17/90
4,917,343	07/110,037	04/17/90	4,917,680	07/345,837	04/17/90
4,917,347	07/270,346	04/17/90	4,917,682	07/118,831	04/17/90
4,917,351	07/323,675	04/17/90	4,917,689	07/278,981	04/17/90
4,917,354	07/295,452	04/17/90	4,917,691	07/304,071	04/17/90
4,917,369	07/047,976	04/17/90	4,917,702	07/153,885	04/17/90
4,917,375	07/396,706	04/17/90	4,917,712	07/275,007	04/17/90
4,917,381	07/349,414	04/17/90	4,917,713	07/355,633	04/17/90
4,917,385	07/261,065	04/17/90	4,917,719	06/853,227	04/17/90
4,917,388	07/332,586	04/17/90	4,917,724	07/255,700	04/17/90
4,917,394	07/344,694	04/17/90	4,917,725	07/246,562	04/17/90
4,917,397	07/169,063	04/17/90	4,917,730	06/788,162	04/17/90
4,917,398	07/348,900	04/17/90	4,917,731	07/283,469	04/17/90
4,917,401	07/230,341	04/17/90	4,917,734	07/261,379	04/17/90
4,917,403	07/341,558	04/17/90	4,917,736	07/326,777	04/17/90
4,917,404	07/133,878	04/17/90	4,917,737	07/322,447	04/17/90
4,917,408	07/314,225	04/17/90	4,917,740	07/166,569	04/17/90
4,917,412	07/303,972	04/17/90	4,917,760	07/233,565	04/17/90
4,917,415	07/226,746	04/17/90	4,917,761	07/393,424	04/17/90



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Patent Number	Serial Number	Issue Date	4,918,082	07/243,108	04/17/90
4,917,763	07/205,604	04/17/90	4,918,096	07/168,102	04/17/90
4,917,764	07/282,818	04/17/90	4,918,098	07/024,763	04/17/90
4,917,765	07/305,094	04/17/90	4,918,101	07/234,252	04/17/90
4,917,769	07/356,549	04/17/90	4,918,102	07/321,780	04/17/90
4,917,770	07/390,611	04/17/90	4,918,105	07/141,072	04/17/90
4,917,776	07/308,847	04/17/90	4,918,110	07/243,383	04/17/90
4,917,778	07/423,974	04/17/90	4,918,113	07/212,646	04/17/90
4,917,781	07/221,720	04/17/90	4,918,125	07/289,935	04/17/90
4,917,784	07/412,736	04/17/90	4,918,143	07/357,050	04/17/90
4,917,788	07/269,345	04/17/90	4,918,148	07/252,763	04/17/90
4,917,800	07/221,307	04/17/90	4,918,149	07/266,978	04/17/90
4,917,803	07/393,139	04/17/90	4,918,153	07/323,594	04/17/90
4,917,818	07/238,509	04/17/90	4,918,155	07/333,864	04/17/90
4,917,820	07/317,140	04/17/90	4,918,159	07/237,982	04/17/90
4,917,824	07/146,838	04/17/90	4,918,167	07/183,213	04/17/90
4,917,825	07/253,634	04/17/90	4,918,170	07/352,595	04/17/90
4,917,826	07/117,851	04/17/90	4,918,175	07/209,372	04/17/90
4,917,833	07/211,635	04/17/90	4,918,183	06/790,656	04/17/90
4,917,839	07/203,475	04/17/90	4,918,188	07/269,319	04/17/90
4,917,841	07/254,732	04/17/90	4,918,195	07/243,384	04/17/90
4,917,843	07/115,775	04/17/90	4,918,198	07/399,187	04/17/90
4,917,853	07/125,509	04/17/90	4,918,201	07/328,575	04/17/90
4,917,854	07/236,719	04/17/90	4,918,204	07/303,325	04/17/90
4,917,857	07/218,239	04/17/90	4,918,209	07/164,897	04/17/90
4,917,859	07/403,458	04/17/90	4,918,212	07/231,475	04/17/90
4,917,860	07/295,275	04/17/90	4,918,217	07/221,609	04/17/90
4,917,861	07/271,578	04/17/90	4,918,218	06/623,973	04/17/90
4,917,864	07/192,615	04/17/90	4,918,222	07/083,397	04/17/90
4,917,867	07/212,016	04/17/90	4,918,226	06/275,806	04/17/90
4,917,868	07/117,388	04/17/90	4,918,235	07/227,224	04/17/90
4,917,870	07/188,622	04/17/90	4,918,241	07/390,014	04/17/90
4,917,871	07/227,073	04/17/90	4,918,250	07/341,447	04/17/90
4,917,872	07/276,311	04/17/90	4,918,251	07/333,004	04/17/90
4,917,881	07/164,194	04/17/90	4,918,253	07/201,547	04/17/90
4,917,885	06/946,119	04/17/90	4,918,257	07/219,417	04/17/90
4,917,887	07/023,634	04/17/90	4,918,265	07/307,422	04/17/90
4,917,897	07/308,196	04/17/90	4,918,271	07/303,105	04/17/90
4,917,902	07/329,729	04/17/90	4,918,283	07/257,889	04/17/90
4,917,903	07/141,745	04/17/90	4,918,285	07/204,640	04/17/90
4,917,905	07/313,309	04/17/90	4,918,289	07/315,457	04/17/90
4,917,912	07/339,877	04/17/90	4,918,291	07/232,786	04/17/90
4,917,917	07/277,011	04/17/90	4,918,292	07/387,424	04/17/90
4,917,938	07/014,391	04/17/90	4,918,294	07/272,647	04/17/90
4,917,953	07/161,104	04/17/90	4,918,304	07/325,455	04/17/90
4,917,954	07/278,035	04/17/90	4,918,305	07/227,041	04/17/90
4,917,956	07/217,506	04/17/90	4,918,314	07/293,916	04/17/90
4,917,962	07/077,812	04/17/90	4,918,315	07/200,133	04/17/90
4,917,969	07/283,407	04/17/90	4,918,318	07/112,671	04/17/90
4,917,980	07/288,197	04/17/90	4,918,319	07/116,452	04/17/90
4,917,981	07/138,118	04/17/90	4,918,325	07/282,358	04/17/90
4,917,984	07/230,530	04/17/90	4,918,328	07/190,955	04/17/90
4,917,985	07/292,291	04/17/90	4,918,334	07/232,399	04/17/90
4,917,986	07/292,191	04/17/90	4,918,337	07/257,361	04/17/90
4,917,987	07/269,430	04/17/90	4,918,340	07/256,315	04/17/90
4,917,991	07/210,397	04/17/90	4,918,347	07/248,424	04/17/90
4,917,998	06/860,169	04/17/90	4,918,354	07/135,193	04/17/90
4,918,005	07/074,745	04/17/90	4,918,355	06/926,826	04/17/90
4,918,006	06/824,912	04/17/90	4,918,361	07/414,945	04/17/90
4,918,012	07/089,454	04/17/90	4,918,362	07/285,096	04/17/90
4,918,014	06/786,631	04/17/90	4,918,363	07/252,381	04/17/90
4,918,015	07/044,325	04/17/90	4,918,371	07/208,931	04/17/90
4,918,019	07/011,913	04/17/90	4,918,375	07/210,662	04/17/90
4,918,022	07/323,376	04/17/90	4,918,394	07/328,110	04/17/90
4,918,030	07/332,286	04/17/90	4,918,395	07/274,407	04/17/90
4,918,035	07/373,700	04/17/90	4,918,409	07/282,554	04/17/90
4,918,037	07/320,460	04/17/90	4,918,410	06/731,518	04/17/90
4,918,038	07/114,040	04/17/90	4,918,411	07/264,607	04/17/90
4,918,040	07/273,290	04/17/90	4,918,412	07/259,831	04/17/90
4,918,041	07/247,225	04/17/90	4,918,413	07/313,954	04/17/90
4,918,048	07/186,329	04/17/90	4,918,415	07/050,472	04/17/90
4,918,054	07/379,656	04/17/90	4,918,420	07/267,395	04/17/90
4,918,059	07/162,741	04/17/90	4,918,424	07/242,578	04/17/90
4,918,060	07/092,901	04/17/90	4,918,429	07/114,254	04/17/90
4,918,061	07/206,994	04/17/90	4,918,442	07/252,897	04/17/90
4,918,065	07/258,055	04/17/90	4,918,445	07/221,856	04/17/90
4,918,079	07/252,373	04/17/90	4,918,459	07/315,484	04/17/90
4,918,080	07/180,960	04/17/90	4,918,463	07/201,996	04/17/90
			4,918,485	07/334,295	04/17/90

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Patent Number	Serial Number	Issue Date	4,918,640	07/296,070	04/17/90
4,918,486	07/348,460	04/17/90	4,918,650	06/944,563	04/17/90
4,918,487	07/300,779	04/17/90	4,918,652	07/251,073	04/17/90
4,918,491	07/211,452	04/17/90	4,918,653	07/149,446	04/17/90
4,918,492	07/172,529	04/17/90	4,918,654	07/292,818	04/17/90
4,918,499	07/256,412	04/17/90	4,918,659	07/403,739	04/17/90
4,918,532	07/027,435	04/17/90	4,918,660	07/177,603	04/17/90
4,918,535	07/262,539	04/17/90	4,918,661	07/284,005	04/17/90
4,918,545	07/262,418	04/17/90	4,918,666	07/288,099	04/17/90
4,918,546	06/767,659	04/17/90	4,918,670	07/310,971	04/17/90
4,918,552	07/228,144	04/17/90	4,918,674	07/274,734	04/17/90
4,918,560	07/225,833	04/17/90	4,918,683	07/178,267	04/17/90
4,918,573	07/393,154	04/17/90	4,918,687	07/247,025	04/17/90
4,918,574	07/183,491	04/17/90	4,918,694	07/202,192	04/17/90
4,918,575	07/264,215	04/17/90	4,918,698	07/315,500	04/17/90
4,918,576	07/273,255	04/17/90	4,918,705	07/376,094	04/17/90
4,918,607	07/242,241	04/17/90	4,918,708	07/027,296	04/17/90
4,918,615	07/248,128	04/17/90	4,918,709	07/280,613	04/17/90
4,918,617	07/269,422	04/17/90	4,918,711	07/186,422	04/17/90
4,918,627	07/058,687	04/17/90	4,918,716	07/307,464	04/17/90
4,918,630	07/281,131	04/17/90	4,918,727	07/204,247	04/17/90
4,918,638	07/107,363	04/17/90	4,918,735	07/295,194	04/17/90
4,918,639	07/116,172	04/17/90	4,918,738	07/279,498	04/17/90
			4,918,742	07/185,100	04/17/90

Patents Reinstated Due to the Acceptance of a  
Late Maintenance Fee From 05/01/98

Patent Number	Serial Number	Filing Date	Issue Date	Granted Date
4,502,616	06/337,080	01/04/82	03/05/85	05/06/98
4,564,953	06/479,373	03/28/83	01/14/86	05/06/98
4,732,881	06/911,381	09/25/86	03/22/88	05/07/98
4,902,119	07/239,196	08/31/88	02/20/90	05/06/98
4,964,401	07/414,467	09/29/89	10/23/90	05/07/98
5,095,917	07/467,882	01/19/90	03/17/92	05/07/98
5,196,595	07/877,280	04/28/92	03/23/93	05/06/98

Reissue Applications Filed

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.12(b)).

**4,709,351**, Re. S.N. 09/002,002, Dec. 31, 1997, Cl. 365/051, SEMICONDUCTOR MEMORY DEVICE HAVING AN IMPROVED WIRING AND DECODER ARRANGEMENT TO DECREASE WIRING DELAY, Kazuhiko Kajigaya, Owner of Record: *Hitachi, Ltd., Tokyo, Japan*, Attorney or Agent: Gregory E. Montone, Ex. Gp.: 2763

**5,375,693**, Re. S.N. 09/070,011, Apr. 30, 1998, Cl. 514/317,000, METHODS AND COMPOSITIONS FOR TREATING ALLERGIC DISORDERS AND OTHER DISORDERS USING METABOLIC DERIVATIVES OF TERFENADINE, Raymond L. Woosley, et. al., Owner of Record: *Sepracor Inc. and Georgetown University, Marlboro, Mass.*, Attorney or Agent: Gordon Kit, Ex. Gp.: 1614

**5,419,930**, Re. S.N. 09/064,258, Apr. 22, 1998, Cl. 427/421, METHOD AND DEVICE FOR APPLYING A PASTE, Josef Schucker, Owner of Record: *SCA Schucker GmbH, Koenigsbach-stein, Germany*, Attorney or Agent: Stephan A. Pendorf, Ex. Gp.: 1112

**5,466,832**, Re. S.N. 08/969,403, Nov. 7, 1997, Cl. 549/330, PROCESS FOR THE MANUFACTURE OF 2,5-DIHYDROFURANS FROM GAMMA, DELTA-EPOXYBUTENES, Gerald C. Tustin, Owner of Record: *Eastman Chemical Co., Kingsport, Tenn.*, Attorney or Agent: Bruce J. Boggs, Jr., Ex. Gp.: 1612

**5,477,435**, Re. S.N. 08/994,136, Dec. 19, 1997, Cl. 362, MODULE PROVIDE INTERMITTENT LIGHT WITH MOVEMENT, Carmen Rapisarda, Owner of Record: *Inventor*, Attorney or Agent: Richard M. Goldberg, Ex. Gp.: 3406

**5,513,272**, Re. S.N. 09/069,371, Apr. 29, 1998, Cl. 382/116, SYSTEM FOR VERIFYING USE OF CREDIT IDENTIFICATION CARD INCLUDING RECORDING PHYSICAL ATTRIBUTES OF UNAUTHORIZED USERS, Charlie A. Bogosian Jr., Owner of Record: *Wizards Inc., Warwick, R.I.*, Attorney or Agent: Stephen J. Holmes, Ex. Gp.: 2606

**5,513,338**, Re. S.N. 09/069,530, Apr. 29, 1998, Cl. 395/500, METHOD AND APPARATUS FOR TRACING ACTIVITY ON A BUS OF AN IN-CIRCUIT EMULATOR, James W. Alexander, et. al., Owner of Record: *Intel Corp., Santa Clara, Calif.*, Attorney or Agent: Aloysius T.C. Au Yeung, Ex. Gp.: 2755

**5,513,640**, Re. S.N. 09/073,876, May 7, 1998, Cl. 128/660,70, DIAGNOSTIC ULTRASOUND SYSTEM, Nobuo Yamazaki, et. al., Owner of Record: *Kabushiki Kaisha Toshio, Kanagawa-ken, Japan*, Attorney or Agent: Richard V. Burgujian, Ex. Gp.: 3305

**5,515,976**, Re. S.N. 09/076,688, May 12, 1998, Cl. 206/586, PACKAGING FOR FRAGILE ARTICLES WITHIN CONTAINER, Michael S. Moren, et. al., Owner of Record: *Plastofilm Industries, Inc., Wheaton, Ill.*, Attorney or Agent: James K. Folker, Ex. Gp.: 3728

**5,516,216**, Re. S.N. 09/076,925, May 12, 1998, Cl. 400/124,010, PRINT ENHANCEMENT SYSTEM FOR ENHANCING DOT PRINTER IMAGES, Timothy M. McDonough, et. al., Owner of Record: *Hewlett-Packard Co., Palo Alto, Calif.*, Attorney or Agent: Brian D. Ogonowsky, Ex. Gp.: 2854

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**5,516,517**, Re. S.N. 09/078,831, May 14, 1998, Cl. 424/401, METHOD FOR NUTRITIONAL OXYGENATION OF THE SKIN, John P. Gardner, Owner of Record: *Echo2 Skin Care Inc., El Paso, Tex.*, Attorney or Agent: Daniel J. Cosgrove, Ex. Gp.: 1615

**5,517,433**, Re. S.N. 09/078,354, May 12, 1998, Cl. 364/602, PARALLEL DIGITAL DATA COMMUNICATIONS, Robert E. Morrison, Owner of Record: *Remote Intelligence Inc., Minneapolis, Minn.*, Attorney or Agent: John F. Klos, Ex. Gp.: 2786

**5,517,501**, Re. S.N. 09/078,324, May 14, 1998, Cl. 370/085.3, DATA TRANSMISSION DEVICE FOR RANDOM ACCESS NETWORK, WITH IMPROVED COLLISION RESOLUTION, AND CORRESPONDING METHOD, Philippe Jacquet, et. al., Owner of Record: *Inria Institut National De Recherche En Informatique Et En Automatique, Le Chesnay Cedex, France*, Attorney or Agent: Brian J. McNamara, Ex. Gp.: 2732

**5,557,324**, Re. S.N. 09/010,838, Jan. 22, 1998, Cl. 348/207, POLARIZATION VIEWER, Lawrence B. Wolff, Owner of Record: *John Hopkins University, Baltimore, Md.*, Attorney or Agent: George M. Cooper, Ex. Gp.: 2711

**5,613,453**, Re. S.N. 09/083,667, May 22, 1998, Cl. 110/237, METHOD AND APPARATUS FOR CONTAINING AND SUPPRESSING EXPLOSIVE DETONATIONS, John L. Donovan, Owner of Record: *Inventor*, Attorney or Agent: George E. Bullwinkel, Ex. Gp.: 3743

**5,630,572**, Re. S.N. 09/024,188, Feb. 17, 1998, Cl. 256/001, RETRACTABLE FENCE SYSTEM FOR SWIMMING POOL OR THE LIKE, Claude Guay, Owner of Record: *Gamblex Inc., St-Antoine-Tilly, Canada*, Attorney or Agent: Paul Marcoux, Ex. Gp.: 3626

**5,633,448**, Re. S.N. 09/025,042, Feb. 17, 1998, Cl. 568/335, CHIMERIC GENE FOR THE TRANSFORMATION OF PLANTS, Michel Lebrun, et. al., Owner of Record: *Rhone-Poulenc Agrochimie, Lyon, France*, Attorney or Agent: Robert G. McMorrow, Jr., Ex. Gp.: 1621

**5,638,950**, Re. S.N. 09/067,748, Apr. 28, 1998, Cl. 206/144, PACKAGING METHOD AND PACKAGING ASSEMBLY FOR PACKAGES ASSEMBLED WITH A PALLET OR THE LIKE, Edward L. Benno, Owner of Record: *Inventor*, Attorney or Agent: None, Ex. Gp.: 3208

**5,653,685**, Re. S.N. 09/070,795, May 1, 1998, Cl. 604/24, METHOD OF PROVIDING CIRCULATION VIA LUNG EXPANSION AND DEFLATION, Ronald M. Klatz, et. al., Owner of Record: *Life Resuscitation Technologies, Inc., Chicago, Ill.*, Attorney or Agent: William P. Berridge, Ex. Gp.: 3306

#### Request for Reexamination Filed

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

**5,488,907**, Reexam. No. 90/004,980, Apr. 28, 1998, Cl. 101/488, PERMANENT HEAT ACTIVATED TRANSFER PRINTING PROCESS AND COMPOSITION, Ming Xu, et. al., Owner of Record: *Sawgrass Systems, Inc., Mt. Pleasant, S.C.*, Attorney or Agent: B. Craig Killough, Barnwell, Whaley, Patterson and Helms, Charleston, S.C., Ex. Gp.: 2854, Requester: John R. Duncan, Gilliam Duncan and Harms, San Diego, Calif.

#### Notice of Expiration of Trademark Registrations Due To Failure to Renew

15 U.S.C. 1059 provides that each trademark registration may be renewed for periods of ten years from the end of the expiring period upon payment of the prescribed fee and the filing of an acceptable application for renewal. This may be done at any time within six months before the expiration of the period for which the registration was issued or renewed, or it may be done within three months after such expiration on payment of an additional fee.

According to the records of the Office, the trademark registrations listed below are expired due to failure to renew in accordance with 15 U.S.C. 1059.

#### TRADEMARK REGISTRATIONS WHICH EXPIRED May 12, 1998 DUE TO FAILURE TO RENEW

Reg. Number	Serial Number	Reg. Date
117,849	71/101,326	08/07/1917
117,871	71/102,417	08/07/1917
117,884	71/103,212	08/07/1917
117,930	71/101,021	08/07/1917
117,941	71/102,188	08/07/1917
117,945	71/102,913	08/07/1917
348,563	71/373,811	08/03/1937
348,580	71/381,923	08/03/1937
348,593	71/384,077	08/03/1937
348,596	71/384,969	08/03/1937
348,626	71/389,551	08/03/1937
348,662	71/390,408	08/03/1937
348,673	71/390,451	08/03/1937
348,689	71/390,709	08/03/1937
348,717	71/391,160	08/03/1937
348,718	71/391,161	08/03/1937
348,740	71/391,377	08/03/1937
649,496	72/014,584	08/06/1957
649,497	72/014,585	08/06/1957
649,501	72/003,364	08/06/1957
649,503	72/005,571	08/06/1957
649,505	72/006,392	08/06/1957
649,508	72/011,020	08/06/1957
649,509	72/012,377	08/06/1957
649,513	72/014,289	08/06/1957
649,514	72/015,703	08/06/1957
649,515	72/018,049	08/06/1957
649,517	72/018,327	08/06/1957
649,520	72/022,236	08/06/1957
649,527	71/692,212	08/06/1957
649,536	72/014,211	08/06/1957
649,542	72/016,451	08/06/1957
649,543	72/016,633	08/06/1957
649,547	72/011,821	08/06/1957
649,558	72/021,670	08/06/1957
649,569	72/021,746	08/06/1957
649,580	72/022,219	08/06/1957
649,583	72/011,018	08/06/1957
649,585	72/020,599	08/06/1957
649,591	72/007,681	08/06/1957
649,612	72/017,804	08/06/1957
649,618	72/005,889	08/06/1957
649,624	72/018,559	08/06/1957
649,625	72/018,586	08/06/1957
649,627	72/020,165	08/06/1957
649,640	72/006,866	08/06/1957
649,643	72/012,906	08/06/1957
649,647	72/015,610	08/06/1957
649,654	72/021,039	08/06/1957
649,658	72/022,059	08/06/1957
649,660	72/022,112	08/06/1957
649,665	72/022,353	08/06/1957
649,675	72/011,531	08/06/1957
649,680	72/013,086	08/06/1957
649,681	72/014,013	08/06/1957
649,691	72/017,423	08/06/1957
649,693	72/017,429	08/06/1957
649,694	72/017,600	08/06/1957

Reg. Number	Serial Number	Reg. Date	1,070,559	73/063,538	08/02/1977
649,698	72/012,288	08/06/1957	1,070,564	73/049,074	08/02/1977
649,705	72/022,579	08/06/1957	1,070,565	73/054,522	08/02/1977
649,726	72/000,727	08/06/1957	1,070,566	73/059,137	08/02/1977
649,732	72/020,862	08/06/1957	1,070,569	73/087,039	08/02/1977
649,736	71/697,121	08/06/1957	1,070,570	73/087,041	08/02/1977
649,737	72/001,337	08/06/1957	1,070,573	73/103,497	08/02/1977
649,741	72/010,153	08/06/1957	1,070,578	73/067,083	08/02/1977
649,742	72/010,298	08/06/1957	1,070,598	73/074,013	08/02/1977
649,743	72/010,932	08/06/1957	1,070,602	73/086,384	08/02/1977
649,746	72/012,095	08/06/1957	1,070,613	73/063,811	08/02/1977
649,748	72/015,237	08/06/1957	1,070,618	73/091,313	08/02/1977
649,762	72/018,001	08/06/1957	1,070,620	73/094,261	08/02/1977
649,765	72/019,939	08/06/1957	1,070,622	73/100,571	08/02/1977
649,767	72/020,231	08/06/1957	1,070,625	73/074,095	08/02/1977
649,768	72/020,232	08/06/1957	1,070,628	73/076,342	08/02/1977
649,775	72/020,818	08/06/1957	1,070,630	73/088,831	08/02/1977
649,776	72/020,930	08/06/1957	1,070,634	73/031,235	08/02/1977
649,780	71/663,854	08/06/1957	1,070,635	73/031,236	08/02/1977
649,785	72/016,102	08/06/1957	1,070,638	73/101,584	08/02/1977
649,792	72/019,232	08/06/1957	1,070,641	73/092,985	08/02/1977
649,797	71/680,687	08/06/1957	1,070,642	73/037,777	08/02/1977
649,804	72/004,114	08/06/1957	1,070,644	73/057,857	08/02/1977
649,805	72/005,361	08/06/1957	1,070,645	73/063,782	08/02/1977
649,810	72/012,811	08/06/1957	1,070,646	73/074,076	08/02/1977
649,817	72/013,969	08/06/1957	1,070,652	73/069,750	08/02/1977
649,825	72/018,672	08/06/1957	1,070,662	73/103,331	08/02/1977
649,827	72/018,853	08/06/1957	1,070,663	73/104,050	08/02/1977
649,828	72/018,892	08/06/1957	1,070,670	73/109,311	08/02/1977
649,831	72/019,320	08/06/1957	1,070,683	73/112,055	08/02/1977
649,832	72/019,335	08/06/1957	1,070,685	73/064,031	08/02/1977
649,833	72/019,360	08/06/1957	1,070,689	73/087,492	08/02/1977
649,835	72/018,135	08/06/1957	1,070,690	73/087,924	08/02/1977
649,841	72/016,783	08/06/1957	1,070,692	73/096,986	08/02/1977
649,845	71/690,401	08/06/1957	1,070,693	73/100,603	08/02/1977
649,846	71/692,974	08/06/1957	1,070,695	73/105,879	08/02/1977
649,850	72/005,653	08/06/1957	1,070,696	73/105,880	08/02/1977
649,852	72/015,041	08/06/1957	1,070,701	73/059,149	08/02/1977
649,854	72/019,236	08/06/1957	1,070,702	73/061,576	08/02/1977
649,857	71/656,096	08/06/1957	1,070,703	73/063,103	08/02/1977
649,864	72/018,095	08/06/1957	1,070,704	73/063,783	08/02/1977
649,873	72/015,085	08/06/1957	1,070,706	73/072,260	08/02/1977
649,881	71/641,930	08/06/1957	1,070,710	73/083,681	08/02/1977
649,883	72/011,811	08/06/1957	1,070,711	73/088,010	08/02/1977
649,887	72/013,735	08/06/1957	1,070,717	73/106,398	08/02/1977
649,904	71/694,354	08/06/1957	1,070,718	73/106,926	08/02/1977
1,058,452	73/045,354	02/08/1977	1,070,719	73/106,927	08/02/1977
1,070,466	73/078,802	08/02/1977	1,070,723	73/107,346	08/02/1977
1,070,477	73/099,736	08/02/1977	1,070,724	73/058,390	08/02/1977
1,070,481	73/104,335	08/02/1977	1,070,725	73/074,075	08/02/1977
1,070,483	73/106,830	08/02/1977	1,070,726	73/080,746	08/02/1977
1,070,485	73/108,435	08/02/1977	1,070,727	73/091,048	08/02/1977
1,070,486	73/108,436	08/02/1977	1,070,728	73/093,660	08/02/1977
1,070,488	73/086,920	08/02/1977	1,070,729	73/104,358	08/02/1977
1,070,492	73/090,917	08/02/1977	1,070,730	73/104,537	08/02/1977
1,070,493	73/096,600	08/02/1977	1,070,731	73/104,895	08/02/1977
1,070,495	73/107,141	08/02/1977	1,070,747	73/026,745	08/02/1977
1,070,501	73/098,718	08/02/1977	1,070,749	73/060,931	08/02/1977
1,070,503	73/100,278	08/02/1977	1,070,751	73/066,254	08/02/1977
1,070,506	73/104,718	08/02/1977	1,070,752	73/075,273	08/02/1977
1,070,507	73/105,670	08/02/1977	1,070,754	73/084,756	08/02/1977
1,070,509	73/109,287	08/02/1977	1,070,760	73/104,572	08/02/1977
1,070,511	73/073,051	08/02/1977	1,070,762	73/108,281	08/02/1977
1,070,512	73/080,144	08/02/1977	1,070,764	73/076,229	08/02/1977
1,070,515	73/085,167	08/02/1977	1,070,769	73/103,509	08/02/1977
1,070,516	73/085,712	08/02/1977	1,070,770	73/103,511	08/02/1977
1,070,517	73/086,654	08/02/1977	1,070,772	73/060,075	08/02/1977
1,070,527	73/092,931	08/02/1977	1,070,773	73/084,347	08/02/1977
1,070,528	73/096,762	08/02/1977	1,070,782	73/030,005	08/02/1977
1,070,530	73/093,325	08/02/1977	1,070,785	73/107,652	08/02/1977
1,070,531	73/047,438	08/02/1977	1,070,787	73/047,439	08/02/1977
1,070,532	73/052,466	08/02/1977	1,070,790	73/069,948	08/02/1977
1,070,534	73/063,015	08/02/1977	1,070,791	73/075,805	08/02/1977
1,070,538	73/074,794	08/02/1977	1,070,793	73/082,844	08/02/1977
1,070,544	73/095,957	08/02/1977	1,070,795	73/090,476	08/02/1977
1,070,550	73/101,176	08/02/1977	1,070,804	72/441,235	08/02/1977
			1,070,805	72/461,243	08/02/1977



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JUNE 30, 1998

Reg. Number	Serial Number	Reg. Date
1,070,806	72/436,967	08/02/1977
1,074,223	73/060,882	09/27/1977

Notice Regarding Technical Center  
Box Issue Fee Mailings

The Office will begin mailing address labels with the PTOL-85, "Notice of Allowance and Issue Fee Due" for patent applications allowed in all Technology Centers. These address labels should be used to ensure proper routing of post-allowance correspondence. This directive supersedes the "Special Boxes for Patent Mail" instruction. Any Notice of Allowance and Issue Fee Due received without the accompanying address labels should continue to be addressed to Box Issue Fee.

March 11, 1998

NICHOLAS P. GODICI  
Deputy Assistant Commissioner  
for Patents (Acting)

Service by Publication

A petition to cancel the registration identified below having been filed, and the notice of such proceeding sent by certified mail to registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrant listed herein, its assigns or legal representatives, shall enter an appearance within thirty days of this publication, the cancellation will proceed as in the case of default.

The Nut Factory, Ltd., Albany, N.Y., Reg. No. 1,233,773 for the mark "NUT FACTORY", Cancellation No. 27,330.

KATRINA PETERSON  
Supervisory Legal Assistant  
Trademark Trial and Appeal Board, for  
ROBERT M. ANDERSON  
Deputy Assistant Commissioner  
for Trademarks

Reclassification Alert Report

This report is a summary of classification changes which became effective by issuance of Classification Orders from April through June 1998. Information includes:

- subclasses established or abolished (major changes)
- subclass title, indent, or position change
- changes to existing classes and subclass definitions (minor changes)

This Reclassification Alert Report may appear from time to time in the Official Gazette and is intended to provide an interim notice of classification changes pending publication of the Manual of Classification and revisions thereto.

The general public may purchase copies of Classification Orders or Classification Definitions by contacting the Editorial Division at 703-305-6101 or 703-305-5099. Payment can be made through a Deposit Account, or by check made payable to "Commissioner of Patents and Trademarks" and sent to:

Chief, Editorial Division  
Office of Classification Support  
U.S. Patent and Trademark Office  
Crystal Mall 2, Room 303  
Washington, D.C. 20231

June 2, 1998

FREDERICK R. SCHMIDT  
Administrator for Search and  
Information Resources

RECLASSIFICATION ALERT REPORT

APRIL - JUNE 1998

CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	ORDER NUMBER
2			DEFN. CHANGE	1688
4			DEFN. CHANGE	1691
5			DEFN. CHANGE	1684
5			DEFN. CHANGE	1685
5	901		ESTABLISH	1691
5	911		ESTABLISH	1691
5	913		TITLE CHANGE	1691
5	910		POSITION CHANGE	1691
15			DEFN. CHANGE	1685
16			DEFN. CHANGE	1685
16			DEFN. CHANGE	1691
19			DEFN. CHANGE	1690
24			DEFN. CHANGE	1690
24			DEFN. CHANGE	1691
28			DEFN. CHANGE	1690
29			DEFN. CHANGE	1689
29			DEFN. CHANGE	1690

JUNE 30, 1998

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CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	ORDER NUMBER
29			DEFN. CHANGE	1691
30			DEFN. CHANGE	1690
33			DEFN. CHANGE	1687
34			DEFN. CHANGE	1691
40			DEFN. CHANGE	1696
43			DEFN. CHANGE	1690
47			DEFN. CHANGE	1691
48			DEFN. CHANGE	1694
52			DEFN. CHANGE	1685
52			DEFN. CHANGE	1691
53			DEFN. CHANGE	1691
53			DEFN. CHANGE	1697
56			DEFN. CHANGE	1685
57			DEFN. CHANGE	1690
60			DEFN. CHANGE	1687
60			DEFN. CHANGE	1691
60			DEFN. CHANGE	1694
62			DEFN. CHANGE	1687
62			DEFN. CHANGE	1691
65			DEFN. CHANGE	1687
66			DEFN. CHANGE	1690
68			DEFN. CHANGE	1690
72			DEFN. CHANGE	1691
73			DEFN. CHANGE	1687
74			DEFN. CHANGE	1685
74			DEFN. CHANGE	1690
83			DEFN. CHANGE	1690
84			DEFN. CHANGE	1684
84			DEFN. CHANGE	1687
87			DEFN. CHANGE	1690
89			DEFN. CHANGE	1685
92			DEFN. CHANGE	1691
99			DEFN. CHANGE	1691
105			DEFN. CHANGE	1685
109			DEFN. CHANGE	1691
111			DEFN. CHANGE	1685
112			DEFN. CHANGE	1690
116			DEFN. CHANGE	1685
119			DEFN. CHANGE	1691
123	186.1		ABOLISH	1694
123	406	428	ABOLISH	1694
123	568	571	ABOLISH	1694
123	602		ABOLISH	1694
123	406.11	406.19	ESTABLISH	1694
123	406.2		ESTABLISH	1694
123	406.21	406.29	ESTABLISH	1694
123	406.3		ESTABLISH	1694
123	406.31	406.39	ESTABLISH	1694
123	406.4		ESTABLISH	1694
123	406.41	406.49	ESTABLISH	1694
123	406.5		ESTABLISH	1694
123	406.51	406.59	ESTABLISH	1694
123	406.6		ESTABLISH	1694
123	406.61	406.69	ESTABLISH	1694
123	406.7		ESTABLISH	1694
123	406.71	406.76	ESTABLISH	1694
123	568.11	568.19	ESTABLISH	1694
123	568.2		ESTABLISH	1694
123	568.21	568.29	ESTABLISH	1694
123	568.3		ESTABLISH	1694
123	568.31		ESTABLISH	1694
123	568.32		ESTABLISH	1694
126			DEFN. CHANGE	1691
135			DEFN. CHANGE	1688
137			DEFN. CHANGE	1687
137			DEFN. CHANGE	1689
137			DEFN. CHANGE	1691
140			DEFN. CHANGE	1690
150			DEFN. CHANGE	1685
150			DEFN. CHANGE	1691
156			DEFN. CHANGE	1690
159			DEFN. CHANGE	1691
160			DEFN. CHANGE	1690
165			DEFN. CHANGE	1691
166			DEFN. CHANGE	1687
171			DEFN. CHANGE	1685

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CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	ORDER NUMBER
172			DEFN. CHANGE	1685
173			DEFN. CHANGE	1685
175			DEFN. CHANGE	1687
177			DEFN. CHANGE	1687
178			DEFN. CHANGE	1684
180			DEFN. CHANGE	1685
181			DEFN. CHANGE	1684
187			DEFN. CHANGE	1687
187			DEFN. CHANGE	1696
188			DEFN. CHANGE	1685
192			DEFN. CHANGE	1690
200			DEFN. CHANGE	1690
201			DEFN. CHANGE	1689
204			DEFN. CHANGE	1687
206			DEFN. CHANGE	1691
210			DEFN. CHANGE	1687
212			DEFN. CHANGE	1696
215			DEFN. CHANGE	1691
217			DEFN. CHANGE	1691
219			DEFN. CHANGE	1691
220			DEFN. CHANGE	1685
220	400	470	ABOLISH	1691
220	1.6		ESTABLISH	1691
220	9.4		ESTABLISH	1691
220	23.87	23.89	ESTABLISH	1691
220	23.9		ESTABLISH	1691
220	23.91		ESTABLISH	1691
220	62.11	62.19	ESTABLISH	1691
220	62.2		ESTABLISH	1691
220	62.21		ESTABLISH	1691
220	62.22		ESTABLISH	1691
220	495.01	495.09	ESTABLISH	1691
220	495.1		ESTABLISH	1691
220	495.11		ESTABLISH	1691
220	560.01	560.09	ESTABLISH	1691
220	560.1		ESTABLISH	1691
220	560.11	560.15	ESTABLISH	1691
220	567.1	567.3	ESTABLISH	1691
220	573.1	573.5	ESTABLISH	1691
220	574.2		ESTABLISH	1691
220	574.3		ESTABLISH	1691
220	592.01	592.09	ESTABLISH	1691
220	592.1		ESTABLISH	1691
220	592.11	592.19	ESTABLISH	1691
220	592.2		ESTABLISH	1691
220	592.21	592.28	ESTABLISH	1691
220	694.1		ESTABLISH	1691
220	908.1	908.3	ESTABLISH	1691
220	915.1		ESTABLISH	1691
220	915.2		ESTABLISH	1691
220	917	921	ESTABLISH	1691
220	345	347	ABOLISH	1697
220	359		ABOLISH	1697
220	345.1	345.6	ESTABLISH	1697
220	359.1	359.5	ESTABLISH	1697
221			DEFN. CHANGE	1691
222			DEFN. CHANGE	1691
222			DEFN. CHANGE	1697
225			DEFN. CHANGE	1690
226			DEFN. CHANGE	1690
228			DEFN. CHANGE	1691
229	3.1		ABOLISH	1691
229	3.5		ABOLISH	1691
229	23		ABOLISH	1691
229	5.81	5.85	ESTABLISH	1691
229	103.11		ESTABLISH	1691
229	117.27	117.29	ESTABLISH	1691
229	117.3		ESTABLISH	1691
229	117.31	117.35	ESTABLISH	1691
229	122.21	122.29	ESTABLISH	1691
229	122.3		ESTABLISH	1691
229	122.31	122.34	ESTABLISH	1691
229	164.1		ESTABLISH	1691
229	164.2		ESTABLISH	1691
229	185.1		ESTABLISH	1691
229	199.1		ESTABLISH	1691

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CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	ORDER NUMBER
229	941		ESTABLISH	1691
229	942		ESTABLISH	1691
229	4.5		POSITION CHANGE	1691
229	5.5	5.8	POSITION CHANGE	1691
229	67		POSITION CHANGE	1691
229	93		POSITION CHANGE	1691
229	4.5		INDENT CHANGE	1691
229	5.5	5.8	INDENT CHANGE	1691
229	67		INDENT CHANGE	1691
229	93		INDENT CHANGE	1691
235			DEFN. CHANGE	1697
241			DEFN. CHANGE	1687
242			DEFN. CHANGE	1691
242	16	18	ABOLISH	1690
242	18.1		ABOLISH	1690
242	19	26	ABOLISH	1690
242	26.1	26.4	ABOLISH	1690
242	26.41	26.45	ABOLISH	1690
242	26.5		ABOLISH	1690
242	27		ABOLISH	1690
242	27.1		ABOLISH	1690
242	28	35	ABOLISH	1690
242	35.5		ABOLISH	1690
242	35.6		ABOLISH	1690
242	36	43	ABOLISH	1690
242	43.1		ABOLISH	1690
242	43.2		ABOLISH	1690
242	46		ABOLISH	1690
242	46.2		ABOLISH	1690
242	46.21		ABOLISH	1690
242	46.3	46.8	ABOLISH	1690
242	47		ABOLISH	1690
242	47.01	47.13	ABOLISH	1690
242	47.5		ABOLISH	1690
242	48	53	ABOLISH	1690
242	158		ABOLISH	1690
242	158.1	158.5	ABOLISH	1690
242	364.11		ESTABLISH	1690
242	364.12		ESTABLISH	1690
242	364.4	364.9	ESTABLISH	1690
242	365		ESTABLISH	1690
242	365.1	365.9	ESTABLISH	1690
242	366		ESTABLISH	1690
242	366.1	366.9	ESTABLISH	1690
242	388.9		ESTABLISH	1690
242	388.91		ESTABLISH	1690
242	472.1	472.9	ESTABLISH	1690
242	473		ESTABLISH	1690
242	473.1	473.9	ESTABLISH	1690
242	474		ESTABLISH	1690
242	474.1	474.9	ESTABLISH	1690
242	475		ESTABLISH	1690
242	475.1	475.9	ESTABLISH	1690
242	476		ESTABLISH	1690
242	476.1	476.9	ESTABLISH	1690
242	477		ESTABLISH	1690
242	477.1	477.9	ESTABLISH	1690
242	478		ESTABLISH	1690
242	478.1	478.9	ESTABLISH	1690
242	480		ESTABLISH	1690
242	480.1	480.9	ESTABLISH	1690
242	481		ESTABLISH	1690
242	481.1	481.9	ESTABLISH	1690
242	482		ESTABLISH	1690
242	482.1	482.9	ESTABLISH	1690
242	483		ESTABLISH	1690
242	483.1	483.9	ESTABLISH	1690
242	484		ESTABLISH	1690
242	484.1	484.9	ESTABLISH	1690
242	485		ESTABLISH	1690
242	485.1	485.9	ESTABLISH	1690
242	486		ESTABLISH	1690
242	486.1	486.9	ESTABLISH	1690
242	487		ESTABLISH	1690
242	487.1	487.9	ESTABLISH	1690



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CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	ORDER NUMBER
242	488		ESTABLISH	1690
242	920		ESTABLISH	1690
242	364.2		TITLE CHANGE	1690
242	364.2		INDENT CHANGE	1690
242	364.3		INDENT CHANGE	1690
242			DEFN. CHANGE	1691
244			DEFN. CHANGE	1691
246			DEFN. CHANGE	1696
248			DEFN. CHANGE	1684
249			DEFN. CHANGE	1691
250			DEFN. CHANGE	1687
250			DEFN. CHANGE	1690
254			DEFN. CHANGE	1685
267			DEFN. CHANGE	1685
280	6.1		ABOLISH	1685
280	6.11		ABOLISH	1685
280	6.12		ABOLISH	1685
280	93		ABOLISH	1685
280	94		ABOLISH	1685
280	95.1		ABOLISH	1685
280	96		ABOLISH	1685
280	96.1		ABOLISH	1685
280	96.3		ABOLISH	1685
280	97		ABOLISH	1685
280	109	111	ABOLISH	1685
280	112.1		ABOLISH	1685
280	112.2		ABOLISH	1685
280	113	123	ABOLISH	1685
280	125	138	ABOLISH	1685
280	660	675	ABOLISH	1685
280	688	726	ABOLISH	1685
280	772		ABOLISH	1685
280	840		ABOLISH	1685
280	846		ABOLISH	1685
280	5.5		ESTABLISH	1685
280	5.501	5.509	ESTABLISH	1685
280	5.51		ESTABLISH	1685
280	5.511	5.519	ESTABLISH	1685
280	5.52		ESTABLISH	1685
280	5.521	5.524	ESTABLISH	1685
280	6.15		ESTABLISH	1685
280	6.151	6.159	ESTABLISH	1685
280	6.16		ESTABLISH	1685
280	86.1		ESTABLISH	1685
280	86.5		ESTABLISH	1685
280	86.75		ESTABLISH	1685
280	86.751	86.758	ESTABLISH	1685
280	89.1		ESTABLISH	1685
280	89.11	89.13	ESTABLISH	1685
280	93.5		ESTABLISH	1685
280	93.501	93.509	ESTABLISH	1685
280	93.51		ESTABLISH	1685
280	93.511	93.515	ESTABLISH	1685
280	124.1		ESTABLISH	1685
280	124.101	124.109	ESTABLISH	1685
280	124.11		ESTABLISH	1685
280	124.111	124.119	ESTABLISH	1685
280	124.12		ESTABLISH	1685
280	124.121	124.129	ESTABLISH	1685
280	124.13		ESTABLISH	1685
280	124.131	124.139	ESTABLISH	1685
280	124.14		ESTABLISH	1685
280	124.141	124.149	ESTABLISH	1685
280	124.15		ESTABLISH	1685
280	124.151	124.159	ESTABLISH	1685
280	124.16		ESTABLISH	1685
280	124.161	124.169	ESTABLISH	1685
280	124.17		ESTABLISH	1685
280	124.171	124.179	ESTABLISH	1685
280	137.5		ESTABLISH	1685
280	137.501	137.507	ESTABLISH	1685
280	400		TITLE CHANGE	1685
280	781		TITLE CHANGE	1685
280	87.1		POSITION CHANGE	1685
280	87.2		POSITION CHANGE	1685
280	88		POSITION CHANGE	1685

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CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	ORDER NUMBER
280	89		POSITION CHANGE	1685
280	90		POSITION CHANGE	1685
280	91.1		POSITION CHANGE	1685
280	92		POSITION CHANGE	1685
280	771		POSITION CHANGE	1685
280	773	780	POSITION CHANGE	1685
280			DEFN. CHANGE	1696
285			DEFN. CHANGE	1691
289			DEFN. CHANGE	1690
296			DEFN. CHANGE	1696
301			DEFN. CHANGE	1685
312			DEFN. CHANGE	1691
313			DEFN. CHANGE	1691
315			DEFN. CHANGE	1696
320			DEFN. CHANGE	1696
324			DEFN. CHANGE	1687
324			DEFN. CHANGE	1690
327			DEFN. CHANGE	1687
332			DEFN. CHANGE	1684
333			DEFN. CHANGE	1684
335			DEFN. CHANGE	1684
336			DEFN. CHANGE	1684
337			DEFN. CHANGE	1684
340			DEFN. CHANGE	1684
340			DEFN. CHANGE	1687
340			DEFN. CHANGE	1690
340			DEFN. CHANGE	1696
341			DEFN. CHANGE	1687
342			DEFN. CHANGE	1687
343			DEFN. CHANGE	1687
348			DEFN. CHANGE	1687
351			DEFN. CHANGE	1684
351			DEFN. CHANGE	1692
356	900	958	ESTABLISH	1686
356			DEFN. CHANGE	1687
356			DEFN. CHANGE	1690
356			DEFN. CHANGE	1691
356			DEFN. CHANGE	1696
359			DEFN. CHANGE	1687
359			DEFN. CHANGE	1696
360			DEFN. CHANGE	1687
360			DEFN. CHANGE	1698
361			DEFN. CHANGE	1684
362	61	80	ABOLISH	1696
362	80.01		ABOLISH	1696
362	81	83	ABOLISH	1696
362	83.1	83.3	ABOLISH	1696
362	459	532	ESTABLISH	1696
362	534	549	ESTABLISH	1696
364	420	422	ABOLISH	1687
364	480	487	ABOLISH	1687
364	492	511	ABOLISH	1687
364	524	527	ABOLISH	1687
364	550		ABOLISH	1687
364	551.01		ABOLISH	1687
364	551.02		ABOLISH	1687
364	552	570	ABOLISH	1687
364	571.01	571.08	ABOLISH	1687
364	572	577	ABOLISH	1687
364	579	582	ABOLISH	1687
364	528		ESTABLISH	1687
364	528.01	528.09	ESTABLISH	1687
364	528.1		ESTABLISH	1687
364	528.11	528.19	ESTABLISH	1687
364	528.2		ESTABLISH	1687
364	528.21	528.29	ESTABLISH	1687
364	528.3		ESTABLISH	1687
364	528.31	528.39	ESTABLISH	1687
364	528.4		ESTABLISH	1687
364	528.41		ESTABLISH	1687
364	578		TITLE CHANGE	1687
364	488	491	INDENT CHANGE	1687
364	512		INDENT CHANGE	1687
364	578		INDENT CHANGE	1687
365			DEFN. CHANGE	1687
367			DEFN. CHANGE	1687

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CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	ORDER NUMBER
368			DEFN. CHANGE	1687
369			DEFN. CHANGE	1698
370			DEFN. CHANGE	1687
375			DEFN. CHANGE	1687
376			DEFN. CHANGE	1687
377			DEFN. CHANGE	1687
378			DEFN. CHANGE	1687
379			DEFN. CHANGE	1684
379	67		ABOLISH	1698
379	88		ABOLISH	1698
379	89		ABOLISH	1698
379	67.1		ESTABLISH	1698
379	88.01	88.09	ESTABLISH	1698
379	88.1		ESTABLISH	1698
379	88.11	88.19	ESTABLISH	1698
379	88.2		ESTABLISH	1698
379	88.21	88.28	ESTABLISH	1698
379	900	917	ESTABLISH	1698
381	24		ABOLISH	1684
381	25		ABOLISH	1684
381	68		ABOLISH	1684
381	68.1	68.7	ABOLISH	1684
381	69		ABOLISH	1684
381	69.1		ABOLISH	1684
381	69.2		ABOLISH	1684
381	88		ABOLISH	1684
381	90		ABOLISH	1684
381	153	159	ABOLISH	1684
381	168		ABOLISH	1684
381	169		ABOLISH	1684
381	183		ABOLISH	1684
381	187		ABOLISH	1684
381	188		ABOLISH	1684
381	192	205	ABOLISH	1684
381	300	433	ESTABLISH	1684
381	89		TITLE CHANGE	1684
381	91		TITLE CHANGE	1684
381	91		INDENT CHANGE	1684
381			DEFN. CHANGE	1687
382			DEFN. CHANGE	1687
383			DEFN. CHANGE	1691
385			DEFN. CHANGE	1690
386			DEFN. CHANGE	1687
386			DEFN. CHANGE	1698
392			DEFN. CHANGE	1691
395			DEFN. CHANGE	1687
396			DEFN. CHANGE	1687
396			DEFN. CHANGE	1688
399			DEFN. CHANGE	1687
403	109		ABOLISH	1692
403	322		ABOLISH	1692
403	374		ABOLISH	1692
403	379		ABOLISH	1692
403	109.1	109.8	ESTABLISH	1692
403	322.1	322.4	ESTABLISH	1692
403	374.1	374.5	ESTABLISH	1692
403	379.1	379.6	ESTABLISH	1692
404			DEFN. CHANGE	1685
410			DEFN. CHANGE	1691
414	786		ABOLISH	1689
414	800	816	ESTABLISH	1689
415			DEFN. CHANGE	1687
425			DEFN. CHANGE	1690
426			DEFN. CHANGE	1691
427			DEFN. CHANGE	1690
428			DEFN. CHANGE	1691
430			DEFN. CHANGE	1690
431			DEFN. CHANGE	1687
432			DEFN. CHANGE	1691
435			DEFN. CHANGE	1687
436			DEFN. CHANGE	1687
446			DEFN. CHANGE	1685
451			DEFN. CHANGE	1690
454			DEFN. CHANGE	1691
455			DEFN. CHANGE	1698
463			DEFN. CHANGE	1688

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CLASS	FIRST SUBCLASS	LAST SUBCLASS	ACTION	ORDER NUMBER
464			DEFN. CHANGE	1694
473			DEFN. CHANGE	1688
505			DEFN. CHANGE	1684
523			DEFN. CHANGE	1687
588			DEFN. CHANGE	1691
600			DEFN. CHANGE	1684
607			DEFN. CHANGE	1691
701			DEFN. CHANGE	1685
701			DEFN. CHANGE	1694
702	1	36	ESTABLISH	1687
702	38	191	ESTABLISH	1687
702	193	199	ESTABLISH	1687
704			DEFN. CHANGE	1687
705			DEFN. CHANGE	1687
711			DEFN. CHANGE	1687
D02			DEFN. CHANGE	1688
D03	328.1		ESTABLISH	1688
D03	328		TITLE CHANGE	1688
D03			DEFN. CHANGE	1693
D04			DEFN. CHANGE	1688
D05			DEFN. CHANGE	1688
D06	552		TITLE CHANGE	1688
D06	580		TITLE CHANGE	1688
D06	406		ABOLISH	1693
D06	406.1	406.6	ESTABLISH	1693
D07			DEFN. CHANGE	1688
D07	550	554	ABOLISH	1693
D07	550.1		ESTABLISH	1693
D07	551.1	551.3	ESTABLISH	1693
D07	552.1		ESTABLISH	1693
D07	552.2		ESTABLISH	1693
D07	553.1	553.8	ESTABLISH	1693
D07	554.1	554.4	ESTABLISH	1693
D07	900		ESTABLISH	1693
D07	901		ESTABLISH	1693
D08			DEFN. CHANGE	1688
D09	434		TITLE CHANGE	1688
D09	526		TITLE CHANGE	1688
D10			DEFN. CHANGE	1688
D11			DEFN. CHANGE	1688
D12	7		TITLE CHANGE	1688
D12	400		TITLE CHANGE	1688
D12	414.1		ESTABLISH	1693
D12	426.1		ESTABLISH	1693
D13			DEFN. CHANGE	1688
D14	115.1		ESTABLISH	1688
D14	117.1	117.9	ESTABLISH	1688
D15			DEFN. CHANGE	1688
D16			DEFN. CHANGE	1688
D17			DEFN. CHANGE	1688
D19			DEFN. CHANGE	1688
D21	1	255	ABOLISH	1688
D21	300	840	ESTABLISH	1688
D21	900		ESTABLISH	1688
D22			DEFN. CHANGE	1688
D23			DEFN. CHANGE	1688
D24			DEFN. CHANGE	1688
D24			DEFN. CHANGE	1693
D25			DEFN. CHANGE	1688
D28	64		ABOLISH	1693
D28	44.1		ESTABLISH	1693
D28	44.2		ESTABLISH	1693
D28	65	68	ESTABLISH	1693
D28	91.2		ESTABLISH	1693
D28	8	10	TITLE CHANGE	1693
D28	20		TITLE CHANGE	1693
D28	27		TITLE CHANGE	1693
D28	28		TITLE CHANGE	1693
D28	37		TITLE CHANGE	1693
D28	44		TITLE CHANGE	1693
D28	45		TITLE CHANGE	1693
D28	52		TITLE CHANGE	1693
D28	73		TITLE CHANGE	1693
D28	91.1		TITLE CHANGE	1693
D29			DEFN. CHANGE	1688
D32			DEFN. CHANGE	1688



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CLASS	FIRST SUBCLASS		LAST SUBCLASS		ACTION		ORDER NUMBER	
D34 D99					DEFN. CHANGE DEFN. CHANGE		1688 1688	
Certificates of Correction for June 30, 1998					5,685,712 5,686,602 5,686,786 5,687,469 5,687,793 5,687,847 5,689,501 5,690,399 5,708,151 5,690,612 5,690,925 5,691,140 5,691,494 5,691,589 5,692,471 5,692,574 5,692,900 5,711,850 5,711,917 5,694,255 5,712,354 5,696,284 5,697,566 5,698,843 5,699,409 5,699,616 5,700,169 5,700,632 5,701,041 5,701,279 5,701,344 5,715,779 5,715,976 5,701,495 5,716,585 5,701,571 5,717,214 5,701,579 5,702,855 5,703,259 5,703,397 5,703,742 5,703,747 5,703,842 5,718,621 5,704,005	5,704,230 5,706,077 5,706,104 5,706,368 5,707,210 5,707,583 5,707,751 5,708,124 5,708,151 5,708,537 5,709,071 5,709,517 5,710,121 5,710,198 5,711,023 5,711,204 5,711,850 5,711,917 5,712,354 5,712,565 5,713,237 5,713,262 5,713,541 5,713,829 5,714,185 5,714,425 5,714,451 5,715,088 5,715,779 5,716,585 5,717,214 5,717,281 5,717,463 5,717,541 5,717,559 5,718,104 5,718,408 5,718,621 5,718,703	5,718,771 5,718,866 5,719,701 5,720,016 5,720,017 5,721,204 5,722,316 5,722,778 5,722,842 5,722,877 5,724,458 5,725,487 5,725,750 5,725,802 5,726,552 5,726,604 5,727,751 5,726,849 5,727,520 5,727,613 5,728,372 5,729,875 5,730,355 5,730,573 5,730,577 5,730,825 5,731,734 5,732,132 5,732,357 5,732,635 5,732,711 5,733,093 5,733,329 5,733,330 5,733,382 5,733,681 5,733,876 5,733,908 5,734,004 5,734,058	5,734,906 5,734,993 5,735,552 5,735,554 5,735,557 5,735,734 5,736,079 5,736,345 5,736,440 5,736,476 5,736,690 5,736,987 5,737,608 5,737,611 5,737,634 5,737,740 5,737,775 5,738,016 5,738,277 5,739,245 5,739,336 5,739,689 5,739,814 5,741,069 5,741,338 5,741,382 5,741,488 5,741,781 5,741,870 5,745,072 5,745,166 5,745,668 5,746,197 5,747,269 5,747,558 5,747,614 5,748,852

JUNE 30, 1998

U.S. PATENT AND TRADEMARK OFFICE

1211 OG 127

Summary of Final Decisions Issued by the Trademark Trial and Appeal Board  
May 11-15, 1998

Date Issued	Type of Case <sup>(1)</sup>	Proceeding or App'n No.	Party/Parties	Issue	TTAB Decision	Opposer's/Petitioner's Mark and Goods/Services	Applicant's/Respondent's Mark and Goods/Services	Mark and Goods Cited by Examining Attorney	Citable as Precedent of TTAB
5-12	EX	74/652,795	Selmer Co., Inc.	2(d) (consent agreement)	Refusal Reversed		"BLACK BEAUTY" [snare drums]	"BLACK BEAUTY COWBELL" [musical instruments, namely, cowbells]	No

(1) EX=EX PARTE APPEAL; OPP=OPPOSITION; CANC=CANCELLATION; CU=CONCURRENT USE; (SD)=SUMMARY JUDGMENT; (R)=REQ. FOR RECONSIDERATION; (MD)=MOTION TO DISMISS; (MR)=MOTION TO REOPEN

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Washington, D.C. 20231

Box Designations	Explanation
Box 7	Reissue applications for patents involved in litigation and subsequently filed related papers.
Box 12	Contributions to the Examiner Education Program.
Box 313b	Petitions under 37 CFR 1.313(b) to withdraw a patent application from issue after payment of the issue fee and any papers associated with the petition, including papers necessary for filing a continuing application.
Box AF	Expedited procedure for processing amendments and other responses after final rejection.
Box Comments Patents	Public comments regarding patent related regulations and procedures.
Box CPA	Requests for Continued Prosecution Applications (CPA's) under 37 CFR 1.53(d).
Box DAC	Petitions decided by the Office of Petitions including petitions to revive and petitions to accept late payment of issue fees or maintenance fees.
Box DD	Disclosure Documents or materials related to the Disclosure Document Program.
Box Design	The filing of all design patent applications and any communications relating thereto.
Box Issue Fee	All communications following the receipt of a PTOL-85, "Notice of Allowance and Issue Fee Due," and prior to the issuance of a patent should be addressed to Box Issue Fee, unless advised to the contrary. Assignments are the exception. Assignments should be submitted in a separate envelope and not be sent to Box Issue Fee.
Box Missing Parts	Response to the Notice to File Missing Parts of Application and associated papers and fees.
Box MPEP	Submissions concerning the Manual of Patent Examining Procedures.
Box Non-Fee Amendment	Non-fee amendments to patent applications. (Use Box AF for responses after final rejection).
Box PATENT APPLICATION	New patent applications and associated papers and fees.
Box Patent Ext.	Applications for patent term extension and any communications relating thereto.
Box PCT	Mail related to applications filed under the Patent Cooperation Treaty.
Box Provisional Patent Application	The filing of all provisional patent applications and any communications relating thereto.
Box Reconstruction	Correspondence pertaining to the reconstruction of lost patent files.
Box Reexam	Requests for Reexamination for <i>original</i> request papers <i>only</i> .
Box Sequence	Submission of diskette for biotechnical application.
Box SN	For fee and petitions under 37 CFR 1.182 to obtain date received and/or serial number for patent applications <i>prior</i> to the Office's standard notification (return post card or the official "Filing Receipt," "Notice to File Missing Parts," or "Notice of Incomplete Application").

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2900 Crystal Drive  
Arlington, Virginia 22202-3513

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Box NEW APP FEE	New trademark applications and fees.
Box ITU FEE	Statements of Use (SOU's) and extension requests.
Box TTAB FEE	Oppositions, cancellation petitions, and ex parte appeals.
Box TTAB NO FEE	Interferences, motions, and extension requests.
Box STATUS NO FEE	Written status inquiries.
Box POST REG FEE	Affidavits, renewals, corrections and amendments.
Box RESPONSES NO FEE	Responses to Examining Attorneys' Office actions and Post Registration actions.

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Box Designations	Explanation
Box 3	Mail for the Office of Personnel from NFC.
Box 4	Mail for the Deputy Assistant Secretary of Commerce and Deputy Commissioner of Patents and Trademarks; Office of Legislative and International Affairs.
Box 6	Mail for the Office of Procurement.
Box 8	All papers for the Office of the Solicitor <i>except</i> communications relating to <i>pending litigation and disciplinary proceedings</i> ; papers relating to pending litigation in court cases shall be mailed only to Office of the Solicitor, P.O. Box 15667, Arlington, Virginia 22215 and papers relating to pending disciplinary proceedings before the Administrative Law Judge or the Commissioner shall be mailed only to the Office of the Solicitor, P.O. Box 16116, Arlington, Virginia 22215.
Box 9	Coupon orders for U.S. patent and trademark copies.
Box 10	Orders for certified copies of PTO documents.
Box 11	Electronic Ordering Service (EOS).
Box 13	Mail for the Employee and Labor Relations Division.
Box 14	Mail directed to the APS Contracts Office.
Box 16	Deposit Account Replenishment Checks.
Box 17	Invoices directed to the Office of Finance.
Box 171	Vacancy Announcement Applications.
Box Assignment	All assignment documents except those filed with new applications.
Box EEO	Mail for the Office of Civil Rights.
Box Interference	Communications relating to interferences and applications and patents involved in interference.
Box M Fee	Correspondence regarding patent maintenance fees and related matter.
Box OED	Mail for the Office of Enrollment and Discipline.



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The following libraries, designated as Patent and Trademark Depository Libraries (PTDLs), receive patent and trademark information from the U.S. Patent and Trademark Office. Many PTDLs have on file patents issued since 1790, trademarks published since 1872, and select collections of foreign patents. All PTDLs receive both the patent and trademark sections of the *Official Gazette of the U.S. Patent and Trademark Office* and numerical sets of patents in a variety of formats. Patent and trademark search systems in the Cassis CD-ROM series are available at all PTDLs to increase access to that information. It is through the CD-ROM systems and other depository materials that preliminary patent and trademark searches may be conducted through the numerically arranged collections.

Each PTDL offers reference publications which outline and provide access to the patent and trademark classification systems, as well as other documents and publications which supplement the basic search tools. PTDLs provide technical staff assistance in using all materials.

All information is available for use by the public free of charge. However, there may be charges associated with the use of on-line systems, photocopying and related services.

Since there are variations in the scope of patent and trademark collections among the PTDLs, and their hours of service to the public vary, anyone contemplating use of these collections at a particular library is urged to contact that library in advance about its collections, services, and hours in order to avert possible inconvenience.

Partnership PTDLs provide enhanced and expanded services for which fees are charged. They offer on-line patent text and image searching, on-line trademark searching, and videoconferencing for examiner interviews and workshops. They accept disclosure documents on site, order file wrappers, assignment documents and certified copies for their customers, and host a variety of seminars aimed at specific audiences, including practitioners, paralegals, and independent inventors. Currently, partnerships are located at the Great Lakes Patent and Trademark Center (GLPTC) at the Detroit Public Library in Detroit, Michigan and the Sunnyvale Center for Innovation, Invention and Ideas (SCI<sup>2</sup>) in Sunnyvale, California.

State	Name of Library	Telephone Contact
Alabama	Auburn University Libraries	(334) 844-1747
	Birmingham Public Library	(205) 226-3620
Alaska	Anchorage: Z.J. Loussac Public Library	(907) 562-7323
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7010
Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 228-7220
	Sacramento: California State Library	(916) 654-0069
	San Diego Public Library	(619) 236-5813
	San Francisco Public Library	(415) 557-4500
	Sunnyvale Center for Innovation, Invention and Ideas	(408) 730-7290
Colorado	Denver Public Library	(303) 640-6220
Connecticut	Hartford Public Library	Not Yet Operational
	New Haven Free Public Library	Not Yet Operational
Delaware	Newark: University of Delaware Library	(302) 831-2965
Dist. of Columbia	Washington: Howard University Libraries	(202) 806-7252
Florida	Fort Lauderdale: Broward County Main Library	(954) 357-7444
	Miami-Dade Public Library	(305) 375-2665
	Orlando: University of Central Florida Libraries	(407) 823-2562
	Tampa Campus Library, University of South Florida	(813) 974-2726
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Hawaii	Honolulu: Hawaii State Public Library System	(808) 586-3477
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 747-4450
	Springfield: Illinois State Library	(217) 782-5659
Indiana	Indianapolis-Marion County Public Library	(317) 269-1741
	West Lafayette Siegesmund Engineering Library, Purdue University	(765) 494-2872
Iowa	Des Moines: State Library of Iowa	(515) 281-4118
Kansas	Wichita: Ablah Library, Wichita State University	(316) 978-3155
Kentucky	Louisville Free Public Library	(502) 574-1611
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-8875
Maine	Orono: Raymond H. Fogler Library, University of Maine	(207) 581-1678
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 405-9157
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Media Union Library, University of Michigan	(313) 647-5735
	Big Rapids: Abigail S. Timme Library, Ferris State University	(616) 592-3602
	Detroit: Great Lakes Patent and Trademark Center	(313) 833-3379
Minnesota	Minneapolis Public Library and Information Center	(612) 630-6120
Mississippi	Jackson: Mississippi Library Commission	(601) 359-1036
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4281
Nebraska	Lincoln: Engineering Library, University of Nebraska-Lincoln	(402) 472-3411
Nevada	Reno: University of Nevada, Reno Library	(702) 784-6500 Ext. 257
New Hampshire	Concord: New Hampshire State Library	(603) 271-2239

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State	Name of Library	Telephone Contact
New Jersey	Newark Public Library	(201) 733-7782
	Piscataway: Library of Science and Medicine, Rutgers University	(908) 445-2895
New Mexico	Albuquerque: University of New Mexico General Library	(505) 277-4412
New York	Albany: New York State Library	(518) 474-5355
	Buffalo and Erie County Public Library	(716) 858-7101
	New York Public Library (The Research Libraries)	(212) 592-7000
	Stony Brook: Engineering Library, State University of New York	Not Yet Operational
North Carolina	Raleigh: D.H. Hill Library, North Carolina State University	(919) 515-3280
North Dakota	Grand Forks: Chester Fritz Library, University of North Dakota	(701) 777-4888
Ohio	Akron - Summit County Public Library	(330) 643-9075
	Cincinnati and Hamilton County, Public Library of	(513) 369-6971
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 292-6175
	Toledo/Lucas County Public Library	(419) 259-5212
Oklahoma	Stillwater: Oklahoma State University Center for International Trade Development	(405) 744-7086
Oregon	Portland: Paul L. Boley Law Library, Lewis & Clark College	(503) 768-6786
Pennsylvania	Philadelphia, The Free Library of	(215) 686-5331
	Pittsburgh, Carnegie Library of	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Puerto Rico	Mayaguez General Library, University of Puerto Rico	(787) 832-4040 Ext. 3459
Rhode Island	Providence Public Library	(401) 455-8027
South Carolina	Clemson University Libraries	(864) 656-3024
South Dakota	Rapid City: Devereaux Library, South Dakota School of Mines and Technology	(605) 394-1275
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	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
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West Virginia	Morgantown: Evansdale Library, West Virginia University	(304) 293-2510 Ext. 113
Wisconsin	Madison: Kurt F. Wendt Library, University of Wisconsin	(608) 262-6845
	Madison: Public Library	(414) 286-3051
Wyoming	Casper: Natrona County Public Library	(307) 237-4935

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PATENT EXAMINING CORPS

BRUCE A. LEHMAN, Commissioner  
LAWRENCE J. GOFFNEY Jr., Assistant Commissioner for Patents  
NICHOLAS P. GODICI, (Acting) Deputy Assistant Commissioner for Patents  
STEPHEN G. KUNIN, Deputy Assistant Commissioner for Patent Policy

PATENT EXAMINING GROUPS	Phone number Area Code 703	New Case Date*
<b>CHEMICAL EXAMINING GROUPS</b>		
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, ENGINEERING AND DESIGNS, GROUP 1100—THEODORE MORRIS, Director.....	308-0661	01/10/96
ORGANIC CHEMISTRY, DRUG, BIO-AFFECTING AND BODY TREATING COMPOSITION, GROUP 1200/2900—JOHN E. KITTLE, Director.....	308-1235	06/18/96
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 1300—RICHARD V. FISHER, Director.....	308-0651	07/15/96
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY STOCK MATERIALS AND COMPOSITIONS, GROUP 1500—MARY LEE, Acting Director.....	308-2351	05/20/96
BIOTECHNOLOGY, GROUP 1800—JOHN J. DOLL, Director.....	308-0196	11/09/95
<b>ELECTRICAL EXAMINING GROUPS</b>		
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 2100—STEWART LEVY, Director.....	308-1782	11/06/95
SPECIAL LAWS AND ADMINISTRATION, GROUP 2200—ROBERT E. GARRETT, Director.....	308-0511	04/12/96
COMPUTER SYSTEMS AND COMPUTER APPLICATION, GROUP 2300—JOSEPH J. ROLLA, Director.....	305-3900	04/12/96
SPECIAL COMPUTER APPLICATIONS: COMPUTER GRAPHICS, BUSINESS PRACTICES, & DIAGNOSTIC TESTING, GROUP 2400—GERALD GOLDBERG, Director.....	305-3900	12/15/95
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 2500—JANICE A. HOWELL, Director.....	308-0956	10/14/96
TELECOMMUNICATIONS, GROUP 2600—JIN F. NG, Director.....	305-3900	09/13/95
DESIGN, GROUP 2900—JOHN E. KITTLE, Director.....	305-3293	06/07/96
<b>MECHANICAL EXAMINING GROUPS</b>		
HANDLING AND TRANSPORTATION MEDIA, GROUP 3100—JOHN F. TERAPANE, JR., Director.....	308-1113	12/08/95
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 3200—ETHEL CROSS, Director.....	308-1148	02/04/97
MEDICAL INSTRUMENTS, DIAGNOSTIC EQUIPMENT AND TREATMENT DEVICES; SURGERY AND SURGICAL SUPPLIES; AMUSEMENT AND EXERCISING DEVICES; ANIMAL HUSBANDRY; SPORTING GOODS; TOBACCO PRODUCTS AND MANUFACTURING EQUIPMENT; AND PRINTING, GROUP 3300—J.J. LOVE, Director.....	308-0858	01/31/96
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 3400—DONALD G. KELLY, Director.....	308-0861	02/06/96
GENERAL CONSTRUCTION, PETROLEUM AND MINING ENGINEERING, GROUP 3500—A.L. SMITH, Director.....	308-2168	01/14/97

\*A communication from the examiner should have been received in most applications filed prior to this date.

Patents will Expire as Follows.

(1) The term of any utility or plant patent that is in force on or results from an application filed before June 8, 1995 is the greater of the 20 year term provided in 35 U.S.C. 154(a)(2) or 17 years from grant subject to any terminal disclaimers. 35 U.S.C. 154(e)(1).  
(2) All utility and plant patents granted on applications having an actual United States filing date on or after June 8, 1995 are granted for a term which begins on the date on which the patent is granted and ends 20 years from the date on which the application was filed in the United States. If the application contains a specific reference to an earlier application under 35 U.S.C. 120, 121 or 365(c), the patent term ends twenty years from that date on which the earliest application was filed. 35 U.S.C. 154(a)(2).  
(3) All design patents are granted for a term of 14 years from the date of the grant. However, the term of any patent may have been curtailed by disclaimer under the provisions of 35 U.S.C. 153, have lapsed due to failure to pay maintenance fees, or have been extended under the provisions of 35 U.S.C. 154, 155, or 156. Thus, if more reliable information is needed with respect to a particular patent, then the specific patent file should be reviewed to determine the actual date of patent expiration.

TRADEMARK OPERATION

Bruce A. Lehman, Commissioner  
Philip G. Hampton, II, Assistant Commissioner  
Robert M. Anderson, Deputy Assistant Commissioner  
David E. Bucher, Director, Trademark Examining Office  
Condition of Trademark Applications as of June 1, 1998

Law Office	Oldest Date	
	New*	Amendment Filed
Law Office 101—Ron Williams, Managing Attorney, (703) 308-9101—4th Floor Foods, Beverages, Wines & Spirits—Int. Classes 29, 30, 31, 32, 33 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	01/09/98	03/16/98
Law Office 102—Thomas Shaw, Acting Managing Attorney, (703) 308-9102—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	10/14/97	02/11/98
Law Office 103—Michael A. Szoke, Acting Managing Attorney, (703) 308-9103—5th Floor Scientific Equipment & Furniture—Int. Classes 9, 20 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	09/16/97	05/01/98
Law Office 104—Sidney Moskowitz, Managing Attorney, (703) 308-9104—6th Floor Unwrought metals, Industrial Equipment, Tools, Installation, Vehicles, Firearms, Musical Instruments, Building Materials & Floor Coverings—Int. Classes 6, 7, 8, 11, 12, 13, 15, 19, 27 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	08/21/97	03/05/98
Law Office 105—Thomas Howell, Managing Attorney, (703) 308-9105—6th Floor Chemicals, Paints, Lubricants, Pharmaceuticals, Medical Apparatus & Tobacco—Int. Classes 1, 2, 4, 5, 10, 34 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	10/14/97	02/12/98
Law Office 106—Mary Sparrow, Managing Attorney, (703) 308-9106—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	10/31/97	04/14/98
Law Office 107—Thomas Lamone, Managing Attorney, (703) 308-9107—7th Floor Cosmetics, Cleaning Preparations, Paper Products & Toys—Int. Classes 3, 16, 28 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	01/09/98	03/10/98
Law Office 108—David Shallant, Managing Attorney, (703) 308-9108—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	08/27/97	01/21/98
Law Office 109—Deborah Cohn, Managing Attorney, (703) 308-9109—8th Floor Precious metals, Fibers, Leather goods, Housewares, Cordage, Yarns, Fabrics, Clothing & Notions—Int. Classes 14, 17, 18, 21, 22, 23, 24, 25, 26 Services—Int. Classes 35, 36, 37, 38, 39, 40, 41, 42.....	08/21/97	04/14/98
**Collective Marks—Class 200 **Certification Marks—Classes A & B		
Office of Trademark Services—Terron Simms, Director, (703) 308-9100 Trademark Assistance Center—(703) 308-9000 Pre-Examination—Alan Lambert, Supervisor, (703) 308-9401 ext. 188 Intent-To-Use (ITU)—(703) 308-9500 Post Registration Section—Mary Bowman, Supervisor, (703) 308-9500 ext. 126 Affidavits Under Sections 8 & 15 (All Classes)..... Renewals (All Classes)..... Section 12(c) Publications (All Classes).....	04/20/98 04/20/98 03/16/98	—0— —0— —0—

- \*\* Assigned to all Law Office
- Applicants with inquiries concerning the status of their applications and a touch telephone should call (703) 305-8747 from 6:30 a.m. to Midnight EST, Monday through Friday. This automated voice system will provide the current status of your application. Applicants are urged not to file unnecessary inquiries concerning the status of their applications. See SECTION 411 of the TRADEMARK MANUAL OF EXAMINING PROCEDURE.
- \* These dates identify the oldest unassigned new case in each Law Office. All cases with earlier dates have either been examined and made the subject of an action or are currently being worked on by the assigned examining attorney.



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## REEXAMINATIONS

JUNE 30, 1998

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B2 4,544,584 (3558th)  
CULTURED ONYX PRODUCTS AND METHODS  
THEREFOR

Gilbert B. Ross, Northridge, and Theodore E. Stevens, Azusa, both of Calif., assignors to Spectrum 21 Licensing Corp., New York, N.Y.

Reexamination Request No. 90/004,277, Jun. 17, 1996.

Reexamination Certificate for Patent 4,544,584, issued Oct. 1, 1985, Ser. No. 572,358, Jan. 20, 1984.

Reexamination Certificate B1 4,544,584, issued Jan. 20, 1984. Division of Ser. No. 146,749, May 5, 1980, Pat. No. 4,433,070.

Int. Cl.<sup>6</sup> B44F 9/04; C08L 67/06

U.S. Cl. 428—15



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1-9 and 13 is confirmed.

Claims 10 and 12 are determined to be patentable as amended.

Claim 11, dependent on an amended claim, is determined to be patentable.

1. The method of manufacturing a cultured onyx, cultured marble, or like mineral-appearing surface structure which includes combining with a first hardenable synthetic organic resin portion, a second visually distinguishable pre-hardened particulate synthetic organic resin resin portion, said first resin portion being hardenable to a like hardness to said second resin portion, hardening said first resin portion with said second resin portion distributively disposed in situ therein to said like hardness in the desired form of said structure.

B1 4,818,410 (3559th)  
METHOD OF REMOVING WATER SOLUBLE ORGANICS  
FROM OIL PROCESS WATER

Thomas J. Bellos; Roy W. Greenlee, and Frederick T. Welge, all of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Reexamination Request No. 90/002,726, May 15, 1992.

Reexamination Certificate for Patent 4,818,410, issued Apr. 4, 1989, Ser. No. 143,438, Jan. 14, 1988.

Int. Cl.<sup>6</sup> C02F 1/26; B01D 17/05

U.S. Cl. 210—639

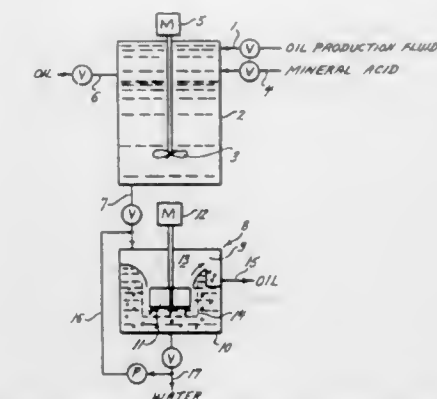
AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 7, 16 and 18 are cancelled.

Claims 1, 8-11 & 13-15 are determined to be patentable as amended.

Claims 2-6, 12, 17, 19 and 20, dependent on an amended claim, are determined to be patentable.

New claims 21 and 22 are added and determined to be patentable.



1. A method of removing water soluble organics from an oil well production fluid, which comprises crude oil and water, [process water] comprising the steps of:

- adding to the oil well production fluid [incorporating in the said water] a strong acid to adjust the pH of the [water] fluid to within the range of about 2-6;
- thereafter or simultaneously making intimate contact between the [acidified] water and oil phases with the result that the content of water soluble organics in the water is substantially reduced by being transferred from the water phase to the oil phase; and
- separating the oil phase and the water phase.

B1 5,030,356 (3560th)  
PROCESS FOR RECOVERING ORGANIC COMPONENTS  
FROM LIQUID STREAMS

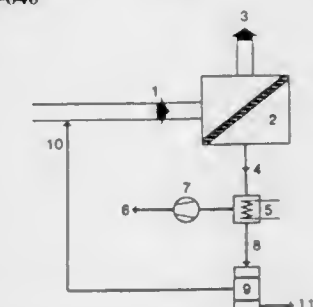
Ingo Blume, Hengelo, Netherlands, and Richard W. Baker, Palo Alto, Calif., assignors to Membrane Technology & Research, Inc., Menlo Park, Calif.

Reexamination Request No. 90/003,051, May 17, 1993.

Reexamination Certificate for Patent 5,030,356, issued Jul. 9, 1991, Ser. No. 359,739, May 31, 1989.

Int. Cl.<sup>6</sup> B01D 61/36

U.S. Cl. 210—640



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 1-12 are cancelled.

New claims 13-32 are added and determined to be patentable.

13. A separation process, comprising:

- performing a pervaporation step, said step comprising:
  - providing a membrane unit having a feed side and a permeate side;
  - contacting said feed side with a feedstream containing a dissolved organic component and a second component, said dissolved organic component being present in a concentration that is below saturation concentration of said dissolved organic component in said second component;

iii) withdrawing from said permeate side a permeate vapor enriched in said organic component compared with said feedstream;

iv) withdrawing from said feed side a non-permeating portion of said feedstream;

b) condensing said permeate vapor to form a two-phase permeate liquid;

c) decanting said permeate liquid to separate said two phases into a first phase having a concentration of said dissolved organic component of at least 90% and a second phase comprising said second component and saturated in said dissolved organic component;

d) returning said second phase to the feed side of said membrane unit, thereby mixing said dissolved organic component saturated second phase with said dissolved organic component unsaturated feedstream.

B1 5,108,745 (3561st)

#### TUBERCULOSIS AND LEGIONELLOSIS VACCINES AND METHODS FOR THEIR PRODUCTION

Marcus A. Horwitz, Los Angeles, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Reexamination Request No. 90/004,350, Sep. 3, 1996.

Reexamination Certificate for Patent 5,108,745, issued Apr. 28, 1992, Ser. No. 232,664, Aug. 16, 1988.

Int. Cl.<sup>6</sup> A61K 39/02; 39/04; C12N 15/00

U.S. Cl. 424—234.1

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–17 is confirmed.

1. A method for producing human vaccine against *Legionella pneumophila*, said method comprising the steps of:

identifying at least one extracellular product of *Legionella pneumophila* which stimulates strong cell mediated immune responses in at least one mammalian host infected with or immune to *Legionella pneumophila*; and

determining a human protective immunity inducing effective amount of said extracellular product.

B1 5,456,976 (3562nd)

#### RESILIENTLY PADDED LAMINATE CONSTRUCTION AND INJECTION MOLDED THERMOPLASTIC ARTICLES FACED THEREWITH

Louis J. LaMarca, II, Hampton Falls, and Paul R. Batts, Mont Vernon, both of N.H., assignors to The Haartz Corporation, Acton, Mass.

Reexamination Request Nos. 90/004,634, May 15, 1997 and 90/004,725, Aug. 5, 1997.

Reexamination Certificate for Patent 5,456,976, issued Oct. 10, 1995, Ser. No. 178,093, Jan. 6, 1994.

Continuation of Ser. No. 508, Jan. 5, 1993, abandoned.

Int. Cl.<sup>6</sup> B32B 3/26; 5/22

U.S. Cl. 442—221

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:



Claims 1–14 are cancelled.

[1. A flexible resiliently padded laminate in sheet form suitable for use as a facing material for the fabrication of injection molded articles having at least one soft, aesthetically pleasing padded surface and exhibiting enhanced resistance to degradation, under injection molding conditions, said laminate consisting of the following discrete elements:

(a) an aesthetically pleasing facing layer composed of a polymer film or textile material bonded to;

(b) a soft resilient cellular polyolefin intermediate layer, said intermediate cellular layer being, in turn, bonded to;

(c) a homogeneous non-cellular thermoplastic polyolefin film backing layer;

whereby said thermoplastic polyolefin film backing layer of said padded laminate is thermoplastically bondable directly to a compatible injection molding grade of a thermoplastic polymer melt injected into an injection mold containing said laminate therein and whereby said thermoplastic polyolefin film backing layer further confers enhanced resistance of said padded laminate to degradation during contact thereof with said melt under injection molding conditions.]

B1 5,492,547 (3563rd)

#### PROCESS FOR PREDICTING THE PHENOTYPIC TRAIT OF YIELD IN MAIZE

Richard Johnson, Urbana, Ill., assignor to Dekalb Genetics Corp., Dekalb, Ill.

Reexamination Request No. 90/004,474, Nov. 8, 1996.

Reexamination Certificate for Patent 5,492,547, issued Feb. 20, 1996, Ser. No. 121,391, Sep. 14, 1993.

Int. Cl.<sup>6</sup> A01H 1/00; C12N 15/00

U.S. Cl. 47—58

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims 1–7 is confirmed.

1. A process for predicting the phenotypic trait of yield in a plant of a progeny maize population through analysis of genotypes of a first and second single cross hybrid maize population, said process comprising the steps of:

(a) quantitatively assessing the distribution of said phenotypic trait of yield in members of said first plant population;

(b) genotyping members of both populations for an inherited genetic marker;

(c) evaluating said phenotypic trait in conjunction with the genotype of said first plant population to define an association between said phenotypic trait and said inherited genetic marker;

(d) predicting the value of the phenotypic trait of yield in progeny of said second plant population using said association; and

(e) selecting progeny of said second population based on said association.

## REISSUES

JUNE 30, 1998

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 35,830

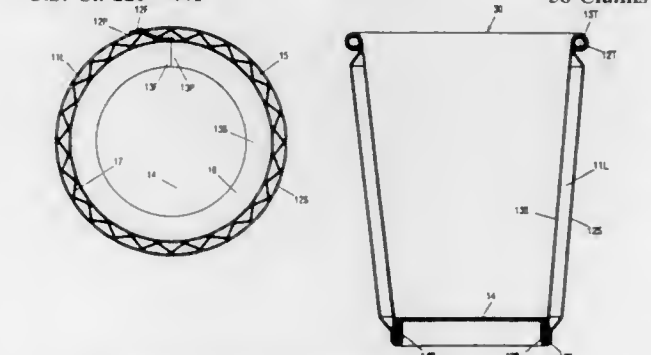
#### MULTI-LAYERED INSULATED CUP FORMED OF ONE CONTINUOUS SHEET

Claus E. Sadlier, San Francisco, Calif., assignor to Insul-Air Holdings, Inc., San Francisco, Calif.

Original No. 5,363,982, dated Nov. 15, 1994, Ser. No. 206,716, Mar. 7, 1994. Application for reissue Aug. 16, 1996, Ser. No. 689,928

Int. Cl.<sup>6</sup> B65D 3/22

U.S. Cl. 220—441



24. A thermally insulated container, comprising:  
an outer shell,  
an inner shell concentrically positioned within said outer shell,  
a deformed layer sandwiched between said outer shell and said inner shell, and  
a bottom closure attached to a bottom portion of said inner shell,  
said outer shell, said inner shell, and said deformed layer all formed of one continuous elongated sheet,  
whereby said outer shell, said deformed layer, and said inner shell cooperate to define plural air pockets therebetween for providing thermal insulation for any material disposed within said container, yet said container is easy and economical to fabricate.

Re. 35,831

#### PITOT STATIC TUBE COVER

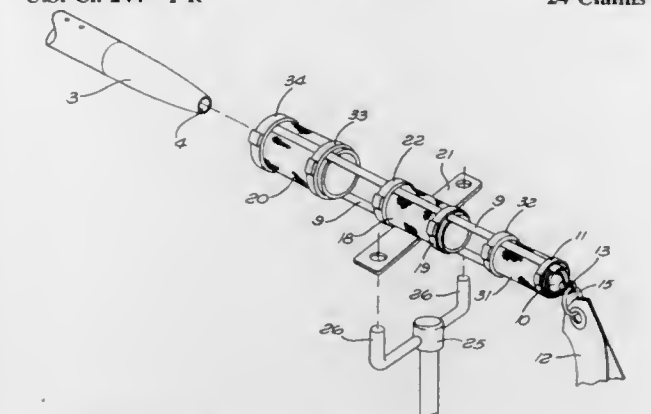
H. Burk Wright, deceased, late of Sierra Madre, by Jacquelyn L. Wright, personal representative, and Jay Miller, Sierra Madre, both of Calif., assignors to Western Filament, Inc., Glendale, Calif.

Original No. 5,026,001, dated Jun. 25, 1991, Ser. No. 471,301, Jan. 25, 1990. Application for reissue Apr. 9, 1993, Ser. No. 56,521

Int. Cl.<sup>6</sup> B64D 45/00

U.S. Cl. 244—1 R

24 Claims



15. A Pitot static tube cover comprising:

a rigid skeleton overbraided with heat resistant braid, adapted to slide over a Pitot static tube; said skeleton further comprising a first member, a second, distal member, and at least one connecting member whereby said connecting member is used to connect the said first and distal members together with open space between the said members to allow heat from the Pitot static tube to escape to avoid overheating.

Re. 35,832

#### ELECTROSTATICALLY PROTECTED IC CARD

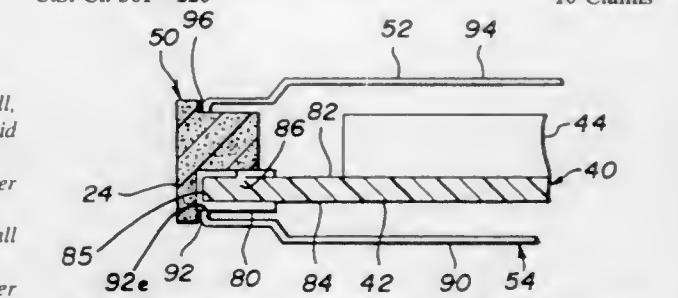
Carl C. Perkins, Irvine, Calif., assignor to ITT Corporation, New York, N.Y.

Original No. 5,319,516, dated Jun. 7, 1994, Ser. No. 84,034, Jun. 28, 1993. Continuation of Ser. No. 756,940, Sep. 9, 1991, abandoned. Application for reissue Nov. 13, 1995, Ser. No. 558,285

Int. Cl.<sup>6</sup> H05F 3/00; H05K 5/04

U.S. Cl. 361—220

10 Claims



14. The combination of components which when assembled, forms the frame of an IC card that is adapted to contain a circuit board assembly, said combination comprising:

a body for supporting the circuit board assembly of said IC card, said body having a top and a bottom, opposite sides, and front and rear ends that are spaced along a length direction, with said ends spaced apart by a greater distance than said sides;

a pair of electrically conductive sheet metal covers for mounting respectively at said top and bottom of said body to enclose the circuit board assembly;

said body having spaced opposite side beams at said sides, with each of said side beams having upwardly and downwardly-facing surfaces;

each of said body side beams has an electrically conductive surface portion, with parts of said conductive surface portion lying at the outside of each of said side beams at said body sides, and at both said upwardly and downwardly-facing surfaces of each of said side beams, with the conductive surface portion at the outside of each of said side beams extending along substantially the entire length of the side beam;

a first of said sheet metal covers has a cover periphery that directly engage said upwardly-facing surfaces of said side beams when said covers are mounted on said body, with said first sheet metal cover being electrically connected to said side beams only at said cover periphery.

Re. 35,833

Patent Not Issued For This Number



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PLANT PATENTS

GRANTED JUNE 30, 1998

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

10,467

AZALEA PLANT NAMED 'CALVARY'S LOVE'  
Elizabeth T. Johnson, 205 Thomas Rd., Clover, S.C. 20710  
Filed Feb. 27, 1997, Ser. No. 805,219  
Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Pkt.—55 1 Claim  
1. A new and distinct azalea plant variety substantially, as shown and described.

10,468

FREESIA PLANT VARIETY NAMED 'VARAYEL'  
Jacob van Andel, Aalsmeer, Netherlands, assignor to Van Staa-  
veren B.V., Aalsmeer, Netherlands  
Filed Mar. 10, 1997, Ser. No. 814,540  
Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Pkt.—83 1 Claim  
1. A new and distinct variety of freesia plant substantially as described and illustrated herein.

10,469

FREESIA PLANT VARIETY NAMED 'VARATWISNO'  
Jacob van Andel, Aalsmeer, Netherlands, assignor to Van Staa-  
veren B.V., Aalsmeer, Netherlands  
Filed Mar. 10, 1997, Ser. No. 814,541  
Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Pkt.—83 1 Claim  
1. A new and distinct variety of freesia plant substantially as described and illustrated herein.

10,470

FREESIA PLANT VARIETY NAMED 'VARABBLUE'  
Jacob van Andel, Aalsmeer, Netherlands, assignor to Van Staa-  
veren B.V., Aalsmeer, Netherlands  
Filed Mar. 10, 1997, Ser. No. 814,542  
Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Pkt.—83 1 Claim  
1. A new and distinct variety of freesia plant substantially as described and illustrated herein.

10,471

VARIETY OF GERANIUM PLANT NAMED 'PATRIOT  
SALMON BLUSH'  
David Lemon, Lompoc, Calif., assignor to John Bodger & Sons  
Company, So. El Monte, Calif.  
Filed Oct. 1, 1996, Ser. No. 724,676  
Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Pkt.—87.12 1 Claim  
1. A new and distinct variety of geranium plant, substantially as shown and described.

10,472

VARIETY OF GERANIUM PLANT NAMED 'RASPBERRY  
ICE'  
David Lemon, Lompoc, Calif., assignor to John Bodger & Sons  
Company, So. El Monte, Calif.  
Filed Oct. 1, 1996, Ser. No. 724,703  
Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Pkt.—87.12 1 Claim  
1. A new and distinct variety of geranium plant, substantially as shown and described.

10,473

VARIETY OF GERANIUM PLANT NAMED 'BUBBLE  
GUM'  
David Lemon, Lompoc, Calif., assignor to John Bodger & Sons  
Company, So. El Monte, Calif.  
Filed Oct. 1, 1996, Ser. No. 724,705  
Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Pkt.—87.12 1 Claim  
1. A new and distinct variety of geranium plant, substantially as shown and described.

10,474

GERANIUM PLANT NAMED BRESSINGHAM'S  
DELIGHT  
Adrian Bloom, Norfolk, England, assignor to Blooms of Bress-  
ingham Ltd., Norfolk, England  
Filed Feb. 4, 1997, Ser. No. 794,059  
Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Pkt.—87.12 1 Claim  
1. A new and distinct cultivar of Geranium plant named 'Bress-  
ingham's Delight', as shown and described.

10,475

BEGONIA PLANT NAMED 'BETULIA'  
Lubbertus H. Koppe, Ermelo, Netherlands, assignor to M.  
Koppe B.V., Am Ermelo, Netherlands  
Filed Jun. 27, 1996, Ser. No. 673,826  
Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Pkt.—87.18 1 Claim  
1. A new and distinct begonia plant named 'Betulia', as described and illustrated.

10,476

BEGONIA PLANT NAMED 'BELLONA'  
Lubbertus H. Koppe, Ermelo, Netherlands, assignor to M.  
Koppe B.V., Am Ermelo, Netherlands  
Filed Jun. 27, 1996, Ser. No. 673,827  
Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. Pkt.—87.18 1 Claim  
1. A new and distinct begonia plant named 'Bellona', as described and illustrated.

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PATENTS

GRANTED June 30, 1998

ERRATA

For CLASS	See PATENT NO.
134—104 .....	5,771,913
474—135 .....	5,772,549
474—256 .....	5,772,551
483—047 .....	5,772,566
604—082 .....	5,772,665
604—243 .....	5,772,687
430—056 .....	5,773,175
210—603 .....	5,773,526
065—168 .....	5,773,529
544—238 .....	5,773,530
427—307 .....	5,773,536
425—387 .....	5,773,540
208—144 .....	5,773,549
430—203 .....	5,773,560
252—519 .....	5,773,566
424—201 .....	5,773,570
422—070 .....	5,773,576
435—187 .....	5,773,585
502—328 .....	5,773,589
514—046 .....	5,773,603
424—401 .....	5,773,611
436—161 .....	5,773,615
055—244 .....	5,773,621
549—221 .....	5,773,628
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434—091 .....	5,773,649
436—050 .....	5,773,662
585—266 .....	5,773,670
044—266 .....	5,773,706
318—460 .....	5,773,976
156—156 .....	5,774,113
395—200 .....	5,774,206
364—506 .....	5,774,449
707—005 .....	5,774,487



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## PATENTS

GRANTED JUNE 30, 1998

## GENERAL AND MECHANICAL

5,771,488

## IMPACT-RESISTANT PROTECTIVE GARMENT

Markku Honkala, Tampere, Finland, assignor to Valtion Teknillinen Tutkimuskeskus, Espoo, Finland

PCT No. PCT/FI96/00336, § 371 Date Feb. 5, 1997, § 102(e) Date Feb. 5, 1997, PCT Pub. No. WO96/39881, PCT Pub. Date Dec. 19, 1996

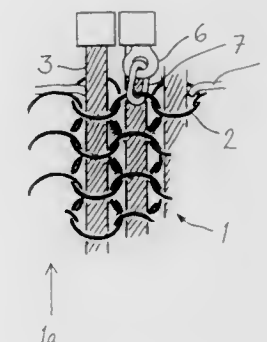
PCT Filed Jun. 6, 1996, Ser. No. 793,009

Claims priority, application Finland, Jun. 7, 1995, 952783

Int. Cl.<sup>6</sup> A41D 13/00

U.S. Cl. 2—2.5

10 Claims



1. An impact-resistant protective garment comprising closed rings joined together to form a layer inside the garment to provide protection against impacts, and elongate filling elements of limited flexibility threaded through the rings to prevent the penetration of spike-shaped objects through the rings.

5,771,489

## PENETRATION-RESISTANT HINGE AND FLEXIBLE ARMOR INCORPORATING SAME

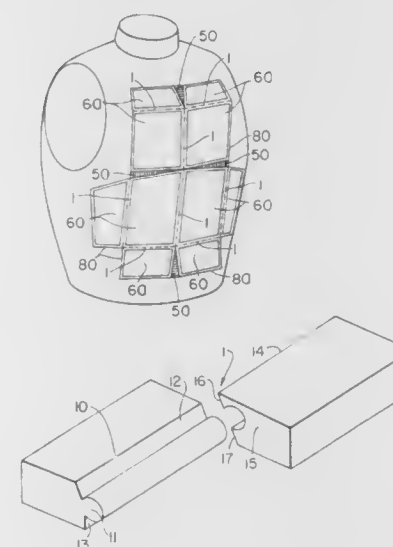
Richard Snedeker, Cranbury, N.J., assignor to Titan Corporation, San Diego, Calif.

Filed Nov. 12, 1996, Ser. No. 746,488

Int. Cl.<sup>6</sup> F41H 1/02

U.S. Cl. 2—12.5

18 Claims



1. A penetration-resistant hinge for joining adjacent armor plates which is useful in flexible body armor, said hinge comprising a first part having a first face and a second part having a second face:

5,771,490

## HAND AND HANDLE COVERING WITH VIBRATION-REDUCING BLADDER

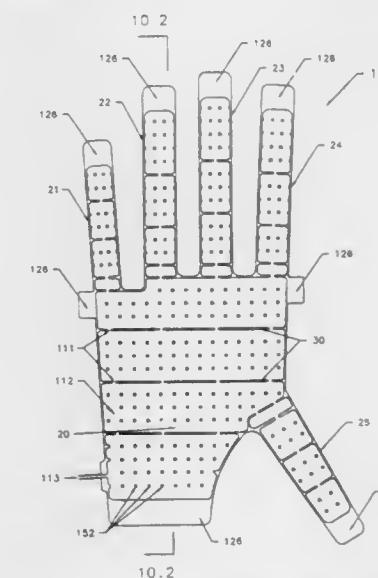
Douglas D. Reynolds, Las Vegas, Nev., and Thomas C. Jetzer, Edina, Minn., assignors to Ergoair Inc., Las Vegas, Nev.

Continuation-in-part of Ser. No. 367,468, Dec. 30, 1994, Pat. No. 5,537,688. This application Dec. 1, 1995, Ser. No. 565,921

Int. Cl.<sup>6</sup> A41D 13/00

U.S. Cl. 2—20

34 Claims



12. A covering for reducing vibration from being transmitted to a user's hand from a hand-held object, wherein the covering defines a longitudinal direction parallel to a user's fingers, the covering comprising:

a bladder defining a fluid cavity and made of a fluid-impervious material for covering the palm of a user's hand, the bladder having a first side for placement against the palm of a user's hand and a second side for placement away from the palm of a user's hand, the first side and the second side being connected together through a plurality of weld points, each of the weld points being surrounded by portions of the first side which are unconnected to the second side, the first side and the second side being also connected together at a plurality of weld lines, wherein the plurality of weld lines extend generally normal to the longitudinal direction and are located within the bladder to define flexing locations associated with the user's hand, with the weld points positioned between the weld lines to define generally non-flexing locations on the covering; and

a backing attached to the bladder for releasably attaching the bladder to one of the hand-held object and the palm of a user's hand.

5,771,491

## JACKET AND INTERCHANGEABLE LAPEL

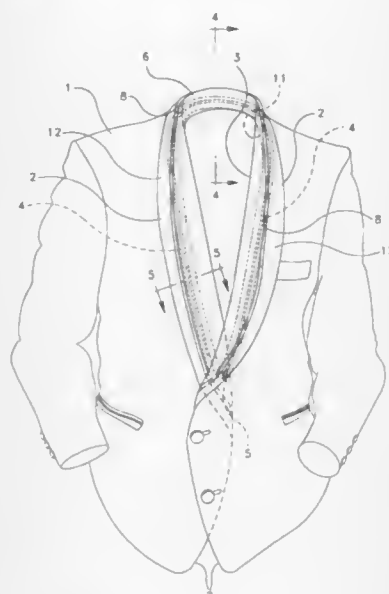
Robert Bennett, Englewood, N.J., and John Galante, Watkinsville, Ga., assignors to Chromalloy American Corp., Hackensack, N.J.

Filed May 23, 1997, Ser. No. 863,076

Int. Cl.<sup>6</sup> A41B 3/04

U.S. Cl. 2—98

2 Claims



1. A jacket comprising:

an open front jacket having a continuous finished collar and lapel having a folded edge about the neck and breast front, a zipper strip secured about the collar and lapel and spaced from a folded edge of the finished collar and lapel on the inner face thereof, and

a unitary combined interchangeable collar and lapel member shaped to fit about said finished collar and lapel with a cooperative zipper strip on the inner face of the member for attachment to the zipper strip of the finished collar and lapel so as to be outwardly invisible, whereby the finished collar and lapel provides support and shape for the interchangeable collar and lapel member and at least a portion of the finished collar and lapel is outwardly visible when the member is attached.

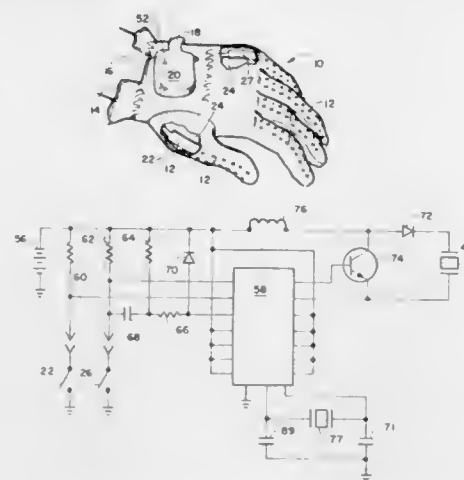
5,771,492  
ELECTRONIC GOLF GLOVE TRAINING DEVICE  
Frank C. Cozza, 2726 Shelter Island Dr., Ste. 319, San Diego, Calif. 92106

Continuation of Ser. No. 505,569, Jul. 21, 1995, Pat. No. 5,655,223. This application Jan. 27, 1997, Ser. No. 788,330

Int. Cl.<sup>6</sup> A41D 19/00; A63B 69/36

U.S. Cl. 2—161.2

14 Claims



1. A golf training glove for emitting distinctive physically perceivable signals in response to a failure of a golfer to maintain a proper grip about a golf club during a golf swing, which comprises:

a glove having a hand access opening and a plurality of finger stalls, configured to fit a golfer's lead hand for gripping a golf club during a swing;

a first sensor means on said glove generally located in a region corresponding to the intersection of the back of a golfer's hand and little finger, for bending when a club is gripped;

activation signal means for generating a physically perceivable signal a predetermined time after a golfer initially correctly grips a golf club; and

first electrical means on said glove connected to said first sensor for emitting a physically perceivable signal in the absence of said bending.

5,771,493

## HEAD WEAR ACCESSORIZATION SYSTEM

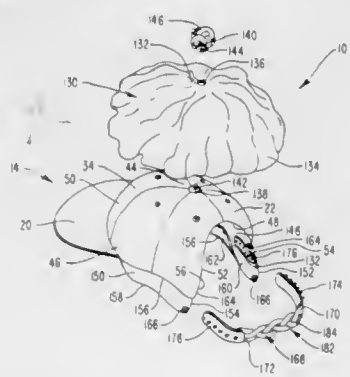
Michael K. Proctor, 1000 Dutch Canyon Rd., Midway, Utah 84049

Filed Jan. 16, 1996, Ser. No. 585,444

Int. Cl.<sup>6</sup> A42B 1/24

U.S. Cl. 2—209.13

27 Claims



18. A head wear system comprising:

(a) a hat comprising:

(i) a cap having a front, a back, a crown, and a base, and

(ii) a bill attached to said base of said cap at said front thereof, said bill extending outwardly from said front of said cap;

(b) an ornament;

(c) cover means for accessorizing said hat; and

(d) attachment means for selectively nondestructively connecting said cover means and said ornament to said crown of said cap.

5,771,494

## PLEATED CHEERLEADING SKIRT

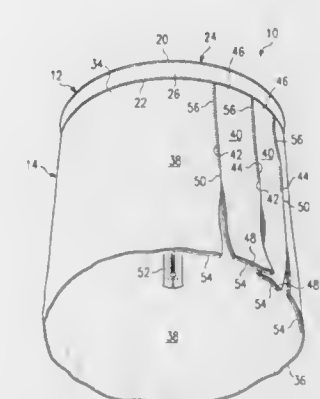
Sherise Ralston, and Michele Wolken, both of Richardson, Tex., assignors to National Spirit Group, Ltd., Garland, Tex.

Filed Apr. 30, 1997, Ser. No. 846,626

Int. Cl.<sup>6</sup> A41D 1/14

U.S. Cl. 2—211

6 Claims



1. A skirt suitable for cheerleading and other active sports, comprising:

a waistband assembly having a first end, a second end, a top edge and a bottom edge, said waistband assembly comprising a first waistband component having a first surface and a second surface, and a second waistband component having a first surface and a second surface, said first waistband component and said second waistband component being attached so that said second surface of said first waistband component is adjacent to and facing said second surface of said second waistband component;

a composite skirt assembly comprising a skirt body and a plurality of skirt panels, wherein said skirt body comprises a first long edge, a second long edge, a top edge, a hem edge and a backing material layer adjacent said first long edge and said second long edge; wherein each of said plurality of skirt panels comprises a first long edge, a second long edge, a top edge, a hem edge and a backing material layer; wherein said top edge of said skirt body and said top edge of each of said plurality of skirt panels is attached to said waistband; wherein each of said plurality of skirt panels is attached to said waistband between said first long edge and said second long edge of said skirt body; wherein a first one of said plurality of skirt panels is adjacent to said first long edge of said skirt body and said first long edge of said skirt body is attached to said first long edge of said first one of said plurality of skirt panels along an attachment seam; wherein said first long edge of said skirt body overlaps said first long edge of said first one of said plurality of skirt panels; wherein a second one of said plurality of skirt panels is adjacent to said second long edge of said skirt body and said second long edge of said skirt body is attached to said second long edge of said second one of said plurality of skirt panels along an attachment seam; wherein said second long edge of said second one of said plurality of skirt panels overlaps said second long edge of said second one of said plurality of skirt panels; wherein each of said first long edges of said plurality of skirt panels, except for said first long edge of said first one of said plurality of skirt panels, is attached to one of said second long edges of said plurality of skirt panels, except for said second long edge of said second one of said plurality of skirt panels, of another of said skirt panels along an attachment seam, said attachment seam extending only partially

along the length of said respective long edges; wherein each of said second long edges of said plurality of skirt panels, except for said second long edge of said second one of said plurality of skirt panels, overlaps said first long edge of an adjacent one of said plurality of skirt panels; and a closure apparatus connected to said skirt body.

5,771,495

## SNOWBOARDING SOCK

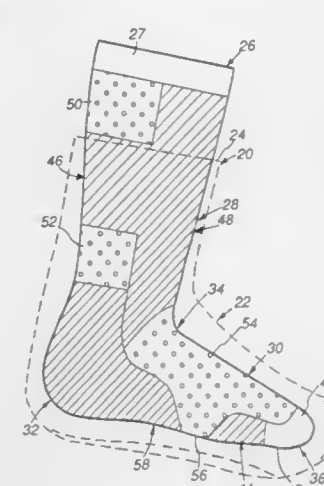
George F. Turner, Alfreton, and Colin Nash, Stonebroom, both of England, assignors to The Burton Corporation, Burlington, Vt.

Filed Jan. 8, 1996, Ser. No. 584,014

Int. Cl.<sup>6</sup> A41B 11/00

U.S. Cl. 2—239

21 Claims



1. A snowboarding sock comprising:

a tubular sock body having a leg section including a front portion and a rear calf portion and a foot section including a bottom portion and an instep portion, a heel between the leg section and the foot section, an enclosed toe at an end of the foot section opposite the heel, and a ball of the foot adjacent the toe;

the sock body including at least a high density of padding and a low density of padding at predetermined locations thereon in a predetermined arrangement appropriate to engagement of the sock to and within a snowboarding boot; and

wherein the low density of padding is provided on at least the bottom portion of the foot section along at least the toe for enhanced toe movement and the high density of padding is located on at least a rear calf portion of the leg section, which contacts the upper portion of the snowboarding boot to prevent chafing between the upper portion of the snowboarding boot and a wearer's leg.

5,771,496

## READILY INSTALLED POCKET PATCH HAVING REINFORCED SEAM

Donald G. Wood, 921 - 30th Avenue Dr., NW, Hickory, N.C. 28601

Filed Dec. 27, 1993, Ser. No. 173,065

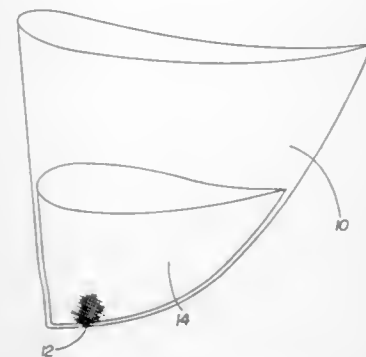
Int. Cl.<sup>6</sup> A41D 27/00; 27/20

U.S. Cl. 2—248

10 Claims

1. A repair patch for worn or damaged garment pockets, comprising a pocket-like member to be installed in a pocket having an exterior, an interior, and a lowermost portion, said patch having exterior surfaces and corresponding substantially in size and configuration to the lowermost portion of the pocket to be repaired, heat sensitive glue applied to the exterior surfaces of said patch, such glue being adapted to engage the fabric of the interior of the





pocket to which said patch is applied, such glue serving when activated, to retain said patch in a selected position within the lowermost portion of the pocket, said repair patch having at least one interiorly-turned seam, which seam is reinforced by the glue that had been applied to the exterior surfaces of the patch.

5,771,497

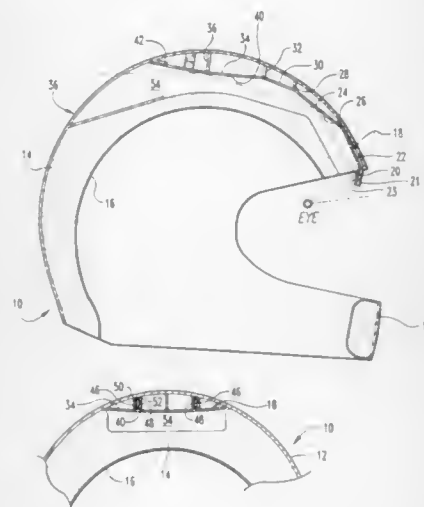
## ARTICLE OF HEADWEAR

Mark Steele, Dunston, United Kingdom, assignor to Hoodco 446 Limited, Wellington, County Durham, United Kingdom  
Continuation-in-part of Ser. No. 489,039, Jun. 9, 1995, abandoned. This application Jan. 18, 1996, Ser. No. 588,135

Int. Cl.<sup>6</sup> A42B 3/04

U.S. Cl. 2—422

1 Claim



1. A helmet comprising an outer protective shell, a channel through the helmet inside the shell, and a one piece mounting adjacent the roof of the channel mounted to the inside of the shell, the mounting carrying or comprising at least one mirror facing from the mounting into the channel, the mirror or mirrors enabling a person wearing the helmet to see through the channel, and sideways locating means between the shell and the mounting, including a rib on one of the shell and the mounting and means defining a groove to receive the rib on the other of the shell and the mounting.

5,771,498  
LATCHING DEVICE FOR ATTACHING A BREATHING MASK TO A HELMET  
Ian Trevor Dampney, London, Great Britain, assignor to Helmet Integrated Systems Ltd., Hertfordshire, United Kingdom

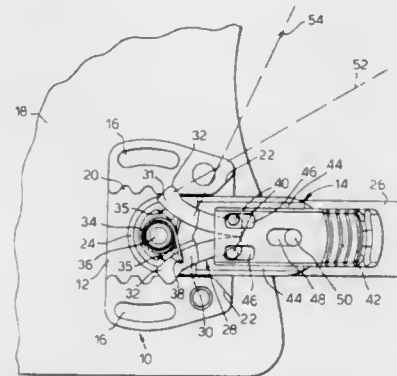
Filed Jun. 24, 1996, Ser. No. 669,574

Claims priority, application United Kingdom, May 24, 1996, 9610883

Int. Cl.<sup>6</sup> A42B 3/04

U.S. Cl. 2—422

24 Claims



23. A latching device comprising first and second portions slidably receivable one in the other, the portions having respective parts detachably engageable with each other for latching the portions together, a carrier member carrying said one detachably engageable part, means defining an arcuate path having a center of revolution, the carrier member being slidably moveable along said arcuate path to disengage said parts, the detachably engageable parts having conforming contacting surfaces disposed relative to the center of revolution of said arcuate path to resist separation of the first and second portions, the said one part being supported by a said portion so that latching forces are not transmitted to the carrier member, the carrier member being disposed in a groove defining said arcuate path.

5,771,499  
SAFETY GOGGLES HAVING FOAMED-IN-PLACE FACE GASKET

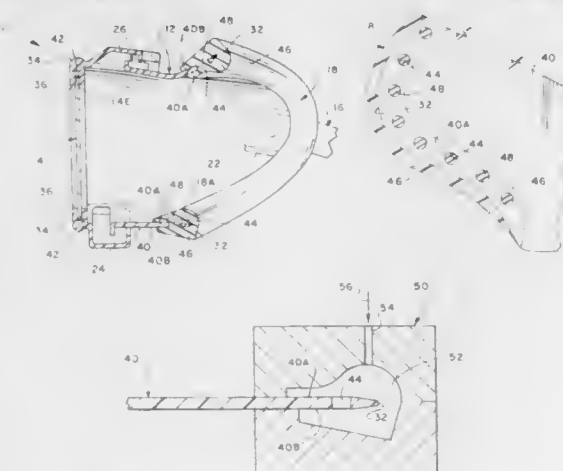
Michael Angelo Monaco, North Tonawanda, and Daniel Wayne Morley, East Bloomfield, both of N.Y., assignors to American Allsafe Company, Tonawanda, and TMP Technologies, Inc., Buffalo, both of N.Y.

Filed May 15, 1996, Ser. No. 648,498

Int. Cl.<sup>6</sup> A61F 9/02

U.S. Cl. 2—428

10 Claims



3. A safety goggles comprising a unitary molded frame including a lens retainer rim, a lens supported on the retainer rim and a

protective sidewall including a curved rim portion disposed adjacent the face of a wearer when the safety goggles is worn in an operative position, and a face gasket attached to the protective sidewall, the face gasket including a main body portion disposed for engagement with a person's face when the safety goggles is worn in the operative position, the curved rim portion being intersected by multiple connecting apertures which are completely surrounded by curved rim portion, the rim portion and connecting apertures being embedded within the main body portion of the face gasket, and the face gasket including attachment link portion integrally formed with the main body portion and extending through the connecting apertures.

5,771,500

## HEADBAND WITH LENS PIECE

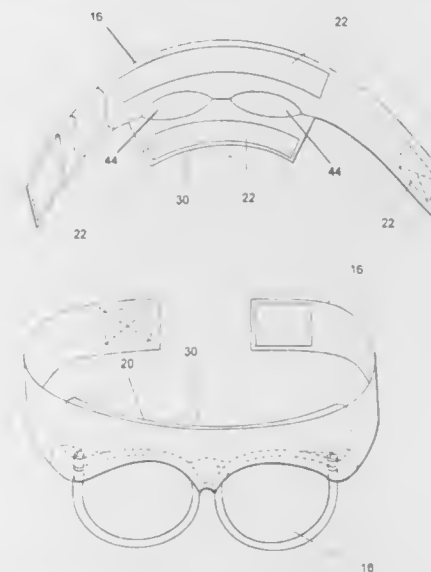
Mervin L. Mayes, 157-10 Riverside Dr. W., Apt. 16-0, New York, N.Y. 10032

Filed Apr. 5, 1995, Ser. No. 416,648

Int. Cl.<sup>6</sup> A61F 9/02

U.S. Cl. 2—452

20 Claims



1. A headband comprising multiple layers of material in at least a portion of the headband, two or more openings formed in a portion of said multiple layers of material to accommodate lenses near the bottom of the layered portion of the headband, the bottom of the layered portion of material being joined lateral to and between the openings whereby the lenses may be held in place in the openings and below the headband.

5,771,501

## PLUMBING CONTROL SYSTEM AND METHOD FOR PRISONS

Daniel C. Shaw, Geneva, Fla., assignor to Sloan Valve Company, Franklin Park, Ill.

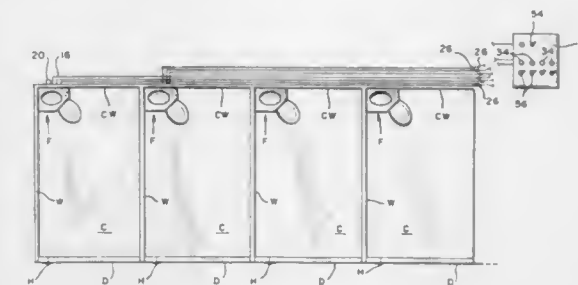
Continuation of Ser. No. 800,718, Dec. 3, 1991, abandoned, which is a continuation of Ser. No. 607,275, Oct. 31, 1990, abandoned, which is a division of Ser. No. 382,113, Jul. 20, 1989, Pat. No. 4,985,944. This application Dec. 22, 1995, Ser. No. 577,534

Int. Cl.<sup>6</sup> E03D 3/00

U.S. Cl. 4—313

32 Claims

1. A control system for a prison plumbing system, comprising:  
a) a plurality of water dispensing fixtures, each of said fixtures including a toilet and a sink for a faucet integral with one another;  
b) a source of water;



c) a first plurality of flow regulating means, each of said plurality of flow regulating means including a flow valve interposed between one of said fixtures and said corresponding source for controlling water flow therebetween;  
d) a first plurality of sensors, each of said sensors positioned proximate a corresponding one of said fixtures and actuatable to request flushing of the corresponding fixture; and  
e) microprocessor-based control means operably associated with each of said flow regulating means and said sensors for automatically causing operation of a selected flow regulating means flow valve upon the expiration of a predetermined time period subsequent to actuation of the sensor associated with said selected flow regulating means, wherein said control means is located in a room remote from rooms in which said fixtures are located, and wherein said predetermined time period is of sufficient length so as to help prevent inmates from flushing sheets or the like down said toilets.

5,771,502

## FLUSH LEVER ASSEMBLY THAT PREVENTS FLUSHING OF THE TOILET UNLESS THE SEAT AND LID ARE IN A LOWERED POSITION

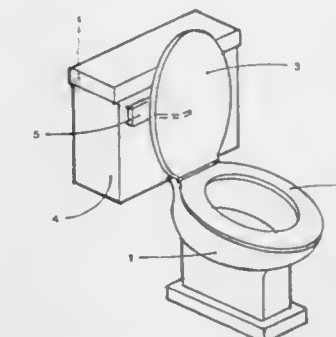
James J. O'Grady, 152 St. Andrews La., Glen Cove, N.Y. 11542

Filed Jul. 5, 1996, Ser. No. 677,356

Int. Cl.<sup>6</sup> E03D 5/09

U.S. Cl. 4—405

22 Claims



1. A flush lever assembly for use in a toilet having a main body having a hole therein, a bowl, a closure lid movable between a first position in which the bowl is covered and a second position in which the bowl is not covered, and a drainage mechanism, said flush lever assembly comprising:  
a bolt for engaging the main body through the hole; and  
a flush lever having a flush arm portion and an insertion portion to be inserted into said bolt to lockingly engage said flush lever to the drainage mechanism, wherein when said flush lever is engaged with the drainage mechanism, a flushing cycle of the toilet is initiated by a motion of said flush arm portion, and said flush lever normally rests with the flush arm portion behind the closure lid when the closure lid is in the second position such that the closure lid must be lowered to the first position for a user to operate the flush lever, wherein said bolt has a collar having a gap therein, said gap being oriented towards the center of a front of the main body, said collar adapted to be located on the front face of the main

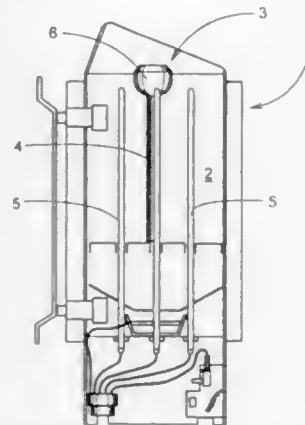
body, said bolt further having a threaded portion for inserting through the hole in the front of the main body.

**5,771,503**  
**HUMIDIFIER FOR USE IN A SAUNA STOVE**  
Markku Tapani Valimaa, Hannosentie 5, FIN-41120 Puuppi,  
and Tapani Rautiainen, Pekkalantie 5, FIN-40207 Palokka,  
both of Finland

Filed May 12, 1997, Ser. No. 854,617  
Int. Cl.<sup>6</sup> A61H 33/06

U.S. Cl. 4—524

4 Claims

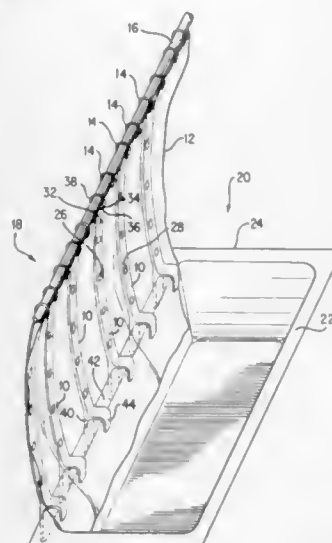


1. A humidifier for use in a sauna stove, comprising an elongated vessel open at the top, forming a store for the water to be vaporized, and adapted to be placed in the stone space of the sauna stove, proximate the source of heat, for the stove, such that when in use, the heat from the heat source vaporizes the water in the vessel, to spread steam to the sauna room, the humidifier further comprising at least one cup placed on top of the elongated vessel, said cup being filled with stones, and said cup including a channel to lead steam from the elongated vessel therebelow through the cup to the sauna room.

**5,771,504**  
**SHOWER CURTAIN RIBS**  
Merill R. Steiner, 304 French Rd., Newtown Square, Pa. 19073  
Filed Jul. 11, 1996, Ser. No. 678,107  
Int. Cl.<sup>6</sup> A47K 3/14

U.S. Cl. 4—558

11 Claims



1. An apparatus for use with a shower curtain, which shower curtain is capable of effectively closing off an opening of a shower

enclosure to contain a shower spray within said shower enclosure, said opening having an upper periphery provided with a curtain rod from which said shower curtain is suspended, and a lower periphery within which said shower curtain is intended to remain, the apparatus comprising:

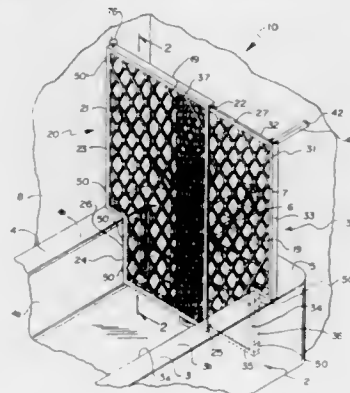
- a plurality of semi-rigid ribs movable positioned along said shower enclosure opening;
- means for suspension of said ribs from said curtain rod at the upper periphery of said opening;
- a lower end of each rib having: an inverted U-shaped stabilizer having inner and outer stays that saddle said lower periphery; for operatively engaging said lower periphery and,
- attachment means to operatively engage said ribs with said shower curtain and prevent movement of said shower curtain inward from said ribs into said shower enclosure.

**5,771,505**  
**BATHTUB SAFETY GUARD**  
Joseph R. Reynolds, 5101-281 So. Monterey Hwy., San Jose,  
Calif. 95111

Filed Feb. 14, 1997, Ser. No. 799,377  
Int. Cl.<sup>6</sup> A47K 3/14

U.S. Cl. 4—559

18 Claims



1. A Bathtub Safety Guard for use in a bathtub having an entry side, a back side, and a forward end wherein a spigot and a water control knob are provided at said forward end, said entry side and said back side each having an inner surface and a substantially horizontal top surface, said bathtub further having a back side enclosure wall extending upwardly from said substantially horizontal top surface of said back side, said Bathtub Safety Guard comprising:

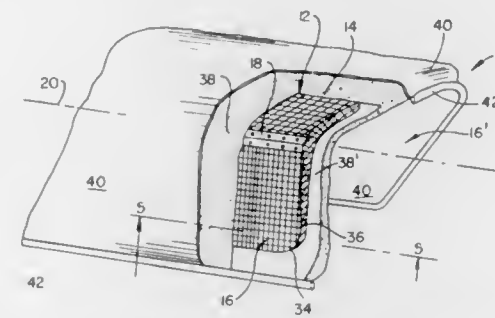
- a first gate section having an upper portion and a lower portion; and
- a second gate section having an upper portion and a lower portion, said second gate section slidably attached to said first gate section, said upper portion of said first gate section being wider than said lower portion of said first gate section and being adapted to extend over said top surface of said back side of said bathtub and abut said back side enclosure wall, said upper portion of said second gate section being adapted to extend over said substantially horizontal top surface of said entry side of said bathtub, whereby the effective combined width of said first gate section and said second gate section can be varied such that said lower portion of said first gate section and said lower portion of said second gate section fit within the width of said bathtub.

**5,771,506**  
**PROTECTION APPARATUS**  
Glenda P. Joiner, 201 First St., Terrell, Tex. 79160  
Filed Oct. 22, 1996, Ser. No. 734,993  
Int. Cl.<sup>6</sup> A47K 3/12

U.S. Cl. 4—575.1

10 Claims

- 1. A protective cushion apparatus, comprising:



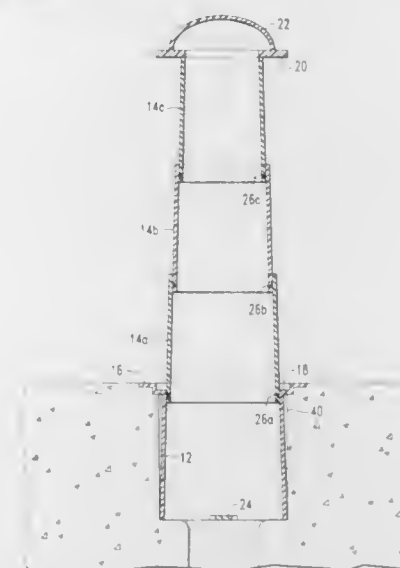
- A. a longitudinally extending internal member having a top surface and a bottom surface for being draped over a hard, relatively narrow edge, said internal member including two longitudinally extending spaced apart hinges forming a generally U-shaped member in cross-section, having two arms and a base portion, said hinges providing a force for biasing said two arms together;
- B. protective cushioning means covering said internal member top surface and said internal member bottom surface for softening a blow, thereby protecting an individual who may fall thereagainst; and
- C. protective covering means for completely covering said protective cushioning means.

**5,771,507**  
**EXTENDIBLE DRAIN CLOSURE DEVICE**  
Patrick E. Healy, Gallitzin, and Brian Christopher Schmidt,  
Johnstown, both of Pa., assignors to New Pig Corporation,  
Tipton, Pa.

Filed Apr. 29, 1997, Ser. No. 841,048  
Int. Cl.<sup>6</sup> E03C 1/22

U.S. Cl. 4—680

14 Claims



- 11. An extendible drain closure device comprising:
  - (a) a tapered hollow tubular main body having an inner surface, a base portion, and a top opening, said base portion having a bottom opening and being sized to seat into a drain opening, said top opening having a flange member attached thereto, said flange member being flush with the surface in which the drain opening is formed, said flange member also having a top surface and a recessed portion in said top surface;
  - (b) a plurality of tapered hollow tubular members disposed inside the main body in a telescopically operative manner, each of said plurality of hollow tubular members having a top opening adjacent the top opening of the main body and a bottom opening adjacent the bottom opening of the base portion when each of said plurality of telescoping members is

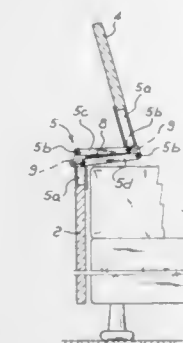
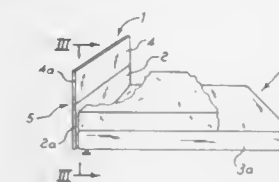
- in a telescopically retracted position, each of said plurality of hollow tubular members sized to slidably surround adjacent inner ones of said plurality of hollow tubular members in a telescopically operative manner, the bottom opening of each of said plurality of hollow tubular members being slightly larger than the top opening of an adjacent surrounding one of said plurality of hollow tubular members, each of said plurality of hollow tubular members having an outer surface and an inner surface, said outer surface having an annular notch therein located near said bottom opening and a seal ring disposed in said annular notch, said seal ring forming a liquid barrier between said outer surface and one of the inner surface of an adjacent one of said plurality of hollow tubular members and the inner surface of the main body;
- (c) a stop ring attached to the top opening of an innermost one of the plurality of hollow tubular members, said stop ring being sized to seat in said recessed portion flush with the top surface of the flange member;
- (d) a handle attached to the stop ring for pulling said plurality of hollow tubular members upwardly to deploy the extendible drain closure device in a telescopically extended position; and
- (e) a retainer attached to the base portion to prevent said plurality of hollow tubular members inside the main body from falling down through the bottom opening of the base portion.

**5,771,508**  
**VARIABLE-POSITION HEADBOARD FOR BEDS, EASY CHAIRS AND THE LIKE**  
Rosario Messina, Seregno, Italy, assignor to FLOU S.p.A., Meda, Italy

Filed Apr. 1, 1997, Ser. No. 831,142  
Claims priority, application Italy, Apr. 17, 1996, MI96U0295  
Int. Cl.<sup>6</sup> A47C 20/04

U.S. Cl. 5—53.2

4 Claims



- 1. An adjustable headboard for a piece of furniture, comprising:
  - a fixed bottom panel;
  - at least one top panel mounted on the bottom panel for supporting the head of a user;
  - at least one pair of elongated rods each hingedly mounted by a respective pair of opposite ends thereof on the top and bottom panels and guiding the top panel between a first position wherein the top and bottom panels are coplanar in a vertical plane and a second position wherein the top panel is inclined with respect to a vertical;
  - a pair of spaced apart pins each operatively connected with one of said panels and extending transversely thereto, and
  - a tension spring engaging the pair of pins at opposite ends of the spring and securing the top panel in the first and second positions.



5,771,509

Patent Not Issued For This Number

5,771,510

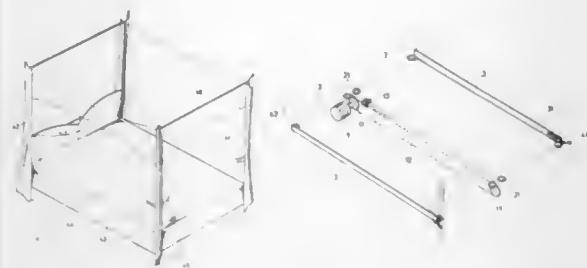
BED WITH MOVABLE BEDPOSTS

Chung-Chuan Sun, No. 9, Alley 17, Chung I Land, Chung Hsiao Road, Pan Chiao City, Taipei Hsien, Taiwan  
Filed Apr. 29, 1997, Ser. No. 848,221

Int. Cl.<sup>6</sup> A47C 19/04

U.S. Cl. 5—181

1 Claim



1. A bed with movable bedposts, comprising a bed portion, two sliding rails, two steel cords, a transmission mechanism, and a fixing member;

said bed portion including a bed plank, side boards inside said bed plank for supporting said bed plank, two fixed bedposts at two head corners of said bed plank, two movable bedposts at two rear corners of said bed plank, and a set of canopy frame supported on a top of said fixed and said movable bedposts for supporting bed frills and curtains;

said sliding rails being horizontally installed at two inner side walls of said bed plank to each guide a sliding rail bearing to move in and along said sliding rails, said sliding rail bearing each having an extended plate which is fixedly connected to one of said movable bedposts near a bottom end of said movable bedpost;

said steel cords being laterally symmetrically arranged and each passing four rollers so as to smoothly move forward or backward, said steel cords separately extending through and being fixedly associated with said sliding rail bearings, so that said sliding rail bearings move forward or backward along with said steel cords;

said transmission mechanism including a motor, a head gear connected to an extended motor shaft, a rear gear, a chain extending between said head and said rear gears, such that when said motor is started, said head and said rear gears rotate at the same time due to the chain extending between them; and

said fixing member being fixedly located at a top of said chain by means of a thread rod which has an upper end extending through said fixing member and a lower end extending down through a space between two links of said chain; and said fixing member being fixedly associated with said two steel cords;

whereby when said motor is started to move the chain through said head and said rear gears, said fixing member fixedly located over said chain and said steel cords fixedly associated with said fixing member are brought by said chain in moving to move, and since said steel cords are also fixedly associated with said sliding rail bearings, said sliding rail bearings are brought by said steel cords to move and in turn cause said movable bedposts fixedly connected to said extended plates of said sliding rail bearings to move toward either a head end of said bed to be in a retracted position or a rear end of said bed to be in a normal position.

5,771,511

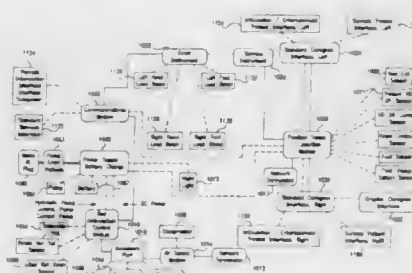
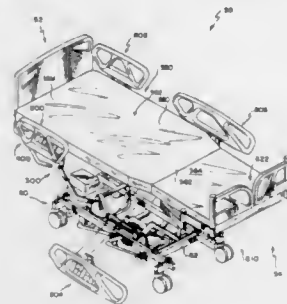
COMMUNICATION NETWORK FOR A HOSPITAL BED  
Joseph A. Kummer, Cincinnati, Ohio; Matthew W. Weismiller, Batesville, Ind.; Daniel F. Dlugos, Jr., West Chester, and Stephen R. Shulte, Harrison, both of Ohio, assignors to Hill-Rom, Inc., Batesville, Ind.

Filed Aug. 4, 1995, Ser. No. 511,556

Int. Cl.<sup>6</sup> A61G 7/00

U.S. Cl. 5—600

57 Claims



1. A bed comprising:  
a base frame;  
a deck coupled to the base frame for supporting a body;  
a peer-to-peer communication network having a plurality of connection points;  
a plurality of modules, each module being electrically coupled to a selected connection point of the peer-to-peer communication network, each module being configured to perform a dedicated function during operation of the bed, and each module being configured to communicate over the peer-to-peer communication network with selected other modules, and each module including a processor circuit configured to transmit information to any other module and to receive information from any other module over the peer-to-peer communication network.

5,771,512

NUCLEAR IMAGE DIAGNOSIS APPARATUS HAVING  
PATIENT ARM AND HEAD SUPPORT

Tadakazu Kurakake, and Toshiro Iwasaki, both of Tochigi-ken, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 527,726, Sep. 13, 1995, abandoned.

This application Mar. 12, 1997, Ser. No. 815,904

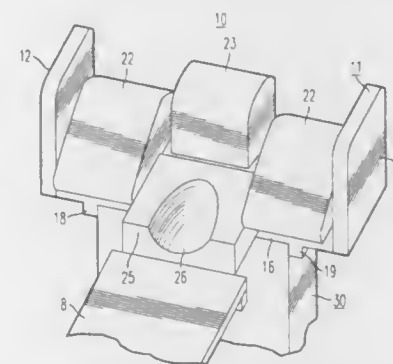
Claims priority, application Japan, Sep. 20, 1994, 6-225063

Int. Cl.<sup>6</sup> A47C 1/036

U.S. Cl. 5—623

42 Claims

1. An apparatus for image diagnosis, comprising:  
a table on which a patient can be placed;  
means for supporting the table;  
means for detecting radiation emitted from a radiation source and passing through the patient in order to obtain a radioisotope distribution image of the patient;  
means for carrying the detecting means to an examining position;  
a detachable base guide disposed along one end of the table, the base guide including at least a base plate for attaching the base guide to the support means and a pair of side wall



5,771,514

ADJUSTABLE CONTOUR PILLOW

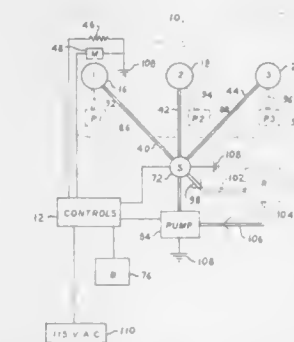
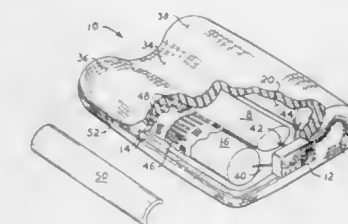
Christopher S. Wilhoit, Columbia, Tenn., assignor to Chris Wilhoit, Columbia, Tenn.

Filed Jul. 8, 1996, Ser. No. 676,462

Int. Cl.<sup>6</sup> A47G 9/00

U.S. Cl. 5—644

7 Claims



5,771,513  
X-RAY COMPATIBLE, PARTIALLY FLEXIBLE PATIENT  
SUPPORT

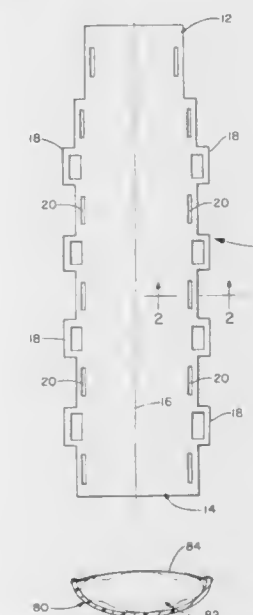
Markus Kirchgorg, Schondorf; Ulrich Baer, Neunkirchen, both of Germany, and James Bradcovich, Akron, Ohio, assignors to Beta Medical Products, Inc., Akron, Ohio

Filed Jun. 3, 1996, Ser. No. 657,208

Int. Cl.<sup>6</sup> A47B 1/00

U.S. Cl. 5—625

39 Claims



1. A device for moving a patient, comprising:  
a support structure defining a lengthwise direction and comprising:  
a core of carbon-fiber material having a greater proportion of carbon fibers oriented substantially in the lengthwise direction than in directions other than the lengthwise direction; and

a synthetic material in which said carbon-fiber material is suspended;  
wherein said support structure is flexible in a direction perpendicular to the lengthwise direction yet is relatively inflexible in the lengthwise direction, and  
wherein said support structure, when flexed to form a curve in cross section, is substantially rigid in the lengthwise direction.

1. An adjustable contour pillow, comprising:  
an adjustably inflatable pillow including a resilient cushion having a first, a second, and a third separate but adjacent elongate selectively inflatable and deflatable chamber of substantially equal volume and length therein and defining the width of said pillow, with each said chamber being laterally disposed within said cushion;  
each said chamber having a lower wall mutually coplanar with one another, with said first chamber and said third chamber each having a substantially circular cross section and with said second chamber being disposed therebetween and having a substantially oval cross section and a lower geometric center than said first chamber and said second chamber, with said cushion of said pillow thereby having an upper surface defining an elongate valley between said first chamber and said third chamber and extending completely across said width of said pillow; a control system cooperating and communicating with said first, second and third chambers of said pillow; said control system adapted to provide for the selective inflation and deflation of said first, second and third chambers of said pillow as desired, said control system being removably installed in said contour pillow to communicate with said first, second and third chamber's of said pillow, with said control system being used selectively to inflate and deflate said first, second and third chambers of said pillow as desired.

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5,771,515

## MATTRESS ELEVATING APPARATUS

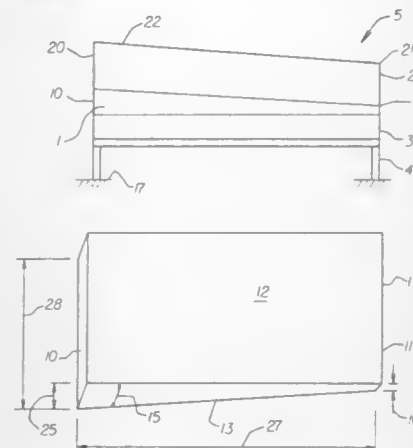
Aubrey T. Carr, 283 Petersburg Rd., Powhatan County, Va. 23139

Filed May 16, 1997, Ser. No. 857,294

Int. Cl.<sup>6</sup> A47C 21/06

U.S. Cl. 5—660

4 Claims



1. A bed accessory removably inserted between a mattress and a box spring, the box spring being supported on a substantially horizontal support surface, the bed accessory having opposite spaced apart first and second ends, opposite spaced apart parallel sides, and top and bottom surfaces, the first end having a first height extending between the top and bottom surfaces and the second end having a second height extending between the top and bottom surfaces with the first height being greater than the second height, the top surface extending substantially in a single angularly extending plane with respect to the support surface, the mattress having opposite spaced apart mattress first and second ends, the mattress being supported by the top surface of the bed accessory at an angle with respect to the support surface whereby the mattress first end is elevated above the mattress second end, the bed accessory having a stabilized means for preventing the mattress from slipping off the bed accessory.

5,771,516

## EXCHANGEABLE POWER HAND TOOL

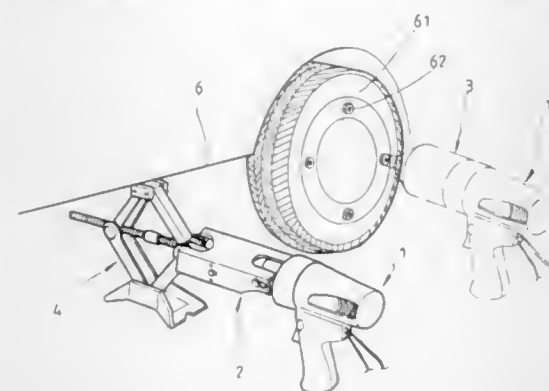
Chen Shu-Hsia Huang, 8F, No. 472 Sec. 3 Ming-Chih Road, Tai-Shan Hsiang, Taipei Hsien, Taiwan

Filed Aug. 26, 1996, Ser. No. 702,926

Int. Cl.<sup>6</sup> B25F 1/02

U.S. Cl. 7—100

10 Claims



1. A power hand tool comprising a power section comprising a rotational output member to provide a rotational motion and a first and a second tool sections selectively and exchangeably connected to the power section to be driven thereby, each of the tool sections comprising releasable connecting means to connect to the power section, the first tool section further comprising first mechanical

coupling means to couple to the rotational output member of the power section to receive the rotational motion therefrom and an end effector having an engaging member adapted to engage a jack to automatically actuate the jack, the second tool section further comprising second mechanical coupling means to couple to the rotational output member of the power section to receive the rotational motion therefrom and an output end adapted to engage a socket for loosening/tightening bolt/nut.

5,771,517

## PROCESS FOR PROCESSING A CELLULOSE FIBER LAP

Jean-Louis Neveu, Lery, and Bernard Louis Dit Picard, Amfreville-la-Champagne, both of France, assignors to Fort James France, Kunheim, France

PCT No. PCT/FR96/00181, § 371 Date Sep. 2, 1997, § 102(e)

Date Sep. 2, 1997, PCT Pub. No. WO96/23922, PCT Pub.

Date Aug. 8, 1996

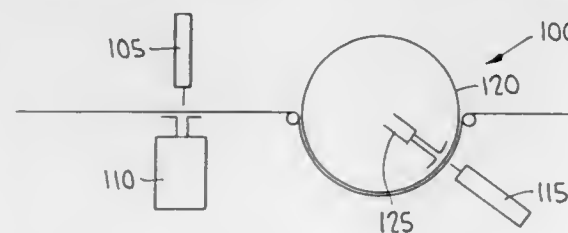
PCT Filed Feb. 2, 1996, Ser. No. 875,596

Claims priority, application France, Feb. 3, 1995, 95 01280

Int. Cl.<sup>6</sup> D06B 11/01

U.S. Cl. 8—151

9 Claims



1. A process for treating natural cellulose fibers comprising (1) depositing the fibers on a continuously moving wire to form a lap having a specific surface weight of between 100 and 800 g/m<sup>2</sup>, (2) impregnating the lap with a treating solution, and (3) rinsing the lap following impregnation of the lap using an aqueous liquid in the form of jets, wherein said jets are directed at a first side of the lap perpendicularly to a direction of advance of said lap and at an energy of 2 to 60 kwh/ton of treated product.

5,771,518

## PRECAST CONCRETE BRIDGE STRUCTURE AND ASSOCIATED RAPID ASSEMBLY METHODS

Michael Lee Roberts, 2516 Craig Ln., Denton, Tex. 76201

Continuation of Ser. No. 291,246, Aug. 16, 1994, abandoned,

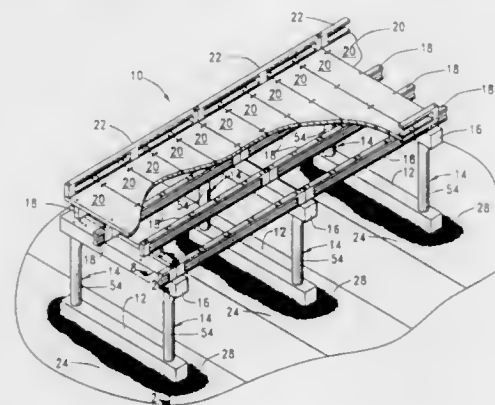
which is a continuation of Ser. No. 367,357, Jun. 16, 1989,

abandoned, This application Mar. 22, 1995, Ser. No. 408,457

Int. Cl.<sup>6</sup> E01D 21/00; 19/02; 19/06

U.S. Cl. 14—73.1

42 Claims



1. A method of rapidly fabricating a vertical load-supporting pier structure comprising the steps of:

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positioning on the ground a base member having a vertical opening extending therethrough between upper and lower exterior side surface portions thereof;

drilling a foundation hole in the ground directly beneath the base member by extending a drilling structure downwardly through the vertical opening in the base member so that the foundation hole is continuous with the vertical opening;

positioning the lower end of an elongated pier member into the foundation hole and the vertical opening in the base member, wherein the pier member is laterally dimensioned to form an annular space between the interior side surfaces of the vertical opening in the base member and the foundation hole and the exterior surface of the lower end of the pier member;

after positioning the lower end of the pier member in the vertical opening of the base member and the foundation hole, filling the annular space with quick-setting grout material; and allowing the quick-setting grout material to harden.

37. A method of rapidly fabricating a load supporting pier structure at a construction site, the method comprising:

interconnecting at the construction site a plurality of prefabricated structural components, wherein the prefabricated structural components comprise pier base beams, support pier structures and pier cap beams; and

securing the interconnections between the prefabricated structural components with quick-setting grout.

5,771,519

## BRUSHLESS HANDLE CONTROLLED ARTICLE COLLECTOR

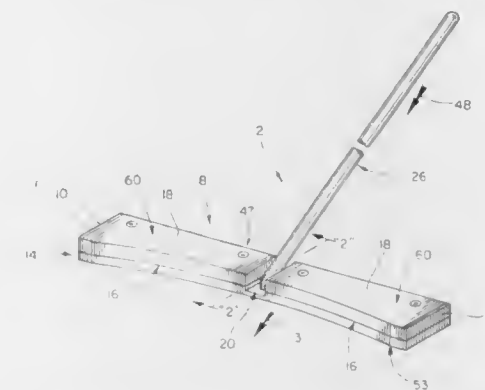
Brenda J. Hrunek, 810 Medford, Carol Stream, Ill. 60188

Filed Jun. 10, 1996, Ser. No. 661,195

Int. Cl.<sup>6</sup> A47L 13/00

U.S. Cl. 15—104.001

11 Claims U.S. Cl. 15—184



1. A brushless handle controlled article collector for collecting articles positioned at various locations on a floor surface comprising:

a rigid elongated floor engaging head having a first end and a second end;

said rigid elongated floor engaging head further defined by a bottom plate, a concave front surface portion, and a pair of shoulder members overlying the bottom plate;

said bottom plate having a partially slotted center portion located substantially midway between the first end and the second end of the rigid elongated floor engaging head;

the partially slotted center portion having a bottom portion; each of said pair of shoulder members independently rigidly connected to the bottom plate and being separated by a completely slotted center portion directly overlying and coinciding with the partially slotted center portion, each member of the pair of shoulder members extending away from the completely slotted center portion in an opposite direction;

a handle member having a front end;

a pin having a first end and a second end;

said pin pivotally mounting the front end of the handle member in spaced relation above the bottom portion of the partially

slotted center portion, said pin extending through a width of the front end of the handle member and traversing a distance between the pair of shoulder members within the completely slotted center portion, the first and second ends of the pin projecting within each respective member of the pair of shoulder members and being rigidly secured therein;

the bottom plate having a smooth substantially flat bottom planar surface for slidably engaging said floor surface; and,

said concave front surface portion adapted to collect said articles positioned at various locations on the floor surface and to maintain said articles in relative position between the first end and the second end of the rigid elongated floor engaging head

when the rigid elongated floor engaging head is pushed in a forward direction across the floor surface to collect said articles.

5,771,520

Patent Not Issued For This Number

5,771,521

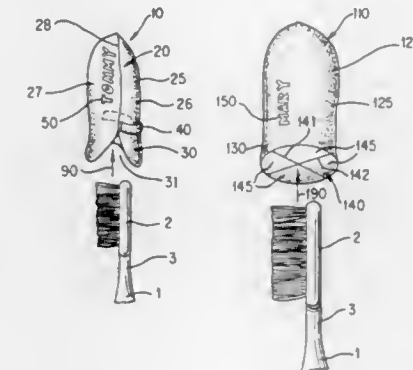
## SANITARY BRUSH COVER SYSTEM

Brian J. McNamee, P.O. Box 676, Severna Park, Md. 21146

Filed Jan. 18, 1996, Ser. No. 588,376

Int. Cl.<sup>6</sup> A46B 17/04

8 Claims



1. A sanitary brush cover system for breathably isolating a bristled portion of a brush from contaminant atmospheric particles and organisms comprising:

(a) a shroud member for substantially enshrouding said bristled portion of said brush, said shroud member having a body portion and an inlet portion, said body portion defining a brush chamber for receiving therein said bristled portion and having at least one flexible panel formed of an air-permeable composition substantially impermeable to said contaminant atmospheric particles and organisms, said inlet portion defining an opening for insert of said bristled portion therethrough into said brush chamber; and,

(b) closure means coupled to said shroud member for selectively closing and opening said inlet portion opening, said brush chamber being substantially enclosed when said inlet portion opening is closed, said closure means including a flexible bottom panel coupled to said inlet portion, said flexible bottom panel having at least one slit formed therein for removable insert of said bristled portion of said brush therethrough.



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5,771,522

## DENTAL HYGIENE WIPE

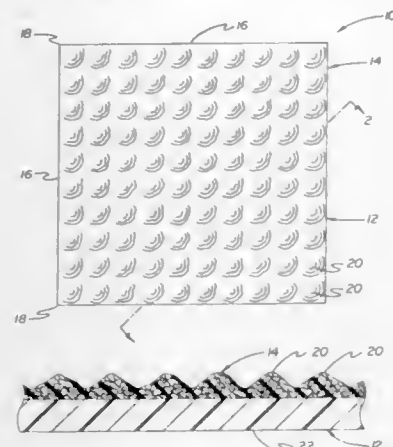
Shawn J. Carmody, 27 Manor Rd., Phillipsburg, N.J. 08865

Filed Oct. 18, 1996, Ser. No. 732,696

Int. Cl.<sup>6</sup> A47K 7/02

U.S. Cl. 15—208

6 Claims



1. A dental hygiene wipe comprising in combination:  
a flexible base substrate;

an abrasive cleaning means coextensively covering an upper surface of the flexible base substrate for abrasively cleaning exterior surfaces and interproximal areas of human teeth, the base substrate and the abrasive cleaning means are shaped so as to define a plurality of intersecting linear edges which cooperate to define corners at intersections of the linear edges, the corners are orthogonal corners which can be utilized as a pick to clean along a juncture of two adjacent teeth to clean debris from the juncture;

the abrasive cleaning means having a flexible layer of material secured to the base substrate, the flexible layer of material being shaped so as to define a plurality of raised quarter-spherical projections extending therefrom, the quarter-spherical projections extend in aligned rows and columns between the linear edges of the flexible base substrate; and  
the quarter-spherical projections are each shaped so as to define a semi-circular planar outer surface and a quarter-spherical outer surface which cooperate to define a quarter-spherical shape of the projections, the semi-circular planar outer surface of each of the projections being oriented so as to reside within a plane oriented orthogonally relative to a plane containing the base substrate such that the quarter-spherical projections provide both a first degree of abrasion when moved in a first direction wherein the semi-circular planar outer surface of each of the projections leads motion of the abrasive cleaning means across a tooth, and a second degree of abrasion when moved in a second direction wherein the semi-circular planar outer surface of each of the projections follows the motion of the abrasive cleaning means across a tooth, wherein the first degree of abrasion is substantially greater than the second degree of abrasion.

5,771,523

## GOLF TOWEL WITH CONNECTOR MEMBER

James M. Rudolph, Orange County, Calif., assignor to Rudolph Sports, Brea, Calif.

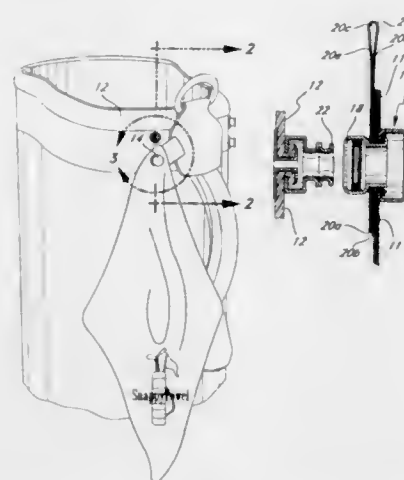
Filed Jul. 30, 1996, Ser. No. 688,422

Int. Cl.<sup>6</sup> A47L 13/16

U.S. Cl. 15—209.1

3 Claims

1. A golf towel including  
a towel body having a snap therein near a corner of the towel, said snap having a cap and a female connector, and  
a reinforcing member comprising a piece of elongated material having opposed ends, said piece of elongated material being formed into a loop with the opposed ends being positioned near each other.



said towel body and said ends of the material being disposed between the cap and female connector, which are fitted together to hold the towel body and said ends securely between the cap and female connector.

5,771,524

## DISPOSABLE PAD

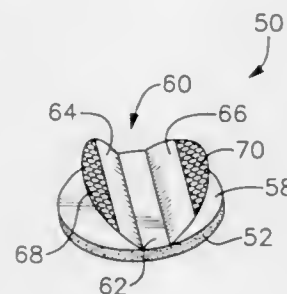
James M. Woods, and Marilyn S. Woods, both of Pisgah Forest, N.C., assignors to M.J. Woods, Inc., Hendersonville, N.C.

Filed Dec. 31, 1996, Ser. No. 775,633

Int. Cl.<sup>6</sup> A47K 7/02

U.S. Cl. 15—209.1

11 Claims



1. A multilayer pad comprising:

an absorbent base pad having a working side, an opposite side, and an outer periphery;

an impervious barrier layer having one side joined to said opposite side of said absorbent base pad, said barrier layer having an outer periphery coextensive with said outer periphery of said absorbent base pad; and

a flexible handle having a central attached portion attached directly to the other side of said impervious barrier layer in a selective attachment area extending as a strip across said impervious barrier layer, and a pair of graspable portions on either side of said central attached portion, said handle having an outer periphery coextensive with said outer peripheries of said absorbent base pad and said impervious barrier layer when said graspable portions are lying adjacent to said impervious barrier layer.

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## DRYWALL AND STUCCO APPLICATION DEVICE

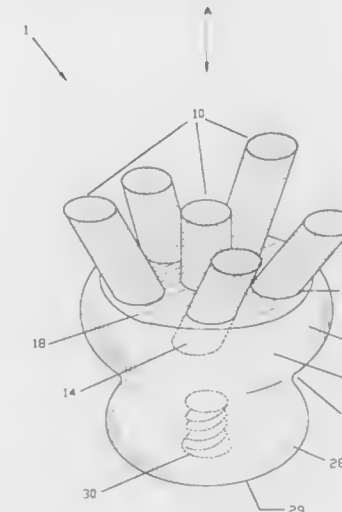
Paula C. Fulcher, and Donald L. Fulcher, both of 1079 SW Benchor Ave., Port St. Lucie, Fla. 34953

Filed Mar. 11, 1996, Ser. No. 707,994

Int. Cl.<sup>6</sup> B05C 17/10

U.S. Cl. 15—244.1

13 Claims



1. A manual handheld tool for creating knock-down texture wall, ceiling and surface patterns, the tool comprising:  
a handheld grip;

plural closed cell polyethylene foam prongs arranged side-by-side in a bundle, the bundle having a top end and a lower end, the lower end of the bundle attached to one side of the grip, and the top end of the bundle of prongs expanding out in a splay pattern, wherein the prongs create knock-down texture patterns on walls, ceilings and surfaces.

5,771,526

## ENCLOSURE AND METHOD FOR CONCEALING REAR WINDSHIELD WIPERS OF AUTOMOBILES

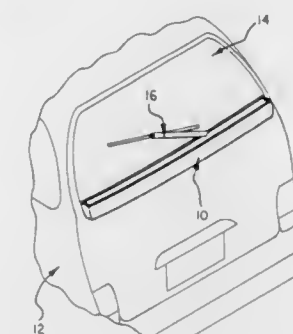
Clifford Keefe Burton, 1412 17th St. Apt. #3, Santa Monica, Calif. 90404-2825

Filed Nov. 21, 1996, Ser. No. 754,788

Int. Cl.<sup>6</sup> B60S 1/04; 1/58; B67D 25/08

U.S. Cl. 15—250.19

9 Claims



1. In an automobile having a rear windshield defining a substantially planar surface with a top and bottom, rear windshield wiper enclosure arrangement mounted on said rear windshield, said arrangement comprising:

an elongated tray, said elongated tray having front and rear spaced apart elongated sidewalls joined by a bottom wall and end walls to define an open space therebetween, said first sidewall detachably secured in facing relationship on and to said planar surface of said rear windshield;

a rear wiper means having a wiper blade assembly supported for movement back and forth across the rear windshield during

use and retained at a stowed position when the wiper means is not in use, said wiper blade assembly at the stowed position being completely accommodated within the open space of said elongated tray, said elongated tray configured for permitting movements of said wiper blade assembly between the use and non-use positions.

5,771,527

## WINDSHIELD WIPER DEVICE WITH CONTACT PRESSURE ADJUSTMENT DEPENDENT ON THE WIPING ANGLE

Thomas Blachetta; Bruno Egner-Walter, both of Heilbronn, and Harro Buhl, Kirchheim, all of Germany, assignors to ITT Automotive Europe GmbH, Frankfurt, Germany

PCT No. PCT/EP95/02220, § 371 Date Apr. 1, 1997, § 102(e)

Date Apr. 1, 1997, PCT Pub. No. WO96/01754, PCT Pub.

Date Jan. 25, 1996

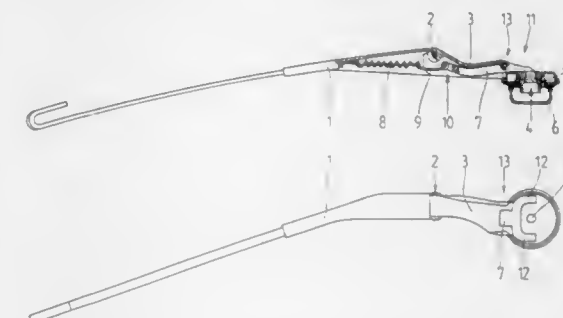
PCT Filed Jun. 8, 1995, Ser. No. 765,362

Claims priority, application Germany, Jul. 8, 1994, 44 24 076.7

Int. Cl.<sup>6</sup> B60S 1/32

U.S. Cl. 15—250.202

10 Claims



1. A windshield wiper device for motor vehicles with contact pressure adjustment dependent on a wiping angle, the windshield wiper device comprising:

an attachment piece configured to be rotatably fixed to a wiper shaft for reciprocating movement therewith about a first axis;

a wiper arm pivotably attached to the attachment piece to pivot in a direction of a windshield;

a wiper blade attached to the wiper arm;

a contact spring operably pressing the wiper blade onto the windshield and having a first end attached to the wiper arm and defining a line of action between the first end of the spring and a second end of the spring; and

an adjusting device to which the second end of the contact spring is attached with the adjusting device configured to vary a force of the wiper blade against the windshield as a function of a wiping angle of the blade and the adjusting device including:

a rocker arm mounted in a fixed position having an annular cam centered on the first axis, and

an adjusting lever pivotably mounted to the attachment piece at a pivot axis for pivoting in the direction of the windshield and the lever having a first end in engagement with the annular cam and the lever having a second end to which a second end of the contact spring is connected.

wherein relative rotation between the attachment piece and the rocker arm displaces the first end of the adjusting lever and resultantly varying the force of the wiper blade toward the windshield wherein the annular cam of the rocker arm includes two mutually synchronous cams and the first end of the adjusting lever includes a forked portion having two fork legs simultaneously displaced by the cams of the rocker arm.

5,771,528

**SELF-CLEANING ENTRY CARPET ASSEMBLY WITH IMPROVED ACCESS AND SHIPPING FEATURES**

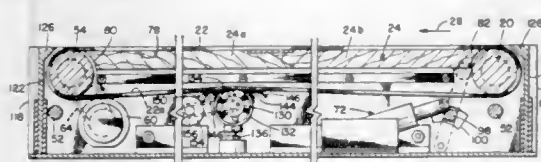
John J. Nappi, Sr., 80 Beckley Rd., Berlin, Conn. 06037

Filed Sep. 4, 1996, Ser. No. 707,436

Int. Cl.<sup>6</sup> A47L 23/02; E04F 19/10

U.S. Cl. 15—311

24 Claims

**1. An assembly comprising:**

- a housing extending along a longitudinal axis thereof and ending in a first and an opposite second end;
- a drive roller mounted for rotational movement at said first end of said housing and being disposed perpendicularly to said longitudinal axis;
- a driven roller mounted for rotation on said second end of said housing and being disposed perpendicularly to said longitudinal axis thereof;
- means associated with said driven roller and said housing second end for slide in connection and slide out removal of said driven roller with said housing;
- an endless loop carpet trained about each of said drive and driven rollers and extending in a direction parallel to said longitudinal axis;
- said endless loop carpet having an upper run and a lower run, said upper run being supported substantially by an upper plate supported by said housing;
- tensioning means associated with said driven roller for causing tension in said endless loop carpet; and
- wherein upon release of pressure on said endless loop carpet applied by said tensioning means, said driven roller may be slidingly removed.

5,771,529

**CONNECTION DEVICE BETWEEN A VACUUM CLEANER AND A SUCTION PIPE**

François Brule, Pacy-sur-Eure, and Pierre Kerboas, Chambray, both of France, assignors to SEB S.A., Ecully, France  
PCT No. PCT/FR94/01410, § 371 Date Jun. 3, 1996, § 102(e)  
Date Jun. 3, 1996, PCT Pub. No. WO95/15109, PCT Pub. Date Jun. 8, 1995

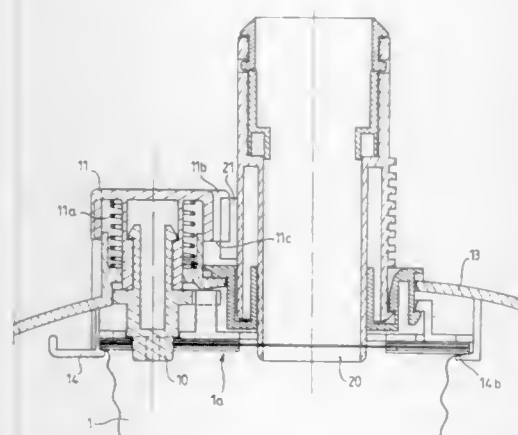
PCT Filed Dec. 2, 1994, Ser. No. 648,193

Claims priority, application France, Dec. 3, 1993, 93 14757

Int. Cl.<sup>6</sup> A47L 9/14

U.S. Cl. 15—339

11 Claims



- 1. A device for connecting a suction pipe to a vacuum cleaning unit and to a removable dust bag (1) for performance of a vacuuming operation, the cleaning unit having a housing (13) and a**

suction inlet, and the bag (1) having a filling opening (2a) and a flap (5), the flap (5) being carried by the bag (1) and being movable between an opening position in which the filling opening (2a) is unlocked and a closing position in which the filling opening is blocked, said device comprising:

- an attachment nozzle (20) connected to form an extremity of the suction pipe;
- means for temporarily securing the dust bag (1) to the housing (13) so that the filling opening (2a) is aligned with the suction inlet;
- a control member (11) which is movable between a first position for placing the flap (5) in the opening position and a second position for placing the flap in the closing position when the dust bag (1) is secured to the cleaning unit; and
- cooperation means coupled to said control member for allowing said nozzle (20) to be locked in the suction inlet and to project past the flap only when said control member (11) is in the first position.

5,771,530

**METAL DETECTION AND RETRIEVAL SYSTEM**

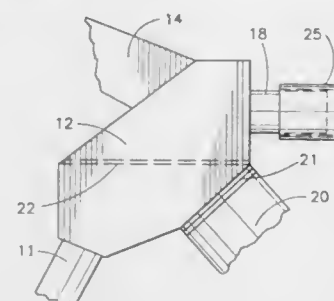
Reinaldo Rodriguez, 12500 Ilyanis Ct., Orlando, Fla. 32828

Filed Jun. 3, 1997, Ser. No. 867,952

Int. Cl.<sup>6</sup> A47L 7/00

U.S. Cl. 15—339

18 Claims

**1. A shell casing retrieval system comprising:**

- a plenum;
- a shell casing pickup tube having two end portions and having a shell casing pickup head on one end portion thereof and being attached to said plenum at the other end portion thereof;
- a metal detector attached to said pickup tube adjacent the shell casing pickup head;
- a shell casing recovery container attached to said plenum for collected shell casings being drawn through said pickup tube; and
- a vacuum connection attached to said plenum for connection to a vacuum source for placing a negative pressure in said plenum and pickup tube to draw shell casings detected by said metal detector into said plenum and into said shell casing recovery container responsive to a negative pressure being placed on said shell casing pickup tube.

5,771,531

**VACUUM FOR ANIMAL FECES**

Donna Swartz, 686 Frisco, Augusta, Kans. 67010

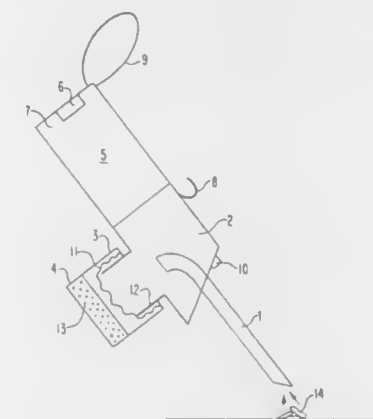
Filed Nov. 19, 1996, Ser. No. 752,146

Int. Cl.<sup>6</sup> A47L 5/24

U.S. Cl. 15—344

14 Claims

- 1. A device comprising a housing having first, second, and third openings, a vacuum motor connected to the first opening of the housing, an elongated tube connected by one end to the second opening of the housing, and a receptacle removably connected to the third opening of the housing, wherein the third opening is positioned between said first and second openings and below said second opening, said housing including an empty space between**



said second and third openings so that material drawn through the elongated tube by the vacuum motor passes without obstruction into the receptacle.

5,771,532

**SUCTION SWEEPING MACHINE**

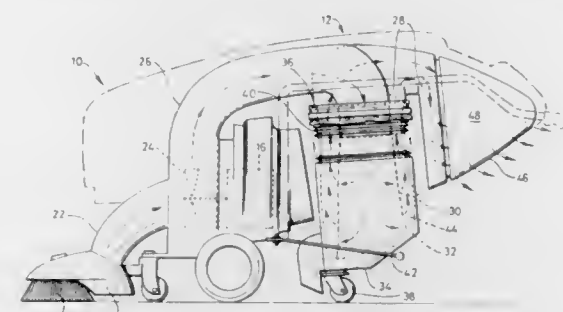
Peter Alexander Clarence Munnoch, Alloa Clackmannanshire, Scotland, assignor to Applied Sweepers Limited, Stirling-shire, Scotland

Filed Oct. 24, 1995, Ser. No. 547,566

Int. Cl.<sup>6</sup> A47L 9/10

U.S. Cl. 15—352

33 Claims

**1. A suction sweeping machine for picking up debris in an air stream generated by a fan, and directed through said machine to an outlet, comprising:**

- a container for collecting debris and having an opening in an upper portion thereof, an open ended flexible porous tube extending from the outlet, through the container opening and to the base of the container, such that the debris-carrying air stream flowing from the outlet diffuses through the porous tube and out of the opening, while the debris remains within the container.

5,771,533

**DOOR STOPPING DEVICE**

Wang Kuang-Pin, No.425, Ta-Tun 4th Street, Taichung, Taiwan

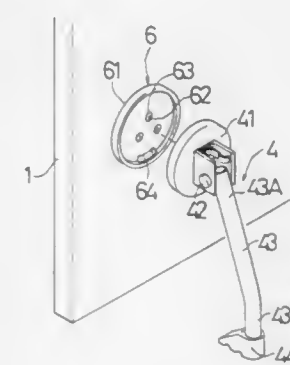
Filed Mar. 19, 1997, Ser. No. 820,175

Int. Cl.<sup>6</sup> E05F 5/02

U.S. Cl. 16—82

11 Claims

- 1. A door stopping device, comprising:**
- a fitting seat for securement to a lower section of a door; and
  - a door stopper releasably coupled to said fitting seat, said door stopper including:
    - a. a base seat releasably coupled to said fitting seat and having a pivot section;
    - b. a pivot shaft coupled to said pivot section of said base seat;
    - c. a longitudinally extended supporting rod having opposing first and second-ends, said first end being pivotally coupled



to said pivot shaft for rotative coupling to said pivot section of said base seat; and,

- d. a slipproof pad secured to said second end of said supporting rod for frictionally engaging a floor surface when said supporting rod is rotated downwardly, said slipproof pad being disengaged from a floor surface when said supporting rod is rotated upwardly.

5,771,534

**SLIDER BLOCK ASSEMBLY FOR A VEHICLE WINDOW**

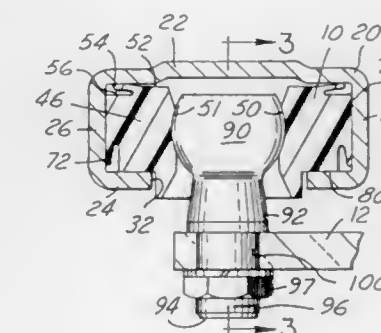
Claire Church, Washington Township, Macomb County, Mich., assignor to Consolidated Industrial Corporation, Birmingham, Mich.

Filed Aug. 11, 1995, Ser. No. 514,064

Int. Cl.<sup>6</sup> F16D 1/00

U.S. Cl. 16—93 R

10 Claims

**1. A slider block assembly for use with an elongate guide channel having a pair of laterally spaced apart side walls and a pair of axially spaced apart base walls joined to the side walls with one of the base walls having an elongate slot therein, the slider block assembly comprising:**

- a slider block having an annular body with a central socket extending about a fastener axis;
- a fastener secured within the socket for connecting a member to be guided;
- said body having a peripherally extending resilient annular side wall flange projecting generally radially of the body to bear springing against the side walls of the guide channel when the slider block is disposed therein and prevent lateral rattling movement within the channel; and
- said body having a peripherally extending resilient annular base wall flange projecting generally axially of the body to bear springing against a rear wall of the guide channel when the slider block is disposed therein and prevent axial rattling movement within the channel.



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5,771,535

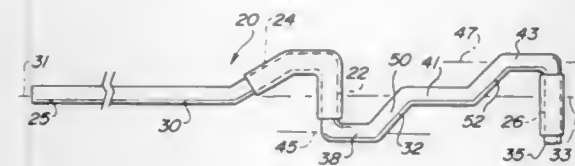
## LAWN AND GARDEN HANDLE

Kenneth C. Blessing, 448 Thornehill Trail, Oxford, Mich. 48371

Filed Dec. 27, 1996, Ser. No. 774,949  
Int. Cl.<sup>6</sup> A47B 95/02

U.S. Cl. 16—110 R

20 Claims



## 1. A handle comprising:

a contiguous, one-piece member having first and second ends, said first end being an implement end; said one-piece member having a handle portion and a shaft portion, said shaft portion terminating at said first end and said handle portion terminating at said second end, said handle portion extending axially along a first longitudinal axis, said shaft portion having a second longitudinal axis, said handle portion including a plurality of grip portions, said grip portions oriented such that at least one of said grip portions is positioned transverse to the first longitudinal axis and one of said grip portions is positioned such that it extends oblique to said first longitudinal axis and slopes outwardly from said first longitudinal axis toward said second end.

5,771,536

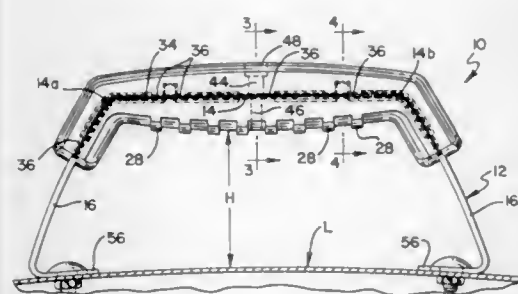
## HANDLE ASSEMBLY FOR GRILL

Ewald Sieg, Palatine, and James C. Stephen, Arlington Heights, both of Ill., assignors to Weber-Stephen Products Co., Palatine, Ill.

Filed Aug. 30, 1995, Ser. No. 520,817  
Int. Cl.<sup>6</sup> A47J 45/08

U.S. Cl. 16—114 R

36 Claims



## 1. A handle assembly for a grill comprising:

a strap having a central portion having opposed first and second ends;  
a pair of legs, one of the legs extending from the first end of the central portion and another leg of the pair extending from the second end of the central portion, an angle being defined between each respective leg and the central portion;  
an insulating material on the strap, the insulating material defining a channel for accommodating the strap, the channel having an inner volume larger than the volume of the strap to define an air space between the insulating material and the strap, and the insulating material substantially covering the central portion of the strap and extending therefrom down a portion of each leg, the insulating material having a defined cross-sectional shape and a defined lengthwise shape in the central portion.

5,771,537

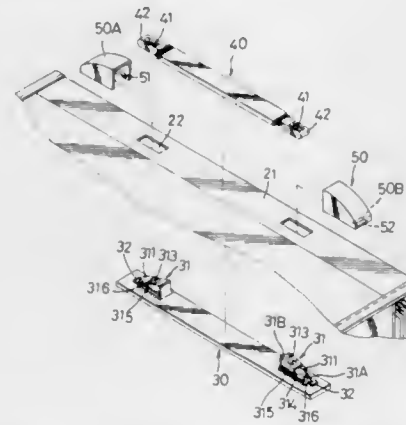
## HANDLE DEVICE ADAPTED TO BE ATTACHED TO TWO MOUNTING HOLES

Chin-Lien Ho, No. 36, Lo-Yang Rd., Hsi-Tun Dist., Taichung, Taiwan

Filed Mar. 25, 1997, Ser. No. 823,705  
Int. Cl.<sup>6</sup> A47B 95/02

U.S. Cl. 16—125

4 Claims



## 1. A handle device adapted to be attached easily on an article having an upper wall formed with two spaced mounting holes such that said article can be carried along by use of said handle device, said handle device comprising:

an elongated mounting plate adapted to be disposed underneath said upper wall and including two spaced positioning seats adapted to be exposed outwardly of said mounting holes, each of said positioning seats having an upright retaining stud;  
an elongated carrier strap having two opposed end portions and two openings formed through said end portions, said end portions respectively being sleeved around said retaining studs of said positioning seats in such a manner that said carrier strap is suspended by said retaining studs so as to define a clearance with said upper wall of said article for gripping said carrier strap;  
two resilient slide members respectively slidable relative to said positioning seats in a longitudinal direction of said mounting plate, each of said slide members being capable of being snugly fitted on a corresponding one of said positioning seats when said slide member is slid from an outboard position to an inboard position relative to said positioning seat; and  
a blocking member disposed on each of said slide members and brought to be over said retaining stud when said slide member is slid to snugly fit on said positioning seat so as to prevent said carrier from slipping off from said positioning seat.

5,771,538

## LUBRICATED HINGE PIN

Norman K. Huppert, Sr., 210 Pelham Rd., Unit #103-B, Fort Walton Beach, Fla. 32547-3643

Continuation of Ser. No. 618,923, Mar. 20, 1996, abandoned.

This application Jun. 9, 1997, Ser. No. 871,283  
Int. Cl.<sup>6</sup> E05D 11/02

U.S. Cl. 16—274

5 Claims

## 1. A hinge pin assembly for pivotally attaching an object comprising a hollow cylindrical body having opposite ends and forming an internal lubricant reservoir, a plurality of grease ports extending through said cylindrical body to supply grease from said reservoir for lubricating contact between the attached object and the cylindrical body.

a grease fitting attached to one of said ends of said cylindrical body to supply grease in said reservoir, said grease fitting normally sealing said cylindrical body and permitting selective introduction of lubricant into said cylindrical body, and removable closure means being substantially axially attached to the other end of said hollow cylindrical body for removal of

5,771,540

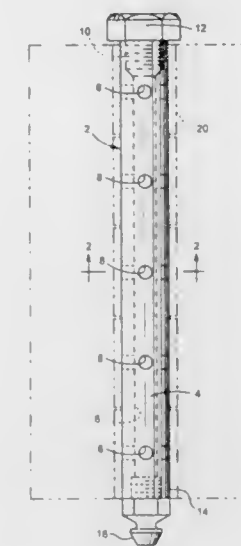
## EQUILIBRATED HINGE WITH VARIABLE FRICTIONAL TORQUE

David A. Carpenter, Clarksville, Md.; Mikhail Gelfand, Milford, Conn., and Edward T. Rude, Columbia, Md., assignors to TorqMaster, Inc., Stamford, Conn.

Filed Jan. 22, 1997, Ser. No. 785,927  
Int. Cl.<sup>6</sup> E05F 1/08

U.S. Cl. 16—308

19 Claims



grease therefrom, said grease fitting having an inlet for selectively introducing grease into and removal of grease out of said cylindrical body, and said inlet of said grease fitting being sealed in use.

5,771,539

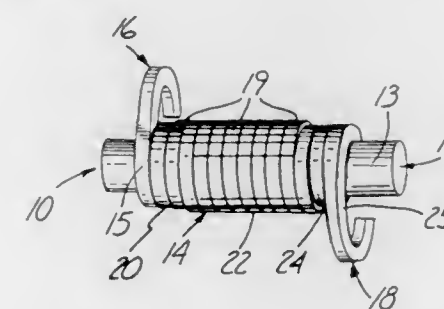
## TORSION FRICTION SPRING HINGE

David Wahlstedt, and Xiangmin Zhou, both of Minneapolis, Minn., assignors to Reell Precision Manufacturing Corporation, St. Paul, Minn.

Filed Sep. 17, 1996, Ser. No. 714,939  
Int. Cl.<sup>6</sup> E05F 1/14; E05C 17/64

U.S. Cl. 16—285

20 Claims



## 1. A torque producing device comprising:

a first hinged element;  
a second hinged element;  
a shaft having a surface portion; and  
a unitary helical device wrapped about the surface, the helical device having a first end coupled to the first hinged element and a second end coupled to the second hinged element, and said helical device having a first portion that frictionally engages the surface producing a friction torque as the first hinged element is rotated relative to the shaft, and a second portion that produces a variable spring torque as the first and second ends are rotated relative to one another, the variable spring torque acting on the first portion to vary the friction torque between the first portion and the surface, relative rotation of the first and second hinged elements producing a combination torque between the first and second hinged elements, said combination torque comprising the friction torque and the variable spring torque.

5,771,541

## APPARATUS FOR CLEANING FIBERS

Shlomo Sterin, and Moshe Kokish, both of Jerusalem, Israel, assignors to MTM—Modern Textile Machines Ltd., Jerusalem, Israel

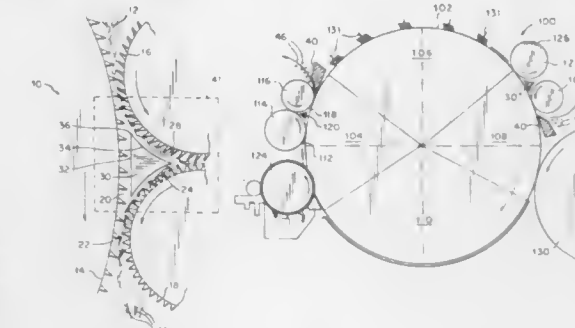
Continuation-in-part of Ser. No. 553,054, Nov. 3, 1995, Pat. No. 5,655,262. This application Mar. 31, 1997, Ser. No. 829,181

Claims priority, application Israel, Nov. 3, 1994, 111520; Feb. 26, 1995, 112791

U.S. Cl. 19—200

Int. Cl.<sup>6</sup> D01B 5/08

28 Claims



## 1. An apparatus for cleaning fibers by means of revolving rollers, the fiber mass being divided, expanded, and recombined while being successively transferred over at least three rollers, the outer surface of at least one of said at least three rollers revolving in close proximity to, but spaced apart from remaining rollers of said at least three rollers, to form a substantially triangular enclosure therebetween, said apparatus comprising:

a first roller of said at least three rollers, driven at peripheral speed faster than said remaining rollers, arranged as a moving source of fiber supply at the beginning of the process and to receive and card fibers from one of said remaining rollers;

a second, condenser roller of said at least three rollers, driven at a peripheral speed slower than said first roller, arranged to receive at least a part of said fiber mass from said first roller and to transport said fibers to one of said remaining rollers; a third, opening roller of said at least three rollers, driven at a peripheral speed relatively slower than said first roller, arranged to receive fibers from said second condenser roller and to transport said fibers back to said first roller; and a stationary fiber stream separator body positioned within said triangular enclosure, said body being of substantially triangular cross-section, for directing fiber streams and preventing turbulent interaction between said streams within said substantially triangular enclosure.

5,771,542

MINIMUM-VALUE SEEKING AUTOLEVELLING  
OPTIMIZATION PROCESS

Joachim Dämmig, Ingolstadt, Germany, assignor to Rieter Ingolstadt Spinnereimaschinenbau AG, Ingolstadt, Germany

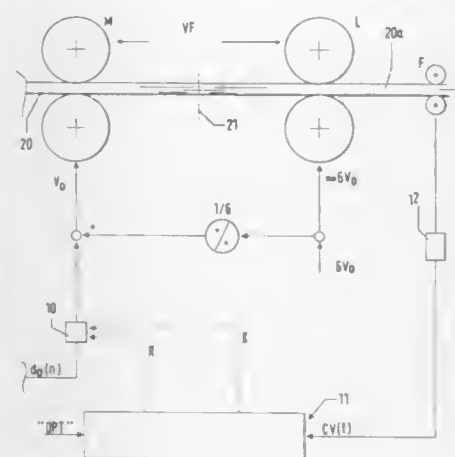
Filed Mar. 20, 1997, Ser. No. 822,339

Claims priority, application Germany, Apr. 22, 1996, 196 15 947.4

Int. Cl.<sup>6</sup> D01H 5/32

U.S. Cl. 19—239

11 Claims



I. A process for controlling the drafting operation of a textile machine drafting equipment, wherein at least one of the parameters of point of autolevelling application and autolevelling amplification are optimized and used as setting values in an operational phase of the drafting equipment, said process comprising the steps of:

in a pre-operational phase of the drafting equipment, processing fiber sliver through the drafting equipment and measuring a quality characterizing value of the fiber sliver as a function of a selected one of the parameters of point of autolevelling application and autolevelling amplification to be optimized; determining from said processing and measuring step an optimized setting value of the selected parameter that generates a minimum value of the quality characterizing value; and utilizing the optimized setting value as a substantially constant optimized parameter in a following operational phase of the drafting equipment.

5,771,543  
LENGTH ADJUSTMENT DEVICE FOR A FOLDING ARM  
TYPE BRACELET CLASP

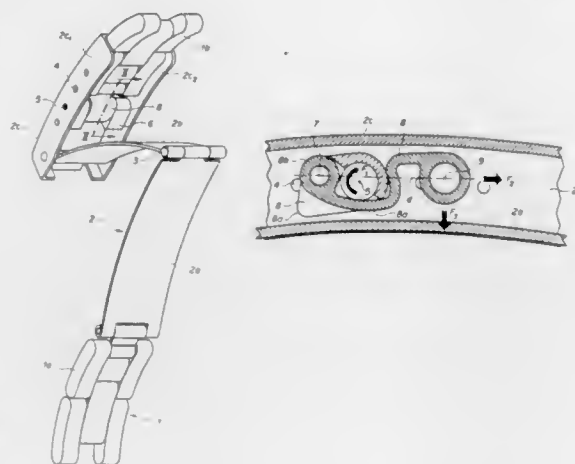
Vincent Froidevaux, Breuleux, and Alberto Jaussi, Petit-Lancy, both of Switzerland, assignors to Montres Rolex S.A., Geneva, Switzerland

Filed Jul. 14, 1997, Ser. No. 892,585

Claims priority, application Switzerland, Jul. 17, 1996, 1783/96

Int. Cl.<sup>6</sup> A44B 11/00; A44C 5/00  
U.S. Cl. 24—71 J

20 Claims



1. A device for adjusting a length of a bracelet having a clasp made of comprising folding arms arranged between two ends of the bracelet to form therewith an endless attachment whose length can vary between two values, one where said folding arms are folded, the other where said folding arms are unfolded, said device comprising an adjustment link having two articulation axes which are substantially parallel transverse to the attachment, said two articulation axes being associated respectively with two element of said attachment to allow, by pivoting of said adjustment link about one of said articulation axes, inversion of respective positions of said articulation axes relative to one another along said attachment to define two determined adjusted lengths of said attachment,

wherein one of said two elements of said attachment comprises locking means arranged in a trajectory described by a portion of said adjustment link when said adjustment link pivots from a position corresponding to a longer adjusted length to another position corresponding to a shorter adjusted length of said attachment, to come into engagement with said portion of said adjustment link in said another position corresponding to the shorter adjusted length of said attachment.

5,771,544

BELT ADJUSTING DEVICE FOR A VEHICLE SAFETY  
BELT SYSTEM

Franz Wier, Peter Haas, both of Göggingen, and Edgar Schneider, Schwäbisch Gmünd-Bettingen, all of Germany, assignors to TRW Occupant Restraint Systems GmbH, Alfdorf, Germany

Filed Mar. 25, 1997, Ser. No. 824,228

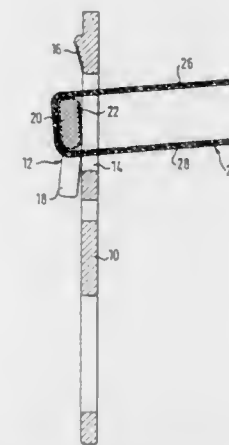
Claims priority, application Germany, Apr. 4, 1996, 296 06294.4

Int. Cl.<sup>6</sup> A44B 11/10  
U.S. Cl. 24—171

6 Claims

1. A belt adjusting device for a vehicle safety belt system having a belt webbing with a free end and a tensioned section, said belt adjusting device comprising:

a holding part having a through passage through which the belt webbing extends and a contact surface adjacent said through passage, said contact surface extending in a first plane which extends at an angle of approximately 15° to a second plane in which said through passage extends;



an arresting part which is movable relative to said holding part, said arresting part having a deflection web and a supporting section, said deflection web having a clamping surface facing said holding part and extending in a third plane, said supporting section extending in a fourth plane which extends at an angle between approximately 160° and approximately 175° to the third plane, whereby the belt webbing is adapted to run through said through passage, around said deflection web, and back through said through passage so that the free end of the belt webbing is adapted to pass through said through passage between an edge defining the through passage adjacent said contact surface and the tensioned section of the belt webbing.

5,771,545

## GARMENT STRAP RETAINER

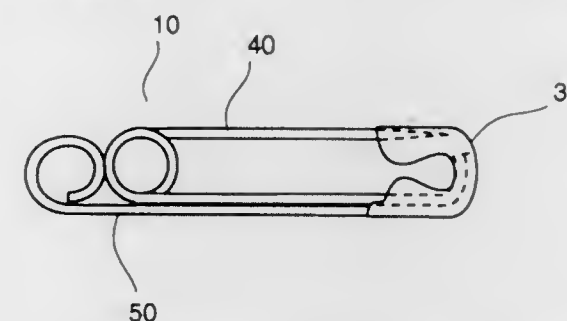
Jane Ellenberger, 63 Gunkel Ave., Dayton, Ohio 45410

Filed Feb. 10, 1997, Ser. No. 798,430

Int. Cl.<sup>6</sup> A44B 9/12

U.S. Cl. 24—351

9 Claims



1. A garment strap retainer for use in retaining a strap of one piece of garment in a relatively fixed position with respect to another piece of garment, which includes:

a first resilient member having a first end, an intermediate portion and a second blunt end;  
a second resilient member having a first end, an intermediate portion and a second blunt end, wherein said second resilient member is disposed adjacent said first resilient member such that said first ends of said resilient members are disposed adjacent one another in a relatively fixed manner and have a first retention contact point formed therebetween, said intermediate portions are movably disposed adjacent one another and said second ends are movably disposed adjacent one another and have a second retention contact point formed therebetween and wherein said second ends may be directly forcibly oppositely displaced from one another in a manner to break said second retention contact point and to permit the strap to be positioned between said intermediate portions and upon replacement of said second ends, said second retention contact point is reformed such that the strap is retained between said retention contact points; and

means connected to one of said resilient members for removably connecting to the another piece of garment.

5,771,546

## PULL TAB FOR SLIDE FASTENER SLIDER

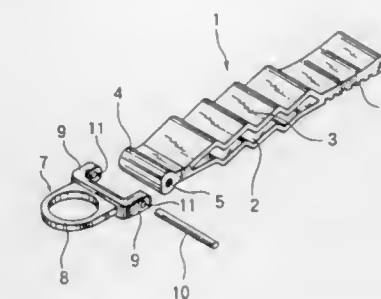
Hitomi Minato, Toyama-ken, Japan, assignor to YKK Corporation, Tokyo, Japan

Filed Dec. 17, 1996, Ser. No. 768,243

Claims priority, application Japan, Dec. 19, 1995, 7-330621  
Int. Cl.<sup>6</sup> A44B 19/00

U.S. Cl. 24—429

20 Claims



1. A pull tab of a slide fastener slider, comprising: a pull tab body molded of thermoplastic synthetic resin having an internal hollow portion extending longitudinally there-through along said pull tab body, said pull tab body having a flexibility by virtue of said hollow portion and an uneven outer surface formed by at least one ridge extending longitudinally on said surface.

5,771,547

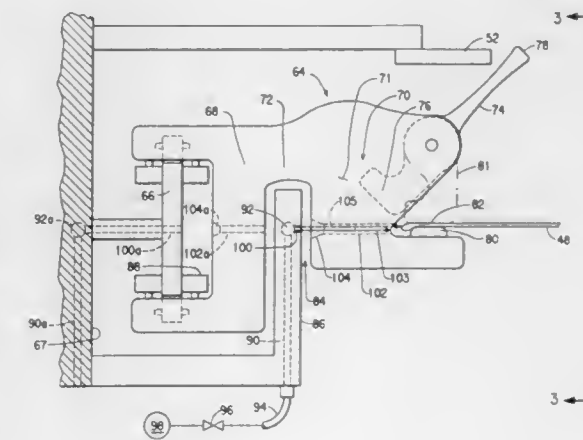
TENTER CLIP CLEANING METHOD AND APPARATUS  
William John Hommes, Hockessin, Del.; Albert White Forrest, Jr., Chillicothe, Ohio, and Paul G. Jennings, Middletown, Del., assignors to E.I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 14, 1997, Ser. No. 911,120

Int. Cl.<sup>6</sup> D06C 3/04

U.S. Cl. 26—93

12 Claims



1. A method of ejecting a loose film edge from a moving film stretching clip of a simultaneous biaxial stretching device for a planar sheet of film, where the clips separate during stretching comprising:

a) directing a jet of fluid at the edge of the film exposed between spaced clips and parallel to the plane of the film at a first position at or before release from the moving clip and at a second position after said release;



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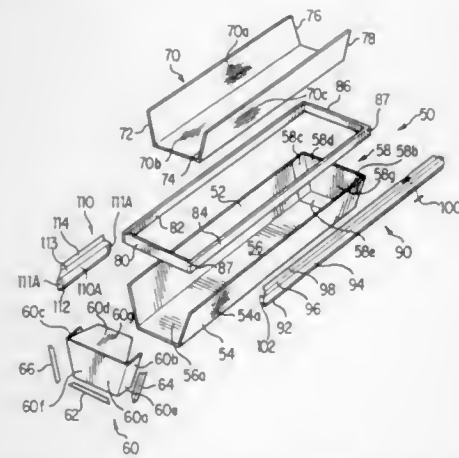
- b) releasing the film from the clip, thereby allowing the jet of fluid to eject the loose film edge from the clip.

**5,771,548  
CASKET**

Kenneth T. Jenkins, Old Forge, Pa., assignor to Chesapeake Packaging Company, Scranton, Pa.  
Filed Sep. 6, 1996, Ser. No. 711,950  
Int. Cl.<sup>6</sup> A61G 17/013

U.S. Cl. 27—2

16 Claims



1. A casket comprising a bottom, two opposing side walls connected to opposing sides of said bottom, and two opposing end walls connected to opposing ends of said bottom and to said two opposing side walls;

wherein each of said two opposing end walls comprises a main panel, two side flanges connected to opposing sides of said main panel, a bottom flange connected to a bottom edge of said main panel, and a top flange connected to a top edge of said main panel; and

wherein said two sides flanges are fixed to said two opposing side walls, respectively, said bottom flange is fixed to said bottom, and said top flange is folded so as to rest against and be fixed to said main panel.

**5,771,549****CASKET SHELL STRUCTURES**

Patrick Michael Saaf, Batesville, Ind., assignor to Batesville Casket Company, Inc., Batesville, Ind.

Filed Jun. 24, 1996, Ser. No. 669,214

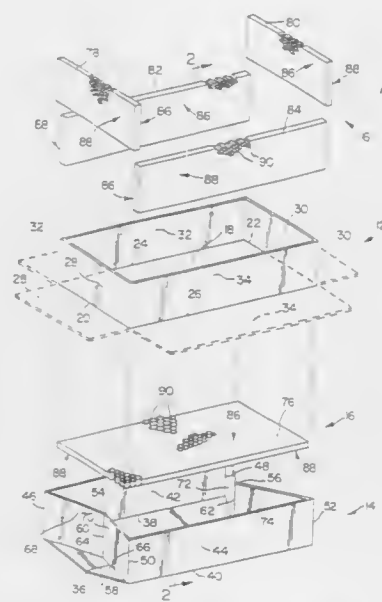
Int. Cl.<sup>6</sup> A61G 17/013

U.S. Cl. 27—4

25 Claims

1. A casket shell comprising an elongated inner box of unitary construction including a generally horizontal bottom having a head end edge, a foot end edge longitudinally spaced apart from the head end edge, spaced-apart first and second side edges extending longitudinally therebetween, and head end, foot end, first side, and second side panels integrally appended to the head end, foot end, first side, and second side edges, respectively, and extending upwardly therefrom.

an elongated outer box of unitary construction including a generally horizontal bottom having a longitudinally-extending first side edge and a longitudinally-extending second side edge spaced apart from the first side edge, first and second side panels appended to the first and second side edges of the bottom, respectively, and extending upwardly therefrom, each of the first and second side panels of the outer box having a head end edge and a foot end edge, a head end panel integrally appended to the head end edges of each of the first and second side panels and extending therebetween, and a foot end panel integrally appended to the foot end edges of each of



the first and second side panels and extending therebetween, the bottom, first and second side panels, and head and foot end panels of the outer box defining an interior region of the outer box, the inner box being congruently disposed the interior region of the outer box, and a core sandwiched between the inner box and the outer box, the core including a top surface attached to the inner box and a bottom surface attached to the outer box.

**5,771,550****METHOD OF LINING SHEET METAL CASKET WITH LIQUID IMPERVIOUS LINER AND CASKET WITH LINER CONSTRUCTED BY SUCH METHOD**

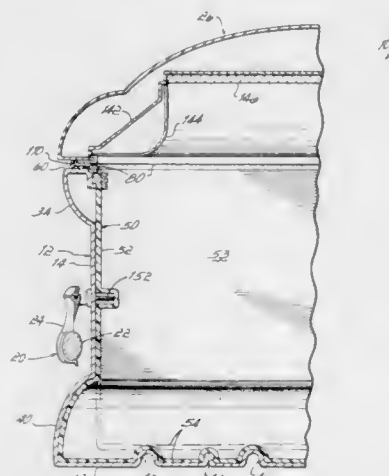
Dennis C. Laphan, Cincinnati, and Ilija Rojdev, Fairfield, both of Ohio, assignors to Batesville Casket Company, Inc., Batesville, Ind.

Filed Aug. 31, 1995, Ser. No. 522,199

Int. Cl.<sup>6</sup> A61G 17/00

U.S. Cl. 27—19

38 Claims



1. A combination casket and liquid impervious liner comprising: a casket shell having a pair of side walls, a pair of end walls and a bottom wall, one side wall of said pair of shell sidewalls including an undercut therein; said one shell side wall including an aperture and hardware mounted to said one shell side wall including a portion extending through said aperture; a plastic liner having a pair of side walls, a pair of end walls and a bottom wall and being inserted into said shell, one side wall

of said pair of plastic liner side walls including an undercut therein conforming to said undercut in said one shell side wall, said one plastic liner side wall additionally conforming to said portion of said hardware extending through said aperture.

**5,771,551****TOOL FOR PUNCHING AND RIVETING INCLUDING A COMBINATION CYLINDER**

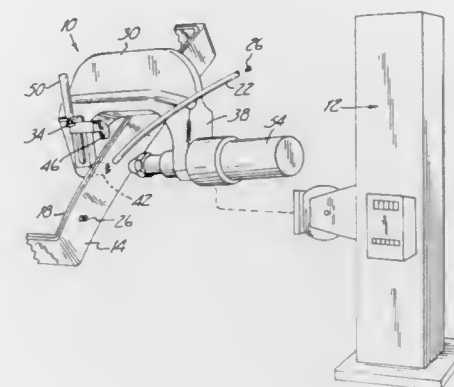
Robert M. Schurter, Colgate; Karl W. Richter, Brookfield, and Edward Y. Byaliy, Shorewood, all of Wis., assignors to AOS Holding Company, Wilmington, Del.

Filed Mar. 13, 1997, Ser. No. 815,039

Int. Cl.<sup>6</sup> B23P 11/00

U.S. Cl. 29—243.54

3 Claims



tions between modeling positioning during the off-line programming and an actual positioning of the workpiece and fixed location are minimized.

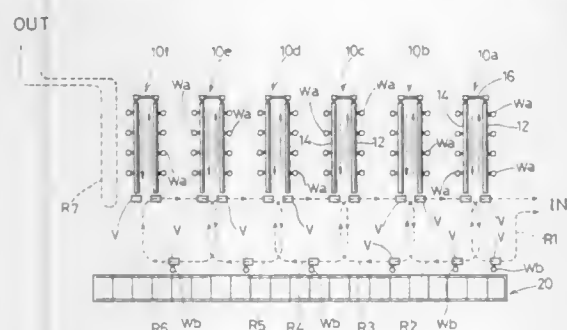
5,771,554

**PARTS ASSEMBLING EQUIPMENT AND PROCESS**  
Shigenobu Komiya, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 3, 1996, Ser. No. 674,801  
Int. Cl.<sup>6</sup> B23P 21/00

U.S. Cl. 29—430

10 Claims



7. A parts assembling process in which a plurality of workers assemble a plurality of parts successively on a work along a plurality of conveying path divisions each having a leading end and a trailing end and thus obtain a complete product, said process comprising the steps of:

- providing a plurality of path division conveying means each for conveying the work with parts assembled thereon in a preceding conveying path division from a trailing end of the preceding conveying path division to a leading end of a succeeding conveying path division and for conveying other parts to be assembled on the work in the succeeding conveying path division;
- moving each said path division conveying means in a closed loop including the trailing end of the preceding conveying path division; a parts stockyard, and the leading end of the succeeding conveying path division;
- supplying the work to each path division conveying means at the trailing end of the preceding conveying path division;
- loading onto each path the division conveying means at the parts stockyard a set of parts to be assembled on the work in the succeeding conveying path division; and
- assembling the set of parts on the work at the succeeding conveying path division.

5,771,555

**METHOD FOR PRODUCING AN ELECTRONIC COMPONENT USING DIRECT BONDING**  
Kazuo Eda, Nara; Yoshihiro Tomita, Osaka; Akihiro Kanaboshi, Higashiosaka, and Masato Sugimoto, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

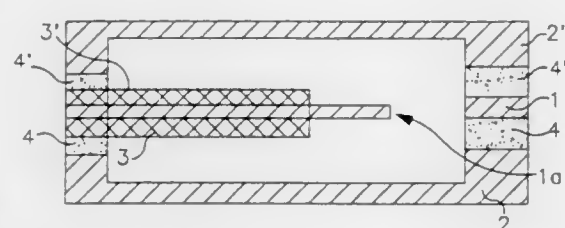
Division of Ser. No. 333,210, Nov. 1, 1994. This application May 4, 1995, Ser. No. 433,687

Claims priority, application Japan, Nov. 1, 1993, 5-273501  
Int. Cl.<sup>6</sup> H01L 41/22

U.S. Cl. 29—25.35

6 Claims

- 1. A method for producing an electronic component, comprising the steps of:
- patterned a single crystalline substrate;
- forming a first patterned conductive layer over a first surface of the single crystalline substrate;
- forming a second patterned conductive layer over a second surface of the single crystalline substrate, wherein the first and second patterned conductive layers correspond to one another



at an oscillating portion of the electronic component, and wherein the first and second patterned conductive layers do not correspond to one another at a terminal electrode portion of the electronic component, thereby preventing the terminal electrode portion of the electronic component from adversely impacting the oscillation of the oscillation portion of the electronic component;

- forming a first patterned insulating layer over the first patterned conductive layer and the first surface of the single crystalline substrate;
  - forming a second patterned insulating layer over the second patterned conductive layer and the second surface of the single crystalline substrate;
  - direct bonding a first holding substrate to the first patterned insulating layer; and
  - direct bonding a second holding substrate to the second patterned insulating layer,
- wherein the first and second holding substrates enclose the electronic component, thereby hermetically sealing the electronic component.

5,771,556

**ACOUSTIC WAVE DEVICE AND MANUFACTURING METHOD**

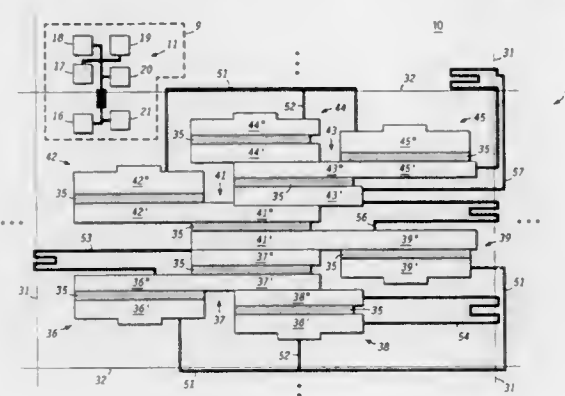
Donald Eugene Allen, Gilbert; Steven Ray Stringer, and Richard Dale Coyne, both of Mesa, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Continuation of Ser. No. 223,878, Apr. 6, 1994, abandoned.  
This application Nov. 7, 1995, Ser. No. 554,469

Int. Cl.<sup>6</sup> H03H 3/08; G01R 31/00

U.S. Cl. 29—25.35

20 Claims



1. A method for making an acoustic wave device, said method comprising steps of:

- (a) providing a substrate suitable for acoustic wave devices;
- (b) processing said substrate to provide a patterned metallization thereon, said patterned metallization including an acoustic wave filter pattern, a first test structure and a second test structure, wherein said first test structure includes a bridge structure having first, second, third and fourth terminals and said second and third terminals are electrically coupled to each other only by a single conductor disposed therebetween;
- (c) measuring a sheet resistance of said first test structure
- (d) determining a resistance of said second test structure to provide a measured resistance; and

- (e) computing an estimated average linewidth for said acoustic wave filter pattern from said measured resistance and said sheet resistance.

5,771,557

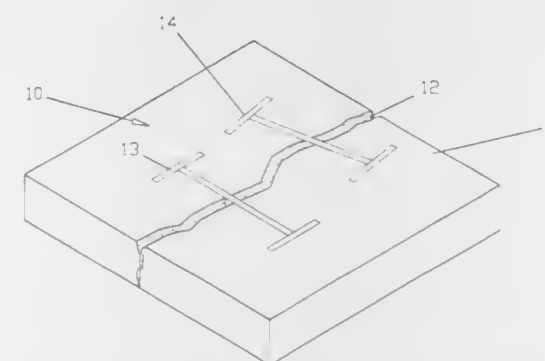
**CONCRETE INTERNAL METAL STITCHING**  
Sam Contrasto, 307 Palm Ave., Nokomis, Fla. 34275

Filed Nov. 21, 1996, Ser. No. 754,386

Int. Cl.<sup>6</sup> B23P 6/00

U.S. Cl. 29—402.11

5 Claims



1. An internal metal stitching method for repairing a crack in concrete, the method comprising:

- removing loose pieces of concrete from the crack to improve the crack surface for bonding;
- assembling and welding a plurality of large brackets and end brackets to form metal stitching brackets, said end brackets being attached at opposite ends of said large brackets;
- marking the concrete at alternating angles to the crack, to the dimensions to be cut using metal stitching brackets as marking templates;
- cutting a first series of saw cuts in the concrete along a line corresponding to the length of said metal stitching brackets;
- cutting a second series of saw cuts across said first series of saw cuts along lines corresponding to the width of said metal stitching brackets;
- said first and second series of saw cuts being sufficiently deep to retain said large and end brackets at least one quarter inch below the surface of the concrete when inserted;
- cleaning and drying the concrete crack and all of said saw cuts;
- mixing a resin filler, a filler additive, and a hardener in a container to form a filler material;
- pouring said filler material into and filling said saw cuts and the crack;
- inserting said metal stitching brackets in each of their original saw cuts, and seating said large metal brackets below the surface of the concrete; and
- smoothing out said filler material to a level flush with the concrete surface and removing excess filler material by scraping or grinding.

5,771,558

Patent Not Issued For This Number

5,771,559

**REMOVABLE HEAT SINK ASSEMBLY PROCESS FOR A CHIP PACKAGE**

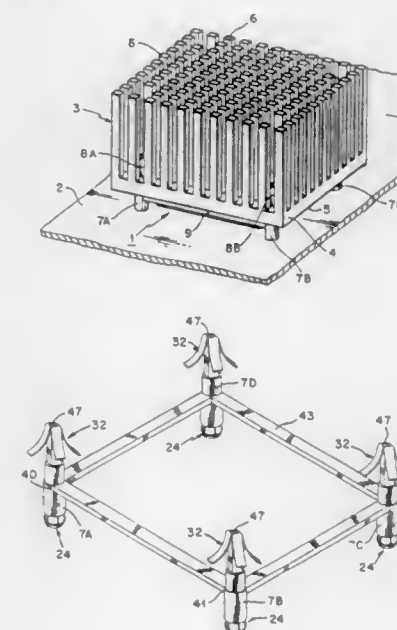
Thomas Mario Cipolla, Katonah, and Paul William Coteus, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 405,069, Mar. 16, 1995, Pat. No. 5,586,005. This application May 2, 1996, Ser. No. 642,251

Int. Cl.<sup>6</sup> B23P 11/02

U.S. Cl. 29—453

8 Claims



1. In an electronic apparatus wherein there is at least one chip package mounted on a circuit card, having circuit connections on one package face connected into the circuitry of said card and having an essentially parallel second package face, separated from said first package face by a height dimension, in contact with a heat sink having first and second faces said first heat sink face being in contact with said second package face, the process of mounting said heat sink in removable compressive contact with said second package face comprising the steps of:

- providing said heat sink with a plurality of holes extending from said first heat sink face to said second heat sink face;
- providing a plurality of post type fastener members each said fastener member having a body with first and second end regions defined by first and second shoulders respectively, said shoulders being separated along the length of said body by a dimension slightly less than said height dimension, each said post type fastener member further having spring means on said first end operable to apply force to said heat sink when positioned in said heat sink in the direction of said first shoulder and each said post type fastener member on said second end having expansion and retention construction features operable to retain said post type fastener member in a hole in said circuit card with said second shoulder in contact with said circuit card;
- positioning each said post type fastener with said first end region extending to said first shoulder, into a separate one of said holes in said heat sink and;
- positioning each said post type fastener with said second end region extending to said second shoulder into a separate hole in said circuit card.



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5,771,560

**METHOD FOR THE CONTINUOUS CASTING OF LONG PRODUCTS AND RELATIVE CONTINUOUS CASTING LINE**

Umberto Meroni; Domenico Wogler Ruzza, both of Udine; Gianni Gensini, Buia, and Dario Lestani, Bicinicco Fraz. Cuccana, all of Italy, assignors to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

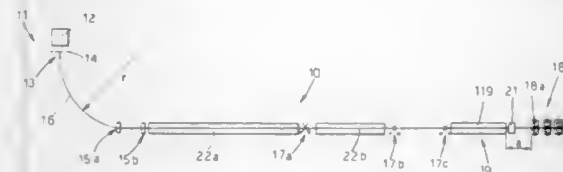
Filed Jul. 31, 1996, Ser. No. 693,796

Claims priority, application Italy, Aug. 2, 1995, UD95 A 000151

Int. Cl.<sup>6</sup> B21B 1/46; 1/26

U.S. Cl. 29—527.7

16 Claims



1. Method for continuous casting, whereby solidification of a cast product is completed at a position downstream of an outlet of a mould, the method comprising:

transferring the cast product from a curved continuous casting machine at a speed of at least 4 mts/min. into a horizontal segment with at least 12% of a section of the cast product having a liquid core without being sheared to size; completely solidifying the liquid core just before introducing the cast product into a temperature-maintaining and pre-heating system; then feeding the cast product to a temperature-equalisation and fast-heating system; then tempering the core of the cast product by propagation of its surface heat to make a temperature of the core and the surface of the cast product uniform and homogeneous; and then feeding the cast product to a rolling train without any discontinuity and/or interruptions of the process; wherein a preset casting speed is controlled to a speed at least greater than a critical speed of rollers of the rolling train.

5,771,561

**CONVERTIBLE MULTISTATION PRESS**

Hans Hofele, Goeppingen, Germany, assignor to Schuler Pressen GmbH & Co., Germany

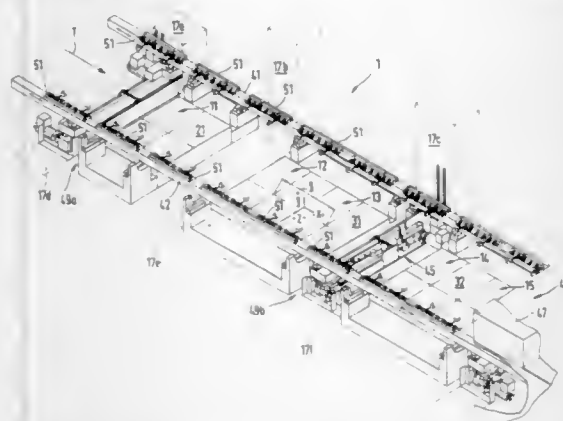
Filed Nov. 13, 1996, Ser. No. 748,581

Claims priority, application Germany, Nov. 13, 1995, 195 42 203.1

Int. Cl.<sup>6</sup> B23Q 5/22; B21D 43/05

U.S. Cl. 29—563

15 Claims



1. A multistation press, comprising a plurality of press stations arranged behind one another corresponding to a machining sequence; sliding tables associated with respective ones of the press stations;

a transfer device for transporting workpieces between the press stations in a transport direction, and having at least two transport rails;  
a driving device for driving the transport rails to carry out a transfer movement;  
carrier devices detachably connected in a mutually spaced manner with the transport rails and provided with gripper devices; and  
at least one receiving device provided on the sliding table and arranged for connecting with the carrier devices, and for holding at least two separate carrier devices in spaced relationship to one another, wherein the carrier devices have a smaller distance from one another with respect to the distance between the transport rails.

5,771,562

**PASSIVATION OF ORGANIC DEVICES**

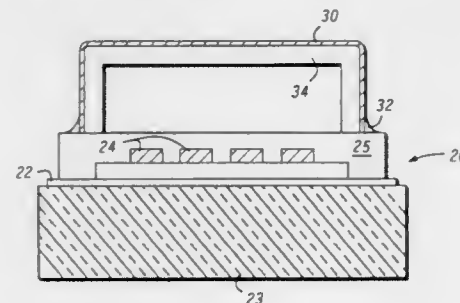
Thomas B. Harvey, III, Scottsdale, and Franky So, Tempe, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 2, 1995, Ser. No. 433,909

Int. Cl.<sup>6</sup> H01S 4/00

U.S. Cl. 29—592.1

15 Claims



1. A method of hermetically sealing organic light emitting devices comprising the steps of:  
providing an organic light emitting device on a supporting substrate;  
overcoating the organic light emitting device with a film of inorganic dielectric material deposited at a temperature less than approximately 300° C.  
sealingly engaging an inorganic layer over the dielectric material so as to substantially hermetically seal the organic light emitting device.

5,771,563

**METHOD AND DEVICE FOR PRODUCING CONDUCTOR BARS FOR DYNAMOELECTRIC MACHINES**

Walter Meier, Waltenschwil, Switzerland, and Günter Müller, Weiz, Austria, assignors to Asea Brown Boveri AG, Baden, Switzerland

Filed Jan. 23, 1996, Ser. No. 589,088

Claims priority, application Germany, Feb. 15, 1995, 195 05 020.7

Int. Cl.<sup>6</sup> H02K 15/14

U.S. Cl. 29—596

11 Claims

1. A method for producing conductor bars for dynamoelectric machines, in which the conductor bars are arranged with a main insulation applied when dry, in a pressing device with the interposition of a separating film, are pressed to size in said pressing device and, together with the pressing device, are impregnated with impregnating resin in an impregnating vessel and cured, the method comprising the steps of:

inserting the dry insulated conductor bars into a pressing device, wherein said pressing device is adapted to the conductor bar shape and surrounds the conductor bar over its entire length and circumference;

5,771,566

**METHOD OF MANUFACTURING A ROTOR WHICH INCLUDES EMBEDDED PERMANENT-MAGNETS**  
Stephen L. Pop, Sr., Warren, Ohio, assignor to Schlenker Enterprises Ltd., Hillside, Ill.

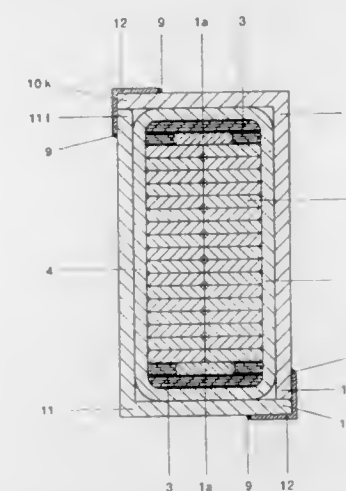
Division of Ser. No. 191,957, Feb. 4, 1994, Pat. No. 5,554,900.

This application Jul. 2, 1996, Ser. No. 675,399

Int. Cl.<sup>6</sup> H02K 15/10

U.S. Cl. 29—598

16 Claims



pressing the conductor bar and insulation into the final dimension in said pressing device; and  
impregnating the conductor bars by inserting the bars and the pressing device into the impregnating vessel which is filled with impregnating resin.

5,771,564

Patent Not Issued For This Number

5,771,565

**METHOD OF MAKING A DIMPLE COMPENSATED LAMINAR STACK**

Harry J. Walters, Pittsburgh, Pa., assignor to Oberg Industries, Inc., Freeport, Pa.

Filed Jan. 14, 1997, Ser. No. 782,985

Int. Cl.<sup>6</sup> H02K 15/02

U.S. Cl. 29—596

9 Claims



1. A method of manufacturing laminated parts from a plurality of laminas, wherein the laminas for forming a laminated part are blanked from strip stock material and are then stacked to form the laminated part, the method comprising the steps of:

- measuring a value of thickness of a plurality of successive sections of said strip stock at a first location of said sections;
- measuring a value of thickness of said sections of said strip stock at a second location of said sections;
- computing a value of a difference between the thickness values at said first location and said second location for said sections of said strip stock;
- computing a running sum of said difference values computed in step (c) for said sections of said strip stock; and
- comparing said summed difference values computed in step (d) to a predetermined value;
- providing a protuberance at selected locations upon selected sections of said strip stock when said sum of said difference values determined in step (d) equals or exceeds said predetermined value.

5,771,567

**METHOD OF FABRICATING CONTINUOUS TRANSVERSE STUB RADIATING STRUCTURES AND ANTENNAS**

Brian M. Pierce, Moreno Valley; Norman H. Harris, Newhall; Thomas Kirk Dougherty, Playa del Rey; William W. Chen, Westchester, and Florentino V. Lee, Culver City, all of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Aug. 29, 1996, Ser. No. 705,508

Int. Cl.<sup>6</sup> H01P 11/00

U.S. Cl. 29—600

8 Claims

1. A method of fabricating a radiating structure for use in a continuous transverse stub electronically-scannable antenna, said method comprising the steps of:





and a clamping element movably coupled to said support structure for engaging said inflator when said support structure is in said nut-securement position so as to act with said nest to clamp said inflator and said air bag unit together, said clamping element moving with said inflator and said air bag unit as said stud is moved to said nut-applying station by said nest.

5,771,573

**WIRE DISPLACING AND STRIPPING METHOD**

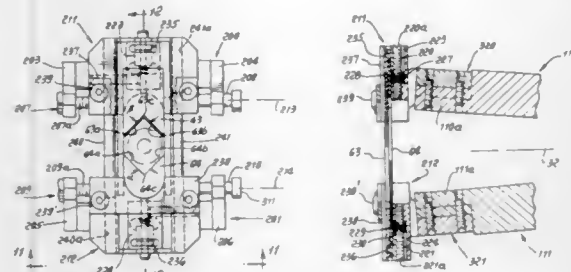
Lloyd A. Talley, Valinda, Calif., assignor to Eubanks Engineering Company, Monrovia, Calif.

Division of Ser. No. 193,548, Feb. 8, 1994, Pat. No. 5,582,078, which is a continuation of Ser. No. 884,928, May 18, 1992, abandoned. This application Apr. 5, 1995, Ser. No. 417,737

Int. Cl.<sup>6</sup> H01R 43/00; H02G 1/12

U.S. Cl. 29—825

42 Claims



1. In the method of stripping sheathing from wire at controllable depths, and wherein blades are operable to cut the sheathing, and a wire clamp is operable to clamp the wire during cutting, the blades having a longitudinal axis of rotation, and there being blade aligners, the steps that include:

- operating the clamp to clamp the wire, and to longitudinally advance the clamped wire to position the wire relative to the blades for cutting, whereby the wire is advanced to said position, the blades being maintained axially stationary;
- advancing the blades relatively toward said wire for positioning the blades to rotatably cut the sheathing;
- rotating the blades about the wire thereby rotatably cutting the sheathing;
- preventing rotation of the wire clamp about said axis during said rotating of the blades and while the wire clamp is maintained axially spaced from the rotating blades;
- providing blade carriers for said blades;
- and aligning the blades during advancement thereof toward the wire, by operation of said aligners.

5,771,574

**APPARATUS FOR MANUFACTURING PRESSURE-WELDED ELECTRICAL HARNESSES AND A METHOD THEREOF**

Sanae Kato, and Kazuhiko Takada, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Jan. 30, 1996, Ser. No. 593,510

Claims priority, application Japan, Feb. 8, 1995, 7-20704

Int. Cl.<sup>6</sup> H01R 43/04

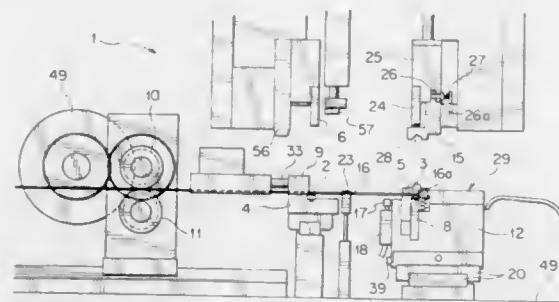
U.S. Cl. 29—861

10 Claims

6. A method of manufacturing pressure-welded electrical harnesses, whereby electrical wires are pressure welded into connectors set on a pair of first and second connector tables, said method comprising the steps of: setting an upwardly-facing connector on said first connector table;

setting a downwardly-facing connector on said second connector table;

disposing said electrical wires, fed from a wire feeding head, under said downwardly-facing connector on said second connector table; and



pressing said downwardly-facing connector set on said second connector table, urged upwardly by springs, toward a pressing blade by means of a connector pressing member to pressure weld said wires into said downwardly-facing connector.

5,771,575

**AUTOMOBILE INSTRUMENT PANEL HARNESS-CONNECTING CONSTRUCTION**

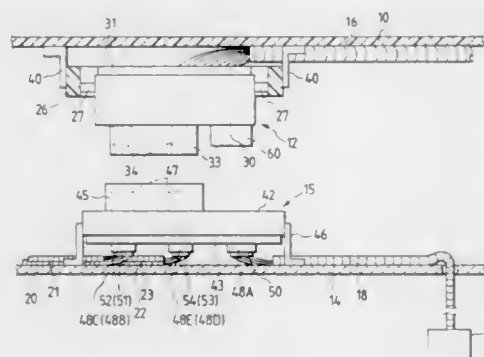
Takahiro Onizuka, and Yasuhiro Hattori, both of Nagoya, Japan, assignors to Harness System Technologies Research, Ltd., Nagoya; Sumitomo Wiring Systems, Ltd., Yokkaichi, and Sumitomo Electric Industries, Ltd., Osaka, all of Japan

Filed Nov. 22, 1996, Ser. No. 753,339

Int. Cl.<sup>6</sup> H01R 43/00

U.S. Cl. 29—868

10 Claims



1. An automobile instrument panel harness-connecting construction for an automobile having an instrument panel attached to a body panel, comprising:

- a junction box divided into a first junction box, having a large-current circuit, and a second junction box having a small-current circuit; and
  - a collective-fitting connector portion provided on each of said first and second junction boxes, the collective-fitting connector portion on the first junction box fitting together with the collective-fitting connector portion on the second junction box;
- wherein said first junction box is attached to the instrument panel, and is connected to an instrument panel harness; and wherein said second junction box is attached to the body panel, and a plurality of harness connector portions are provided on said second junction box for attaching a corresponding plurality of wire harnesses, other than said instrument panel wire harness, to the second junction box.

5,771,576

**STRAIN RELIEF DEVICE AND METHOD**

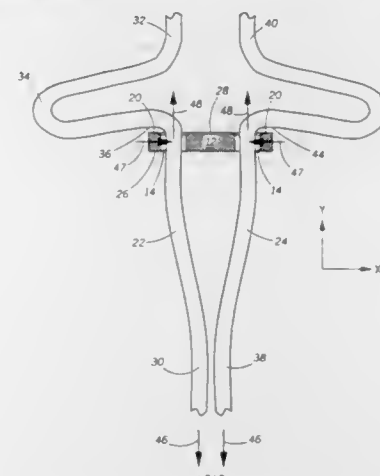
Thomas R. Braxton, 11211 S. Military Trail, Boynton Beach, Fla. 33436, and Gregg M. Connary, 8389 Elaine Dr., Boynton Beach, Fla. 33437

Filed May 22, 1997, Ser. No. 862,050

Int. Cl.<sup>6</sup> H01R 43/01

U.S. Cl. 29—868

6 Claims



1. A method for providing strain relief for a plurality of wires, comprising:

- providing a single non-conductive plate having a first side, a second side, an outer perimeter, a central axis and a plurality of through-holes distributed around the central axis;
- threading each one of said wires through one of the through-holes such that a load portion of each of said wires extends beyond the first side of the non-conductive plate and an opposite portion of each of said wires extends beyond the second side of the nonconductive plate; and
- bending the opposite portion of each of said wires so as to provide a load-resisting portion that extends toward and beyond the outer perimeter of the non-conductive plate, whereby a load applied to said load portion of one of the wires is transferred to the single non-conductive plate.

5,771,577

**METHOD FOR MAKING A FLUID COOLED ARTICLE WITH PROTECTIVE COATING**

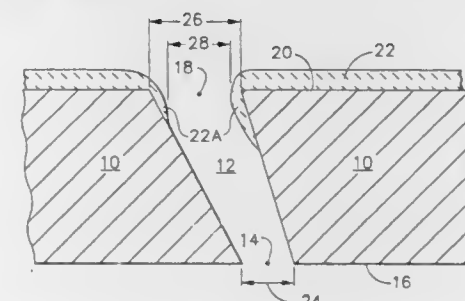
Bhupendra K. Gupta, Cincinnati; Robert P. Ziegler, Montgomery, and Wilbur D. Scheidt, Cincinnati, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed May 17, 1996, Ser. No. 649,352

Int. Cl.<sup>6</sup> B23D 15/00

U.S. Cl. 29—889.721

6 Claims



1. In a method for making a fluid cooled article including a wall having therethrough a fluid cooling passage extending from a first opening in a first wall surface to a second opening in a second wall surface, the second wall surface including a protective coating thereon at least adjacent the second opening, the steps of:

selecting a first cross sectional area for the first opening to establish a desired amount of cooling fluid flow through the fluid cooling passage;

selecting a coating method for deposit of the protective coating on the second wall surface at least about the second opening, the method partially depositing a coating amount within the passage at the second opening;

selecting a coating thickness range for the coating on the second wall surface, by the coating method, at least adjacent the second opening;

generating the fluid cooling passage through the wall, prior to coating, so that the first opening has the first cross sectional area and the second opening has a second cross sectional area greater than the first cross sectional area by an area amount which is no less than a reduction in coating cross sectional area resulting from the partial depositing of the coating within the passage at the second opening; and,

depositing the coating on the second wall surface with the coating method, within the selected coating thickness range, at least adjacent the second opening.

5,771,578

**METHOD AND APPARATUS FOR MAKING SEALANT CONTAINING WIRE CONNECTORS**

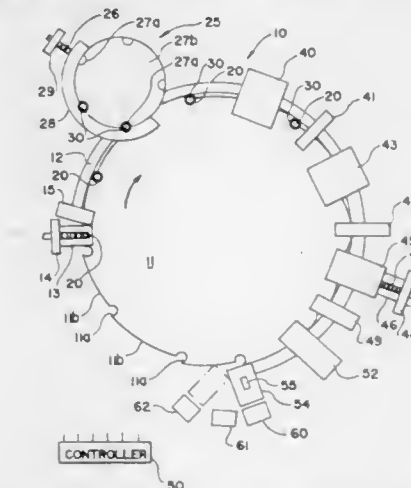
L. Herbert King, Jr., Town & Country; Kerry Graham, New Florence, and Douglas L. Kirk, Ballwin, all of Mo., assignors to King Technology of Missouri, Inc., St. Charles, Mo.

Filed Sep. 20, 1996, Ser. No. 717,460

Int. Cl.<sup>6</sup> H01R 43/16; H02G 1/12

U.S. Cl. 29—885

17 Claims



1. A method for assembling a capped, sealant containing, twist-on wire connector comprising the steps of: determining if a plurality of capped, sealant containing, twist-on wire connector components are available for assembling and interrupting the assembly process until the components are available for assembly, but continuing the assembly process if components are faultily assembled, but segregating the faultily assembled components from the properly assembled components so that only the properly assembled components are available for packaging and delivery to a customer.

5,771,579

**CONVECTIVE AND SHEAR MIXING INJECTOR ASSEMBLY**

Shabram Farhangi, Woodland Hills, and James M. McKinnon, Moorpark, both of Calif., assignors to Boeing North American, Inc., Seal Beach, Calif.

Filed Sep. 24, 1996, Ser. No. 719,099

Int. Cl.<sup>6</sup> F02K 9/00

U.S. Cl. 29—890.01

4 Claims

1. A method of making an injector assembly comprising:

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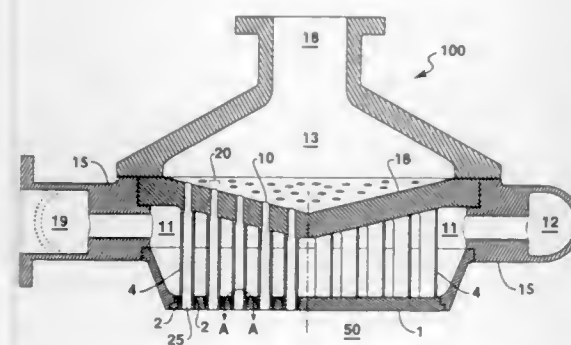
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forming an oxidizer tube array structure with oxidizer tubes integrally formed with the oxidizer tube array structure, forming a face plate with receiving apertures for the oxidizer tubes and fuel passages surrounding each aperture, inserting the oxidizer tubes into respective face plate apertures, and securing the oxidizer tubes to the face plate apertures.

5,771,580

ELECTRIC RAZOR

Yoshitaka Tezuka, Tsuna-gun, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

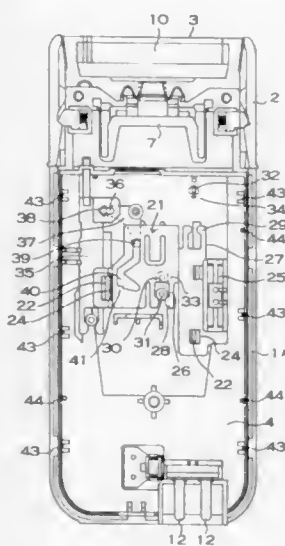
Filed Aug. 27, 1996, Ser. No. 703,880

Claims priority, application Japan, Sep. 29, 1995, 7-253898; Mar. 27, 1996, 8-072399

Int. Cl.<sup>6</sup> B26B 19/02

U.S. Cl. 30—43.92

20 Claims



1. An electric razor comprising:

- a main case;
- main blades mounted on said main case;
- a trimmer mounted on said main case for movement between a closed position and an open position;
- a motor mounted in said main case and drivingly coupled to said main blades and said trimmer;
- an electrical contact member movably mounted to said main case for movement between a motor energizing position and a motor off position;
- a trimmer pop out member operably connected to said trimmer and movably mounted to said main case for movement between a trimmer opening position and a trimmer closing position;
- a switch clasp operably connected to said trimmer pop out member to move said trimmer pop out member between said trimmer opening position and said trimmer closing position, operably connected to said electrical contact member to move said electrical contact member between said motor energizing

position and said motor off position, and mounted on said main case for movement between an idle position maintaining said electrical contact member in said motor off position and said trimmer pop out member in said trimmer closing position, a first position maintaining said electrical contact member in said motor energizing position and said trimmer pop out member in said trimmer closing position, a second position maintaining said electrical contact member in said motor energizing position and said trimmer pop out member in said trimmer opening position, and a third position maintaining said electrical contact member in said motor off position and said trimmer pop out member in said trimmer opening position.

5,771,581

CIGAR CAP-CUTTING AND EJECTION TOOL

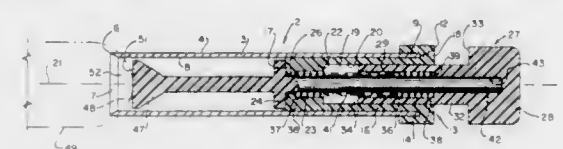
Gerald K. Smith, 17575 Holiday Dr., Morgan Hill, Calif. 95037

Filed Mar. 15, 1996, Ser. No. 616,265

Int. Cl.<sup>6</sup> A24F 13/24

U.S. Cl. 30—111

6 Claims



1. A cigar cap-cutting and cap extraction tool, comprising:
  - a) a housing one end of which is provided with a sharp cutting edge adapted to cut into the cap-end of a cigar when pressed thereagainst to sever therefrom a cap-end portion which remains temporarily within said housing adjacent said cutting edge; and
  - b) a resiliently biased plunger axially translatable mounted on said housing normally in a retracted position and having a cap-end ejection head on one end normally retracted within said sharp cutting edge when said cutting edge is pressed into the cap-end of said cigar, said plunger being selectively manipulable to cause said ejection head to expel said cut cap-end portion of the cigar from said housing.

5,771,582

APPARATUS FOR CARRYING SPARE LINE SPOOL ON FLEXIBLE LINE TRIMMER

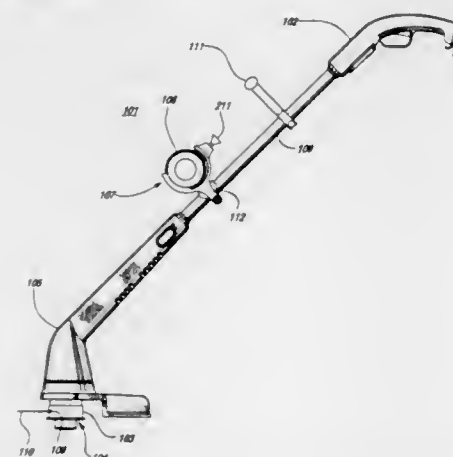
Lloyd H. Tuggle, Shreveport, La., assignor to WCI Outdoor Products, Inc., Cleveland, Ohio

Filed Jul. 26, 1996, Ser. No. 690,194

Int. Cl.<sup>6</sup> A01G 3/06; A01D 50/00

U.S. Cl. 30—125

15 Claims



7. A method of operating a flexible line trimmer, the flexible line trimmer having a rotating line head operatively coupled to a prime

mover and a means for connecting a spool at a location remote from line head, the line head including a first, replaceable spool; the method comprising:

- connecting a second spool wound with line to the means for connecting, the second spool having substantially the same dimensions as the first spool;
- removing the first spool from the line head when substantially depleted of cutting line;
- disconnecting the second spool from the means for connecting; and
- inserting the second spool into the line head.

5,771,583

CUTTER BLADE SUPPORT FOR A HEDGE TRIMMER

Dieter Kremser, Spiegelberg; Kirsten Schellin, Schorndorf; Wolfgang Weissert, Winnenden, and Stephan Ostendorf, Weinstadt, all of Germany, assignors to Andreas Stihl, Waiblingen, Germany

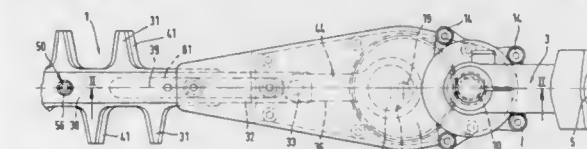
Filed Apr. 23, 1997, Ser. No. 839,154

Claims priority, application Germany, Apr. 26, 1996, 296 07 614 U

Int. Cl.<sup>6</sup> B26B 19/04

U.S. Cl. 30—216

12 Claims



1. A blade support in combination with cutter blades, the combination comprising:
  - first and second bars conjointly defining a space therebetween; and
  - first and second cutter blades arranged in said space and defining respective aperture means formed therein;said first bar having opening means formed therein; a plurality of threaded bolts held in said second bar; said threaded bolts extending through said aperture means and having respective end portions extending through said opening means; attachment nuts disposed on said first bar to threadably engage corresponding ones of said end portions; and, said threaded bolts being pressed into said second bar so as to be tightly held therein and so as to be nonrotatable with respect thereto.

5,771,584

SHEAR WITH LINK INTERCONNECTED HANDLES

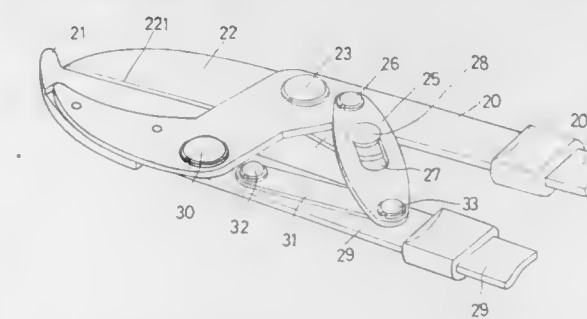
Meng Tun Wang, No. 9-4-1, Chung Nan Lane, Tai Ping City, Taichung Hsien, Taiwan

Filed Mar. 20, 1997, Ser. No. 821,230

Int. Cl.<sup>6</sup> B26B 13/26

U.S. Cl. 30—251

1 Claim



1. A shear device comprising:
  - a body including a first end having a fixed jaw and including a middle portion and including a second end having a hand grip.

a handle pivotally coupled to said body for moving toward and away from said hand grip.

- a bar including a first end pivotally coupled to said handle and including a second end;
- a cutter blade including a middle portion pivotally coupled to said middle portion of said body at a pivot shaft and including a first end having a cutter edge and including a second end having a pin, and
- a lever including a first end pivotally coupled to said middle portion of said body at a pivot rod and including a second end pivotally coupled to said second end of said bar at a pivot pole, said lever including a middle portion having a groove for slidably engaging with said pin, said pin being caused to move along said groove of said lever for rotating said cutter blade about said pivot shaft when said lever is rotated about said pivot rod, and said pin being provided between said pivot pole and said pivot rod for allowing said pin and said cutter blade to be rotated with less force.

5,771,585

Patent Not Issued For This Number

5,771,586

APPARATUS FOR SKIVING BELT ENDS

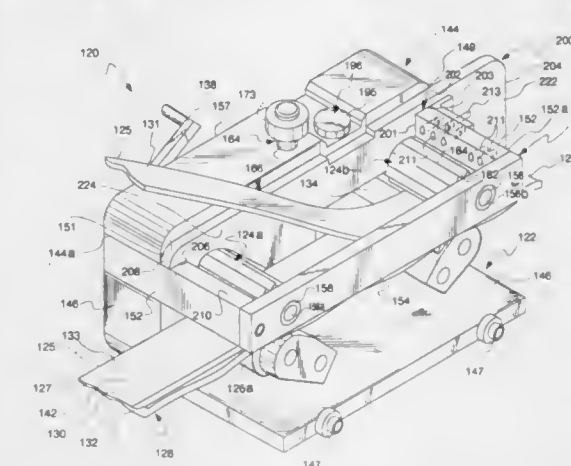
David A. Lotarski, Bolingbrook, and Joseph C. Vogrig, Naperville, both of Ill., assignors to Flexible Steel Lacing Company, Downers Grove, Ill.

Continuation-in-part of Ser. No. 301,696, Sep. 7, 1994, abandoned. This application Jun. 6, 1995, Ser. No. 467,589

Int. Cl.<sup>6</sup> B26D 3/06; 3/28

U.S. Cl. 30—293

18 Claims



1. An apparatus for skiving a conveyor belt having upper and lower faces with a belt thickness therebetween with operation of the skiving apparatus removing a narrow transverse strip having a predetermined width from the upper face of the conveyor belt at a transverse end portion thereof from a first, leading side of the belt end portion to a second, trailing side of the belt end portion, the apparatus comprising:

- a carriage for traveling across the belt end portion in a transverse direction;
- a belt cutting blade mounted on said carriage, said belt cutting blade having a forward cutting edge for cutting away the narrow transverse strip from the upper face of the conveyor belt at the belt end portion;
- first drive means on the carriage forming a first nip forward of said belt cutting blade to clamp on both faces of the belt at the belt end portion and for driving the carriage in the transverse direction across and along the belt end portion from said



leading side of the belt toward said trailing side of the belt end portion, with the belt cutting blade cutting the belt end portion during said driving of the carriage relative to the belt, with the belt end portion passing out of engagement with the first drive means upon the trailing side of the belt end portion passing through said first nip which leaves a small uncut portion of the narrow transverse strip adjacent the trailing side of the belt end portion; and

second drive means on the carriage forming a second nip rearward of said belt cutting blade for continuing said driving of the carriage in the transverse direction across and along the belt end portion subsequent to said trailing side of the belt end portion passing through said first nip, to drive the forward cutting edge of the cutting blade past said trailing side of the belt end portion to cut said small uncut portion remaining adjacent the trailing side of the belt end portion.

5,771,587

## MANUAL BELT SKIVER

Wolfgang Herold, Offenbach, Germany, assignor to Mato Maschinen-und Metallwarenfabrik Curt Matthaei GmbH & Co KG, Offenbach, Germany

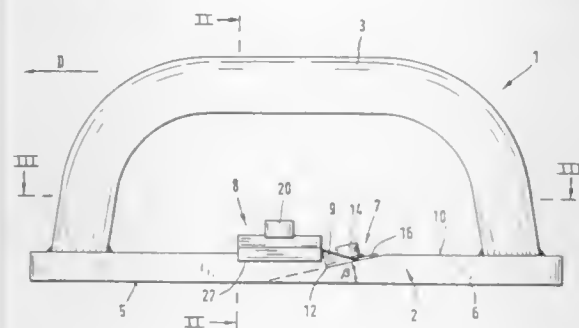
Filed Nov. 6, 1996, Ser. No. 744,795

Claims priority, application Germany, Nov. 9, 1995, 195 41 822.0

Int. Cl.<sup>6</sup> B26B 29/00

U.S. Cl. 30—294

30 Claims



1. A manual belt skiver for removing a top layer of material along an end edge of a belt in preparation for mounting a lacing thereon, comprising:

- a base having a normally vertically oriented contact surface adapted to slidably abut the end edge of the belt during use;
- a handle connected with said base, and adapted for manually moving said skiver along the end edge of the belt;
- a knife mounted on said base, and having a thin, generally flat blade protruding laterally outwardly from said contact surface; said blade having a sharpened forward cutting edge with a substantially straight interior portion adapted to cut a normally horizontal recess surface in the belt, and an upwardly turned outer tip adapted to cut a normally vertical recess surface in the belt;
- a pressure bar mounted on said base, generally forward of said knife, and having a foot portion thereof protruding laterally outwardly from said contact surface, with a lower surface of said foot portion positioned generally above the straight interior portion of said blade cutting edge, and adapted to slidably abut the upper surface of the belt, and guide said blade through the belt as said skiver is manually drawn across the end edge of the belt to remove the top layer therefrom.

5,771,588

## FOLDING AX

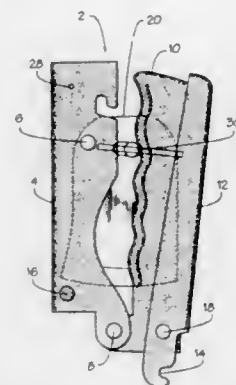
Richard F. Petrich, 310 W. Knepp, Fullerton, Calif. 92832

Filed Jan. 27, 1997, Ser. No. 790,747

Int. Cl.<sup>6</sup> B26B 23/00

U.S. Cl. 30—308.2

7 Claims



1. A folding ax comprising a first shaft having a round configuration on one side and an elongated channel on the other side, an ax head pivotally attached to one end of the first shaft inside of the elongated channel, said ax head having first and second locking means, wherein the second locking means comprises a large steel ball bearing contained in the ax head, said steel ball being adapted to fit in a recessed portion near said one end of the first shaft, a second shaft pivotally connected to the other end of the first shaft, said second shaft having a round configuration on one side and an elongated channel on the other side for receiving the ax head in a closed configuration; and a third shaft pivotally attached to the second shaft, said third shaft containing a round configuration on one side and an elongated channel for receiving a portion of the second shaft, wherein the third shaft has locking means for attaching to the first shaft, locking said first, second and third shafts in a rigid configuration in an open position.

5,771,589

## SAFETY RAZOR BLADE TOOL

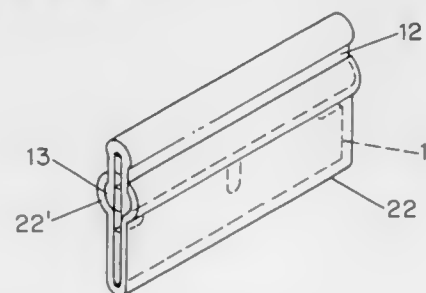
Jisu Kim, New York, N.Y., assignor to Triton International Corporation, New York, N.Y.

Filed Jan. 3, 1996, Ser. No. 582,388

Int. Cl.<sup>6</sup> B26B 21/54; 21/60

U.S. Cl. 30—346.58

12 Claims



1. A safety razor blade tool, comprising:  
a substantially rectangular, single-edged safety razor blade having a cutting edge and an opposing non-cutting edge; and  
a thermoplastic protective cover fixedly attached to said non-cutting edge, the protective cover comprising an extruded substantially rigid inner layer of thermoplastic material and a rubberizing outer layer covering the rigid inner layer, the outer layer comprising a compatible thermoplastic rubber coextruded with the rigid inner layer, said protective cover being substantially coextensive with the length of the non-cutting edge of the blade and having a resilient, slip-resistant surface.

5,771,590

## MANUAL VENTING AND CUTTING APPARATUS FOR OSTOMY POUCHES

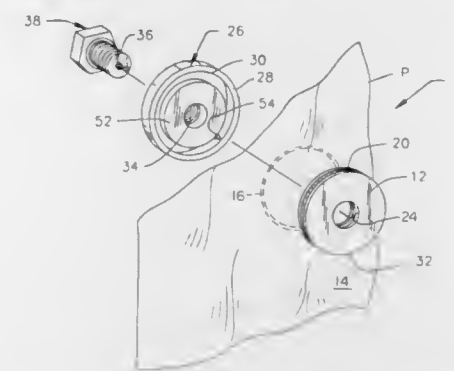
Albert A. Colacello, 4 Cranbrook Rd., Hamilton Square, N.J. 08690, and Michael A. Colacello, 543 Emmett, Trenton, N.J. 08629

Continuation-in-part of Ser. No. 238,884, May 6, 1994, abandoned, which is a division of Ser. No. 100,370, Aug. 2, 1993, Pat. No. 5,372,594. This application Apr. 22, 1996, Ser. No. 636,099

Int. Cl.<sup>6</sup> B26F 1/32

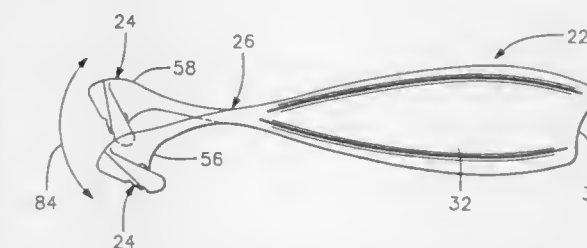
U.S. Cl. 30—360

4 Claims



1. A cutting assembly for cutting a geometrically-shaped opening through a thin plastic material having a generally flat surface, comprising:

- A. retainer means, said retainer means being generally circularly-shaped and provided with a centrally disposed aperture;
  - B. cooperating disc member having a depending flange portion having:
    - a) an inside diameter adapted to cooperate with the external diameter of the retainer means with a portion of said material therearound, and
    - b) a centrally disposed aperture;
  - C. elongated holding means, said holding means rotatably disposed within said cooperating means centrally disposed aperture having:
    - a) a cutting device disposed on one distal end thereof, said cutting device being provided with a protruding portion generally disposed in line with the circumference of said centrally disposed aperture provided in said internal retainer, and
    - b) rotation means for rotating said elongated holding means on the other end thereof to allow rotation of said elongated holding means of said cutting device;
- wherein when said elongated holding means is rotated, said cutting device, disposed on said one distal end of said elongated holding means, cuts a geometrically-shaped hole through said material.



shaved in response to force exerted on the handle to move the razor head and razor blade into engagement with the skin surface, said cutting edge of the razor blade engaging a hair shaft closely adjacent the skin surface for cutting the hair shaft in perpendicular relation to the longitudinal axis of the hair shaft, said handle being an elongated member having longitudinally extending concave surfaces on opposite sides, said handle including an upper and lower edge convexly curved longitudinally, said handle including a concavely curved end edge remote from the razor head extending between the top and bottom edges of the razor, said concave side surfaces and end edge enabling the thumb and fingers to engage opposite concave surfaces with the little finger or first finger engaging the concave end edge to enable the razor to be effectively but lightly gripped when supported for vertical upward movement or vertical downward movement.

5,771,592

## RAZOR PROTECTIVE SEAL

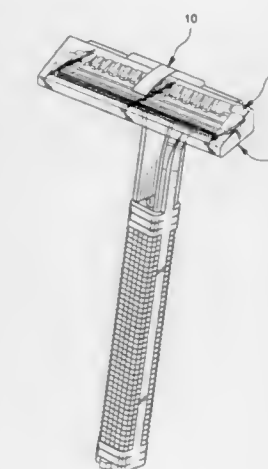
Ilya Nizker, Orange, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 29, 1995, Ser. No. 564,691

Int. Cl.<sup>6</sup> B26B 21/00

U.S. Cl. 30—540

6 Claims



1. A razor unit comprising:  
a razor head having one or more blades;  
cutting edges on each of the one or more blades;  
a cover capable of enclosing and protecting the cutting edges of the blades;  
one or more protective seal means which has two more portions wherein one portion of the seal means is attached to the razor head and the other portion of the seal means is attached to the cover to affix the cover to the razor head in a manner such that the cover is removable from the razor head only upon the exertion of manual force; and wherein the protective seal means comprises one or more pieces of adhesive material which is in the form of a strip having two ends which is placed on the razor in a location such that a consumer may determine whether or not the cover has been previously removed from the razor head.

5,771,591

## DISPOSABLE RESILIENT RAZOR

Joseph M. Armbruster, and Sue B. Armbruster, both of 2700 NE. 47 St., Lighthouse Point, Fla. 33064

Filed Sep. 28, 1995, Ser. No. 535,578

Int. Cl.<sup>6</sup> B26B 21/56

U.S. Cl. 30—527

11 Claims

1. A disposable resilient razor comprising a generally longitudinally extending handle, a razor head at one end of said handle and extending transversely thereof, said razor head including a razor blade having a sharpened cutting edge mounted thereon and a flexible, resilient connecting area connecting the razor head to said handle, said handle, connecting area and razor head, except for the razor blade, being constructed of plastic material having memory and resilient characteristics to enable the razor head and the cutting edge of the razor blade mounted thereon to be positioned in substantially flush, parallel relation to the skin surface being

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5,771,593

Patent Not Issued For This Number

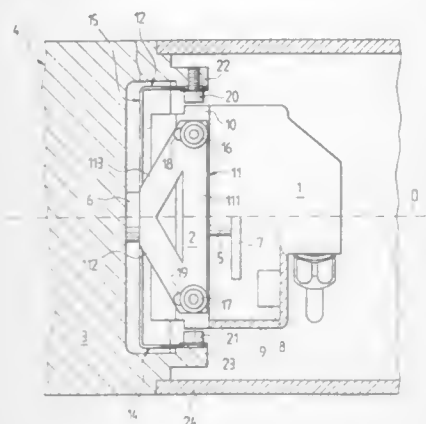
5,771,594

## ANGULAR ENCODER

Kurt Feichtinger, Palling, Germany, assignor to Johannes Heidenhain GmbH, Traunreut, Germany  
Filed Jul. 22, 1996, Ser. No. 681,053  
Claims priority, application Germany, Aug. 5, 1995, 195 34 063.9; European Pat. Off., May 23, 1996, 96108240  
Int. Cl.<sup>6</sup> G01D 5/34

U.S. Cl. 33—1 PT

8 Claims



1. An angular encoder for determining an angular position between a stationary element and an element rotatable relative to the stationary element, the angular encoder comprising:  
a measuring standard associated with the relatively rotatable element;  
a scanning unit for scanning the measuring standard;  
and  
a coupling for connecting the scanning unit with the stationary element without a possibility of the scanning unit being twisted with respect to the stationary element but with a possibility of displacement of the scanning unit in radial and axial directions;  
wherein the coupling is formed of a spring material and has at least two plates which extend transverse to each other by, one of which extends parallel to a rotational axis of the rotatable element and the other extends transverse to the rotational axis and of the rotatable element, and  
wherein each of the at least two plates has a plurality of leaf spring arms which are so formed and aligned that the leaf spring arms extend in directions of respective application lines thereof in which directions forces are applied to the coupling during rotation of the rotatable element relative to the stationary element.

5,771,595

## SCOPE TUBE ADJUSTING AND LOCKING DEVICE

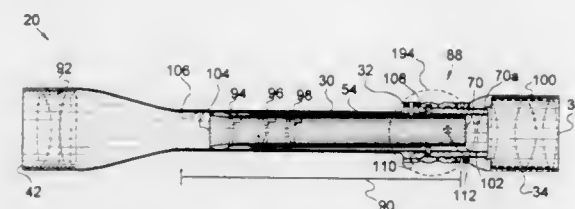
Dennis L. Bell, Greeley, Colo., assignor to Burris Company, Inc., Greeley, Colo.

Filed Jun. 13, 1997, Ser. No. 874,169  
Int. Cl.<sup>6</sup> F41G 1/38

U.S. Cl. 33—248

20 Claims

1. A scope tube adjusting and locking device for use in a sighting scope having a scope outer tube, the scope outer tube having an inner guide tube longitudinally disposed therein, the scope outer tube also having an enlarged portion, the enlarged portion having a non-threaded area and an adjacent threaded area, the scope tube adjusting and locking device providing vertical and horizontal adjustment of the inner guide tube comprising:



- adjusting means having bias means channels eccentrically formed therein rotatably encompassing the non-threaded area of the enlarged portion of the scope outer tube;
- a plurality of bias means disposed in the bias means channels contacting and tracking the bias means channels;
- a plurality of inner tube adjusting means having an end and an opposite end laterally and movably disposed through the non-threaded area of the enlarged portion of the scope outer tube, the opposite end rotatably cradling the plurality of bias means, the end contacting and adjusting the longitudinally disposed inner guide tube; and
- locking means threadably encompassing the threaded area of the enlarged portion of the scope outer tube adjacent to the adjusting means, wherein the locking means rotatably locks the adjusting means when the inner guide tube has been adjusted to a desired position.

5,771,596

## CONTAINER FOR LIQUIDS INCLUDING A LEVEL CONTROL AND A GYRO COMPASS

Ulf Bey, Groszharrie, Germany, assignor to Raytheon Anschuetz GmbH, Germany

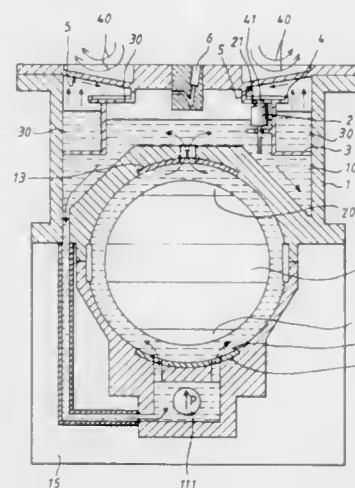
Filed May 3, 1996, Ser. No. 642,280

Claims priority, application Germany, May 6, 1995, 195 16 695.7

Int. Cl.<sup>6</sup> G01C 19/38

U.S. Cl. 33—327

7 Claims



1. A device comprising a first liquid container (1) having a supply of liquid (10) stored therein, and including a level control for the stored liquid, comprising a float valve (2), a liquid storage tank (3), and a further liquid container (4) having therein a liquid maintained at a fixed liquid level, said further container being connected by the float valve (2) to the liquid in said first container (1) to effect replenishment thereof, and said further container being replenished by the storage tank through an inlet portion spaced from the storage tank, (3) thereby to maintain said fixed liquid level therein.

5,771,597

## DEVICE FOR CONNECTING THE ARMS OF AN ANGLE

Leonhard Hopf, Westendorf, Germany, assignor to Klaus Bau-Technik, Germany  
PCT No. PCT/EP94/03537, § 371 Date Jul. 29, 1996, § 102(e)  
Date Jul. 29, 1996, PCT Pub. No. WO95/12728, PCT Pub. Date May 11, 1995

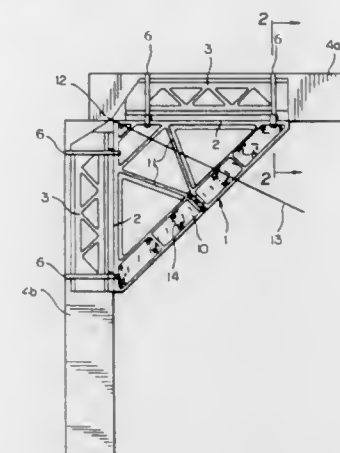
PCT Filed Oct. 27, 1994, Ser. No. 637,775

Claims priority, application Germany, Nov. 5, 1993, 43 37 885.4

Int. Cl.<sup>6</sup> B43L 7/027; 7/10

U.S. Cl. 33—474

17 Claims



1. A device for connecting the arms (4) of an angle, comprising a corner piece (1) having receptacles which are at an angle to each other, for the detachable fixing of arms, characterized in that the receptacles are formed from two rails (5) which form an angle with each other and which have abutment surfaces (2a, 3a) for the arms (4), and that retaining means (6) for the detachable connection of arms (4) on the rails (5) are provided on the rails (5), said retaining means (6) being formed by clamping bands.

5,771,598

## MEASUREMENT DEVICE WITH BRITISH/METRIC SCALES

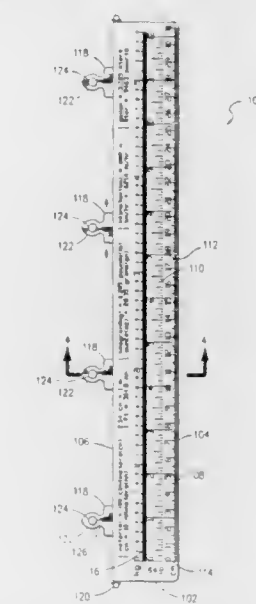
Hilmar J. Lassberg, 13164 Memorial Dr., Suite 102, Houston, Tex. 77079-7220

Filed Mar. 25, 1996, Ser. No. 618,025

Int. Cl.<sup>6</sup> B43L 7/00

U.S. Cl. 33—494

20 Claims



1. A measurement device comprising:

- a generally flat member having a first edge extending therealong;  
a first set of British scale graduations formed along said first edge and extending inwardly of said first edge for a desired distance, said first set of British scale graduations having numerical designations arranged in a first orientation; and  
a first set of metric scale graduations formed adjacent said first set of British scale graduations and spaced in parallel relationship from said first edge by approximately said desired distance, said first set of metric scale graduations having numerical designations arranged in a similar orientation of said first set of British scale graduations.

5,771,599

## METHOD OF AND INSTRUMENT FOR MEASURING ROLL DIAMETER IN ROLL GRINDER

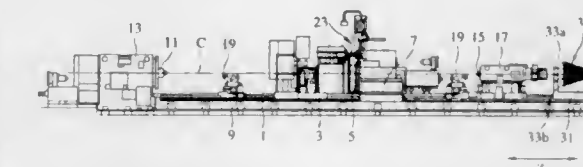
Hiroshi Uchimura, Numazu; Takazumi Watanabe, Mishima; Masayuki Tataka, Numazu; Yoshinori Hata, and Kazuo Kimura, both of Fujisawa, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, and Kanto Special Steel Works, Ltd., Fujisawa, both of Japan

Filed Aug. 29, 1996, Ser. No. 704,998

Claims priority, application Japan, May 31, 1996, 8-138609  
Int. Cl.<sup>6</sup> G01B 5/08; 7/12

U.S. Cl. 33—657

8 Claims



1. A method of measuring a roll diameter of a roll mounted on a roll grinder having roll diameter measuring means for measuring the roll diameter, said method comprising steps of:  
preparing a step-shaped conical master roll consisting of a plurality of diametrical parts arranged coaxially, respective diameters of said diametrical parts being different from each other;  
measuring the diameters of said diametrical parts under a condition at a predetermined temperature thereby obtaining standard diameter values of said diametrical parts;  
mounting said master roll on said roll grinder thereby placing said master roll under a temperature condition similar to that surrounding said roll mounted on said roll grinder;  
measuring a diameter of one of said diametrical parts by said roll diameter measuring means, the standard diameter value of said one diametrical part being closest to said roll diameter value of said roll;  
calculating a difference between said diameter value of said one diametrical part and said standard diameter value as a correction value; and  
correcting said roll diameter value of said roll, which is measured by said roll diameter measuring means, by said correction value.

5,771,600

## COFFEE-BEAN ROASTING ATTACHMENT FOR A ROTISSERIE

James D. Romanow, 3211 Wayne St., Endwell, N.Y. 13760  
Filed May 31, 1996, Ser. No. 656,511

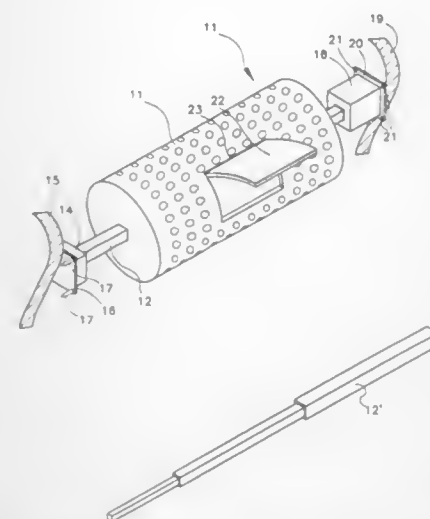
Int. Cl.<sup>6</sup> F26B 19/00

U.S. Cl. 34—63

6 Claims

1. An apparatus comprising:  
a kit for converting an existing home oven or grill to a coffee-bean roasting apparatus, said kit including components for mounting to inner walls of an existing home oven or grill;





- a hollow, perforated drum having a closable, loading aperture for loading coffee beans into said hollow, perforated drum and mounting means for mounting said hollow, perforated drum to a rotatable shaft;
- a rotatable shaft for mounting said hollow, perforated drum to a drive motor, and for rotatably mounting to a wall of said existing oven or grill wherein said rotatable shaft comprises a telescoping-shaft configuration thereby defining means for adapting said rotatable shaft to a plurality of sizes of said existing oven or grill;
- at least one fin mounted within said hollow, perforated drum for stirring said coffee beans in said hollow, perforated drum as said hollow, perforated drum is caused to rotate; a drive motor having means for connecting said drive motor to said rotatable shaft for rotating said hollow, perforated drum via said rotatable shaft; and
- at least one mounting bracket for mounting said drive motor and said rotatable shaft to a wall of said existing oven or grill.

5,771,601

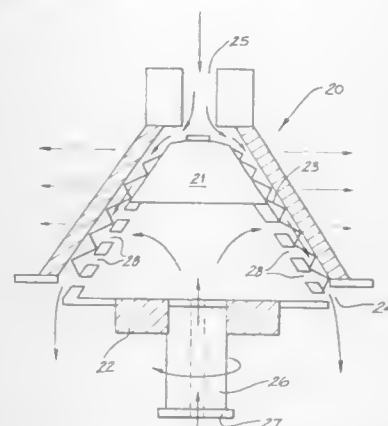
**PROCESS FOR THE DEWATERING OF COAL AND MINERAL SLURRIES**

Christopher John Veal, Turramurra; Stuart K. Nicol, Charles-town, and Barry Kenneth Johnston, Kieraville, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organisation, Campbell, Australia  
Filed May 21, 1996, Ser. No. 651,669  
Claims priority, application Australia, May 23, 1995, PN3140

Int. Cl.<sup>6</sup> F26B 5/08

U.S. Cl. 34—314

10 Claims



1. A method of reducing moisture content of a bed of solid particles comprising subjecting the bed to a stream of gas to establish turbulent flow through the bed to strip a significant

proportion of the moisture contained in the bed, wherein said moisture content of said bed is reduced predominantly by means of a mass transport mechanism effected by the established turbulent flow.

5,771,602

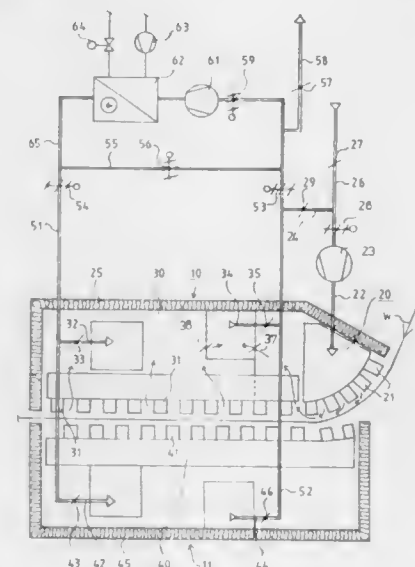
**METHOD AND DEVICE FOR DRYING A COATING ON A PAPER WEB OR EQUIVALENT**

Pertti Heikkilä, Raisio, and Bertel Karlstedt, Parainen, both of Finland, assignors to Valmet Corporation, Helsinki, Finland  
Filed Oct. 23, 1996, Ser. No. 735,691

Claims priority, application Finland, Oct. 25, 1995, 955082  
Int. Cl.<sup>6</sup> D21F 5/00

U.S. Cl. 34—420

26 Claims



1. A method for drying a coating on a paper web whose running path includes a curved segment, comprising the steps of:
- directing heated air at the web from a first drying device arranged on a first side of the web,
- directing heated air at the web from a second drying device arranged on a second side of the web and at least partially in opposed relationship to said first drying device,
- directing a flow of heated air at the web along the curved segment from a turning device arranged on the first side of the web such that the web is adapted to run along the curved segment without contact between the turning device and the web,
- arranging the first drying device and the turning device under a common box construction to isolate the turning device and first drying device from space surrounding the box construction, and
- removing exhaust air from an interior of the common box construction in the vicinity of the first drying device and the turning device through a single, common exhaust device.

5,771,603

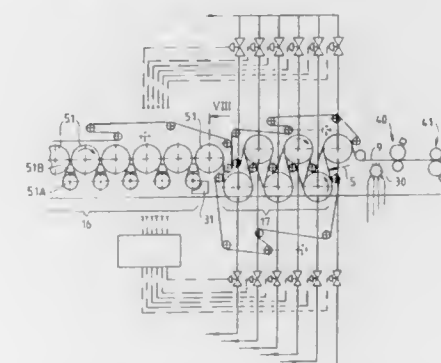
**DRYER SECTION**

Gerard Kotitschke, Steinheim; Hans-Peter Sollinger, Heidenheim; Markus Oechsle, Bartholomae, and Karlheinz Straub, Heidenheim, all of Germany, assignors to Voith Sulzer Papiermaschinen GmbH, Germany  
Continuation-in-part of Ser. No. 344,736, Nov. 23, 1994, Pat. No. 5,557,860. This application Sep. 24, 1996, Ser. No. 719,390  
Claims priority, application Germany, Sep. 16, 1994, 94 14963.1

Int. Cl.<sup>6</sup> D21F 5/00

U.S. Cl. 34—446

35 Claims



16. Method for drying a paper web in a paper making machine, the method including the steps of:
- guiding the paper web over a plurality of heatable drying cylinders arranged as a plurality of successively located drying groups of a drying section;
- moistening the paper web at least at the edges thereof or substantially over the entire width thereof at an end region of the drying section for reducing the tendency of the paper web to curl; and
- directing cooling air at a bottom side of the paper web prior to said moistening of the paper web, to cool the bottom side of the paper web to promote greater absorption of moisture through the bottom side of the paper web.

5,771,604

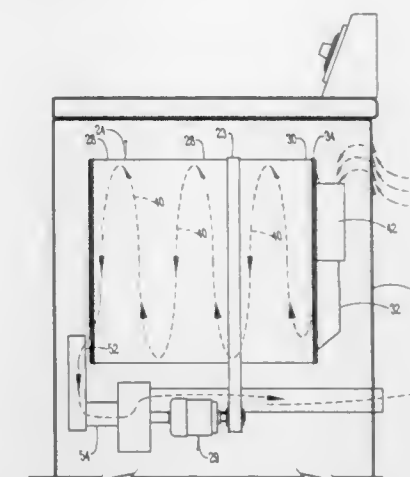
**CLOTHES DRYER AIR INLET ARRANGEMENT**

Daniel F. Wunderlich, and Kirk M. Dunsbergen, both of Newton, Iowa, assignors to Maytag Corporation, Newton, Iowa  
Filed Apr. 7, 1997, Ser. No. 834,905  
Int. Cl.<sup>6</sup> F26B 11/02

U.S. Cl. 34—603

24 Claims

12. An improved laundry dryer including a cabinet having a top panel, a rear panel, opposite side panels, a front panel with an access opening, and a door pivotally mounted on the front panel for movement between open and closed positions relative to the access opening, the improvement comprising:
- a drum having a cylindrical sidewall rotatably mounted within the cabinet, with a substantially open forward end aligned with the access opening and a rearward end;
- a rear bulkhead sealingly covering the rearward end of the drum sidewall;
- a heater for heating for air, the heater producing a hot inner air core and a cool outer air envelope surrounding the inner air core;



- an air inlet in the rear bulkhead for introducing air from the heater into the drum, the air inlet being free from any structure directly contacting the inner air core; and
- an air outlet adjacent the forward end of the drum.

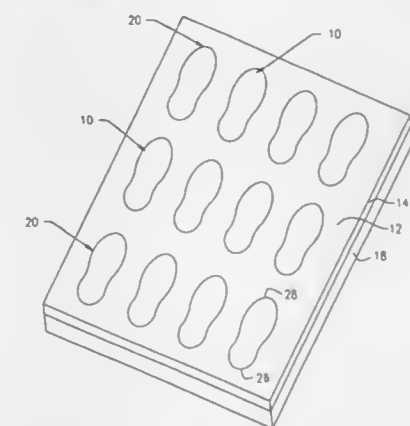
5,771,605

**PROTECTIVE COVERING FOR A SHOE OUTSOLE**

Edward M. Safdie, 245 Carter Dr., Edison, N.J. 08817  
Continuation of Ser. No. 362,907, Dec. 23, 1994, abandoned.  
This application May 24, 1996, Ser. No. 653,124  
Int. Cl.<sup>6</sup> A43B 13/00; 3/10; 5/00; 13/22

U.S. Cl. 36—25 R

10 Claims



1. An outsole for a shoe, said outsole having a toe end and an opposite end and having a removable protective covering, comprising:
- a) a sheet of outsole material, including a ground contact area and a non-ground contact area;
- b) a sheet of protective covering material adhesively attached to said sheet of outsole material to form a composite sheet for attaching to a shoe upper to form a shoe, said sheet of protective covering material adhesively attached to said entire outsole from said toe end to said opposite end of said sheet of outsole material, including said ground contact area and said non-ground contact area; and
- c) printed indicia applied to said sheet of protective covering material before said composite sheet is attached to a shoe upper to form a shoe.

5,771,606

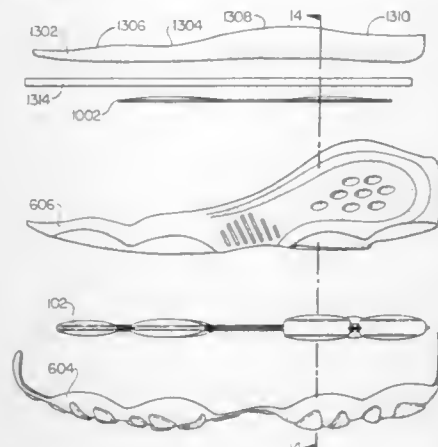
## SUPPORT AND CUSHIONING SYSTEM FOR AN ARTICLE OF FOOTWEAR

Paul E. Litchfield, Westborough; Matthew J. Montross, Quincy; Steven F. Smith, Taunton; J. Spencer White, N. Easton, and Alexander W. Jessiman, Scituate, all of Mass., assignors to Reebok International Ltd., Stoughton, Mass. Continuation-in-part of Ser. No. 599,100, Feb. 9, 1996, abandoned, which is a continuation of Ser. No. 284,646, Oct. 14, 1994, abandoned. This application Sep. 3, 1996, Ser. No. 697,895

Int. Cl.<sup>6</sup> A43B 13/18; 13/20; 19/00

U.S. Cl. 36—29

28 Claims



1. An article of footwear comprising:

- a sole;
- a resilient insert disposed within said sole, said resilient insert including a plurality of first chambers fluidly interconnected to each other, a plurality of second chambers fluidly interconnected to each other, and a connecting passage connecting said plurality of first chambers and said plurality of second chambers; and
- a flexible bladder disposed above said resilient insert and beneath a wearer's foot.

5,771,607

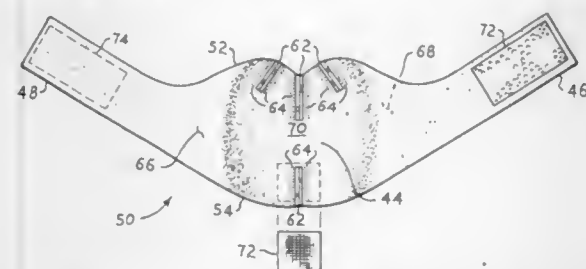
## SHOE HEEL PROTECTOR

Michael B. Dean, 35 Surrey Way, Exton, Pa. 19341 Filed Jan. 9, 1997, Ser. No. 780,900

Int. Cl.<sup>6</sup> A43B 13/22

U.S. Cl. 36—72 B

11 Claims



1. A shoe heel protector for the protection of the heel and counter of a shoe, with the shoe heel having a bottom surface and a rearward surface with the counter extending upwardly therefrom, comprising:

- an elongate device constructed of a single unbroken rectangular strip of flat, planar material having a first end and an opposite second end and a first surface and an opposite second surface; said device including a central area with an upper periphery and an opposite lower periphery, said upper periphery of said central area includes three darts formed therein and said lower periphery of said central area includes a single dart formed therein;

each said dart including a first edge and an opposite second edge, with said first edge and said second edge of each said dart being secured together to gather said upper periphery and said lower periphery and to form a heel pocket therebetween for removably fitting about the counter, rearward surface, and at least a portion of the bottom surface of the shoe heel, said first end and said second end including mating first and second attachment means disposed respectively upon said first surface of said first end and said second surface of said second end, said mating first and second attachment means comprising a first portion and a second portion of hook and loop fastening material, with said heel pocket precluding upward and forward movement and said first end and said second end precluding downward and rearward movement of said device relative to the shoe when said first end and said second end are secured together over the shoe; and a heel reinforcement patch affixed within said heel pocket and over said at least one dart of the lower periphery, with said heel reinforcement patch being disposed beneath at least a portion of the bottom surface of the shoe heel when said device is applied to the shoe.

5,771,608

## SHOE WITH ANKLE STRAP PROTECTOR

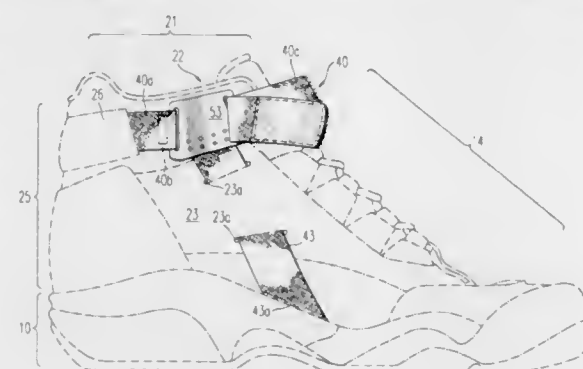
William R. Peterson, Granada Hills, Calif., assignor to K-Swiss Inc., Chatsworth, Calif.

Filed Sep. 17, 1996, Ser. No. 715,089

Int. Cl.<sup>6</sup> A43B 7/20; A43C 11/00

U.S. Cl. 36—89

29 Claims



1. A shoe having a support strap assembly comprising:

- (a) a sole;
- (b) an upper connected to said sole, said upper having:
  - (i) a bottom portion adjacent said sole;
  - (ii) a top portion defining an opening through which a foot is inserted;
  - (iii) a rear portion;
  - (iv) a front portion;
  - (v) a first side portion on a lateral side of said shoe;
  - (vi) a second side portion on a medial side of said shoe;
- (c) a support strap assembly comprising:
  - (i) an upper strap assembly adjacent said top portion of said upper;
  - (ii) a first side strap assembly extending along said first side of said upper, said first side strap assembly connected to said upper strap assembly and extending at an oblique angle with respect to said upper strap assembly; and
  - (iii) a second side strap assembly extending along said second side of said upper, said second side strap assembly connected to said upper strap assembly and extending at an oblique angle with respect to said upper strap assembly; and
  - (d) wherein a slot is disposed on at least one of said first side portion and said second side portion of said shoe and a corresponding one of said first side strap assembly and said second side strap assembly extends through said slot and is connected to said upper strap assembly at a location above said slot.

5,771,609

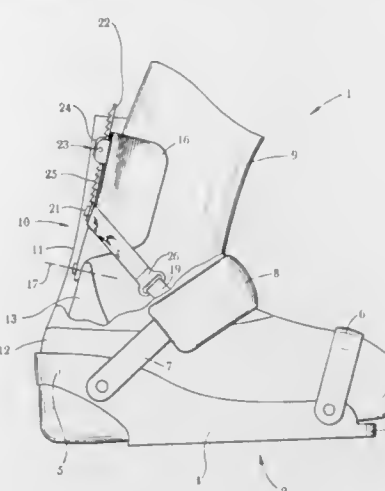
## SNOWBOARD BOOT WITH INNER STIFFENING ASSEMBLY

Karl Messmer, Goldach, Switzerland, assignor to Salomon S.A., Metz-Tessy, France, and USP, Unique Sports Products, Marketing und Vertriebs GmbH, Munich, Germany Continuation of Ser. No. 547,429, Oct. 24, 1995, abandoned, which is a continuation of Ser. No. 317,037, Oct. 3, 1994, abandoned. This application Oct. 28, 1996, Ser. No. 738,701 Claims priority, application Germany, Oct. 1, 1993, 43 33 503.9

Int. Cl.<sup>6</sup> A43B 7/20

U.S. Cl. 36—89

35 Claims



1. A boot adapted to be worn for snowboarding, said boot being configured to encase the foot, the ankle and the lower calf, said boot including:

- an outer shell formed of flexible material, said outer shell having a lower section shaped to encase the foot and a shaft section that extends upward from said lower section so as to encase the ankle and lower calf;
- an inner shell formed of flexible material disposed in said outer shell; and
- a stiffening assembly disposed between said outer shell and said inner shell, said stiffening assembly including: a foot plate located between said outer shell lower section and inner shell so as to be located adjacent the sole of the foot, said foot plate being formed of rigid material and shaped to have opposed sides, a toe end adjacent the front of the foot, a heel end adjacent the heel of the foot, and an ankle stop that extends upwards from said heel end so as to be located adjacent the back of the ankle, said ankle stop being formed with an end tip positioned to be located at approximately the axis at which the ankle pivots around the calf; a back plate formed of rigid material pivotally attached to said foot plate ankle stop end tip and located above said ankle stop adjacent said outer shell shaft section, said back plate shaped to at least partially encase the adjacent back section of the lower calf; and a pair of flexible tension straps, each said tension strap extending between said back plate and a separate one of said sides of said foot plate so as to impose an upward force on said associated side of said foot plate when placed in tension by rearward movement of said back plate.

5,771,610

## FOOTWEAR FOR WATER SPORTS

Steve McDonald, Portland, Oreg., assignor to Patagonia, Inc., Ventura, Calif.

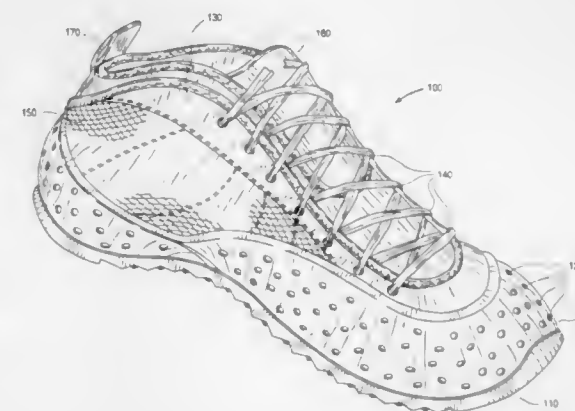
Filed May 24, 1996, Ser. No. 653,542

Int. Cl.<sup>6</sup> A43B 7/06; 7/10

U.S. Cl. 36—116

17 Claims

1. A piece of footwear, said footwear comprising: a sole, said sole comprising a textured surface;



a mesh lateral side, said mesh lateral side having small apertures that prevent the transmission of sand;  
an ankle gasket, said ankle gasket comprising a large opening in an elastic material, said opening having a toe end and a heel end; and  
a tongue, said tongue located within said ankle gasket at said toe end, said tongue cooperating with said ankle gasket to provide a seal around an ankle area of said footwear, wherein lifting of said tongue stretches said elastic material to enlarge said opening in said elastic material.

5,771,611

## TRANSPARENT, LIGHTED SOLE CONSTRUCTION

Chung-Tang Chang, Taichung City, Taiwan, assignor to Shuang-Bang Industrial Corporation, China

Filed Jun. 20, 1996, Ser. No. 666,233

Int. Cl.<sup>6</sup> A43B 23/00

U.S. Cl. 36—137

5 Claims



1. A sole construction comprising:

- a one-piece unitary midsole made of a transparent polyurethane material and having a toe portion, a heel portion, a plurality of side-by-side adjacent cavities, and a plurality of transparent walls which confine said cavities, said transparent walls including a base wall, a plurality of resilient upright partition walls formed on said base wall, and a transparent peripheral wall extending upward from said base wall so as to surround said cavities and said partition walls, said cavities having open ends opposite to said base wall;
- a sole layer bonded to said midsole at said open ends of said cavities; and
- light emitting units provided in some of said cavities to emit light to said transparent walls of said cavities, including said peripheral wall.

5,771,612

## LOADER BUCKET SIFTING SYSTEM

Eddie T. Lynch, 104 Turner St., Bloomfield, N. Mex. 87413

Filed Jul. 15, 1996, Ser. No. 680,015

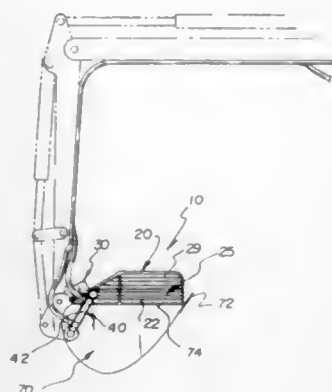
Int. Cl.<sup>6</sup> E02F 5/22

U.S. Cl. 37—142.5

6 Claims

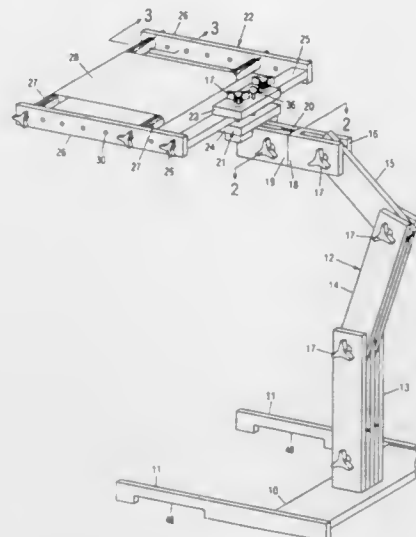
1. A loader bucket sifting system comprising:  
a sifting structure pivotally secured to the rear portion of a conventional loader bucket and formed to fit the shape of the conventional loader bucket;





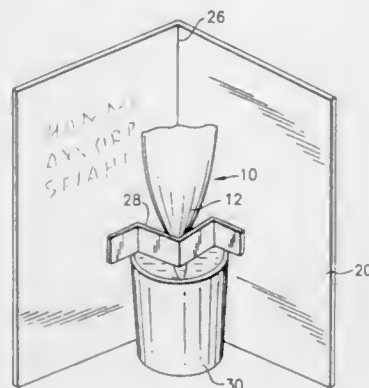
- the sifting structure including
- a. an upper edge engaging support rim formed to fit a loader bucket upper edge;
  - b. a plurality of pivoting members secured to a shortened end of the upper edge engaging support rim, where the pivoting members rotatably engage a rear upper portion of the conventional loader bucket opposite of a front cutting edge of the conventional loader bucket;
  - c. a left sifting side secured to the upper edge engaging support rim opposite of the pivoting members projecting along a substantial portion of an elongated side thereafter the upper edge of the left sifting side slants towards an edge of the upper edge engaging support rim securing the pivoting members, projecting orthogonally to a plane of said upper edge engaging support rim;
  - d. a right sifting side secured to the upper edge engaging support rim opposite of the pivoting members projecting along a substantial portion of an elongated side opposite of the left sifting side thereafter the upper edge of the right sifting side slants towards an edge of the upper edge engaging support rim securing the pivoting members, projecting orthogonally to the plane of said upper edge engaging support rim;
  - e. a front sifting side secured to the upper edge engaging support rim opposite of the pivoting members, adjacent and secured to the first and right sifting sides, and projecting orthogonally to the plane of said upper edge engaging support rim;
  - f. a bottom sifting side secured to the front sifting side opposite of the upper edge engaging support rim, and projecting along the left sifting side and the right sifting side orthogonally and opposite of the upper edge engaging support rim until said left and right sifting sides begin to slant thereby forming a U-shaped structure with one end enclosed by the front sifting side allowing a predetermined size of an object to pass through; and
  - g. a slanted sifting side secured adjacent to the edge of the bottom sifting side opposite the front sifting side thereafter projecting along a slanted portion of the left and right sifting sides terminating at an edge of the upper edge engaging support rim securing the pivoting members;
  - h. a hydraulic releasing means pivotally secured to the sifting structure at one end and pivotally secured to the conventional loader bucket at the opposite end; and
  - i. a vibrating means secured to a lower rear portion of the sifting structure for vibrating the sifting structure allowing sifting of the loaded dirt.

5,771,613  
EMBROIDERY EASEL APPARATUS  
Neal Geils, 2338 Kipland Dr., Santa Rosa, Calif. 95401, and  
Victoria Meyer, 1657 Finlaw, Santa Rosa, Calif. 95404  
Filed Oct. 10, 1997, Ser. No. 947,512  
Int. Cl.<sup>6</sup> D06C 3/08; A47C 29/00  
U.S. Cl. 38—102.21 9 Claims  
1. An easel for holding an embroidery frame, comprising:  
a base;



- an elongated adjustable arm having a lower end attached to said base, said arm including a U-shaped top section with opposite sides connected by a forward connecting member, an adjacent lower section of said arm being hingeably positioned between said opposite sides of said U-shaped top section;
- a hollow cylindrical member extending forwardly from said connecting member of said U-shaped top section, said hollow cylindrical member parallel to said opposite sides of said U-shaped top section;
- a rotatable head including two spaced sides positioned around said cylindrical member, said spaced sides abutting said forward connecting member of said U-shaped top section, said rotatable head having an end portion connecting said spaced sides opposite a distal end of said cylindrical member, said rotatable head having a rod extending from said end portion and positioned between said spaced sides, said rod coaxially and rotatably positioned within hollow cylindrical member; means for tightening said spaced sides around said cylindrical member; and
- a clamp attached to said head for clamping said embroidery frame.

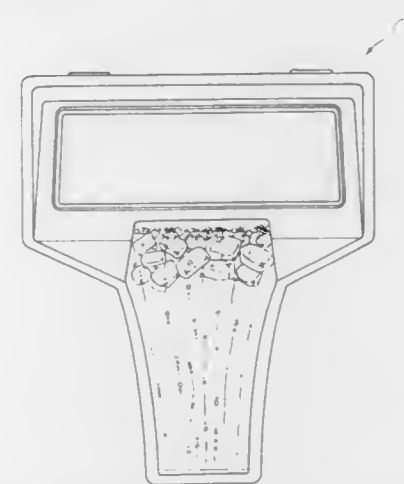
5,771,614  
FLORAL ASSEMBLY  
Neil K. Dawson, 1145-B New Litchfield St., Torrington, Conn. 06790  
Filed Aug. 19, 1996, Ser. No. 699,165  
Int. Cl.<sup>6</sup> G09F 1/00  
U.S. Cl. 40—124.06 2 Claims



1. A greeting card assembly comprising:
- a. a card having a pair of panels having lower ends and being folded at a vertical-hinge line and having an open and a closed condition, and a retaining arm spaced above the lower ends of the panels and secured to at least one of the panels

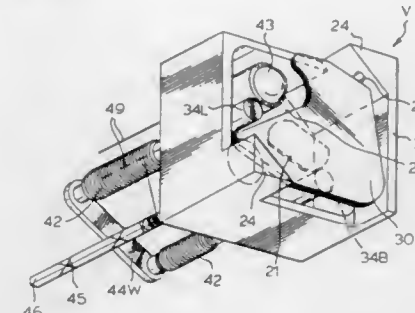
- and adapted when the card is in the open condition to have a portion spaced out from the panels, and
- b. a floral assembly disposed between the panels and engaging and at least partly supported by the arm, the floral assembly comprising a seed-germinating receptacle in the form of a flattenable artificial flower and having an upper end and a lower end, the upper end being a flared bloom-shaped seed pocket made of absorbent paper, the lower end being a stem-shaped support also made of absorbent paper, and a seed disposed in the seed pocket, the assembly being flattened when the panels are in closed condition, and
- c. with the panels in the open condition, a container of water disposed under the arm and receiving in the water the lower end of the floral assembly to dampen the seed by capillary action of the absorbent paper drawing water up from the container to the seed pocket.

5,771,615  
ANIMATED DISPLAY ASSEMBLY  
Kenneth George Weldon, Capalaba; Kenneth John Thornton, Wynnum; Colin John Staples, Cleveland; Keith Michael Daly, Victoria Point, and Rodney David Davidson, Wynnum West, all of Australia, assignors to 3D Displays Pty. Ltd., Capalaba, Australia  
PCT No. PCT/AU94/00611, § 371 Date Apr. 1, 1996, § 102(e) Date Apr. 1, 1996, PCT Pub. No. WO95/10105, PCT Pub. Date Apr. 13, 1995  
PCT Filed Oct. 7, 1994, Ser. No. 624,441  
Claims priority, application Australia, Oct. 7, 1993, PM 1675; Jan. 20, 1994, PM 3466  
Int. Cl.<sup>6</sup> G09F 19/00  
U.S. Cl. 40—406 22 Claims



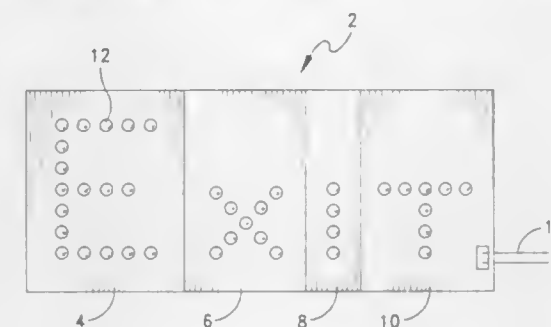
1. Display apparatus for simulating a container of gaseous liquid, comprising
- inner and outer walls at least partially defining a reservoir, the outer wall being at least light transmissive and shaped or contoured to resemble at least a portion of the container, the inner wall generally following the shape or contour of the outer wall but spaced inwardly therefrom,
  - a foamable liquid contained, in use, in the reservoir, and aeration means for introducing gas into the liquid at a bottom portion of the reservoir to thereby form bubbles which rise through the liquid and form a head of foam in a space above the liquid, and
  - foam regulating means for venting gas from burst foam bubbles but returning liquid component of the burst foam bubbles to the reservoir.

5,771,616  
DISPLAY DEVICE WITH DISK AND LED  
Veso S. Tijanic, Mississauga, Canada, assignor to Mark IV Industries Limited, Mississauga, Canada  
Filed Jul. 19, 1996, Ser. No. 684,064  
Int. Cl.<sup>6</sup> G09F 3/04  
U.S. Cl. 40—452 12 Claims



1. Display element for viewing in a viewing direction comprising a stator and a rotor:
- said rotor being a disk mounted on said stator to rotate about an angle between 160° and 180° between ON and OFF limiting positions about an axis generally perpendicular to the viewing direction,
  - said rotor displaying bright and dark sides in said viewing direction in ON and OFF limiting positions, respectively,
  - means for causing rotation about a rotation axis of said disk between ON and OFF positions,
  - an LED mounted on the stator having a lens with a forward end projecting forwardly therefrom,
  - said disk being contoured to mask said LED in the viewing direction in OFF position,
  - said disk being contoured to allow passage of light from said LED in said viewing direction in ON position,
  - said disk being contoured to allow rotation of said disk between ON and OFF positions,
  - wherein an opaque shroud surrounds an extent of the lens and extends forwardly of the LED but not the forward end of the lens.

5,771,617  
DISPLAY DEVICE  
Paul Baker, Cheshire, United Kingdom, assignor to Gradus Limited, Cheshire, United Kingdom  
PCT No. PCT/GB93/02276, § 371 Date Sep. 18, 1995, § 102(e) Date Sep. 18, 1995, PCT Pub. No. WO94/10673, PCT Pub. Date May 11, 1994  
PCT Filed Nov. 4, 1993, Ser. No. 428,201  
Claims priority, application United Kingdom, Nov. 5, 1992, 9223223  
Int. Cl.<sup>6</sup> G09F 13/22  
U.S. Cl. 40—544 8 Claims



1. A display device that is incorporated into a building structure, the display device comprising at least one rigid block composed of a robust grindable composition, the block having at least one light

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emitting device molded therein, the light emitting device being electrically connected to a power source to enable illumination of the light emitting device when in use, the light emitting device being visible from at least one surface of the block for providing at least one illuminated display surface in use, the block being incorporated within the building structure such that the display surface is exposed at, and protrudes from at least one surface of the building structure, at least one surface of the block being ground to render visible the light emitting device for providing said display surface and to render the surface substantially non-slippery so as to prevent an object in contact with the display surface from slipping thereon in use.

5,771,618

**SAFETY APPARATUS FOR INDICATING THE PRESENCE OF A TRANSLUCENT MEDIUM**

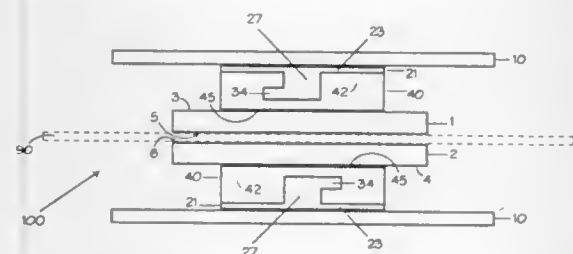
Eileen M. Burke, 20 Champion St., Merrimac, Mass. 01860, and Barbara Gilinsky, 1410 Johnson Ave. Waterview #17, Point Pleasant, N.J. 08742

Filed Nov. 27, 1995, Ser. No. 562,732

Int. Cl.<sup>6</sup> G09F 7/04

U.S. Cl. 40—600

2 Claims



1. A safety apparatus for indicating the presence of a translucent medium comprising:

a first magnetic element having an inner face and an outer face; a translucent medium;

a second magnetic element having an inner face and an outer face, said inner face of said second magnetic element being juxtaposed to said inner face of said first magnetic element for magnetic attraction to said inner face of said first magnetic element through said translucent medium, each of said first and said second magnetic elements being a permanent magnet;

a visible element, and

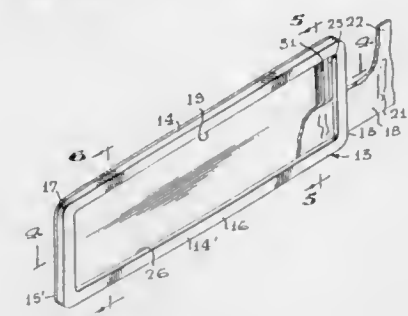
means for removably attaching said visible element to at least one of said outer face of said first magnetic element and said outer face of said second magnetic element comprising a first interlocking member having a base with an outer face and an inner face, said outer face of said base for fixedly attaching to one of said at least one said first and second magnetic element to said visible element, said inner face of said base including a tongue element fixedly attached thereto, said tongue element having a flange extending perpendicularly therefrom, and a second interlocking member comprising a housing with an outer face and inner face, said outer face of said housing for fixedly attaching to the of said at least one said first and second magnetic element to said visible element, said inner face of said housing having a channel extending therein, said channel being open to receive said tongue element of said first interlocking member and having a groove therein for receiving said flange of said tongue element.

5,771,619  
**SURFACE-MOUNTED DISPLAY DEVICE**  
Timothy E. Wells, 4703 Halen St., Palmdale, Calif. 93552  
Continuation of Ser. No. 383,970, Feb. 6, 1995, abandoned.  
This application Sep. 27, 1996, Ser. No. 718,647

Int. Cl.<sup>6</sup> G09F 21/04

U.S. Cl. 40—643

12 Claims



1. A surface-mounted holder for a resilient, flexible display sheet having a surface bearing a display, said holder comprising:

opposed side walls joined by end walls to define a window exposing the display;

an opening through one of the end walls for insertion of a display sheet into said holder;

guides associated with said side walls for slidingly retaining the opposite edges of a display sheet, said guides being spaced inwardly of and offset from said opening;

a floor including an inclined ramp leading from said opening to said guides;

a shoulder formed on one of said end walls in confronting alignment with said guides for blocking motion of the display sheet in the direction of said opening, said shoulder being spaced from said floor for allowing the display sheet to pass through the opening, whereby the display sheet is capable of being readily displaced from confronting alignment with said shoulder by the application of force against the surface of the display sheet; and

attachment means for mounting said holder to a supporting surface.

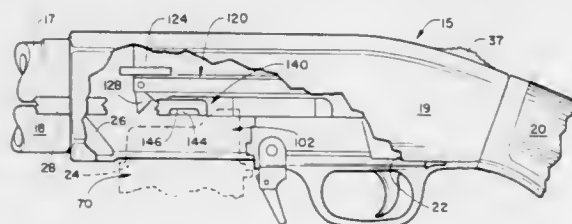
5,771,620  
**MAGAZINE LOADED PUMP ACTION SHOTGUN**  
Willard H. Crawford, 1836 Orange St., Bakersfield, Calif. 93004, and James K. Bentley, 2489 Starling Dr., Paso Robles, Calif. 93446

Filed Nov. 20, 1995, Ser. No. 559,842

Int. Cl.<sup>6</sup> F41B 3/66; 3/12

U.S. Cl. 42—19

5 Claims



1. A magazine loaded shotgun comprising:

a receiver having a front end, a rear end, a top surface and a bottom surface;

an elongated gun barrel having a rear end that is connected to the front end of said receiver;

a stock having a front end that is connected to the rear end of said receiver;

a trigger housing assembly having a front end and a rear end, said trigger housing assembly being mounted in a trigger housing assembly aperture in the bottom surface of said receiver;

an elongated shotgun shell magazine aperture in the bottom surface of said receiver and said shotgun shell magazine aperture is located forwardly of said trigger housing assembly aperture;

a bolt assembly having a front end, a rear end, a top surface and a bottom surface; a firing pin extending from the front end of said bolt assembly; a tang extending downwardly below the bottom surface of said bolt assembly and means for pivoting said tang upwardly into a slot in the bottom surface of said bolt assembly; said tang on said bolt assembly functions to engage the rear surface of a shotgun shell located in a feed lip assembly of a shotgun shell magazine and drag the shotgun shell forwardly into the rear end of the gun barrel of the shotgun so that the shotgun shell can be fired; and

a bolt slide having a bottom surface having a longitudinally extending concave recess that provides for clearance over a shotgun shell, means detachably securing said bolt slide to the bottom surface of said bolt assembly.

5,771,621

**BALL PITCHING MACHINE**

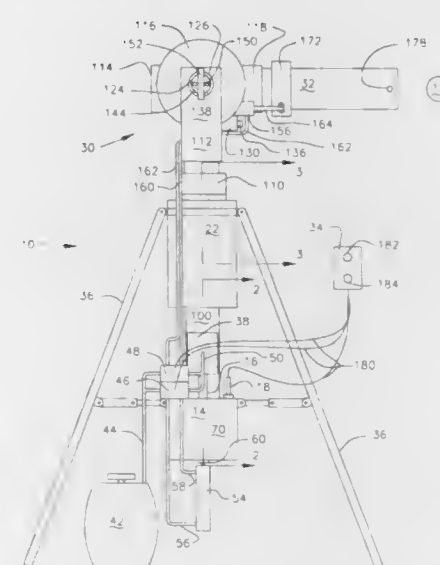
Harold W. Rogers, 825 McKinney, Arlington, Tex. 76012

Filed Feb. 24, 1997, Ser. No. 805,131

Int. Cl.<sup>6</sup> A63B 65/12

U.S. Cl. 42—55

16 Claims



1. A method of projecting a ball from a ball pitching machine comprising:

a) loading a ball against an air exit of a ball housing and an end of a barrel;

b) feeding a combustable gas into a combustion chamber;

c) igniting the combustable gas in the combustion chamber;

d) said ignition of the combustable gas driving a compression piston through a compression chamber to produce a volume of compressed air;

e) directing the compressed air to the air exit of the ball housing; and

f) driving the ball out of the barrel with the compressed air.

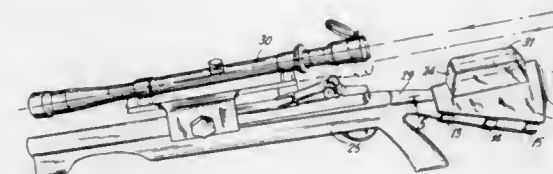
5,771,622  
**FIREARM SIGHTING ASSEMBLY**  
Richard Koziuk, 9 Cedar Dr., Plainview, N.Y. 11803, and Henry Teja, 74 Tyrconnell Ave., Massapeque Park, N.Y. 11762

Filed Feb. 2, 1995, Ser. No. 382,443

Int. Cl.<sup>6</sup> F41C 23/00

U.S. Cl. 42—74

6 Claims



1. A firearm sighting assembly capable of being mounted upon the stock of a rifle comprising:

a. a mounting structure comprising

(1) a base member defining an opening;

(2) an end member structurally affixed to said base member;

(3) loop fastener means structurally affixed to the under surface of said base member surrounding the opening formed in said base member;

(4) means to selectively structurally affix said mounting structure to the stock of a rifle;

b. an elevational element comprising

(1) a base member;

(2) a mounting element structurally affixed to said base member so as to define on the surface of said base member a border surface not covered by said mounting element, said mounting element being shaped so as to compatibly fit through the opening formed in said base member and to protrude above the surface of said base member;

(3) hook fastener means structurally affixed to the surface of said base member not covered by said mounting element and capable of selective mechanical interfit with said loop fastener means structurally affixed to the under surface of said base member of said mounting structure such that upon the insertion of said mounting element through the opening formed in said base member of said mounting structure said hook fastener means structurally affixed to said base member of said elevational element comes into contact with the loop fastener means structurally affixed to the under surface of said mounting structure so as to structurally affix in a selected fashion said elevational element to said mounting structure.

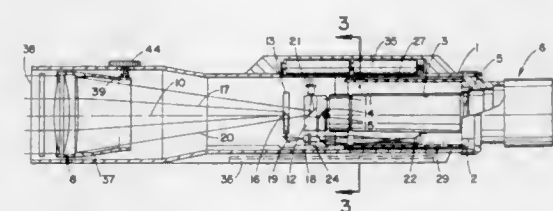
5,771,623  
**TELESCOPIC SIGHT**  
Ludwig Pernstich, Innsbruck; Konrad Seil, Schwaz, and Dietmar Menges, Innsbruck, all of Austria, assignors to Swarovski Optik KG, Absam, Austria  
Filed Oct. 31, 1995, Ser. No. 550,666

Claims priority, application Germany, Oct. 31, 1994, 44 38 955.8

Int. Cl.<sup>6</sup> F41G 1/38

U.S. Cl. 42—101

21 Claims



1. A telescopic sight for firearms comprising:

a reticle (4), a device for adjusting the reticle on a point of impact (5) and a laser rangefinder for the target with a laser transmitter (18) and a laser receiver (21), wherein a telescopic



sight objective (8) is simultaneously the objective for the laser transmitter (18) and the laser receiver (21) since the beam path (17) of the laser transmitter (18) and the beam path (20) of the laser receiver (21) are brought into a visual telescopic sight beam path (9), and the device for adjusting the reticle (4) on the point of impact including an optical member movable relative to the firearm between the reticle (4) and the light entrance side (38) of the telescopic sight.

5,771,624

## FISH BITE ALERT

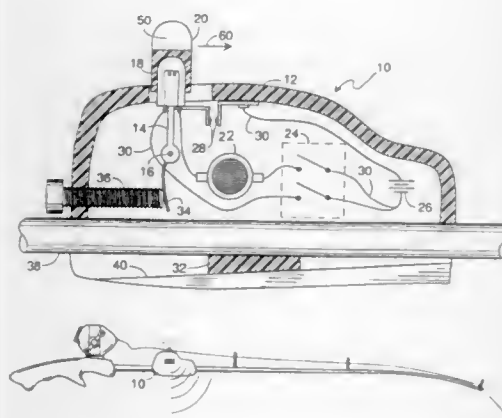
Roger D. Vickery, 890 Forest Mills Rd., Waukon, Id. 52172;  
John C. May, 2707 South Ave., La Crosse, Wis. 54601, and  
Thomas J. Arendt, Rte. 2, Box 60, Norwalk, Wis. 54648

Filed Jan. 22, 1996, Ser. No. 589,339

Int. Cl.<sup>6</sup> A01K 97/12

U.S. Cl. 43—17

3 Claims



1. A fish bite alert attachable to a fishing rod having a handle at one end and a rod tip at an opposite end, said fish bite alert being adapted to pinch a fish line in a single-pass configuration extending along a length of said fishing rod, said fish bite alert comprising:
  - a housing attachable to said fishing rod;
  - an alarm attached to said housing, said alarm including a light, said alarm having a status of on and off;
  - a 3-position gripper being illuminated by said light, said gripper formed of a flexible see-through material which is affixed to said light, both the gripper and the light being movably mounted to the housing said 3-position gripper being flexible to define a crevice of variable width, said 3-position gripper being repositionably attached to said housing, said 3-position gripper having a release position, a set position, and a trip position, wherein in said release position said fish line is spaced completely apart from said 3-position gripper with the width of said crevice being at a predetermined minimum and said alarm being off, in said set position said 3-position gripper applying a holding force pinching said fish line within said crevice with said fish line being in a single-pass configuration and said alarm being off, and in said trip position said 3-position gripper pinching said fish line within said crevice with said fish line being in a single-pass configuration and said alarm being on, said 3-position gripper being repositionable from said set position to said trip position in response to tension of said fish line between said 3-position gripper and said rod tip exceeding a predetermined limit, said 3-position gripper automatically shifting from said trip position to said release position in response to tension in said fish line drawing said fish line out from within said crevice, said holding force being independent of any tension of said fish line in said crevice; and
  - an adjustment on said housing and co-acting with said 3-position gripper to vary said predetermined limit.

5,771,625  
FISH HOOK TRACE AND CONTAINER  
Ian Savaglia, 483 Henley Beach Road, Fulham, South Australia 5024, Australia

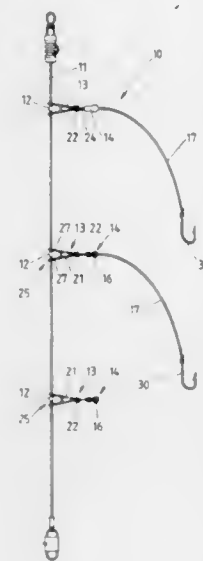
Filed Sep. 4, 1996, Ser. No. 706,455

Claims priority, application Australia, Sep. 12, 1995, PN 5371

Int. Cl.<sup>6</sup> A01K 91/00; F16G 11/00

U.S. Cl. 43—42.74

17 Claims



1. A fish trace, comprising a trace line, at least one projection fast with said trace line,
  - a resilient clip having two ends, one said end being a pendant attachment end, the other said end being an engagement end and having a pair of spaced legs, each of which has a leg return portion, the shapes of the legs and return portions defining between them a lead-in mouth,
  - the dimensions of said projection, legs and return portions being such that said trace line portions adjacent opposite sides of said projection are insertable through said mouth into spaces between said legs and their return portions, and said projection is retained between said legs and their return portions by entrapment of said trace line adjacent said projection.

5,771,626

Patent Not Issued For This Number

5,771,627  
CRAB POT WITH POSITIVE TRIGGER MECHANISM  
Leonard W. R. Mattson, 1600 Alternate Hwy. 101, Warrenton, Oreg. 97146, and Elmer James Mattson, Rte. 1, Box 777, Astoria, Oreg. 97103

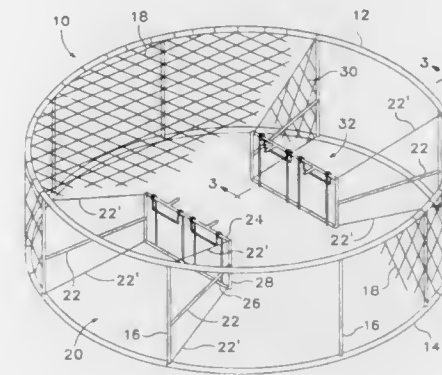
Filed Oct. 23, 1996, Ser. No. 735,761

Int. Cl.<sup>6</sup> A01K 69/00

U.S. Cl. 43—100

4 Claims

1. In combination with a crab pot having at least one entrance tunnel having an inner end and an opening at the inner end of the tunnel by which crabs enter the pot, the opening being defined by top and bottom vertically spaced, horizontally extending frame members, a trigger mechanism for removably closing said tunnel opening, comprising:
  - a) at least one elongated trigger finger mounted pivotally on the top frame member of said tunnel opening and extending downward therefrom for movement between a position abutting the bottom frame member and closing said opening



- against escape of crabs from within the pot and a position retracted from said opening allowing crabs to enter the pot, and
- b) a limit rod mounted on the opening frame of the crab pot in position to and limit pivotal movement of said trigger finger to less than 180°.

5,771,628

## INSECT AND PEST TRAP

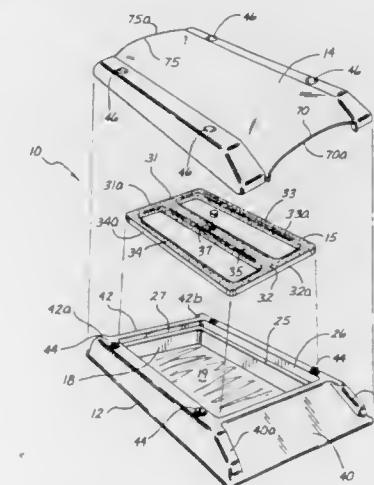
Jeffrey Mulford Nobbs, Hacienda Heights, Calif., assignor to  
Jeunike International, Inc., City of Industry, Calif.

Filed Oct. 25, 1996, Ser. No. 738,914

Int. Cl.<sup>6</sup> A01M 1/12; 1/18

U.S. Cl. 43—121

10 Claims



1. An improved insect and pest trap for roaches of various sizes and the like comprising:
  - an elongated lower housing member having side walls and end walls which are inclined in opposite directions and an open base section between the walls,
  - shoulder means provided in said lower housing member located above said open base section,
  - top lid means having side walls and end walls adapted to be received over said lower housing member,
  - said top lid being proportioned with respect to said side and end walls of the lower housing to provide an access space along the side walls and said end walls and which opens into said open base section,
  - the access space along said side walls having a clearance less than the access space along said end walls,
  - an activated trap plate being received on said shoulder and being spaced from the top lid and the open base section,
  - said activated trap plate including a plurality of spaced curved sections adjacent to each of said side walls and end walls and

an additional curved section located between the curved sections and spaced therefrom,  
the curved sections and the additional section including curved surfaces extending towards the open base,  
means in said base to retain any insects which travel or fall into said open base,  
attractant means in said insect trap positioned so that insects must traverse at least a portion of the curved surfaces to reach the attractant,  
the curved surfaces being coated with an electrostatically charged powder whereby the electrostatically charged powder is transferred to any insects which traverse the trap plate thereby causing the insect to lose stability on the curved surface and fall into the open base where the insect is retained.

5,771,629

Patent Not Issued For This Number

5,771,630

## AGRICULTURAL COVERING MATERIAL

Isamu Harasawa, Higashikurume; Yoshiaki Ishisaki, Ikeda, and Yasuaki Oonishi, Uozu, all of Japan, assignors to Nippon Carbide Kogyo Kabushiki Kaisha, Tokyo, Japan

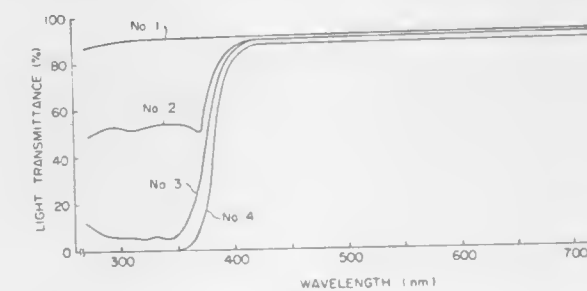
PCT No. PCT/JP94/00258, § 371 Date Aug. 20, 1996, § 102(e)  
Date Aug. 20, 1996, PCT Pub. No. WO95/22244, PCT Pub.  
Date Aug. 24, 1995

PCT Filed Feb. 21, 1994, Ser. No. 696,818

Int. Cl.<sup>6</sup> A01G 9/14

U.S. Cl. 47—26

14 Claims



1. An agricultural covering material comprising a fluororesin film which intercepts a transmission of ultraviolet rays having a wavelength range of at least 300–330 nm, by at least 40% and which transmits at least 70% of visible rays having a wavelength range of 400–800 nm, wherein the fluororesin film comprises an inorganic fine powder capable of intercepting the transmission of the ultraviolet rays having the wavelength range of at least 300–330 nm.

5,771,631

## LANDSCAPING BLOCK

William B. Dawson, Maple Grove, Minn., assignor to Keystone Retaining Wall Systems, Inc., Bloomington, Minn.

Continuation of Ser. No. 245,869, May 19, 1994, Pat. No.

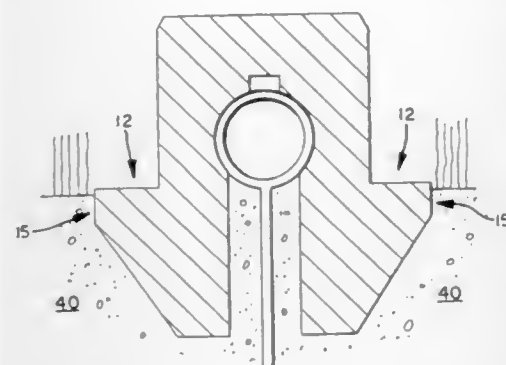
5,568,994. This application Oct. 29, 1996, Ser. No. 741,344

Int. Cl.<sup>6</sup> A01G 1/00; E01C 11/22

U.S. Cl. 47—33

10 Claims

1. A method of installing a landscaping block in a substrate comprising:
  - providing a landscaping block having a top and a generally opposed bottom, first and second generally opposed sides, each side extending from the top to the bottom, first and second generally opposed ends, each end extending from the



top to the bottom and from the first side to the second side, wherein the first side comprises a first upper face extending from the top downward to an inner edge of a first lip, the first lip extending outward from the first upper face to an outer edge of the first lip, and a first lower face extending from the outer edge of the first lip to the bottom, and further wherein the second side comprises a second upper face extending from the top downward to an inner edge of a second lip, the second lip extending outward from the second upper face to an outer edge of the second lip, and a second lower face extending from the outer edge of the second lip to the bottom, and inserting the block into the substrate such that at least one of the first and second lips is below and at least partially anchored by an upper surface of the substrate.

5,771,632

**ARTIFICIAL SEED WITH A POWDER STRUCTURE FOR ANTI-CONTAMINATION**

Sijiu Liu; Wannan Xu, both of 262 Harvard St. #8, Cambridge, Mass. 02139; Lily Qianli Liu, 2887 Hinman, Hanover, N.H. 03755, and Qianye Liu, 36 Oxford St. #418, Cambridge, Mass. 02138

Filed Sep. 23, 1996, Ser. No. 717,711

Int. Cl.<sup>6</sup> A01C 1/06; 21/00; A01G 1/00; A01H 1/02

U.S. Cl. 47—57.6

10 Claims

1. An artificial seed comprising an isolated meristematic tissue which has potential to develop into a plantlet, an artificial endosperm which contains nutrients to nourish said tissue, an enclosing means which encloses, except at least one opening or mouth, a complex consisting of said tissue and said endosperm, and a piece of water-soluble film which covers said mouth and temporarily seals the artificial seed, wherein a mass of hydrophobic powder which consists of numerous fine sandy hydrophobic particles, is deposited in a reserved space between said complex and said water-soluble film, so as to form a powder padded layer covering at least a part of the complex, whereby said powder padded layer blocks water permeation and microbes therein, while allows oxygen to get in and tissue to grow out after said film being dissolved in wet soil, wherein said hydrophobic powder is made from hydrophilic particles which are coated with hydrophobic material.

**5,771,633  
METHOD FOR PRODUCING POTATO TUBERS USING A GRAFT PLANT**

Ichiro Oka, Shizuoka, Japan, assignor to Japan Tobacco Inc., Tokyo, Japan

PCT No. PCT/JP96/00314, § 371 Date Oct. 16, 1996, § 102(e) Date Oct. 16, 1996, PCT Pub. No. WO96/25030, PCT Pub. Date Aug. 22, 1996

PCT Filed Feb. 14, 1996, Ser. No. 727,478

Claims priority, application Japan, Feb. 16, 1995, 7-050317

Int. Cl.<sup>6</sup> A01B 79/00; A01C 1/00; A01G 31/00; 1/06

U.S. Cl. 47—58

10 Claims

1. A method for producing potato tubers comprising: grafting a potato plant as a scion on a tomato plant which does not form tubers as a stock; and culturing the resultant graft plant by hydroponics to thereby form tubers on the aerial part of said graft plant.

5,771,634

**HYDROPONIC CONTROL APPARATUS**

Michael Edward Fudger, 242 King St. Box 507, Harriston, Ont., Canada, N0G 1Z0

PCT No. PCT/CA94/00487, § 371 Date Jun. 20, 1996, § 102(e) Date Jun. 20, 1996, PCT Pub. No. WO95/08260, PCT Pub. Date Mar. 30, 1995

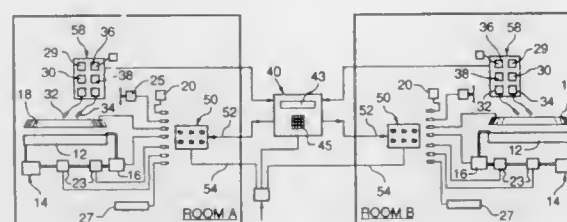
PCT Filed Sep. 16, 1994, Ser. No. 615,315

Claims priority, application United Kingdom, Sep. 20, 1993, 9323751

Int. Cl.<sup>6</sup> A01G 31/00

U.S. Cl. 47—62

6 Claims



1. Apparatus for controlling hydroponic cultivation, characterized in that the apparatus combines the following features: the apparatus includes several electrical output elements; one of the output elements is connected, in use of the apparatus to control the operation of a hydroponic cultivation facility, to an electric light unit of the facility; the apparatus includes several electrical input elements, the input elements being capable, in use of the apparatus, of receiving input signals from respective independent sensors; one of the input elements is so arranged as to receive, in use, an electrical signal from a sensor which senses the temperature of the hydroponic cultivation facility; the apparatus includes a computer; the apparatus includes means for conveying the signals from the sensors into the computer, and the computer is effective to receive said signals; the apparatus includes a timer or clock, which is effective to produce electrical time signals, and the apparatus includes means for conveying the signals from the clock into the computer, and the computer is effective to receive said signals; the apparatus includes a manual input device, which is effective to produce electrical signals corresponding to manual manipulations of the device, and the apparatus includes means for conveying the signals from the manual input device into the computer, and the computer is effective to receive said signals; the apparatus includes respective control switches, one for each output element, for setting the on/off status of the respective output elements; the computer is effective, in accordance with a pre-determined program, and in response to the signals from the sensors,

signals from the clock, and signals from the manual input device, to operate the control switches, whereby the computer is effective to control independently the on/off status of the output elements;

the apparatus includes a visual display means;

in respect of each output element, at least one of the sensors corresponds to that output element, and the computer is effective to set the on/off status of the output element in accordance with the setting of that corresponding sensor;

the apparatus includes means for stepping the display means sequentially through the output elements, and for selecting each output element in turn for display, sequentially, on the display means;

the arrangement of the apparatus is such that, as each element is selected for display, the display means is effective to identify the selected element, and is effective to display the setting of the corresponding sensor;

the arrangement of the apparatus is such that, when the setting of the corresponding sensor is on display, the apparatus is at that time then enabled to allow an operator to manually adjust the setting of the corresponding sensor by means of a keyboard.

5,771,635

**PNEUMATIC DEVICE AND SYSTEM**

Keith Thomas Skinner, Coventry, England, assignor to Xcalibre Equipment, Ltd., England

PCT No. PCT/GB95/02208, § 371 Date Aug. 16, 1996, § 102(e) Date Aug. 16, 1996, PCT Pub. No. WO96/08657, PCT Pub. Date Mar. 21, 1996

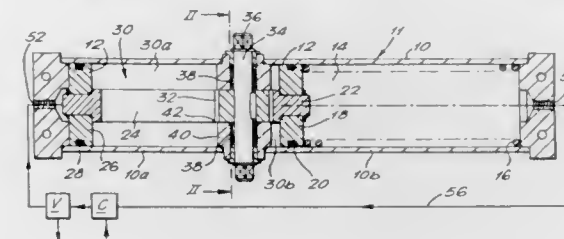
PCT Filed Sep. 18, 1995, Ser. No. 646,364

Claims priority, application United Kingdom, Sep. 16, 1994, 9418662

Int. Cl.<sup>6</sup> E05F 15/20

U.S. Cl. 49—25

26 Claims



10. A pneumatic device for connecting between two members, one of which is movable relative to the other at a pre-determined rate, the device comprising a body having a bore, a piston reciprocal in the bore against a resilient bias, rate of movement of the piston being controlled by gas flow control means.

5,771,636

**SECURE SWING GATE SYSTEM THAT PROVIDES FREE ACCESS WHEN POWER IS OFF**

Calvin Franklin Mathis, 10755 Artesia Blvd., Cerritos, Calif. 90703

Filed Apr. 10, 1996, Ser. No. 632,350

Int. Cl.<sup>6</sup> E05F 15/04

U.S. Cl. 49—139

6 Claims

1. A gate opening and closing apparatus comprising:

a gate swinging in a horizontal direction;

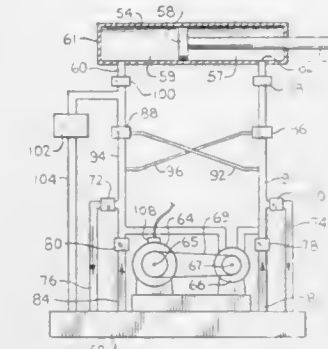
at least two hinges, said hinges having first ends and second ends, said first ends attached to one end of said gate;

a fixed structure, said second ends of said hinges attached to said fixed structure;

a key operated control switch;

a reversible electric motor with control sensing to supply power to a hydraulic pump;

a remote control device to provide a signal to said control sensing;



a hydraulic pump to supply hydraulic pressure;  
a hydraulic reservoir to hold hydraulic fluid;  
a double acting hydraulic cylinder to move said gate, said double acting cylinder having a rod, a piston connected to said rod and a casing, said rod being attached to said gate and said casing being attached to a fixed structure;  
means to open said gate without said hydraulic power means;  
check valves to prevent flow of hydraulic fluid to said hydraulic reservoir;  
relief valves to control hydraulic pressure;  
pilot operated check valves to open said check valve when required to allow hydraulic fluid to drain from said double acting hydraulic cylinder;  
pressure switches to shut off power to said reversible electric motor, said pressure switches being activated at full open or closed position or when encountering an obstruction;  
A solenoid valve to close by electrical power and open by spring biased means.

5,771,637

**PLASTIC LOWER SASH FOR VEHICLE WINDOW GLASS**

Hiroshi Oikawa; Hiroshi Funada, and Hiromitsu Yoshida, all of Soja, Japan, assignors to OM Corporation, Okayama, Japan

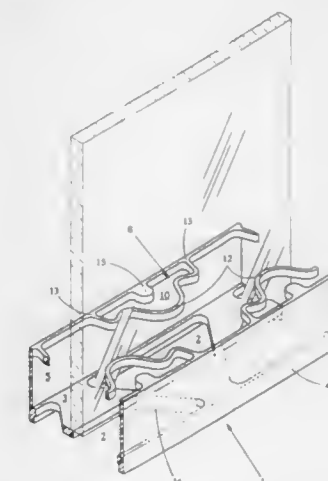
Filed Mar. 3, 1997, Ser. No. 808,484

Claims priority, application Japan, Mar. 5, 1996, 8-047671

Int. Cl.<sup>6</sup> E05D 13/00

U.S. Cl. 49—416

7 Claims



1. A lower sash installed inside a door panel formed by joining an outer panel and an inner panel so as to guide and hold a window glass that is accommodated inside said door panel, wherein said lower sash is a plastic lower sash having a channel shape in cross-section which has an outer-panel-side outer wing and an inner-panel-side inner wing on either side of a frame plate, truss-form openings are formed in said frame plate, glass guides which are elastic projections arranged in an alternating fashion so as to



respectively face said outer and inner wings, and said frame plate, outer wing, inner wing and glass guides are molded as an integral unit.

5,771,638

Patent Not Issued For This Number

5,771,639

## EMERGENCY SHELTER

Marcus Bennett Wood, and Wendy Margaret Wood, both of 26 King Street, Arundel, West Sussex, BN18 9BW, United Kingdom

PCT No. PCT/GB94/00823, § 371 Date Oct. 20, 1995, § 102(e) Date Oct. 20, 1995, PCT Pub. No. WO94/24380, PCT Pub. Date Oct. 27, 1994

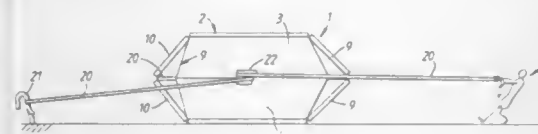
PCT Filed Apr. 19, 1994, Ser. No. 535,158

Claims priority, application United Kingdom, Apr. 22, 1993, 9308355

Int. Cl.<sup>6</sup> E04B 1/344; E04H 9/00

U.S. Cl. 52—71

17 Claims



1. A shelter comprising a central polygonal roof panel surrounded by an array of wall panels equal in number to the number of sides of the roof panel, characterized in that all the wall panels each have two parallel sides of unequal length and the shorter of the parallel sides set at an obtuse angle to each of the adjoining sides, in that each such wall panel is hingedly attached at the shorter of the respective parallel sides to one side of the polygonal roof panel, and in that a tension element is provided attached to the wall panels at locations remote from the roof panel for maintaining adjacent sides of respective adjacent pairs of wall panels in contact by drawing said panels inwardly to form a three dimensional structure, which is collapsible to a coplanar array of said panels with said side panels extending outwardly from said roof on release of said tension; and

said wall panels being freely pivotal to extend outwardly from said roof panel to form a substantially flat configuration with said roof panel when unconstrained by said tension member.

5,771,640

## MODULAR SOLARIUM AND KIT FOR CONSTRUCTING THE SAME

Mark A. Back, 8833 W. Ridge Dr., Belvedere, Ill. 61008

Continuation-in-part of Ser. No. 257,736, Jun. 9, 1994, Pat. No. 5,560,155. This application Sep. 20, 1996, Ser. No. 717,487

Int. Cl.<sup>6</sup> E04B 1/343

U.S. Cl. 52—90.1

39 Claims

1. A modular solarium comprising:

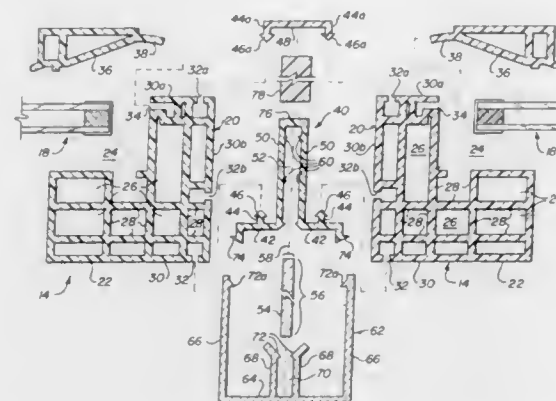
(a) a plurality of prefabricated wall panels, each said prefabricated wall panel including:

(i) at least one transparent sheet of material having a peripheral edge, and

(ii) a peripheral frame supporting said peripheral edge and positioned therearound, said peripheral frame having opposite exposed surfaces with an opening in at least one of said exposed surfaces;

(b) a plurality of prefabricated ceiling panels, each said prefabricated ceiling panel including:

(i) at least one transparent sheet of material having a peripheral edge,



(ii) a peripheral frame supporting said peripheral edge and positioned therearound, said peripheral frame having opposite exposed surfaces with an opening in at least one of said exposed surfaces; and

(c) a plurality of joint members for connecting together said prefabricated wall and ceiling panels, each said joint member including:

(i) a joint frame member, and

(ii) at least two protrusions extending from said joint frame member, each said protrusion having a free enlarged end such that one protrusion lockingly engages within a respective said opening of a first one of said panels and another protrusion lockingly engages within a respective said opening of a second one of said panels, wherein said first and second panels are locked to each other by said joint members to form said modular solarium.

5,771,641

## RODENT PEST INFESTATION PREVENTION ASSEMBLY

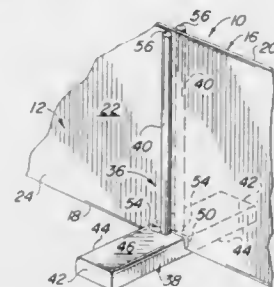
Bill Morris, III, 19624 Four Corners Rd., Bunker Hill, Kans. 67626

Filed Jun. 20, 1996, Ser. No. 667,077

Int. Cl.<sup>6</sup> E04B 1/72

U.S. Cl. 52—101

20 Claims



1. A rodent pest infestation prevention assembly, comprising:

(a) an elongated wall for surrounding a predetermined area and having a pair of opposite end portions, a pair of opposite top and bottom edges and a pair of opposite inner and outer surfaces;

(b) means for fastening said opposite end portions of said wall to one another so as to make said wall a substantially continuous structure extending about the predetermined area; and

(c) means for maintaining said wall in an upright position, said maintaining means being at least one holder member including a base having a pair of opposite side portions, a pair of opposite top and bottom surfaces and a transverse groove formed in said top surface extending interiorly into said base toward, but terminating at a location spaced above, said bottom surface and extending from one to another of said opposite side portions such that said groove is adapted to receive said bottom edge of said wall therein for maintaining said wall in said upright position surrounding said predetermined area.

5,771,642

## EARTHQUAKE SURVIVABLE PLATFORM FOR ELEVATED STRUCTURES

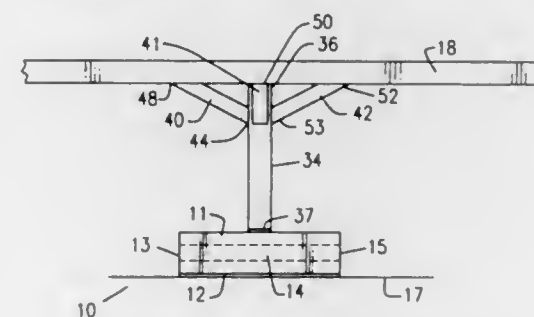
William M. Lester, 616 S. Orange Ave., Apt. SH2, Maplewood, N.J. 07040

Filed Oct. 27, 1995, Ser. No. 549,455

Int. Cl.<sup>6</sup> E02D 27/34

U.S. Cl. 52—167.1

17 Claims



1. A device in combination with an elevated highway for surviving an earthquake, said device comprising:

a bearingless free-standing platform structure having a flat, horizontal top surface and a bottom surface, wherein said bottom surface is embedded in the ground; and

a bearingless column which supports said elevated highway said column having a first end and a second end, wherein said first end of said column is fastened to said elevated highway and said second end rests atop said top surface of said platform structure, said second end slidably moving atop said top surface, whereby said platform structure absorbs and dissipates forces present during an earthquake, thereby preventing said column from being damaged by said earthquake and enabling said column to continue supporting said elevated highway.

5,771,643

## CONCRETE SLAB-WALL SPACER WITH WATER AND RADON REMOVAL FEATURES

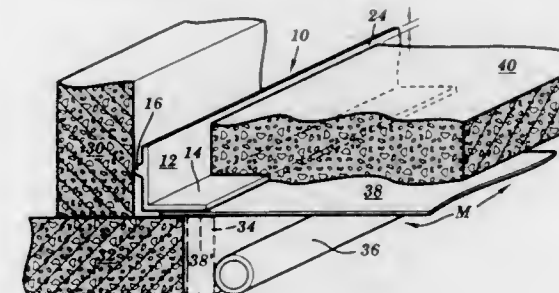
Alton F. Parker, 8 Hiawatha Dr., Clifton Park, N.Y. 12065

Filed May 10, 1995, Ser. No. 437,981

Int. Cl.<sup>6</sup> E02D 19/00

U.S. Cl. 52—169.5

21 Claims



1. A water seepage control device with radon scavenging aid means comprising:

a semi-rigid, nonbiodegradable strip bent lengthwise into an L-shape and having a shelf means projecting orthogonally from a backside of a vertical portion of the strip away from and essentially parallel a base of the strip such that the shelf means partitions the vertical portion into an upper channel and a lower chamber when said shelf means is disposed against a wall and while an underside of the base rests on a footing that supports the wall;

a sealing means for closing any spacing between the shelf means and the wall; and

a fluid communication means disposed on said underside of the base for effecting a fluid scavenging between the chamber and the underside of the base, and a conduit means penetrating said shelf means from said outside of said lower chamber, wherein said lower chamber, said shelf means, said sealing means, said communication means, and said conduit means proving said radon scavenging aid means.

5,771,644

## DOOR FRAME ANCHORING CLIP

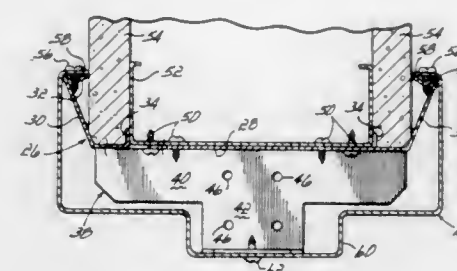
Duane L. Kidd, 1056 Olympia Dr., Mason, Ohio 45040

Filed Jun. 28, 1996, Ser. No. 672,743

Int. Cl.<sup>6</sup> E06B 1/60

U.S. Cl. 52—213

28 Claims



1. A door frame comprising in combination:

a hollow door frame having a hinge jamb, a strike jamb and a header for installation into a door opening; and

a plurality of generally U-shaped clips securing the door frame to a wall surrounding the door opening, each of the clips further comprising:

(1) a backplate web and a pair of opposed extension flanges

each projecting from a side edge of the backplate web, the backplate web being juxtaposed to a wall stud joining opposing faces of the wall surrounding the door opening and the extension flanges being inserted within the door frame and engaging the frame, a first one of the U-shaped clips being secured to the wall at a bottom of the hinge jamb proximate an intersection of the wall and a floor, a second one of the U-shaped clips being secured to the wall at a position remote from the intersection and along a height of the hinge jamb, a third one of the U-shaped clips being secured to the wall at a bottom of the strike jamb proximate the intersection of the wall and the floor and a fourth one of the U-shaped clips being secured to the wall at a position remote from the intersection and along a height of the strike jamb;

(2) a plurality of wall fasteners securing the clip to the wall, wherein the extension flanges retain the door frame to the wall; and

(3) a bottom flange projecting from a bottom edge of the clip, a portion of the bottom flange being inserted into the door frame to provide added strength to the door frame, the bottom flange of the first and fourth clips also being attached to the floor proximate the wall;

wherein the first and fourth clips further comprise:

a plurality of floor fasteners securing the bottom flange of the first and fourth clips to the floor.

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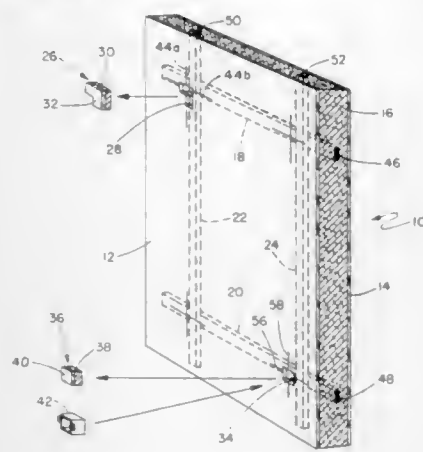
5,771,645

**ELECTRICAL ACCESS IN STRUCTURAL INSULATED FOAM CORE PANELS**

William H. Porter, P.O. Box 249, Saugatuck, Mich. 49453  
Filed Apr. 12, 1996, Ser. No. 632,633  
Int. Cl.<sup>6</sup> E04F 17/08

U.S. Cl. 52—220.2

21 Claims



1. A structural insulated panel comprising:  
a generally planar insulating core comprised of foam plastic;  
first and second rigid facings attached to opposed lateral portions of said core;  
a cutout portion disposed in and formed of said core and extending between opposed edges of said core, said cutout portion comprised of a plurality of elongated, linear, thin foam sections; and  
a plug cut out of and removed from one of said facings and an adjacent portion of said core to form an aperture in the panel in providing access to said cutout portion of said core to permit said foam sections to be removed from said cutout portion through said aperture in forming a wiring chase within the panel extending between opposed edges thereof.

5,771,646

**RAILING POST REINFORCEMENT BRACKET**

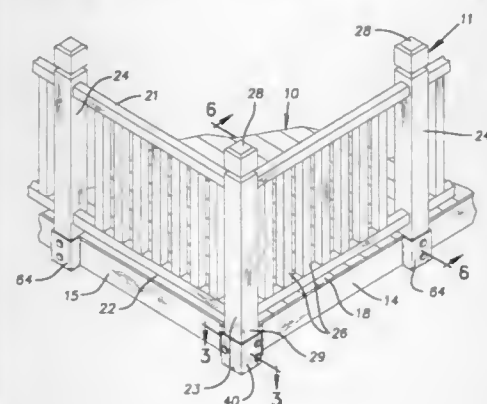
Joseph DeSouza, 10580 Tudor Circle, North Royalton, Ohio 44133

Filed Jun. 5, 1997, Ser. No. 869,747

Int. Cl.<sup>6</sup> E04B 1/00

U.S. Cl. 52—263

6 Claims



1. A corner post assembly on a wood deck having a corner formed by two intersecting rim joists and a deck on top of said rim joists, comprising a post having a bottom end portion, said end portion having vertical side surfaces, a recess in said bottom end portion having a vertical surface and a horizontal surface making abutting engagement with the top of the deck, a unitary sheet metal

mounting bracket having a vertical wall extending around and abutting said vertical surfaces of said end portion to the edges of said recess, said bracket having a pair of wall panels extending outwardly from the outer edges of said wall at said recess and arranged to abut the outer sides of said rim joists, said wall and panels having openings to receive fasteners extending through said wall and panels and said post at right angles and into said rim joists.

5,771,647

**GRILLE ASSEMBLY AND RELATED METHOD**

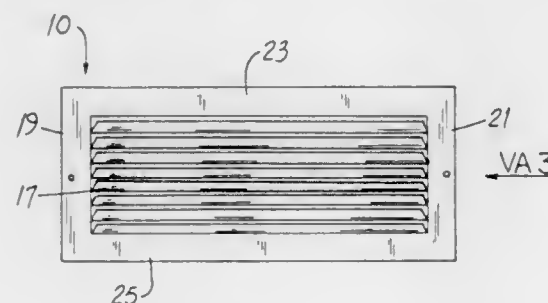
Tony J. Kempen, and Kenneth E. Prochnow, both of Madison, Wis., assignors to Carnes Company, Inc., Milwaukee, Wis.

Filed Sep. 27, 1996, Ser. No. 722,483

Int. Cl.<sup>6</sup> E04B 1/70

U.S. Cl. 52—302.1

9 Claims



1. In a grille assembly connected to an HVAC system by a duct, the grille assembly having two frame members and a grille bar extending along a grille bar axis and supported by such frame members, and wherein the frame members are substantially coplanar, and each frame member has a mounting face against the same wall surface of a room and a single panel extending away from the mounting face perpendicular to the wall surface, and wherein the panels are generally parallel to one another, the improvement wherein:

each panel has a round hole;  
the bar is opaque and has a proximal edge and a hollow axle integrally formed with the bar and extending along the proximal edge and through the holes;  
the bar includes a blade and the blade and the axle are formed of the same material;  
each hole and the axle are cooperatively sized to provide a friction fit between such hole and axle, thereby permitting rotation of the axle in the panels and frictionally retaining the grille bar in a rotational position.

5,771,648

**FOAM FORM CONCRETE SYSTEM**

Brian J. Miller, McHenry, and David W. Turner, Cary, both of Ill., assignors to Foam Form Systems, L.L.C., McHenry, Ill. Continuation of Ser. No. 238,968, May 5, 1994, abandoned, which is a continuation of Ser. No. 987,551, Dec. 8, 1992, abandoned, which is a continuation of Ser. No. 725,396, Jul. 1, 1991, abandoned, which is a continuation of Ser. No. 501,416, Mar. 28, 1990, abandoned, which is a continuation of Ser. No. 167,782, Mar. 4, 1988, abandoned. This application

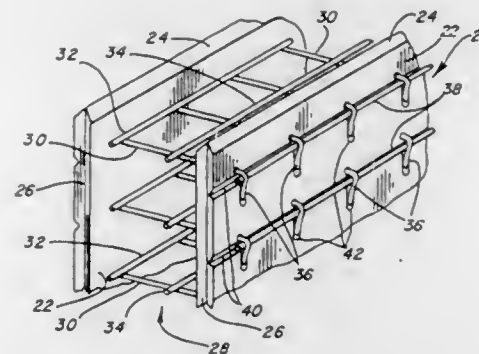
Jun. 7, 1995, Ser. No. 474,541

Int. Cl.<sup>6</sup> E04C 1/00

U.S. Cl. 52—309.7

30 Claims

1. A unitary forming system for a pourable hardenable material comprising first and second unitary, elongate wall panels of a lightweight foam plastic material arranged in spaced relation, each of said first and second wall panels having a periphery, an interior



surface and an exterior surface with a plurality of through holes formed within a predetermined surface area spaced inwardly from the periphery of each wall panel, said holes in the first wall panel being laterally aligned with corresponding holes in the second wall panel,

- a plurality of laterally extending relatively spaced elongated first rods spanning the space between said wall panels, each rod having portions passing through corresponding laterally aligned holes in said first and second wall panels, said first rods extending substantially perpendicular to the wall panel interior surfaces, said portions including retaining portions extending beyond respective wall panel exterior surfaces,  
an elongate second rod angularly disposed relative to said first rods, spanning the spacing between said first rods and being attached to at least some of said first rods, said second rod engaging substantially throughout its length the interior surface of said first wall panel disposed between said first rods and providing support therefor,  
an elongate third rod spaced from said second rod, angularly disposed relative to said first rods and spanning the spacing between said first rods and being attached to at least some of said first rods, said third rod engaging substantially throughout its length the interior surface of said second wall panel disposed between said first rods and providing support therefor; said first, second and third rods being arranged relative to one another to form a unitary grid, the second and third rods of said grid being fixedly maintained in predetermined spaced relation by said first rods, said grid being adapted to be substantially embedded within hardenable material when the latter is poured between the first and second wall panels,

elongate retaining means angularly disposed relative to said first rods and lockingly engaged with and extending between respective retaining portions of adjacent first rods, each retaining means engaging substantially throughout its length the exterior surface of the adjacent first or second wall panel disposed between said portions of adjacent first rods, whereby said first wall panel is fixedly sandwiched and supported between said second rod and said retaining means and said second wall panel is fixedly sandwiched and supported between said third rod and said retaining means;  
said second rod and said retaining means being disposed relative to one another and supportively engaging opposite surfaces of said first wall panel to effect reinforcement of said foam plastic material between said adjacent end portions, and said third rod and said retaining means being disposed relative to one another and supportively engaging opposite surfaces of said second wall panel to effect reinforcement of said foam plastic material between adjacent end portions; said first and second wall panels being reinforced against outward distortion by said unitary grid and said elongate retaining means during pouring of hardenable material between the first and second wall panels whereby said portions of said first rods are

retained in position in a hole in said panels against outward forces exerted by hardenable material when poured between said panels.

5,771,649

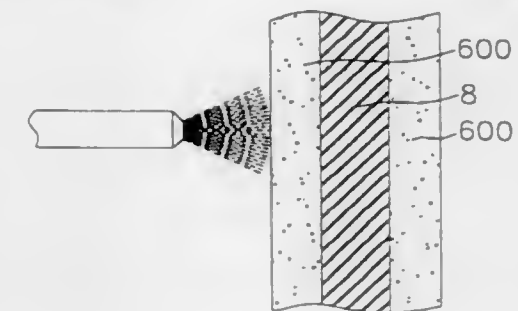
**CONCRETE MONOCOQUE BUILDING CONSTRUCTION**  
Peter J. Zwieg, Houston, Tex., assignor to Monotech International, Inc., Houston, Tex.

Filed Dec. 12, 1995, Ser. No. 570,754

Int. Cl.<sup>6</sup> E04B 2/02

U.S. Cl. 52—405.1

38 Claims



1. A concrete monocoque shell house comprising:  
a concrete foundation;  
a plurality of blocks, supported by the foundation, forming a structure of the house having perpendicularly interlocking walls having inner and outer surfaces; and  
a layer of concrete over each of the inner and outer surfaces of the structure continuing on the foundation proximate the walls of the structure, forming a double monocoque shell having inner and outer load bearing shells.

5,771,650

**INTERLOCKING BUILDING BLOCK SYSTEM**

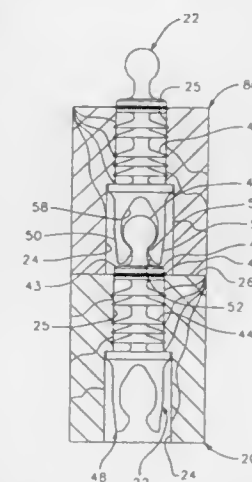
Stephen J. Williams, and Kristi L. Williams, both of Peoria, Ill., assignors to Kingswood, Inc., Peoria, Ill.

Filed Mar. 14, 1997, Ser. No. 818,719

Int. Cl.<sup>6</sup> G09B 25/04; E04C 1/00; E04B 1/38

U.S. Cl. 52—568

12 Claims



1. A set of building blocks useful for constructing model structures, each of a plurality of said set comprising:  
a block body having a planar surface; and  
block interconnecting structure fixed to said block body for detachably connecting said block body to a block body of an adjacent building block of said plurality of building blocks



whereby said planar surface of said block body is in contact with a planar surface of the block body of said adjacent building block, said block interconnecting structure being constructed and arranged to resist movement of said block body of said building block in a first direction with respect to said block body of said adjacent building block when said block interconnecting structure of said building block is connectively engaged with block interconnecting structure of said adjacent building block to substantially maintain contact between the planar surfaces of said block body and said adjacent block body and to permit limited play of said building block with respect to said adjacent building block in a second direction substantially transverse to said first direction and substantially parallel to said planar surface when said interconnecting structure of said building block is connectively engaged with said interconnecting structure of said adjacent building blocks of said plurality of building blocks to be manipulated.

5,771,651

## FRAMEWORK FOR SMALL-SCALE BUILDING

Takaaki Shino, 473-1, Oaza Ukizuka, Yashio-shi, Saitama-ken, Japan

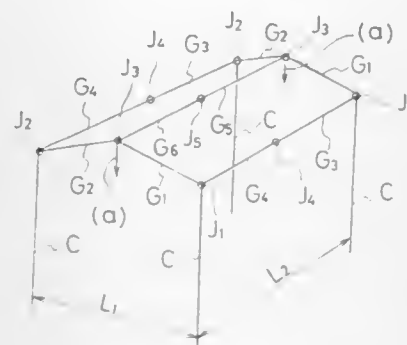
Filed Aug. 12, 1996, Ser. No. 695,395

Claims priority, application Japan, Nov. 29, 1995, 7-334054

Int. Cl.<sup>6</sup> E04B 1/344

U.S. Cl. 52—641

7 Claims



1. A framework for a small-scale building comprising:

- four poles;
- two joint beams;
- two crossbeams; and
- a ridge beam;

wherein:

a top end of each of the four poles is connected to a joint beam and a crossbeam by way of a first joint, each of the joint beams is divided into joint beam portions at a joint beam intermediate point and each joint beam portion is connected at said joint beam intermediate point by way of a second joint,

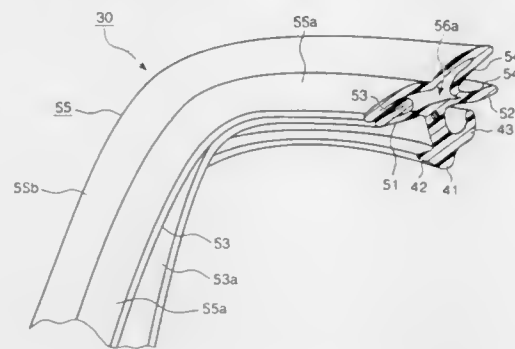
the ridge beam is divided into ridge beam portions at a ridge beam intermediate point and each ridge beam portion is connected at said ridge beam intermediate point by way of a third joint, and the ridge beam is also connected between the joint beams by way of the second joints,

each of the crossbeams is divided into crossbeam portions at a crossbeam intermediate point and each crossbeam portion is connected at a crossbeam intermediate point with a fourth joint,

and wherein the joint beams are bendable at the second joint by movement of the second joint in a first direction, the crossbeams are bendable at the fourth joint by movement of the fourth joint in the first direction, and the ridge beam is bendable at the third joint by movement of the third joint in a second direction.

5,771,652  
WINDOW MOLDING FOR AUTOMOBILES  
Takui Nagata; Masao Kobayashi, both of Aichi-ken; Shinichi Goto, Gifu-ken, and Hiroshi Iwasaki, Aichi-ken, all of Japan, assignors to Toyota Gosei Co., Ltd., Nishikasugai-gun  
Filed Jul. 18, 1996, Ser. No. 683,318  
Claims priority, application Japan, Jul. 18, 1995, 7-181472; May 17, 1996, 8-122916  
Int. Cl.<sup>6</sup> B60J 1/02; 10/02  
U.S. Cl. 52—716.5

6 Claims



1. A window molding for an automobile adapted to be inserted between and interconnect an automobile body with first and second side edges and an upper edge of a windshield of the automobile, said window molding comprising:

- at least one vertical member; and
- a horizontal member integrally connected with said vertical member,

wherein said vertical and horizontal members each includes an elongated leg member and a head integrally formed on an upper edge of said elongated leg member, said head having first and second water guide members, said first water guide member defined by a first side surface of said head facing the windshield when said window molding is inserted between the automobile body and the windshield, said second water guide member defined by a second side surface of said head facing away from the windshield when said window molding is inserted between the automobile body and the windshield, wherein at least a portion of said first water guide member of said vertical member has a maximum height for deterring water on the windshield from overflowing on to side windows of the automobile, and said second water guide member of said vertical member has a minimum height for enhancing the aerodynamic characteristic of the automobile, and

wherein said first water guide member of said horizontal member has a minimum height for enhancing the aerodynamic characteristic of the automobile, and at least a portion of said second water guide member of said horizontal member has a maximum height for deterring water from flowing from a roof of the automobile onto the windshield.

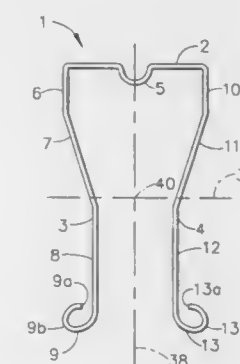
5,771,653  
CHORD FOR USE AS THE UPPER AND LOWER CHORDS OF A ROOF TRUSS

Masoud Dolati, Alpharetta; Rahim A. Zadeh, Fayetteville, both of Ga.; Charles C. Hoover, Haines City, Fla.; David R. Willis, Arlington, and John C. Carpenter, Hallettsville, both of Tex., assignors to Unimast Incorporated, Schiller Park, Ill.  
Filed Oct. 11, 1996, Ser. No. 729,549  
Int. Cl.<sup>6</sup> E04C 3/30

U.S. Cl. 52—737.6

22 Claims

1. An integral, one-piece, metallic chord for use as the top and bottom chords of a roof truss, said chord comprising an elongated member of generally U-shaped, singly symmetric cross-section having a planar base terminating in longitudinal edges, mirror image legs extending from said base longitudinal edges and extending the length of said base, said base having a central depressed rib formed therein and extending the length thereof, each



of said legs comprising a first planar portion perpendicular to said base and extending from the adjacent one of said longitudinal edges thereof, said first planar portion leading to an inwardly sloped planar portion, said inwardly sloped planar portion leading to a planar attachment portion perpendicular to said base and having an area through which fasteners may extend, said attachment portion terminating in an outwardly directed flange ending in an edge and being so configured that said edge faces said attachment portion, said flange comprising a semi-closed reinforcement member, said first planar portion of each leg and the outermost part of the flange of said leg being co-planar, whereby said chord can lie flat on either of its legs on a support surface with said attachment portions parallel to said support surface.

5,771,654

## METHOD OF CONSTRUCTION USING MOLDED POLYMER BLOCKS

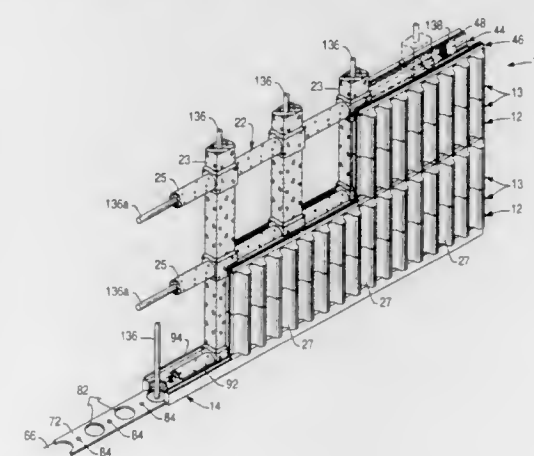
Dennis A. Moore, Dayton; Robert F. Freund, Waynesville, and Fredric L. Abrams, Dayton, all of Ohio, assignors to Modern Technologies Corp., Dayton, Ohio

Filed Nov. 14, 1994, Ser. No. 339,485

Int. Cl.<sup>6</sup> E04B 2/24

U.S. Cl. 52—742.14

10 Claims



1. A method of constructing a finished rigid polymer structure for receiving material comprising the steps of:

- assembling a plurality of Polymer block member to define said finished polymer structure comprising a lattice of passages;
- situating a plurality of joist hangers in said lattice of passages such that they are captured in said material; and
- introducing said material in said lattice of passages such that said material captures said plurality of joist hangers.

5,771,655  
SYSTEM AND METHOD FOR CONSTRUCTING METAL FRAME STRUCTURES

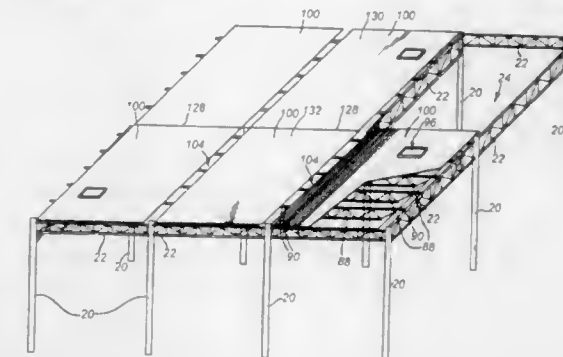
Michael R. Strickland, Hanover, and Kevin O. Clark, Salem, both of Mass., assignors to Canam Steel Corporation, Point of Rocks, Md.

Filed Dec. 18, 1995, Ser. No. 573,928

Int. Cl.<sup>6</sup> E04G 21/10; 21/18; E04B 1/35

U.S. Cl. 52—745.2

9 Claims



1. A method for constructing a metal frame structure comprising the steps of:

- erecting a structure frame having columns and a gridwork of girder beams supported by the columns, each of the girder beams being remote from a ground surface and the girder beams defining at least one bay having a predetermined size and shape within the girder beams;
- assembling a jig having a plurality of frame members adjacent the ground surface and remote from the structure frame, the frame members approximately defining the predetermined sized and shape of the bay;
- detachably locating a plurality of joists so that each of the joists is supported by a pair of the frame members;
- locating at least one decking template joist between the pair of the frame members, the decking template joist including a raised projection surface for receiving corrugated decking thereon in a predetermined registration;
- locating decking over the plurality of joists in engagement with the plurality of joists and in engagement the raised projection surface in the predetermined registration therewith;
- permanently attaching the decking in the predetermined registration to each of the plurality of joists, so that the decking and the joists together define a module;
- removing the module from the frame members, including lifting the module away from the frame members and into position remote from the ground surface adjacent the bay defined by the girder beams; and
- lowering the module into position within the bay so that the joists are supported by the girder beams.

5,771,656

## FIBERBOARD DOORS

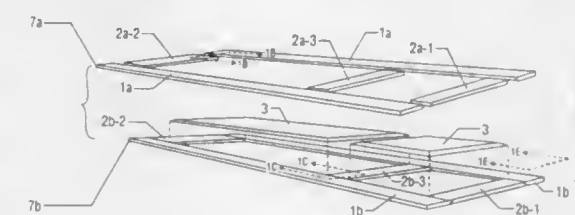
Ronald J. Amoretti, San Antonio, Tex., assignor to Connoisseur Doors, San Antonio, Tex.

Filed Jun. 5, 1996, Ser. No. 659,189

Int. Cl.<sup>6</sup> E06B 3/74

U.S. Cl. 52—745.14

14 Claims



1. A method of making a door, comprising:

providing a first set of door-half components consisting essentially of fiberboard, said set comprising a plurality of vertical frame components and a plurality of horizontal frame components;

providing a second set of door-half components consisting essentially of fiberboard, said set comprising a plurality of vertical frame components and a plurality of horizontal frame components;

first, assembling the first set of door-half components to form a first door-half, and assembling the second set of door-half components to form a second door-half; and

then assembling the first and second door-halves together.

5,771,657

**AUTOMATIC PRESCRIPTION FILLING, SORTING AND PACKAGING SYSTEM**

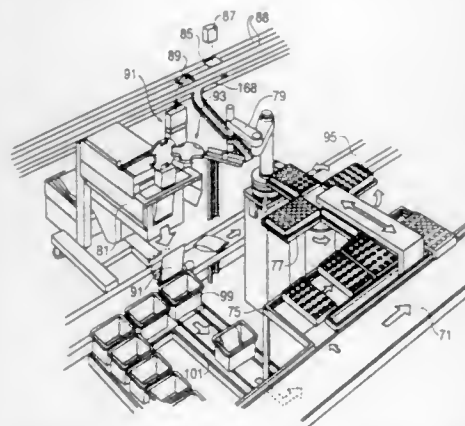
Christopher J. Lasher, Ridgewood; Dennis Wayne Rice, Union; Michael Joseph Szesko, Freehold; Frank Modrowsky, Branchburg; James McErlean, Allendale, all of N.J.; Michael Kennedy, Doylestown, Pa., and Paul Thomas Shupert, Parkton, Md., assignors to Merck Medco Managed Care, Inc., Montvale, N.J.

Filed May 7, 1996, Ser. No. 646,016

Int. Cl.<sup>6</sup> B65B 57/20; 61/20; B65G 37/00; 59/00

U.S. Cl. 53—55

15 Claims



1. An automatic prescription filling and packing system comprising pill dispensing machines to automatically count out and dispense pills into prescription bottles in accordance with prescription orders, means to print literature packs customized to said prescription orders, and order consolidation means to present a shipping container for each order, to insert the prescription bottle for said order into such shipping container and to insert, separately from any prescription bottle inserted into the shipping container, the literature pack for said order into such shipping container.

5,771,658

**ARTICLE PACKAGING APPARATUS**

Allen L. Olson; Kelly W. Ziegler, and Jeffrey A. Lashyro, all of Crosby, Minn., assignors to Riverwood International Corporation, Atlanta, Ga.

Continuation of Ser. No. 610,994, Mar. 5, 1996, abandoned, which is a continuation of Ser. No. 426,217, Apr. 21, 1995, abandoned, which is a continuation of Ser. No. 399,757, Mar. 7, 1995, abandoned, which is a continuation of Ser. No. 123,142, Sep. 17, 1993, abandoned. This application Feb. 20, 1997, Ser. No. 803,526

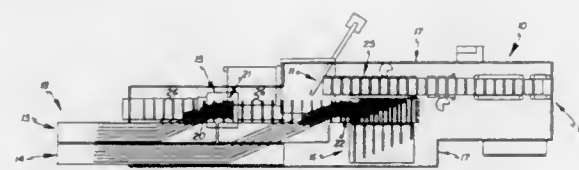
Int. Cl.<sup>6</sup> B65B 35/54

U.S. Cl. 53—157

16 Claims

15. A continuous apparatus for forming and packaging stacked article groups, comprising:

(a) a first article infeed for supplying a first stream of articles in a first travel path;



- (b) a second article infeed for supplying a second stream of articles in a second travel path and at a vertically separate and distinct level with respect to said first article infeed, said first and said second infeed each having a plurality of article lanes;
- (c) an article group selector having a longitudinal third travel path intersecting said first and second article infeed travel paths and lanes at a predetermined angle, said selector having a plurality of spaced, transversely oriented flight bars intersecting said first and second article streams which select articles from said first and second infeed article lanes, said flight bars forming lower article subgroups, upper article subgroups and a stream of spaced, stacked article groups, each said stacked article group comprising a lower and an upper article subgroup;
- (d) a divider deposit mechanism for depositing a divider member between said upper and lower article subgroups, said article group selector further slidably forming said upper article subgroups across said divider member disposed on said lower article subgroups to simultaneously form said stacked article groups;
- (e) a carton supplier having a longitudinal fourth travel path parallel to said selector travel path, said carton supplier forming a stream of cartons with open ends facing said article groups on said selector; and
- (f) a transfer mechanism for loading article groups from said selector to cartons on said carton supplier.

5,771,659

**APPARATUS TO WELD A WRAPPING SHEET TO THE CORE OF A WARPED ROLL-LIKE ARTICLE**

Niels Henrik V. Hansen, Sabro, Denmark, assignor to Campen A/S, Aarhus V, Denmark

PCT No. PCT/DK95/00187, § 371 Date Nov. 12, 1996, § 102(e) Date Nov. 12, 1996, PCT Pub. No. WO95/31373, PCT Pub. Date Nov. 23, 1995

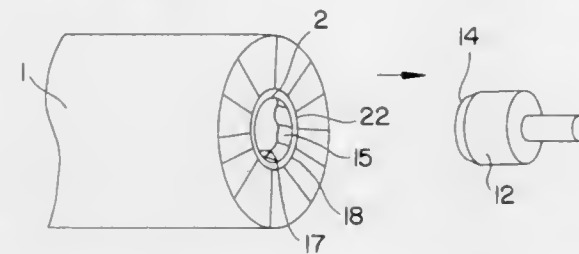
PCT Filed May 11, 1995, Ser. No. 737,366

Claims priority, application Denmark, May 13, 1994, 0548/94

Int. Cl.<sup>6</sup> B65B 51/10; 25/14; 51/22

U.S. Cl. 53—370.7

11 Claims



1. An apparatus for attaching a plastic sheet to a composite product formed of an elongated core tube comprised of a plastic material and a web-shaped material wrapped around the elongated core tube, said core tube having a length which is substantially equal to a width of the web-shaped material and defining first and second ends in substantial alignment with respective opposite first and second side edges of the web-shaped material, the plastic sheet including a first end portion which extends beyond the first end of the core tube and first side edge of the web-shaped material, said apparatus comprising closing means for gripping and gathering the first end portion of the plastic sheet, welding means for welding said gathered first end portion of said plastic sheet to said first end

of said core tube, said welding means including a welding head having an engagement face for engaging the plastic sheet material along one of an inner and outer annular edge of the first end of the core tube and cutting means comprising a milling head mounted to be axially slidable in an inward direction toward an interior of the core tube for removing free excess plastic sheet parts after welding.

5,771,660

**TRANSVERSE SEALING APPARATUS FOR A TUBULAR BAG PACKAGING MACHINE**

Horst Loewenthal, Tiengen, Germany, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

PCT No. PCT/CH95/00285, § 371 Date Apr. 21, 1997, § 102(e) Date Apr. 21, 1997, PCT Pub. No. WO96/17720, PCT Pub. Date Jun. 13, 1996

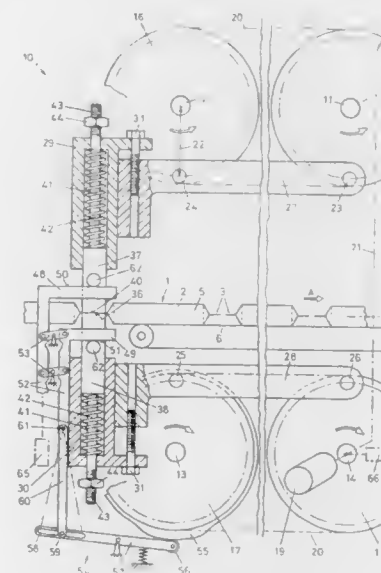
PCT Filed Dec. 1, 1995, Ser. No. 817,674

Claims priority, application Switzerland, Dec. 6, 1994, 3696/94

Int. Cl.<sup>6</sup> B65B 51/10; 51/30

U.S. Cl. 53—374.5

10 Claims



1. A transverse sealing apparatus for sealing a packaging tube (1), in particular, for a tubular bag packaging machine, comprising two drive units (15–21) arranged on opposite sides of a center plane (4) of the packaging tube (1), which drive a first and second holder (27–30) to be circulating synchronously and counter to one another,

a sealing jaw (37), which is guided in the first holder (27, 29) so as to be displaceable and biased by a first contact pressure element (41) against a first stop (44), from which sealing jaw is projecting a first stop element (62),

an opposite jaw (38), which is guided in the second holder (28, 30) so as to be displaceable and biased by a second contact pressure element (41) against a second stop (44), from which opposite jaw is projecting a second stop element (62),

two movable supporting elements (48, 49) with supporting surfaces (50, 51),

a control device (54) for moving the supporting elements (48, 49) in such a way that the first and second stop element (62) run onto the associated supporting surface (50, 51) before the sealing jaw (37) and the opposite jaw (38) impact the tube (1) for pressing contact, and that the two supporting elements (48, 49) are subsequently moved toward one another to delay the motion component perpendicularly to the center plane of the sealing jaw (37) and of the opposite jaw (38) in a guided manner.

5,771,661

**MACHINE FOR RELEASING A BALE, PARTICULARLY A BALE OF TOBACCO, FROM A PACKAGE**

Mario Martin, Treviso, Italy, assignor to Comas S.p.A., Silca, Italy

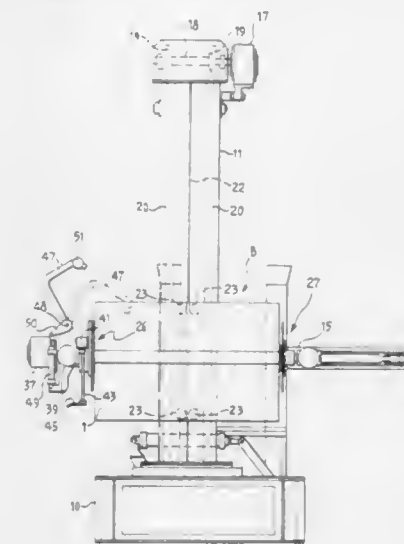
Filed Dec. 12, 1996, Ser. No. 766,457

Claims priority, application Italy, Dec. 12, 1995, T095A1000

Int. Cl.<sup>6</sup> B65B 43/38

U.S. Cl. 53—382.1

17 Claims



1. A machine for releasing a bale, a bale of tobacco, from a package comprising a parallelepipedal box of cardboard or like material, said box including at least one principal face having a plurality of articulated wings or flaps restrained in a folded closure position by at least one strap or like retaining means fastened around the box, and in which the bale is covered by a protective sheet or is enclosed in a wrapper beneath said flaps, wherein the machine comprises:

a conveyor and support device for supporting a packaged bale in a predetermined position in a working area with the principal face of said box in a horizontal plane,

an upright disposed in front of said working area,

a movable structure movable vertically along said upright,

a pair of arms fixed to said movable structure and carrying respective rotatable, horizontally-facing and spaced-apart gripping devices,

first drive means for moving said movable structure along said upright,

second drive means carried by said movable structure for bringing about relative movement of the gripping devices between a spaced-apart condition in which the gripping devices are separated by a distance greater than the length of a packaged bale and a close-together condition, in which the gripping devices are separated by a distance less than or equal to the length of a packaged bale,

third drive means for rotating at least one of said gripping devices about a horizontal axis,

restraining means carried by at least one of said pair of arms and movable between a rest position and a working position, and control and operating means connected to said first, second and third drive means and to said restraining means for positioning of the gripping devices in the spaced-apart condition and the positioning of the movable structure in a raised position in which a packaged bale can be placed in the predetermined position in the working area;

downwardly moving of the movable structure to a lowered position in which the gripping devices face two end faces of the packaged bale;

moving of the gripping devices to the close-together condition in order to grip the end faces of the packaged bale;

lifting of said movable structure from the lowered position and the operation of said third drive means so as to rotate the packaged bale gripped between the gripping devices, thereby arranging the bale in a position in which the wings or flaps of



the packaging box are in a substantially vertical plane in order that said at least one strip or like retaining means being removed, the wings or flaps of the face of the box being unfolded, the protective sheet or wrapper being removed, and the wings or flaps being reclosed;

moving of the restraining means to the working position in order to restrain the wings or flaps substantially in the closure position;

rotating of the box and of the bale contained therein towards a position in which the wings or flaps are in a substantially horizontal plane and facing downwardly; and

moving of the restraining means to the rest position in which they release the wings or flaps of the box so that the bale is free to slide vertically by gravity towards and onto the conveyor and support device away from the box.

5,771,662

#### APPARATUS AND METHODS FOR PRODUCING SHRINK WRAP PACKAGING

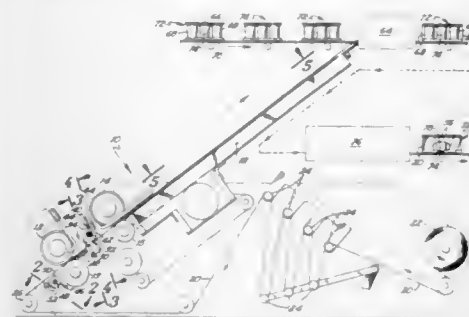
Mike Struges, Evansville; Rodney Tebben, Alexandria; Kenneth Dean Paulzine, Alexandria, and Scott Christopher Larson, Alexandria, all of Minn., assignors to Douglas Machine Limited Liability Company, Alexandria, Minn.

Filed Jun. 28, 1996, Ser. No. 671,601

Int. Cl.<sup>6</sup> B65B 53/02; 13/02

U.S. Cl. 54—399

25 Claims



1. Method comprising the steps of: supplying a continuous web of film having a leading edge and first and second, spaced, longitudinal edges; moving the web of film through a first portion of a path, with the web of film being under tension in the first portion of the path; substantially cutting the web of film in the first portion between first and second longitudinal edges to form a single sheet of film having a trailing edge spaced from the leading edge and creating a new leading edge on the web of film, with the trailing edge and new leading edge being connected together by a plurality of tie strips to maintain tension of the web of film in the first portion of the path after cutting; and breaking the tie strips between the single sheet of film and the new leading edge after the trailing edge and the new leading edge leave the first portion of the path; wherein the breaking step comprises the step of moving the web of film through a second portion of the path, with the first and second portions of the path being contiguous; wherein the step of moving the web of film through the second portion comprises the step of conveying the web of film on a vacuum table, with the vacuum table moving faster than the first portion such that the single sheet of film after moving from the first portion of the path onto the vacuum table moves faster than the web of film in the first portion and placing tensional forces on the tie strips which exceed their tensional strength causing them to break.

#### 5,771,663 METHOD FOR MANUFACTURING COMPRESSED FLUID CONTAINERS, METHOD FOR MANUFACTURING EVACUATED CONTAINERS

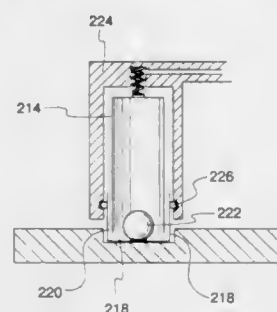
Benjamin N. Wold, Scottsdale, Ariz., and John H. Cover, Coronado, Calif., assignors to Air Taser, Inc., Scottsdale, Ariz.

Filed Dec. 1, 1995, Ser. No. 566,350

Int. Cl.<sup>6</sup> B65B 31/00

U.S. Cl. 53—403

9 Claims



1. A method for producing a compressed fluid container comprising the steps of:

- a) selecting a first casing having a first end that defines an opening and a second end that is closed;
- b) placing a second casing in said first casing to define an enclosed chamber, said second casing having a first end that defines an opening and a second end that is closed, said opening of said first end of said second casing being smaller than said opening of said first end of said first casing;
- c) charging said defined enclosed chamber with a fluid; and
- d) sealing said open first end of said first casing whereby said first end of said first casing and said second end of said second casing are integrally joined, wherein the step of sealing said open first end of said first casing includes the steps of:
  - e) selecting a solidified substrate, said substrate selected from the group consisting of metal, solder, braze, plastic or glass;
  - f) liquifying the substrate so as to completely engulf the open end of the second casing and closed end of the first casing; and
  - g) allowing the substrate to solidify.

5,771,664

#### LABEL FOR BAGS WITH WIRE LOOP CLOSURES

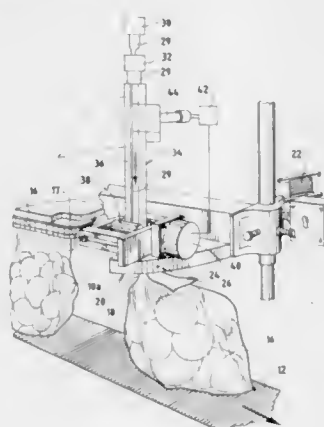
Michael J. Recchia, Jr., Roselle, Ill., assignor to Tagit Enterprises Corporation, Chicago, Ill.

Filed Nov. 12, 1996, Ser. No. 747,282

Int. Cl.<sup>6</sup> B65B 51/04

U.S. Cl. 53—417

10 Claims



1. The method of attaching a supplemental label to a bag having a wire loop closure, which comprises:

forming a bag neck of a filled, flexible bag, by collapsing bag material about a mouth of the bag;

advancing a strip of labels attached together by lines of tearing weakness to place an elongated neck of a label against the bag neck, with the labels of the strip being advanced to be sequentially placed against sequential bag necks of bags advancing along a process line, in which rollers advance said strip of labels by a length of a single label with each placement of an elongated label neck against a bag neck, each said label comprising a transversely-enlarged portion integral with said elongated neck;

applying a wire loop closure tightly around the bag neck and the elongated label neck to close the bag and to simultaneously attach the label to the bag by wire loop closure attachment; and tearing away said label from said strip after attachment to the bag neck by further movement of the bag along the process line.

5,771,665

#### SAND BAGGING SYSTEM

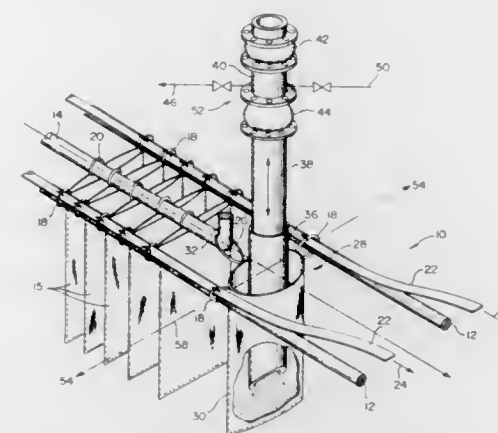
W. Titus Nelson, and Gary Leeman, both of 16449 53rd Pl. S., Tukwila, Wash. 98188

Filed Dec. 11, 1996, Ser. No. 763,336

Int. Cl.<sup>6</sup> B65B 1/16; 43/14; 43/26; 43/54

U.S. Cl. 53—459

29 Claims



1. A method of bagging bulk material, comprising: providing a plurality of bags, each having a closed lower end, an openable upper end, a leading side and a trailing side; connecting the bags in series to at least one elongated tension member that extends perpendicular to the leading and trailing sides of the bags;

moving the bags in succession to a charging station, leading side first, by pulling on the elongated tension member, said leading and trailing sides of each bag being contiguous each other as they move towards the charging station;

positioning a lead bag at the charging station;

opening the top of the lead bag;

collecting a measured charge of bulk material at the charging station in a charge tube;

discharging bulk material through the charge tube into the open top of the lead bag while such bag is at the charging station; closing the lead bag after discharging the measured charge of bulk material into the open top of the lead bag;

severing the connection of the lead bag to the elongated tension member;

moving the lead bag away from the charging station after discharging the bulk material into the lead bag at the charging station; and

moving the next bag in succession to a lead position at the charging station for receiving bulk material from the charge tube.

5,771,666

#### METHOD OF CONTINUOUSLY WRAPPING PRODUCTS

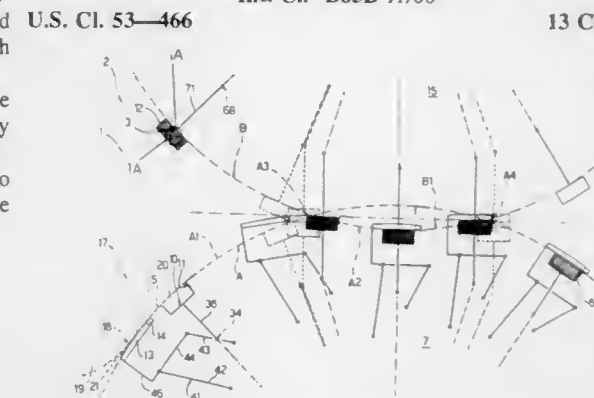
Francesco Bertuzzi, Vedrana Di Budrio; Fabio Sassi, Imola, and Fiorenzo Draghetti, Medicina, all of Italy, assignors to G.D. Societa' Per Azioni, Bologna, Italy

Filed May 2, 1996, Ser. No. 641,851

Claims priority, application Italy, May 10, 1995, B095A0210

Int. Cl.<sup>6</sup> B65B 11/00

13 Claims



1. A method of continuously wrapping products (12) in respective sheets (5) of wrapping material, comprising:

continuously feeding along a given path (A) at least one empty seat (10) for accommodating a respective said product (12), together with a retaining element (13) for retaining a said sheet (5) of wrapping material; the seat (10) having a lateral opening (11), and the retaining element (13) being movable, in relation to the seat (10), between a first position to a first side of the seat (10), and a second position over the seat with a portion of said retaining element extending to a second side at said seat (10) and substantially closing said opening (11);

continuously feeding the sheet (5) of wrapping material in such a manner that a first portion (20) of the sheet (5) is positioned over the empty seat (10) and closing said opening (11), and a second portion (21) of the sheet (5) is engaged by the retaining element (13) in said first position to draw the sheet (5) along said path (A);

continuously inserting said product (12) inside said empty seat (10), through said opening (11) closed by the first portion (20) of said sheet (5), so as to fill the empty seat (10) and fold at least the first portion (20) of the sheet (5) substantially in a U about the product (12) and inside the seat (10); and

moving the retaining element (13) from the first to the second position, so as to fold at least part of the second portion (21) of the sheet (5) about and onto the product (12); the sheet (5) being mated with the retaining element (13) in such a position that, upon the said portion of said retaining element (13) being moved into the second position, an end portion (21a) of the second portion (21) of the sheet (5) is moved to said second side of said product seat (10); said end portion (21a) being folded square about the product (12) to complete a tubular wrapping (6) about the product (12).

5,771,667

#### BAG FILLING, CLOSING, AND SEALING MACHINE

James R. McGregor, P.O. Box 710, Owatonna, Minn. 55060; Tracy J. Steiger, and LaVern N. Wobschall, both of Owatonna, Minn., assignors to James R. McGregor, Owatonna, Minn.

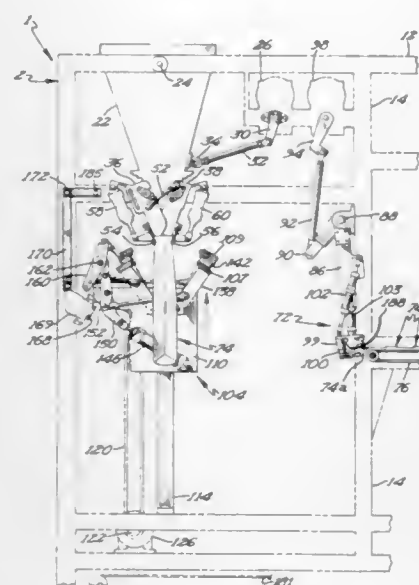
Filed Nov. 6, 1996, Ser. No. 744,628

Int. Cl.<sup>6</sup> B65B 1/06; 7/06; 51/14

U.S. Cl. 53—469

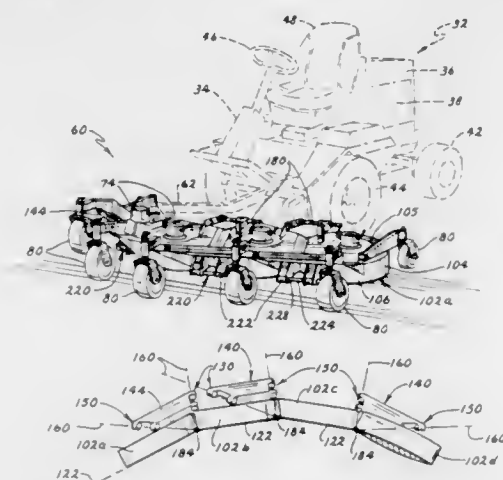
19 Claims

1. Apparatus for filling and sealing bags comprising: a material dispensing spout having a discharge end defined by closure members operable between closed and open positions for discharging particulate material into a bag; a first power actuator positioned and arranged to open and close the spout discharge end closure members;



observing the rider and the animal to determine if the rider has been thrown from the animal;  
observing the rider to determine if the rider has a hand caught in the rope after being thrown from the animal;  
transmitting a radio signal when the rider has been thrown from the animal and has a hand caught in the rope;  
receiving said radio signal; and  
actuating said fastening device to release the rope from the animal and thereby allow the rider to fully detach from the animal in response to the received signal.

5,771,669  
METHOD AND APPARATUS FOR MOWING  
IRREGULAR TURF AREAS  
Thomas F. Langworthy, Cologne; Herman P. Christopherson,  
Prior Lake, and Richard A. Nelson, Bloomington, all of  
Minn., assignors to The Toro Company, Bloomington, Minn.  
Filed Jun. 27, 1996, Ser. No. 672,157  
Int. Cl.<sup>6</sup> A01D 75/30  
U.S. Cl. 56—6 25 Claims



1. An improved turf mower comprising:  
a) a plurality of cutting unit frames which are movable over the ground;  
b) a plurality of cutting blades, at least one cutting blade being movably carried by each cutting unit frame;  
c) a plurality of support members each rigidly connected to one of the cutting unit frames;  
d) a span member associated with and disposed between each pair of adjacent cutting unit frames; and  
e) a pair of hinging means for pivotally connecting each span member to the support members of adjacent cutting unit frames, wherein each hinging means permits relative pivotal movement about a hinge axis, and wherein the hinge axes associated with adjacent cutting unit frames are non-parallel, whereby each cutting unit frame may display a range of independent motion relative to an adjacent cutting unit.

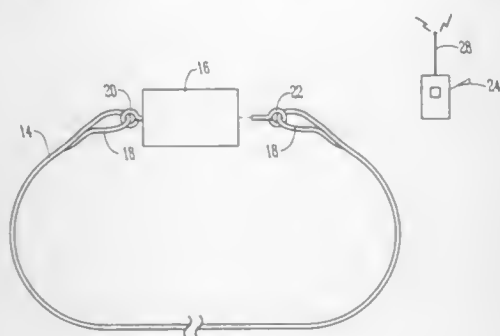
5,771,670  
BALANCED-WHEELED GRASS AND WEED TRIMMER  
APPARATUS

Ben C. Perry, 4773 Mooresville Rd., Kannapolis, N.C. 28081  
Continuation-in-part of Ser. No. 381,349, Jan. 31, 1995, abandoned. This application Dec. 18, 1995, Ser. No. 574,109  
Int. Cl.<sup>6</sup> A01D 75/10  
U.S. Cl. 56—12.1 9 Claims

1. A balanced, wheeled, rotary string grass and weed trimmer apparatus for mounting a gas or electric powered rotary weed trimmer can be converted from a hand or shoulder carried model, to a model adapted for use on a wheel-mounted carriage, said apparatus including:

clamping members on the spout discharge end movable between a closed position in clamping engagement with a bag mouth on the spout discharge end and an open position;  
a carriage movable in a travel path between a first, bag receiving position in close proximity to the spout discharge end and a second, bag discharge position away from the spout;  
sealing apparatus mounted on the carriage and movable between a first, inoperative position and a second position in sealing juxtaposition with a bag mouth, whereby bags may be clamped on the spout and filled one at a time, and thereafter released by the spout clamping members for movement by the carriage to a release position, with the bag mouth being sealed by the sealing apparatus as the carriage moves between its first and second positions.

5,771,668  
REMOTE BUCKLE RELEASE DEVICE  
James C. Younger, 5222 Hwy. 151, Box 41, Platteville, Wis. 53818  
Filed Aug. 21, 1996, Ser. No. 700,843  
Int. Cl.<sup>6</sup> B68B 1/00  
U.S. Cl. 54—1 12 Claims



1. A method of releasing a bull rope from a rodeo animal when a rider is thrown from the animal comprising the steps of:  
providing a rope adapted to fit around the chest of the animal proximate the front legs of the animal to provide a handle for a rider of the animal;  
providing an electrically actuated releasable fastening device coupled to the rope to releasably secure the rope around the chest of the animal;  
providing a radio receiver operatively coupled to the electrically actuated fastening device;



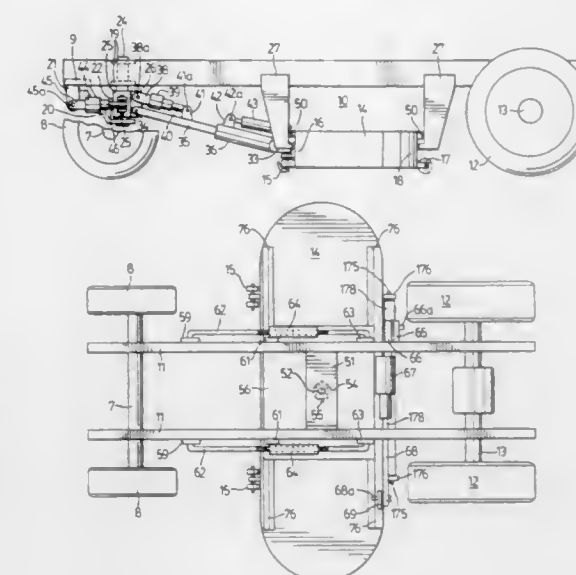
A. a base frame having:  
i) an axle mounted on and extending through said frame at the rearward, aft portion of said frame, and said axle including a wheel operatively mounted on each end thereof;  
ii) a rotary string cutting head assembly mounted on the underside of said frame at the leading edge thereof;  
iii) a control handle mounted on the rearward, aft portion for guiding and steering said wheeled rotary string weed trimmer;  
B. said control handle including an upper end having a grip assembly thereon, and a lower end attached to said frame means;  
C. a motor having an output shaft; a drive shaft means operatively connecting said output shaft of said motor to said rotary string cutting head assembly, for driving said rotary string cutting head; said motor being mounted on said frame in a position such that the center of gravity of said apparatus is slightly forward of said axle;  
D. said drive shaft means including a pair of meshing toothed gears having a differential ratio selected to produce greater cutting head speed while requiring less output speed from said motor;  
E. a throttle control means mounted on said control handle in an area substantially adjacent said grip assembly; and  
F. means for operatively connecting said throttle control means to said motor;  
G. a connector means having a relatively flat, rectangular shape, and a relatively short length, for connecting said drive shaft to said motor output shaft;  
whereby the torque normally produced by the conventional extended length of a flexible motor output shaft required on hand or shoulder carried rotary weed trimmers is eliminated by use of said connector means; which connector means operatively connects the motor output shaft directly to said drive shaft.

5,771,671

Patent Not Issued For This Number

5,771,672  
LATERALLY AND VERTICALLY MOVABLE GRASS  
CUTTING MOWER ATTACHMENT  
Elwyn Gummerson, R.R. #2, Tavistock, Ontario, Canada, N0B 2R0  
Continuation-in-part of Ser. No. 231,132, Apr. 22, 1994, Pat. No. 5,483,789. This application Jan. 2, 1996, Ser. No. 582,157  
Int. Cl.<sup>6</sup> A01D 34/64; 34/82  
U.S. Cl. 56—15.4 46 Claims

1. The combination of a motor-driven vehicle having front wheels and rear wheels and a longitudinally-extending frame bed therebetween, a transversely-mounted powered grass-cutting mower, the mower having a housing and powered grass cutting blades, and a suspended mounting system for mounting the mower to the frame bed, said suspended mounting system comprising:  
(i) vertical guidance means which are a component of said suspended mounting system, said vertical guidance means being secured between said longitudinally-extending frame bed of said motor-driven vehicle and said mower housing;



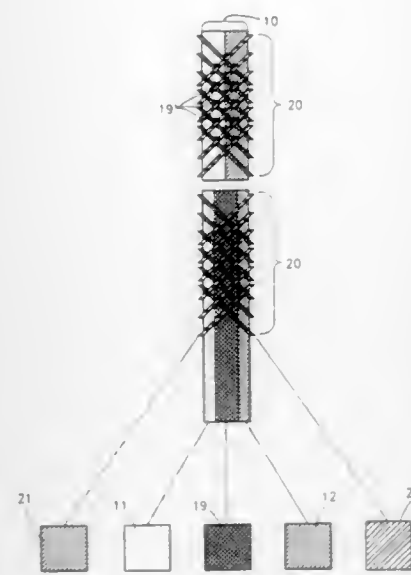
(ii) rigid linkage means secured between said longitudinally-extending frame bed of said motor driven vehicle and said mower housing;  
(iii) a first powered operating means which is connected to said rigid linkage means for moving said mower housing in a finite number of controlled, vertically-upwardly guided positions to a maximum upper position within the constraints of said vertical guidance means, and for moving said mower housing through a finite number of controlled, vertically-downwardly guided positions to a minimum lower position within the constraints of said vertical guidance means, said vertical locations thereby being between an upper limit and a lower limit;  
(iv) horizontal guidance means secured to said mower housing for guiding lateral movement of said mower housing relative to said longitudinally-extending frame, said lateral movement being between a left lateral limit and a right lateral limit; and  
(vi) a second powered operating means, which is operatively associated with said horizontal guidance means, for moving said mower housing, within the constraints of said horizontal guidance means, through a finite number of positively-controlled lateral locations between said left lateral limit and said right lateral limit.

5,771,673  
LINE, IN PARTICULAR FISHING LINE, AS WELL AS  
METHOD FOR ITS PRODUCTION

Wilhelm Lorch, Winterlingen, Germany, assignor to Lozetex-Zwirne GmbH, et al, Winterlingen, Germany  
PCT No. PCT/DE95/00085, § 371 Date Jul. 18, 1996, § 102(e)  
Date Jul. 18, 1996, PCT Pub. No. WO95/20703, PCT Pub. Date Aug. 3, 1995  
PCT Filed Jan. 21, 1995, Ser. No. 676,379  
Claims priority, application Germany, Jan. 31, 1994, 44 02 630.7  
Int. Cl.<sup>6</sup> D02G 3/36 14 Claims

1. A fishing line with a core and a sheath encompassing the core, wherein the core as well as the sheath are formed of high-strength filaments, characterized in that the core (10) is formed of filaments (11, 12) and said core is cross-entwined by filaments (21, 22) forming a sheath (20) and that the core and sheath filaments (11, 12, 21, 22) are bonded by means of a thermoplastic fusion-adhesive filamentary yarn (19) integrated into the fishing line and then is heated to fuse and incorporate completely in the core





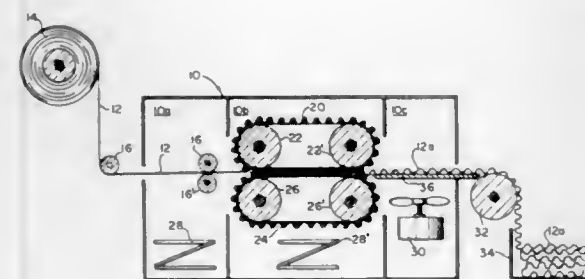
wherein the thermoplastic yarn permeates the core and the sheath filaments from the core the thermoplastic yarn (19) ceasing to exist throughout a filamentary yarn form.

5,771,674

**PROCESS AND APPARATUS FOR CRIMPING FIBERS**  
W. Novis Smith, 412 S. Perth St., Philadelphia, Pa. 19147, and  
Toby Burnham, 1480 Pumphrey Ave., Auburn, Ala. 36830  
Filed May 28, 1996, Ser. No. 654,333  
Int. Cl. D01H 5/00

U.S. Cl. 57—284

10 Claims



1. In an apparatus for crimping and heat setting a filament or a tow of filaments of acrylic or heat stabilized fibers which contains at least one heating zone with means for heating said filament or tow of filaments in an oxidizing or inert atmosphere while passing therethrough, the improvement which comprises said heating zone having an upper endless belt having a multiplicity of self indexing bars and a lower endless belt mating with said upper endless belt and having a multiplicity of spaced stationary bars for conveying and imparting crimps to said filament or tow while passing through said heating zone, said bars on said upper endless belt having a degree of play so that they are positioned by gravity between the bars on said lower endless belt.

5,771,675

**PROCESS AND DEVICE FOR ALTERNATELY GIVING A YARN AN "S" TWIST OR A "Z" TWIST**

Wolfgang Rader, Schonungen, and Gunther Schmitt, Hammelburg, both of Germany, assignors to Temco Textilmaschinenkomponenten GmbH & Co. KG, Hammelburg, Germany  
PCT No. PCT/EP95/00158, § 371 Date Oct. 18, 1996, § 102(e) Date Oct. 18, 1996, PCT Pub. No. WO95/19460, PCT Pub. Date Jul. 20, 1995

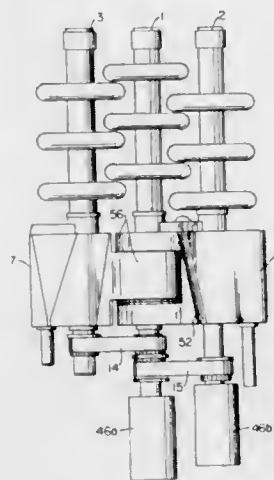
PCT Filed Jan. 17, 1995, Ser. No. 682,686

Claims priority, application Germany, Jan. 18, 1994, 44 01 321.3

Int. Cl. D01H 1/11

U.S. Cl. 57—339

13 Claims



1. A device for false-twist texturing, said device comprising: at least three rotatable twisters for disposition polygonally around a yarn texturing center and driven in a same rotative direction to exert a common effect on a yarn passing through said twisters;

"S"/"Z" twist changeover means for adjusting width-wise positions of two of said twisters in relation to a first of said twisters and to transpose said two twisters with each other to effect a changeover between "S" and "Z" twists; and drive changeover means for reversing the rotative direction of all of said twisters;

said "S"/"Z" twist changeover means comprising swivel elements in each of which one of said transposable and adjustable twisters is mounted, said swivel elements being hingedly connected to said first twister.

5,771,676

**PIVOT ANGLE LIMITING STOPPER STRIKING NOISE SUPPRESSING DEVICE OF CABLE DRAG CHAIN**

Shoichiro Komiya, Hyogo; Hiroshi Nishimura, and Takashi Yaono, both of Osaka, all of Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

Filed Oct. 23, 1996, Ser. No. 735,589

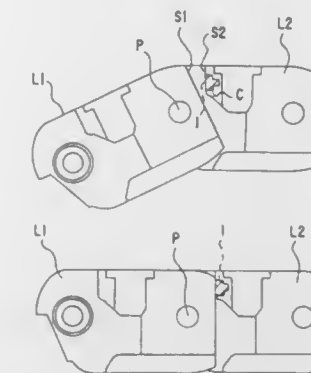
Claims priority, application Japan, Oct. 27, 1995, 7-280656

Int. Cl. F16G 13/16

U.S. Cl. 59—78.1

14 Claims

1. In a cable drag chain having a plurality of link assemblies connected end to end, each of said link assemblies including link plates juxtaposed to each other, said link plates each link assembly being rotatably connect to respective link plates of adjacent link assemblies to form pairs of connected adjacent link plates, at least one pair of said connected adjacent link plates having a pivot angle limiting stopper, said limiting stopper comprising abutment surfaces on each of said one pair of connected adjacent link plates.



the improvement comprising a cushioning material being provided between said abutment surfaces, thereby suppressing striking noise.

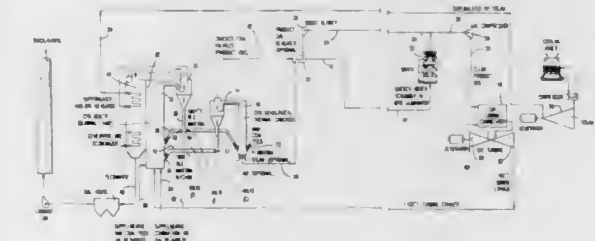
5,771,677

**COMBINED CYCLE POWER PLANT WITH INTEGRATED CFB DEVOLATILIZER AND CFB BOILER**  
John W. Rohrer, 133 Pope Ave., South Portland, Me. 04106, assignor to John W. Rohrer, York, Me.  
Continuation-in-part of Ser. No. 522,763, Sep. 1, 1995, Pat. No. 5,666,801. This application Aug. 29, 1996, Ser. No. 704,973

Int. Cl. F02C 3/26; 3/28; 3/30; 3/34

U.S. Cl. 60—39.02

8 Claims



8. A process for generating power from a volatile containing carbonaceous feed, comprising:

- providing first and second fully entrained flow circulating fluidized bed reaction zones through which a loop of heat-conveying materials continuously circulate and being fluidized by first and second fluidizing gases, respectively;
- introducing a volatile-containing carbonaceous feed into said first circulating fluidized bed reaction zone;
- heating said feed with said heat-conveying materials, for a time period sufficient to produce a product gas comprised of partially thermally cracked volatiles and substantially devolatilized feed, said heat-conveying material entering the first reaction zone at a first temperature between about 1000° F. and about 2400° F. and exiting at a second temperature lower than said first temperature because of the endothermic heat requirements of said first reaction zone;
- separating said substantially devolatilized feed with said heat-conveying materials from said product gas and, recycling some of said product gas for use as said first fluidizing gas;
- either increasing product gas yield or devolatilization reaction temperature in step c by substituting steam and/or air or oxygen as the fluidizing gas;
- introducing into said second circulating fluidized bed reaction zone said substantially devolatilized feed together with said heat-conveying material from step e and, as said second fluidizing gas, an oxygen containing turbine exhaust gas;
- exothermically reacting said substantially devolatilized feed in the presence of said oxygen-containing turbine exhaust gas at a temperature above the temperature of said first reaction zone for a time period sufficient to substantially combust said substantially devolatilized feed, produce a flue gas, preheat

compressed air for a gas turbine, generate high pressure steam and, elevate the temperature of said heat-conveying material from said second temperature to a temperature greater than said first temperature, said high pressure steam being conveyed to a steam turbine to provide power;

- separating said re-elevated temperature heat-conveying material into first and second portions, said first portion being conveyed to said first reaction zone as said heat-conveying material;
- providing compressed air from a compressor section of a gas turbine;
- providing a recuperator and introducing said compressed air of step i into said recuperator in heat exchange relationship with turbine exhaust from a gas turbine thereby transferring heat from said turbine exhaust to said compressed air in said recuperator to form preheated compressed air at a first temperature;
- providing a first air heater; introducing a portion of said compressed air of step i at said first temperature into said first air heater; and introducing product gas of step e into said first air heater thereby transferring heat from said product gas to elevate the temperature of said portion of preheated compressed air at said first temperature to a second temperature higher than said first temperature;
- providing a fluidized bed air heater, introducing another portion of said preheated compressed air from step i at said first temperature into said fluidized bed air heater, introducing and fluidizing said separated second portion of heat-conveying material from step h into said fluidized bed air heater thereby transferring heat from said second portion of separated heat-conveying material to elevate the temperature of said another portion of preheated compressed air at said first temperature in said fluidized bed heater to a third temperature higher than said first temperature;
- providing a second compressed air heater in a convective boiler section of said second circulating bed reaction zone, introducing a further portion of said preheated compressed air of step i into said second air heater whereby heat in said flue gas generated in said second fully entrained flow circulating fluidized bed zone transfers heat to said further portion of said compressed air in said second air heater to form preheated compressed air at a fourth temperature higher than said first temperature;
- providing a compressed product gas;
- providing a gas turbine; introducing said compressed product gas of step m and said preheated compressed air portions from steps j, k, l and m into said gas turbine, combusting said compressed product gas and said preheated compressed air portions in said gas turbine thereby providing power and an oxygen containing turbine exhaust having a temperature of at least 800° F. to about 1200° F. that is used as said turbine exhaust of step i; and
- recycling said oxygen containing turbine exhaust gas of step o to said second fully entrained flow circulating fluidized bed reaction zone as said second fluidizing gas.

5,771,678

**WATER-INJECTED STOICHIOMETRIC-COMBUSTION GAS TURBINE ENGINE**

Ahmad R. Shouman, 1006 Bloomdale Dr., Las Cruces, N. Mex. 88005

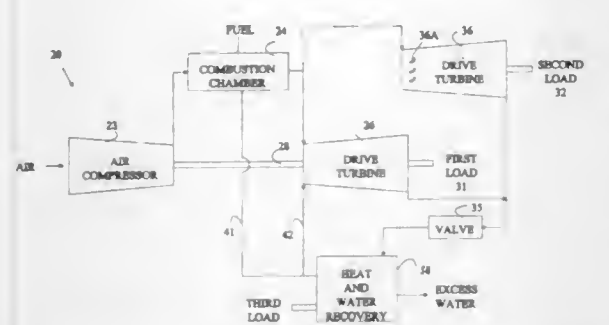
Filed Feb. 12, 1996, Ser. No. 598,575

Int. Cl. F02C 7/00

U.S. Cl. 60—39.55

8 Claims

- A gas turbine engine comprising:
  - an air compressor;
  - a combustion chamber connected to said air compressor for burning fuel with air from said air compressor, said combustion chamber including means for receiving water and combining said water with gases generated by the burning of said fuel to generate a gaseous output;



first and second turbines driven in parallel by said gaseous output of said combustion chamber, said first turbine accommodating a maximum mass flow that is greater than or equal to the maximum gaseous output of said combustion chamber in the absence of said water and less than the maximum mass output of said combustion chamber in the presence of said water; and means for recovering heat from said gaseous output after said gaseous output has passed through said turbines.

5,771,679  
ALUMINIZED PLATEAU-BURNING SOLID  
PROPELLANT FORMULATIONS AND METHODS FOR  
THEIR USE

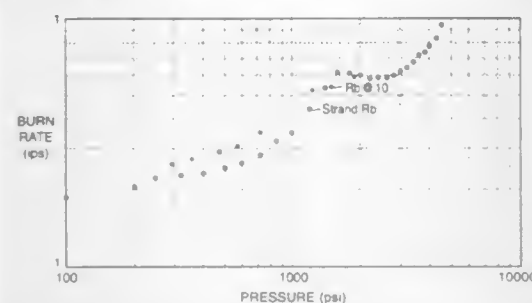
Robert H. Taylor, Jr., Harvest, Ala., and Carol J. Hinchshaw, Ogden, Utah, assignors to Thokol Corporation, Ogden, Utah

Continuation of Ser. No. 220,100, Mar. 30, 1994, abandoned, which is a continuation-in-part of Ser. No. 981,774, Nov. 25, 1992, Pat. No. 5,334,270, which is a continuation-in-part of Ser. No. 827,207, Jan. 29, 1992, abandoned. This application Dec. 5, 1996, Ser. No. 760,727

Int. Cl.<sup>6</sup> C06B 45/10

U.S. Cl. 60—219

18 Claims



1. A method for tailoring the performance of a metallized solid rocket motor propellant such that the propellant exhibits at least two stable burn rates over at least two corresponding pressure ranges comprising the steps of:

incorporating within said propellant a biplateau burning amount of ammonium perchlorate having at least two distinct particle sizes, wherein a portion of the ammonium perchlorate particles have sizes in the range of from about 2 $\mu$  to about 5 $\mu$  and wherein another portion of the ammonium perchlorate particles have sizes in the range of from about 150 $\mu$  to about 400 $\mu$ ;

incorporating within said propellant a biplateau burning amount of a refractory oxide selected from the group consisting of TiO<sub>2</sub>, Al<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub>, SnO<sub>2</sub>, and ZrO<sub>2</sub>; and selecting a binder for incorporation into the propellant incorporating within said propellant at least one binder, such that a metallized solid rocket motor propellant is formed;

igniting said solid rocket motor propellant such that the propellant formulation burns at at least two stable burn rates over at least two corresponding pressure ranges such that the propellant provides boost-sustain operation when burned in a solid rocket motor.

5,771,680  
STIFFENED COMPOSITE STRUCTURES AND METHOD  
OF MAKING THEREOF

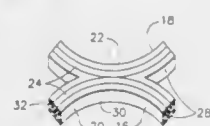
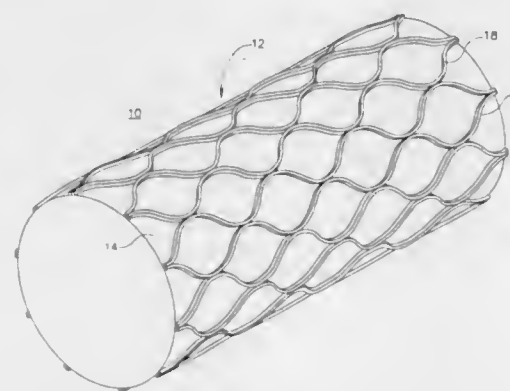
Ahmad P. Zahedi, Cincinnati, and Stephen C. Mitchell, West Chester, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 21, 1995, Ser. No. 576,249

Int. Cl.<sup>6</sup> F02C 2/20

U.S. Cl. 60—226.1

9 Claims



1. A composite structure comprising:  
(a) a tubular substrate, and

(b) a plurality of stiffeners adhered to said substrate, wherein each of said stiffeners is a serpentine stiffener which longitudinally merges toward, joins with and then diverges from an adjacent stiffener, wherein each of said serpentine stiffeners comprises a plurality of reinforcing fibers extending longitudinally within said serpentine stiffener.

9. An aircraft engine comprising:

(a) a bypass duct comprising:

(i) a tubular substrate,

(ii) a plurality of fiber reinforced serpentine stiffeners attached to said substrate, wherein each serpentine stiffener longitudinally merges toward, joins with and then diverges from an adjacent stiffener, said serpentine stiffener comprises a plurality of reinforcing fibers extending longitudinally within said serpentine stiffener, wherein each serpentine stiffener comprises a plurality of reinforcing fibers extending longitudinally within said serpentine stiffener.

5,771,681  
AIRCRAFT TURBOFAN ENGINE MIXING APPARATUS  
Peter K. C. Rudolph, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 17, 1996, Ser. No. 710,425

Int. Cl.<sup>6</sup> F02K 3/10

U.S. Cl. 60—262

23 Claims

1. A mixing apparatus for mixing primary exhaust of an engine generator with secondary airflow at a mixing plane in an aircraft turbofan engine, the mixing plane including a cross-sectional primary exhaust area and a cross-sectional secondary airflow area, the mixing apparatus comprising:

(a) a plurality of segments connected to the gas generator of which at least a portion of the plurality of segments are movable segments, each movable segment having an inboard position for increasing the ratio of secondary airflow area to primary exhaust area, each movable segment having an outboard position for decreasing the ratio of secondary airflow area to primary exhaust area;

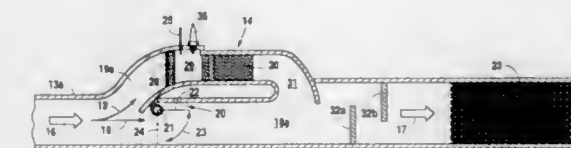
5,771,683  
ACTIVE POROUS MEDIUM AFTERTREATMENT  
CONTROL SYSTEM  
Cynthia Chaffin Webb, San Antonio, Tex., assignor to Southwest Research Institute, San Antonio, Tex.

Filed Aug. 30, 1995, Ser. No. 521,310

Int. Cl.<sup>6</sup> F01N 3/20

U.S. Cl. 60—274

14 Claims



1. A system for controlling undesirable emissions in gases exhausted from the exhaust port of an internal combustion engine during cold start-up of the engine, comprising:

(a) an exhaust gas treatment member interposed between the exhaust port of said engine and the environment external of said engine and adapted to treat unburned hydrocarbons in the exhaust gases emitted by said internal combustion engine, said treatment member being heated by the exhaust gases passing therethrough when said engine is hot;

(b) a chamber defined by wall surfaces interconnected with said exhaust gas treatment member at a position between the exhaust port of said engine and said exhaust gas treatment member and having a fueled burner disposed therein, said fueled burner being adapted to provide a flame coincidently with start-up of said engine; and

(c) a porous ceramic foam member defining at least one of said wall surfaces of said chamber and interposed between the fueled burner disposed within said chamber and said exhaust gas treatment member, said porous ceramic foam member simultaneously providing confinement of the flame within said chamber and passage of gases heated by the flame in said chamber to said exhaust gas treatment member.

5,771,682  
THERMAL REACTOR

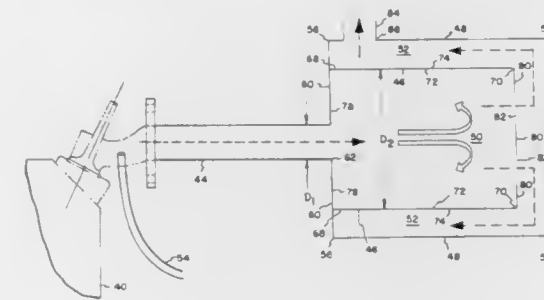
Gary Richard Simons, New Brighton, Minn., assignor to Onan Corporation, Minneapolis, Minn.

Filed Jul. 28, 1995, Ser. No. 508,981

Int. Cl.<sup>6</sup> F01N 3/18

U.S. Cl. 60—274

14 Claims



1. A thermal reactor used with a small utility engine comprising: an outer housing having an inlet opening for receiving exhaust gas from the engine, and an outlet opening for allowing the exhaust gas to exit the thermal reactor;

an inner core mounted within the outer housing and defining an expansion chamber for receiving the exhaust gas through the inlet opening, wherein the exhaust gas expands as it enters the expansion chamber, and at least some of the exhaust gas is oxidized within the expansion chamber; and

wherein the outer housing and the inner core together define only one recirculation chamber located thereinbetween for receiving the exhaust gas from the expansion chamber, recirculating the exhaust gas around the inner core, and directing the exhaust gas toward the outlet opening.

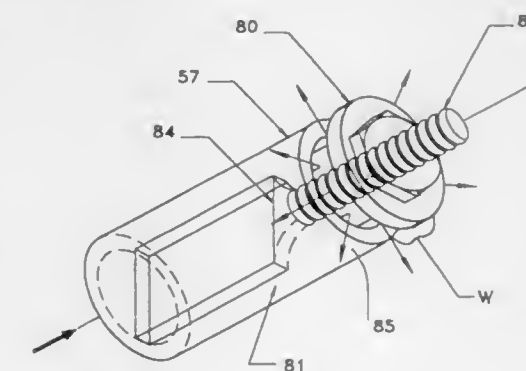
5,771,684  
GAS TREATMENT SYSTEMS  
William Hertl, Corning; Donald L. Guile, Horseheads; Malanagouda D. Patil, Corning, and Jimmie L. Williams, Painted Post, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Continuation-in-part of Ser. No. 484,617, Jun. 8, 1995, which is a continuation-in-part of Ser. No. 284,360, Aug. 2, 1994, abandoned. This application Dec. 20, 1995, Ser. No. 575,426

Int. Cl.<sup>6</sup> F01N 3/20

U.S. Cl. 60—274

24 Claims



1. Fluidic apparatus for diverting a substrate gas stream from a first flow path to a second flow path of higher flow resistance through an enclosure for both flow paths which comprises:

a diverter body within the enclosure disposed on the first flow path;

a molecular sieve structure disposed on the second flow path;



a conduit connected to a source of diversion fluid and having an outlet within the enclosure for directing the diversion fluid toward the diverter body;  
the outlet being positioned sufficiently close to the diverter body to permit the body to deflect and impart to the diversion fluid an increased flow component transverse to the direction of flow of the substrate gas stream along the first path, the diversion fluid thus deflected being effective to direct at least a portion of the substrate gas stream, impinged upon by the diversion fluid, along the second flow path of higher flow resistance and through the molecular sieve structure.

5,771,685

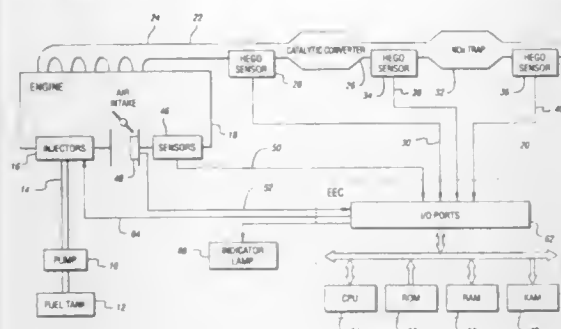
**METHOD FOR MONITORING THE PERFORMANCE OF A NO<sub>x</sub> TRAP**

Jeffrey Scott Hepburn, Dearborn, Mich., assignor to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Oct. 16, 1996, Ser. No. 733,079  
Int. Cl.<sup>6</sup> F01N 3/20

U.S. Cl. 60—274

19 Claims



1. A method of monitoring performance of a NO<sub>x</sub> trap disposed in an exhaust passage of an internal combustion engine, comprising a sequence of the following steps:

- switching the operation of said engine from a relatively lean mode of operation to a relatively rich mode of operation to purge said NO<sub>x</sub> trap;
- detecting a change in the content of the exhaust gas composition at a predetermined exhaust passage location;
- determining the amount of NO<sub>x</sub> stored onto the NO<sub>x</sub> trap during the previous lean period of operation as a function of the elapsed time between said switching step and said detecting step;
- estimating the amount of NO<sub>x</sub> produced by the engine since the last purge; and
- determining the sorption efficiency of said NO<sub>x</sub> trap by dividing the quantity of NO<sub>x</sub> stored onto the trap by the estimated quantity of NO<sub>x</sub> produced by the engine.

5,771,686

**METHOD AND APPARATUS FOR OPERATING A DIESEL ENGINE**

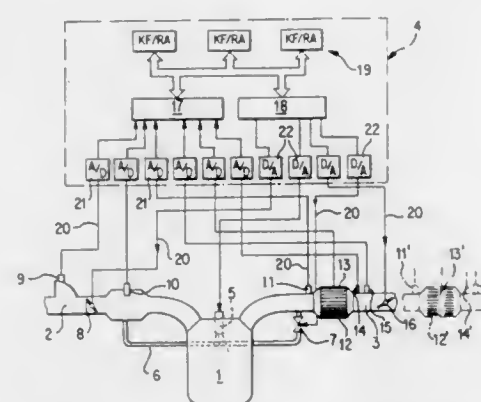
Stefan Pischinger, Waiblingen; Christof Schön, Remsbalden; Michel Weibel, Stuttgart; Bernd Krutzsch, Denkendorf; Rüdiger Pfaff, Stuttgart; and Walter Boegner, Remseck, all of Germany, assignors to Mercedes-Benz AG, Stuttgart, Germany

Filed Nov. 20, 1996, Ser. No. 752,386  
Claims priority, application Germany, Nov. 20, 1995, 195 43 219.3

Int. Cl.<sup>6</sup> F02D 41/14; F01N 3/18; 3/20  
U.S. Cl. 60—274

21 Claims

1. A method for operating a diesel engine including an intake air line and an exhaust line carrying exhaust, an exhaust feedback device communicating said exhaust line with said intake air line, said exhaust feedback device being adjustable as a function of



signals from an electronic control device, an engine regulating device controlling an air-fuel ratio of the diesel engine as a function of operating parameters of the diesel engine, a storage catalyst being provided in said exhaust line, said catalyst being capable of adsorbing, desorbing, and reducing NO<sub>x</sub>, a sensor being provided in said exhaust line downstream from said storage catalyst for detecting the NO<sub>x</sub> concentration in the exhaust, said method comprising the step of:

switching operation of the diesel engine from an operation with the air-fuel ratio greater than one to an operation with the air-fuel ratio less than one when said sensor senses a predetermined NO<sub>x</sub> threshold value, which value varies in terms of a characteristic map of said diesel engine as a function of rpm and load.

5,771,687

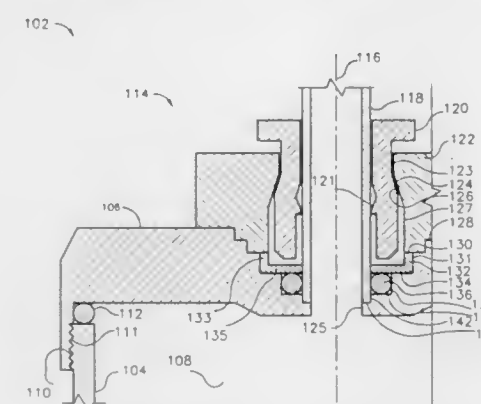
**METHOD FOR THE CALIBRATION OF A LAMBDA PROBE IN AN INTERNAL COMBUSTION ENGINE**

Ulrich Staufenberg, Diethardt, and Peter Olejnik, Bad Soden, both of Germany, assignors to VDO Adolf Schindling AG, Frankfurt, Germany

Filed Dec. 5, 1996, Ser. No. 762,121  
Claims priority, application Germany, Dec. 7, 1995, 195 45 706.4

Int. Cl.<sup>6</sup> F01N 9/00; F02D 41/14  
U.S. Cl. 60—274

4 Claims



1. A method for the calibration of a lambda probe in an internal combustion engine in which the lambda probe serves for regulating a fuel/air mixture of the internal combustion engine and is arranged at least one of in front of, behind, and in front of and behind, a catalytic converter, the lambda probe giving off signal values during a measurement period, as a function of exhaust gas produced by the engine from the fuel-air mixture, the method comprising the steps of:

supplying an overly rich fuel-air mixture to the engine, the catalytic converter responding for a certain amount of time to the overly rich fuel-air mixture;

producing signal measurement values by the lambda probe;

measuring the probe signal values independently of other control signals;  
processing a signal from the probe;  
introducing a correction value to the probe signal based on the probe signal measurement value; and  
adding the correction value to the probe signal in a controlled condition of operation of the internal combustion engine.

5,771,688

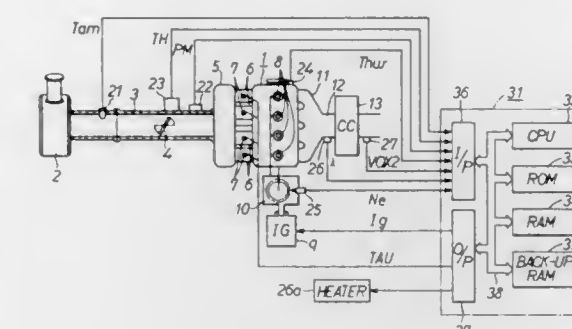
**AIR-FUEL RATIO CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES**

Jun Hasegawa, and Hisashi Iida, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 8, 1996, Ser. No. 694,176  
Claims priority, application Japan, Aug. 29, 1995, 7-220608; May 31, 1996, 8-139076

Int. Cl.<sup>6</sup> F02D 41/14; F01N 3/20  
U.S. Cl. 60—276

11 Claims



1. An air-fuel ratio control apparatus for internal combustion engines, comprising:

- state-of-load determining means for detecting a state of load of an internal combustion engine equipped with a catalyst on its exhaust gas passageway; and
  - air-fuel ratio control means for controlling an air-fuel ratio of an air-fuel mixture to be supplied to the internal combustion engine; wherein
- the air-fuel ratio control means includes "rich" side target air-fuel ratio setting means for, when the state of load of the internal combustion engine is in a state of high load, setting a target air-fuel ratio to a "rich" side in correspondence with a level of load of the internal combustion engine and air-fuel ratio feedback means for performing feedback control so that an air-fuel ratio at an upstream side of the catalyst may become the target air-fuel ratio.

5,771,689

**PIPE EVAPORATOR FOR FEEDING ADDITIONAL FUEL INTO THE EXHAUST GAS**

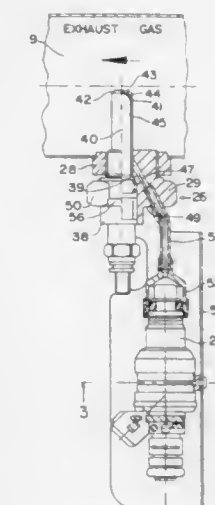
Marc Bareis, Markgoeningen; Horst Harndorf, Schwieberdingen, and Thomas Theml, Eberdingen-Hochdorf, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 21, 1996, Ser. No. 752,949  
Claims priority, application Germany, Jun. 26, 1996, 196 25 447.7

Int. Cl.<sup>6</sup> F01N 3/20; 3/36; B01D 53/94  
U.S. Cl. 60—286

20 Claims

1. A device for re-treating exhaust gases of an internal combustion engine with a reducing catalytic converter (11) which serves to reduce NO<sub>x</sub> ingredients in the exhaust gases, in which an exhaust pipe (9) leads to the catalytic converter, an electrically controlled valve (23) is provided as a device for metering a reducing agent to be introduced into the stream of exhaust gas supplied to the catalytic converter (11), an evaporator device (26) is provided to



evaporate the metered reducing agent before being introduced into the exhaust gas, the evaporator device (26) has a hollow body (41) which protrudes through a wall of the exhaust pipe (9) into the exhaust stream and communicates with the exhaust stream through at least one flow opening (43), a heating body (40) protrudes into an interior (44) of the hollow body, the heating body is spaced slightly apart from the inner wall of the hollow body, by which a reducing agent introduced into the remaining interior by the heating body is heated to a temperature of evaporation, and the hollow body (41) is a metal sheath, which for communication of its interior with the exhaust stream has a flow opening (43) on a face end.

5,771,690

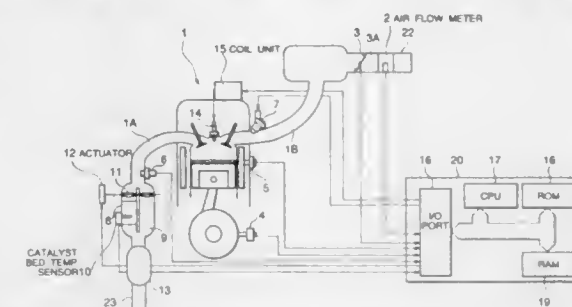
**ENGINE EXHAUST PURIFIER**

Shigeaki Kakizaki; Kenichi Sato, both of Yokohama; Koji Ishihara, Yokosuka, and Mikio Matsumoto, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Jan. 16, 1997, Ser. No. 783,905  
Claims priority, application Japan, Jan. 22, 1996, 8-008563  
Int. Cl.<sup>6</sup> F01N 3/28

U.S. Cl. 60—288

11 Claims



1. An exhaust purifier for an engine comprising:  
an exhaust passage connected to said engine for expelling exhaust of the engine.

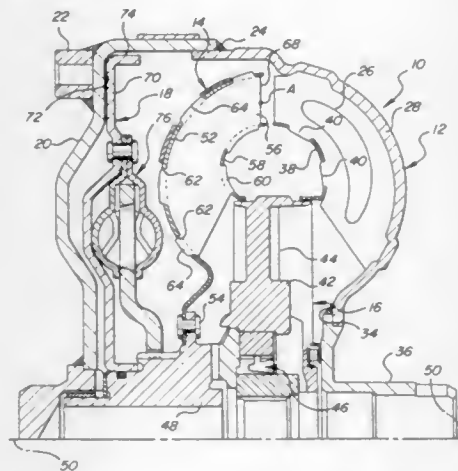
- an upstream catalytic converter disposed in said exhaust passage,
- a downstream catalytic converter disposed downstream of said upstream catalytic converter in said exhaust passage,
- a by-pass passage for by-passing the upstream converter, means for selectively connecting a flow of exhaust to said converter and said by-pass passage,
- means for detecting a running state of said engine,
- means for detecting a catalyst temperature of said upstream catalytic converter,
- first means for controlling said selecting means such that exhaust is routed to said by-pass passage when said catalyst temperature exceeds a threshold value A,

means for storing said catalyst temperature when exhaust is routed to said by-pass passage and said engine is in a steady running state as a convergence temperature according to the running state of said engine, and second means for controlling said selecting means such that exhaust is routed to said upstream converter when exhaust has been routed to said by-pass passage, and both said catalyst temperature and said convergence temperature corresponding to the running state at that time are less than a threshold value B which is less than the threshold value A.

5,771,691  
**TORQUE CONVERTER HAVING SPATIALLY ORIENTED FLAT TURBINE BLADES**  
Malcolm E. Kirkwood, Livonia, and Michael E. Fingerman, West Bloomfield, both of Mich., assignors to Borg-Warner Automotive, Inc., Sterling Heights, Mich.  
Filed Oct. 23, 1996, Ser. No. 735,778  
Int. Cl.<sup>6</sup> F16D 33/00

U.S. Cl. 60—345

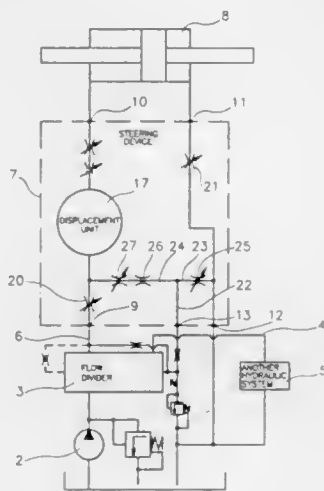
17 Claims



1. A torque converter for translating kinetic energy between a prime mover and a transmission, said torque converter comprising: a turbine assembly rotatable about an axis and including a shell, a core and a plurality of turbine blades mounted therebetween; each of said plurality of turbine blades having flat working surfaces such that each of said turbine blades defines a single plane and such that each of said turbine blades is positioned spatially so as to define an angle Alpha of between  $-5^\circ$  and  $65^\circ$  relative to the axis of rotation of said turbine assembly and wherein each of said turbine blades has a leading edge including a point A which is disposed a predetermined distance X1 from a plane containing said axis of rotation of said turbine assembly between  $-30$  mm and  $30$  mm.

5,771,692  
**HYDRAULIC STEERING UNIT WITH LOAD SIGNAL**  
Erhard Bergmann, Kiekut 12, 19079 Mirow; Manfred Schildmann, Gesew.-Scholl-Strasse 30, 19370 Parchim, and Gerhard Voss, Karl-Liebknecht-Strasse 9, 19370 Parchim, all of Germany  
PCT No. PCT/DE95/00393, § 371 Date Sep. 27, 1996, § 102(e) Date Sep. 27, 1996, PCT Pub. No. WO95/26292, PCT Pub. Date Oct. 5, 1995  
PCT Filed Mar. 23, 1995, Ser. No. 718,488  
Claims priority, application Germany, Mar. 28, 1994, 44 10 693.9

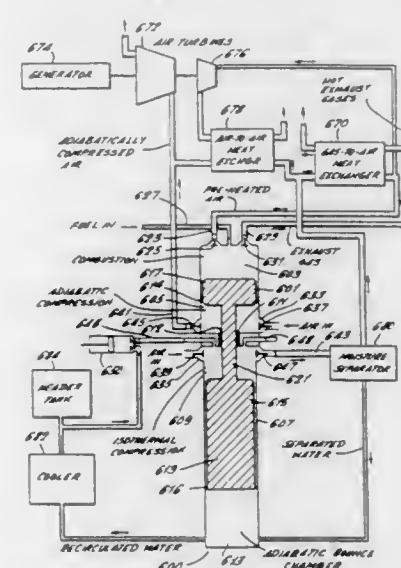
Int. Cl.<sup>6</sup> F16D 31/02  
U.S. Cl. 60—384  
1. A hydraulic steering device with a load signal, comprising a control unit with an internal control piston and an outer control



sleeve, which are both furnished with radial and axial channels for communicating said radial and axial channels with each other and for communicating said radial and axial channels with a displacement unit; wherein said channels form a main line connected between an input connector and said displacement unit, with an adjustable input throttle disposed in the main line; and said channels form a first auxiliary branch line connected between said main line, downstream of said adjustable input throttle, and a return connector; wherein a second auxiliary branch line is connected between said main line, upstream of said adjustable input throttle, and a load-signal connector; said second auxiliary branch line being a part of a current flow path, which is joined to said first auxiliary branch line, subdividing said first auxiliary branch line into a first path and into a second path; and wherein a first adjustable load-signal throttle is disposed in said first path and a second adjustable load-signal throttle and a third throttle are disposed, in series, in said second path; wherein said adjustable input throttle is opened as said first adjustable load-signal throttle is closed.

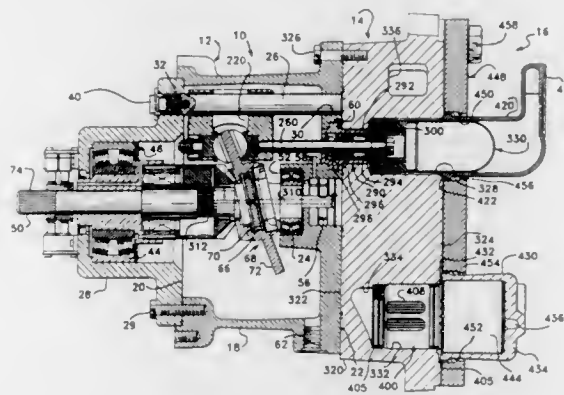
5,771,693  
**GAS COMPRESSOR**  
Michael Coney, Swindon, United Kingdom, assignor to National Power PLC, Wiltshire, United Kingdom  
PCT No. PCT/GB93/01137, § 371 Date Nov. 29, 1994, § 102(e) Date Nov. 29, 1994, PCT Pub. No. WO93/24754, PCT Pub. Date Dec. 12, 1993  
PCT Filed May 28, 1993, Ser. No. 343,499  
Claims priority, application United Kingdom, May 29, 1992, 9211405.7; Jun. 29, 1992, 9213775.1; Jul. 20, 1992, 9215404.6; Mar. 10, 1993, 9304853.6  
Int. Cl.<sup>6</sup> F16D 31/02; F04B 9/08

U.S. Cl. 60—407  
1. A gas compressor comprising:  
a compression chamber to contain gas to be compressed;  
a first piston to compress the gas by movement of the first piston into said compression chamber;  
a sprayer to form a spray of liquid in said compression chamber to cool the gas during compression;  
a first valve to allow compressed gas to be drawn from said compression chamber;  
an expansion chamber;  
a second piston arranged to drive said first piston;  
a feeder to feed compressed gas from said compression chamber to said expansion chamber;  
a second valve to allow expanded gas to be drawn from said expansion chamber;  
a heat exchanger arranged to pre-heat the compressed gas from said compression chamber with expanded gas from said expansion chamber;



a heater to add heat to the pre-heated compressed gas from said heat exchanger for expansion in said expansion chamber;  
a turbine; and  
a feeder to feed pre-heated compressed gas from said heat exchanger directly to said turbine for expansion therein.

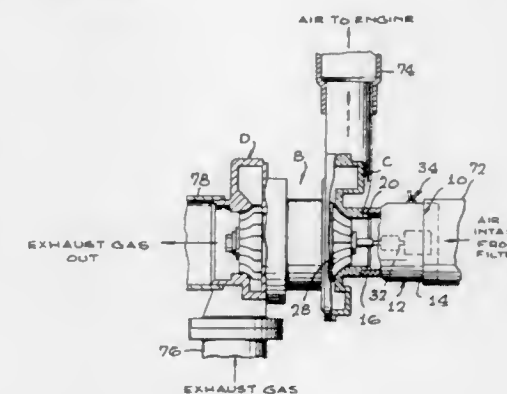
5,771,694  
**CROSSHEAD SYSTEM FOR STIRLING ENGINE**  
William H. Houtman, Ann Arbor; Christopher E. Domanski, Petersburg, and James C. Chaplin, Ann Arbor, all of Mich., assignors to Stirling Thermal Motors, Inc., Ann Arbor, Mich.  
Filed Jan. 26, 1996, Ser. No. 592,196  
Int. Cl.<sup>6</sup> F02G 1/04  
U.S. Cl. 60—517  
9 Claims



1. A Stirling engine comprising:  
a drive case assembly,  
cylinder block means for forming a plurality of cylinder bores,  
a plurality of pistons positioned within said cylinder bores and reciprocable therein,  
a drive shaft journaled for rotation about an axis of rotation within said drive case assembly,  
a swashplate within said drive case assembly coupled to said drive shaft and rotatable with said drive shaft, said swashplate having a disc in the form of a generally circular plate having opposing generally parallel surfaces, said swashplate disc being tipped with respect to said axis of rotation,  
a plurality of crossheads having means for engaging both of said swashplate surfaces, said crossheads further having a pair of parallel guide bores,

a plurality of connecting rod means for connecting said pistons to said crossheads,  
a pair of guide rods associated with each of said crossheads, said pair of guide rods mounted within said drive case assembly in a mutually parallel orientation, and said crossheads being slidable along said guide rods with said guide rods passing through said crosshead guide bores, said guide rods constraining said crossheads to reciprocate in response to reciprocation of said pistons and rotation of said swashplate about said axis of rotation, and  
guide rod mounting means for affixing said guide rods to said drive case assembly causing the outside diameter of said guide rod to expand into tight engagement with a guide rod bore of said drive case assembly.

5,771,695  
**METHOD AND APPARATUS FOR OVERCOMING TURBO LAG**  
Edward M. Halimi, 370 Ortega Ridge Rd., Montecito, Calif. 93108  
Continuation-in-part of Ser. No. 707,696, May 30, 1991, abandoned. This application Feb. 24, 1993, Ser. No. 21,966  
Int. Cl.<sup>6</sup> F02B 33/44  
U.S. Cl. 60—608  
15 Claims



1. A drive system comprising:  
a rotary compressor for delivering compressed air to the inlet of an internal combustion engine, said rotary compressor having a compressor shaft, said rotary compressor having an inlet duct;  
an exhaust gas turbine having an impeller permanently connected to said rotary compressor shaft, said exhaust gas turbine being connected to the engine for receiving exhaust gas from the engine for driving said rotary compressor;  
an electric motor in said inlet duct to said rotary compressor, said electric motor having a rotatable shaft therein, said shaft being in axial alignment with said rotary compressor shaft; and  
a one-way clutch permanently connecting said electric motor to said rotary compressor shaft, said one-way clutch being positioned so that said electric motor drives said rotary compressor at a speed above idle speed until said exhaust gas turbine drives said rotary compressor at a rotative speed higher than the rotative speed of said electric motor so that said rotary compressor always rotates at a speed at least that of the electric motor so that when the internal combustion engine produces more exhaust gas in response to a power demand, said rotary compressor is already running.



5,771,696

**INTERNAL MANIFOLD FUEL INJECTION ASSEMBLY FOR GAS TURBINE**

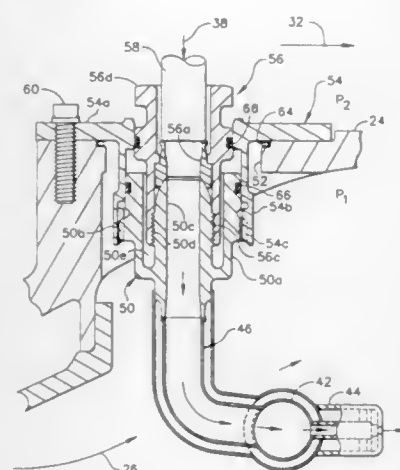
Harold R. Hansel, Mason, and George E. Cook, Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Oct. 21, 1996, Ser. No. 734,164

Int. Cl. F02C 7/22

U.S. Cl. 60—739

10 Claims



1. A gas turbine engine fuel injection assembly comprising:
- an annular combustor case;
  - an annular combustor disposed coaxially inside said combustor case, and having a dome;
  - an arcuate fuel manifold disposed inside said combustor case adjacent to said dome, and having a plurality of circumferentially spaced fuel injectors disposed in flow communication therewith for receiving fuel therefrom for injection through said dome;
  - an inlet stem having a distal end joined in flow communication with said manifold for channeling fuel thereto, and having an inner fitting at a proximal end thereof disposed at a mounting port in said combustor case;
  - a mounting adaptor fixedly joined to said combustor case at said mounting port and circumferentially engaging said inner fitting;
  - means for restraining torsional movement of said inner fitting; and
  - an outer fitting extending in said adaptor and threadably engaging said inner fitting in flow communication therewith for supplying fuel thereto.

5,771,697

**STERILIZABLE INSTALLATION FOR PROVIDING A DOSE OF A CRYOGENIC LIQUID**

Jean-Pierre Germain, Montigny, and Boris Gammal, Meudon, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procédés Georges Claude, Paris, France

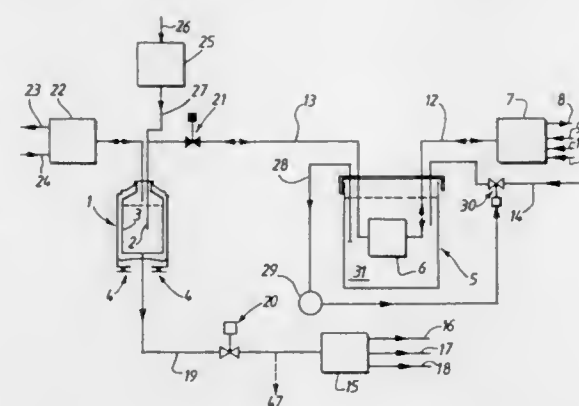
Filed Apr. 4, 1996, Ser. No. 627,550

Claims priority, application France, Aug. 24, 1995, 95 10052 Int. Cl. F17C 7/02

U.S. Cl. 62—50.1

18 Claims

1. A sterilizable installation for supplying at least one dose of a cryogenic liquid to a use station, comprising:
- a source of a first cryogenic liquid;
  - a reservoir, suitable for temporary storage of the first cryogenic liquid, comprising a plural number of parts, and a plurality of welds connecting the parts, the welds connecting the parts such that total penetration with no lap between any two of the parts is achieved, and such that the reservoir is free, at connection points between the parts, from surface irregularities



ties of the type permitting bacterial contamination, and the welds providing resistance to temperature fluctuations;

- a first conduit connecting the source of the first cryogenic liquid and the reservoir;
- means for withdrawing the first cryogenic liquid from the reservoir to supply a use station; and
- a second conduit connecting the reservoir and the withdrawing means.

5,771,698

**APPARATUS AND METHOD FOR CREATING AND RESURFACING ICE**

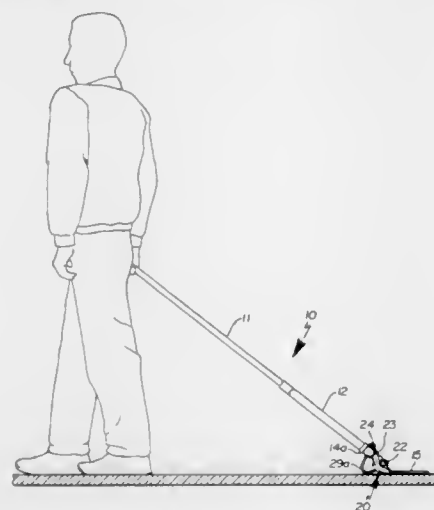
Thomas H. Abel, Hudson, Wis., assignor to Abel Ice, Inc., Hudson, Wis.

Filed Feb. 7, 1997, Ser. No. 796,203

Int. Cl. F25C 3/02

U.S. Cl. 62—66

18 Claims



1. An ice making and reconditioning tool comprising:
- (a) a frame structure including a handle and a base;
  - (b) a fluid dispensing member connected to said base, wherein said fluid dispensing member dispenses fluid on an external surface, and wherein said external surface is a base surface upon which ice is to be formed or is ice;
  - (c) a mat member connected to said base for contact with said external surface;
  - (d) means to provide fluid to said fluid dispensing member; and
  - (e) a frame support stand assembly comprising a vertical support member located and extending downwardly from an underside of said handle, said vertical support member having a wheel at a distal end thereof, said stand assembly further comprising at least two wheels attached by at least one bracket to a horizontal support member of said base, all of said wheels are being adapted for contact with said external surface.

5,771,699

**THREE COIL ELECTRIC HEAT PUMP**

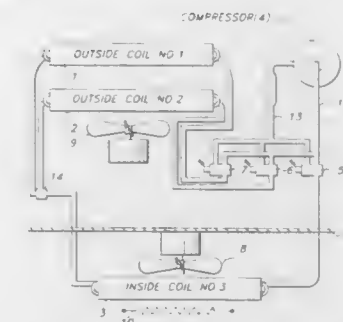
Henderson F. Ponder, P.O. Box 145, Summerville, Ga. 30747

Filed Oct. 2, 1996, Ser. No. 720,581

Int. Cl. F25B 41/00; 47/00

U.S. Cl. 62—81

4 Claims



1. A three coil electric heat pump, comprising:
- (a) a compressor;
  - (b) a first outside heat exchanger coil connected by a fluidic piping to said compressor;
  - (c) a second outside heat exchanger coil connected to said first outside heat exchanger coil and said compressor by said fluidic piping;
  - (d) an inside heat exchanger coil connected to said first outside heat exchanger coil, said second outside heat exchanger coil and said compressor by said fluidic piping,
- wherein heat will radiate from said first outside heat exchanger coil and be reabsorbed into the same refrigeration circuit within the heat pump system via said second outside heat exchanger coil when said inside heat exchanger coil functions as a condenser, and said first outside heat exchanger coil functions as an evaporator for defrosting said first outside heat exchanger coil.

5,771,700

**HEAT PUMP APPARATUS AND RELATED METHODS PROVIDING ENHANCED REFRIGERANT FLOW CONTROL**

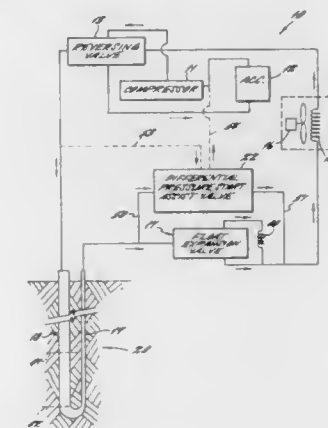
Robert W. Cochran, Lakeland, Fla., assignor to ECR Technologies, Inc., Lakeland, Fla.

Filed Nov. 6, 1995, Ser. No. 554,583

Int. Cl. F25B 5/00; F25D 23/12

U.S. Cl. 62—117

46 Claims



1. A heat pump apparatus comprising:
- a condenser, an evaporator, and a compressor for circulating refrigerant through said condenser and said evaporator;
  - expansion means connected in fluid communication between an outlet of said condenser and an inlet of said evaporator for restricting liquid refrigerant flow from said condenser to said evaporator; and

start assist valve means movable between open and closed positions for permitting liquid refrigerant to flow from the outlet of said condenser to the inlet of said evaporator during start-up of the heat pump apparatus to thereby provide a bypass for liquid refrigerant flow around said expansion means during start-up of the heat pump apparatus.

5,771,701

**OPERATING CONTROL CIRCUIT FOR A REFRIGERATOR HAVING HIGH EFFICIENCY MULTI-EVAPORATOR CYCLE (H.M. CYCLE)**

Kook Jung Suh, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

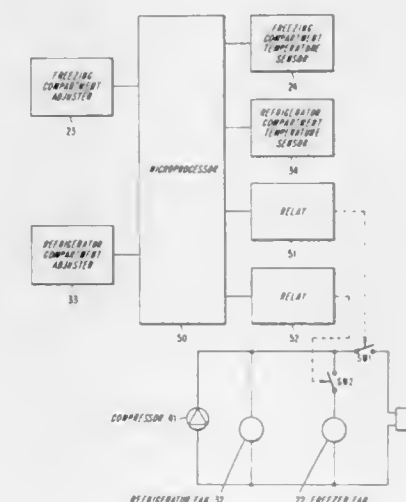
Filed Nov. 9, 1995, Ser. No. 555,811

Claims priority, application Rep. of Korea, Nov. 11, 1994, 94-29470; Nov. 11, 1994, 94-29472; May 30, 1995, 95-13929

Int. Cl. F25D 17/06

U.S. Cl. 62—179

6 Claims



1. A refrigerator comprising:
- at least first and second cooling compartments operating at different temperatures, respectively;
  - a refrigeration circuit including first and second evaporators communicating with the first and second compartments, respectively, and a compressor for compressing refrigerant supplied to the first and second evaporators;
  - a first temperature sensor for sensing a temperature of the first compartment;
  - a second temperature sensor for sensing a temperature of the second compartment;
  - first and second fans for circulating air across the first and second evaporators, respectively, the first and second fans connected in parallel relative to a power source;
  - first and second switches,
  - the first switch interconnecting the power source with the compressor, the first fan, and the second switch for supplying power thereto,
  - the second switch interconnecting the first switch with the second fan for turning on/off the second fan during operation of the compressor and first fan; and
  - a control mechanism connected to the first and second sensors and the first and second switches for automatically controlling the first and second switches in response to temperatures detected by the first and second sensors;
  - the first switch connected to the first fan and the compressor in the refrigeration circuit such that power is always supplied to the first fan whenever power is supplied to the compressor, and power is always supplied to the compressor whenever power is supplied to the first fan.

# UMI

1. A unitary air-to-air heat exchanger device comprising an air-to-air water vapor transfer element and an air-to-air sensible heat transfer element, said transfer elements being configured such that air may pass there through, said water vapor transfer element being configured for the capture and release of water vapor from and to air and said sensible heat transfer element being configured for the capture and release of sensible heat from and to air.



5,771,708

## BLOWOFF ORIFICE

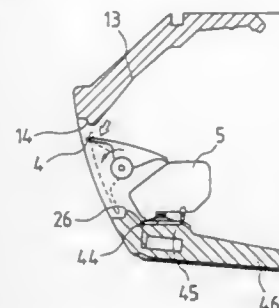
Tomoko Suzuki; Takayuki Yoshida; Satoru Kotoh; Hiroaki Ishikawa; Kazunobu Jojima; Itsutarou Akiyama; Akihiro Matsushita, and Masataka Kabuki, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 740,708, Nov. 1, 1996. This application Jun. 2, 1997, Ser. No. 867,255

Claims priority, application Japan, Nov. 20, 1995, 7-301456 Int. Cl.<sup>6</sup> F25D 21/14

U.S. Cl. 62—285

1 Claim



1. An blowoff orifice comprising:  
an upper wall;  
a lower wall; and

a vertical wind deflecting plate provided between said upper wall and said lower wall, said vertical wind deflecting plate being changeable of changing an airflow from a horizontal direction to a downward direction;

where said lower wall is formed of a drain recovery device made of synthetic resin in which a reinforcement material serving as a component attachment stand is embedded.

5,771,709

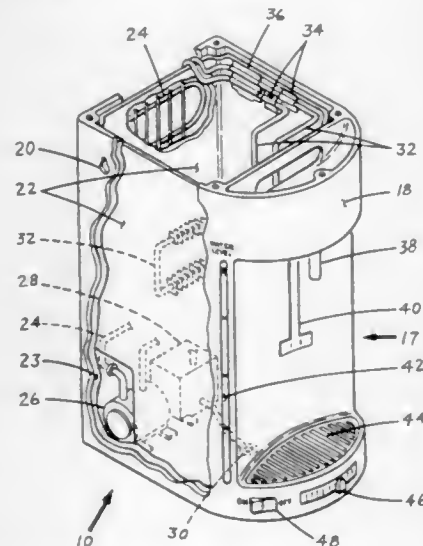
## ELECTRIC COUNTER MOUNTED BEVERAGE COOLER AND DISPENSER

Curley P. Smith, 103 N. Montford Ave., Baltimore, Md. 21224 Filed Sep. 4, 1996, Ser. No. 708,299

Int. Cl.<sup>6</sup> B67D 5/62

U.S. Cl. 62—389

7 Claims



1. A cooling and dispensing system for beverages, comprising:  
a housing means having opposing front and rear ends, and opposing upper and lower ends and two side walls disposed between the said opposing front and rear ends, and opposing upper and lower ends front, rear, upper and lower ends,

a reservoir means positioned inside of said housing means for receiving and holding a liquid supply;  
insulation means positioned between said housing means and said reservoir means for insulating said liquid supply;  
refrigeration means for cooling said liquid supply and having an evaporator means mounted inside of said reservoir means;  
pump means for circulating said liquid supply;  
dispensing means for dispensing said liquid supply; and  
liquid supply level gauge;  
a temperature control gauge;  
a drain port in said reservoir means and through said housing means for draining said system; under the counter installation holes provided in the side walls proximate to the upper and rear end, thereby enabling installation under a counter; and  
a lid disposed in a horizontal plane over the upper end of the housing and an opening formed in said lid proximate the front end of the housing, with a swivel closure disposed on said lid over said opening, pivotable from side to side in the horizontal plane of the lid, thereby providing access to said reservoir to enable filling it with liquid.

5,771,710

## THERMOSYPHON COOLED ABSORBER FOR AIR COOLED ABSORPTION CYCLES

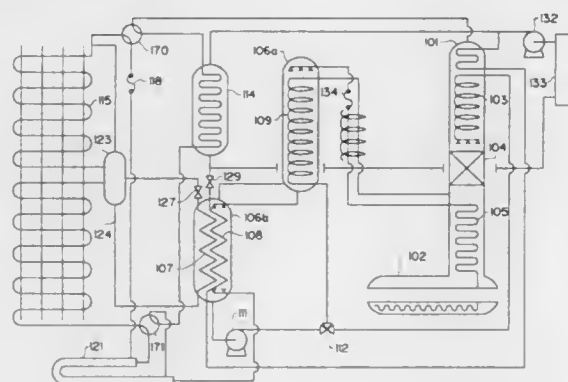
Donald C. Erickson, Annapolis, Md., assignor to Gas Research Institute, Chicago, Ill.

Continuation of Ser. No. 406,159, Mar. 17, 1995. This application Oct. 23, 1996, Ser. No. 736,028

Int. Cl.<sup>6</sup> F25B 37/00; 15/00

U.S. Cl. 62—494

23 Claims



1. A continuous cycle absorption cooling apparatus which is comprised of an externally cooled absorber; a first direct air-cooled thermosyphon comprised of a warm end which is a means for heat removal from said absorber; an absorbing solution, a pump for circulating said solution; an internally cooled absorber; and a means for transferring heat from said internally cooled absorber to said solution discharged from said pump.

5,771,711

## HIGH-TEMPERATURE REGENERATOR

Norikazu Kubota, Ohra-gun, Japan, assignor to Sanyo Electric Co., Ltd., Osaka-fu, Japan

Filed Feb. 28, 1997, Ser. No. 807,548

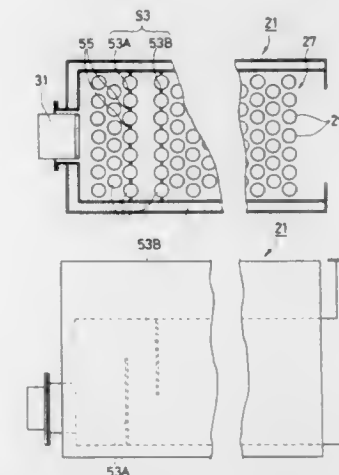
Int. Cl.<sup>6</sup> F25B 33/00; F22B 7/00

U.S. Cl. 62—497

1 Claim

1. A high-temperature regenerator for heating a working medium circulating in an absorption type refrigerator to evaporate a refrigerant absorbed in an absorption solution contained in the working medium, comprising:

a group of pipes for passing the working medium which are disposed in a combustion furnace and spaced apart from one another;



a combustion burner for causing a combustion gas to flow between the pipes of the group of pipes; and  
partition plates, provided in a high-temperature region of a combustion gas flow for increasing the residence time of combustion products, a plurality of the partition plates being arranged in a substantially horizontal direction in a zigzag form by installing some on a top portion of the combustion furnace and others on a bottom portion of the combustion furnace alternately;  
wherein the group of pipes are formed by arranging in a direction of the flame a plurality of pipe rows disposed in a direction perpendicular to the direction of the flame of the combustion burner, the plurality of partition plates are arranged in parallel to pipes, and there are no pipes between the partition plates.

5,771,712

## HYDROCARBON GAS PROCESSING

Roy E. Campbell; John D. Wilkinson, and Hank M. Hudson, all of Midland, Tex., assignors to Elcor Corporation, Dallas, Tex.

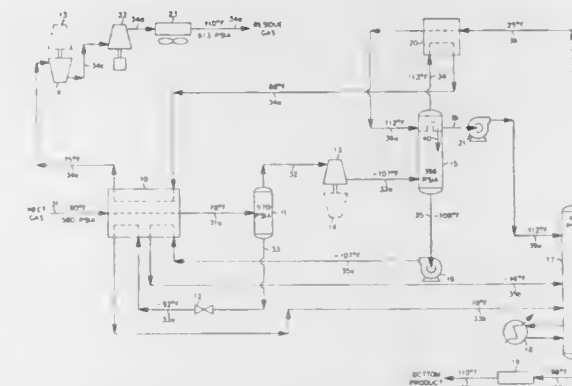
Continuation of Ser. No. 477,423, Jun. 7, 1995, abandoned.

This application Aug. 13, 1996, Ser. No. 696,114

Int. Cl.<sup>6</sup> F25J 3/02

U.S. Cl. 62—621

10 Claims



1. In a process for the separation of a gas stream containing methane, C<sub>2</sub> components, C<sub>3</sub> components and heavier hydrocarbon components into a volatile residue gas fraction containing a major portion of said methane and C<sub>2</sub> components and a relatively less volatile fraction containing a major portion of said C<sub>3</sub> components and heavier hydrocarbon components, in which process

(a) said gas stream is treated in one or more heat exchange and/or expansion steps to partially condense at least a portion thereof and provide thereby at least a first vapor stream and at least one first C<sub>3</sub>-containing liquid stream which also contains lighter hydrocarbons; and

(b) at least one of said first C<sub>3</sub>-containing liquid streams is directed into a distillation column wherein said liquid is separated into a second vapor stream containing predominantly methane and C<sub>2</sub> components and said relatively less volatile fraction containing the major portion of said C<sub>3</sub> components and heavier hydrocarbon components;

the improvement wherein

- (1) said second vapor stream is cooled sufficiently to condense at least a part of it, thereby forming a condensed stream;
- (2) a portion of said condensed stream is supplied to said distillation column at a top feed position;
- (3) at least a portion of said first vapor stream is intimately contacted with at least part of the remaining portion of said condensed stream in a contacting device having no more than one fractionation zone, thereby forming a third vapor stream and a second C<sub>3</sub>-containing liquid stream;
- (4) said second C<sub>3</sub>-containing liquid stream is supplied to said distillation column as a second feed thereto;
- (5) at least a portion of said third vapor stream is directed into heat exchange relation with said second vapor stream, thereby to supply the cooling of step (1) and thereafter discharging at least a portion of said third vapor stream as said volatile residue gas fraction;
- (6) said first C<sub>3</sub>-containing liquid stream is heated and supplied to said distillation column as a third feed thereto; and
- (7) the quantities and temperatures of said feed streams to said contacting device and said distillation column are effective to maintain the overhead temperatures of said contacting device and said distillation column at temperatures whereby the major portion of said C<sub>3</sub> components and heavier hydrocarbon components is recovered in said relatively less volatile fraction.

5,771,713

## CRYOGENIC RECTIFICATION SYSTEM FOR RECOVERY OF FLUORINE

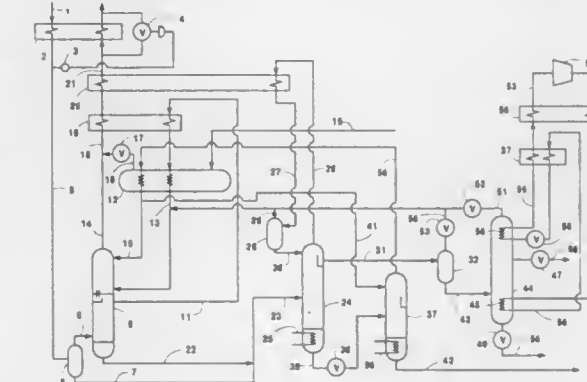
Theodore Fringelin Fisher, Amherst, N.Y., assignor to Praxair Technology, Inc., Danbury, Conn.

Filed Aug. 20, 1997, Ser. No. 914,788

Int. Cl.<sup>6</sup> F25J 1/00

U.S. Cl. 62—625

8 Claims



1. A method for recovering fluorine compounds comprising:  
(A) passing gaseous feed comprising carrier gas and high volatility fluorine compounds into a mass transfer contacting device, and passing wash liquid into the mass transfer contacting device;  
(B) passing high volatility fluorine compounds into the wash liquid within the mass transfer contacting device to produce vapor comprising carrier gas and wash liquid comprising high volatility fluorine compounds;  
(C) passing the wash liquid comprising high volatility fluorine compounds into a first rectification column as first column feed and separating the first column feed within said first rectification column by cryogenic rectification into top fluid comprising high volatility fluorine compounds and first column bottom fluid;

- (D) passing first column bottom fluid comprising low volatility fluorine compounds into a second rectification column as second column feed, separating the second column feed by cryogenic rectification into second column top fluid and into second column bottom fluid, and passing second column top fluid into the mass transfer contacting device as wash liquid;
- (E) passing top fluid comprising high volatility fluorine compounds into a third rectification column as third column feed and separating the third column feed by cryogenic rectification into third column top vapor and product high volatility fluorine compounds; and
- (F) recovering high volatility fluorine compounds from the third rectification column.

5,771,714

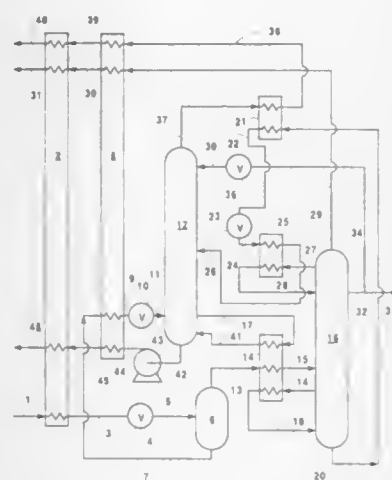
**CRYOGENIC RECTIFICATION SYSTEM FOR PRODUCING HIGHER PURITY HELIUM**

Rae Lynn Emley, Buffalo, and James Joseph Maloney, Amherst, both of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Aug. 1, 1997, Ser. No. 904,591  
Int. Cl.<sup>6</sup> F25J 1/00

U.S. Cl. 62—639

7 Claims



1. A method for producing higher purity helium by cryogenic rectification comprising:

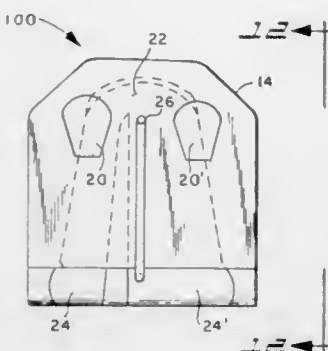
- (A) processing a feed comprising helium, nitrogen and hydrocarbons to produce a first fluid enriched in hydrocarbons, and a second fluid enriched in helium;
- (B) passing the first fluid into a lower pressure column and passing the second fluid into a higher pressure column;
- (C) separating the second fluid within the higher pressure column by cryogenic rectification to produce a helium-rich fluid, a nitrogen-rich fluid and a hydrocarbons-rich fluid;
- (D) passing nitrogen-rich fluid and hydrocarbons-rich fluid from the higher pressure column into the lower pressure column; and
- (E) recovering helium-rich fluid from the higher pressure column as product higher purity helium.

5,771,715  
**CONVERTIBLE EAR ORNAMENT**  
Joseph Soukenik, 5296 ColdBrook Dr., Mantua, Ohio 44235; Thomas Quirk, 726 Village Club Dr., Sagamore Hills, Ohio 44067, and Christopher Mielczarek, 493 Peacock La., Rockcreek, Ohio 44084

Continuation of Ser. No. 601,090, Feb. 14, 1996, abandoned.  
This application Apr. 14, 1997, Ser. No. 837,087  
Int. Cl.<sup>6</sup> A44C 7/00

U.S. Cl. 63—14.1

6 Claims



1. A convertible ear ornament, said ornament comprising an ornamental member having an accessible open-sided pocket having an entryway thereto, a bracket member having a pair of resilient spaced-apart legs operative to be received through the entryway into the pocket upon being squeezed towards each other and to thence expand away from each other upon their release to releasably secure the bracket member to the ornamental member with an end portion thereof exposed outside of the pocket, and attachment means secured to the bracket member and extending through the open side of the pocket for attaching the bracket member to an ear portion.

5,771,716

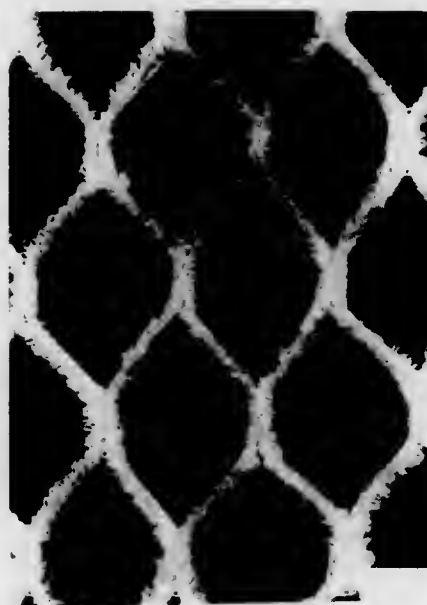
**WARP-KNITTED LOOP NET FABRIC**

Edward Schlüssel, 333 Longwood Crossing, Lawrence, N.Y. 11559

Filed Sep. 18, 1995, Ser. No. 529,424  
Int. Cl.<sup>6</sup> D04B 21/14; 21/10

U.S. Cl. 66—195

7 Claims



1. A warp-knitted loop net fabric comprising a first group of threads forming warp chains of stitches knitted by a front bar, a second group of threads guided by a second bar and forming

lay-ins between overlaps and underlaps of the first group of threads in every course of the warp chains, the underlaps of the warp chains of the first group of threads being loops formed by tensioning the threads of the second group, and a knitted net forming a groundwork incorporating the warp chains and lay-ins.

5,771,717

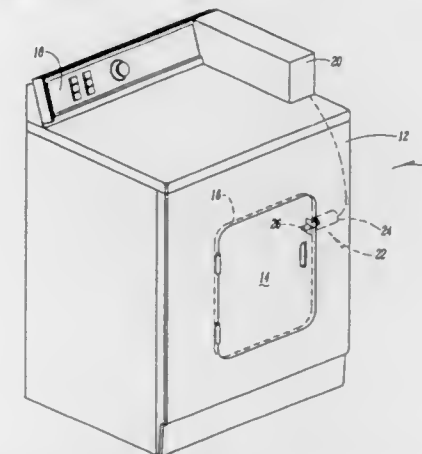
**SECURITY LOCK AND METHOD FOR LOCKING A LAUNDRY APPLIANCE**

John F. Broker; Joel L. Herr; John E. Thomas, all of Newton, and Evan R. Vande Haar, Pella, all of Iowa, assignors to Maytag Corporation, Newton, Iowa

Filed Oct. 7, 1996, Ser. No. 717,082  
Int. Cl.<sup>6</sup> D06F 39/14

U.S. Cl. 68—12.26

20 Claims



1. A laundry appliance comprising:  
a machine for washing or drying articles placed within a laundry receiving space,  
a lock operable between engaged and disengaged states respectively to prevent and permit access to the laundry receiving space,  
a control for recognizing inputs identifying a particular user of the appliance,  
the control being capable of selectively engaging and disengaging the lock upon recognition of the input.

5,771,718

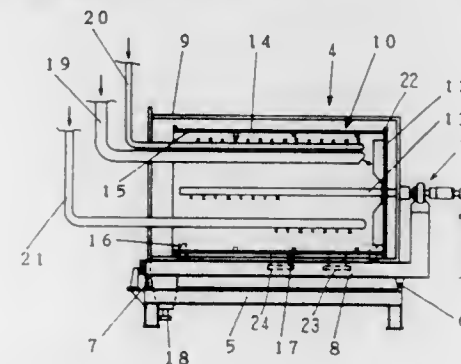
**CONCENTRATED WASHING MACHINE**

Tetsuo Ide, and Takefumi Ide, both of Fuji, Japan, assignors to Kabushiki Kaisha Taizen, Shizuoka, Japan

Filed Mar. 12, 1996, Ser. No. 614,046  
Claims priority, application Japan, May 14, 1995, 7-139999  
Int. Cl.<sup>6</sup> D06B 5/04

U.S. Cl. 68—142

3 Claims



1. A concentrated washing machine comprising:  
a case body,

a generally horizontally disposed rotatable cylindrical drum made of punched metal enclosed by said case body, said drum being open at one end and having a closure at its other end defined by a plurality of radially spaced ribs,  
a wire mesh lining the inner surface of said drum and said closure at said other end thereof,  
a plurality of vanes mounted on said drum closure,  
a plurality of fluid-conducting pipes extending from the exterior of said drum into the interior thereof, said pipes including:  
a wire mesh cleaning nozzle operative to spray cleaning fluid onto said wire mesh lining the inner surface of said drum and the closure thereof,  
a paper stock charge pipe having openings operative to spray paper stock onto said vanes;  
a pipe having a plurality of openings operative to spray cleaning water onto said vanes, said pipe being disposed in proximity to a discharge outlet of said paper stock charge pipe, and  
a replenishment wetting water pipe.

5,771,719

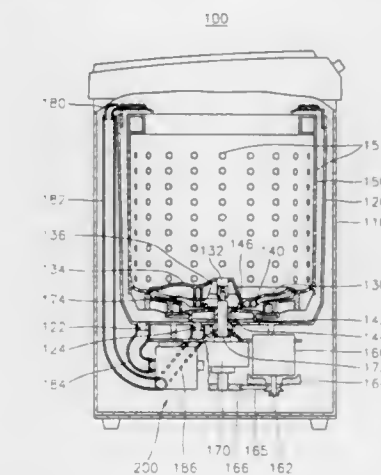
**WASHING MACHINE HAVING A CENTRIFUGAL PUMP**

Sung-Dai Moon, Kyeongsangbuk-do, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

Filed Sep. 19, 1996, Ser. No. 715,759  
Int. Cl.<sup>6</sup> D06F 17/12; 39/02

U.S. Cl. 68—183

22 Claims



1. A washing machine comprising:  
a cabinet;  
an outer tub for receiving a washing liquid, the outer tub being disposed in the cabinet;  
a spin tub having a plurality of discharging pores at a side wall, the spin tub being accommodated in the outer tub;  
a pulsator for generating a swirl-shaped liquid flow in the spin tub, the pulsator being mounted on a bottom wall of the spin tub;  
a motor for generating a rotational force;  
a first means for rotating the spin tub;  
a second means for rotating the pulsator; and  
a third means for circulating the washing liquid into a spraying nozzle mounted on an upper portion of the outer tub and for generating an air bubble in the washing liquid, the third means supplying the washing liquid having the air bubble into the outer tub.



**5,771,720**  
**Z-BAR SECURITY SYSTEM WITH KEY AND SECURED LATCH**

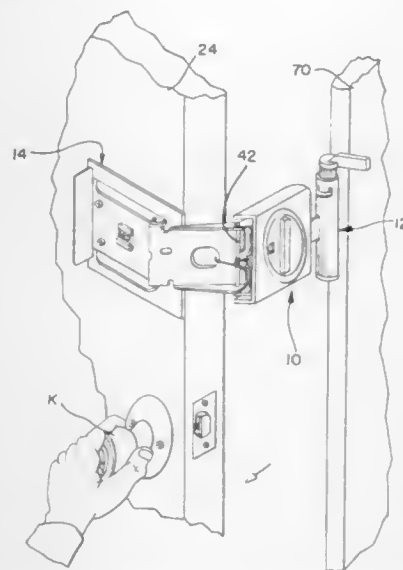
Alvin S. Levenson, Baltimore, Md., assignor to The Brooke - Duveen Group, Ltd., Baltimore, Md.

Filed Mar. 26, 1996, Ser. No. 622,006

Int. Cl.<sup>6</sup> E05C 17/32

U.S. Cl. 70—93

28 Claims U.S. Cl. 70—209



1. A system to secure a latch member of a Z-Bar door latch system to a latch plate, wherein the Z-Bar door latch system provides (1) entry, (2) inspection, and (3) dead bolt modes of operation, the system to secure the latch member comprising:

- a latch plate for mounting on a door frame;
- a Z-Bar latch assembly for mounting onto an interior side of a door, the Z-Bar latch assembly including (1) a base plate for securing to an edge of said door, (2) an intermediate link pivotally connected to said base plate, and (3) a mode selection and latching assembly pivotally mounted to said intermediate link, said Z-Bar latch assembly further comprising a latch member;
- said latch plate comprising a tube having a tube opening for receiving said latch member;
- a sleeve having an opening, said sleeve being rotatably positioned inside of said tube of said latch plate;
- a handle affixed to one end of said sleeve for rotating said sleeve to engage said latch member inside said sleeve in a secure position;
- said latch plate further comprising a locking device which releasably locks said sleeve into said secure position, said locking device comprising a locking detent, a locking member, and a spring, said spring releasably holding said detent into engagement with said locking member in said secure position until said spring is compressed; and
- a latch assembly control mechanism to selectively lock and unlock said latch assembly from an exterior side of the door, said mechanism comprising a key-operated cylinder for mounting on said exterior of the door, a shaft connected at one end to said key-operated cylinder and a freely rotatable adapter connected to an opposite end of the shaft, wherein rotation of the handle in a first direction engages the sleeve in the secure position with the spring in the locking device urging the locking detent into engagement with the locking member such that the sleeve is prevented from rotating and movement of the latch member is prevented even with use of the key, and wherein rotation of the handle in an opposite second direction against the urging of the spring releases the engagement of the locking detent from the locking member such that the sleeve rotates and the key controls movement of the latch member such that the latch member may be disengaged from the sleeve.

**5,771,721**  
**VEHICULAR ANTI-THEFT DEVICE**

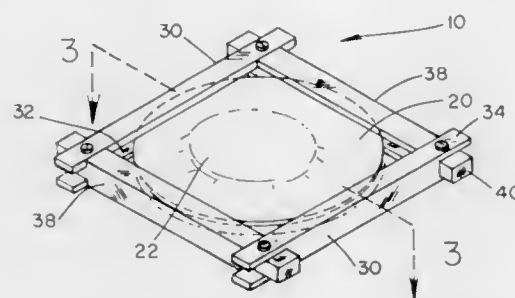
William F. Covone, 133 Elm St. Apt. BMST, West Haven, Conn. 06516

Filed Aug. 28, 1997, Ser. No. 922,136

Int. Cl.<sup>6</sup> B60R 25/02

U.S. Cl. 70—209

5 Claims



1. A vehicle theft prevention device comprising, in combination: a steering wheel assembly including a central portion with an airbag situated therein and an annular wheel with a generally circular cross-section coupled about the central portion in coplanar relationship therewith;

a circular disk-shaped shield with a semispherical protrusion formed in a central extent of the disk and extending outwardly therefrom, a diameter of the shield greater than that of the wheel of the steering wheel assembly and a diameter of the protrusion equal to that of the central portion of the steering wheel assembly;

a wheel cover having an annular configuration and including a pair of halves with one of the halves coupled to the shield, the halves having a pair of first ends hingeably coupled and a pair of second ends releasably coupled with respect to each other for defining a toroid with an open inner periphery for being situated about the wheel of the steering wheel assembly when the second ends of the halves thereof are coupled;

a first pair of interconnection members each having a rectilinear configuration with four rectangular faces, one of the rectangular faces having a rectangular recess formed therein along a length thereof, each of the first pair of interconnection members further having ends each with a parallel pair of rectangular tabs integrally coupled thereto and extending in collinear alignment with the associated interconnection member and in coplanar relationship with a pair of opposite faces of the associated interconnection member not including that with the rectangular recess formed therein, each pair of tabs defining a slot and having a pair of coaxial apertures formed therein;

a second pair of interconnection members each having a rectilinear configuration with four rectangular faces, one of the rectangular faces having a rectangular recess formed therein along a length thereof, each of the second pair of interconnection members further having ends each with a rectilinear post integrally coupled thereto and extending in collinear alignment with the associated interconnection member with a cross-sectional area less than that of the interconnection member, each post having an aperture formed therein;

whereby said wheel cover is situated about the wheel of the steering wheel assembly and the interconnection members are situated to define a square wherein the posts of each of the second interconnection members are situated within the slots of the first interconnection members such that the apertures thereof are in alignment, wherein a periphery of the shield is situated within the recesses of each of the interconnection members and a plurality of pins are locked within the aligned apertures for precluding the removal thereof.

**5,771,722**  
**DUAL CONTROL MODE LOCK SYSTEM**

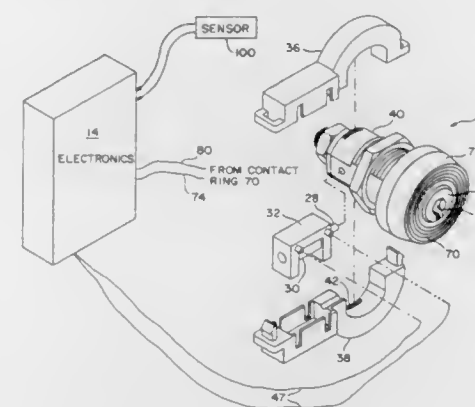
Thomas J. DiVito, and Edward F. Humphrey, both of Southington, Conn., assignors to Kaba High Security Locks Corporation, Southington, Conn.

Continuation-in-part of Ser. No. 152,220, Nov. 12, 1993, Pat. No. 5,423,198. This application Jun. 7, 1995, Ser. No. 483,277

Int. Cl.<sup>6</sup> E05B 49/00

U.S. Cl. 70—278

17 Claims



1. A lock system comprising:

lock means, said lock means including a plug which is rotatable within a cylinder, the plug and cylinder each having at least a first array of alignable first pin tumbler receiving chambers, said plug defining a keyway, the chambers of said first array in said plug and cylinder communicating with said keyway, primary pin tumbler stacks being disposed in at least some of said chambers for displacement by a blade of a key inserted in said keyway, said lock means further including at least a first movable blocking member for preventing rotation of said plug relative to said cylinder when said primary pin tumbler stacks are displaced by a properly bitted key, said blocking member being isolated from said keyway when said first pin tumbler chambers of said arrays are in alignment;

actuator means for said blocking member, said actuator means being normally deenergized and converting an applied electrical signal to motion when energized, said motion being delivered to said blocking member whereby said plug may be rotated by a properly bitted key;

control signal generator means for producing an encoded electrical lock identification signal in response to an interrogation signal, said control signal generator means producing an energizing signal for said actuator means in response to a command signal;

key means, said key means including a blade which is bitted to define a coded mechanical signal whereby insertion of said blade into said keyway will cause displacement of said primary pin tumbler stacks to enable rotation of said plug relative to said cylinder upon production of said energizing signal;

active command signal generator means for producing said interrogation signal and said command signal, said command signal generator means including data processor means and data storage means for storing lock identification information, said command signal generator means producing said command signal in response to recognition of said encoded lock identification signal by said data processor means, said command signal generator means further including timer means for enabling the production of at least one of said interrogation signal and said command signal, said timer means having an enablement time of preselected duration and being responsive to receipt and recognition of an encoded enablement signal by said command signal generator means;

static information storage means for providing said encoded enablement signal to said command signal generator means upon stimulation by a voltage source; and means for establishing signal transmission paths between said command signal generator means and both of said control signal generator means and said static information storage means.

**5,771,723**  
**KEY CYLINDER DEVICE**

Masahiko Itoh, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

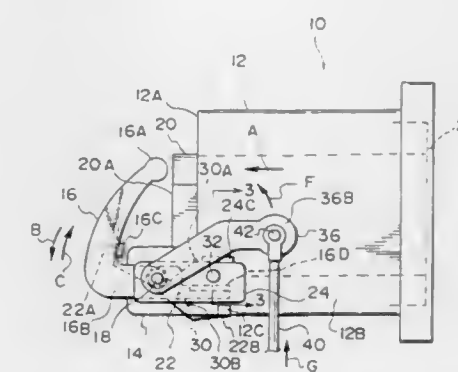
Filed Feb. 29, 1996, Ser. No. 610,062

Claims priority, application Japan, Mar. 24, 1995, 7-066433

Int. Cl.<sup>6</sup> E05B 27/00

U.S. Cl. 70—360

20 Claims



1. A key cylinder device in which a locking mechanism is lock-released by depressing a push button, comprising:

- lever means pivotally mounted on a cylinder case such that when the push button is depressed, said lever means pivots with respect to the cylinder case; and
- a link mechanism which moves in a direction in which the locking mechanism is lock-released only when the push button is depressed to cause said lever means to pivot with respect to the cylinder case, wherein said lever means and said link mechanism are not operatively interengaged prior to said lever means pivoting with respect to the cylinder case when the push button is depressed.

**5,771,724**  
**METHOD AND APPARATUS FOR AN ANTICIPATORY THICKNESS CONTROL IN FOIL ROLLING**

Hans-Georg Hartung, Pulheim, Germany, assignor to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

Filed Mar. 29, 1996, Ser. No. 625,730

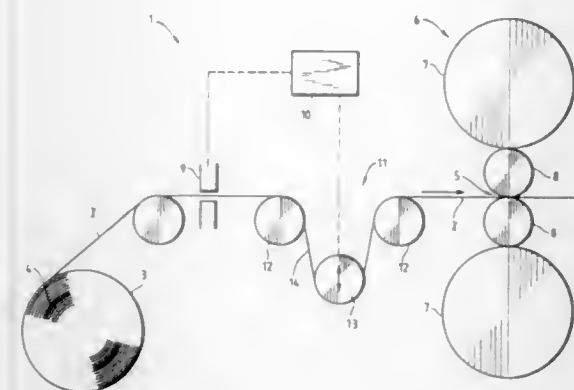
Claims priority, application Germany, Mar. 30, 1995, 195 11 801.4

Int. Cl.<sup>6</sup> B21B 37/58

U.S. Cl. 72—11.8

11 Claims

1. A method for controlling a foil thickness in foil rolling in a roll stand by utilizing characteristic lines of individual manipulated



variables for various operating points stored in a process control computer, also in combination with a monitor, the method comprising determining thickness changes of the foil on an entry side of the roll stand, and carrying out an anticipatory thickness control for compensating the thickness changes by changing a desired back tension value.

5,771,725

# METHOD OF PRODUCING A BAND BLADE, A METHOD OF BENDING A STRIP MATERIAL, AND AN APPARATUS FOR BENDING A STRIP MATERIAL

Suehiro Mizukawa, 4-25, Torikainishi 5-chome, Settsu-shi, Osaka 566, Japan

PCT No. PCT/JP95/02747, § 371 Date Aug. 13, 1996, § 102(e) Date Aug. 13, 1996, PCT Pub. No. WO96/21543, PCT Pub. Date Jul. 18, 1996

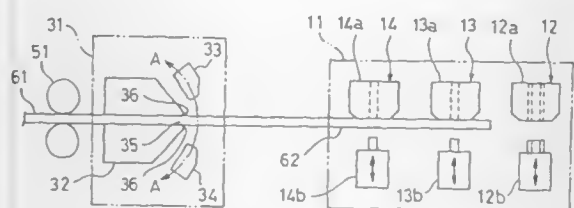
PCT Filed Dec. 27, 1995, Ser. No. 687,438

Claims priority, application Japan, Jan. 11, 1995, 7/002897

Int. Cl.<sup>6</sup> B21D 5/01

U.S. Cl. 72—17.3

12 Claims



1. A method of producing a band blade with a bending apparatus having a front consisting of an edged strip material in which notches recessed in a width direction are formed in predetermined portions in a longitudinal direction and predetermined portions are bent, comprising the steps of:

- bending a process object region of said edged strip material having the notches into a predetermined shape; and
- under a state where said bent strip material is not returned to a bending apparatus and said bent strip material is positioned in front of said bending apparatus, cutting off a not-yet-processed region which backward elongates from said bent strip material.

## 5,771,726 APPARATUS AND METHOD FOR TWISTING HOLLOW RODS

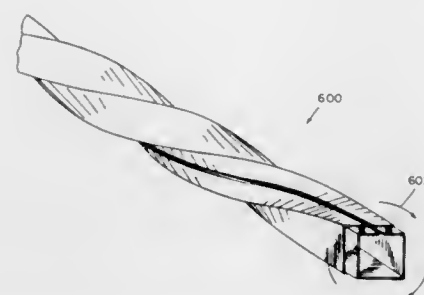
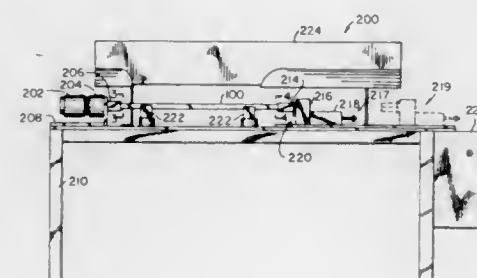
Keith M. Bibby, Mansfield, Mass.; Robert H. Hesford, Sr., North Kingstown, R.I.; John Surrette, Warwick, R.I., and Richard A. Ross, Cranston, R.I., assignors to Kenney Manufacturing Company, Warwick, R.I.

Filed Aug. 28, 1996, Ser. No. 704,845

Int. Cl.<sup>6</sup> B21D 11/14

U.S. Cl. 72—20.2

43 Claims



1. An apparatus for twisting a telescoped pair of hollow, open-seam rods, wherein the rod pair includes an outer rod and an inner rod, the rod pair being dimensioned such that the inner rod slides frictionally into and out of the outer rod, the inner rod having a length slightly greater than the outer rod, the rod pair having a longitudinal axis parallel to the length and cross-sectionally centered within the rod pair and having a first end and a second end longitudinally distal from each other, the rod pair being peripherally twisted by the apparatus about the longitudinal axis throughout substantially the entire length of the rod pair such that the inner rod can still frictionally slide into and out of the outer rod, the apparatus comprising:

- a motor;
- a gear head connected to the motor;
- a rotatable first chuck connected to the gear head for engaging the first end of the rod pair, the first chuck having a male component for engaging the inside of the first end of the rod pair;
- a substantially non-rotatable second chuck aligned with the first chuck and positioned a distance from the first chuck in accordance with the length of the rod pair, the second chuck engaging the second end of the rod pair, the second chuck having a male component for engaging the inside of the second end of the rod pair;
- and
- a linear thruster connected to the second chuck for reciprocating motion between a first position and a second position, the motion being in alignment with the first and second chucks to permit loading and unloading of the rod pair and to permit engagement of each chuck with a respective end of the rod pair.

## 5,771,727 PROCESS AND DEVICE FOR STRAIGHT-DRAWING LONG DRAWING MATERIAL IN MULTIPLE STEPS

Horst Stinnertz, Willich; Peter Kalkenings, Aachen, and Karl Heinz Häusler, Korschenbroich, all of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

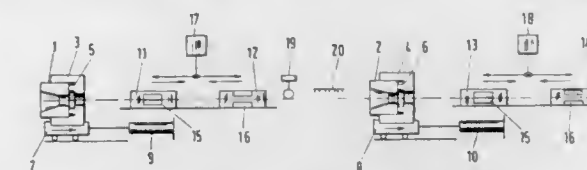
Filed Nov. 15, 1996, Ser. No. 749,819

Claims priority, application Germany, Nov. 15, 1995, 195 44 383.7

Int. Cl.<sup>6</sup> B21C 1/20

U.S. Cl. 72—21.4

5 Claims



1. A process for drawing a stretched metal workpiece for cross-sectional reduction in more than one drawing step with at least two sequential drawing aggregates, comprising the steps of: gripping an outer periphery of the workpiece in each of the aggregates with two alternately-moving clamping carriages for continuously drawing the workpiece through respective drawing rings arranged in drawing-ring holders of respective ones of the aggregates; driving the aggregates independently of one another by selectively moving and clamping the drawing-ring holders in a longitudinal direction of the workpiece in at least one of a power-regulated and moment-regulated manner for maintaining a defined prestress force that prevents deflection of the workpiece from a straight line during drawing; and permanently measuring an actual value of drawing force and comparing the actual value to a preset value stored in a computer, and, when the actual value is not equal to the set value, sending a signal to a drive of at least one of the drawing aggregates to adjust the drawing force to the preset value.

5,771,728

## SYSTEM FOR PREPARING WIRES MADE OF STEEL, IRON, OR FERROUS MATERIALS IN GENERAL FOR DRAWING

Santo Esposito, Via S. Carlo 15, 24030 Monte Marenzo, Italy

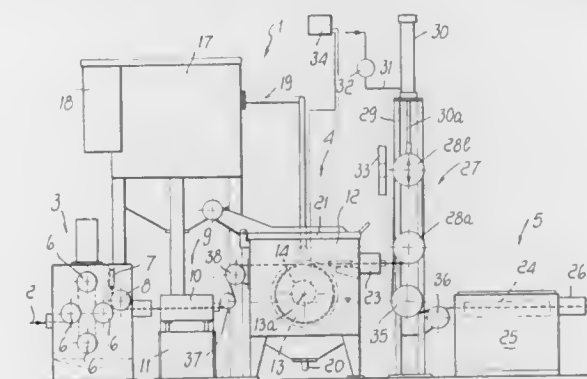
Filed Nov. 13, 1996, Ser. No. 748,264

Claims priority, application Italy, Nov. 22, 1995, MI95A2428

Int. Cl.<sup>6</sup> B21C 43/02

U.S. Cl. 72—41

23 Claims



1. A system for preparing wires made of steel, iron, or ferrous materials in general for drawing, including a phosphating station, said phosphating station comprising: a vat for containing a phosphating solution; and a drum for winding and unwinding a wire to be treated, said drum being at least partially immersed in said phosphating solution and being actuable with a rotary motion about an axis thereof, for gradually releasing the treated wire, wherein said drum has a portion on which the wire is meant to wind which is shaped like a truncated cone whose cross-section tapers gradually, starting from a region where the wire starts to be wound and toward a region where said wire is released, traction

reducing means being provided to reduce the traction applied to the wire between the region where winding on the drum begins and the region where the wire is released, to avoid packing of the wire on the drum and facilitating contact between the phosphating solution and each portion of the wire.

5,771,729

## PRECISION DEEP PEENING WITH MECHANICAL INDICATOR

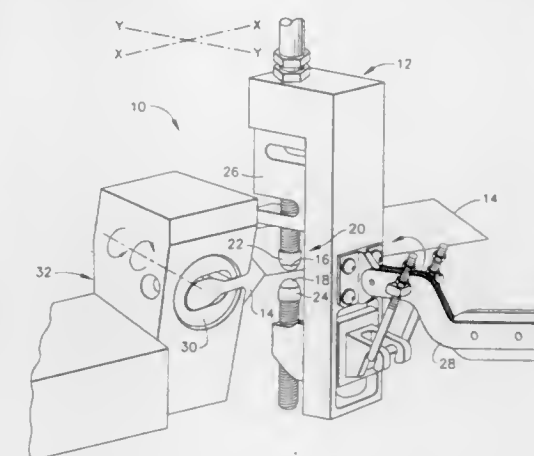
Peter G. Bailey, Hamilton, and Dewey D. Dunkman, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Jun. 30, 1997, Ser. No. 886,167

Int. Cl.<sup>6</sup> B21J 9/20

U.S. Cl. 72—53

15 Claims



1. An apparatus for producing compressive stress in a component surface comprising: positioning means to control positioning of a contact area of the component surface; at least one indenter element fixtured to contact the component surface and cause an indentation at the contact area; measurement means to measure force of the at least one indenter element as the at least one indenter element contacts the contact area; and control means to control force of the at least one indenter element at the contact area.

5,771,730

## EQUIPMENT FOR FORMING METAL PROFILES

Jean-Paul Huet, Nantes, France, assignor to GEC Alsthom ACB, Paris, France

Filed Aug. 29, 1997, Ser. No. 921,037

Claims priority, application France, Aug. 30, 1996, 96 10620 Int. Cl.<sup>6</sup> B21D 11/02

U.S. Cl. 72—58

4 Claims

1. Equipment for forming metal profiles on a stretch-bending machine on which a profile to be formed is held at its ends by jaws connected to stretching rams and to means for bending it against a convex punch member fixed to a toolholder table of the machine, said equipment comprising a die member, means for pressing it against said punch member once said profile has been bent against said punch member, an elastic material mandrel adapted to be



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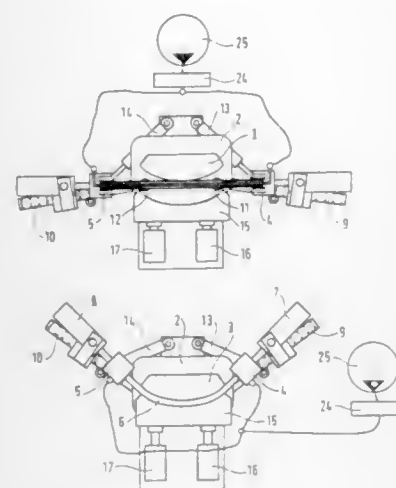
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placed inside said profile and means for compressing-expanding said mandrel so that it presses said profile against internal surfaces of said punch member and of said die member when closed one against the other.

5,771,731

#### HOT STRIP PRODUCTION PLANT FOR FERRITIC ROLLING AND METHOD OF PRODUCING FERRITIC ROLLED STRIP

Wolfgang Rohde, Dormagen, and Manfred Albedyhl, Mettmann, both of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

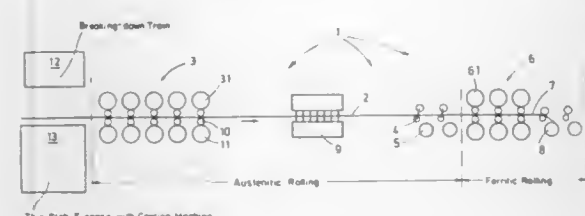
Filed Aug. 22, 1996, Ser. No. 704,005

Claims priority, application Germany, Aug. 25, 1995, 195 31 538.3

Int. Cl.<sup>6</sup> B21B 27/06; 1/00

U.S. Cl. 72—201

10 Claims



1. A production plant for hot-rolled flat products in the form of strip, the production plant comprising a rolling train including a plurality of roll stands, a run-out table including devices for cooling the strip, and subsequently arranged coiling machines for coiling the strip, further comprising a compact deformation stage arranged in a rolling direction behind the coiling machines, wherein the compact deformation stage comprises a rolling mill having at least one roll stand for rolling thin strips, and wherein the rolling trains including a plurality of roll stands is configured to carry out rolling in the austenitic temperature range and the compact deformation stage arranged following the rolling train in the rolling direction is configured to carry out rolling in the ferritic temperature range at a temperature of between 600° C. and 780° C., and wherein the devices for cooling the strip are configured to cool the strip from the austenitic temperature range to the ferritic temperature range and are arranged in an area of the run-out table between the rolling train and the compact deformation stage.

5,771,732

#### STECKEL MILL

Stephan Krämer, Hilchenbach; Dieter Rosenthal, Niedertischbach, and Peter Sudau, Hilchenbach, all of Germany, assignors to SMS Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

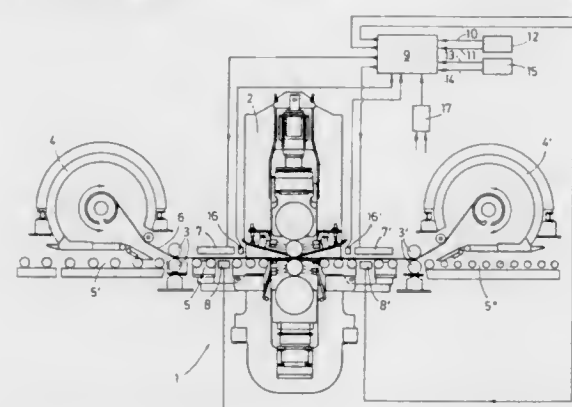
Filed Apr. 19, 1996, Ser. No. 635,065

Claims priority, application Germany, Apr. 19, 1995, 195 14 475.9

Int. Cl.<sup>6</sup> B21B 27/06; 41/06

U.S. Cl. 72—202

7 Claims



1. Steckel mill comprising at least one reversing stand having an entry side and an exit side for strip to be rolled, drivers and coiler furnaces arranged on the entry side and the exit side of the reversing stand, and a roller conveyor for the strip to be rolled for connecting the reversing stand with the drivers and the coiler furnaces, least one heating unit between the coiler furnaces and the reversing stand arrange at least one of above and below the roller conveyor, further comprising a control device configured for influencing a heating power of the at least one heating unit in dependence on a strip temperature and a strip position said dependence upon said strip position being irrespective of the direction in which the strip travels between said coiler furnaces.

5,771,733

#### COMPACT ROLLING BLOCK

Ferruccio Tomat; Attilio Sacchi; Gianni Nonino, all of Udine, and Giorgio Lavaroni, Buttrio, all of Italy, assignors to Daniele & C. Officine Meccaniche S.p.A., Buttrio, Italy

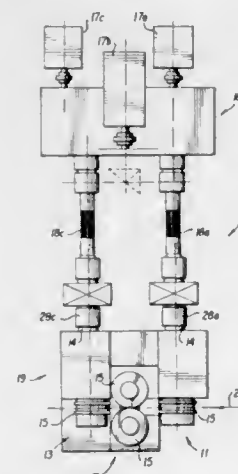
Filed Dec. 9, 1996, Ser. No. 762,815

Claims priority, application Italy, Dec. 22, 1995, UD95 A 000248

Int. Cl.<sup>6</sup> B21B 35/02

U.S. Cl. 72—235

20 Claims



1. A compact rolling block (10) comprising two end rolling mill stands having the same axis and being separated by a central stand.

5,771,735

#### SUPPORT ARM ASSEMBLY FOR PIPE BENDING MACHINES WITH AUTOMATIC PIPE POSITIONING

Alessandro Caporusso, and Marcio Caporusso, both of Frosinone, Italy, assignors to C.M.L. Costruzioni Meccaniche Liri S.r.l., Piedimonte San Germano, Italy

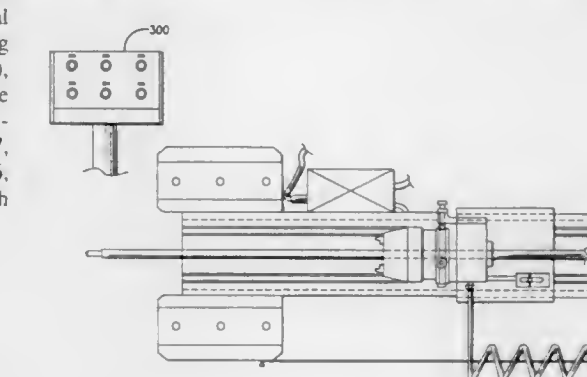
Filed Jan. 27, 1997, Ser. No. 789,530

Claims priority, application Italy, Jan. 25, 1996, RM96A0047

Int. Cl.<sup>6</sup> B21D 43/00

U.S. Cl. 72—307

2 Claims



1. A support arm assembly for a pipe bending machine, with a support arm, a mandrel (M) for positioning a pipe slideable on the support arm, and a pipe carrier gripper (16), comprising: one or more linear ledges (19) arranged along the support arm; the mandrel (M) including a piece (100) for intercepting said ledges (19) through a click (106) switched between a raised rest position and a lowered working position by the displacement of an eyelet, in which the click (106) slides and which has raising edges (105) against which the click is loaded under the actuation of a piston; and a single hydraulic or air drive or actuator contemporaneously actuating the pipe carrier gripper (16) and the switching of the click (106).

5,771,734

#### REPLACEABLE RING FOR DUMMY BLOCK

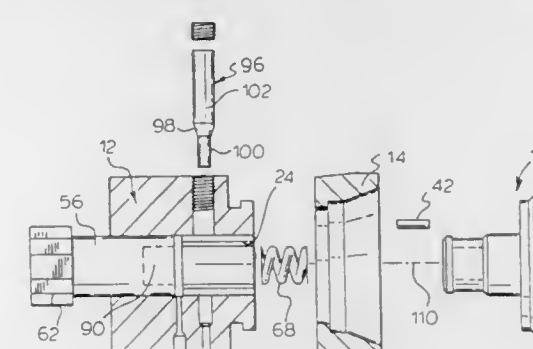
Paul H. Robbins, 5 Springmaple Chase, Aurora, Ontario L4G 6X1, Canada

Filed Jul. 18, 1996, Ser. No. 683,268

Int. Cl.<sup>6</sup> B21C 25/00

U.S. Cl. 72—273

10 Claims



1. In a dummy block construction for use in extruding an extrudable metal, said dummy block having

- i) a dummy block base;
- ii) means for connecting said dummy block base to a stem of an extruder;
- iii) a replaceable wear ring connected to a forward circumferential portion of said dummy block base;
- iv) means for releasably securing said wear ring to said dummy block base;
- v) means for expanding said ring to engage a billet container inside wall of an extrusion press during extrusion of a billet of extrudable metal through such extrusion press;

the improvement being characterized in:

- vi) said wear ring being a metal collar having a conical interior surface converging towards said dummy block base; and
- vii) said means for expanding said ring comprising a metal plunger having a plunger head with a conical surface for engaging said collar conical surface to expand said collar as said plunger head is forced into said collar during extrusion;
- viii) said plunger head having a planar face and said collar having a forward planar face;
- ix) said converging surfaces of said collar and said plunger head extending a sufficient distance to permit telescoping of said plunger head into said collar to an extent whereby said plunger head face is essentially planar with said face of said collar.

5,771,736

#### APPARATUS AND METHOD FOR THE CUTTING AND BENDING OF SHEET MATERIAL SUCH AS METAL

John G. Argiropoulos, 3857 N. Tazewell, Arlington, Va. 22207

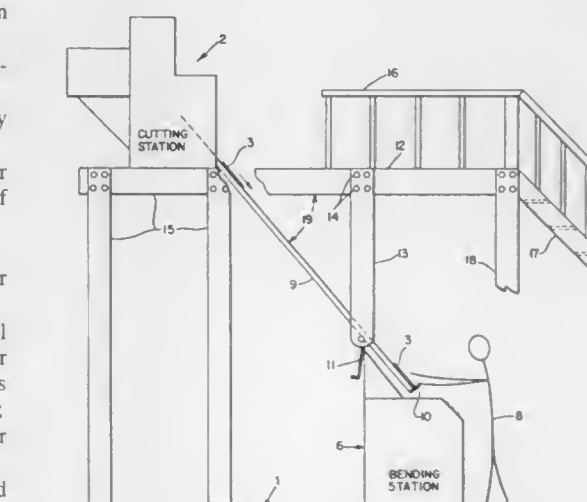
Continuation of Ser. No. 319,558, Oct. 7, 1994, abandoned.

This application May 5, 1997, Ser. No. 841,777

Int. Cl.<sup>6</sup> B21D 43/28

U.S. Cl. 72—339

8 Claims



1. A two station apparatus for the multiple processing of relatively wide, thin, flexible sheet material of such wide, thin, and

flexible nature that it will visibly, elastically bend of its own weight when supported only by its ends, to form articles of manufacture comprising:

- A first elevated station supported at a first elevated level which receives said relatively wide, thin, flexible sheet material, performs a first cutting operation thereon, and exits by the weight of said relatively wide, thin, flexible sheet material, a plurality of relatively wide, thin, flexible, and precisely cut blanks therefrom all having the same physical consecutive orientation, said relatively wide, thin, flexible, and precisely cut blanks also being of such relatively wide, thin, and flexible nature that they will visibly and elastically bend of their own weight when supported only by their widest ends;
- A second station supported at a second lower level from said first elevated level and offset laterally from said first elevated station which receives said relatively wide, thin, flexible, and precisely cut blanks all having the same physical consecutive orientation exited from said first elevated station, and performs a bending or folding operation thereon to form said articles of manufacture;
- A massive superstructure which forms and supports said elevated level at a level vertically displaced upwardly from said second lower level;
- A single inclined chute between said first elevated station and said second station which receives said relatively wide, thin, flexible, and precisely cut blanks all having the same physical consecutive orientation exited from said first elevated station, and automatically transfers them by sliding them to the input of said second station;
- Said single inclined chute being formed without any manual or mechanical intervention such as stops, momentary arresting means, or transfer tables at any point between said first elevated station and said input of said second station, and wherein said single inclined chute transfers said relatively wide, thin, flexible, and precisely cut blanks all having the same physical consecutive orientation to the input of said second station solely by gravity; and
- A single fixed upstanding flange at the input of said second station, wherein said plurality of said relatively wide, thin, flexible, and precisely cut blanks all having the same physical consecutive orientation traveling down said single inclined chute are neatly stacked against said single fixed upstanding flange at the input of said second station wherein said bending or folding operation is subsequently performed thereon in said second station to form said articles of manufacture.

5,771,737

**METHOD FOR PRODUCING A PROPELLER SHAFT**  
Toshihiko Yaegashi, Tokyo, Japan, assignor to Matsui Universal Joint, Japan

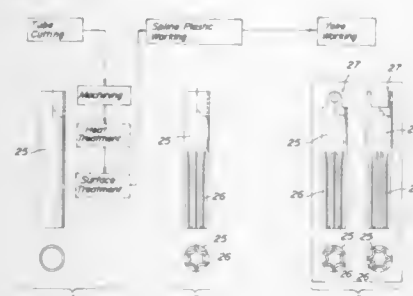
Filed Mar. 13, 1995, Ser. No. 402,657

Claims priority, application Japan, Oct. 13, 1994, 6-247823; Oct. 13, 1994, 6-247824; Nov. 15, 1994, 6-280215; Nov. 21, 1994, 6-286239

Int. Cl.<sup>6</sup> B21D 3/00; 22/00

U.S. Cl. 72—367

13 Claims



1. A method for producing a propeller shaft having male and female shafts, each having at one end a yoke and at the other end a spline sliding portion, the spline sliding portions of said male and female shafts being fitted with each other, comprising a plastic working pretreatment step for making a hollow tube for said male or female shaft into a predetermined length and pretreating it; a

spline sliding portion plastic working step for forming a spline sliding portion at said other end with a press-die and a mandrel, wherein said press-die has a forming profile which is able to form spline teeth having a larger diameter smaller than the inner diameter of said hollow tube; and a yoke providing step for providing a yoke on said one end of said hollow tube opposite to said spline sliding portion, wherein said press-die has a forming profile which is able to form spline teeth having a larger diameter smaller than the inner diameter of said hollow tube, and any one of said last mentioned two steps being carried out prior to the other.

5,771,738

**RIVET-NUT TOOL WITH A FIXING HOLE**

Yung-Chang Ko, 7th Fl.-1, No.21, Sec. 3, Minsheng E. Rd., Taipei, Taiwan

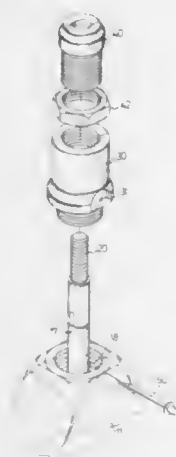
Filed Aug. 12, 1997, Ser. No. 909,701

Claims priority, application Taiwan, Dec. 26, 1996, 85220047

Int. Cl.<sup>6</sup> B21L 15/04

U.S. Cl. 72—391.8

1 Claim



1. A hand rivet-nut tool comprising a body, a pair of handles pivotally connected with the body, a block respectively and pivotally connected with each of the pair of handles via a pair of links, a drill unit securely connected with the block and extending outward therefrom, a sphere detachably connected with a distal end of the drill unit, a hollow collet case threadably connected with the body, a hollow nosepiece detachably connected with the collet case via a mating between outer threads of the nosepiece and inner threads of the collet case, a lock nut threadably connected to an outer periphery of the nosepiece and a rotary mandrel securely connected with a first end of a positioning seat and extending outward from the nosepiece; wherein the improvements are:

said rotary mandrel is freely rotatable relative to said body and a slot is defined therein; said collet case has a through hole defined therein for alignment with said slot, such that a pin is able to extend into said through hole and said slot to retain said rotary mandrel and said positioning seat in a fixed position with the body of the hand rivet-nut tool.

5,771,739

**AUTOMATIC CHAIN LOCK**

Virgil H. Hinson, 373 Choctaw Sq., Brunswick, Ga. 31525

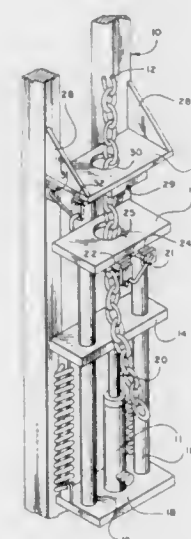
Filed Jan. 24, 1997, Ser. No. 787,314

Int. Cl.<sup>6</sup> B21D 1/12

U.S. Cl. 72—447

8 Claims

1. In a vehicle straightening apparatus including at least one pull tower, and a chain extending from said pull tower to be fixed to the vehicle to be straightened, said chain having a first group of links with a first orientation, and a second group of links with a second orientation, means for pulling said chain along said pull tower, and a chain lock for locking said chain to said means for pulling said



chain, the improvement wherein said chain lock is an automatic chain lock, said automatic chain lock comprising a first gate fixed with respect to said means for pulling said chain and a second gate fixed with respect to said pull tower, each of said gates being adapted to selectively engage a link of said chain selected from the group consisting of said first group and said second group.

5,771,740

**FORGE MACHINE**

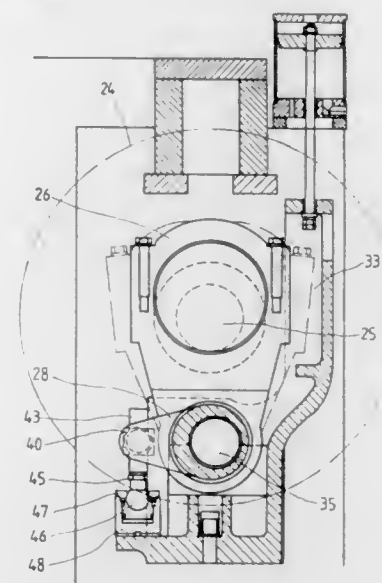
Shi-Chi Chang, 58, Ma Yuan West St., Taichung, Taiwan

Filed Jul. 10, 1997, Ser. No. 897,231

Int. Cl.<sup>6</sup> B21J 9/18

U.S. Cl. 72—452.5

4 Claims



1. A forge machine comprises:

a main body, a motor disposed on a top portion of the main body, a flywheel disposed on an upper portion of the main body and driven by the motor, an eccentric shaft driven by the flywheel, a slide block disposed on the upper portion of the main body, a middle portion of the eccentric shaft inserted in a link seat, a round hole formed on a lower end of the link seat receiving a first drive arm and a second drive arm, an adjusting seat disposed between the first drive arm and the second drive arm, a ball screw rod having a hexagonal flange and a ball formed on a lower end of the ball screw rod, the ball screw rod inserted through a hollow disk, the hollow disk blocked by the hexagonal flange, the ball inserted in an oil

press box, an oil pipe connected to the oil press box and an oil adjusting box, an upper end of the ball screw rod inserted in the adjusting seat, and an axle passing through the slide block, the first drive arm and the second drive arm via the round hole.

5,771,741

**METHOD FOR TESTING GAS DRIVEN TORPEDOES USING A STEAM DELIVERY SYSTEM**

Peter A. Roy, Warwick, and Stephen E. Turner, Newport, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

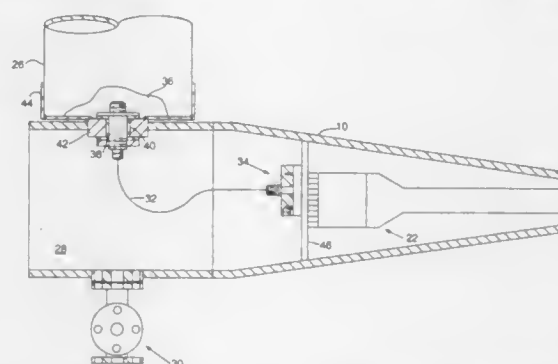
Division of Ser. No. 682,877, Jul. 31, 1996. This application

Jul. 9, 1997, Ser. No. 890,503

Int. Cl.<sup>6</sup> G01N 19/00

U.S. Cl. 73—167

4 Claims



1. A method for static testing a torpedo having a propulsion system driven by hot gas generated by the combustion of a fuel, said method comprising: providing the torpedo to be tested in a test fixture of the type normally provided for static testing hot gas driven torpedoes generally;

removing hot gas generation components of the torpedo providing an inlet adapter in place of the hot gas generation components; and connecting the inlet adapter to a remote source of steam under pressure whereby the torpedo's propulsion system is driven from steam rather than the hot gas.

5,771,742

**RELEASE DEVICE FOR RETAINING PIN**

Michael D. Bokaie, Fremont; John D. Busch, San Jose; A. David Johnson, San Leandro, and Bruce Petty, Dunsmuir, all of Calif., assignors to TiNi Alloy Company, San Leandro, Calif.

Filed Sep. 11, 1995, Ser. No. 526,715

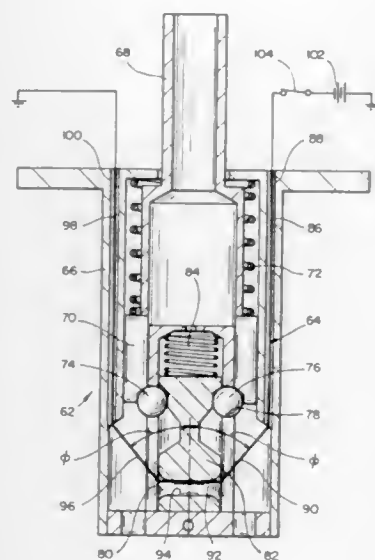
Int. Cl.<sup>6</sup> B25G 3/18

U.S. Cl. 74—2

10 Claims

1. A release mechanism for use in a device which moves a latch in a direction to activate an energy source with the activated energy source releasing a retaining element from engagement with a structure, the release mechanism comprising the combination of an elongate actuating element comprising a head portion having an end carried by the structure and a tail portion having an end carried for movement with the latch, said actuating element being comprised of a shape memory alloy material which has a phase-change transition temperature, said head portion extending along a first path which is constrained from angular displacement relative to the structure, said head portion being free to elongate and contract along the first path, said tail portion extending along a second path which is free to angularly displace relative to the structure and latch; means for heating the actuating element through said phase-change transition temperature for recovery of the actuating element by contraction from a low temperature shape to a memory shape, said tail portion being positioned so that the second path makes an





acute angle with respect to said direction of movement of the latch, said contraction resulting in an effective contraction stroke of the actuating element being concentrated in the tail portion with the contraction stroke moving the latch to a position which activates the energy source responsive to said recovery of the actuating element to its memory shape.

5,771,743

**CONTINUOUSLY VARIABLE TORQUE TRANSMISSION WITH TORSION BARS AND ENERGY RECUPERATING BRAKE DEVICE**

Ulrich Menzi, Neuchatel, Switzerland, assignor to Ulrich Menzi, Neuchatel, Switzerland

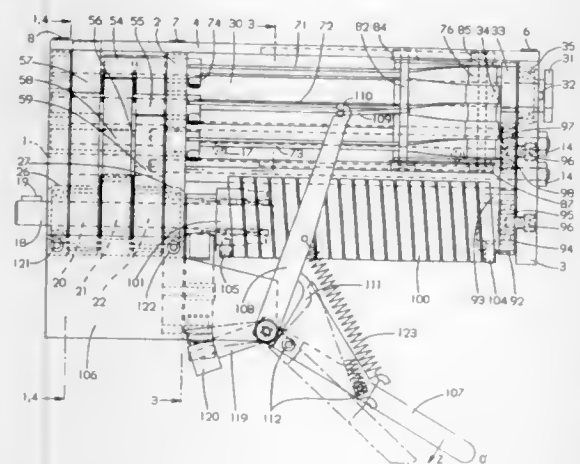
Filed Sep. 22, 1995, Ser. No. 532,247

Claims priority, application Switzerland, Apr. 13, 1995, 01076/95

Int. Cl.<sup>6</sup> F16H 29/00

U.S. Cl. 74—116

13 Claims



1. A mechanical transmission comprising:  
a rotatable input shaft;  
a rotatable output shaft;  
eccentrics mounted on the input shaft for rotation with the input shaft;  
oscillating members and overrunning clutches mounted on the output shaft for rotating the output shaft in a driving direction of oscillation of the oscillating members;

flexible traction means for transmitting motion from the eccentrics to the oscillating members, the flexible traction means connected to the oscillating members and encircling the eccentrics, the flexible traction means including elastic members which are adjustable in elasticity to vary torque in the output shaft and movable to move the oscillating members in the driving direction; and  
a stop and springs, the springs pulling the flexible traction means against the stop;  
wherein the flexible traction means includes members chosen from among the group comprising bands, tooth belts and cables;  
further comprising a movable control lever connected to the elastic members for adjusting the elasticity of the elastic members by adjusting the length of the elastic members, wherein a neutral position of the control lever corresponds to a position of the flexible traction means in which the eccentrics rotate freely without effect on the flexible traction means; whereby neutral position of the control lever results in no movement of the output shaft;  
and wherein the elastic members are torsion bars with twisted ends.

5,771,744

**DEVICE FOR SUBJECTING A SHAFT TO A COMBINED SIMPLE ROTATION AND ALTERNATING ROTATION OF LIMITED EXTENT ABOUT ITS OWN AXIS**

Enrico Canova, Ponte S. Nicolo', and Tiziano Salviato, Dolo, both of Italy, assignors to Holmac S.a.s. di Gastaldi Christian E.C., Padova, Italy

Filed Mar. 12, 1996, Ser. No. 614,414

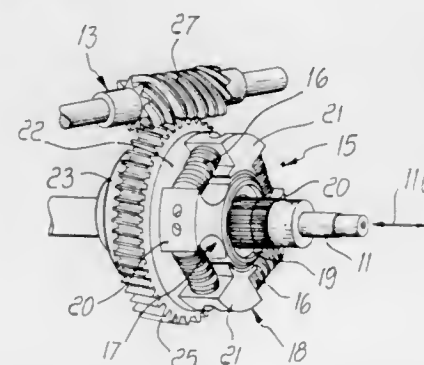
Claims priority, application Italy, Mar. 14, 1995, PD950018

U

Int. Cl.<sup>6</sup> B06B 1/10; F16H 33/06

U.S. Cl. 74—411

20 Claims



1. Device for subjecting a shaft to a combined simple rotation and alternating rotation of limited extent about its own axis, comprising elastic means that are arranged diametrically opposite with respect to said shaft that is coupled to a generator of torsional vibrations such that said generator of torsional vibrations subjects said shaft to a desired continuous alternating rotation of limited extent, said elastic means being rigidly coupled between first supporting elements that rotate with said shaft and second supporting elements that are rigidly coupled to a gear system that is freely mounted on said shaft and is coupled to means for actuating rotation of said shaft in combination with the desired continuous alternating rotation of limited extent provided by said generator of torsional vibrations.

5,771,745

**GEAR ARRANGEMENT HAVING A MAGNETIC TOOTHED DISK**

Timo Goette, and Helmut Goebels, both of Gifhorn, Germany, assignors to Volkswagen AG, Wolfsburg, Germany

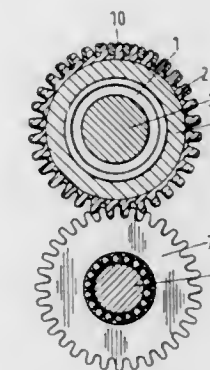
Filed May 2, 1996, Ser. No. 641,824

Claims priority, application Germany, Oct. 5, 1995, 195-17-043.1

Int. Cl.<sup>6</sup> F16H 55/18

U.S. Cl. 74—440

6 Claims



1. A gear arrangement comprising a gear having a number of teeth and a magnetic toothed disk disposed on one side of the gear and magnetically attracted thereto to provide frictional engagement therewith to resist relative rotation and having the same outer diameter as that of the gear and having a number of teeth which differs from the number of teeth of the gear and wherein the toothed disk has at least one tooth fewer than the gear in order to cause the teeth

5,771,748

## HIGHLY STABLE Z AXIS DRIVE

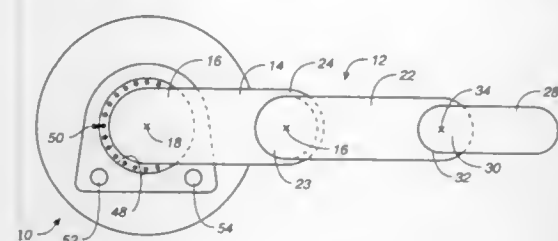
Genco Genov, Sunnyvale, and Gou-Kin Cui, Fremont, both of Calif., assignors to Genmark Automation, Sunnyvale, Calif.

Filed Jan. 26, 1996, Ser. No. 592,227

Int. Cl.<sup>6</sup> F16H 25/20; B25J 5/02; 18/00

U.S. Cl. 74—490.03

3 Claims



1. A vertical positioner, comprising:  
a rigid frame comprising:

a base;

a rigid vertically extending structure having a structure upper end portion, the structure extending upwardly in a generally orthogonal manner from base to the structure upper end portion; and

a flange attached to the structure upper end portion, the flange being generally horizontally aligned, the flange having a central opening and at least two peripheral openings; central opening bearing means adjacent the central opening defining a central bearing region; peripheral opening bearing means adjacent each of the peripheral openings defining respective peripheral bearing regions;

a vertically movable structure telescopically mounted to the rigid frame, comprising:

an upper plate located above the flange;

a lower plate located below the flange generally parallel to the upper plate;

a pair of linearly extending generally parallel members, each of the members having a respective upper end portion and a respective lower end portion, each of the members extending from the upper plate to the lower plate, the members each being generally orthogonal relative to the plates and passing through the respective peripheral bearing in bearing contact therewith;

a central tube connected between the lower plate and the upper plate in orthogonal relation thereto and passing through the central bearing region in bearing contact therewith;

motor means supported rigidly relative to the base for motivating the linearly extending members selectively upwardly and downwardly relative to the base.

5,771,749

## SLIDE MECHANISM COMBINED ROUGH AND FINE ADJUSTMENT IN MICROMANIPULATOR

Shinji Yoneyama, Tokyo, Japan, assignor to Narishige Co., Ltd., Tokyo, Japan

Filed Sep. 9, 1996, Ser. No. 709,723

Claims priority, application Japan, Sep. 7, 1995, 7-229761

Int. Cl.<sup>6</sup> G02B 21/26; G05G 11/00; F16H 25/20

U.S. Cl. 74—490.12

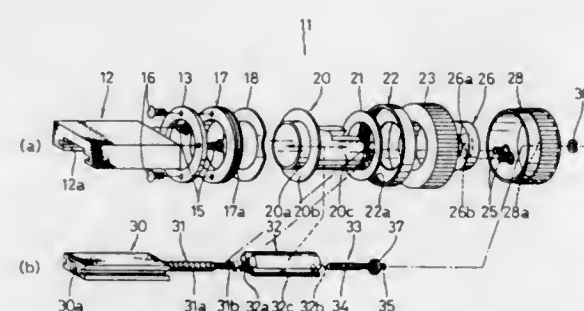
1 Claim

1. Slide mechanism combined rough and fine adjustment in micromanipulator comprises:

an inside slider provided with a rough adjustment female screw in axial direction and slidably fitted in axial direction in recessed grooves provided in a basic outside slider;

a rough adjustment screw shaft fitted into the rough adjustment female screw of the inside slider;

a fine adjustment inside slider to fix a basic part of the rough adjustment screw shaft, said fine adjustment inside slider



being provided in axial direction with a fine adjustment female screw on the same shaft as said rough adjustment screw shaft,

a rough adjustment bearing metal and concurrently fine adjustment outside slider to fit and support the fine adjustment inside slider non-rotatively but movably in axial direction in a through hole provided in axial direction,

a fine adjustment screw shaft fitted to a fine adjustment female screw of the fine adjustment inside slider,

an annular rough adjustment operation handle to rotate the rough adjustment bearing metal and concurrently fine adjustment outside slider,

a cylindrical shaped fine adjustment operation handle to rotate the fine adjustment screw shaft, and

the rough adjustment operation handle is rotated and the rough adjustment bearing metal and concurrently fine adjustment outside slider and the fine adjustment inside slider are rotated and then the inside slider is roughly displaced in axial direction,

the fine adjustment operation handle is rotated and the fine adjustment screw shaft is rotated and then the fine adjustment inside slider is finely displaced in axial direction and further the inside slider is finely displaced in axial direction.

5,771,750

## ADJUSTABLE CABLE CLIP

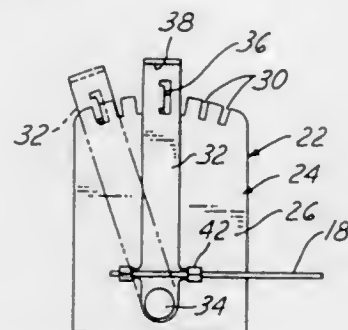
David John Bell, Grand Blanc; James Allen Morse, Canton; Michael Joseph Zaitz, Flint; Bernard Thomas Londeck, Waterford, and Derek Ingham, Mt. Morris, all of Mich., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Sep. 23, 1996, Ser. No. 717,576

Int. Cl.<sup>6</sup> G01D 5/04; F16C 1/22

U.S. Cl. 74—502.6

4 Claims



1. In a transmission shift indicator assembly having an indicator coupled to an operator by a cable, a clip for adjustably anchoring one end of the cable to the operator for aligning the indicator, comprising:

a bracket for mounting to the operator;

an array of positioning features on the bracket;

a lever pivoted at one end to the bracket with the other end movable along the array of positioning features;

means on the other end of the lever for selectively engaging the positioning features for fixing the lever position;

and means for permanently fastening the cable directly to the lever at a fixed point between the ends;

whereby the cable position is adjusted relative to the operator by pivoting the lever about the one end and fixing the lever at a desired position.

5,771,751

## TURNBUCKLE FOR A TENSIONING CABLE

Jörg Schwarzbich, Wertherstr. 15, D-33615 Bielefeld, Germany

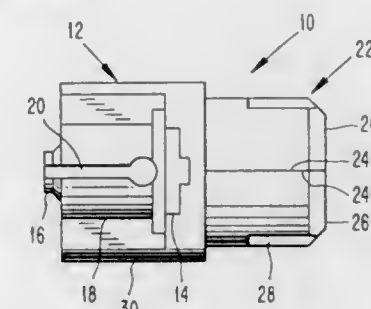
Filed Oct. 9, 1996, Ser. No. 728,389

Claims priority, application European Pat. Off., Nov. 18, 1995, 95118171

Int. Cl.<sup>6</sup> F16C 1/16

U.S. Cl. 74—502.6

14 Claims



1. A turnbuckle for a tensioning cable device comprising:

a casing forming an interior cavity defining a longitudinal axis; a first threaded member comprising an externally threaded bolt extending axially into the cavity and being mounted for axial movement relative to the casing, and fixed against rotation relative to the casing about the axis, the first threaded member including a recess extending radially through the external thread for being affixed to a cable;

a second threaded member mounted to the casing for rotation relative thereto about the axis and fixed against axial movement relative thereto, the second threaded member including a thread connected to a thread of the first threaded member so that rotation of the second threaded member produces axial movement of the first threaded member for selectively tensioning or slackening a cable;

the first threaded member including a radial cam formed at least at one axial end thereof, the cam projecting radially past the external thread and including a generally axially facing sloping surface and a circumferentially facing first stop surface extending from an end of the sloping surface, an axial length of the first stop surface being a function of the thread pitch to enable the first stop surface to engage a circumferentially facing second stop surface of the second threaded member during relative axial movement between the first and second threaded members, to terminate rotation of the second threaded member.

5,771,752

## ADJUSTABLE AUTOMOBILE PEDAL SYSTEM

Edmond B. Cicotte, 11086 Hedgeway, Utica, Mich. 48317

Continuation of Ser. No. 266,937, Aug. 16, 1994, abandoned, which is a continuation-in-part of Ser. No. 772,326, Oct. 7, 1991, Pat. No. 5,351,573. This application Oct. 15, 1996, Ser. No. 730,573

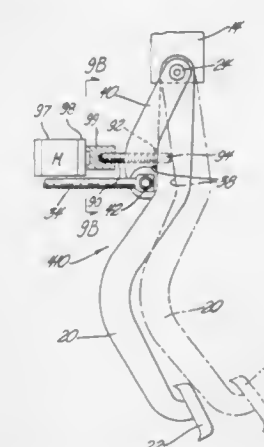
Int. Cl.<sup>6</sup> G05G 1/14

U.S. Cl. 74—512

41 Claims

1. An adjustment device for adjusting a pedal arm with respect to a datum point on a reaction member, said pedal arm being rotatable about an axis of arm rotation, said adjustment device comprising:

a link member having a first pivot axis in one end and a second pivot axis in an oppositely disposed other end, said one end of said link member mounted juxtaposed said pedal arm about said axis of arm rotation; and



means, rotatably mounted to one of said pedal arm and said link member, for rotating said pedal arm about said axis of arm rotation, said rotating means having an axis of rotation complementary with one of said pedal arm and said link member and spaced a predetermined distance from said axis of arm rotation, said predetermined distance being no greater than the distance between said first pivot axis and said second pivot axis, said rotating means further comprising:

a rotatable member mounted about said axis of rotation, said rotatable member having one portion mounted to one of said pedal arm and said link member and another peripheral portion extending in a direction towards the other of said pedal arm and said link member so as to make contact therewith;

means for mounting said rotatable member to said one of said pedal arm and said link member; and

drive means interconnected with said rotatable member for rotating said rotatable member about said axis of rotation whereby as said drive means rotates said rotatable member said pedal arm is rotated about said axis of arm rotation; and

means for mounting said datum point of said reaction member to said link member, said mounting means being located on said link member interposed said first pivot axis and said second pivot axis of said link member.

5,771,753

## STOPPER FOR ROBOT ROTARY ARTICULATION

Jung wook Kwon, and Chan-seob Oh, both of Suwon, Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

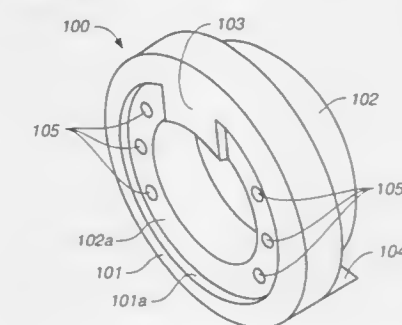
Filed Oct. 18, 1996, Ser. No. 733,932

Claims priority, application Rep. of Korea, Jul. 30, 1996, 96-22883

Int. Cl.<sup>6</sup> G05G 1/04

U.S. Cl. 74—526

3 Claims



1. A stopper for robot rotary articulation, for limiting the rotation angle of a shaft where a protrusion is formed comprising: a first ring-shaped bush member;



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a second bush member, having an inner diameter smaller than that of said first bush member, connected to an inner circumference of said first bush member to form a step surface against said first bush member, and rotatably supported by inserting said shaft therein;

a first stop protrusion extending from an inner surface of said first bush member in a radial direction thereof; and

a second stop protrusion protruded from an outer circumferential surface of said second bush member,

wherein the protrusion of said shaft during rotation of said shaft slides against said step surface and contacts with said first stop protrusion, to thereby rotate said stopper, and said second stop protrusion contacts with a protrusion fixed to a housing of a robot rotary articulation to thereby stop rotation of said shaft and stopper, and

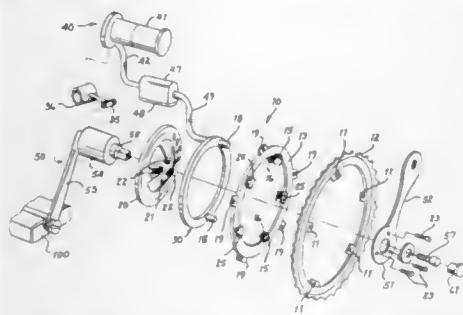
wherein a plurality of screw holes are formed on the step surface and a bolt is selectively engaged with said screw holes, to thereby control the rotation angle of said stopper.



5,771,754  
BIKE HYDRAULIC DISK DRIVE AND METHOD THEREFOR

Stephen F. Smeeth, 835 Lee Mountain Rd., Sedona, Ariz. 86351  
Filed Jan. 24, 1996, Ser. No. 599,498  
Int. Cl.<sup>6</sup> G05G 1/14; B62M 19/00  
U.S. Cl. 74—594.2

16 Claims



I. A hydraulically controlled bicycle drive system for variably transferring rotational motive power from a rider pedalling a bicycle to a chain of a chain-driven bicycle comprising, in combination:

chain drive assembly means constructed and configured to rotate comprising a sprocket for receiving and driving the chain wherein such chain drive assembly means further comprises at least one hydraulic clamp and at least one roller clamp; pedals rotationally attached to said chain drive assembly means; disk means mounted for rotation driven by rotation of said pedals having a portion of said disk means received in said hydraulic clamp and in said roller clamp; and means controllable by the rider for applying a variable pressure using the hydraulic clamp coupled to said disk means thereby variably transferring rotational power from said disk means to said chain drive assembly means.

5,771,755  
DAMPED FLYWHEEL ADAPTED TO BE INTERPOSED IN A MOTOR VEHICLE PROPULSION UNIT

Didier Duclos, Ozoir La Ferriere, and Jacques Feigler, St. Brice S/Foret, both of France, assignors to Valeo, Paris, France

PCT No. PCT/FR95/00877, § 371 Date Feb. 28, 1996, § 102(e) Date Feb. 28, 1996, PCT Pub. No. WO96/00860, PCT Pub. Date Jan. 11, 1996

PCT Filed Jun. 30, 1995, Ser. No. 604,955

Claims priority, application France, Jun. 30, 1994, 94 08257

Int. Cl.<sup>6</sup> F16F 15/139; 15/167

U.S. Cl. 74—574

10 Claims

I. A damped flywheel (10) arranged operatively between two coaxial rotatable assemblies (12, 14), one of which is adapted to be

coupled to an internal combustion engine of a propulsion unit, the other one being adapted to be coupled to the input shaft of a gearbox of the propulsion unit, and comprising a first rotating element (12) and a second rotating element (14), which are coaxial and have the general form of parallel plates (20, 26) that define between them an annular housing (30), which is delimited mainly by the first rotating element (12) and which is disposed radially towards the outside and receives a circumferentially acting resilient damping device (32) a lubricating agent for the said device (32), and an annular space (36) arranged radially towards the inside, which receives an axially acting friction damping device (58), and sealing means which separate the annular housing (30) and space (36), and which comprises two coaxial sealing rings (56A, 56B), each of which is in engagement through one of its faces against a first support surface associated with the first rotating element (12), and through the other one of its faces against a second support surface associated with the second rotating element (14), wherein the second rotating element (14) comprises an annular disc (42) which extends into the annular space (36) and which penetrates through its outer periphery into the annular housing (30), characterised in that the friction damping device (58) comprises a part (62, 60) which is driven in rotation by the second rotating element (14) through at least one interposed head (68) of a member (66) for fastening one (56A) of the sealing rings (56A, 56B) on to the annular disc (42) of the second rotating element (14), and in that the annular disc (42) of the second rotating element (14) is fixed on the said second element (14) by means of a set of coupling members (44) which are distinct from the fastening members (66).

5,771,756

DOUBLE DAMPING FLY-WHEEL

Ayman Mokdad, Saint-Ouen, France, assignor to Valeo, Paris, France

PCT No. PCT/FR95/01222, § 371 Date May 28, 1996, § 102(e) Date May 28, 1996, PCT Pub. No. WO96/10139, PCT Pub. Date Apr. 4, 1996

PCT Filed Sep. 22, 1995, Ser. No. 652,491

Claims priority, application France, Sep. 26, 1994, 94 11434

Int. Cl.<sup>6</sup> F16F 15/10

U.S. Cl. 74—574

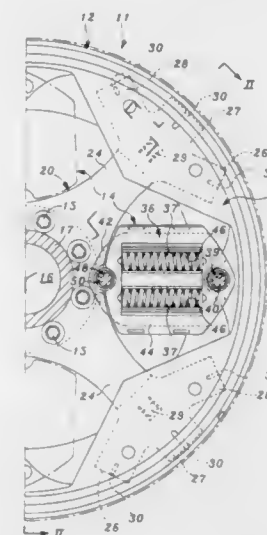
5 Claims

I. A damping flywheel comprising: first and second coaxial masses (12, 13) movably mounted circumferentially in relation to one another in opposition to resilient means (14), in which said first coaxial mass (12) is intended to be fixed to a driving shaft (16), said first coaxial mass (12) is formed of a central portion (20) fixed to the driving shaft and of at least one massive portion (22) having an annular shape connected to an outer periphery of the

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GENERAL AND MECHANICAL

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central portion by being mounted on the outer periphery of said central portion and the central portion (20) comprises peripheral lugs (26—29) situated at a heart of the massive portion.

5,771,757  
CLIPLESS BICYCLE PEDAL WITH LARGE SHOE-CONTACTING AREA

Junichi Hanamura, Sakai, Japan, assignor to Shimano, Inc., Osaka, Japan

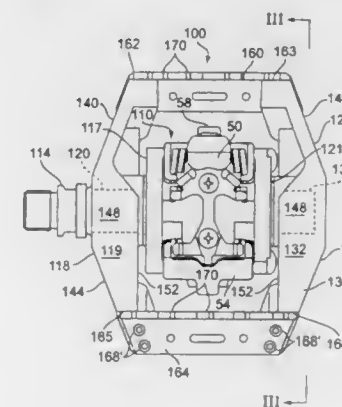
Continuation of Ser. No. 588,660, Jan. 19, 1996, abandoned.

This application May 28, 1997, Ser. No. 864,436

Int. Cl.<sup>6</sup> G05G 1/14

U.S. Cl. 74—534.4

28 Claims



I. A bicycle pedal comprising:

an axle;

a cleat clamping unit mounted to the axle for rotation about the axle;

a first sole engaging member having a first sole engaging surface, the first sole engaging member being disposed at an external side of the clamping unit and having a first opening for receiving the axle therethrough;

a second sole engaging member formed separately from the first sole engaging member and having a second sole engaging surface, the second sole engaging member being disposed at an opposite external side of the clamping unit;

a first bridge member formed separately from the first sole engaging member and the second sole engaging member, wherein the first bridge member is mounted by first screws to a front surface of the first sole engaging member that faces in a forward direction and to a front surface of the second sole engaging member that faces in the forward direction, and wherein the first bridge member has a rear first bridge member surface that faces the front surface of the first sole engaging member that faces in the forward direction and the front

surface of the second sole engaging member that faces in the forward direction; and

a second bridge member formed separately from the first sole engaging member, the second sole engaging member and the first bridge member, wherein the second bridge member is mounted by second screws to a rear surface of the first sole engaging member that faces in a rearward direction and to a rear surface of the second sole engaging member that faces in the rearward direction, and wherein the second bridge member has a front second bridge member surface facing the rear surface of the first sole engaging member that faces in the rearward direction and the rear surface of the second sole engaging member that faces in the rearward direction.

5,771,758  
AXLE DRIVING APPARATUS HAVING IMPROVED CASING DESIGN

Ray Hauser, Decatur, Ill., assignor to Hydro-Gear Limited Partnership, Sullivan, Ill.

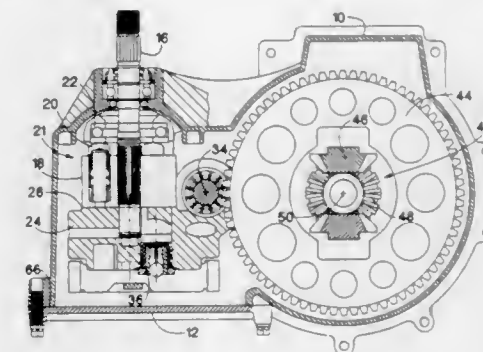
Continuation of Ser. No. 430,360, Apr. 28, 1995, Pat. No.

5,613,409. This application Mar. 19, 1997, Ser. No. 820,582

Int. Cl.<sup>6</sup> F16H 57/02

U.S. Cl. 74—606 R

10 Claims



I. An axle driving apparatus, comprising:

a main casing;

a hydraulic transmission comprising a hydraulic pump and a hydraulic motor;

a motor shaft drivingly linked to said hydraulic motor;

a brake mounted on the distal end of said motor shaft;

a cap plate coupled to said main casing section along a first split line; and

an axle cap coupled to said main casing section along a second split line;

wherein said motor shaft extends from said main casing section and at least a portion of said brake is housed within said axle cap.

5,771,759  
BEVERAGE CONTAINER EASY OPENER  
John F. Warren, 618 Country Lake Dr., St. Peters, Mo. 63376  
Filed Jul. 15, 1996, Ser. No. 680,014  
Int. Cl.<sup>6</sup> B67B 7/44

U.S. Cl. 81—3.09

5 Claims

I. A container opener for a can having a can upper surface having a tab generally parallel to said upper surface comprising:

a handle portion;

a first tab engagement member integral with said handle portion;

said first tab engagement member being spaced from said handle portion at a distal end;

said first tab engagement portion having a distal end portion making an angle with the horizontal, when said handle portion is in a horizontal position; and extending upwardly, to facilitate engagement with a first surface of a can tab;

said handle portion, having an extension, extending directly below said first tab engagement member to define a second tab engagement member when said handle portion is in said horizontal position;

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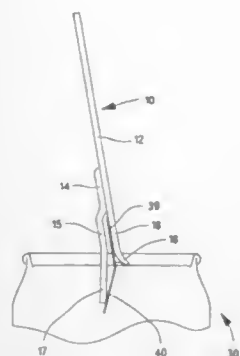
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said second tab engagement member, having a second inclined portion at its distal end, to facilitate engaging a second surface of said tab; whereby when a can, having an outwardly extending horizontal tab is contacted, said horizontal tab portion is engaged by both said first tab engagement member, and said second tab engagement member, and upon rotation of said handle portion, said tab is rotated upwardly and at the same time a can top portion is opened to enable a substance to be extracted from the container; said first tab engagement member having a distal end making an angle of from 10 to 20 degrees with the horizontal; said second can tab engagement member having a distal end portion makes an angle of from 10 to 30 degrees, with respect to the horizontal; said handle portion including at an opposite end, a bottle top opener.

5,771,760

## RATCHETING SCREWDRIVER

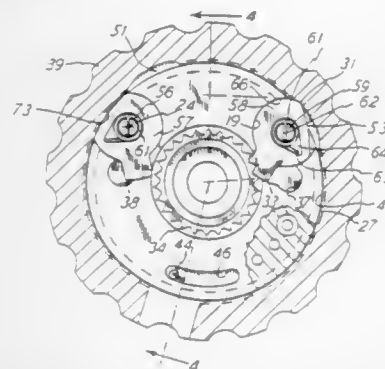
Clair L. Tiede, Mukwonago, Wis., assignor to Beere Precision Medical Instruments, Inc., Racine, Wis.

Continuation of Ser. No. 553,866, Nov. 6, 1995, Pat. No. 5,619,891. This application Dec. 17, 1996, Ser. No. 781,941

Int. Cl.<sup>6</sup> B25B 13/46

U.S. Cl. 81—62

11 Claims



1. In a ratcheting tool of the type having a handle, a circular gear rotatable on said handle and having a longitudinal axis, two pawls having teeth and being disposed on said handle and being spaced apart on a circle surrounding said gear and being movable into and out of rotational drive contact with said gear, a first one of said pawls being positioned and arranged to transmit rotation to said gear in a clockwise direction around said axis and a second one of said pawls being positioned and arranged to transmit rotation to said gear in a counterclockwise direction around said axis, springs operative on said pawls for urging said pawls into contact with said gear, a ring co-axial with said longitudinal axis and rotatable on said handle for moving said pawls out of contact with said gear, and positioners on said handle and said ring for releasably securing said ring in the moved positions on said handle, the improvement comprising

two spaced-apart and mutually facing surfaces on said ring for movement in an arcuate path upon rotation of said ring, said pawls each including a portion extendable radially across said arcuate path and being arranged to be respectively

engaged by said two surfaces for alternate movement of said pawls out of engagement with said gear and against the forces of said springs, and

said ring also including additional surfaces adjacent said two mutually facing surfaces and being arranged and disposed to contact said pawls when said pawls are in the disengaged mode and thereby hold said pawls disengaged.

5,771,761

## SPRING PIVOTED, RATCHETING LEVER WRENCH

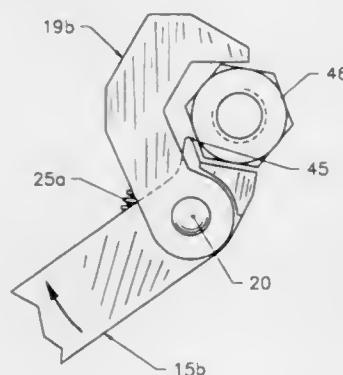
Kazimierz M. Binkowski, 17 Riggs St., Ansonia, Conn. 06401

Filed Apr. 16, 1996, Ser. No. 632,821

Int. Cl.<sup>6</sup> B25B 13/28

U.S. Cl. 81—99

21 Claims



1. A spring pivoted, ratcheting lever wrench for use in gripping opposed parallel flat surfaces of a bolthead or nut which are separated by a distance defining the size of said bolthead or nut, and rotating said bolthead or nut, comprising:

a handle having two ends and a fixed jaw disposed at one end thereof, said fixed jaw having a first flat surface;

a pivoted jaw having a second flat surface, said pivoted jaw joined to said handle near said one end by a pivot and rotatable through a gripping position in which said second surface is parallel to said first surface and spaced therefrom by said distance;

said first and second surfaces each having a proximal edge near said pivot and a distal edge opposite to the respective one of said proximal edges, said distal edges being the extreme distal edges of said jaws, respectively; and

means resiliently urging said pivoted jaw to rotate in a direction to bring said second surface closer to said first surface; characterized by the improvement comprising:

the axis of said pivot being within a plane which includes the respective proximal edges of said first and second flat surfaces when in said gripping position and which is perpendicular to said first flat surface, said first flat surface extending from said plane to the extreme distal edge of said fixed jaw, and said second flat surface extending from said plane to the extreme distal edge of said pivoted jaw, thereby providing a nut or bolthead with unimpeded access to the space between said first and second flat surfaces when said pivoted jaw is rotated to a position in which said second surface is parallel with said first surface; and

a secondary lever extending from the proximal edge of said first surface generally toward said second surface in a position to engage a flat surface of a bolthead or nut when said bolthead or nut is engaged by said first flat surface.

5,771,762

## QUICK-COUPLING FACE-DRIVER ASSEMBLY OF A ROTARY DRIVE DEVICE AND METHOD FOR CHANGING FACE DRIVERS

Kevin J. Bissett, 1773 Milddrum St., Union Grove, Wis. 53182

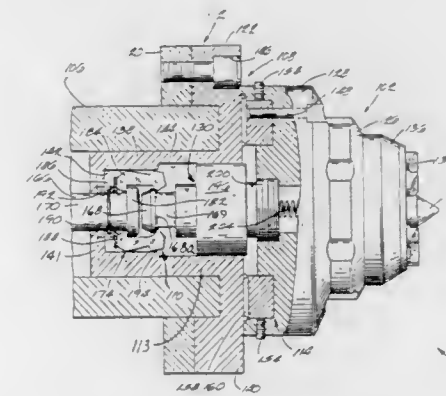
Continuation of Ser. No. 236,498, Apr. 29, 1994, abandoned.

This application Apr. 8, 1996, Ser. No. 629,192

Int. Cl.<sup>6</sup> B23B 3/00

U.S. Cl. 82—1.11

16 Claims



1. A face-driver assembly for removable coupling of a face driver with a spindle of a rotary-drive machining device along the spindle axis, comprising:

a face driver having forward and rear ends; a hub on the spindle and defining a prealignment bore; a pair of annular, self-centering coacting tooth sets, one set on the hub and one set on the face driver;

an engagement post extending rearwardly from the face driver and forming a prealignment shaft which is closely complementary to the prealignment bore allowing insertion of the prealignment shaft into the prealignment bore; and

interengageable means on the hub and engagement post to releasably hold and draw the engagement post rearwardly, thus drawing the prealignment shaft further into the prealignment bore to join the tooth sets to facilitate final accurate centering;

thereby facilitating quick face-driver mounting with final accurate centering of the face driver for accurate torque transmission to a workpiece held by the face driver.

5,771,763

## CUTTING TOOL INSERT

Jonas Näslund, Sandviken, and Anders Jonsson, Gävle, both of Sweden, assignors to Sandvik AB, Sandviken, Sweden

Continuation of Ser. No. 326,933, Oct. 21, 1994, abandoned.

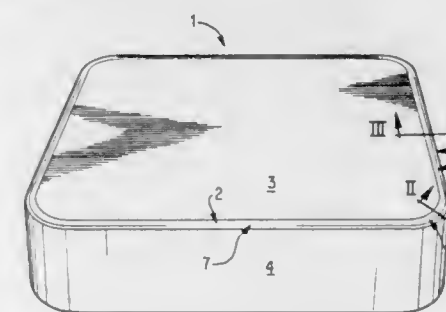
This application Mar. 24, 1997, Ser. No. 826,407

Claims priority, application Sweden, Oct. 21, 1993, 9303471

Int. Cl.<sup>6</sup> B23B 27/22

U.S. Cl. 82—1.11

19 Claims



18. A method of machining a metal workpiece with an edge rounded cutting tool insert comprising at least one main cutting edge and a connecting nose area wherein the main cutting edge has a width W of edge rounding along a rake face and a width H of edge rounding along a clearance face, a W/H ratio in the nose area

of at least 1.25 times larger than the W/H ratio in a middle of the main cutting edge and the H in the middle of the main cutting edge of at least 1.1 times larger than the H in the nose area, the method comprising contacting the workpiece with the main cutting edge of the cutting tool insert and moving the workpiece relative to the cutting tool insert such that the main cutting edge removes metal from the workpiece.

5,771,764

## USE OF CUTTING TOOLS FOR PHOTOGRAPHIC MANUFACTURING OPERATIONS

Dilip K. Chatterjee; Syamal K. Ghosh, both of Rochester, and Dennis J. Eichorst, Fairport, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

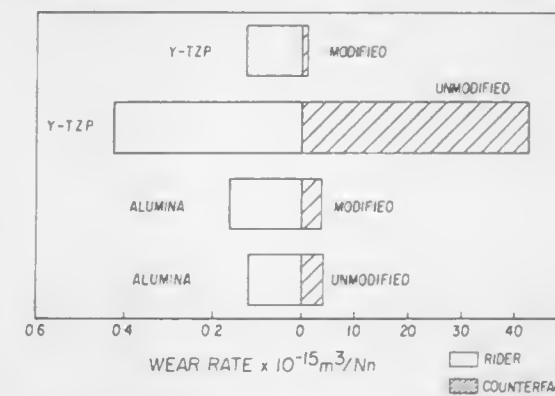
Continuation of Ser. No. 556,346, Nov. 13, 1995, abandoned.

This application Sep. 16, 1997, Ser. No. 931,782

Int. Cl.<sup>6</sup> B26D 1/00

U.S. Cl. 83—13

17 Claims



1. A method of cutting, slitting and perforating photographic imaging elements comprising polymeric webs coated with materials selected from the group consisting of photographic emulsions and magnetic recording layers, said method comprising cutting said photographic imaging elements with a cutting tool comprising a member of the group consisting of zirconia and zirconia-alumina composite doped with a member of the group consisting of yttria, ceria, calcia, and magnesia wherein the molar ratio of yttria to zirconia is from about 0.5:99.5 to about 5:95 for a cutting tool comprising zirconia doped with yttria; and wherein the molar ratio of a member of the group consisting of ceria, calcia and magnesia, to zirconia is from about 0.5:99.5 to about 25:75 for a cutting tool comprising zirconia doped with a member selected from the group consisting of ceria, calcia and magnesia, and wherein said doped zirconia is in the tetragonal phase.

5,771,765

## SAWDUST REMOVING APPARATUS FOR SAW MACHINE

Shouji Aihara, Hiratsuka, Japan, assignor to Amada Company, Limited, Kanagawa, Japan

Continuation of Ser. No. 335,366, Nov. 3, 1994, abandoned.

This application Mar. 26, 1997, Ser. No. 824,259

Int. Cl.<sup>6</sup> B23D 59/00; B27B 13/16

U.S. Cl. 83—168

12 Claims

1. A sawdust removing apparatus for a saw machine, comprising:

a saw blade housing for rotatably supporting a saw blade for sawing work;

cleaning instrument means for removing sawdust adhering to the saw blade when said work is being sawed;

cleaning instrument support means movably supported by said saw blade housing for rotatably supporting said cleaning instrument means;

cleaning instrument position adjusting means mounted on said saw blade housing for adjusting an amount of overlap of said cleaning instrument means with the saw blade;



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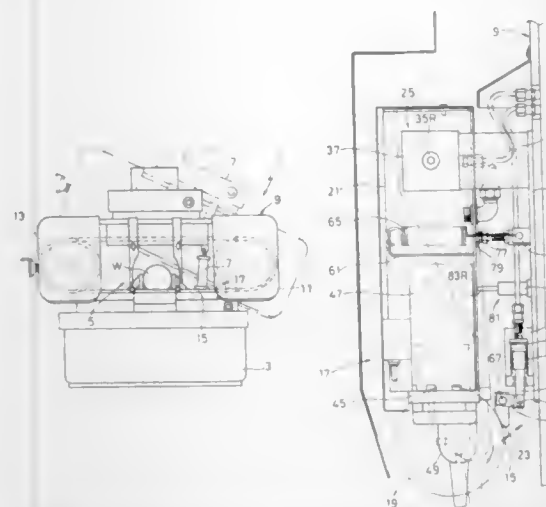
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cleaning instrument position fixing means mounted on said saw blade housing for fixing said cleaning instrument support means after the amount of overlap of said cleaning instrument support means with the saw blade has been adjusted by said cleaning instrument position adjusting means; and

cleaning instrument separating means mounted on said saw blade housing for pivoting said cleaning instrument support means to separate said cleaning instrument means from the saw blade when work is not being sawed.

5,771,766

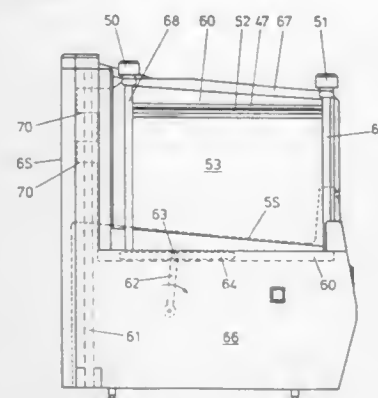
**DEVICE FOR CUTTING CHEESE, VEGETABLES, SAUSAGE AND LIKE PRODUCTS INTO SLICES**  
Ronald Ferdinand Vedders, Zoetermeer, and Henricus Johannes Gregorius ter Bekke, Epse, both of Netherlands, assignors to Albert Heijn B.V., Zaandam, Netherlands  
Filed Jul. 5, 1995, Ser. No. 498,523

Claims priority, application Netherlands, Jul. 4, 1994, 9401117

Int. Cl. B26D 7/01

U.S. Cl. 83—241

1 Claim



1. A device for cutting cheese, vegetables, sausage into consumption-ready slices, comprising a supporting surface for the products to be cut and a knife, characterized in that adjacent an end edge of the supporting surface a stop plate for the products to be cut is arranged, extending transversely to the supporting surface, which stop plate is coupled with an upwardly and downwardly movable knife holder comprising an elongate knife, which knife holder is located near an upper edge of the stop plate, while the distance between the stop plate and the knife in a direction transverse to the stop plate defines the thickness of the slices to be cut and is adjustable by means of adjusting means, and that an electric motor is provided for effecting the up and down movement of the knife holder; and further characterized in that the knife holder is arranged in a frame which is self-supportingly mounted for up and down movement on a single substantially vertical stationary guide arranged next to the supporting surface near said end edge, and

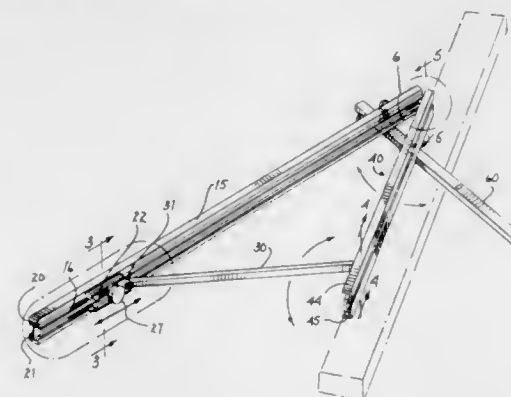
which frame further carries the stop plate, and in that the frame further carries on opposite sides of the stop plate a vertical rod, individually rotatable by means of a connected to each rod knob, each rod comprising at least one eccentric member for individual adjustment of the distance between the stop plate and the knife in a direction transverse to the stop plate by rotation of either one of said vertical rods about a vertical axis, by way of said knobs; whereby the stop plate is pivoted about a vertical axis.

5,771,767

**ANGLE ATTACHMENT FOR WOODWORKING TOOLS**  
Steven D. Itami, 15618 N. 54th Pl., Scottsdale, Ariz. 85254  
Filed Sep. 23, 1996, Ser. No. 717,366  
Int. Cl. B27B 25/10; 27/06

U.S. Cl. 83—435.13

20 Claims



1. An angle attachment for use with a plurality of different tools comprising in combination:

an elongated base member having first and second ends and having a first track thereon formed by a pair of outwardly protruding extensions which extend substantially along the entire length thereof;

a fence member having a flat material-engaging surface thereon and having first and second ends wherein said first end of said fence member is pivotally coupled to said first end of said base member;

a slider member on top of said pair of outwardly protruding extensions and engaging the first track of said base member for movement between said first and second ends of said base member substantially along the entire length thereof; and

a coupler arm means having first and second ends wherein the first end is pivotally coupled to said slider member and the second end is pivotally coupled to said fence member a predetermined distance from said second end of said fence member for setting said fence member to a desired angle relative to said base member when said slider member is moved.

5,771,768

**HOLE PUNCH WITH QUICK-CHANGE DIE ASSEMBLY**  
Wayne Malmstrom, 1175 Boeing, Boise, Id. 83705  
Filed Mar. 5, 1996, Ser. No. 611,301  
Int. Cl. B26F 1/14

U.S. Cl. 83—571

9 Claims

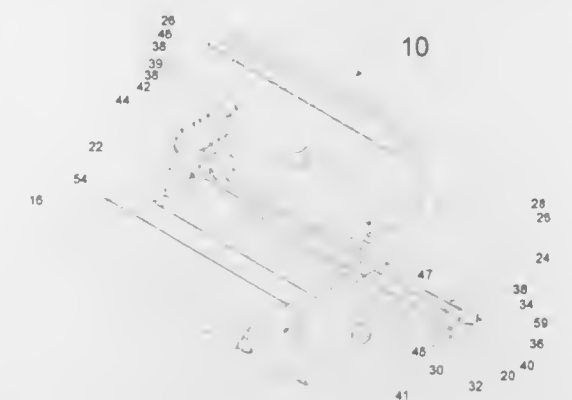
1. A paper punch machine comprising:

a machine housing;

a quick-change die assembly having a front portion and a back portion;

wherein said front portion comprises an elongated die having a longitudinal axis, a slot parallel to the longitudinal axis for receiving paper and a plurality of die holes extending perpendicularly to the longitudinal axis; and

wherein said back portion consists of an elongated pin-retainer plate generally parallel to said elongated die and having a front surface, a back surface, and a plurality of retainer holes extending through said plate from the back surface to the front surface and a plurality of punch pins slidably extending



through said retainer holes, each punch pin having a first end with a head in back of said plate and abutting said plate back surface and a second end extending from said plate front surface to said elongated die and slidably received in one of said die holes;

an anchor member fixedly connected to the machine housing in a forward position inside the housing;

a means for clamping said die assembly front portion against said anchor member;

a driving means for moving the die assembly back portion toward and away from the die assembly front portion to punch paper received in said die assembly; and

a connection means for slidably connecting said back portion to said driving means, said connection means comprising a push-bar connected to said driving means and generally parallel to said back portion, the push-bar having an elongated front surface facing the back portion and a C-channel extending longitudinally along said push-bar front surface and slidably receiving and capturing said pin-retainer plate, wherein the punch pins are retained in the retainer holes by the punch pin heads being held between the pin-retainer plate back surface and the push-bar front surface; and

wherein the C-channel has an open end for allowing the pin-retainer plate to be slid longitudinally off of the push-bar; whereby the die assembly is adapted to be unclamped and slid out of the machine housing.

5,771,769

**EXTERNALLY DRIVEABLE CASSETTE FOR LIGHT-SENSITIVE WEB MATERIAL, INCLUDING KNIFE FOR CUTTING MATERIAL**

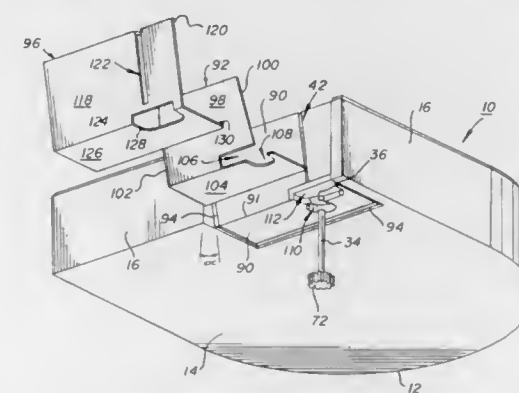
Jeffrey Charles Robertson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 27, 1996, Ser. No. 606,793

Int. Cl. B26D 1/143

U.S. Cl. 83—649

9 Claims



1. A cassette for photosensitive web material, comprising:

a hollow cassette housing having a peripheral wall with an outside surface;

a first exit slit extending through said peripheral wall to said outside surface;

means, located within said housing, for rotatably supporting a roll of the web material;

means, located within said housing for engaging a leading end of a web material to drive the web material through said first exit slit, said means for engaging comprising a driven member;

means for permitting external access to said driven member;

a knife blade adjacent said first exit slit, said blade having a cutting edge extended at an acute angle to said first exit slit;

means for slidably mounting said blade for movement between a first position in which said first exit slit is open, and a second position in which both the web material has been cut by said cutting edge and said first exit slit has been closed by said blade to prevent entry of light into said housing through said first exit slit; and

means formed in said blade to permit engagement of said blade by an external driver for said driven member, which driver both moves said blade between said first and second positions and engages and drives said driven member when said blade is in said first position.

5,771,770

**CUTTING CYLINDER WITH ADJUSTABLE CUTTER BAR**

Roger Müller, Bern, Switzerland, assignor to Maschinenfabrik WIFAG, Bern, Switzerland

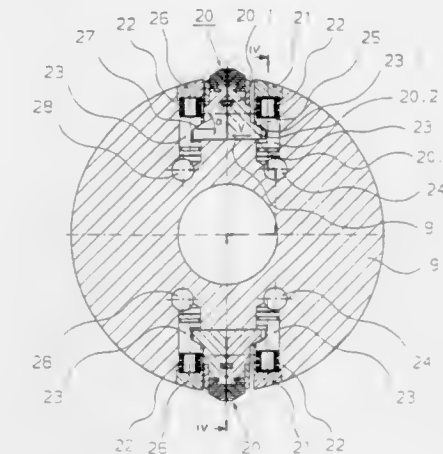
Filed Jul. 19, 1996, Ser. No. 684,035

Claims priority, application Germany, Jul. 20, 1995, 195 26 507.6

Int. Cl. B26D 1/62; 7/26; B41F 13/60

U.S. Cl. 83—698.61

12 Claims



1. A cutting cylinder for transversely cutting or perforating a material web running in a rotary press, comprising:

a displacing surface forming a part of the cutting cylinder;

a cutter bar pressing against said displacing surface, said cutter bar having a contact surface and a first longitudinal side with a first wedge surface and a second longitudinal side with a second wedge surface;

a first adjusting means for displacing said cutter bar in a circumferential direction, said first adjusting means being connected to said cutter bar in a frictionally engaged manner pressing said cutter bar via said first wedge surface, said first wedge surface being directed toward said displacing surface to form an acute angle with said displacing surface; and

a second adjusting means for displacing said cutter bar in another circumferential direction, said second adjusting means being connected to said cutter bar in a frictionally engaged manner pressing said cutter bar via said second wedge surface, said second wedge surface being directed toward said displacing surface to form an acute angle with said displacing surface.

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## APPARATUS FOR CUTTING A SAUSAGE PRODUCT

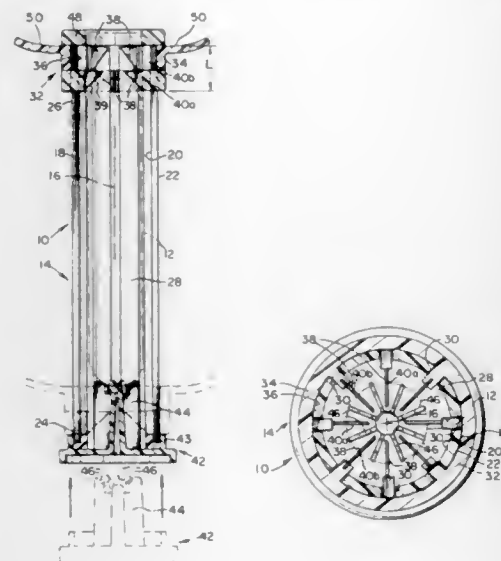
Eugene D. Gagliardi, Jr., Atglen, Pa., assignor to Visionary Design, Inc., Atglen, Pa.

Filed Oct. 15, 1996, Ser. No. 732,541

Int. Cl.<sup>6</sup> A47J 43/00; B26D 1/11

U.S. Cl. 83—882

10 Claims



1. An apparatus for cutting an elongate sausage product comprising:

an elongate generally cylindrical housing having an axis, a circumferential side wall with radially inner and outer surfaces, and first and second axial ends, the housing defining a cutting chamber for receiving a sausage product, the side wall including a plurality of elongate generally parallel axial slots extending therethrough, the slots being spaced from each other around the circumference of the side wall; and

a generally annular cutter member having an axial length and a curved inner circumferential surface with a diameter at least slightly greater than that of the outer surface of the housing side wall, the cutter member extending around the outer surface of the housing to be generally co-axial therewith and being axially movable with respect to the housing, the cutter member including a plurality of generally radially inwardly extending blades, the blades being spaced from each other around the circumference of the cutter member, wherein each blade is generally aligned with and extends through one of the housing slots and into the cutting chamber, whereby axial movement of the cutter member with respect to the housing results in a plurality of generally parallel axially extending cuts being made into a sausage product located within the cutting chamber;

a generally circular base member removably secured to the first end of the housing, the base member including a support member extending into the cutting chamber a predetermined distance from the first end of the housing for supporting the sausage product; and

an annular cap member secured to the second end of the housing, the cap member having a radial outer dimension at least slightly greater than the diameter of the inner circumferential surface of the cutter member so that the cap member limits movement of the cutter member toward the second end of the housing.

5,771,772

## DRIVE DEVICES

John B. Gorst, Kendal, and David Andrew Eaglestone, Mill-wood, both of United Kingdom, assignors to Vickers Ship-building &amp; Engineering Limited, United Kingdom

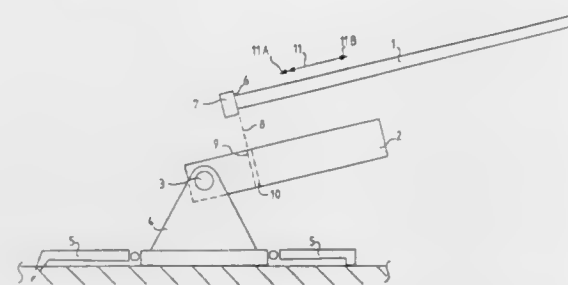
Continuation-in-part of Ser. No. 311,368, Sep. 23, 1994, Pat. No. 5,495,788, which is a continuation of Ser. No. 91,332, Jul. 12, 1993, abandoned. This application Dec. 5, 1995, Ser. No. 567,325

Claims priority, application United Kingdom, Jul. 15, 1992, 9215052

Int. Cl.<sup>6</sup> F41A 5/36

U.S. Cl. 89—4.1

4 Claims



1. A gun comprising a power-operated breech mechanism and a drive device operative to actuate said breech mechanism, the drive device comprising:

- (i) a driving member;
- (ii) a driven member; and
- (iii) a first element and a second element wherein the second element is moveable relative to the first element between a first position at which the first and second elements abut, and a second position at which the first and second elements are spaced apart, the arrangement being such that the second element approaches and contacts the first element on returning to the first position, wherein
- (iv) the driving member is connected to the first element and the driven member is connected to the second element so that the driving member and the driven member are separable as the elements move between their first and second positions and reengageable as the elements move between their second and first positions;
- (v) the respective connections between said driving member and said first element and between said driven member and said second element permit when the driving and driven members are engaged, said driving and driven members to execute a rotary motion about an essential common axis; and
- (vi) energy is transferred to the driving member thereby to drive the driven member when the driving member and the driven member are engaged, wherein said energy transferred to the driving member is energy derived from movement of the second element from the first position to the second position.

5,771,773

## BRAKE APPARATUS HAVING AN IMPROVED BRAKE FEEL

Shigeru Sakamoto, Nishikamo-gun; Yoichi Kato, Toyota; Hiroshi Isono, Susono, and Yoshihide Sekiya, Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jun. 13, 1996, Ser. No. 661,799

Claims priority, application Japan, Jul. 17, 1995, 7-180358

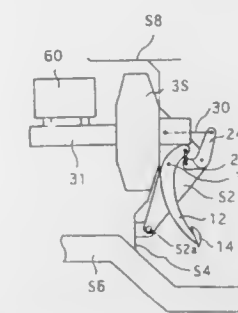
Int. Cl.<sup>6</sup> F15B 9/10

U.S. Cl. 91—369.2

11 Claims

1. A brake apparatus for a vehicle comprising a link mechanism and a power generating unit generating a hydraulic pressure to each wheel of said vehicle, said link mechanism comprising:

a brake pedal including a lever portion having a first end and a second end, a pedal provided on said first end, said lever



portion being pivotally supported at a pivot point between said first and second ends;

a pivot link having a first end and second end, said second end of said pivot link connected to a force transmission member connected to said power generating unit, said pivot link being pivotally supported at a pivot point between said first and second ends of said pivot link; and

a connection link having a first end and a second end, said first end of said connection link connected to said second end of said lever portion of said brake pedal, said second end of said connection link connected to said first end of said pivot link, wherein travel of said pedal of said brake pedal is transmitted to said force transmission member via said connection link so that a lever ratio of said link mechanism is changed while said pedal travels from an initial position to a stroke end position, said lever ratio defined as a ratio of a rate of change in movement of said pedal to a rate of change in movement of said force transmission member.

5,771,774

## SPRING BRAKE ACTUATOR HAVING PLASTIC PRESSURE PLATE ASSEMBLY

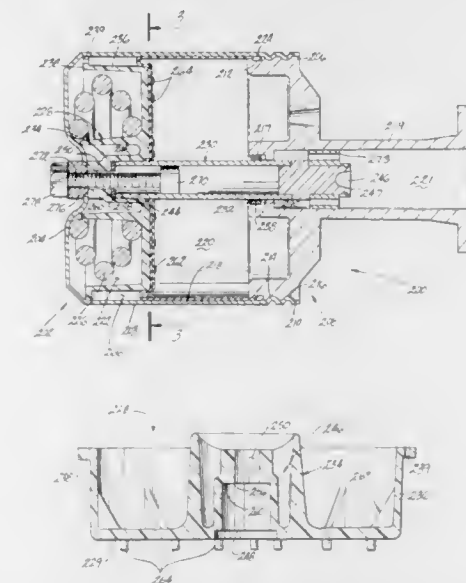
Steven M. Stojic, Holland, Mich., assignor to Nai Anchorlok, Inc., Muskegon, Mich.

Filed Oct. 9, 1996, Ser. No. 728,096

Int. Cl.<sup>6</sup> F01B 19/00

U.S. Cl. 92—98 D

19 Claims



1. In an air-operated diaphragm spring brake actuator comprising:

a housing having a first end wall and at another end a second end wall defining a push rod opening;

a movable diaphragm in the housing defining a spring chamber and a fluid pressure chamber, the diaphragm adapted to move between a retracted position and an actuation position;

a push rod connected to the diaphragm and extending through the push rod opening for actuating a brake in response to movement of the diaphragm between the retracted position and the actuation position;

a pressure plate mounted to the diaphragms distal to the push rod, and in the spring chamber; and

a compression spring mounted in the housing between the first end wall and the pressure plate;

the improvement which comprises:

the pressure plate comprising an integrally molded plastic body.

10. A method of making an air-operated diaphragm spring brake actuator comprising the steps of:

providing a housing having at one end an end wall and at another end an adapter wall defining a push rod opening;

installing a movable diaphragm in the housing to define a spring chamber and a fluid pressure chamber so that the diaphragm is adapted to move between a retracted position and an actuation position;

mounting a pressure plate to the diaphragm in the spring chamber;

connecting a push rod to the pressure plate so that it extends through the push rod opening for actuating a brake in response to movement of the diaphragm between the retracted position and the actuation position;

installing a compression spring in the housing between the end wall and the pressure plate to bias the diaphragm to the extended position;

the improvement which comprises:

integrally molding the pressure plate from a synthetic plastic material with a plurality of axially extending pins; and

the step of mounting a pressure plate to the diaphragm comprises the step of positioning the pins in openings in the diaphragm and inelastically deforming the pins to lock the pressure plate to the diaphragm.

5,771,775

## DEVICE FOR GUIDING A PISTON

Masaki Ota; Kazuya Kimura, and Hiroaki Kayukawa, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyota Jidoshokki Seisakusho, Kariya, Japan

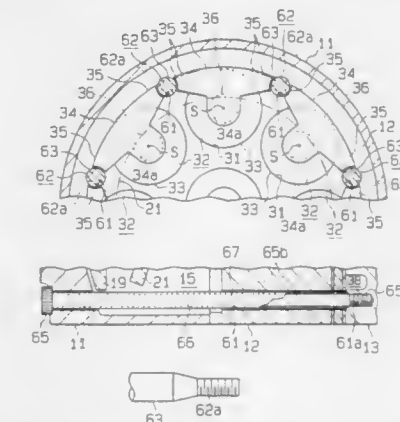
Filed Aug. 11, 1997, Ser. No. 909,045

Claims priority, application Japan, Aug. 9, 1996, 8-211626

Int. Cl.<sup>6</sup> F16J 15/18

U.S. Cl. 92—165 PR

23 Claims



1. A device for guiding a piston including bolt means for restricting rotation of the piston in a compressor, the compressor having a plurality of housing segments secured to one another by the bolt means to form a housing, the housing including a cylinder bore, wherein said piston reciprocally moves in the cylinder bore to compress gas, wherein said bolt means comprises:

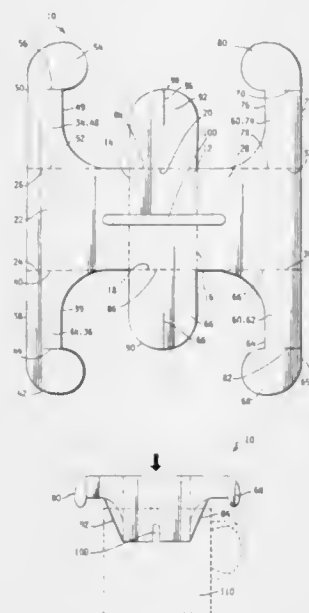
a contacting portion extending through at least two of the housing segments, wherein said piston abuts against the contacting portion when the piston rotates and wherein the rotation of the piston is restricted by such abutment;



a threaded portion to thread into at least one of the housing segments, wherein said contacting portion has a diameter greater than that of the threaded portion.

15. A device for guiding a piston for the compressor including a housing bolt assembly, the compressor including a front housing, a cylinder block and a rear housing, said housings and cylinder block being secured together by the bolt, said front housing and the cylinder block defining a crank chamber therebetween, said cylinder block including a cylinder bore, wherein a cam plate is supported on a drive shaft for integral rotation therewith in the crank chamber to convert rotation of the drive shaft to reciprocal movement of a piston in the cylinder bore, whereby the piston rotates about its axis in accordance with force transmitted from the cam plate and abuts against the bolt, wherein said bolt assembly comprises:

- a threaded portion for fastening the housings and the cylinder block together;
- a body portion extending through at least the crank chamber; and
- a sleeve fitted on the body portion to be abutted by the piston when the piston rotates, said sleeve having an outer diameter greater than that of the threaded portion.



5,771,776

## ENGINE PISTON AND METAL MOLD

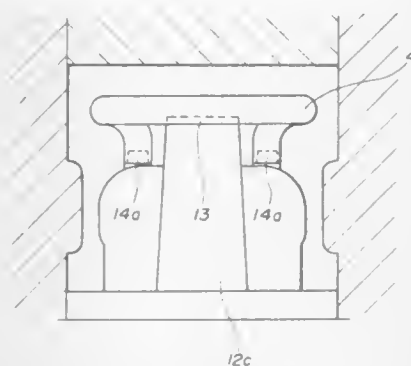
Hideki Itoh, Kanagawa, Japan, assignor to Unisla Jecs Corporation, Atsugi, Japan

Filed Apr. 17, 1997, Ser. No. 840,848

Int. Cl.<sup>6</sup> F01P 1/04

U.S. Cl. 92—186

11 Claims



1. An engine piston comprising:

- a main body comprising a piston head comprising a top surface; and
  - a cooling oil pipe which is inserted in the piston head of the main body;
- wherein the cooling oil pipe comprises an intermediate pipe segment and first and second extensions extending from the intermediate segment in a downward direction away from the top surface.

5,771,777

## DISPOSABLE BEVERAGE MAKER

George T. Davis, P.O. Box 8542, Mission Hills, Calif. 91346

Filed Feb. 7, 1997, Ser. No. 796,345

Int. Cl.<sup>6</sup> A47J 31/00

U.S. Cl. 99—323

19 Claims

1. A disposable beverage maker comprising a flat, insoluble, material having:

- a) a lower base having a first scored mark, a second scored mark, a third scored mark and a fourth scored mark;
- b) a first side wall extending outward from the first scored mark;
- c) a second side wall extending outward from the second scored mark;

d) a first handle that extends outward from each side of said first side wall and a second handle that extends outward from each side of said second side wall, wherein said first and second handles each have outward sections;

e) means for attaching the outward sections of said first and second handles;

f) a first stabilizing flap that abuts the third scored mark and a second stabilizing flap that abuts the fourth scored mark; and

g) an elongated slot located along said lower base, wherein when the outer sections of said first and second handles are attached and said first and second stabilizing flaps are folded upward, said beverage maker is configured to be placed into a container with the outward sections of said first and second handles extending over the top of said container, whereupon sequentially a beverage filter is placed into said beverage maker, a quantity of beverage grounds are placed into said beverage filter, and hot water is poured into said filter causing the water to interact with the beverage grounds which then allows the resulting beverage liquid to pass through the elongated slot into the container.

5,771,778

## MARKETING SYSTEM

John A. MacLean, IV, 380 N. Middle Rd., Belgium, Wis. 53004

Filed Oct. 15, 1996, Ser. No. 732,788

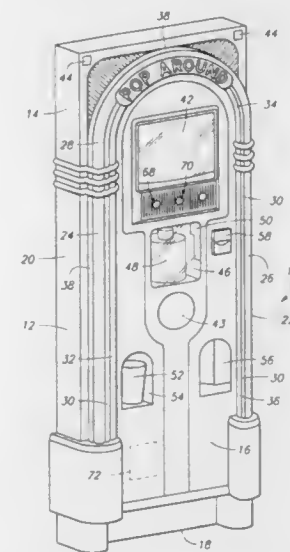
Int. Cl.<sup>6</sup> A23L 1/18

U.S. Cl. 99—323.6

20 Claims

1. A marketing apparatus comprising:

- a housing having a face including a bottom, having opposite edges including generally semi-tubular portions that are at least partially columnar, the opposite edges including upper ends, and the housing having a downwardly facing arcuate semi-tubular portion extending between the upper ends of the opposite edges;
- a display supported by the housing;
- an aromator supported by the housing and selectively emitting an aroma; and



a sensor supported by the housing and triggering the display in response to sensing presence of a person spaced apart from but proximate the housing.

5,771,779

## AUTOMATED CORN POPPING APPARATUS

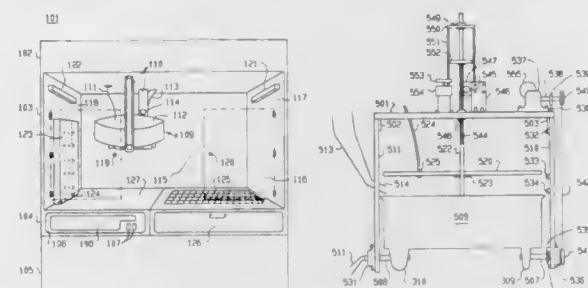
Andrew M. Stein, Floral Park; Andrew Jinks, Amityville, and Robert Murphy, Lindenhurst, all of N.Y., assignors to Six Corners Development, Inc., Amityville, N.Y.

Filed Oct. 9, 1996, Ser. No. 728,363

Int. Cl.<sup>6</sup> A23L 1/18

U.S. Cl. 99—323.7

29 Claims



1. A popcorn popping apparatus comprising:

- a kettle assembly for popping popcorn; the kettle assembly includes:
  - i. a kettle having a base member for holding the popcorn and an open top;
  - ii. an agitator assembly for agitating the popcorn, the agitator assembly rotationally mounted to the base member of the kettle;
  - iii. a lid having a first position in contact with the top of the kettle, and a second position spaced from the top of the kettle sufficient to permit rotation of the kettle between an operative position and a dumping position; and
  - iv. a motion mechanism for rotating the agitator assembly and vertically moving the lid, the motion mechanism being releasably coupled to the agitator assembly, so that when the lid is in the first position the motion mechanism engages and rotates the agitator assembly, upon the motion mechanism vertically moving the lid between the first position and the second position the motion mechanism disengages the agitator assembly;
- b. a display arrangement for the kettle assembly; and
- c. a support arrangement pivotally mounting the kettle assembly to the display arrangement.

5,771,780

## ELECTRIC TOASTER

Antonio Basora, and Julian Arnedo, both of Barcelona, Spain, assignors to Moulinex S.A., Paris, France

PCT No. PCT/FR96/00041, § 371 Date Aug. 28, 1997, § 102(e)

Date Aug. 28, 1997, PCT Pub. No. WO96/21386, PCT Pub.

Date Jul. 18, 1996

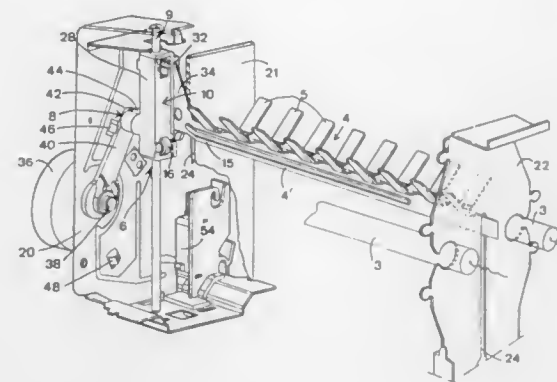
PCT Filed Jan. 11, 1996, Ser. No. 860,874

Claims priority, application France, Jan. 13, 1995, 95 00378

Int. Cl.<sup>6</sup> A47J 37/08

U.S. Cl. 99—327

9 Claims



1. Electric toaster comprising:

- a casing defining a toasting enclosure of parallelepipedal shape overall and having on a top face a slot for the insertion of slices of bread;
- at least one bread-carrier carriage mounted so as to move vertically on a guide device;
- a lowering and raising mechanism arranged between the casing and the toasting enclosure for lowering the carriage to a low toasting position situated at the bottom of the enclosure and for raising the carriage, after a previously fixed toasting period has elapsed, to a high extraction position for removal of toasted slices of bread;
- said guide device including a single sliding column having a slider movably mounted thereon, said carriage being attached only to the slider such that said carriage is cantilevered from said column; and said slider including at least two sliding devices having a lower coefficient of friction with the column and disposed substantially in the same vertical plane on each side of the column.

5,771,781

## ELECTRICAL DEEP-FRYER

John C. K. Sham, Hong Kong, Hong Kong, assignor to Pentalpha Enterprises Ltd., Aberdeen, Hong Kong

Filed Jul. 28, 1997, Ser. No. 901,526

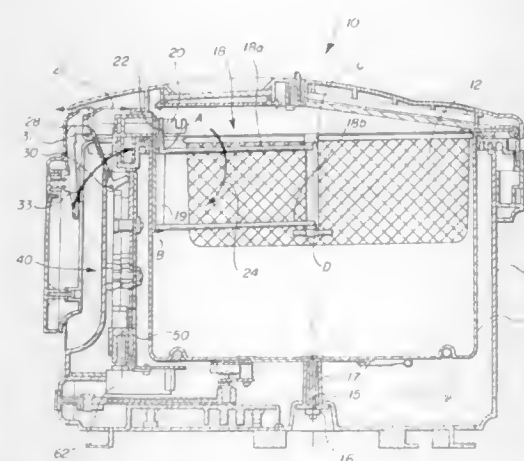
Int. Cl.<sup>6</sup> A47J 37/12

U.S. Cl. 99—336

24 Claims

1. A frying appliance that comprises a frying basket that is moveable between an upper, non-immersed, oil pan position and a lower, immersed, oil pan position, said frying appliance comprising:

- a housing supporting a moveable frying basket and a stationary oil pan disposed adjacent said frying basket, said oil pan having means for receiving and heating oil for frying food disposed in said frying basket;
- a translational mechanism connected to said frying basket for moving said frying basket between an upper, non-immersed, oil pan position to a lower, immersed, oil pan position, wherein said foods disposed in said frying basket are cooked in heated oil disposed in said oil pan, said translational mechanism allowing said frying basket to remain substantially horizontal during said movement between its upper and lower positions; and



drive means operatively connected to said translational mechanism for driving said translational mechanism between said upper, non-immersed, oil pan position to said lower, immersed, oil pan position.

5,771,782

## CONVERSION BROILER ASSEMBLY

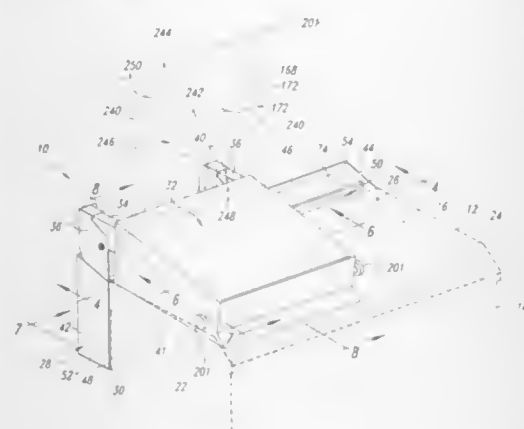
Bruce E. Taber, Bothell; Bradley Allen, Redmond; Michael Quiring, Seattle, and Bradley J. Miner, Bellevue, all of Wash., assignors to Lang Manufacturing Company, Everett, Wash.

Continuation of Ser. No. 712,583, Sep. 13, 1996, Pat. No. 5,676,046. This application Jul. 31, 1997, Ser. No. 904,077

Int. Cl.<sup>6</sup> A47J 37/06

U.S. Cl. 99—340

24 Claims



1. A conversion broiler assembly to adapt a single-sided cooking apparatus to a double-sided cooking apparatus, the single-sided cooking apparatus having an upwardly facing cooking surface with front and rear edge portions, the conversion broiler assembly comprising:

a rear housing mountable at the rear edge portion of the cooking apparatus, the rear housing having opposing first and second laterally spaced apart sidewalls and a rear wall extending between the first and second sidewalls and positioned to be spaced apart from the rear edge portion of the cooking apparatus, the rear wall defining with the first and second sidewalls an interior area;

first and second broiler support members connected to the rear housing and laterally spaced apart from each other;

a broiler attached to the first and second broiler support members, the broiler being movable relative to the rear housing between a lowered, cooking position over the cooking surface of the cooking apparatus when the conversion broiler assembly is mounted to the cooking apparatus and a raised, open position, the broiler having a heatable broiler surface position-

able above the cooking surface when the broiler is in the lowered, cooking position, the broiler and the first and second broiler support members defining a broiler exhaust opening adjacent to the broiler and between the first and second broiler support members, the broiling surface being useable to create a broiler exhaust and the interior area being positioned to receive the broiler exhaust; and

an exhaust separator extending between the first and second broiler support members and across the interior area, the exhaust separator being spaced apart from the rear wall of the rear housing and defining an exhaust passageway positioned to receive the broiler exhaust from the broiler exhaust opening, the exhaust separator being shaped and sized to direct the broiler exhaust upwardly through the exhaust passageway and form a layer of broiler exhaust with the exhaust separator being positioned between the rear wall and the layer of broiler exhaust.

5,771,783

## COOKWARE TOP

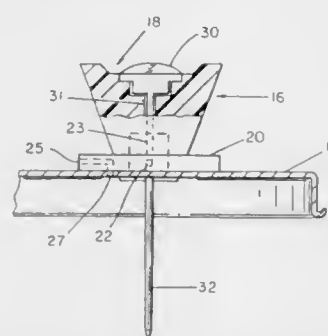
Tom Uss, 9675-A Main St., Fairfax, Va. 22031

Filed Sep. 22, 1995, Ser. No. 532,328

Int. Cl.<sup>6</sup> A47J 36/06

U.S. Cl. 99—343

3 Claims



1. A cookware lid comprising a handle knob having a base and an upstanding handle portion, a first aperture extending through said handle portion and said base, means to mount said handle knob to said cookware lid, said base having a second aperture mating with an aperture in said cookware lid where pressure built during the heating of a cookware will cause a whistling sound through said second aperture, said handle portion having a top surface with a molded depression receiving a thermometer having a probe which extends through said first aperture and an aligned opening in said cookware lid, said thermometer probe extends into a cookware to penetrate half way into a piece of food, where the internal temperature of the food is measured.

5,771,784

## PADDLE FOR BREAD-MAKING MACHINE

John C. K. Sham, Hong Kong, Hong Kong, assignor to Pentalpha Enterprises Ltd., Aberdeen, Hong Kong

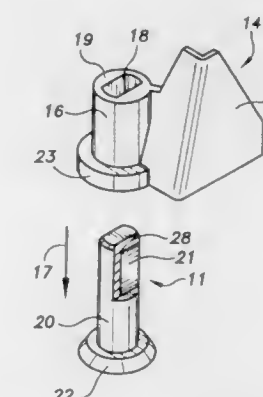
Filed Jul. 28, 1997, Ser. No. 901,176

Int. Cl.<sup>6</sup> A21D 2/00; 8/00; A47J 27/00; 37/00

U.S. Cl. 99—348

3 Claims

1. A kneading mechanism for making bread, comprising: a bucket for receiving bread dough to be kneaded and baked; a rotative drive-shaft disposed in said bucket for rotating a kneading paddle in order to knead said bread dough, said rotative drive-shaft having a generally rectangular, cross-sectional shape and a lip portion that is disposed on a top section of said rotative drive-shaft; and a kneading paddle having a kneading blade extending from a central, hollow, hub portion, said central, hollow, hub portion having a bore disposed therein for attaching said kneading



paddle to said rotative drive-shaft and a top face portion, said bore comprising a generally rectangular-shaped, cross-sectional hole, said bore loosely fitting about said drive shaft, so that when said rotative drive-shaft is initially actuated, said kneading paddle will be caused to shift with respect to said drive-shaft, and said generally rectangular, rotative drive-shaft will shift approximately 25° with respect to said rectangular-shaped hole, thereby causing said lip portion of said shaft to ride over said top face portion of said paddle, and become engageable therewith, so that said paddle will become vertically affixed to said rotative drive-shaft.

5,771,785

Patent Not Issued For This Number

5,771,786

## SYSTEM OF COOKING OR HEATING FOOD PRODUCTS WITH MICROWAVES AND HOT OIL

Jing-Yau Chung, 13310 Pebblebrook, Houston, Tex. 77079

PCT No. PCT/US95/10831, § 371 Date Aug. 28, 1995, § 102(e)

Date Aug. 28, 1995, PCT Pub. No. WO96/07299, PCT Pub.

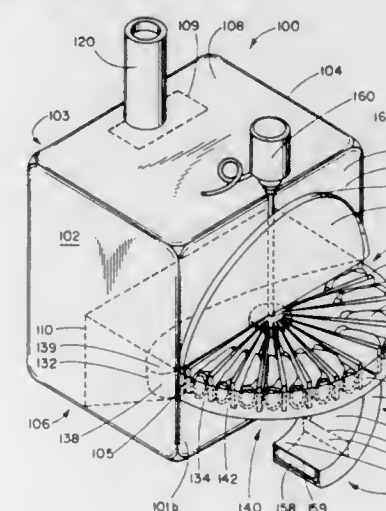
Date Mar. 7, 1996

PCT Filed Aug. 28, 1995, Ser. No. 507,464

Int. Cl.<sup>6</sup> A47J 37/12; H05B 6/80

U.S. Cl. 99—404

21 Claims



10. An apparatus for preparing a food product by heating, comprising:

an oven which defines an opening allowing access to the oven: a microwave source/receiver mounted in the oven;

a means for externally heating the food product mounted in the oven such that a heating medium heated by said means

for externally heating the food product will overlap a microwave field emitted by the microwave source/receiver; a means for moving the food product through the oven and hence through the heating medium, the microwave field, and out of the oven including an internal portion mounted inside the oven and an external portion mounted outside the oven;

said external portion of the means for moving the food product having a means for loading the food product and a means for removing the food product; and said oven having a gap for preventing the emission of the microwave field.

5,771,787

## CAKE CONTAINER AND ITS MANUFACTURING METHOD

Kunihiro Hirano, Gifu-ken, Japan, assignor to Hirano Shiki Co., Ltd., Gifu-ken, Japan

PCT No. PCT/JP95/02222, § 371 Date Jul. 9, 1996, § 102(e)

Date Jul. 9, 1996, PCT Pub. No. WO96/13978, PCT Pub.

Date May 17, 1996

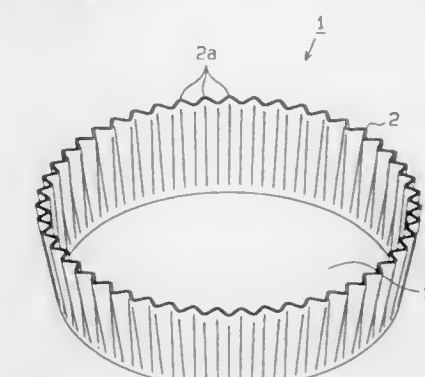
PCT Filed Jan. 31, 1995, Ser. No. 656,340

Claims priority, application Japan, Nov. 2, 1994, 6-269877; Oct. 19, 1995, 7-271367

Int. Cl.<sup>6</sup> A21D 8/06

U.S. Cl. 99—426

6 Claims



1. A cake container for containing a cake batter, wherein said cake batter is heated to swell in a predetermined shape to form a cake, said container comprising:

a bottom portion having a predetermined area and a plurality of through holes, said plurality of said through holes collectively having the predetermined area of said entire bottom portion; and

said container being made from: sheet of a material having a single layer, a layer of synthetic resin, and an adhesive layer adhering said resin layer to a surface of said sheet.

5,771,788

## FOOD STORAGE DEVICE EMPLOYING A THERMOELECTRIC ELEMENT AS A HEAT SOURCE AND SINK

Young-Gil Lee, Asan, and Suk-Jae Choi, Cheonan, both of Rep. of Korea, assignors to Mando Machinery Corp., Rep. of Korea

Filed Jul. 17, 1997, Ser. No. 896,044

Claims priority, application Rep. of Korea, Jul. 23, 1996, 96-29738

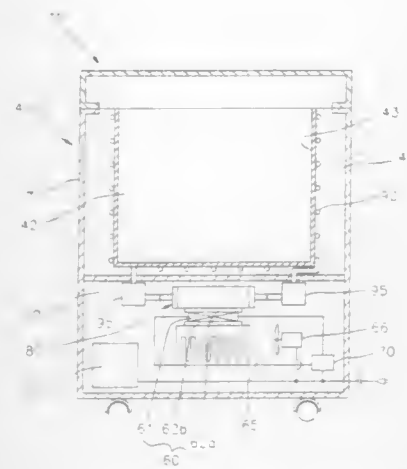
Int. Cl.<sup>6</sup> C12H 1/00

U.S. Cl. 99—468

7 Claims

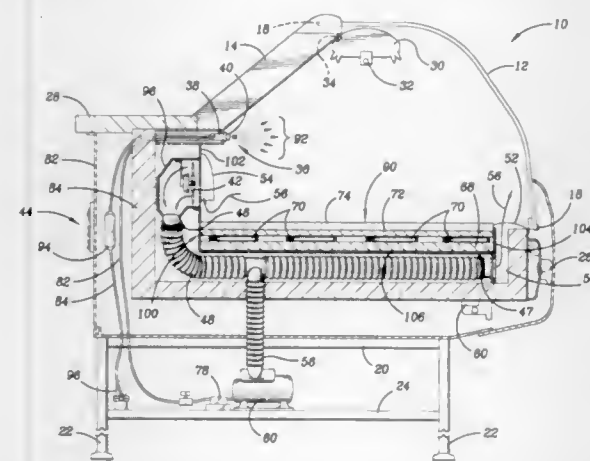
1. A food storage device provided with a food compartment within which the food is contained, the food storage device comprising:





a circulation tube for providing a fluid with a flow path arranged around the food compartment;  
a heat exchanger connected to both ends of the circulation tube to thereby form a closed flow path for the fluid together with the circulation tube;  
at least a pump mounted to one portion of the closed flow path so as to forcibly circulate the fluid along the closed flow path; and  
a thermoelectric element including a first heat transfer plate in thermal contact with said heat exchanger for heating the fluid in a fermenting mode of the food storage device and for cooling the fluid in a refrigerating mode of the food storage device, thermoelectric material and a second heat transfer plate opposed to the first heat transfer plate about the thermoelectric material to be in an external environment, the first and the second heat transfer plates adhering to the thermoelectric material, respectively.

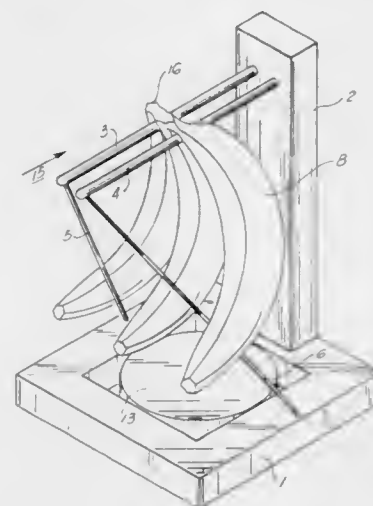
5,771,789  
**HEATED FOOD DISPLAY CASE WITH MOISTURIZING SPRAY NOZZLE**  
John C. Davis, Bethlehem, Pa., assignor to Arneg USA, Inc., Nazareth, Pa.  
Filed Aug. 20, 1997, Ser. No. 915,100  
Int. Cl.<sup>6</sup> A21B 1/00; A23L 1/00; F27D 1/00; A47J 27/00  
U.S. Cl. 99—468 10 Claims



1. A display case which heats and preserves diverse foodstuffs while allowing these foodstuffs to be clearly viewed comprising:  
a display window constructed from a thermally insulating transparent material;  
an outer housing having said display window mounted thereon;  
an inner housing disposed within said outer housing, said inner housing having a rear wall, a front wall and a base;

a primary food heating means disposed across the base of said inner housing;  
at least one air circulation means for recirculating warmed air to maintain a defogged condition on said display window located between said inner and said outer housings; and  
at least one spray nozzle for providing an atomized humidifying fluid stream to retain a pre-determined level of humidity within said display case; and  
control means for maintaining a heat/humidity balance within said display case so that foodstuffs contained therein are at ready to eat temperatures and consistency.

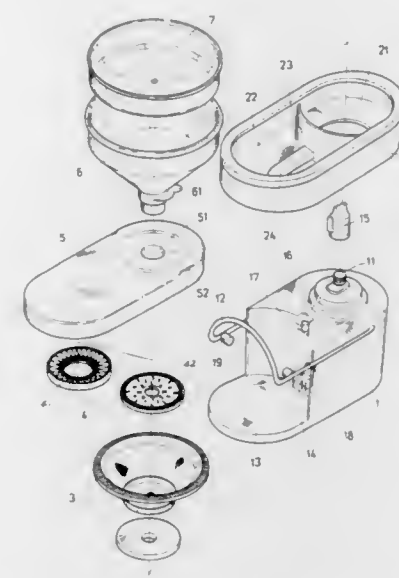
5,771,790  
**APPARATUS FOR DELAYING THE RIPENING OF FRUIT**  
Matthew Barrows, 2615 N. Causeway, Apt D77, Mandeville, La. 70471  
Filed Jul. 24, 1995, Ser. No. 506,065  
Int. Cl.<sup>6</sup> A23B 7/04; A23L 3/00; 3/36  
U.S. Cl. 99—476 15 Claims



1. An apparatus for delaying the ripening of a bunch of fruit, comprising:  
support means for supporting a bunch of fruit;  
spreader means associated with said support means, said spreader means for spreading said fruit;  
air flow means for directing a current of air through said spread fruit;  
a base having a top face, said base further supporting said air flow means, said base configured such that the current of air generated by said air flow means emanates from said top face of said base;  
wherein said support means is situated generally above said top face of said base.

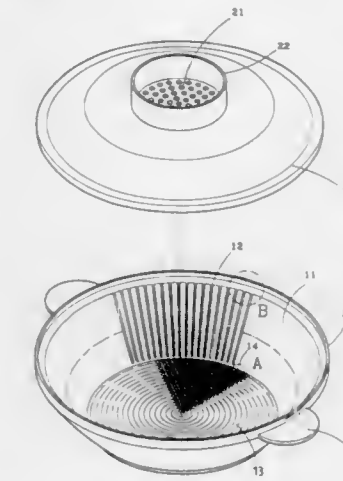
5,771,791  
**MULTIPURPOSE JUICE EXTRACTOR**  
Kuo-I Ling, 9F, No. 12, Alley 31, Che Lu To Street, and Rong-Yuan Tseng, 10F, No. 3, Lane 65, Chung Hsiao Rd., both of San Chong City, Taipei Hsien, Taiwan  
Filed Sep. 15, 1997, Ser. No. 929,401  
Int. Cl.<sup>6</sup> A23N 1/00; 1/02; A23L 1/212; 2/06  
U.S. Cl. 99—492 7 Claims

1. A multipurpose juice extractor, comprising:  
a motor base having a threaded spindle extended from a motor inside said motor base to project from a top of said motor base, said motor base also having a forward extended front seat with a power source socket provided at a low position of a side wall of said motor base adjacent said front seat, a safety button provided slightly above said socket, and a recess



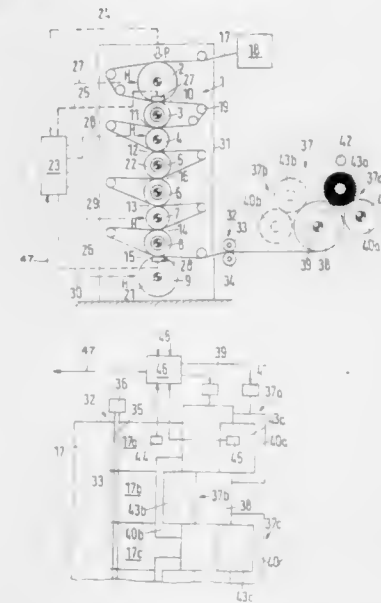
formed at a top edge of said side wall for a press button to mount therein; a generally U-shaped frame being pivotally connected at two free ends to two lateral sides of said motor base with two rotatable cylindrical shafts connected near two inner corners of said frame; and an internally threaded cap being screwed onto said threaded spindle;  
a lower chamber being located on said motor base and divided into a front and a rear compartment by a partition, said partition having a lower portion extending into said front compartment to form a juice outlet; said threaded spindle of said motor base upward projecting into said rear compartment;  
a filter being disposed about said threaded spindle in said rear compartment of the lower chamber, such that said filter rotates along with said threaded spindle when said motor is started;  
a grinding set including an upper grinding disc adhering to a bottom surface of an upper cover of said juice extractor and a lower grinding disc disposed in said filter and fixed about said threaded spindle by said internally threaded cap;  
an upper cover being covered over said lower chamber to close said lower chamber, a material inlet being formed on said upper cover corresponding to said rear compartment of said lower chamber and said upper grinding disc being adhered to a lower surface around said material inlet, two retaining recesses being separately formed on two lateral top edges of said upper cover to receive said two rotatable cylindrical shafts of said frame on said motor base when said frame is pulled upward to hold said upper cover, said lower chamber, and said motor base together;  
a feeding funnel being inserted into said material inlet on said upper cover for receiving material to be ground, said feeding funnel having an adjusting plate provided near a lower end thereof for adjusting an openness of said feeding funnel;  
a water funnel being disposed on said feeding funnel for controlling water amount poured into said feeding funnel during grinding a material; and  
a juice collector being disposed in said front seat of said motor base below said juice outlet for collecting juice extracted from material ground by said juice extractor, said juice collector including an outer cup for containing water therein and having a bottom provided with a built-in electric heating means and an inductive block provided on a wall near said bottom, an inner cup having a top flange for resting said inner cup on a top rim of said outer cup, and a cup cover having a centered juice inlet; said juice collector being so positioned in said front seat that said inductive block on said outer cup contacts with and induces said safety button on said motor base, said top flange of said inner cup being provided with air vents, and said cup cover being provided at one side with an extended pressing bar and at a lower surface of said juice inlet with a plunger to open or close said juice inlet.

5,771,792  
**FRUIT CLEANING DEVICE**  
Chen Tsung-Ming, 2F, No. 9, Alley 5, Lane 21, Wen Hwu St., Nei Hwu Dist., Taipei, Taiwan  
Filed Jul. 29, 1997, Ser. No. 902,267  
Int. Cl.<sup>6</sup> A47J 43/04; B01D 33/00; 29/85; B08B 3/02  
U.S. Cl. 99—536 5 Claims



1. A fruit cleaning device comprising a lid and a bowl and the improvements comprising:  
said bowl comprising a plural blades extending along the inner wall vertically and  
a plural scrapers bulging upward from the bottom inner surface;  
said lid comprising a plurality of small apertures in a barrel shaped handle on the center portion thereof.

5,771,793  
**CALENDER HAVING A CONTROL DEVICE**  
Franz Kayser, Geldern, Germany, assignor to Voith Sulzer Finishing GmbH, Krefeld, Germany  
Filed May 22, 1996, Ser. No. 651,262  
Claims priority, application Germany, May 24, 1995, 195 19 011.4  
Int. Cl.<sup>6</sup> D21G 1/02  
U.S. Cl. 100—47 23 Claims



1. A calender for treating a web of material comprising:  
at least two rollers forming a roller nip therebetween;  
a take-up device disposed downstream from said at least two rollers; and

1. An ink supply control device for a stencil printing machine which controls the supply of printing ink to an ink reservoir formed in a printing drum according to a signal produced from an ink amount detecting device which produces a first signal when the amount of ink stored in said ink reservoir is detected to be greater than a prescribed level, and a second signal when the amount of

# UMI



ink stored in said ink reservoir is detected to be less than said prescribed level, comprising:

an arithmetic computing device for computing a relative relationship between a time period during which said ink amount detecting device produces said first signal and a time period during which said ink amount detecting device produces said second signal;

an ink amount determining device for determining if the amount of ink in said ink reservoir is less than said prescribed level or not according to a result of said computing by said arithmetic computing device; and

an ink supply device for supplying printing ink to said ink reservoir when an output from said ink amount determining device indicates that the amount of ink in said ink reservoir is less than said prescribed level.

5,771,801

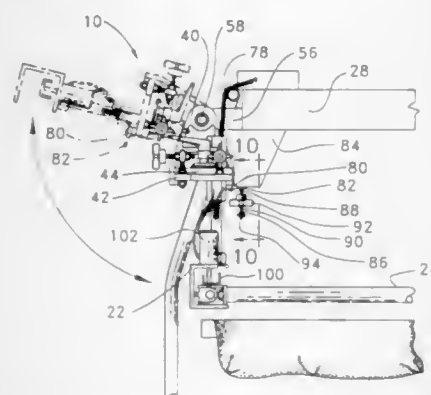
**FRONT HEAD FOR CAROUSEL SCREEN PRINTING MACHINE**

Don E. Newman, Wyncote, Pa., and Thomas A. McKeever, Maple Shade, N.J., assignors to Stretch Devices, Inc., Philadelphia, Pa.

Filed Oct. 25, 1995, Ser. No. 547,857  
Int. Cl.<sup>6</sup> B41F 15/36

U.S. Cl. 101—127.1

31 Claims



6. An apparatus for securing a screen printing frame in a printing machine comprising:

a beam extending along a longitudinal axis;

a mounting head located at an end of the beam, the mounting head having a channel for receiving the screen printing frame; the mounting head having a frame, the frame having an apex and a base, the apex of the frame being pivotably mounted to the beam for pivoting the mounting head between an open raised position in which the channel is retracted from the screen printing frame and a closed lowered position in which the channel is engageable with the screen printing frame;

a retainer for securing the frame in the lowered position;

a first plate carried by the base of the frame;

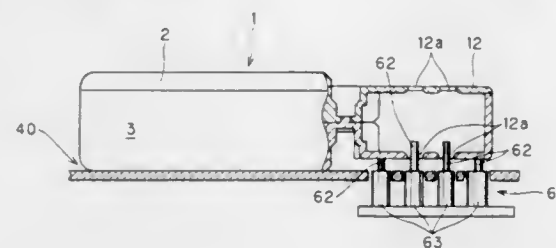
a second plate slideably located on the first plate;

a plurality of adjustment mechanisms for adjustably moving the second plate relative to the first plate; and  
the channel being carried by the second plate.

5,771,802

Patent Not Issued For This Number

5,771,803  
**TAPE CASSETTE HOUSING THERMALLY PERFORATED STENCIL PAPER**  
Hiroshi Takami, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan  
Filed Sep. 17, 1996, Ser. No. 714,811  
Claims priority, application Japan, Sep. 25, 1995, 7-246205  
Int. Cl.<sup>6</sup> B05C 17/06  
U.S. Cl. 101—128.21 10 Claims



1. A combination of a print device and cassettes used in the print device, comprising:

a tape cassette including:

a print tape; and

a print tape case housing the print tape and having a portion with a predetermined shape;  
a thermal stencil paper; and  
a stencil sheet case housing the thermal stencil paper and having a portion with the predetermined shape; and

a print device including:

a cassette mounting portion for detachably receiving the portions with the predetermined shape;

a thermal print means provided in the tape mounting portion for thermally printing characters and symbols on the print tape and thermally perforating characters and symbols in the thermal stencil paper;

a transport means for transporting the print tape in the tape cassette and the thermal stencil paper in the stencil sheet cassette;

a cassette identifying means for identifying which of the tape cassette and the stencil sheet cassette is mounted in the cassette mounting portion; and

means for applying energy to the thermal print means according to the identified one of the tape cassette and the stencil sheet cassette.

5,771,804

**DRIVE WITH RESISTER DEVICE FOR A PRINTING UNIT OF A ROTARY PRINTING MACHINE**

Peter Knauer, Münster/Lech, and Josef Singler, Augsburg, both of Germany, assignors to MAN Roland Druckmaschinen AG, Offenbach AM Main, Germany

Filed Apr. 3, 1997, Ser. No. 833,077

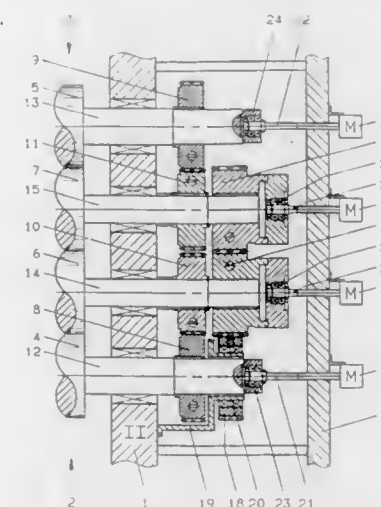
Claims priority, application Germany, Apr. 12, 1996, 196 14 397.7

Int. Cl.<sup>6</sup> B41F 5/00

U.S. Cl. 101—183

9 Claims

1. In a printing unit of a rotary printing machine having a sidewall and two printing groups, each of which printing groups contains a form cylinder and a transfer cylinder, the transfer cylinders of which are positionable across from one another to print on both sides of a web passed between them, the transfer cylinders and the form cylinders having journals, a drive and register device, comprising: helical gears attached in non-rotatable fashion to the journals of the transfer cylinders and in drive connection with one another; straight spur gears mounted on the journals of the form cylinders and the transfer cylinders, the spur gears of the transfer cylinder and the form cylinder of each printing group being drivingly connected; a further spur gear in driving connection with the helical gear of one of the transfer cylinders; means, acting upon each form cylinder, for axially moving the



form cylinder for lateral register adjustment, the helical gears being slidably arranged on the journals of the transfer cylinders so as to be axially moveable; and means for axially moving the helical gears on the transfer cylinder journals for adjusting circumferential register.

5,771,805

**ROTATING PRINTING MACHINE**

Jose Branas, Rue, and Daniel Rota, Lausanne, both of Switzerland, assignors to Bobat SA, Lausanne, Switzerland

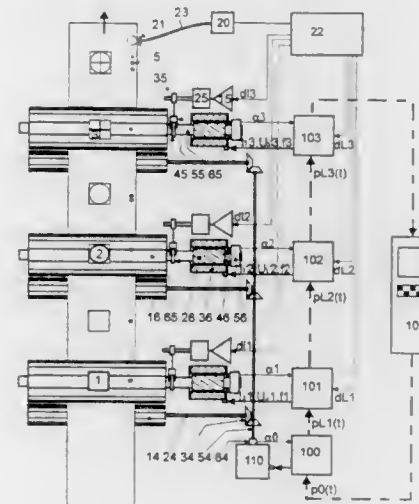
Filed Feb. 7, 1997, Ser. No. 797,568

Claims priority, application Switzerland, Feb. 9, 1996, 00334/96

Int. Cl.<sup>6</sup> B41J 13/14

U.S. Cl. 101—248

8 Claims



1. In a rotating printing machine having a plurality of printing stations, each station having a printing form cylinder being driven directly by an asynchronous vectorial electric motor being controlled by an electronic circuit means for monitoring and controlling the angular position of the cylinder at a command value that changes over time and is received from the central electronic calculating station for the synchronization of each station with another, each of the printing form cylinder axes being fixed in common with the axle of the rotor of its respective motor, the improvements comprising the common axle of the cylinder and rotor assembly of each station being moved in axial translation for the correction of the lateral registry of the printing form of the cylinder, the machine having means for reading the registration marks printed by each station and establishing the possible lateral and longitudinal registration errors for each station, each lateral

error being applied to the electronic circuit means of the electrical motor of the corresponding station which controls by means of a mechanism, the axial position of the common axle of the rotor and cylindrical assembly and each of the longitudinal registration errors being added directly to the cylinder position command of the corresponding station, and the machine including an angular encoder for each common axle, means for mounting the encoder at one end of each common axle in order to generate a signal representing an angular position of the axle, which signal is applied in a feedback loop of the monitoring control circuit of the corresponding asynchronous motor, the means for mounting providing an angular rigidity but permitting the encoder to follow the axle displacement of the axle, said means for mounting the encoder comprising a plurality of lamella in the form of parallel coaxial extending collars, said collars being connected to one another by diametric pairs of mounting devices which are arranged so that the pair between two lamella are oriented 90° to the next pair between the next adjacent lamella.

5,771,806

**STAMP WITH RESILIENT FRAME**

Teruo Imamaki, Kasugai, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

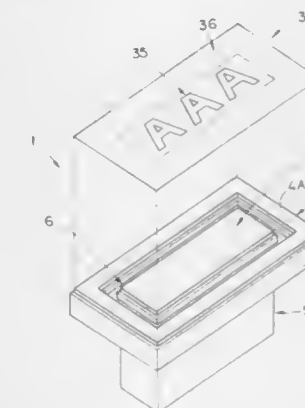
Filed Nov. 12, 1996, Ser. No. 747,386

Claims priority, application Japan, Nov. 20, 1995, 7-325112

Int. Cl.<sup>6</sup> B41K 1/42

U.S. Cl. 101—333

15 Claims



1. A stamp for forming an image on a recording medium comprising:

a supporting member having a supporting surface with a peripheral edge;

an ink impregnable member disposed on the supporting surface of the supporting member;

an elastic frame disposed on the peripheral edge of the supporting surface of the supporting member surrounding the ink impregnable member, the supporting member having a groove formed in the surface thereof at the peripheral edge in which the frame is received; and

a stamp surface member having an ink permeable portion and an ink impermeable portion forming an image pattern therein, the stamp surface member being secured to the elastic frame over the ink impregnable member.

5,771,807

**REUSABLE MANDREL FOR USE IN A PRINTING PRESS**  
James R. Moss, Satellite Beach, Fla., assignor to Presstek, Inc., Hudson, N.H.

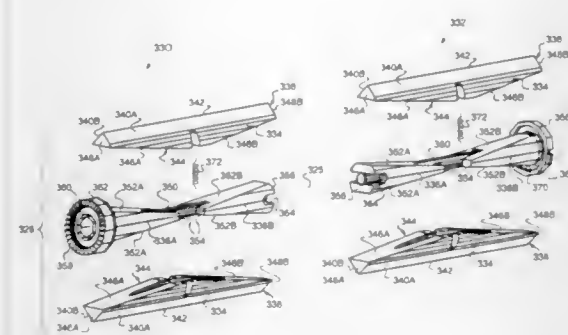
Filed Nov. 13, 1996, Ser. No. 748,597

Int. Cl.<sup>6</sup> B41F 13/10; 1/28; B23B 5/22

U.S. Cl. 101—375

22 Claims

22. A plate cylinder having an interior and an exterior surface, the plate cylinder comprising:



means for accepting a pair of mandrels in the interior, each mandrel having a diameter; and  
means for facilitating passage of a plate material from one mandrel around at least a portion of the exterior surface of the plate cylinder to the other mandrel;  
wherein at least one mandrel is capable of being operably coupled to a rotational drive and comprises:  
an outer surface having a quantity of plate material rolled therearound;  
means for accepting and securing the plate material to the at least one mandrel;  
means for operably engaging the rotational drive, such that activation of the rotational drive causes the at least one mandrel to accept additional plate material; and  
means for allowing removal of the quantity of plate material from the at least one mandrel in an axial direction, including means to vary the diameter of the at least one mandrel.

5,771,808

#### STAMP MATERIAL, STAMP MAKING METHOD USING THE STAMP MATERIAL AND STAMP MANUFACTURED BY THE STAMP MAKING METHOD

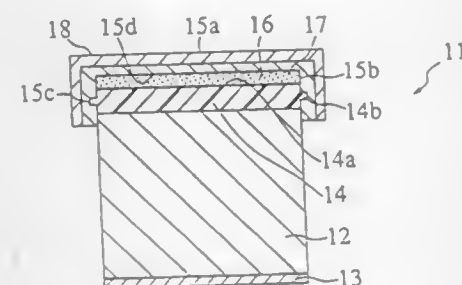
Hiroshi Kuriyama, and Youichi Kodaira, both of Nagano-ken, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan  
PCT No. PCT/JP95/02373, § 371 Date Nov. 12, 1996, § 102(e)  
Date Nov. 12, 1996, PCT Pub. No. WO96/15909, PCT Pub. Date May 30, 1996

PCT Filed Nov. 21, 1995, Ser. No. 682,749

Claims priority, application Japan, Nov. 24, 1994, 6-289424  
Int. Cl.<sup>6</sup> B41K 1/34

U.S. Cl. 101—401.1

33 Claims



1. A stamp material comprising:

- a face of a seal forming member having a liquid photosensitive resin which is changeable to a solid in response to a received light;
- a cover member including a light transmitting member detachably attached to said stamp stock; and
- a stamp stock for holding said face of a seal forming member.

#### 5,771,809 METHOD OF MAKING A COATING PLATE WITH RAISED PRINTING AREAS

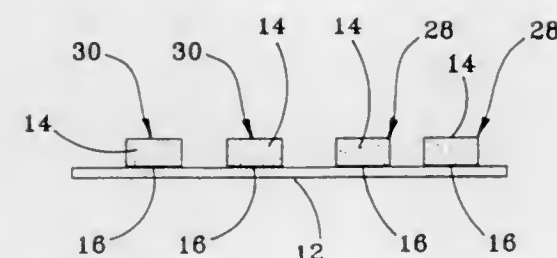
Myer H. Hecht, 1429 Central Ave., Deerfield, Ill. 60015

Filed Oct. 18, 1996, Ser. No. 734,625

Int. Cl.<sup>6</sup> B41C 1/02

U.S. Cl. 101—401.1

13 Claims



1. A method for processing a coating plate (10) to provide a pattern of areas on the surface thereof, adapted to provide a coating of a liquid coating material on selected areas of a sheet of printed material, said coating plate (10) comprising, a carrier sheet (12) formed of a strong, flexible, light-transmitting polymeric material, and an applicator sheet (14) releasably affixed to said carrier sheet (12) by means of an adhesive (16), said applicator sheet (14) being formed of a flexible light-transmitting polymeric material, at least an outer surface of said applicator sheet (14) having a surface energy sufficiently great to accept a sufficient amount of said coating material on its surface, and to transfer the coating material on select areas of the surface of said printed material during the coating process, said method comprising:

- providing a pattern (26) having indicia (22)(24) thereon delineating the selected areas of the printed material to be coated, positioning said pattern (26) with said pattern (26) engaging the carrier sheet (12) of said coating plate (10) so that said indicia (22)(24) can be viewed through said coating plate (10), cutting through said applicator sheet (14) in conformity with the indicia (22)(24) of said pattern outlining the selected areas of said printed material to be coated, and, lifting off the areas of said applicator sheet (14) surrounding the selected areas indicated by said indicia (22)(24) to be coated, whereby a processed coating plate (10) is produced having upstanding areas (28)(30) representing the selected areas of the printed material to be coated.

5,771,810

#### CONTINUOUS TONE MICROFLUIDIC DISPLAY AND PRINTING

Dana W. Wolcott, Honeoye Falls, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 25, 1997, Ser. No. 882,620

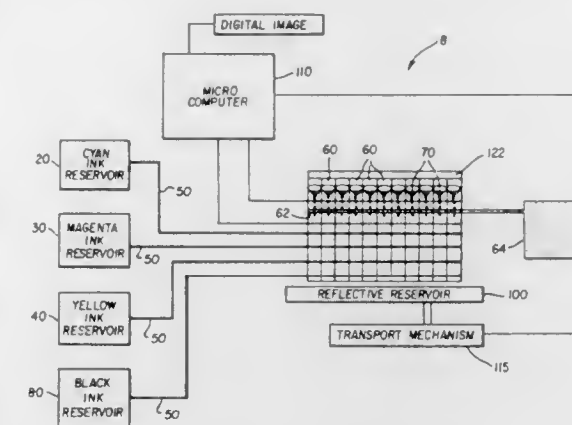
Int. Cl.<sup>6</sup> B41J 13/02; 2/165

U.S. Cl. 101—483

6 Claims

1. A method for microfluidic display and printing comprises the steps of:

- (a) providing colored inks needed for printing colored pixels;
- (b) pumping the colored inks through capillary microchannels into delivery chambers where the colored inks are mixed to provide a desired color for each pixel, having the correct hue and tone scale;
- (c) arranging the delivery chambers so as to provide a viewable representation of the image prior to printing; and



(d) evacuating the delivery chambers when it is not desired to print an image and moving a receiver into engagement with the delivery chambers when it is desired to print an image for transferring colored ink to a reflective receiver to thereby form an image having colored pixels.

5,771,811

#### PRE-REGISTRATION SYSTEM FOR A PRINTING PRESS

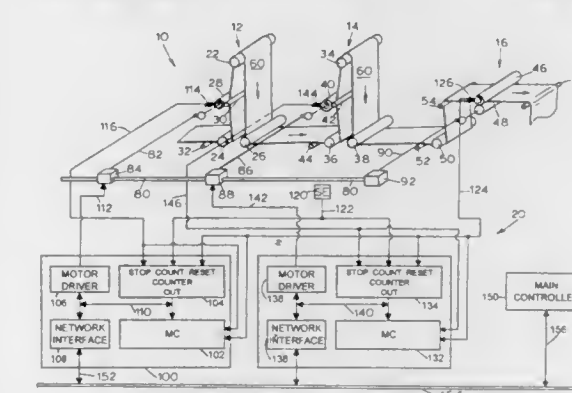
Steven J. Siler, Cary; Scott T. Hilkert, Skokie, and Jeffrey C. Petrin, Arlington Heights, all of Ill., assignors to Hurlertron, Incorporated, Danville, Ill.

Filed Oct. 10, 1996, Ser. No. 728,203

Int. Cl.<sup>6</sup> B41F 13/24

U.S. Cl. 101—486

24 Claims



1. A printing press, comprising:

- a die cut cylinder having a circumference and being adapted to form a cut in a web, said die cut cylinder having a raised cutting edge and a reference mark;
- a first rotatable printing cylinder adapted to print an image on said web, said first printing cylinder being spaced from said die cut cylinder by a first web distance, said first printing cylinder having a circumference substantially the same as said circumference of said die cut cylinder, said first printing cylinder having a printing layer disposed thereon and a cylinder reference mark, said printing layer having a layer a reference mark and being disposed on said first printing cylinder so that said layer reference mark is in a predetermined alignment relative to said cylinder reference mark;
- a second rotatable printing cylinder adapted to print an image on said web, said second printing cylinder being spaced from said die cut cylinder by a second web distance, said second printing cylinder having a circumference substantially the same as said circumference of said die cut cylinder, said second printing cylinder having a printing layer disposed thereon and a cylinder reference mark, said printing layer disposed on said second printing cylinder having a layer reference mark and being positioned on said second printing cylinder so that said layer reference mark of said printing layer disposed on said second printing cylinder is in a pre-

terminated alignment relative to said cylinder reference mark of said second printing cylinder;

- a first detector for detecting an angular position of said first printing cylinder by sensing when said reference mark disposed on said first printing cylinder is in a predetermined angular position;
- a second detector for detecting an angular position of said second printing cylinder by sensing when said reference mark of said second printing cylinder is in a predetermined angular position;
- a third detector for detecting an angular position of said die cut cylinder by sensing when said reference mark of said die cut cylinder is in a predetermined angular position;
- means for automatically adjusting said angular position of said first printing cylinder relative to said angular position of said die cut cylinder based on said circumference, said first web distance, and said angular positions of said die cut cylinder and said first printing cylinder; and
- means for automatically adjusting said angular position of said second printing cylinder relative to said angular position of said die cut cylinder based on said circumference, said second web distance, and said angular positions of said die cut cylinder and said second printing cylinder.

5,771,812

#### ARTICULATED GANGWAY

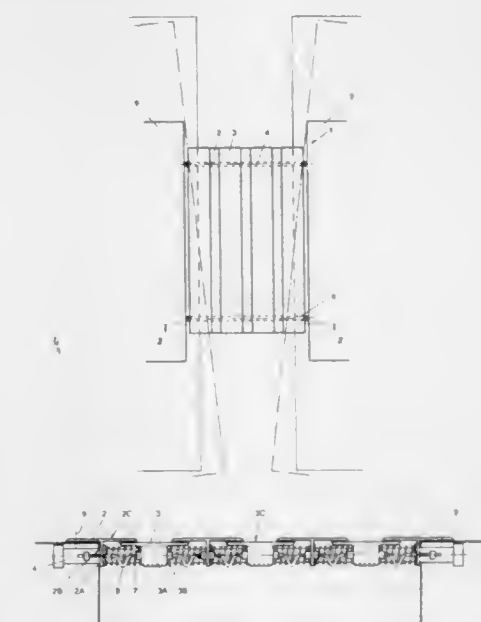
Ingo Britzke, Kassel, Germany, assignor to Hubner Gummi-Und Kunststoff GmbH, Kassel, Germany

Filed Nov. 27, 1996, Ser. No. 757,836

Int. Cl.<sup>6</sup> B61D 49/00

U.S. Cl. 105—458

9 Claims



1. An articulated gangway of a corridor between two vehicles hinged to each other, said gangway comprising at least two stepping and gliding members which overlap each other, said stepping and gliding members being slidably supported for movement relative to each other on common support members (4), the stepping and gliding members (2, 3) being arranged for movements in a direction parallel to the longitudinal axes of the supporting members (4), the support members (4) being held by the vehicles, and the stepping and sliding members (2) being located on the support members (4) and propped up against each other by coiled spring elements surrounding each one of said support elements (4).



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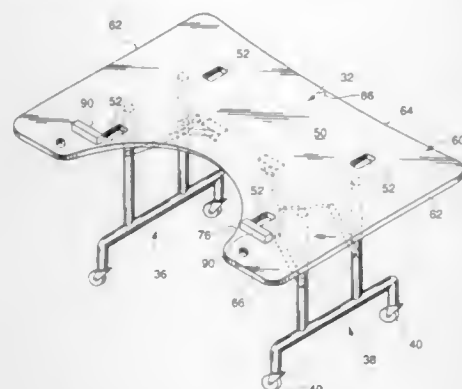
1998

UMI

5,771,813  
UTILITY TABLE FOR REMOVING, STORING AND  
INSTALLING VEHICLE SEAT  
Prentice R. Jackson, 360 Cypress Creek Cir., Oldsmar, Fla.  
34677

Filed Dec. 26, 1996, Ser. No. 773,388  
Int. Cl.<sup>6</sup> A47B 83/00  
U.S. Cl. 108—50.011

12 Claims



1. A table for conveying a seat to and from the floor of a van-type or sports-utility vehicle through a door of the vehicle, said seat being detachably connected to the floor of the vehicle in an operative position and having rollers for facilitating moving of the seat between an operative position on the vehicle floor and the door of the vehicle, comprising

a table top having upper and lower surfaces and front and rear edges,

a leg assembly attached to the lower surface of the table top for supporting the top with its upper surface essentially co-planar with the floor of the vehicle on which the seat rests, said leg assembly having casters for rolling the table toward and away from the vehicle,

said front edge of the table top conforming in shape to a edge of a floor of a vehicle at a door so that the table can be positioned immediately adjacent the floor, and the seat can be rolled onto the upper surface of the table top,

and anchoring devices in the upper surface for engaging the seat to hold the seat in a fixed position on the table top.

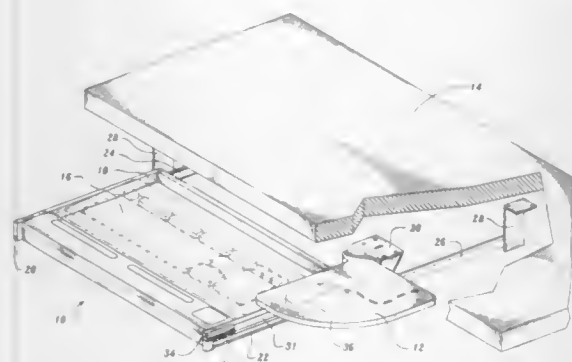
5,771,814  
KEYBOARD TRAY INCLUDING RETRACTABLE MOUSE  
TRAY

Eivind Clausen, Bellingham, Wash., assignor to Allsop, Inc.,  
Bellingham, Wash.

Continuation of Ser. No. 339,327, Nov. 14, 1994, abandoned.  
This application May 19, 1997, Ser. No. 858,294

Int. Cl.<sup>6</sup> A47B 57/00  
U.S. Cl. 108—93

17 Claims



1. An apparatus for attaching to a structure, said apparatus comprising:

(a) a mounting bracket for attaching to a structure;

(b) a retractable bracket slidably mounted to said bracket, said drawer defining a front edge behind which the drawer is capable of fully retracting;

(c) a rail attached to said drawer; and

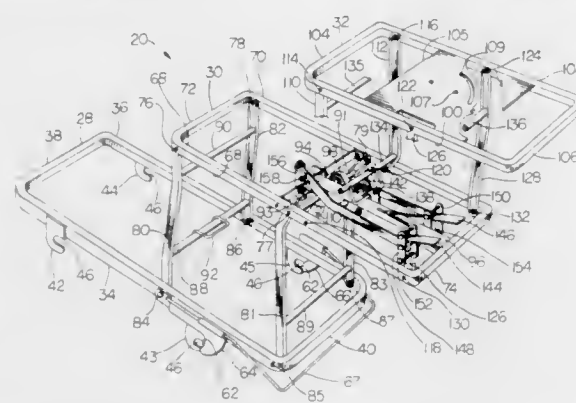
(d) a tray including: (i) means for engaging said rail and (ii) an eccentrically positioned pivotal mount attached to said tray, said means for engaging including means for pivoting said tray about said eccentrically positioned pivotal mount when said drawer is moved forwardly or rearwardly relative to said bracket between a first position in which said drawer, said tray and said eccentrically positioned pivotal mount are substantially maintained behind said front edge of said drawer and a second position in which the eccentrically positioned pivotal mount remains behind said front edge of said drawer, at least a portion of said drawer is pulled forward of said front edge, and a substantial portion of the tray is swung outward to extend past said front edge of said structure.

5,771,815  
COLLAPSIBLE TABLE FOR MOTOR VEHICLE  
William B. Leftwich, Elkhart, Ind., assignor to Glaval Corporation, Elkhart, Ind.

Filed Dec. 24, 1996, Ser. No. 773,653  
Int. Cl.<sup>6</sup> A47B 57/00

U.S. Cl. 108—99

30 Claims



1. Collapsible table for a motor vehicle, comprising:

a lower frame;

an intermediate frame pivotally attached to said lower frame,

said intermediate frame being shiftable between a folded position parallel and adjacent to said lower frame and an extended position parallel and spaced from said lower frame;

an upper frame pivotally attached to said intermediate frame, said upper frame being shiftable between a folded position parallel and adjacent to said intermediate frame and an extended position parallel and spaced from said intermediate frame;

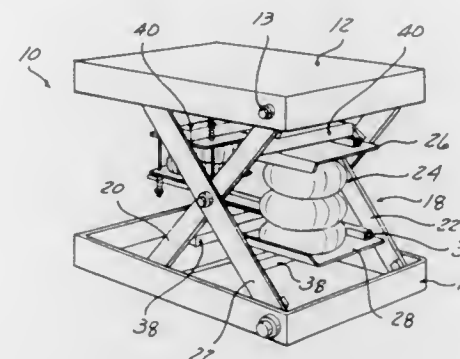
latch means for locking the support surface carried by said upper frame in a lower position, an intermediate position, a raised position, said latch means including means for locking said intermediate frame in the folded position and in the extended position and for locking said upper frame in the folded position and in the extended position.

5,771,816  
LIFT TABLE  
James Zaguroli, Jr., Drayton Plains, Mich., assignor to Knight Industries, Inc., Auburn Hills, Mich.

Filed Oct. 26, 1994, Ser. No. 329,219  
Int. Cl.<sup>6</sup> A47B 9/00

U.S. Cl. 108—147

8 Claims



1. A lift table for supporting a number of load items at a variable height comprising:

a generally planar load platform adapted to receive load items thereon;

a base;

support means supporting said load platform above said base for up and down movement;

said support means including a main air spring containing a volume of compressed air and bearing the weight of said platform and load items to cause said platform to move downwardly on said base with increasing total weight of said load items; and,

an auxiliary expandable reservoir in fluid communication with said main air spring and containing an air volume connected to said main air spring air volume, said auxiliary reservoir expandable under pressure but not bearing the weight of said platform or load items so that said auxiliary reservoir is not compressed thereby;

whereby a compressibility of said main air spring corresponds to a total air volume of said main air spring and said auxiliary air reservoir, but only the main air spring is compressed by the weight of said platform and load items.

5,771,817  
RECOVERY BOILER  
Lars Olausson, Angered; Jan Bergman, Mölnlycke; Sven-Erik Jansson, Göteborg, and Agneta Larsson, Västra Frölunda, all of Sweden, assignors to Kvaerner Pulp AB, Sweden  
PCT No. PCT/SE95/00562, § 371 Date Dec. 17, 1996, § 102(c)  
Date Dec. 17, 1996, PCT Pub. No. WO95/35409, PCT Pub. Date Dec. 28, 1995

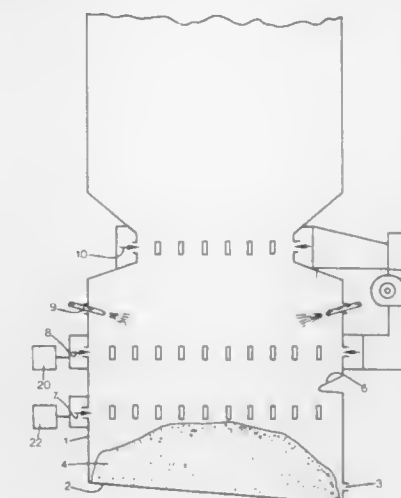
PCT Filed May 18, 1995, Ser. No. 750,880  
Claims priority, application Sweden, Jun. 20, 1994,  
9402152.4

Int. Cl.<sup>6</sup> F23G 7/04  
U.S. Cl. 110—238

14 Claims

1. A method for combusting spent liquor from cellulose in a recovery boiler while at the same time recovering chemicals therefrom, the method comprises the steps of:

providing a recovery boiler having a level section having a first opening defined therein, the recovery boiler having a second opening defined therein disposed below the first opening, the recovery boiler having a constricted section having a third opening defined therein that is positioned above the first opening, the recovery boiler having a longitudinal axis and



providing the recovery boiler with an inwardly protruding member that is attached to an inner wall of the recovery boiler;

providing gases in the recovery boiler;

blowing in combustion air as primary and secondary air into the second opening so that the secondary air is rotated about the longitudinal axis of the recovery boiler in a first direction within the recovery boiler and the secondary air and the gases are arisen along the longitudinal axis of the recovery boiler;

injecting liquor into the first opening;  
while injecting liquor, injecting tertiary air into the third opening at the constricted section and causing the tertiary air to rotate in a second direction, the second direction being opposite the first direction; and

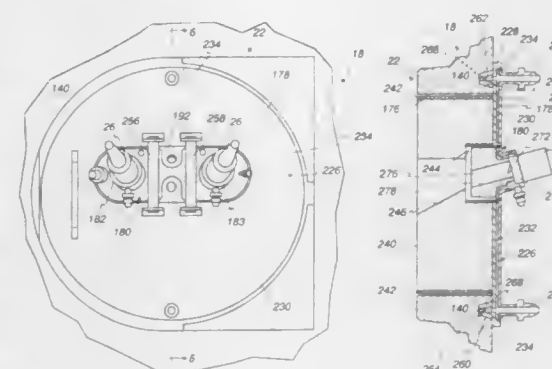
while blowing in secondary air into the secondary opening, permitting gases to arise along the longitudinal axis of the recovery boiler through the constricted section.

5,771,818  
COOLING SYSTEM FOR WASTE DISPOSAL DEVICE  
Shuji Tada, Higashimatsuyama, and Jun Aoki, Misato, both of Japan, assignors to Prometron Technics Co., Ltd., Tokyo, Japan

Filed May 20, 1996, Ser. No. 650,297  
Int. Cl.<sup>6</sup> F23G 5/00

U.S. Cl. 110—250

21 Claims



17. A torch assembly to be mounted to a wall structure on a waste disposal device, said torch assembly comprising:

a base plate;

a torch holder on the base plate having a seat for a torch;

first means for circulating a cooling liquid in heat exchange relationship with at least one of the base plate and torch

holder independently of a wall structure on a waste disposal device and with there being no torch in the torch holder seat; and  
second means on the torch assembly for cooperating with a wall structure for a waste disposal device for maintaining the torch assembly in an operative position on a wall structure on a waste disposal device.

5,771,819

## INCINERATING FURNACE

Shigeru Saitoh, 169, Dai, Obamamachi, Iwaki-shi, Fukushima 974, Japan

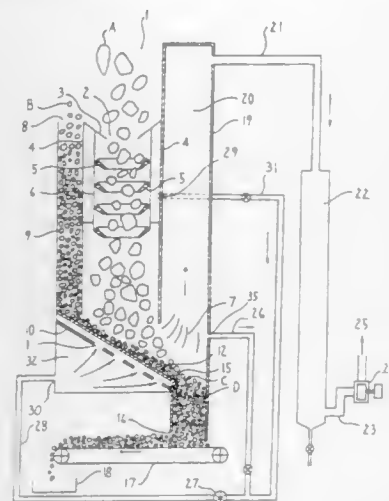
PCT No. PCT/JP96/00793, § 371 Date Nov. 26, 1996, § 102(e) Date Nov. 26, 1996, PCT Pub. No. WO96/30699, PCT Pub. Date Oct. 3, 1996

PCT Filed Mar. 27, 1996, Ser. No. 750,446

Claims priority, application Japan, Mar. 27, 1995, 7-091986 Int. Cl.<sup>6</sup> F23K 3/00

U.S. Cl. 110—267

3 Claims



1. A hearth particle bed incinerating furnace comprising a hopper for introducing materials to be incinerated; means for preventing upward backflow of combustion exhaust gas comprising the hopper, at least one baffle provided underneath the hopper, a combustion air inlet and a sidewall member provided underneath the hopper; a furnace sidewall extending around and underneath the sidewall member; a hearth particle inlet comprising a chamber formed between the furnace sidewall and a furnace outer wall; an inclined channel member attached to the furnace outer wall and provided underneath the hearth particle inlet; a sloped hearth bed formed on the inclined channel member, said sloped hearth bed comprising a layer of hearth particles which flow down the inclined channel member without being fluidized and at an angle approximately equal to the angle of repose of the hearth particles; a combustion chamber comprising the sloped hearth bed, a lower portion of the furnace outer wall and a lower portion of the furnace side wall; a furnace outlet provided underneath the combustion chamber for discharging a combustion mixture of burnt residue and hearth particles from the combustion chamber; means for removing a portion of the combustion exhaust gas from the combustion chamber; means for removing the remainder of the combustion exhaust gas provided at an upper portion of the combustion chamber; means for removing combustion air through the combustion air inlet; means for forming a mixed gas of the portion of the combustion gas and combustion air; means for introducing the mixed gas into the lower hearth bed for combustion; a movable plane member provided underneath the furnace outlet for removing the combustion mixture and means for regulating the discharge of the combustion mixture so that the combustion mixture deposits on the movable plane member at an angle approximately equal to the angle of repose of the hearth particles.

5,771,820

## METHOD FOR THE THERMAL TREATMENT OF WASTE MATERIAL, PARTICULARLY REFUSE, AND A ROTARY TUBULAR FURNACE FOR APPLYING THE METHOD

Hans Ruegg, Wohlen, Switzerland, assignor to Von Roll Umwelttechnik AG, Zurich, Switzerland

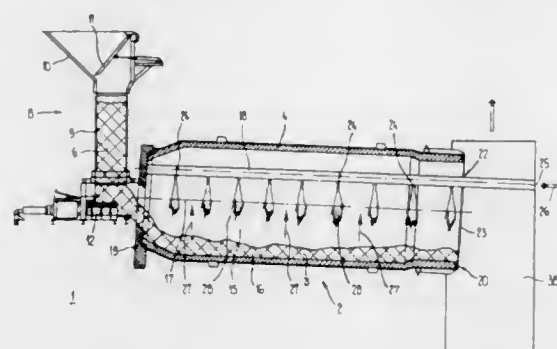
Filed Sep. 28, 1995, Ser. No. 535,907

Claims priority, application Switzerland, Sep. 29, 1994, 02 946/94

Int. Cl.<sup>6</sup> F23G 5/20

U.S. Cl. 110—346

21 Claims



1. A method for a thermal treatment of waste material, the method comprising the steps of:  
conveying and mixing a waste material through a combustion chamber which is in the form of a rotary drum of a rotary tubular furnace;  
feeding air enriched with oxygen in a radial direction of said rotary drum so as to act on the waste material along the rotary tubular furnace, wherein, above the waste material, the air enriched with oxygen and volatile combustible constituents of the waste material form flames the heat of which effects a liberation of additional volatile constituents of the waste material; and  
obtaining the waste material freed of the volatile constituents as refuse coke, and unburnt volatile constituents as combustible gas.

5,771,821

## METHOD OF TREATING PLASTIC WASTE

Gennady Ivanovich Zhuravsky; Valery Vladimirovich Mulyarchik; Vladimir Alexeevich Marchenko; Anatoly Vasilievich Kukharev; Leonid Mikhailovich Vinogradov; Anatoly Zhoresovich Grebenkov; Vladimir Nikolaevich Drozdov; Valery Grigorievich Konstantinov; Vitaly Ivanovich Stets-jurenko; Ivan Ivanovich Khomich, and Valery Vladimirovich Chemetiev, all of Minsk, Belarus, assignors to Science-Technical and Product-innovative Center "Tokema", and Small State Enterprise "Ekores", both of Belarus

PCT No. PCT/BY95/00002, § 371 Date Nov. 27, 1995, § 102(e) Date Nov. 27, 1995, PCT Pub. No. WO95/26127, PCT Pub. Date Oct. 5, 1995

PCT Filed Mar. 24, 1995, Ser. No. 553,287

Claims priority, application Belarus, Mar. 25, 1994, 1827-01 Int. Cl.<sup>6</sup> F23G 5/00

U.S. Cl. 110—346

3 Claims

1. A method of treating plastic waste comprising heating the plastic waste with superheated steam at a temperature of 400° C. to 500° C. in a multi-layered insert dispersing material wherein within said multi-layered insert dispersing material are layers of

5,771,823

METHOD AND APPARATUS FOR REDUCING NO<sub>x</sub> EMISSIONS FROM A MULTIPLE-INTERTUBE PULVERIZED-COAL BURNER

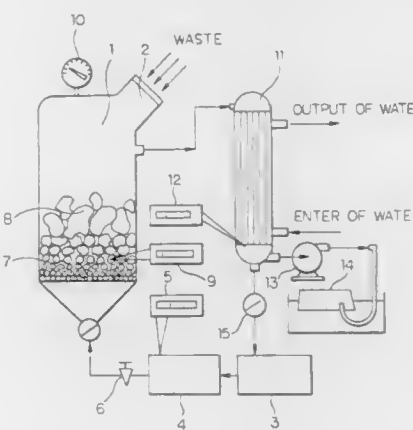
Scott A. Vierstra, Canal Winchester, and John J. Letcavits, Hilliard, both of Ohio, assignors to AEP Resources Service Company, Columbus, Ohio

Filed Jan. 31, 1996, Ser. No. 594,855

Int. Cl.<sup>6</sup> F23D 1/00; F23J 3/00

U.S. Cl. 110—347

10 Claims



particles of diminishing size, wherein the particles of a first layer have a diameter of about 3.83 mm and the particles of a last layer having a diameter of about 0.12 mm, wherein the direction of flow of the heated plastic is from the first layer to the last layer; and removing gaseous products.

5,771,822

## PROCESS FOR THE DISPOSAL OF RESIDUAL SUBSTANCES FROM WASTE INCINERATION PLANTS AS WELL AS ACTIVATED COKE AND/OR ACTIVATED CARBON

John Rizzon, Rösraht, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

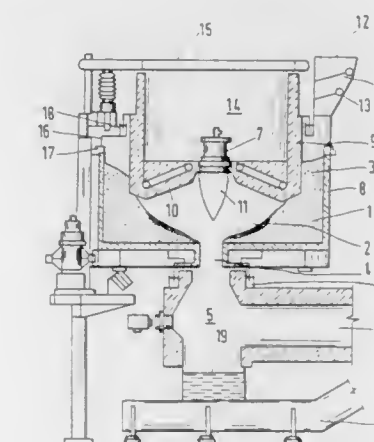
Filed Nov. 22, 1995, Ser. No. 561,649

Claims priority, application Germany, Dec. 3, 1994, 44 43 088.4

Int. Cl.<sup>6</sup> F23G 5/00

U.S. Cl. 110—346

8 Claims



1. A process for the disposal of residual substances from waste incineration plants as well as at least one of activated coke and activated carbon by surface-melting of a furnace charge where  
a) the residual substance is introduced into the primary chamber (2) of the furnace (1).  
b) at least one of the activated coke and activated carbon are comminuted to a grain size < 1 mm and are directly blown into the primary chamber (2) via a burner (7).  
c) in the primary chamber (2) a temperature of 1250° C. to 1500° C. is set, d) a molten material flowing off from the surface of the furnace charge leaves the primary chamber (2) together with flue gases, the molten material is passed through a secondary chamber (5) and is discharged as slag.

5,771,824

Patent Not Issued For This Number



5,771,825

**EMBROIDERY MACHINE WITH AUTOMATIC THREAD CHANGER**

Manfred Degen; Ludwig Günther, both of Chemnitz; Hans-Jürgen Heinrich; Roland Thiemer, both of Röhrsdorf; Franz-Josef Haffmans, Geldern; Willibert Nüsser, Linnich; Manfred Weidlich, Krefeld, and Peter Wiemer, Meerbusch, all of Germany, assignors to ZSK Stickmaschinen GmbH, Krefeld-Gartenstadt, Germany

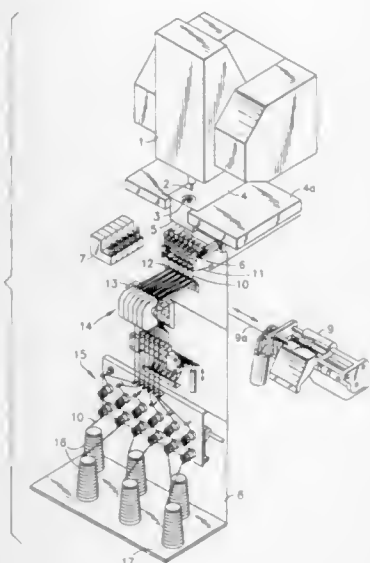
Filed Oct. 15, 1996, Ser. No. 721,315

Claims priority, application Germany, Oct. 13, 1995, 195 38 044.4

Int. Cl.<sup>6</sup> D05C 11/00

U.S. Cl. 112—80.7

31 Claims



1. An embroidery machine for embroidering embroidery fabric (23), comprising

an embroidery head (1), which is located above the embroidery fabric (23), and

an embroidery needle (2) which is movably supported in the embroidery head (1) in such a way that by means of drive mechanisms (9), the embroidery needle (2) is movable up and down and is also rotatable about its longitudinal axis,

a stitch plate (3) which is located below the embroidery fabric (23) and on which at least some of the embroidery fabric (23) rests during embroidering, and

located on the side of the stitch plate (3) remote from the embroidery fabric (23) is a thread layer (18) by which the embroidery thread (10) to be used in stitching is guided, and by rotation of the thread layer (18), the embroidery thread (10) is laid around the embroidery needle (2) that has pierced the embroidery fabric (23), and

a cutting tool (19, 20) is provided by means of which the embroidery thread (10) can be severed, characterized in that on the side of the thread layer (18) remote from the embroidery fabric (23), a plurality of injector nozzles (8) that blow compressed air are provided, and by means of the compressed air stream one embroidery thread (10) is inserted at a time into the thread layer (18), and the injector nozzles (6) are movable relative to the thread layer (18) by means of a drive mechanism (9) in such a way that a respective blower opening (24a) of an injector nozzle (6) is aligned with the opening of the thread layer (18) toward the injector nozzle (6).

5,771,826

**MEMORY CARD STORING EMBROIDERY DATA AND EMBROIDERY SEWING DEVICE FOR USE WITH MEMORY CARD**

Takashi Hirata, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Oct. 31, 1996, Ser. No. 742,836

Claims priority, application Japan, Nov. 6, 1995, 7-311579

Int. Cl.<sup>6</sup> D05B 21/00; D05C 5/04

U.S. Cl. 112—102.5

14 Claims



8. An embroidery data processor comprising:  
an embroidery sewing memory medium including:

a first storage region storing sets of pattern data under corresponding lead addresses, each set of pattern data corresponding to an embroidery pattern that is sewable in at least one of a plurality of embroidery sewing machine types; and  
a second storage region storing data in table form indicating correspondence between the embroidery sewing machine types and the lead addresses of pattern data based on which pattern data is sewable in which embroidery sewing machine type.

a memory medium mounting portion for detachably mounting the memory medium;

display means including a display and a controller; and  
pattern display control means for storing information indicating at least one of the plurality of sewing machine types applicable to the embroidery data processor and for displaying on the display means each embroidery pattern sewable in the indicated at least one sewing machine type and not displaying other embroidery patterns not sewable in the indicated at least one sewing machine type.

5,771,827

Patent Not Issued For This Number

5,771,828

**SEWING OR EMBROIDERING MACHINE WITH A THREAD-CUTTING DEVICE**

Kurt Arnold, Kaiserslautern, Germany, assignor to G.M. Pfaff Aktiengesellschaft, Kaiserslautern, Germany

Filed Apr. 17, 1997, Ser. No. 847,835

Claims priority, application Germany, Apr. 18, 1996, 196 15 308.5

Int. Cl.<sup>6</sup> D05B 19/00; 65/00

U.S. Cl. 112—470.01

12 Claims

1. A sewing or embroidering machine, comprising:  
a motor for driving stitch-forming tools, which comprise at least one needle bar and a hook cooperating with a needle of the said needle bar;  
a machine shaft;  
a thread-cutting device including a catch thread device movable relative to the hook and a drive associated with said catch thread device;  
signal transmitters coupled, respectively, with said machine shaft and with said thread-cutting device;  
movement program means for acting on said drive of said catch thread device as a function of signals generated by said signal

5,771,830

**METHOD AND APPARATUS FOR MANIPULATING A LENGTH OF FLEXIBLE MATERIAL**

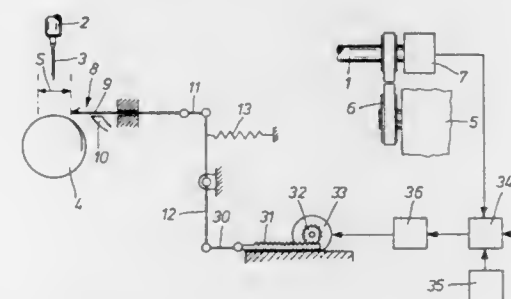
Michael John Hodges, Buckinghamshire, England, assignor to Detexomat Machinery Limited, Buckinghamshire, England

Filed Apr. 10, 1996, Ser. No. 631,709

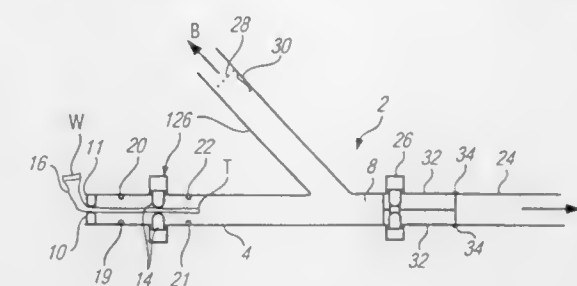
Int. Cl.<sup>6</sup> D05B 33/00

U.S. Cl. 112—470.15

24 Claims



transmitters according to a movement program stored in a memory, said movement program having path data in a certain relation to a rotary movement of said hook.



1. Apparatus for handling elongate flexible hosiery articles having first and second ends to orient said articles with a selected one of said ends of said articles leading, said apparatus comprising:

a first fluid conduit having an inlet for receipt of a said article;  
a second fluid conduit in fluid communication with said first conduit, said first fluid conduit being connectable to a source of suction and said second conduit being connectable to a source of suction;

a detect or located along said first conduit upstream of said second conduit for detecting which of said article ends is leading; and

a control system configured, upon a selected end of said article being detected as leading said article into said first conduit, to apply suction in said first conduit to cause the article to move past said second conduit, without entering said second conduit, for further handling and configured, upon a non-selected end of said article being detected as leading said article into said first conduit, to apply suction in said second conduit to cause said non-selected end to move into said second conduit and thereafter apply suction to said first conduit to cause said selected end of said article to move beyond said second conduit and become the lead end of said article for further handling.

5,771,829

**METHOD AND APPARATUS FOR SHIRring A FABRIC**

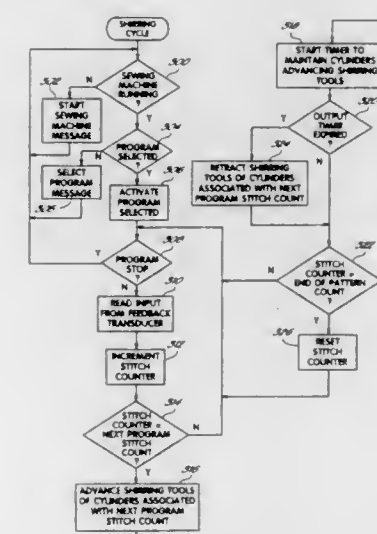
Wilbur Schebler, Batesville; Louis H. Werner, Sunman, and Dale J. Enncking, Batesville, all of Ind., assignors to Batesville Casket Company, Inc., Batesville, Ind.

Filed Dec. 30, 1994, Ser. No. 366,837

Int. Cl.<sup>6</sup> D05B 35/08

U.S. Cl. 112—475.04

22 Claims



14. A method of shirring a fabric onto a backing material comprising the steps of:

moving the fabric and the backing material in a layered relationship at a feed velocity past a plurality of shirring tools and a plurality of reciprocating needles spaced a predetermined distance from the plurality of shirring tools;

moving less than all of the plurality of shirring tools and selected portions of the fabric with respect to the backing material and toward the reciprocating needles at a shirring velocity greater than the feed velocity of the backing material to produce gathered portions of the fabric on the backing material at selected points across a width of the fabric; and  
sewing the gathered portions of the fabric to the backing material with the plurality of reciprocating needles.

5,771,831

Patent Not Issued For This Number

5,771,832

**CLEW BOARD WITH TRAVELLER FOR SELF TACKING HEAD SAILS**

Ian Cameron MacDiarmid, and Norman James Longworth, both of New South Wales, Australia, assignors to Ausman Engineering and Associates Pty. Ltd., New South Wales, Australia

Filed Apr. 15, 1997, Ser. No. 834,278

Claims priority, application Australia, Apr. 16, 1996, PN9316

Int. Cl.<sup>6</sup> B63H 9/04

U.S. Cl. 114—106

9 Claims

1. A sail fastening apparatus for a yacht, said apparatus comprising a first track extending along a sail clew in a direction generally normal to a preferred vertical sheeting angle of the sail, a first carriage slidably mounted for movement along the first track, and a sheet extending between the first carriage and a sheeting point on



the yacht aft of the clew, whereby the first carriage tends automatically to adopt a stable equilibrium position on the track such that the preferred vertical sheeting angle for the sail is maintained.

5,771,833

## ARRANGEMENT FOR SWEEPING MOORED LINES

Werner Hasse, Hamburg, Germany, assignor to Rheinmetall Industrie Aktiengesellschaft, Ratigen, Germany  
Filed Nov. 14, 1996, Ser. No. 749,116

Claims priority, application Germany, Nov. 14, 1995, 195 42 377.1

Int. Cl.<sup>6</sup> B62D 1/26

U.S. Cl. 114—221 A

3 Claims



I. Arrangement for the sweeping of the moored mines comprising:

- at least one cable cutter, for cutting a mooring line for a respective moored mine, which is arranged on a sweeping line; and
- a respective mine destruction device attached to the sweeping line and in front of a respective said cable cutter in a towing direction, said mine destruction device including a clamping device that is attachable to a mooring line of a respective mine, a buoyancy element connected to the clamping device via an unreleasable line, an activator for destroying a mine and which is attached to said buoyancy element, and means for releasably attaching the clamping device activator and buoyancy element to said sweeping line such that after a mooring line runs into a respective mine destruction device, the clamping device detaches itself from the sweeping line and clamps onto the mooring line and the buoyancy element with attached activator subsequently is released and moves upward toward the mine attached to the respective cable; and wherein

the clamping device is arranged on the mine destruction device such that a respective one of said cable cutters which is following a respective said destruction unit and which hits the respective mooring line after the clamping device of the associated respective said mine destruction device clamps down on the mooring line, cuts through the mooring line at a position below the attached clamping device.

5,771,834

## DOUBLE TIRE INFLATION BALANCER AND TIRE PRESSURE INDICATOR

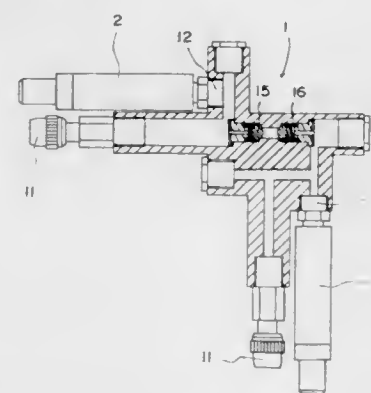
Jing-Long Hsiao, No.55-1, Tuan-Chu Lane, Tuan-Chu Li, Chia-I City, Taiwan

Filed Oct. 4, 1996, Ser. No. 725,479

Int. Cl.<sup>6</sup> B60C 23/04; G01L 17/00

U.S. Cl. 116—34 R

3 Claims



I. A double tire inflation balancer and tire pressure indicator comprising:

- a) a main body including a first inflation tube and a first pressure indicator in fluid communication with each other, a second inflation tube and a second pressure indicator in communication with each other, an inflation valve for emitting pressurized air into the main body, a first one-way valve permitting pressurized air to only flow from the inflation valve to the first inflation tube and first pressure indicator, a second one-way valve permitting pressurized air to only flow from the inflation valve to the second inflation tube and the second pressure indicator;
- b) each inflation tube including an inflation adaptor for connecting the inflation tube to an air valve of a tire by an inflation hose; and
- c) each pressure indicator including a visual indicator for indicating an air pressure in each tire.

5,771,835

## PASSIVE MARKER DEVICE FOR PARTICULAR POINTS, SUBSURFACE ITEMS AND CONDITIONS

Steven Alan Schneider, P.O. Box 2758, San Rafael, Calif. 94912-2758

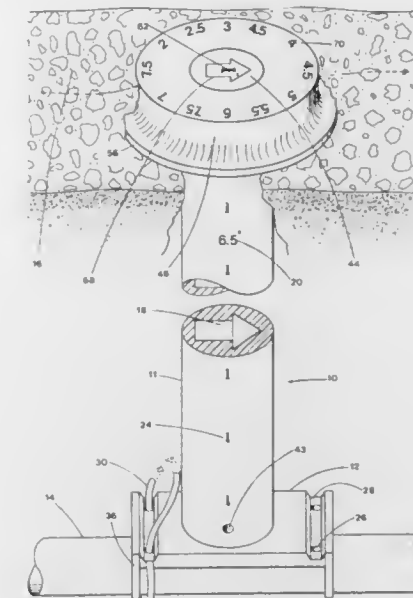
Filed Oct. 2, 1995, Ser. No. 537,618

Int. Cl.<sup>6</sup> G01D 21/00

U.S. Cl. 116—209

6 Claims

- I. A passive marker device for indicating information concerning a hidden object positioned underneath a concealing surface, said passive marker device comprising:
- a stem containing an arrow shaped opening throughout the length of said stem; and
  - an alignment saddle mateable with a second end of the stem, said alignment saddle for orienting the stem relative to the hidden object,
- whereby said stem delineates the position of said hidden object when said stem is placed vertically upon the top surface of the hidden object, or in immediate adjacency of said hidden



object, so that the first end of said stem is extended flush to or projected beyond the concealing surface.

5,771,836

## WATER SKIER WARNING FLAG SYSTEM

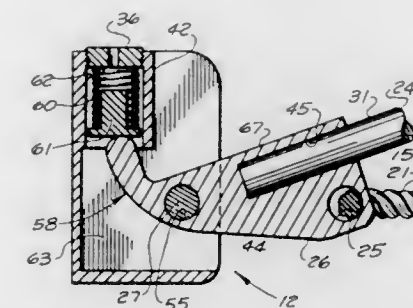
Tyler J. Crouse, Sun City, Ariz., assignor to Dupras Grinding Company, Inc., Phoenix, Ariz.

Filed Apr. 15, 1996, Ser. No. 632,655

Int. Cl.<sup>6</sup> G09F 17/00; B63C 9/00

U.S. Cl. 116—209

20 Claims



I. A water skier warning flag system for automatically raising a warning flag on a flag pole to the rear of a stern transom of a ski boat when a tow rope on the ski boat goes slack comprising, in combination:

- mechanical means for positionally controlling the flag pole;
- connection means for connecting said mechanical means to the stern transom of the ski boat;
- said mechanical means comprising
  - a lever structure having a short arm and a long arm and having transverse-hole means, through a pivot line of said lever structure, for holding a shaft means for rotatably holding said lever structure,
  - housing means for housing said lever structure comprising a shaft means for rotatably holding said lever structure, and a compression spring means constructed and arranged to push against said short arm of said lever structure,
  - first long arm means on said long arm for connecting with the tow rope, and
  - second long arm means on said long arm for connecting with the flag pole.

5,771,837

## IMPLEMENT FOR AUTOMATICALLY MILKING ANIMALS

Olaf van der Lely, Steinhausen, Switzerland, assignor to Maasland N.V., Netherlands

PCT No. PCT/NL95/00207, § 371 Date Feb. 16, 1996, § 102(e) Date Feb. 16, 1996, PCT Pub. No. WO95/35028, PCT Pub. Date Dec. 28, 1995

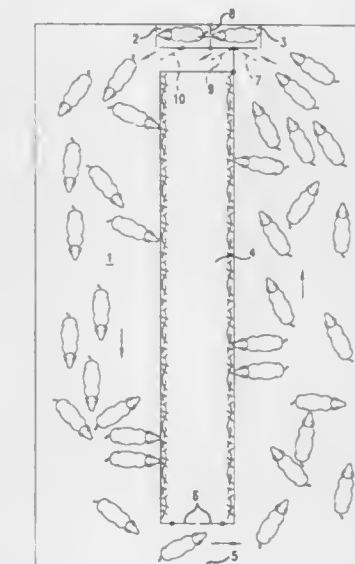
PCT Filed Jun. 12, 1995, Ser. No. 605,180

Claims priority, application Netherlands, Jun. 17, 1994, 9400992

Int. Cl.<sup>6</sup> A01J 5/00

U.S. Cl. 119—14.02

27 Claims



I. An apparatus for automatically milking animals, such as cows, comprising a computer controlled milking machine that (1) automatically connects teat cups to the teats of an animal to be milked, (2) automatically milks the animal, and (3) automatically disconnects the teat cups from the animal, an animal recognition system in communication with a computer system that governs when an animal is allowed to be milked again by said milking machine based a numerical value which is a function of the number of other animals which have been milked after the last milking of said animal, said computer systems including signaling means for selectively activating said milking machine to milk said animal on the basis of whether or not said numerical value is exceeded.

5,771,838

## BIRD FEEDER WITH FEED RECAPTURE RESERVOIR

David Scott Bloom; Michael Andrew Bloom; Drucella Ann Bloom, and Timothy K. Bloom, all of 7203 W. Wier Ave., Phoenix, Ariz. 85043

Filed Apr. 15, 1996, Ser. No. 632,553

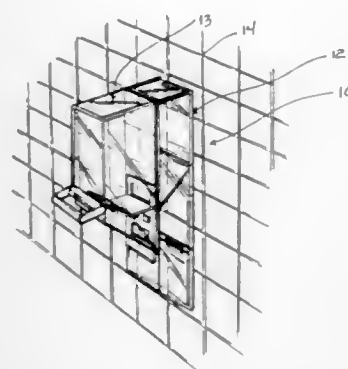
Int. Cl.<sup>6</sup> A01K 39/01

U.S. Cl. 119—52.2

12 Claims

- I. A bird feeder for use with an enclosure and for recapturing bird feed for re-use, the bird feeder comprising:
- a feed reservoir positionable outside the enclosure for receiving bird feed and having a feeder opening;
  - a trough positionable inside the enclosure and coupled to the feed reservoir at the feed opening for receiving feed from the feed reservoir;
  - a recapture reservoir coupled to the feed reservoir for receiving and collecting uncontaminated bird feed displaced from the trough, the recapture reservoir including a recapture bin positionable outside the enclosure and a chute positionable inside the enclosure, the chute is positioned under the trough and sloped to direct displaced feed into the recapture bin;





a perch coupled proximate the trough and upon which birds may rest to obtain access to the trough, the perch being positioned so as not to overlie the chute and thereby preventing contamination of the recapture reservoir;

the feed reservoir including a bottom sloped downward, in a direction toward the perch, to the trough; and

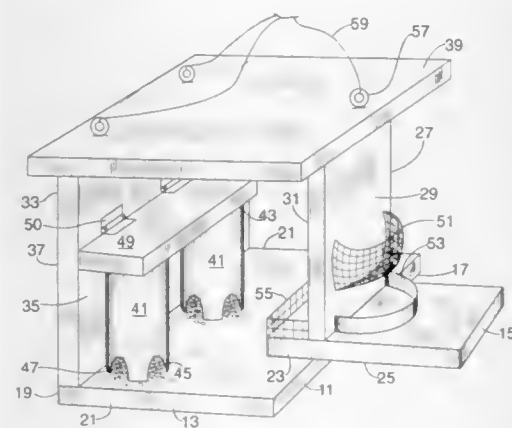
a shield enclosing the trough and chute, the shield having an open side adjacent the perch allowing access to the trough by birds.

**5,771,839  
BIRD FEEDER**

Colleen E. Marsh, 21 Misty Ln., Clarks Summit, Pa. 18411  
Filed Apr. 7, 1997, Ser. No. 826,723  
Int. Cl.<sup>6</sup> A01K 39/01

U.S. Cl. 119—52.2

5 Claims



1. A bird feeder to protect perishable bird seed from the weather, such bird feeder comprising:

a base including a main plate having a front edge and a rear edge and two side edges;

a partial wall having an inside surface and an outside surface, the partial wall having a width substantially less than the width of the base and being aligned with the front edge;

a full wall having a width substantially the same as the width of the main plate from side edge to side edge, the full wall and the partial wall extending substantially the same distance above the main plate and the full wall being aligned with the rear edge of the main plate;

a roof mounted on the full wall and the partial wall above the main plate;

a silo having an upper end and a lower end, the silo being mounted on the main plate against the full wall, the silo including a hollow container with notches at its lower end;

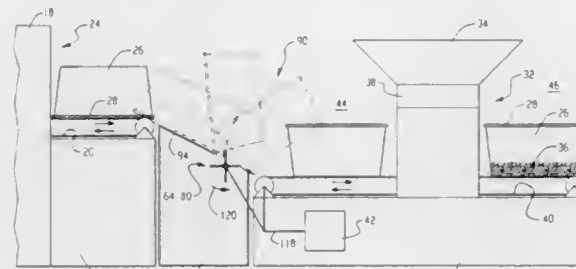
a cover mounted to be removable on the upper end of the silo; and

means for mounting the bird feeder.

**5,771,840  
APPARATUS FOR RIGHTING ANIMAL CAGES  
DISCHARGE FROM A WASHING DEVICE**  
Gaetan Pelletier, Beauport, Canada, assignor to Steris Corporation, Mentor, Ohio  
Filed Jan. 23, 1997, Ser. No. 788,099  
Int. Cl.<sup>6</sup> A01K 1/00

U.S. Cl. 119—452

18 Claims



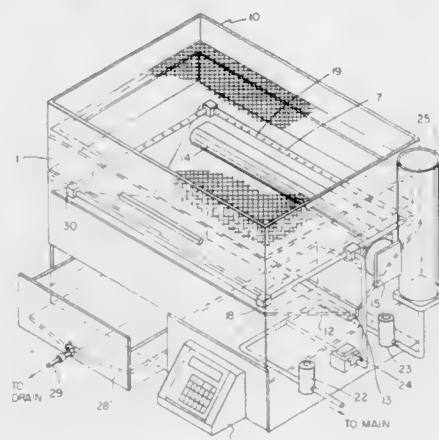
1. An object orienting apparatus for use in an object cleaning and filling system including a washing device having a first processing station and a first conveyor which transports an object through the first processing station in a first orientation, and further including a bedding dispenser having a second processing station and a second conveyor for transporting the object through the second processing station in a second orientation, the object orienting apparatus interposed between the first conveyor and the second conveyor, the apparatus including:

a rotating flip wheel which receives the object from the first conveyor and which repositions said object from the first orientation to the second orientation before transferring the object to the second conveyor.

**5,771,841  
SANITATION SYSTEM FOR ANIMAL CAGES**  
Jonathan Jarrett Boor, 2931 NE. 39th Ct., Lighthouse Point, Fla. 33064  
Filed Apr. 8, 1997, Ser. No. 835,756  
Int. Cl.<sup>6</sup> A01K 29/00

U.S. Cl. 119—452

15 Claims



1. An animal cage comprising:

a removable litter tray and means for supporting the litter tray in the cage, the tray being designed so that it can be removed, inverted and reinserted into the cage;

a spray head below the litter tray, said spray head having nozzle orifices for directing cleaning liquid upward against the tray;

a source of cleaning liquid;

means for pumping said liquid under pressure to said spray head;

a drain pan below the spray head, to catch cleaning liquid dropping from the litter tray.

an ultraviolet lamp disposed below the litter tray for disinfecting the tray, and

programmable means for operating the pumping means and the ultraviolet lamp in sequence, so as to first wash the tray and then sterilize it.

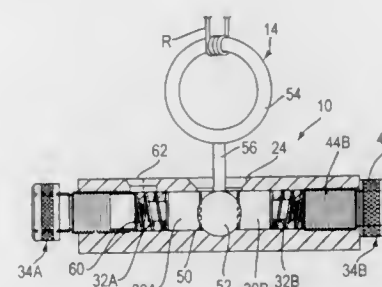
5,771,842

Patent Not Issued For This Number

**5,771,843  
BREAK-AWAY TIE APPARATUS FOR SECURING  
ANIMALS**  
William C. Karlin, Peyton, Colo., assignor to Safe-T-Tie Inc., Peyton, Colo.  
Filed Sep. 24, 1996, Ser. No. 719,072  
Int. Cl.<sup>6</sup> A01K 3/00; B68B 5/00

U.S. Cl. 119—772

11 Claims



1. A break-away animal tie apparatus comprising a base adapted to be anchored to a support, a tie element to which an animal's rein can be fastened, and a spring-biased, reusable break-away connection connecting the tie element to the base, wherein the base includes a body and a pair of gripping members mounted on the body in spaced apart relationship to form a pocket in which a mounting portion of the tie element is disposed, at least one of the gripping members being spring biased toward the other gripping member for gripping the mounting portion of the tie element, the at least one gripping member being retractable against its spring bias in response to the tie member being urged out of the pocket under a predetermined force.

**5,771,844  
CYCLONE SEPARATOR HAVING INCREASED GAS  
FLOW CAPACITY**  
David H. Dietz, Hampton, N.J., assignor to Foster Wheeler Development Corp., Clinton, N.J.  
Filed Apr. 4, 1996, Ser. No. 628,004  
Int. Cl.<sup>6</sup> B01D 51/02; 45/12; B04C 5/08

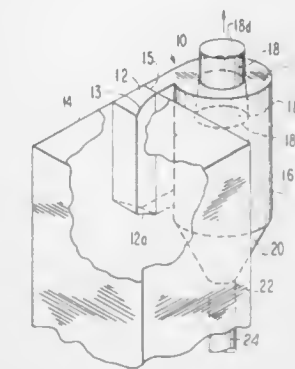
U.S. Cl. 122—4 D

12 Claims

1. A cyclone separator adapted for attachment to an outlet of a fluidized bed combustor or reactor for particle collection from a gas stream containing entrained solid particles, said cyclone separator comprising:

a cylindrical-shaped central body portion having a rectangular-shaped inlet passage connected tangentially to the body portion, said inlet passage having a height (h) to width (w) aspect ratio of at least 4/1;

a cylindrical-shaped upper outlet vortex tube centrally connected to the central body portion at its upper end; said outlet vortex tube having a lower truncated cone shaped portion extending downwardly into said central body portion with an inlet cross-sectional flow area exceeding its outlet cross-sectional flow area; and

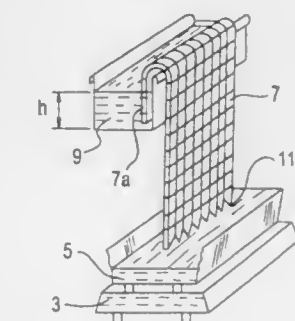


a conical-shaped lower outlet hopper portion centrally connected to the central body portion at its lower end, said hopper portion having a bottom opening for particulate solids withdrawal.

**5,771,845  
VAPORIZATION METHOD DEVICE**  
Jacques Pistien, Iles Saint-Denis; Jean-Louis Giazzi, Argenteuil; Robert Desage, Verneuil Sur Seine, and Philippe Deblay, Chatenay-Malabry, all of France, assignors to Gaz De France, Paris; Cogia, Palaiseau, and Superba, Mulhouse all of France  
PCT No. PCT/FR95/00656, § 371 Date Apr. 8, 1996, § 102(e) Date Apr. 8, 1996, PCT Pub. No. WO95/31674, PCT Pub. Date Nov. 23, 1995  
PCT Filed May 18, 1995, Ser. No. 583,121  
Claims priority, application France, May 18, 1994, 94 06076  
Int. Cl.<sup>6</sup> F24F 6/08

U.S. Cl. 122—366

21 Claims



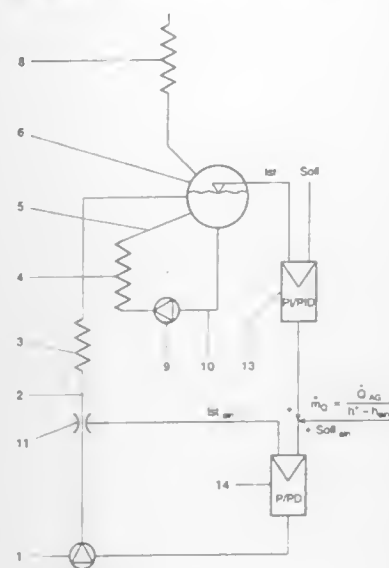
1. A device for vaporizing a liquid, the device comprising:

at least one porous substrate having a pre-determined width and a thickness, the thickness being between about 0.05 mm and about 5 mm, said at least one substrate further having an upstream portion and a downstream portion;

liquid supply means in liquid communication with at least a major part of said pre-determined width of the substrate upstream portion for distributing the liquid to be supplied to at least said major part of the width of the substrate and for causing a circulation of said liquid along said substrate from said upstream portion to said downstream portion thereof; and

heating means for heating said porous substrate to a temperature adapted for vaporizing said liquid, the device configured such that, for a given thermal flux and substrate surface area, the quantity of liquid to be vaporized entering the porous substrates is optimally balanced with the thermal flux and substantially all liquid is vaporized out of said porous substrate between said upstream portion and said downstream portion thereof such that virtually no liquid remains in said substrate at said downstream portion.

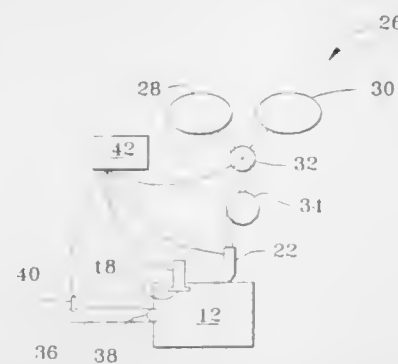
5,771,846  
**METHOD FOR FEED WATER CONTROL IN WASTE HEAT STEAM GENERATORS**  
Christoph Ruchti, Uster, Switzerland, assignor to Asea Brown Boveri AG, Baden, Switzerland  
Filed Mar. 22, 1996, Ser. No. 620,331  
Claims priority, application Germany, Mar. 23, 1995, 195 10 619.9  
Int. Cl.<sup>6</sup> F22D 5/30  
U.S. Cl. 122—451 R 4 Claims



1. A method for feed water control in waste heat steam generators, in particular drum boilers with a circulating pump and drum boilers with natural circulation employed in combination power plants, said method comprising:  
providing a three-component control by means of a superordinated level regulator and a flow-through regulator subordinated to the level regulator,  
displacing a set value ( $S_m$ ) of the flow-through regulator by the level regulator in such a way that the water level in the drum is always regulated to a constant set value (S), regardless of interfering effects,  
guiding the flow-through regulator for the feed water flow ( $\dot{m}_f$ ) by the heat amount ( $Q_{AG}$ ) in the exhaust gas flow of the gas turbine.

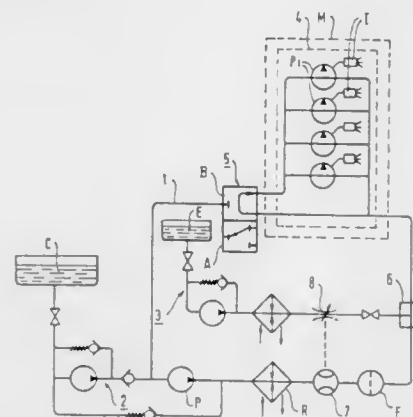
5,771,847  
**FUEL OXIDIZER EMULSION INJECTION SYSTEM**  
Anthony W. Duva, Middletown, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.  
Filed Jun. 24, 1996, Ser. No. 684,837  
Int. Cl.<sup>6</sup> F02D 41/14; F02B 45/00; 47/02  
U.S. Cl. 123—1 A 12 Claims

1. A system for reducing exhaust emissions in an engine combusting at least one of a fossil fuel and an organic fuel, the system comprising:  
a first tank for storage of said at least one fuel;  
an oxidant;  
a second tank for storage of said oxidant;  
a mixing valve combining the at least one fuel from the first tank and the oxidant from the second tank, said oxidant being emulsified in said at least one fuel to form a fuel oxidant emulsion; and  
an injector for introducing the emulsion into a combustion chamber of said engine, the emulsion flowing through the injector into the chamber, the emulsion being ignited in the combustion chamber to provide a work output, the oxidant



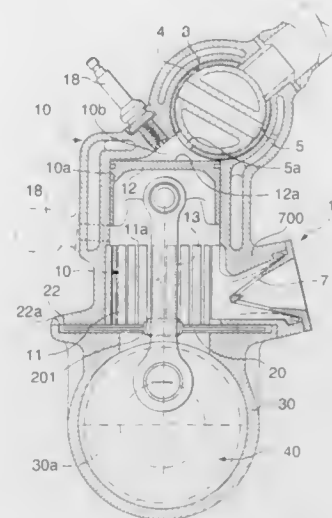
resulting in a more complete combustion when compared to combustion of the at least one fuel without the emulsified oxidant of said emulsion, the more complete combustion resulting in a lowering of emissions of unburned hydrocarbon and lower emissions of carbon monoxide.

5,771,848  
**DEVICE FOR FEEDING LIQUID FUEL TO A DIESEL-TYPE I.C. ENGINE**  
Dirk Bastenhof, Eaubonne, France, assignor to S.E.M.T. Peilstick, Saint Denis, France  
Filed Dec. 20, 1996, Ser. No. 770,812  
Claims priority, application France, Dec. 21, 1995, 95 15286; Jan. 10, 1996, 96 00212  
Int. Cl.<sup>6</sup> F02B 47/02  
U.S. Cl. 123—25 C 5 Claims



1. A device for feeding liquid fuel to a diesel-type I.C. engine, said device comprising a pipe feeding fuel to the injection pumps of said engine, said feed pipe forming a feed loop and comprising a pipe for admission of said fuel, means for treating and circulating said fuel and a pipe for introducing additional liquid into said fuel so as to provide a fuel/liquid mixture,  
wherein the point of connection of said pipe for introducing additional liquid to said fuel feed pipe is located immediately upstream of that part of said feed pipe which supplies said injection pumps of said engine, and  
a closure valve for closing said feed pipe such that said fuel/liquid mixture flows directly to said injection pumps without recirculating through said feedloop, said closure valve being located immediately downstream of said part of the feed pipe which supplies said injection pumps of said engine and, attendantly, downstream of said injection pumps.

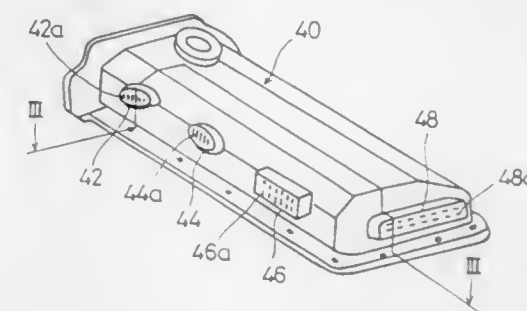
5,771,849  
**INTERNAL COMBUSTION ENGINE WITH CRANKCASE PRESSURE BARRIER**  
Norbert Hamy, 236 The Kingsway, Etobicoke, Ontario, Canada, M9A 3T5  
Filed Sep. 12, 1996, Ser. No. 713,222  
Int. Cl.<sup>6</sup> F02B 33/12  
U.S. Cl. 123—73 R 18 Claims



1. An internal combustion engine comprising:  
a cylinder having a cylinder wall and a longitudinal axis;  
a crankcase;  
a crankshaft rotatable in said crankcase;  
a piston mounted on a connecting rod supporting said piston for reciprocating movement in said cylinder, said connecting rod being mounted on said crankshaft;  
a barrier member extending around said connecting rod to sealingly separate said cylinder from said crankcase throughout a complete crankshaft cycle, said barrier member being laterally displaceable to provide for angular motion of the connecting rod as said piston reciprocates in said cylinder;  
an intake port including a non-return valve located above said barrier member, said intake port leading to a first space below said piston;  
a row of transfer ports circumferentially spaced around said cylinder wall to establish communication between said first space and a second space above said piston over a limited range of the piston stroke such that intake air drawn through said intake port is first compressed in said first space during the downstroke of the piston and subsequently enters said second space through said transfer ports and to collide in the center of the cylinder and form a turbulent vertical air column above said piston; and  
an overhead rotary exhaust valve offset relative to said longitudinal axis.

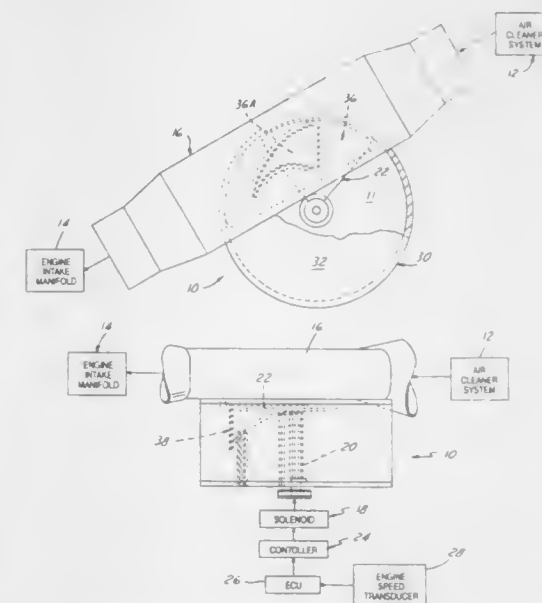
5,771,850  
**CYLINDER HEAD COVER HAVING A WIRING PORTION**  
Kunio Okada, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan  
Filed May 21, 1997, Ser. No. 861,085  
Claims priority, application Japan, May 23, 1996, 8-128086  
Int. Cl.<sup>6</sup> F02P 23/00  
U.S. Cl. 123—143 C 10 Claims

1. A cylinder head cover for an internal combustion engine, comprising:  
a plurality of contacts to which electronic parts of the engine are electrically connected;  
a control-unit connector having terminals to which an electronic control unit of the engine is electrically connected; and



a wiring portion having electric connections for interconnecting the contacts and the terminals of the control-unit connector, said wiring portion being integral with a wall of the cylinder head cover.

5,771,851  
**VARIABLY TUNED HELMHOLTZ RESONATOR WITH LINEAR RESPONSE CONTROLLER**  
Ian R. McLean, Chatham, Canada, assignor to Siemens Electric Limited, Ontario, Canada  
Filed Jul. 29, 1997, Ser. No. 902,454  
Int. Cl.<sup>6</sup> F02M 35/10  
U.S. Cl. 123—184.57 10 Claims



1. A tunable Helmholtz resonator for attenuating noise propagated through a duct, said resonator comprising:  
a resonator chamber;  
a tubular connection having an internal passage establishing fluid communication between said duct and said resonator chamber;  
a tuning member mounted to be movable across said tubular connection to vary the cross sectional area thereof;  
an actuator for driving said tuning member to cause said tuning plate to assume any of a series of predetermined positions, each partially blocking said tubular connection internal passage to a varying extent;  
a control signal source transmitting signals to said actuator to cause said tuning member to be moved to a position in a range of partially blocking positions in correspondence thereto;  
said internal passage having a shape configured to provide a linear relationship between the position of said tuning member through said range of partially blocking positions and said open cross sectional area of said internal passage.



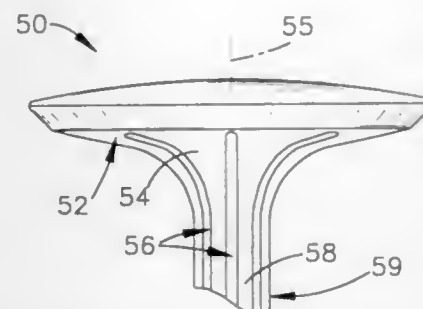
5,771,852

**POPPET VALVE WITH EMBOSSED NECK STRUCTURE**  
Rudy J. Heimann, Jr., Brunswick; Victor D. Levin, Highland Hts.; William Neumann, Lakewood; Joseph L. Palko, Strongsville, and Robert E. Southam, Hudson, all of Ohio, assignors to TRW Inc., Lyndhurst, Ohio

Filed Mar. 4, 1997, Ser. No. 811,334  
Int. Cl.<sup>6</sup> F01L 3/20

U.S. Cl. 123—188.3

2 Claims



1. A poppet valve having a disk-shaped head, an elongated stem, and a tapered neck between said head and said stem, said neck having a ribbed outer surface, said neck being defined by an embossed hollow wall portion of said valve having a grooved inner surface with a contour complementary to the contour of said ribbed outer surface.

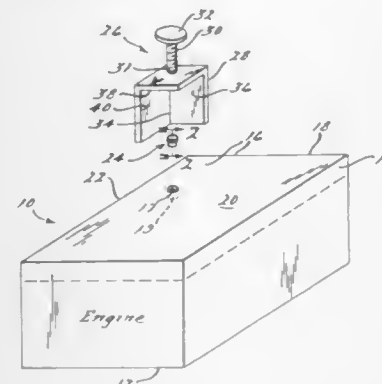
5,771,853

**TOOL AND PLUG FOR BLOCKING ENGINE OIL GALLERY ACCESS HOLE**  
Shau-fen Kuo, W. Bloomfield, Mich., assignor to Chrysler Corporation, Auburn Hills, Mich.

Filed Jun. 17, 1996, Ser. No. 664,748  
Int. Cl.<sup>6</sup> F01M 1/12

U.S. Cl. 123—196 R

11 Claims



1. A system for sealing a vehicle engine having an oil gallery access hole defined therein, comprising:

- (a) a vehicle engine with a surface portion defining an access hole;
- (b) a unitary solid body for advancing in the access hole, including:
  - a circularly-shaped flat distal face;
  - a disc-shaped intermediate portion defining an intermediate diameter;
  - a shoulder portion having a curved outer surface, the shoulder portion interconnecting the distal face and the intermediate portion; and
  - a proximal disc-shaped flange contiguous to the intermediate portion, the proximal flange defining a proximal diameter greater than the intermediate diameter; and
- (c) a cup-shaped seal having an upper edge for placement in the access hole, wherein upon placement of the solid body and

seal in the access hole the intermediate portion of the solid body is disposed within the cup-shaped seal, and the flange abuts the upper edge of the seal.

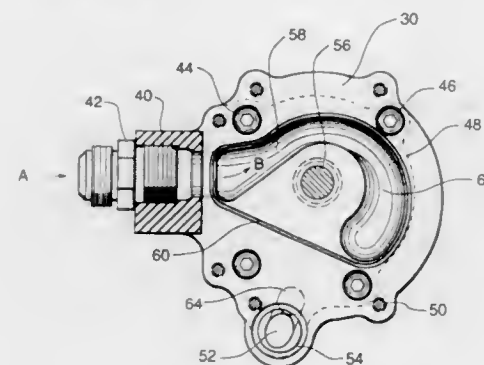
5,771,854

**OIL PUMP ADAPTOR**  
Raymond A. Barton, Wernersville, Pa., assignor to Ray Barton Racing Engines, Inc., Wernersville, Pa.

Filed Jan. 7, 1997, Ser. No. 779,399  
Int. Cl.<sup>6</sup> F01M 1/02

U.S. Cl. 123—196 R

14 Claims



1. An adaptor for use with an engine having a bolt pattern by which an externally mounted oil pump can be removably attached to said engine, said engine having a port by which filtered high pressure oil is introduced into said engine, a sump by which dirty engine oil is removed from said engine, and a hole by which a gear pump drive shaft may be inserted in said engine, said adaptor comprising:

- (a) a plate having a first surface, a second surface, and a side wall, said surfaces being flat and spaced apart with said side wall forming the peripheral boundary of said surfaces;
- (b) a plurality of first apertures disposed within said plate in a pattern aligned with and complementary to said bolt pattern of said engine, said first apertures being perpendicular to said first surface;
- (c) a plurality of second apertures in said plate, the second apertures describing a peripheral shape larger than that described by the first apertures;
- (d) a through passage in said plate, said passage disposed perpendicular to said first surface and aligned with said gear pump drive shaft hole;
- (e) an orifice through which dirty engine oil is introduced to said adaptor from said sump, said orifice positioned on and passing through said side wall;
- (f) a cavity in said second surface, said cavity being joined to said orifice to form a channel through which oil may flow, said cavity being spaced apart from said first surface and disposed in a semi-circular pattern about said passage; and
- (g) an opening through which said filtered high pressure oil is introduced into said engine through said port.

5,771,855

**DAMAGE DETECTING APPARATUS FOR CERAMIC PARTS**

Hideo Kawamura, Samukawa-machi, Japan, assignor to Isuzu Ceramics Research Institute Co., Ltd., Kanagawa-ken, Japan

Filed Oct. 28, 1996, Ser. No. 740,187  
Claims priority, application Japan, Nov. 8, 1995, 7-313767; Nov. 8, 1995, 7-313768; Nov. 8, 1995, 7-313769  
Int. Cl.<sup>6</sup> F02B 77/00

U.S. Cl. 123—198 D

22 Claims

1. A damage detecting apparatus, for ceramic parts for an engine, comprising:

5,771,857

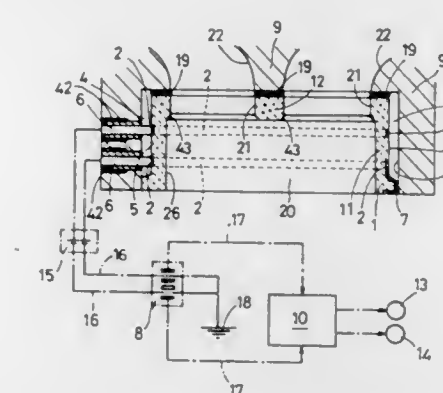
**DIRECT INJECTED GAS ENGINE WITH VARIABLE GAS PRESSURE CONTROL APPARATUS AND METHOD OF OPERATION**

Martin L. Willi, Lafayette, Ind., assignor to Caterpillar Inc., Peoria, Ill.

Filed Nov. 6, 1996, Ser. No. 744,552  
Int. Cl.<sup>6</sup> F02D 41/30; F02M 21/02

U.S. Cl. 123—305

12 Claims



a ceramic combustion chamber structure installed in a cavity in the engine and including a cylinder upper surface portion and a part of a cylinder liner;

a wire made of a conductive ceramic and arranged on an outer circumferential surface of the combustion chamber structure; current supply means for supplying a small current through the wires;

a current detector coupled to the wire and the current supply means; and

a controller comprising means to turn on an alarm lamp and stop a fuel supply to the combustion chamber structure in response to a wire break detection signal from the current detector when the wire is broken by cracking of the combustion chamber structure,

wherein the wires are formed by embedding powdered metal in a wire portion etched in an outer circumferential surface of the combustion chamber structure.

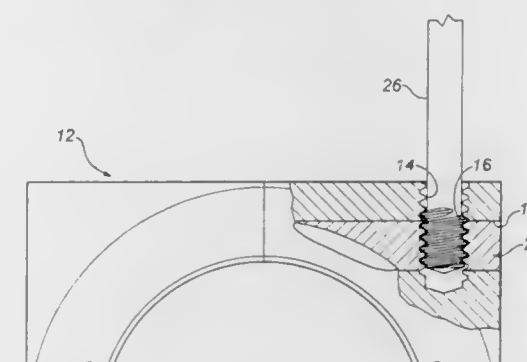
5,771,856

**METHOD OF REINFORCING THREADS**  
Gerald Merchant, Red Deer, Canada, assignor to Merch Performance Inc., Red Deer, Canada

Filed Feb. 5, 1997, Ser. No. 796,025  
Int. Cl.<sup>6</sup> F02B 77/00

U.S. Cl. 123—198 R

7 Claims



1. A method of reinforcing threads, comprising the steps of: firstly, providing a workpiece;

secondly, determining the position on the workpiece that a hole is to be drilled and into which threads are to be tapped;

thirdly, boring an opening in the workpiece which transversely intersects the hole, the opening having a diameter which is greater than a diameter of the hole;

fourthly, inserting an insert into the opening in interference fit relation, the insert being of a harder material than the workpiece;

fifthly, boring the hole through the workpiece and into the insert; and

sixthly, tapping threads in the hole, such that a portion of the threads are reinforced by virtue of being tapped into the harder material of the insert.

5,771,858

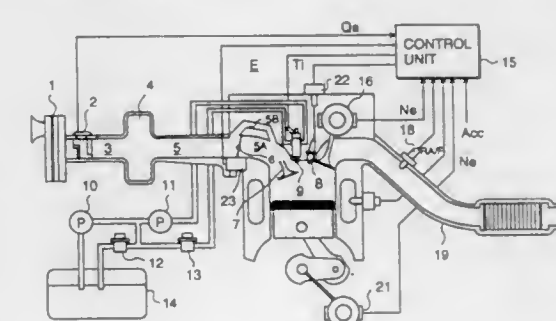
**CONTROL APPARATUS FOR DIRECT INJECTION ENGINE**

Yoshiyuki Yoshida, Hitachinaka, and Nobuo Kurihara, Hitachiota, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 23, 1996, Ser. No. 771,917  
Claims priority, application Japan, Jan. 5, 1996, 8-000305  
Int. Cl.<sup>6</sup> F02B 31/00; F02D 41/04

U.S. Cl. 123—306

6 Claims



1. Control apparatus for a multicylinder direct injection engine, including an injector and a spark plug installed at each cylinder, and an intake air pipe at each cylinder having a primary air passage and a secondary air passage provided for generating at least one of swirl and tumble flow of intake air taken in said each cylinder, comprising:

a gas flow control valve provided at said primary air passage and configured to further serve as a throttle valve; and control means for controlling air/fuel ratio in each cylinder by controlling a fuel injection amount without executing control based on the opening of said gas flow control valve in each cylinder, for a first operational region at a small amount of acceleration pedal operation, wherein said control means further includes valve opening control means for controlling the opening of said gas flow control valve, corresponding to an amount of acceleration pedal operation, for a second operational region at a larger amount of acceleration pedal operation than an amount of acceleration pedal operation in said first operational region.

5,771,859

**METHOD AND ARRANGEMENT FOR CONTROLLING THE IDLE OF AN INTERNAL COMBUSTION ENGINE**

Walter Schlagnmueller, Schwieberdingen; Thomas Wiesa, Vaihingen; Rolf Litzinger, Hechingen; Juergen Rottler, Karlsruhe; Ralph Schmitzke, Obersulm/Sulzbach, and Peter Jauernig, Tiefenbronn, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

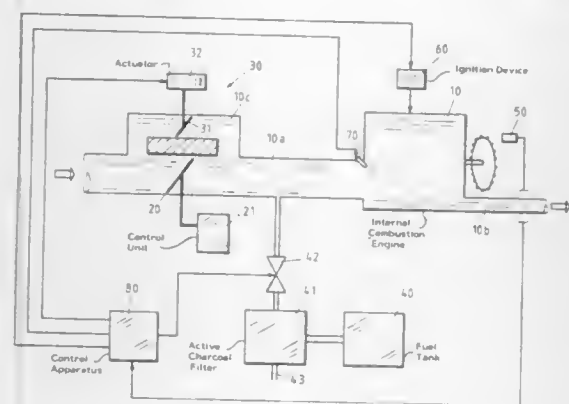
Filed Oct. 18, 1996, Ser. No. 731,738

Claims priority, application Germany, Oct. 18, 1995, 195 38 786.4

Int. Cl.<sup>6</sup> F02D 41/16

U.S. Cl. 123—339.11

5 Claims



I. A method for controlling the idle of an internal combustion engine having an intake channel for conducting air to the engine, the method comprising the steps of:

utilizing sensors for generating signals characterizing the operating state of the engine and for supplying said signals to a control apparatus;

providing a tank-venting valve through which air can be conducted into the intake channel when the tank-venting valve is open;

computing control quantities in said control apparatus in dependence upon said signals for at least the following: said tank-venting valve, and idle adjuster device, a fuel metering device and an ignition device;

controlling the air supplied to the engine with the aid of said tank-venting valve; and,

throttling the engine in addition to controlling the air supplied to the engine with said tank-venting valve thereby permitting an emergency operation of said engine when the idle adjuster device is defective.

**5,771,860  
AUTOMATIC POWER BALANCING APPARATUS FOR TANDEM ENGINES AND METHOD OF OPERATING SAME**

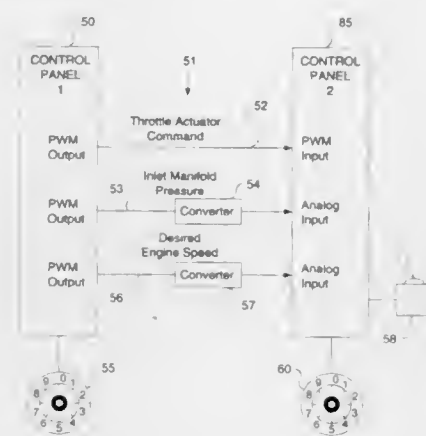
John J. Bernardi, Chillicothe, Ill., assignor to Caterpillar Inc., Peoria, Ill.

Filed Apr. 22, 1997, Ser. No. 837,728

Int. Cl.<sup>6</sup> F02D 31/00; 25/00

U.S. Cl. 123—352

6 Claims



1. An apparatus for controlling power output of a first and second engine each having a power output, the output of said first and second engine being connected to a load, said apparatus comprising:

an electronic control module electrically connected to said first engine;

a first throttle actuator installed on said first engine;

a second throttle actuator installed on said second engine;

an engine speed sensor connected to said first engine and producing an engine speed signal;

a first inlet manifold pressure sensor installed in said first engine and producing a first inlet manifold pressure signal;

a second manifold pressure sensor installed in said second engine and producing a second inlet manifold pressure signal; and

wherein said engine control module receives said engine speed signal and produces an engine speed error signal in response to a difference between said engine speed signal and a desired engine speed signal, said engine control module produces first and second throttle actuator signals in response to said engine speed error signal, said first throttle actuator signal controlling said first throttle actuator and said second throttle actuator signal controlling said second throttle actuator.

5,771,861

**APPARATUS AND METHOD FOR ACCURATELY CONTROLLING FUEL INJECTION FLOW RATE**

Keith L. Musser, Cloumbus; Daniel D. Wilhelm, Nashville, both of Ind.; David A. Olson, Columbus, Ind.; James H. Ross, Cedar Falls, Iowa; Jeffrey P. Seger, Columbus, Ind.; Michael J. Ruth, Franklin; Prakash Bedapudi, Columbus, both of Ind.; David A. Bolis, Nashville; Stephen M. Holl, Columbus, both of Ind., and Gregory Weber, Rochester Hills, Mich., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jul. 1, 1996, Ser. No. 674,280

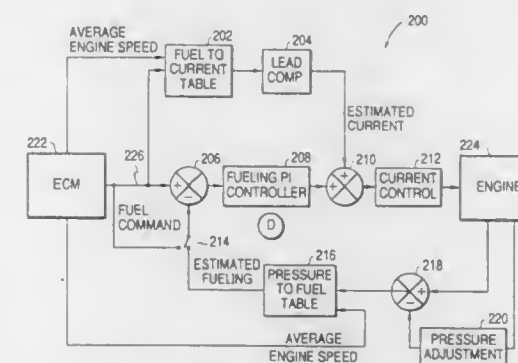
Int. Cl.<sup>6</sup> F02D 31/00

U.S. Cl. 123—357

52 Claims

1. A fuel control system for an internal combustion engine for delivering fuel to a fuel rail for distribution to a plurality of fuel injectors, comprising:

computing means for receiving a plurality of operating condition signals indicative of an operating state of the internal combustion engine and for generating a desired fuel quantity signal





5,771,864

## FUEL INJECTOR SYSTEM

Akira Morishita; Shuzo Isozumi, and Kelichi Konishi, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

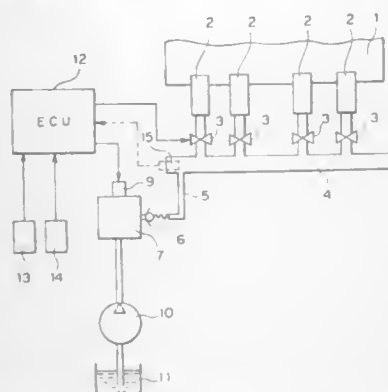
Filed Mar. 7, 1997, Ser. No. 813,901

Claims priority, application Japan, Apr. 17, 1996, 8-095554

Int. Cl.<sup>6</sup> F02M 41/00

U.S. Cl. 123—456

17 Claims



1. A fuel injector system comprising:

- a common rail for accumulating pressurized fuel;
- an injection nozzle for injecting the pressurized fuel in said common rail into an engine cylinder of an engine;
- a high pressure supply pump having a pump chamber into which said fuel flows, said high pressure supply pump delivering said fuel in said pump chamber into said common rail and pressurizing said fuel in said common rail;
- a spill solenoid valve which is provided in a path communicating said pump chamber with a low pressure fuel path and which, when opened, communicates said pump chamber with said low pressure fuel path and, when closed, delivers said fuel from said pump chamber to said common rail; and
- control means for controlling the opening and closing of said spill solenoid valve to keep said spill solenoid valve closed or opened for the entire period of time of each stroke in which the delivery of fuel is possible so as to adjust the number of times which said fuel is delivered to said common rail for each rotation of said engine in accordance with a load on said engine, thereby maintaining the fuel pressure in said common rail at a predetermined pressure.

5,771,865

## FUEL INJECTION SYSTEM OF AN ENGINE AND A CONTROL METHOD THEREFOR

Akio Ishida, Yokohama, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

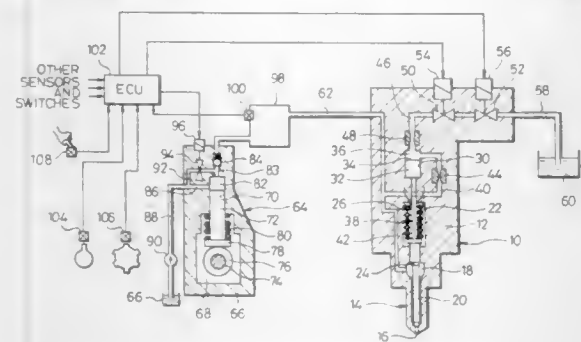
Filed Feb. 5, 1997, Ser. No. 795,805

Claims priority, application Japan, Feb. 7, 1996, 8-044071

Int. Cl.<sup>6</sup> F02M 37/04

U.S. Cl. 123—467

13 Claims

1. A fuel injection system of an engine, comprising:  
a fuel tank for storing a fuel;

a fuel pressurizing device for pressurizing the fuel supplied from the fuel tank;

an injector for injecting the fuel pressurized by the fuel pressure device into a cylinder of the engine;

a fuel supply passage for connecting the fuel pressurizing device and the injector and for supplying the pressurized fuel from the fuel pressurizing device to the injector;

a fuel return passage for connecting the injector and the fuel tank and for returning the pressurized fuel from the injector to the fuel tank;

at least two solenoid valves arranged in the fuel return passage, said solenoid valves being opened and closed to control fuel injection from the injector, and

an accumulator disposed in the fuel supply passage, wherein said injector includes

a nozzle connected to the fuel supply passage by means of a connecting passage such that the pressurized fuel is injectable through the nozzle,

a pressure chamber into which the pressurized fuel is introduced from the connecting passage, and

a nozzle valve for opening and closing the nozzle depending on the fuel pressure in the pressure chamber,

said fuel return passage connects the pressure chamber and the fuel tank,

said solenoid valves are arranged in series in the fuel return passage, and

said nozzle valve opens the nozzle to inject the fuel through the nozzle when all the solenoid valves are opened to lower the fuel pressure in the pressure chamber.

5,771,866

## NOZZLE FOR LOW PRESSURE FUEL INJECTION SYSTEM

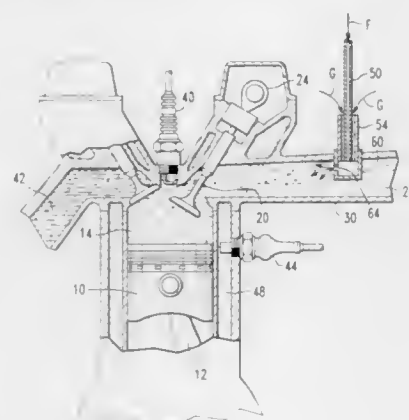
Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Lake Forest, Ill.

Filed Jun. 24, 1997, Ser. No. 881,770

Int. Cl.<sup>6</sup> F02M 23/00; F02B 23/00

U.S. Cl. 123—531

20 Claims



1. A nozzle, comprising:

a first conduit for conducting a flow of liquid fuel;

a second conduit for conducting a flow of a first gas, said first and second conduits having a common termination at a common location;

a cap disposed over said common termination, said cap having an opening formed therein, said common termination and said cap being arranged to cause said liquid fuel to form a mist within said cap in response to the flow of said first gas from said second conduit; and

a third conduit associated with an internal combustion engine for directing a flow of a second gas into a combustion chamber of said internal combustion engine, said opening formed in said cap being disposed in fluid communication with said third conduit to cause said mist to pass from said cap into said third conduit.

5,771,867

## CONTROL SYSTEM FOR EXHAUST GAS RECOVERY SYSTEM IN AN INTERNAL COMBUSTION ENGINE

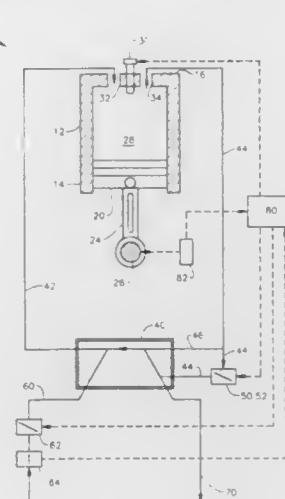
Alois Amstutz, Knonau, Switzerland, and James J. Faletti, Spring Valley, Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Jul. 3, 1997, Ser. No. 888,167

Int. Cl.<sup>6</sup> F02M 25/07; F02B 33/44

U.S. Cl. 123—569

24 Claims



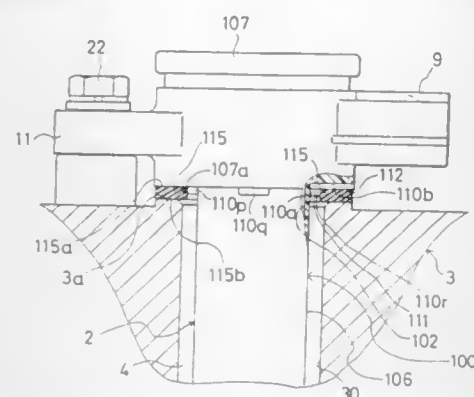
wherein said malfunction determining means calculates an amount of change in said actual valve opening degree when an amount of change in said target valve opening degree is one of equal to and greater than a first predetermined value so as to determine an occurrence of malfunction in said exhaust gas recirculation system based on a comparison between said amount of change in said actual valve opening degree and a second predetermined value.

# 5,771,870 IGNITION COIL FOR AN INTERNAL COMBUSTION ENGINE

Yoshitaka Satou, Toyohashi; Kazutoyo Oosuka, Gamagori; Masami Kojima, Chiryu, and Yoshihiro Shimoide, Tokai, all of Japan, assignors to Denso Corporation, Kariya, Japan  
Filed Dec. 6, 1996, Ser. No. 761,827  
Claims priority, application Japan, Dec. 6, 1995, 7-317680  
Int. Cl.<sup>6</sup> F02P 15/00

U.S. Cl. 123—635

11 Claims



1. An ignition coil for an internal combustion engine having a plug hole comprising:
  - a casing having a head portion and a pipe portion, said head portion being adapted to be disposed outside said plug hole, said pipe portion being adapted to be disposed in said plug hole;
  - a seal having a generally ring shape provided on said head portion and adapted to seal against said combustion engine, said seal and an outer periphery of said pipe portion defining a gap therebetween; and
  - a head passage being provided on said head portion and connected to said gap and extending outside of said head portion.

# 5,771,871 IGNITION DEVICE FOR INTERNAL COMBUSTION ENGINES

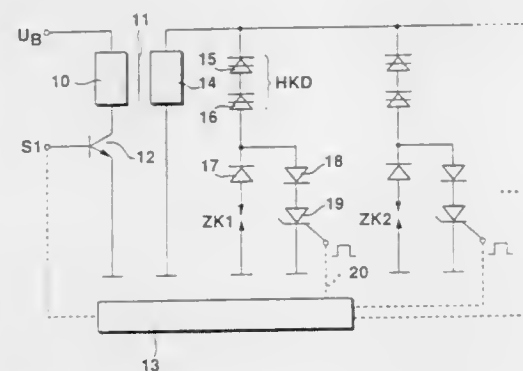
Manfred Vogel, Ditzingen; Werner Herden, Gerlingen, and Johann Konrad, Tamm, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany  
PCT No. PCT/DE95/01825, § 371 Date Jul. 7, 1997, § 102(e) Date Jul. 7, 1997, PCT Pub. No. WO96/23139, PCT Pub. Date Aug. 1, 1996  
PCT Filed Dec. 21, 1995, Ser. No. 875,475  
Claims priority, application Germany, Jan. 26, 1995, 195 02 304.8

Int. Cl.<sup>6</sup> F02P 3/12

U.S. Cl. 123—655

6 Claims

1. An ignition device for internal combustion engines, having at least one ignition coil (11) comprising a primary winding (10) and secondary winding (14), wherein a controllable switch (12) is disposed in series with the primary winding (10) and is triggerable by a control unit (13), wherein in each secondary-side ignition branch between the high-voltage-side end of the secondary winding (14) and a spark plug (ZK1, ZK2, . . . ZKn) at least one



high-voltage break-over diode (HKD) is disposed, which comprises a plurality of series-connected planar break-over diode chips, and having a controllable switching unit (19, 40) which is in series with the high-voltage break-over diode (HKD) and is triggerable by the control unit (13) during the ignition coil charging operation, so that a conditioning current caused by the positive ignition coil charging current flows in the reverse direction through the high-voltage break-over diode (HKD) and in the high-voltage break-over diode floods the blocking region with charge carriers (38).

# 5,771,872 COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

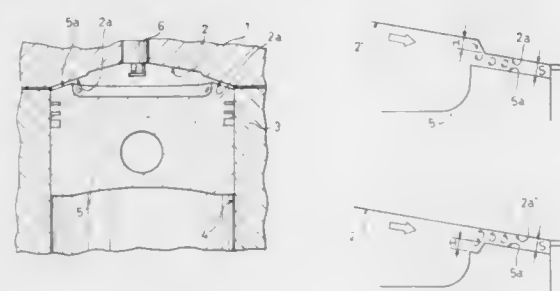
Takanori Ueda, and Takeshi Okumura, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 8, 1997, Ser. No. 826,819

Claims priority, application Japan, Apr. 11, 1996, 8-089581  
Int. Cl.<sup>6</sup> F02B 23/02

U.S. Cl. 123—661

8 Claims



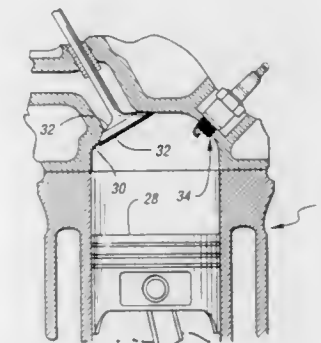
1. A combustion chamber of an internal combustion engine comprising:
  - an approximately triangular upper wall in at least one vertical section passing through the center of said combustion chamber;
  - a squish area formed by a peripheral portion of an upper wall of a piston and a peripheral portion of said upper wall of said combustion chamber; and
  - a step which is formed on one of said peripheral portion of the upper wall of said piston and said peripheral portion of the upper wall of said combustion chamber, whereby radial and outward flows impinge on said step inside of said squish area, a height of said step in at least the vicinity of said vertical section being approximately equal to the smallest clearance of said squish area.

# 5,771,873 CARBONACEOUS DEPOSIT-RESISTANT COATING FOR ENGINE COMPONENTS

Timothy J. Potter, Dearborn; Xia Zhang, Canton; William Vassell, Bloomfield Hills; Michael R. Rigley, Westland, and Robert E. Hetrick, Dearborn Heights, all of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.  
Filed Apr. 21, 1997, Ser. No. 837,679  
Int. Cl.<sup>6</sup> F01L 1/14

U.S. Cl. 123—668

18 Claims



1. A deposit-resistant internal combustion engine component, comprising:
  - a coating on at least one surface of the engine component, said surface being susceptible to deposit formation; and
  - said coating selected from the group consisting of amorphous hydrogenated carbon and doped amorphous hydrogenated carbon whereby said coating prevents deposit formation on the engine component.

# 5,771,874 CLAY TARGET TRAPS

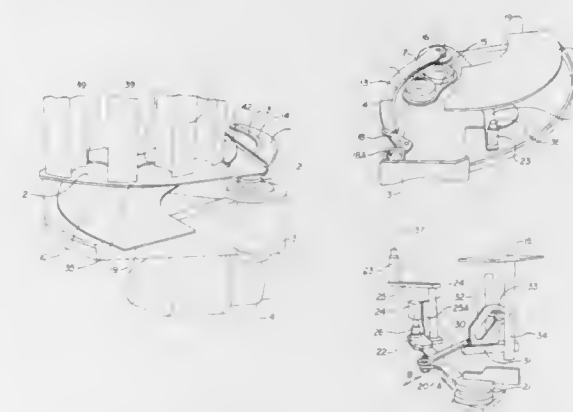
Ludwig Kohler, 33 Brushwood Drive, Alford's Point, Sydney, New South Wales, Australia, 2234

Filed Feb. 27, 1997, Ser. No. 810,999

Claims priority, application Australia, Feb. 27, 1996, PN8290  
Int. Cl.<sup>6</sup> F41J 9/18

U.S. Cl. 124—8

9 Claims



1. A machine for launching clay shooting targets, said machine comprising a target storage magazine, a delivery plate adjacent the base of said magazine, a user controllable delivery means adapted to unload either one or a pair of said targets from the magazine onto the plane of said delivery plate in a side by side configuration, a throwing arm adapted upon release to move across said delivery plate from a cocked position behind said one or pair of targets to a discharged position whereby said one or pair of targets are catapulted into the air from said delivery plate, wherein a leading edge of said throwing arm is curved so as to be in contact with or sufficiently closely adjacent said one or pair of targets when in said

cocked position to avoid target impact breakage upon release and also provide close flight trajectories for said pair of targets.

# 5,771,875 GAS POWERED REPEATING GUN

Brian E. Sullivan, 517 N. Mountain Ave. #203, Upland, Calif. 91786

Filed Apr. 28, 1995, Ser. No. 433,248

Int. Cl.<sup>6</sup> F41B 11/00; 11/02

U.S. Cl. 124—72

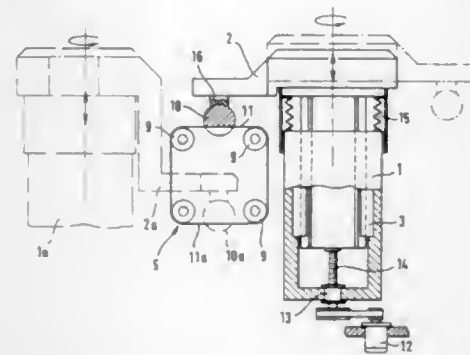
10 Claims



1. A gas powered repeating gun capable of firing projectiles with compressed gas, the gun having a forward end and a rearward end and comprising:
  - (a) a central section having a proximal end and a distal end;
  - (b) a stock section disposed below and attached to the central section proximate to the proximal end of the central section;
  - (c) a barrel section attached to the distal end of the central section;
  - (d) a barrel disposed within the barrel section, the barrel having a longitudinal axis, a central bore, a proximal end and a distal end;
  - (e) a breech disposed proximate to the proximal end of the barrel;
  - (f) an appendage disposed below the central section forward of the stock section;
  - (g) a primary reservoir capable of retaining at least about 50 projectiles wherein the primary reservoir is disposed within the appendage;
  - (h) a conveyance mechanism capable of delivering projectiles from the primary reservoir to the breech at a rate greater than about 300 per minute;
  - (i) a firing mechanism capable of delivering discreet bursts of compressed gas to the breech and thereby firing projectiles at a rate greater than about 300 per minute;
  - (j) a forestock section disposed below the barrel section; and
  - (k) a secondary reservoir capable of retaining projectiles, wherein the secondary reservoir is disposed within the forestock section;
 wherein the conveyance mechanism is disposed within the appendage, and wherein the projectiles within the primary reservoir and the conveyance mechanism are under atmospheric pressure.



5,771,876  
**WIRE SAW FOR AND METHOD OF CUTTING OFF SLICES FROM A WORKPIECE**  
Karl Eggthuber, Hebertsfelden, Germany, assignor to Wacker Siltronic Gesellschaft für Halbleitermaterialien AG, Burghausen, Germany  
Filed Apr. 25, 1996, Ser. No. 638,982  
Claims priority, application Germany, May 26, 1995, 195 19 460.8  
U.S. Cl. 125—21 Int. Cl.<sup>6</sup> B28D 1/02 20 Claims



1. A wire saw for cutting off slices from a workpiece comprising a cutting head having a side and said cutting head containing a plurality of wire guide rollers and around which a multiplicity of wire sections lying parallel to one another and forming a plane wire web are moved;  
a feed for guiding the workpiece from above toward the wire web;  
the feed comprising a holding arm carrying the workpiece, said feed being located at the side of the cutting head and said holding arm swivelling the workpiece in a horizontal plane parallel to the wire web; and  
means for supplying an auxiliary sawing medium to the wire saw.

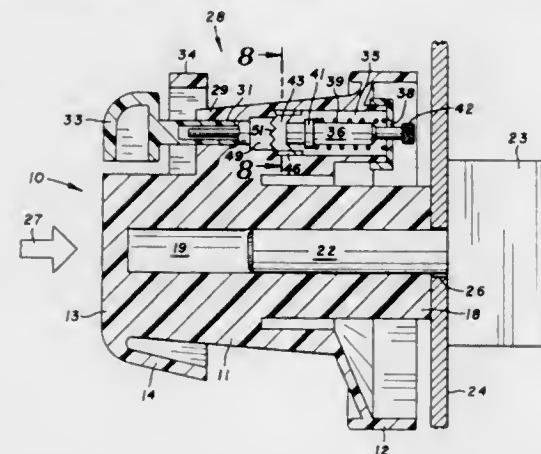
5,771,877  
**FIELD BARBECUE APPARATUS**  
Thomas E. Kelly, 219 Plymouth Ave., Oreland, Pa. 19075  
Filed Sep. 5, 1996, Ser. No. 708,523  
U.S. Cl. 126—29 Int. Cl.<sup>6</sup> F24B 3/00 2 Claims



1. In combination with a field barbecue apparatus having a  
(1) firebox,  
(2) fire bed, and  
(3) a sheet metal enclosure  
(a) over the firebox,  
(b) rectangular in vertical and horizontal cross-section,  
(c) greater in height than in width,  
(d) with ventilating holes,  
(e) containing and positioning a body of still gases above food being cooked in the apparatus; the improvement compris-

ing rack means having a plurality of vertical stackable racks, for supporting the food during the  
(1) preparation for barbecuing outside the apparatus  
(2) barbecue inside the apparatus, and  
(3) serving outside the apparatus; wherein the racks can be used selectively and individually for each of the above, each rack having a horizontal frame supporting a metal screen within the frame, and legs depending from the frame, wherein the racks are adapted to be stacked one atop the other within the sheet metal enclosure and over the fire bed.

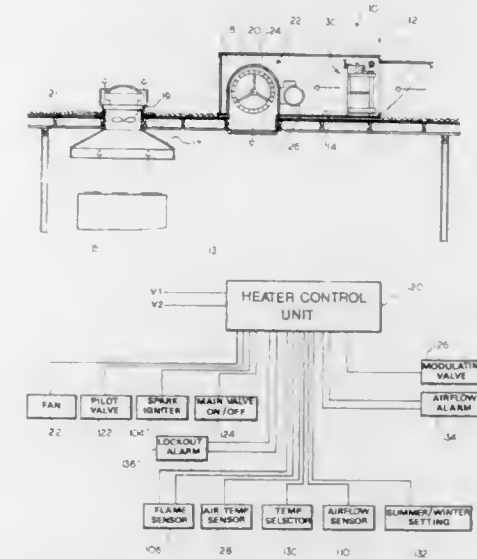
5,771,878  
**SAFETY KNOB**  
Luke E. Lewis, and Christopher E. Lewis, both of 312 Arbor Vista Blvd., Jackson, Miss. 39209  
Continuation-in-part of Ser. No. 44,508, Sep. 25, 1995, Pat. No. Des. 378,045. This application Oct. 21, 1996, Ser. No. 734,101  
U.S. Cl. 126—42 Int. Cl.<sup>6</sup> F24C 3/08 12 Claims



1. A knob for a control device mounted on a support, the control device having a shaft which is linearly moved between lock and release positions and rotatable when in the release position to actuate the control device comprising: a body adapted to be mounted on the shaft and used to linearly move the shaft between lock and release positions and rotate the shaft when it is in the release position to actuate the control device, and a releasable holding assembly secured to the body for selectively retaining the body in the first position and allowing the body to be moved to the second position, the releasable holding assembly has a pin movable to a first position to engage the support to retain the body in the first position and movable from the first position to a second position wherein the pin is spaced from the support, means operatively connected to the pin to selectively move the pin to its first position and second position, the means operatively connected to the pin includes a holding member movable between first and second longitudinal positions to retain the pin in its first and second positions, and button means for moving the holding member between its first and second positions.

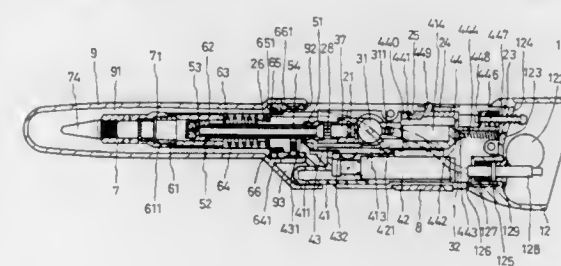
5,771,879  
**HEATED MAKEUP AIR SYSTEM FOR A COMMERCIAL KITCHEN**  
Todd J. Saltzman, Raleigh, N.C., assignor to Captive-Aire Systems, Inc., Youngsville, N.C.  
Filed Mar. 22, 1996, Ser. No. 611,454  
U.S. Cl. 126—299 R Int. Cl.<sup>6</sup> F24C 15/08 26 Claims

1. In a commercial kitchen of the type having an exhaust system for exhausting air from the kitchen and a makeup air system for



heating outside air and directing the heated outside air into the kitchen to replace exhausted air, a direct gas-fired kitchen makeup air unit comprising:  
(a) a duct structure;  
(b) a gas burner mounted in the duct structure;  
(c) a fan for moving air through the duct structure and past the burner; and  
(d) a pair of spaced-apart air-directing plates disposed outwardly of the burner, the plates converging in the direction of airflow through the duct structure and defining two outer airflow channels, one between each air-directing plate and the duct structure, and a central airflow channel between the air-directing plates themselves and aligned with the burner.

5,771,880  
**MULTIPURPOSE GAS BURNER**  
Chin-Lin Tsai, 3F, No. 94, Sec. 4, Chung Hsin Rd., San Chung City, Taipei Hsien, Taiwan  
Filed Nov. 6, 1995, Ser. No. 553,975  
U.S. Cl. 126—414 Int. Cl.<sup>6</sup> F23D 14/62; F23Q 7/12 10 Claims



1. A multipurpose gas burner comprising a rear housing (1), a front housing (2), a pressure regulating device (3), a control device (4), a gas release device (5) and an outer tube unit (6);  
said rear housing (1) consisting of a rear housing portion (11) and a relay seat (12), said rear housing portion (11) and a relay seat (12) being joined to each other, said rear housing portion (11) having an elongated structure, an open end, a central portion, a compartment (111) formed in said central portion, a gas container (150) fitted into said compartment, said compartment (111) having a front rim, two parallel housing plates (112) extending from said front rim for coupling with said relay seat (12), each of said two parallel housing plates (112) having a slot (113), two round push buttons (114) fitted into each of said slots and protruding from said rear housing, said relay seat (12) having one hole (121) in a rear portion thereof and one hole (121) in a front portion thereof,

said rear housing plates (112) entering into said hole (121) located in the rear portion of said relay seat (12) after assembly, said relay seat (12) having two second holes (122) located on opposite sides thereof, said two push buttons (114) of said rear housing each entering into one of said second holes (122), said relay seat (12) having a partition (123), a rectangular through-hole (124) adjacent said partition, a seat post (125) located on said partition, said seat post (125) having a central bore (126), said gas container (150) having a spout (160) and a press plate (155), an insert nozzle (128) received into said central bore (126), after assembly, said insert nozzle being connected to said gas spout of said gas container after said rear housing (1) containing the gas container is fitted onto said relay seat (12);

said front housing (2) consisting of left housing (21) and right housing (22) of symmetrical structure and joined together face to face, each of said left housing (21) and right housing (22) having a rim (23) at a rear end thereof, each rim engaging with said hole (121) located in the front portion of said relay seat (12), each of said left housing (21) and right housing (22) having an opening (24) in to upper part thereof, said opening having a lower portion, said left and right front housing having an upper post (25) on an inner wall extended from a lower portion of said upper opening (24), said front housing (2) having at a front thereof a tiered portion (26), said tiered portion (26) having an opening (27), said front housing (2) having a plurality of vents (28) for entry of ambient air, said pressure regulating device (3) comprising a T-shaped pressure regulator (31) having a rear end and a front end, said pressure regulator rear end being connected to said insert nozzle (128) which is connected to said relay seat (12), said pressure regulator front end being provided with a gas nozzle (37) for ejecting fuel gas, said pressure regulating device having means for regulating the pressure of said fuel gas;

said control device (4) consisting of a lower slide seat (41), a piezo-electric device (42), a conductive plate (43) and an upper slide seat (44), a pressing rod (446) and a through hole (445) formed in said upper slide seat (44), said piezo-electric device having a rim and a wire end (422), said lower slide seat (41) having a front end extending to form an elongate push button (411) and a rear end provided with a slide slot (412), said rim of said piezo-electric device entering into said slot (412), said slot having a horizontal upper side, said slot (412) having a groove (413) in said horizontal upper side of said slot, said groove having a rear end thereof extending upwardly to form an U-shaped slot (414) for receiving said upper slide seat (44), said U-shaped slot (414) being provided with a stop piece (415) at the rear end of said U-shaped slot (414) said conductive plate (43) having two ends, one end thereof being connected to said gas release device (5) and the other end being connected to said piezo-electric device, said upper slide seat (44) having a slide track (441) at a bottom portion thereof for coupling with said U-shaped slot (414) whereby said upper slide seat (44) slides along said slide track (441), said upper slide seat (44) having a baffle piece (442) at a lower portion thereof for urging against said stop piece (415), said baffle piece having a rear end, said rear end of said baffle piece being provided with a horizontally extending post (443), said post having fitted thereon a spring (444), said upper slide seat (44) having a through hole (445) formed at a rear end thereof, said pressing rod (446) being fitted with a spring element (447) having one end thereof inserted into said through hole (445) of said upper slide seat, said pressing rod (446) being positioned by a C-clip (448), at one end thereof, said gas container (150) having a press plate (155), the other end of said pressing rod (446) urging against said press plate of the gas container, after assembly, an elastic piece (450) being further provided in front of said through hole (445) of said upper slide seat, said elastic piece having a hook (440) provided at a front end thereof for engaging with or disengaging from said upper post (25) of said front housing, a lug (449) being provided to project from said front opening (24) of said front housing;

said gas release device (5) consisting of an inner tube (52), a fire nozzle (53) and a receiving ring (51) for receiving fuel gas

ejected via said gas nozzle (37) and air drawn in via said air vents (28), said conductive plate (43) of said piezo-electric device (42) being in contact with said receiving ring (51) and said inner tube (52) whereby a mixture of fuel gas and air passes through said inner tube (52) after assembly to be ejected via said fire nozzle;

said outer tube unit (6) consisting of a positioning ring (61), a ceramic tube (62), a connecting ring (66), a heat insulating ring (65), an extension tube (64) and spring means (63), said piezo-electric device (42) having a wire end (422), said connecting ring (66) having a flange (661), said positioning ring (61), said ceramic tube (62) and said spring means (63) being all disposed within said extension tube (64), said fire nozzle (53) and said inner tube (52) being located in said ceramic tube and in said spring means (63) and being connected with said extension tube (64) by means of said connecting ring (66), said extension tube (64) having a rear rim (641), said wire end (422) of said piezo-electric device being gripped between said flange (661) of said connecting ring and said rear rim (641) of said extension tube, and said connecting ring (66) being locked with said tiered portion (26) of said front housing.

5,771,881

## IGNITION APPARATUS AND A HEATING TOOL

Alfred P. Oglesby, Kilbride; John P. Oglesby, Anneville; Michael J. Griffin, Carlow; Damian Brett, Ashfinto; Patrick J. Brereton, Carlow; Michael P. Normanly, Pollerton, and John P. Watmore, Winterbourne, all of Ireland, assignors to Oglesby & Butler Research and Development Limited, Carlow, Ireland

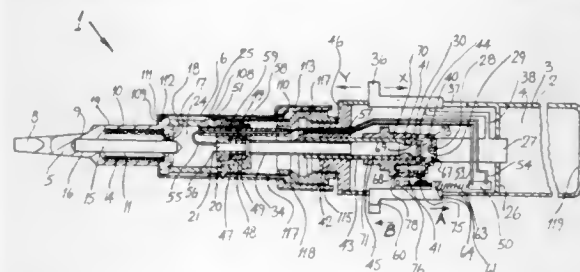
PCT No. PCT/IE94/00038, § 371 Date Jan. 16, 1996, § 102(c) Date Jan. 16, 1996, PCT Pub. No. WO95/02788, PCT Pub. Date Jan. 26, 1995

PCT Filed Jul. 18, 1994, Ser. No. 586,668

Claims priority, application Ireland, Jul. 16, 1993, S93 0529 Int. Cl.<sup>6</sup> B23K 3/02

U.S. Cl. 126—414

19 Claims



1. An ignition apparatus for raising the temperature of a gas catalytic combustion element (14) of a gas powered heating device to its ignition temperature, wherein the heating device comprises: a jet means (21) for delivering fuel gas to the gas catalytic combustion element (14) in gaseous form, for conversion to heat by the gas catalytic combustion element (14), the jet means (21) being located relative to the gas catalytic combustion element (14) for directing a flame at the gas catalytic combustion element (14) for raising the temperature of the gas catalytic combustion element (14) to its ignition temperature, and

a means (4) for supplying a stream of fuel gas in gaseous form to the jet means (21), the ignition apparatus comprising:

an ignition means (50,55) located adjacent the jet means (21) for igniting the fuel gas from the jet means (21) to burn with a flame,

a flame extinguishing means (67) provided by an interrupt means (67) for temporarily interrupting the flow of fuel gas to the jet means (21) for extinguishing the flame when the gas catalytic combustion element (14) has been raised to its ignition temperature, the interrupt means (67) being located upstream of the jet means (21) adjacent the fuel gas stream,

and being moveable from an idle position spaced apart from the fuel gas stream to a temporary interrupt position whereby the interrupt means (67) extends into the fuel gas stream for interrupting the fuel gas stream, and

an actuator means (60) located on the heating device and being cooperable with the ignition means (50,55) and the interrupt means (67), the actuator means (60) being operable for sequentially operating the ignition means (50,55) for igniting the fuel gas stream to burn with a flame and the interrupt means (67) for urging the interrupt means (67) temporarily into the interrupt position for temporarily interrupting the flow of fuel gas to the jet means (21).

5,771,882

## ANESTHETIC ADMINISTRATION APPARATUS WHICH DELIVERS ANESTHETIC IN MICRODROPLETS

Georgios Psaros, Tullinge, and Rolf Castor, Hagersten, both of Sweden, assignors to Siemens Elema AB, Solna, Sweden

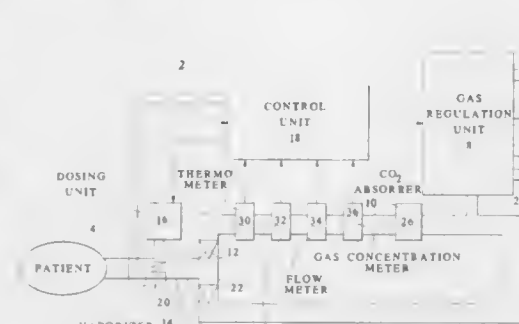
Filed Sep. 9, 1996, Ser. No. 711,654

Claims priority, application Sweden, Sep. 12, 1995, 9503141

Int. Cl.<sup>6</sup> A61M 15/00

U.S. Cl. 128—203.12

10 Claims



1. An anesthetic administration apparatus comprising:

a respiratory circuit including a connection piece directly connectable to a respirating subject to be anesthetized for carrying respiratory gas to and from a subject;

a dosing unit connected to said connection piece and supplying liquid anesthetic to said connection piece, said dosing unit including a container containing said liquid anesthetic, and a micropump in fluid communication with said container for supplying said liquid anesthetic in microdroplets to said connection piece; and

control means for operating said micropump for causing said micropump to deliver a predetermined amount of said liquid anesthetic in microdroplets during an inspiratory phase of a subject.

5,771,883

Patent Not Issued For This Number

5,771,884

## MAGNETIC EXHALATION VALVE WITH COMPENSATION FOR TEMPERATURE AND PATIENT AIRWAY PRESSURE INDUCED CHANGES TO THE MAGNETIC FIELD

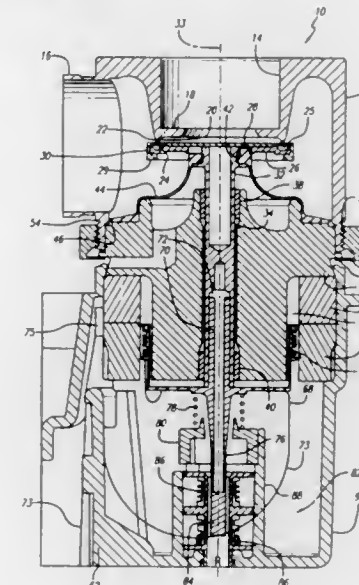
Stephen T. Yarnall, Poway; David P. Winter, Encinitas, and Bruce Van Wagner, Oceanside, all of Calif., assignors to Nellcor Puritan Bennett Incorporated, Pleasanton, Calif.

Filed Mar. 14, 1997, Ser. No. 818,171

Int. Cl.<sup>6</sup> A61M 16/00; A62B 7/00; 9/04; F16K 1/08

U.S. Cl. 128—205.24

12 Claims



1. An exhalation valve for a patient ventilator having a patient airway for breathing gas, comprising:

a valve housing adapted to be connected to the patient ventilator, said valve housing having an exhalation line inlet port for receiving breathing gas from the patient airway, a valve seat on said inlet port, and an exhalation outlet port;

a valve poppet disposed in said valve housing adjacent to said valve seat, said valve poppet having a longitudinal shaft and a face perpendicular to the shaft with a surface defining an annular groove, and said valve seat having an annular shoulder corresponding to and adapted to interfit with said valve poppet annular groove;

a magnetic body disposed in said valve housing having a generally cylindrical longitudinal bore, said valve poppet shaft being disposed in said generally cylindrical longitudinal bore in said magnetic body, said valve poppet shaft being suspended in said generally cylindrical longitudinal bore in said magnetic body by a plurality of annular low friction bearings; an annular permanent magnet disposed around said magnetic body for producing a magnetic field of predetermined flux density;

an annular magnetic ring disposed around said magnetic body adjacent to said annular permanent magnet for providing a flux path, said annular permanent magnet and said annular magnetic ring being spaced apart from said magnetic body so as to define an air gap therebetween;

an armature disposed adjacent to said magnetic body having a central plate portion extending into said air gap, said armature including an electromagnetic coil disposed on said armature central plate portion in said air gap between said magnetic ring and said magnetic body, said valve poppet shaft having a generally cylindrical longitudinal bore, said armature including a cylindrical longitudinal shaft having an upper portion extending within said central bore of said valve poppet shaft, and a lower portion;

a control mechanism for supplying current to said electromagnetic coil for causing an axial force for axial movement of said poppet with respect to said valve seat; and means for positioning said magnetic body relative to said valve housing.

5,771,885

## EXERCISE FILTER

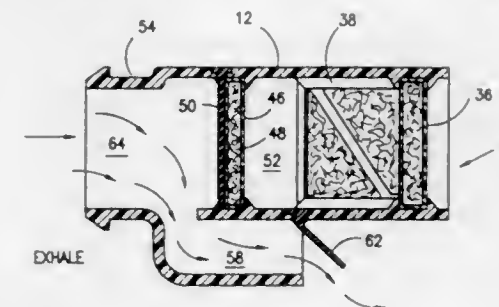
Andrew C. Putrello, Utica, N.Y., assignor to Tri-Pact Enterprises, Inc., Utica, N.Y.

Filed Feb. 22, 1996, Ser. No. 605,675

Int. Cl.<sup>6</sup> A62B 7/10

U.S. Cl. 128—205.27

20 Claims



1. A filter assembly comprising:

a hollow body formed from upper and lower body sections attached along a center line defining an enclosed cavity having an inlet port, a first removable filter, a second removable filter, and a first one way valve in series for uni-directionally allowing the flow of air through the body such that air passes through the first filter, the second filter and the first one way valve;

an exhaust port having an open end and a second one way valve for unidirectionally exhausting air from the body;

at least one slot formed between a plurality of bosses extending inwardly from the inner surface of the body, and the first one way valve comprising a flap sheet inserted into a slot in the upper housing section approximately behind the second filter.

5,771,886

## INFLATABLE HEAD HARNESS WITH HEARING DEVICE PLACEMENT

Patrick Maire, Raizeux, and Thierry Touratier, Montmorency, both of France, assignors to Intertechnique, Plaisir, France

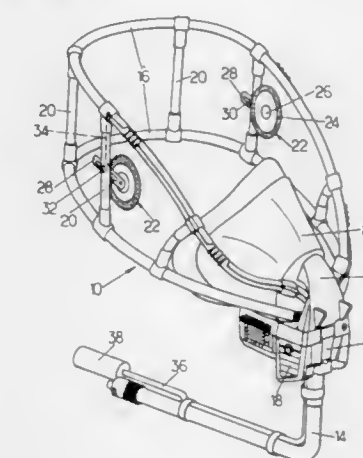
Filed Aug. 11, 1997, Ser. No. 907,976

Claims priority, application France, Aug. 12, 1996, 96 10122

Int. Cl.<sup>6</sup> A62B 18/08; 9/04

U.S. Cl. 128—207.11

8 Claims



1. Fast donning breathing apparatus, comprising:

a mask provided with a regulator arranged for connection to a source of pressurized breathable gas; and a harness having at least one stretchable strap whose ends are attached on the mask and including an inflatable element, and means connectable to a source of pressurized breathable gas and manually controllable to admit a pressurized breathable gas to the mask.



the inflatable element to extend said stretchable strap up to a large size and to discharge said pressurized breathable gas from said inflatable element to decrease the size of said stretchable strap and to enable the strap to tighten and to bias the mask onto a face of wearer; and  
at least one ear piece secured to the harness or to the mask by means arranged for applying it against the auditory track or around the ear with a sufficient pressure for correct hearing, when the harness straps are deflated.

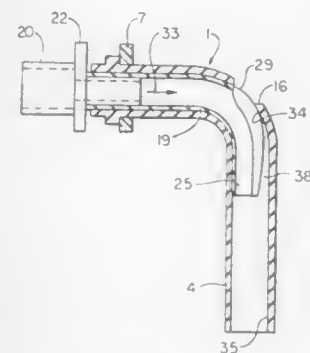
5,771,887

Patent Not Issued For This Number

5,771,888  
**TRACHEAL CANNULA FOR THE MECHANICAL RESPIRATION OF TRACHEOTOMISED PATIENTS**  
Michael Keim, Geroldshausen, Germany, assignor to Rusch AG, Kernen, Germany  
PCT No. PCT/EP94/03647, § 371 Date Aug. 22, 1996, § 102(e) Date Aug. 22, 1996, PCT Pub. No. WO95/14499, PCT Pub. Date Jun. 1, 1995

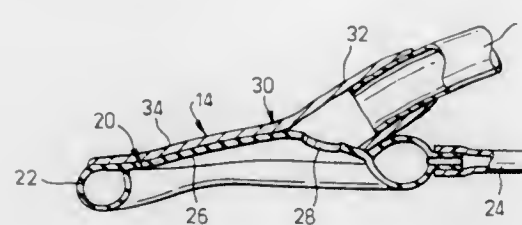
PCT Filed Nov. 8, 1994, Ser. No. 648,187  
Claims priority, application Germany, Nov. 22, 1993, 43 39 706.9

Int. Cl.<sup>6</sup> A61M 16/00  
U.S. Cl. 128—207.15



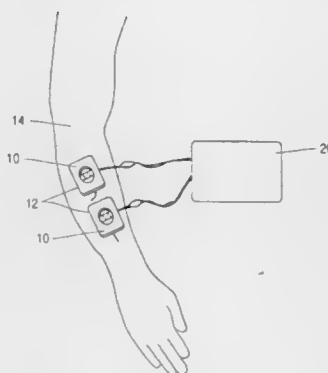
1. A tracheal cannula assembly for mechanical respiration of tracheotomised patients said cannula assembly comprising an outer cannula (1) having a cuff (10) which is adapted to enclose and seal a proximal section (4) of said outer cannula (1) in a trachea, which section (4) is insertable in a trachea, said outer cannula having a curved section (3) arranged adjacent the cuff (10), and an inner cannula (19) disposed substantially concentrically in said outer cannula (1). An exhalation opening (16) being provided in said outer cannula (1) proximate said cuff (10), and disposed proximate a hypothetical extension of a longitudinal axis (17) of the proximal section (4), characterised in that in a portion of said inner cannula adjacent the exhalation opening (16), the inner cannula (19) is provided with an elongated opening (26) in a side wall of said inner cannula (19) and extending from a proximal end (25) of said inner cannula (19), which opening (16) is at least in part covered by an elastic diaphragm (29) operable as a valve, and at said proximal end (25) thereof is provided with an end opening constricted in cross section.

5,771,889  
**LARYNGEAL MASK AIRWAYS**  
Eric Pagan, Folkestone, England, assignor to Smiths Industries PLC, London, England  
Filed Feb. 23, 1996, Ser. No. 606,307  
Claims priority, application United Kingdom, Mar. 14, 1995, 9505134  
Int. Cl.<sup>6</sup> A61M 29/00  
U.S. Cl. 128—207.15



1. A laryngeal mask assembly comprising: a mask subassembly, said mask subassembly being adapted during use to locate in the hypopharynx and to open on its forward side to the patient's airway; and an elongate tube, said tube opening at its patient end into said mask subassembly, wherein said mask subassembly has an inflatable sealing ring and a generally planar backing member extending on a rear side of said mask subassembly to overlap a patient end of said sealing ring such that, when said sealing ring is deflated for insertion, said backing member inhibits rearward deflection of the patient end of said sealing ring.

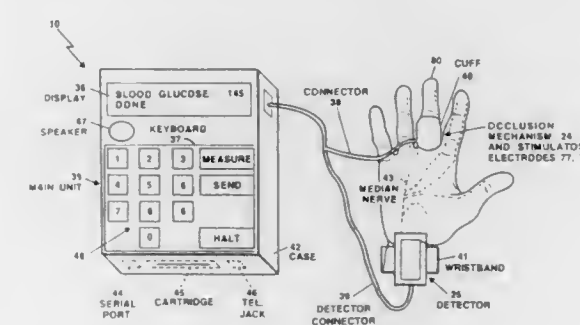
5,771,890  
**DEVICE AND METHOD FOR SAMPLING OF SUBSTANCES USING ALTERNATING POLARITY**  
Janet Tamada, Belmont, Calif., assignor to Cygnus, Inc., Redwood City, Calif.  
Filed Jun. 24, 1994, Ser. No. 265,844  
Int. Cl.<sup>6</sup> A61B 5/05  
U.S. Cl. 128—635



1. A method for sampling of a substance from a subject which comprises:  
(a) placing a device comprising a first and second sampling chamber each sampling chamber comprising an electrode in electrical communication with the tissue on a collection site on a tissue surface on the subject;  
(b) conducting electrical current through the tissue in a first polarity to the collection site to extract a substance from the subject into the first sampling chamber;  
(c) analyzing the first sampling chamber for the concentration of the substance or a substance metabolite;  
(d) reversing the polarity of the electrodes in the first and second sampling chamber and conducting electrical current through the tissue in a second opposite polarity to the collection site to extract a substance from the subject into the second sampling chamber;

(e) analyzing the second sampling chamber for the concentration of the substance or a substance metabolite.

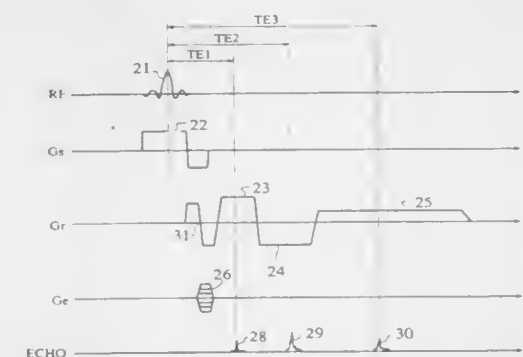
5,771,891  
**APPARATUS AND METHOD FOR NON-INVASIVE BLOOD ANALYTE MEASUREMENT**  
Shai N. Gozani, 1574 Beacon St., Apt. 1, Brookline, Mass. 02146  
Division of Ser. No. 435,403, May 10, 1995. This application Oct. 28, 1996, Ser. No. 738,183  
Int. Cl.<sup>6</sup> A61B 5/05  
U.S. Cl. 128—635



1. Apparatus comprising:  
a stimulator adapted for applying an electrical or magnetic stimulus to an endogenous tissue responsive to said stimulus;  
a detector adapted for detecting a response of an endogenous tissue to said stimulus;  
a correlator adapted for correlating said detected response of said endogenous tissue to a quantitative measure of an analyte concentration; and  
an indicator adapted for indicating said quantitative measure of said analyte concentration in response to said correlation by said correlator.

5,771,892  
Patent Not Issued For This Number

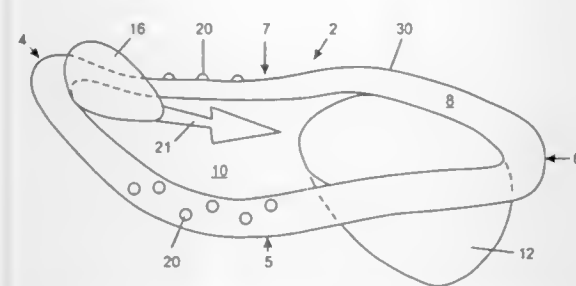
5,771,893  
**METHOD AND APPARATUS FOR NUCLEAR MAGNETIC RESONANCE IMAGING OF PHYSIOLOGICAL FUNCTION INFORMATION**  
Yoshimori Kassai, Tochigi-ken; Shoichi Kanayama, Saitama-ken; Shigehide Kuhara, and Arturo Calderon, both of Kanagawa-ken, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan  
Filed Sep. 6, 1995, Ser. No. 524,257  
Claims priority, application Japan, Sep. 6, 1994, 6-212984  
Int. Cl.<sup>6</sup> A61B 5/055  
U.S. Cl. 128—653.3



1. A method for nuclear magnetic resonance imaging, comprising the steps of:  
imaging a body to be examined placed in a homogeneous static magnetic field by applying radio frequency magnetic field and gradient fields having a slicing gradient field, a reading gradient field and a phase encoding gradient field, according to a pulse sequence in which a pulse of said radio frequency magnetic field and a pulse of said slicing gradient field are applied for selectively exciting the body to be examined in one slicing direction, a pulse of said reading gradient field for suppressing a motion artifact is applied during an application of a pulse of said phase encoding gradient field, and field echoes are sequentially generated by sequentially switching said reading gradient field, detecting nuclear magnetic resonance signals emitted from the body to be examined in response to the radio frequency magnetic field and the gradient magnetic fields, and processing the nuclear magnetic resonance signals to construct nuclear magnetic resonance images; and  
controlling the pulse sequence by varying periods for switching said reading gradient field so as to realize a first imaging scheme for acquiring first image data emphasizing the nuclear magnetic resonance signals from blood flow portions in a desired region of the body to be examined, and a second imaging scheme for acquiring second image data emphasizing a change of a magnetic field inhomogeneity due to a change of an amount of blood flow in the desired region of the body to be examined, by a single execution of the pulse sequence at the imaging step.







a barrier portion extending across said loop, said barrier portion including a cervical dome which opens generally in said first axial direction.

5,771,901

## ERGONOMIC PALMAR SUPPORT

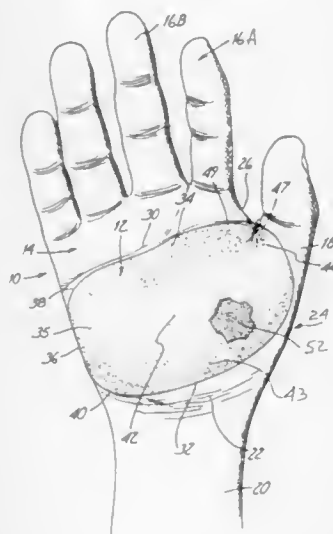
Virginia H. O'Brien, 1141 Hillcrest Dr., Woodbury, Minn. 55125

Filed Jan. 27, 1997, Ser. No. 789,091

Int. Cl.<sup>6</sup> A61F 5/37

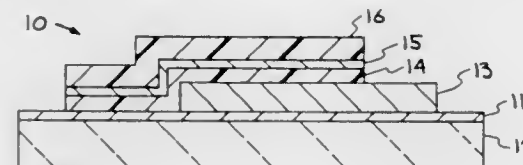
U.S. Cl. 128—878

14 Claims



1. A hand support comprising a unitary member that extends across and is contiguous with the palm portion of a hand of a wearer, said hand support being made of a material that is sufficiently rigid to distribute weight across a surface area of the palm when subjected to loads in localized regions, and comprising a first edge portion extending just distal to the distal wrist crease, and curved upwardly from the first edge, the hand support having a second edge portion joining the first edge portion and extending in direction to overlie an ulnar side of the hand of a wearer, the hand support having a third edge portion opposite from the first edge portion, the third edge portion terminating on a proximal side of a distal palmar crease of the hand of a wearer, and a thumb saddle formed on an opposite side from the second edge portion contoured to receive and support a thumb of a user, and extending no farther than the second joint of the thumb to permit the outer end of the thumb to flex, the edge portions and thumb saddle providing load support regions for the hand support while permitting the hand to bend at the palmar crease.

5,771,902  
MICROMACHINED ACTUATORS/SENSORS FOR  
INTRATUBULAR POSITIONING/STEERING  
Abraham P. Lee, Walnut Creek; Peter A. Krulevitch, Mountain View; M. Allen Northrup, Berkeley, and Jimmy C. Trevino, French Camp, all of Calif., assignors to Regents of the University of California, Oakland, Calif.  
Filed Sep. 25, 1995, Ser. No. 533,426  
Int. Cl.<sup>6</sup> A61B 19/00  
U.S. Cl. 128—897 20 Claims



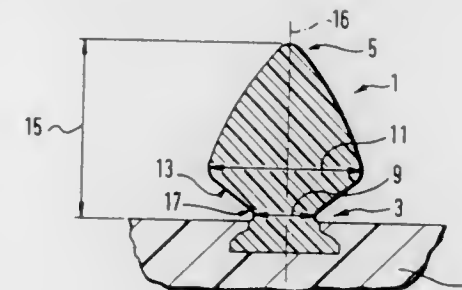
1. A device adapted for guiding a tool or the like through a passageway, said device comprising:  
a plurality of bendable means; and  
means for individually activating each of said plurality of bendable means.

5,771,903  
SURGICAL METHOD FOR REDUCING THE FOOD  
INTAKE OF A PATIENT  
Arne Jakobsson, Antibes, France, assignor to Kirk Promotions Limited, St. Johns, Isle of Man  
Filed Sep. 22, 1995, Ser. No. 532,357  
Int. Cl.<sup>6</sup> A61B 19/00  
U.S. Cl. 128—898 9 Claims



1. A surgical method for reducing the food intake of a patient, comprising:  
dissecting the lower part of the Esophagus of a patient,  
applying a band to form a loop around the Esophagus,  
displacing an upper part of the stomach through said loop, thereby forming a small pouch above said band connected to the Esophagus, and  
suturing said upper part to the stomach wall, thereby tunneling said band.

5,771,904  
BRISTLES FOR A HAIRBRUSH  
Peter Lange, Eppstein; Peter Ruppert, Karben, and Cornelia Seifert, Bad Soden, all of Germany, assignors to Braun Aktiengesellschaft, Frankfurt, Germany  
Filed Mar. 8, 1996, Ser. No. 612,594  
Claims priority, application Germany, Dec. 8, 1995, 295 20 134 U  
Int. Cl.<sup>6</sup> A45D 24/00  
U.S. Cl. 132—159 25 Claims



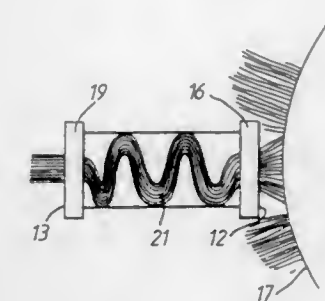
1. Bristles for a hair treatment implement having a bristle supporting structure, said bristles comprising a bristle base head and a bristle body disposed along a longitudinal axis extending therebetween, wherein the bristle base is adapted to be mounted proximal to the bristle supporting structure, the bristle head is located in an outward direction from the bristle base, the bristle body comprises at least a first body portion having a first cross-sectional area and a second body portion having a second cross-sectional area, said second cross-sectional area being larger than said first cross-sectional area, and wherein the second body portion is adjacent the first body portion and the first body portion is proximal the bristle base, and wherein the bristle body further comprises a notch undercutting the bristle body immediately adjacent the bristle body first portion to resiliently engage hairs passing through the neck portion for applying a light pulling force to the hairs and guiding the hairs towards the base.

5,771,905

Patent Not Issued For This Number

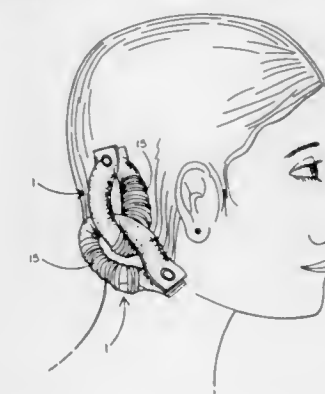
5,771,906  
METHOD OF WAVING HAIR  
Alfredo De Benedictis, 30 Falcon Avenue, Springfield, Milton Keynes, Buckinghamshire, MK6 3HJ, Great Britain  
PCT No. PCT/GB95/00406, § 371 Date Aug. 27, 1996, § 102(e) Date Aug. 27, 1996, PCT Pub. No. WO95/22920, PCT Pub. Date Aug. 31, 1995  
PCT Filed Feb. 27, 1995, Ser. No. 704,498  
Claims priority, application United Kingdom, Feb. 28, 1994, 9403790  
Int. Cl.<sup>6</sup> A45D 7/04  
U.S. Cl. 132—207 12 Claims

12. A method of treating hair including the steps of enclosing at least a part of a tress of hair within a length of resiliently extendible tube stretched lengthwise, said tress of hair extending lengthwise of said stretched length of resiliently extendible tube; releasing the stretched length of tube so that the length of tube contracts lengthwise while maintaining first and second ends of the length of



tube located relative to locations spaced apart along the tress of hair to cause that part of the tress of hair enclosed in the length of resiliently extendible tube to be contracted into a waved form.

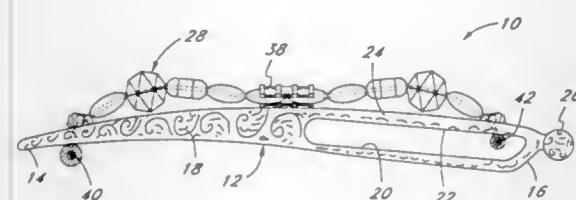
5,771,907  
FLEXIBLE HAIR ROLLER  
Deanna R. Dickson, 1567 W. Tedmar, Anaheim, Calif. 92802  
Filed Jun. 4, 1996, Ser. No. 658,133  
Int. Cl.<sup>6</sup> A45D 2/20  
U.S. Cl. 132—247 7 Claims



1. A hair styling system including a plurality of flexible hair rollers to be worn during sleep so as to enable the wearer's hair to be styled without subjecting the wearer to appreciable discomfort, each of said plurality of flexible hair rollers comprising a first end and an opposite end, an elongated central core formed from a soft, resilient material and extending between said first and opposite ends, a soft outer covering surrounding said central core and forming a surface around which the wearer's hair can be rolled, and first and second fasteners located respectively at said first and opposite ends so as to be mated to one another for connecting said first and second ends together, a first of said plurality of flexible hair rollers being folded to move said first end thereof towards said opposite end and thereby connect said first and second fasteners together for retaining said first hair roller in a closed loop, said first flexible hair roller in said closed loop being interlinked with at least a second of said plurality of flexible hair rollers in said closed loop to form a chain therebetween.

5,771,908  
HAIRCLIP  
John Dorsey, Mission Viejo, Calif., assignor to O'Dorsay, Inc., Mission Viejo, Calif.  
Filed Sep. 25, 1996, Ser. No. 719,479  
Int. Cl.<sup>6</sup> A45D 8/00  
U.S. Cl. 132—275 20 Claims

1. A hairclip comprising:  
an elongated central body having a tip end and a head end and a slot in said elongated central body extending from adjacent said head end toward said tip end;



a flexible inelastic band formed with a first loop and a second loop, said first and second loops being arranged end-to-end one another;  
said first loop being received in and movable through said slot;  
and  
said second loop being sized to fit over said tip end of said elongated central body, said inelastic band being of such length so that when said first loop is at the end of said slot toward said tip end, said second loop will fit over and around said tip end and when said first loop is moved through said slot away from said tip end and towards said head end, said second loop is engaged and retained by said tip end.

5,771,909

## PROGRAM CONTROLLED DISHWASHER

Wolfgang Hein; Ulrich Hettenhausen, both of Bielefeld; Frank Kethers, Lage/Lippe, and Peter Obermeier, Bielefeld, all of Germany, assignors to Carl Miele & Cie. GmbH & Co., Guetersloh, Germany

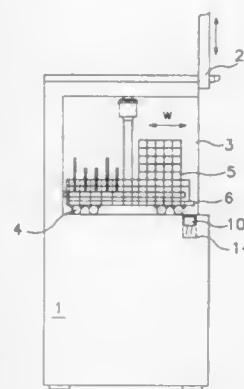
Filed Apr. 22, 1996, Ser. No. 635,500

Claims priority, application Germany, Apr. 22, 1995, 195 14 873.8

Int. Cl.<sup>6</sup> B08B 3/02

U.S. Cl. 134—57 D

26 Claims



1. An apparatus for cleaning, sterilizing and drying of articles under the control of a predetermined program selected from a plurality thereof, comprising:

cavity means defining a wash chamber;

means movable relative to said wash chamber for storing said articles;

magnetic key means provided with a predetermined pattern of magnetization determinative of said predetermined program for washing, sterilizing and drying said articles in said storing means, said magnetic key means comprising a plurality of individual magnetic means of predetermined magnetic polarities; and

means for releasably mounting said magnetic key means on said storing means.

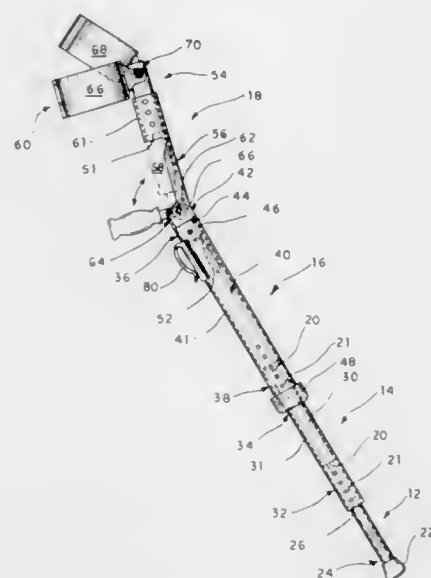
5,771,910  
COLLAPSIBLE SECTIONAL LOFSTRAND-TYPE  
CRUTCH

Sherri L. Kluttz, 4105 Crabapple La., Greensboro, N.C. 27405  
Filed Jul. 24, 1997, Ser. No. 899,477

Int. Cl.<sup>6</sup> A61H 3/02

U.S. Cl. 135—68

14 Claims



1. A collapsible, sectional crutch comprising:

a stud section having a ground contacting end portion and an upper end portion;

a lower tubular member, having a stud receiving end portion, a top end portion and defining a longitudinal axis therebetween, the stud section telescopically attached to the lower tubular member along the longitudinal axis;

first means to said lower tubular member securing the stud section to said lower tubular member at one of a plurality of predetermined positions along the longitudinal axis;

an upper tubular member, having a first end and a second end, collinear with the longitudinal axis, the second end telescopically attached to the top end portion of the lower tubular section along the longitudinal axis;

second means securing the lower tubular member to said upper tubular member at one of a plurality of predetermined positions along the longitudinal axis; and

a tubular support member having

a support handle;

a seating end portion configured to have a shoulder for removably and securely seating upon the first end of the upper tubular member;

a bracing end portion;

a middle portion, said middle portion defining a recess dimensioned to receive the support handle;

a first pivoting means pivotally attaching the support handle to the middle portion, wherein the first pivoting means permits the support handle to be pivoted between an open state and a closed state, wherein the support handle is received by the recess in the closed state and rests cantilevered upon the middle portion in the open state;

whereby the stud section, the lower tubular member, and the upper tubular member can be manually made to telescopically retract into compact nesting assembly, and whereby further the tubular support member may be removed from the upper tubular member and folded lateral to the compact nesting assembly.

5,771,911

Patent Not Issued For This Number

5,771,912

## ATTACHMENT DEVICE FOR ERECTING A TENT

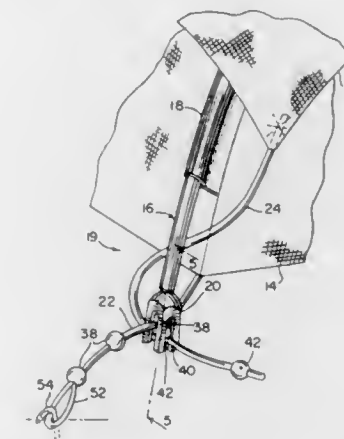
Thomas R. Swetish, Kenosha, Wis., assignor to Johnson Worldwide Associates Inc., Sturtevant, Wis.

Filed May 8, 1996, Ser. No. 643,418

Int. Cl.<sup>6</sup> E04H 15/32

U.S. Cl. 135—87

24 Claims



1. An attachment structure for a tent having a shell made of a flexible material and a pole cooperating with the shell to adjustably hold the flexible material in a tensioned position, the attachment structure comprising:

a securing cord attachable to the shell;

at least two enlarged regions disposed along the securing cord; and

a claw disposable at an end of the pole to selectively engage the enlarged regions, the claw having a base portion and at least two fingers extending from the base portion, the at least two fingers having a slot therebetween, the slot configured to receive a portion of the securing cord and the at least two fingers arranged to selectively contact one of the plurality of enlarged regions, wherein the tensioned position of the flexible material is thereby adjusted.

5,771,913

Patent Not Issued For This Number

5,771,914

## FLEXIBLE FLUID JUNCTION

Michael T. K. Ling, Vernon Hills; Leon Woo, Libertyville, both of Ill.; Eric J. Hénaut, Arkenne; Patrick Balteau, Ohey, both of Belgium; Eric P. Loh, Park Ridge, Ill.; Francesco Peluso, Heverlee; Alphonse Heremans, Genappe, both of Belgium; Ying-Cheng Lo, Green Oaks, Ill.; Marc Bellotti, Libertyville, Ill.; Rafael A. Castellanos, Roselle, Ill., and Robin Peters, McHenry, Ill., assignors to Baxter International Inc., Deerfield, Ill.

Filed Feb. 13, 1997, Ser. No. 799,855

Int. Cl.<sup>6</sup> E03B 1/00

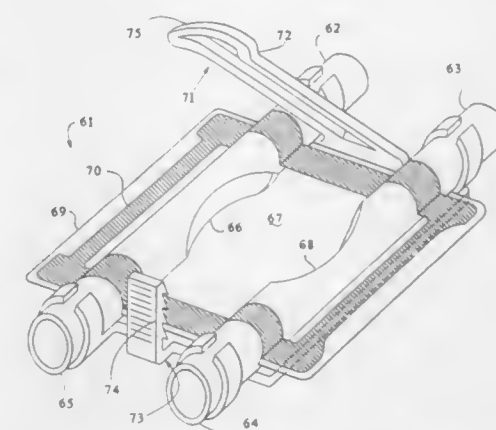
U.S. Cl. 137—1

15 Claims

1. A method of linking at least two containers, including a solution container, a drainage container, and at least one supply tube, without introducing air bubbles to the supply tube, the method comprising the following steps:

providing at least two containers including the solution container and the drainage container,

providing a flexible fluid junction comprising a pair of flexible webs, each of the webs having an outer periphery, and at least three tubes including a solution tube, a drainage tube and a supply tube, each of said tubes being disposed between the flexible webs, the outer peripheries of the webs being sealed



together and around the tubes to define a flexible mixing chamber, an end of each of the tubes terminating inside the chamber,

isolating the solution tube from the drain and supply tubes with a clamp that extends across the flexible fluid junction between the solution tube and the drain and patient tubes,

connecting the drain tube to the drain container,

connecting the patient tube to a source of waste fluid,

connecting the solution container to the solution tube,

establishing fluid flow between the source of waste fluid and the drain container,

removing the clamp.

5,771,915

Patent Not Issued For This Number

5,771,916

AUTOMATIC SHUT-OFF FOR A CONDUIT FLUID  
CONTAINMENT SYSTEM

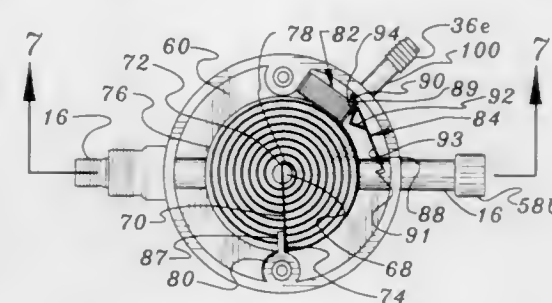
John G. Armenia, P.O. Box 716, and Alfred L. Calciano, 3342 W. Gulf Dr., both of Sanibel Island, Fla. 33957

Filed Oct. 8, 1996, Ser. No. 727,775

Int. Cl.<sup>6</sup> F16K 17/36

U.S. Cl. 137—67

11 Claims



1. Apparatus for conducting fluids from a fluid source to a fluid receiver and for controlling fluid loss therefrom, said apparatus comprising:

at least one conduit having an inlet end and an outlet end, at least one containment housing having a first end and a second end, said containment housing being sized and configured to receive at least a portion of said conduit therein, such that a containment chamber is defined between said outer surface of said conduit and said inner surface of said containment housing;

a valve attached in fluid flow relationship to said conduit, said valve being adjustable from an open position, defined as when a fluid is able to pass through said valve and through said



conduit, to a closed position defined as when a fluid is unable to flow through said conduit;  
a release engaging said valve, said release holding said valve in said open position;  
means for biasing said valve to said closed position being attached to said valve;  
an air vent formed in said containment housing such that when a fluid enters said containment housing at least a portion of the air is vented from said containment housing; and  
a block inserted within said containment chamber such that said block engages said containment housing and lies adjacent said release, said block expanding when said fluid enters said containment chamber to at least partially immerse said block, said expanding block operatively engaging said release so that said valve is moved to said closed position by said biasing means.

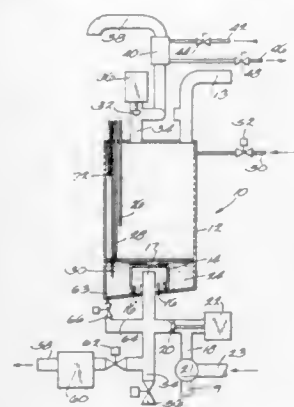
5,771,917

## SANITARY ASEPTIC DRAIN SYSTEM

Michael Carney, Kenosha, and Richard D. Kramer, Racine, both of Wis., assignors to Tri-Clover, Inc., Kenosha, Wis.  
Filed Sep. 25, 1995, Ser. No. 533,612  
Int. Cl.<sup>6</sup> B08B 9/06; 9/08; F16K 31/02

U.S. Cl. 137—238

14 Claims



1. A buffer system for separating an aseptic fluid handling assembly from a drain comprising  
a fluid receiving housing in fluid flow communication with a fluid discharge outlet of said aseptic fluid handling assembly  
a trapped fluid discharge opening near the bottom of said housing, said opening including a tube which extends above said bottom into a baffle container, said baffle container being in the form of an enclosure having openings at the bottom thereof to admit therein fluids contained in said housing and preventing back flow of fluids from said drain,  
a discharge conduit in fluid flow communication with said discharge opening said discharge opening being in fluid flow communication with said drain,  
first and second fluid level detection means in said housing for detecting high and low fluid levels in said housing, respectively, both of said high and low levels being above said openings of said enclosure,  
at least one valve in said discharge conduit,  
control means operatively connected to said first and second fluid level detection means to open and close said valve in response selected fluid levels detected by said first fluid level detection means, whereby a fluid level in said housing is controlled in a preselected depth range above the level of said openings of said enclosure during a static operational mode, said first fluid level detection means being operatively connected to a drain valve to open said valve to provide a draining mode of said system when said high fluid level is exceeded,  
a supply of clean-in-place fluid being connected to said entire buffer system by a conduit having a valve to selectively enable control of flow of said clean-in-place fluid into said entire buffer system during a cleaning mode of operation and

to selectively enable discontinuation of said flow of said clean-in-place fluid after said entire buffer system has been cleaned.

5,771,918

## DEVICE FOR CONNECTING OUTPUT PIPE TO VALVE

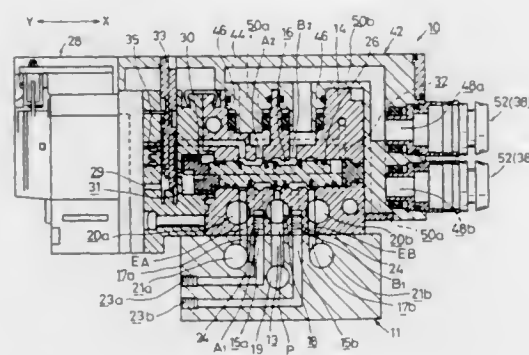
Yoshihiro Fukano, and Yoshitada Doi, both of Tsukuba-gun, Japan, assignors to SMC Kabushiki Kaisha, Tokyo, Japan  
PCT No. PCT/JP94/00639, § 371 Date Dec. 18, 1995, § 102(e)  
Date Dec. 18, 1995, PCT Pub. No. WO95/28590, PCT Pub. Date Oct. 26, 1995

PCT Filed Apr. 18, 1994, Ser. No. 553,552

Int. Cl.<sup>6</sup> F16K 39/00

U.S. Cl. 137—269

9 Claims



1. A device for connecting an output pipe to a valve, said device comprising:  
a supply port;  
an output port;  
a discharge port;  
a valve body having a valve hole defined therein, said hole communicating with the supply, output, and discharge ports, said valve body further comprising a valve output port;  
a valve member disposed in said valve body and displaceable inside the valve body;  
a pipe adapter selectively and detachably attached to the valve output port defined in a first side surface of the valve body, an axis of said valve output port extending in a first direction, said pipe adapter having respective surfaces of abutting against said first side surface and another second side surface of said valve body;  
wherein said pipe adapter comprises an adapter output port, an axis of said adapter output port extending in a second direction substantially perpendicular to said first direction, for attachment of a pipe joint for connection to an output pipe, and an output passage defined in said pipe adapter for communication between said valve output port and said adapter output port.

5,771,919

## FLUID CONTROLLER

Shigeru Itoi; Michio Yamaji, and Tetsuya Kojima, all of Osaka, Japan, assignors to Fujikin Incorporated, Osaka, Japan  
Filed Jul. 17, 1996, Ser. No. 682,366

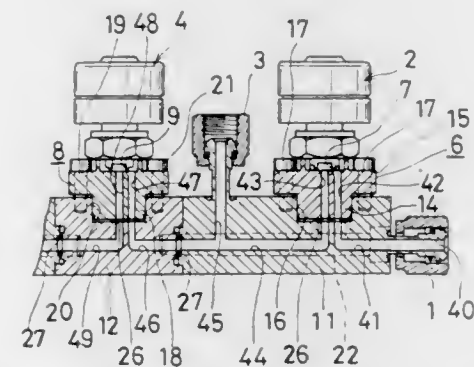
Claims priority, application Japan, Jul. 19, 1995, 7-182350

Int. Cl.<sup>6</sup> F16K 25/00

U.S. Cl. 137—454.6

14 Claims

1. A fluid controller comprising:  
a controller main body formed with a controller main body inlet channel and a controller main body outlet channel, wherein said controller main body outlet channel and said controller main body inlet channel each have a downwardly open end;  
an operating portion integral with said controller main body for any one of opening and closing said controller main body



inlet and outlet channels, changing a direction of flow, and regulating a rate of flow;

a connector formed with a connector inlet channel and a connector outlet channel, wherein said connector inlet channel and said connector outlet channel each have a first end which is upwardly open and a second end which is laterally open and each communicate with said controller main body inlet channel and said controller main body outlet channel of said controller main body, respectively said connector being removably attached to said controller main body;

a seal provided between said controller main body and said connector, wherein said seal comprises a first gasket provided between a first edge portion of said controller main body defining said downwardly open end of said controller main body inlet channel and a first edge portion of said connector defining said upwardly open end of said connector inlet channel and said first edge portion of said connector being opposed to said first edge portion of said controller main body, a second gasket provided between a second edge portion of said controller main body defining said downwardly open end of said controller main body outlet channel and a second edge portion of said connector defining said upwardly open end of said connector outlet channel and said second edge of said connector being opposed to said second edge of said controller main body; and

a retainer holding said first and second gaskets thereto, wherein said retainer is attached to any one of said controller main body and said connector.

5,771,920

## DOMESTIC WATER VALVE ASSEMBLY

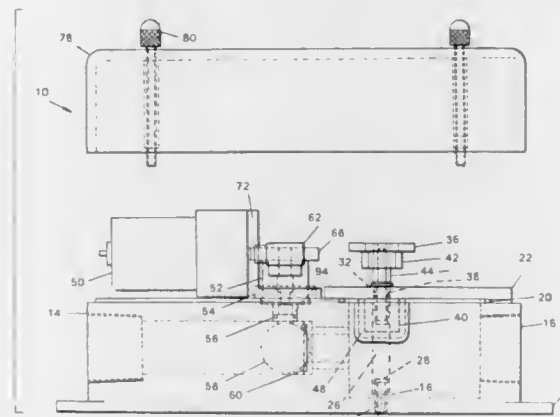
Warren R. Jewett, Cary, and Perry A. Genova, Chapel Hill, both of N.C., assignors to FloLogic, Inc., Raleigh, N.C.

Filed Aug. 4, 1997, Ser. No. 905,587

Int. Cl.<sup>6</sup> F16K 17/00

U.S. Cl. 137—460

14 Claims



1. A domestic water valve assembly, comprising:  
a housing, said housing having a water inlet in fluid communication with a water outlet;

a means for determining a flow rate of a flow of water from said water inlet through said housing and out said water outlet;  
a means for storing a predetermined high flow rate, a predetermined low flow rate and a predetermined time-out period;  
a means for comparing said flow rate of water with said predetermined high flow rate and said predetermined low flow rate;  
and  
a means for controlling said flow of water;  
wherein said controlling means stops said flow of water when said flow rate of water exceeds said predetermined high flow rate;  
and wherein said controlling means stops said flow of water when said flow of water is detected by said determining means and said flow rate of water falls below said predetermined low flow rate for a length of time exceeding said predetermined time-out period.

5,771,921

## PRESSURE REGULATOR

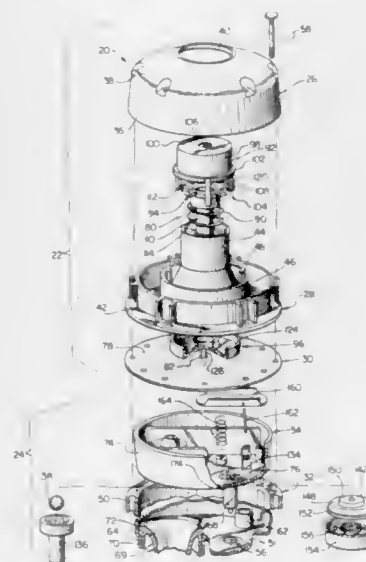
Dwight N. Johnson, Carlsbad, Calif., assignor to CTB, Inc., Milford, Ind.

Filed Sep. 19, 1995, Ser. No. 530,083

Int. Cl.<sup>6</sup> G05D 16/02

U.S. Cl. 137—505

26 Claims



1. A pressure regulator for supplying water to an associated watering system comprising: a housing having an inlet through which water flows into the regulator and an outlet through which water flows out from the regulator; a diaphragm positioned within the housing; and isolating structure for substantially isolating said diaphragm from higher water pressure in said regulator during a flushing period of said regulator, said isolating structure comprising a bulkhead dividing said housing and defining a main chamber and a diaphragm chamber, said bulkhead having a bulkhead inlet for allowing the flow of water from said housing inlet into said diaphragm chamber and a bulkhead outlet for allowing the flow of water from said diaphragm chamber to said housing outlet; valving structure for selectively blocking said bulkhead outlet, and draining structure which can be selectively activated for draining the water in said diaphragm chamber from said diaphragm chamber such that said pressure in said diaphragm chamber reaches approximately atmospheric pressure.

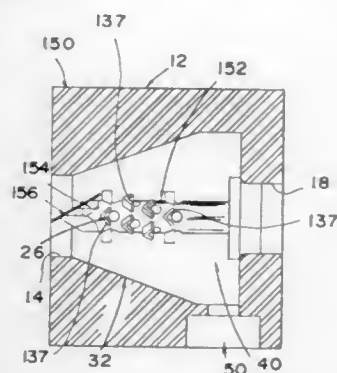
5,771,922

## FLOW RESTRICTOR

Raymond E. Fisher, 14511 Sandy Creek, Houston, Tex. 77070  
Filed Oct. 23, 1995, Ser. No. 546,001  
Int. Cl.<sup>6</sup> B01D 21/26

U.S. Cl. 137—546

7 Claims



1. A flow restrictor for restricting fluid flow through a flow channel, the flow restrictor disposable to intercept and restrict the fluid flow, the flow restrictor comprising
- a body with an interior space therein and an inlet and an outlet in fluid communication with the interior space,
  - a hollow mandrel with a first end, a second end, and a mandrel flow channel therethrough, a plurality of holes through the mandrel in fluid communication with the mandrel flow channel, the mandrel flow channel blocked at a first end thereof and open at a second end thereof in fluid communication with the outlet of the body so that fluid flowing into the inlet of the body flows through the holes, through the mandrel, to the outlet of the body, and out from the body,
  - the hollow mandrel's first end having flow directing means for directing flow of fluid entering the body through the inlet and for directing solids entrained in said fluid away from the hollow mandrel,
  - the flow directing means comprising a hole shield about each hole to direct solids away from the holes, and the hole shields connected to each other.

5,771,923

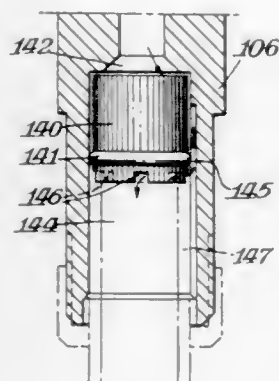
GASKETING AND BLEED MEANS FOR AN  
ELECTRICALLY CONTROLLED FAUCET ASSEMBLY  
Graham H. Paterson, and Willard A. Denham, both of Wil-  
mington, Del., assignors to Speakman Company, Wilmington,  
Del.

Filed Apr. 22, 1996, Ser. No. 635,501

Int. Cl.<sup>6</sup> F16K 31/14

U.S. Cl. 137—513.5

5 Claims



1. An electrically operated faucet assembly comprising a faucet, a solenoid operated valve for controlling flow of fluid through the faucet and in fluid connection therewith, a temperature control valve with an outlet thereof connected to the supply side of the

solenoid valve, check valves in the hot and cold water inlets of the temperature control valve and a longitudinal notch in the inside of at least one of the inlets extending from a point above the check valve to a point below the check valve whereby excess fluid pressure buildup between the check valve and solenoid valve is relieved through the longitudinal notch.

5,771,924

## VALVE

Jan Cornelis Huygen, Rotterdam, Netherlands, assignor to  
Flamco B.V., Gouda, Netherlands

PCT No. PCT/NL94/00109, § 371 Date Feb. 20, 1996, § 102(e)

Date Feb. 20, 1996, PCT Pub. No. WO94/27071, PCT Pub.

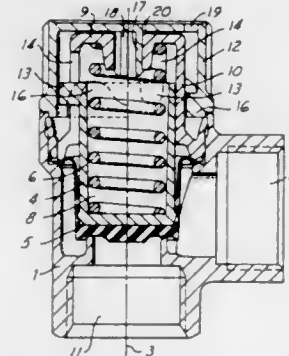
Date Nov. 24, 1994

PCT Filed May 11, 1994, Ser. No. 454,135

Claims priority, application Netherlands, May 18, 1993,  
9300862Int. Cl.<sup>6</sup> F16K 7/00

U.S. Cl. 137—522

8 Claims



1. A safety valve comprising, in combination:
- a housing having a passage therethrough;
  - a valve seat in the housing around the passageway;
  - a valve body in the housing guided therein for sidable movement toward and from the valve seat to open and close the passageway;
  - said valve body having a cavity therein opening outwardly through the valve body at that side opposite the valve seat;
  - a spring seat in the housing at that side of the valve body opposite from the valve seat;
  - a spring in said cavity bearing against said spring seat for pressing the valve body against the valve seat;
  - a wall extending between and connecting the spring seat and valve seat and having a slot extending in the direction of said valve body movement;
  - said valve body having a boss extending into said slot to prevent rotation of the valve body;
  - a rotary knob on the housing having a portion engaging said boss to slide the valve body away from the valve seat upon rotation of the knob; and
  - a flexible diaphragm fixed to the housing and the valve body.

5,771,925

## SOAP DISPENSER AND WASH SIGNAL DEVICE

James Lewandowski, 1845 McKinney Ave., Benson, Minn.  
56215

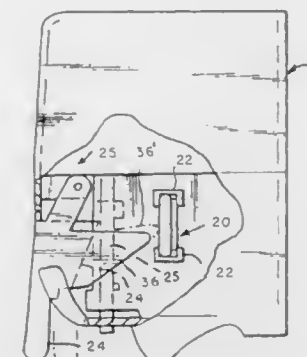
Filed Nov. 27, 1996, Ser. No. 754,404

Int. Cl.<sup>6</sup> E03B 7/07

U.S. Cl. 137—552.7

2 Claims

2. A soap dispensing and washing timer signaling device comprising a soap dispenser and a signal timer device, said soap dispenser having a housing, said signaling timer device having a housing with a flexible panel on one side and means to secure the signaling timer housing to the dispenser on the other side, said signaling timer device having electrical counting means, signaling



means and battery means in said signal timer housing, said panel being flexible for activation of said electrical counting means by said operator compressing said panel with said panel upon compression activating said counting means on said signaling timer device so that said counting means will immediately sound an alarm to indicated the start of the timing and will count an interval of time considered adequate for washing a person's hand and will sound an alarm when said device has counted the interval of time considered adequate for washing's one hands.

5,771,926

## DOUBLE SEAT VALVE WITH SWITCH MONITORING DESIGN

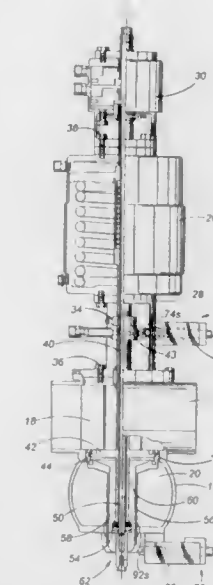
George L. Medal, 2901 Buckingham Ct., Waukesha, Wis.  
53188, and Allan G. Worley, N52W35237 Lake Dr.,  
Okauchee, Wis. 53069

Filed Nov. 3, 1995, Ser. No. 553,105

Int. Cl.<sup>6</sup> E03B 7/07

U.S. Cl. 137—554

10 Claims



1. A sensor construction for sensing movement of a valve with respect to a valve seat, the valve including an actuator stem providing movement of the valve along a valve axis, the sensor construction comprising:

- a sensor housing disposed proximate to the actuator stem defining a bore transverse to the valve actuator stem;
- a limit switch plunger rod having a first portion disposed within the bore of the housing and having a second portion in contacting relation with a portion of the valve actuator stem, the plunger rod being displaced when the actuator stem is moved; and
- a proximity sensor transducer spaced from the limit switch plunger rod portion within the bore of the housing, the proximity sensor transducer detecting transverse movement of the

plunger rod, converting the sensed transverse movement to an electrical sensing signal, and providing the electrical sensing signal at a pair of output terminals when movement of the plunger rod is detected.

5,771,927

UNDERSEA HYDRAULIC CONNECTOR WITH  
EQUALIZATION CHANNEL

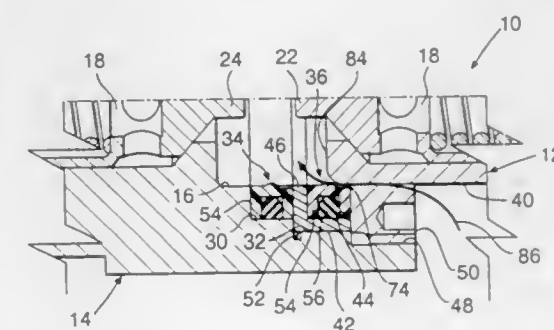
John A. Johansen, Houston, and Timothy R. Goggans, Cypress,  
both of Tex., assignors to Kongsberg Offshore A.S., Kongs-  
berg, Norway

Filed Oct. 24, 1996, Ser. No. 740,059

Int. Cl.<sup>6</sup> F16L 37/28

U.S. Cl. 137—614.04

20 Claims



1. A hydraulic coupling comprising:
- a pair of interconnectable male and female members, each of the members having a body portion and a fluid valve disposed within the body portion, the male and female members cooperating with the fluid valves to actuate the valves such that the valves are placed in one of an open position and a closed position to control fluid flow therebetween;
  - said female member having a receiving chamber for receiving the male member, and a longitudinal axis defining a direction of engagement and disengagement between the male and female members;
  - at least one annular seal in the receiving chamber for engaging the male member in sealed cooperation with the female member when the male member is received within the receiving chamber; and
  - at least one vacuum relief channel disposed in the annular seal, the vacuum relief channel permitting a fluid surrounding the male and female members to pass through the at least one vacuum relief channel to equalize pressure between the receiving chamber and the fluid surrounding the male and female members during engagement and disengagement of the male and female members.

5,771,928

ROTARY SLIDE VALVE FOR SELECTIVE APPLICATION  
OF PRESSURIZED AIR OR VACUUM TO AN  
APPARATUS

Janez Zepic, Ljubljana, and Kilijan Vizjak, Kranj, both of  
Slovenia, assignors to LPKF D.O.O., Kranj, Slovenia

Filed Dec. 12, 1996, Ser. No. 764,462

Claims priority, application Germany, Dec. 16, 1995, 195 47  
124.5Int. Cl.<sup>6</sup> F16K 11/076

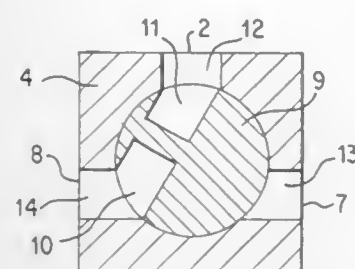
U.S. Cl. 137—625.22

4 Claims

1. A rotary slide valve for selective application of vacuum or pressurized air to an apparatus through a control port disposed in a valve housing,

said valve comprising a valve rotor disposed in the housing and having an axis of rotation, said rotor having two longitudinally axially extending transfer passages formed in circumfer-



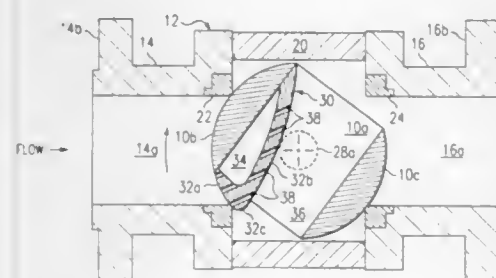


ent portions thereof offset 120° from each other about the axis of rotation thereof;

said housing being formed with three transfer ducts opening contiguous to the rotor and lying in a common reference plane offset 120° from each other about the rotor axis, one of said transfer ducts communicating with the control port, a second communicating with a first inlet/outlet port, and a third communicating with a second inlet/outlet port; said housing further being provided with a vacuum connection and a pressurized air connection each communicating with a respective one of the longitudinally extending transfer passages, said housing additionally comprising closed wall sections between the control port transfer duct and the inlet/outlet port transfer ducts and between the inlet/outlet port transfer ducts, said closed wall sections each covering a larger circumferential portion of the rotor than either of the two transfer passages; wherein the vacuum connection or the pressurized air connection can selectively be connected to the control port or the respective inlet/outlet ports by rotating the rotor so that the transfer passage communicating with the respective connection confronts the transfer duct communicating with the respective port, or the valve can be shut off by rotating the rotor so that the transfer passages confront closed wall sections of the housing.

5,771,929  
LOW NOISE BALL VALVE ASSEMBLY WITH AIRFOIL INSERT  
Henry William Boger, Foxboro, Mass., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 24, 1996, Ser. No. 736,508  
Int. Cl. F16K 47/04  
U.S. Cl. 137—625.32 9 Claims

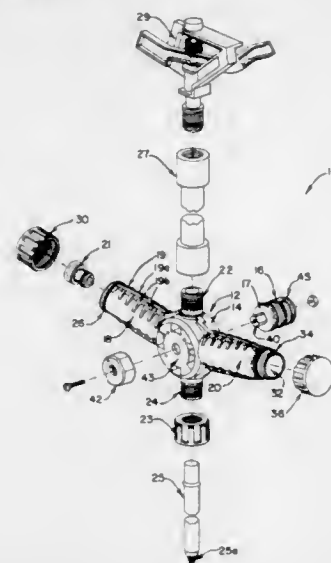


1. A valve assembly for controlling the flow of fluid through a conduit section having an inlet and an outlet, the valve assembly comprising a ball valve having a through bore formed therein, the valve being rotatable in the conduit section to selectively permit fluid flow through the bore to control the flow of the fluid through the conduit section; and an insert disposed in the bore for reducing the noise caused by the fluid flow through the bore, the insert comprising a plate-like member having a plurality of relatively small-diameter passages for receiving the fluid, the plate-like member defining, with a portion of a surface of the valve defining the bore, a relatively large-diameter through passage; the valve being positionable in a first open position in the conduit section so that the fluid flows through the relatively small-diameter passages

to reduce the flow rate and the noise generated by the fluid flow, the valve being positionable in a second position in the conduit section so that the fluid flows through the relatively large-diameter passage to increase the flow rate, a portion of the plate-like member forming an airfoil surface to prevent separation of the fluid as it passes through the relatively large-diameter passage.

5,771,930  
SPRINKLER AND ROOT FEEDER VALVE ASSEMBLY  
John R. Visk, Chicago, Ill., assignor to Fleming Sales Company, Inc., Lombard, Ill.

Filed Dec. 10, 1996, Ser. No. 764,717  
Int. Cl. F16K 11/08  
U.S. Cl. 137—625.47 19 Claims

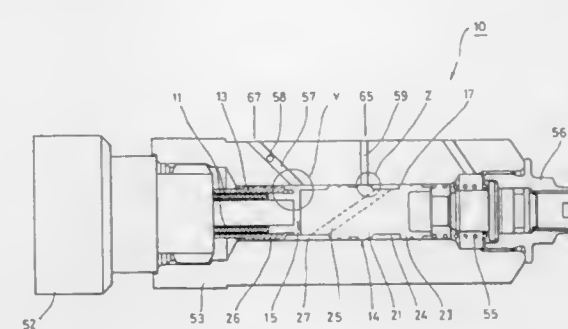
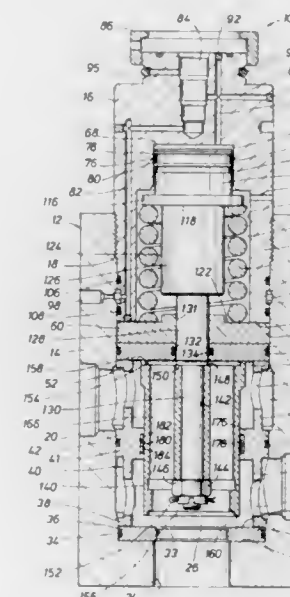


1. A valve assembly useful for directing the flow of liquid in one of two directions comprising:  
a one-piece valve housing having a central hub;  
a pair of diametrically opposite, first and second hollow arm members projecting radially outward;  
the first arm member adapted for receiving a liquid;  
the second arm member including a removable closure on an opposed end;  
an upwardly positioned top outlet port and an opposed downwardly positioned bottom outlet port;  
a valve drum secured within the central hub, the valve drum being rotatable between at least a first position and a second position and adapted for directing the flow of liquid from the first to the second arm member, and from the second arm member through either the top outlet port or the bottom outlet port.

5,771,931  
HIGH PRESSURE WEAR RESISTANT PILOT VALVE  
Richard R. Watson, Missouri City, Tex., assignor to Gilmore Valve Company, Houston, Tex.

Filed Oct. 31, 1996, Ser. No. 739,887  
Int. Cl. F15B 13/042  
U.S. Cl. 137—625.66 18 Claims

1. A two position, three-way pilot valve comprising:  
(a) a valve body defining a valve chamber and a piston chamber therein, said valve body having a supply opening, a vent opening and a function opening and defining a pilot pressure circuit in communication with said piston chamber;  
(b) a piston being movably disposed within said piston chamber and having a piston stem movably disposed within said piston chamber and having a piston stem movably disposed within said valve chamber;

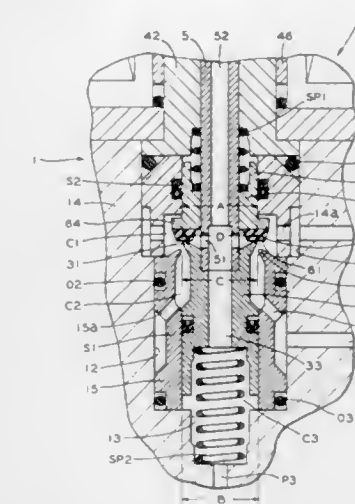


a bore formed in said spool extending in the moving direction of said spool and receiving the oil in said housing, and a pin fixed with respect to said housing and extending into said bore for guiding the movement of said spool.

5,771,933  
THREE-POSITION SOLENOID VALVE  
Osamu Akamatsu, Akashi, and Kazunori Morimoto, Kobe, both of Japan, assignors to Nabco Ltd., Kobe, Japan

Filed Feb. 13, 1997, Ser. No. 800,142  
Claims priority, application Japan, Feb. 15, 1996, 8-053866  
Int. Cl. F15B 13/044 7 Claims

U.S. Cl. 137—627.5



(c) first and second seal elements being located in spaced relation within said valve chamber;  
(d) a seal sleeve having an axial length less than the spacing of said first and second seal elements and being mounted to said piston stem, said seal sleeve defining an external cylindrical sealing surface and having axial sealing ends disposed for respective sealing engagement with said first and second seal elements depending upon the position of said seal sleeve within said valve chamber, said seal sleeve defining at least one flow passage for communicating supply pressure from said supply opening through said seal sleeve to said function opening when said seal sleeve is in spaced relation with said first seal element;  
(e) a cage member being located in sealed relation within said valve chamber and maintaining said first and second seal elements in said spaced relation;  
(f) means sealing said cage member with respect to said external cylindrical sealing surface of said cage member; and  
(g) a wear resistant material being provided on said seal sleeve and defining at least a portion of said external cylindrical sealing surface, said sealing means having sealing engagement with said wear resistant material.

5,771,932  
PRESSURE CONTROL VALVE FOR A POWER STEERING APPARATUS  
Sung Hyun Cho, Seoul; Byeoung Cho Lee, Guri; Je Tae Yoo, and Dae Jong Jeong, both of Seoul, all of Rep. of Korea, assignors to Mando Machinery Corporation, Gunpo, Rep. of Korea

Filed Oct. 31, 1995, Ser. No. 550,568  
Claims priority, application Rep. of Korea, Nov. 5, 1994, 1994-29003

Int. Cl. F15B 13/04 6 Claims  
U.S. Cl. 137—625.69

1. An oil pressure control valve of a power steering apparatus comprising:

a housing, and a spool slidably provided in said housing, said housing providing a first port communicated with an oil passage change valve and a second port communicated with a reaction chamber through a fixed throttle;  
said spool providing a first groove communicating with said first port, a second groove communicating with said second port, an oil passage connecting said first and second grooves;

1. A three-position solenoid valve wherein a first chamber that connects with a primary side, a second chamber that connects with a secondary side, and a third chamber that connects with an exhaust side are formed inside a casing, and which can adopt a connecting position wherein said first chamber and said second chamber are connected with each other while said third chamber is blocked off, a blocking position wherein said first chamber, said second chamber and said third chamber are all blocked off, and an exhaust position wherein said first chamber is blocked off and said second chamber and said third chamber are connected with each other, characterized in that it comprises:

(a) a fixed valve seat situated between said first chamber and said second chamber;  
(b) a moving valve situated inside said first chamber with freedom to slide while remaining airtight, and which can interlock with said fixed valve seat;  
(c) a push rod joined at one end to a moving iron core of such solenoid and at its other end perforates said moving valve through to said second chamber, said push rod defines from said one end thereof through to said other end thereof a linking hole;  
(d) a hollow moving element joined to said other end of said push rod and slotted between said second chamber and said third chamber with freedom to slide while remaining airtight;

- (e) a moving valve seat provided on said moving element opposite said moving valve, and which can be fed through an inside of said fixed valve seat;
- (f) a connecting part formed in any one of (i) said other end of said push rod approximate said moving element and (ii) said hollow moving element, and which, when said solenoid valve is in said exhaust position, connects said second chamber with said third chamber through said hollow of said moving element;
- (g) a first spring to press said moving valve toward said fixed valve seat and said moving valve seat; and
- (h) a second spring to press said moving element and said push rod in an opposite direction to a pressing force of said first spring with a pressing force that is greater than said pressing force of said first spring.

5,771,934

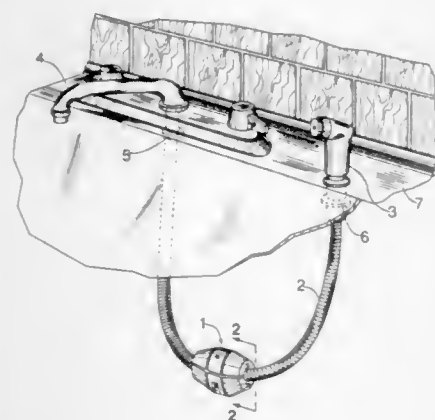
**ZINC-BASED SPRAY FAUCET HOSE COLLAR WEIGHT**  
Jerome Warshawsky, Hewlett Harbor, N.Y., assignor to IW Industries, Inc., Melville, N.Y.

Filed May 24, 1994, Ser. No. 248,521

Int. Cl.<sup>6</sup> E03C 1/04

U.S. Cl. 137—801

4 Claims



1. A collar weight used for securing, and in combination with, a flexible hand held spray faucet hose in an untangled position beneath a sink, comprising:

- said collar weight mounted on said hose;
- said collar weight comprises a composition of a zinc based alloy wherein said zinc based alloy is provided in an amount of about 95 percent by weight;
- said collar weight having an upper portion and a lower portion mounted on opposite sides of said hose, each portion having a curved surface in continuous contact with the outer surface of said hose;
- said upper portion having a pair of oppositely extending flat surfaces extending out from the curved surface of said upper portion;
- said lower portion having a pair of oppositely extending flat surfaces extending out from the curved surface of said lower portion, the outwardly extending flat surfaces of said upper and lower portions being spaced apart and facing each other;
- said upper portion and lower portion being joined together by a plurality of threaded fastener screws passing through openings in said facing surfaces, said upper portion having bores to threadably receive said screws, a portion of the outer surface of said hose and said screws being exposed in the space formed by said flat surfaces separated from and facing each other.

5,771,935  
**CHECK VALVE, ESPECIALLY FOR THE MEDICAL TECHNIQUE**

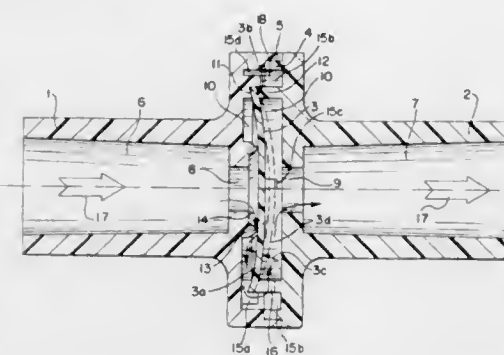
Jan Willem Marinus Myers, Venlo/Holand, Netherlands, assignor to Filtertek B.V., Ireland

Filed Jan. 9, 1997, Ser. No. 781,011

Int. Cl.<sup>6</sup> F16K 15/14

U.S. Cl. 137—859

17 Claims



1. A check valve for the medical technique in a fluid pressure range from 0.1 to 0.02 bar comprising a first hose connector housing and a second hose connector housing, said first hose connector housing having a lip shaped sealing ring and a fluid entry space and said second hose connector housing having a compression ring (12) that defines a compression ring passage (16) and a fluid exit space, said first and second hose connectors joined together, and an imperforate diaphragm disk consisting of a flexible material positioned between the first and second hose connector housings, thereby forming a ring-shaped valve space (10) in the first hose connector housing and a generally annular bypass channel (18) around the circumference of said diaphragm disk (3), said diaphragm disk at an overpressure in the entry space is liftable from the lip-shaped sealing ring, whereby a flow cross-sectional area is created and said ring-shaped valve space (10) fluidly communicates with said compression ring passage (16) to permit fluid communication between said entry space and exit space of said first and second hose connector housings and which at an overpressure in the exit space said diaphragm disk is pressed onto the lip-shaped sealing ring to close the valve, wherein the circular diaphragm disk (3) is of a material selected from the group consisting of liquid silicone, silicone rubber or natural rubber and in that the thickness (3c) of the diaphragm cross-section (3a) is generally uniform.

5,771,936

**ACCUMULATOR, PROCESS AND APPARATUS FOR MAKING THE SAME**

Kenji Sasaki, Sizuoka-ken, and Katsumi Matsui, Kakegawa, both of Japan, assignors to Nok Corporation, Tokyo, Japan

Filed Jul. 25, 1995, Ser. No. 506,882

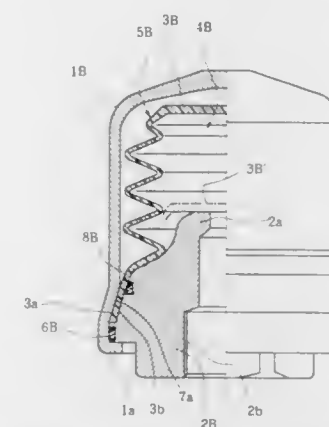
Claims priority, application Japan, Jul. 25, 1994, 6-172710; Jul. 25, 1994, 6-172711

Int. Cl.<sup>6</sup> F16L 55/04

U.S. Cl. 138—31

16 Claims

1. An accumulator comprising:
- a shell having a first member and a second member and having an internal space formed by said first and second member;
- a fixing means for fixing said first member to said second member; and
- a bladder arranged in said internal space of said shell to divide said internal space into a liquid chamber and a gas chamber; said gas chamber being formed by said first member and said bladder;
- said liquid chamber being formed by said second member and said bladder;
- said second member having a port through which a liquid is introduced into said liquid chamber;



said first member having no hole for introducing said gas into said gas chamber;

said bladder being formed in the shape of a bellows so as to be easily compressed or expanded in response to changing of the pressure in said liquid chamber;

the pressure of said gas chamber being larger than the pressure of said liquid chamber when the pressure of said liquid chamber is equal to an atmospheric pressure;

said second member having a stopper which stops said bladder when the pressure of said liquid chamber is equal to an atmospheric pressure so that said bladder comes to a minimal compressed position thereof.

5,771,937

**PIPE PLUG AND METHOD**

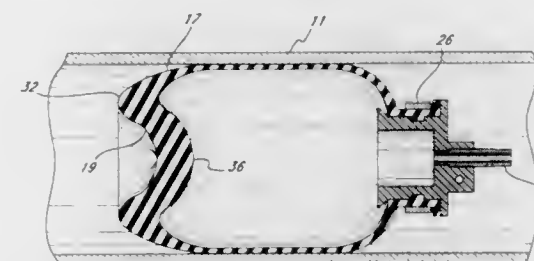
Fred Collins, Corona, Calif., assignor to MCP Industries, Inc., Corona, Calif.

Filed Dec. 13, 1996, Ser. No. 766,716

Int. Cl.<sup>6</sup> F16L 55/12

U.S. Cl. 138—93

14 Claims



7. A pipe plug adapted to be inserted into a pipe having a generally cylindrical inside pipe wall with a predetermined inside diameter, including

- a generally cylindrical body member having a hollow interior and opposed first and second ends connected by an exterior wall, said body member being made of a resilient material, the first end of the body member having a valve for introducing pressurized fluid into the interior of the body member, the second end of the body member having a wall which closes said other end so that fluid can only escape from the interior through the valve, said wall having a substantially conical configuration with an apex that points inward towards the hollow interior and a perimeter which is connected to the exterior wall of the body member, said perimeter and apex being spaced apart by a predetermined distance,
- said conically shaped wall including a transition section connecting said exterior wall to the perimeter of said conically shaped wall, with the transition section deforming and becoming thinner when the hollow interior of said body member is subjected to pressure substantially above ambient pressure, when the fluid pressure in the interior is at ambient, said body member has an outside diameter which is less than said

5,771,938

**WATER MAIN BREAK REPAIR TOOL**

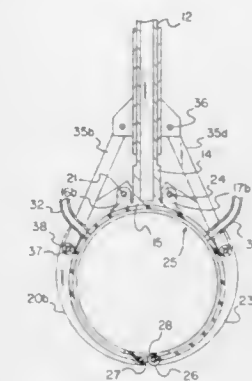
Lowell McKenzie, 106 Harrison St., Sunbury, Ohio 43074

Filed May 2, 1997, Ser. No. 850,375

Int. Cl.<sup>6</sup> F16L 55/16

U.S. Cl. 138—99

13 Claims



1. A tool for temporarily enclosing a break in a water main, comprising:

- an elongate shaft with a handle attached to an upper end thereof; first and second clamping assemblies pivotally connected to a lower end of the elongate shaft, said clamping assemblies being disposed relative to each other such that they are able to clamp the water main therebetween;
- a sealing band attached to the clamping assemblies for forming a sealed channel around the portion of the water main containing the break when the water main is clamped between the clamping assemblies;
- an actuating means for pivoting the clamping assemblies into and out of clamping engagement with the water main;
- wherein said first and second clamping assemblies each comprise a pair of spaced clamping flanges, each said flange being pivotally connected at one end thereof to the lower end of the shaft and having a distal end spaced from said one end;
- wherein said sealing band comprises an elongate flexible member secured at opposite ends thereof to the distal ends of the clamping flanges of the first and second clamping assemblies; and
- wherein the ends of the flexible member are looped, one of the looped ends being disposed between the pair of spaced clamping flanges of the first clamping assembly, and the other looped end being disposed between the pair of spaced clamping flanges of the second clamping assembly.

5,771,939

**FUEL HOSE AND METHOD OF PRODUCING THEREOF**

Koyo Murakami, Nagoya; Hiroaki Ito, and Tetsuji Narasaki, both of Komaki, all of Japan, assignors to Tokai Rubber Industries, Ltd., Komaki, Japan

Filed Feb. 20, 1996, Ser. No. 603,100

Claims priority, application Japan, Feb. 21, 1995, 7-032658

Int. Cl.<sup>6</sup> F16L 11/04

U.S. Cl. 138—137

4 Claims

1. A fuel hose comprising an outer rubber layer and an inner polyamide resin layer, the outer rubber layer formed of rubber material crosslinked so that polysulfide bonding density is not less





than  $4 \times 10^{-5}$  mol/cm<sup>3</sup> and containing phenol based resin, the inner polyamide resin layer laminated directly on an inside face of the outer rubber layer and bonded thereon by a heat treatment.

5,771,940

# EXTRUDED MULTIPLE PLASTIC LAYER COATING BONDED TO A METAL TUBE AND PROCESS FOR MAKING THE SAME

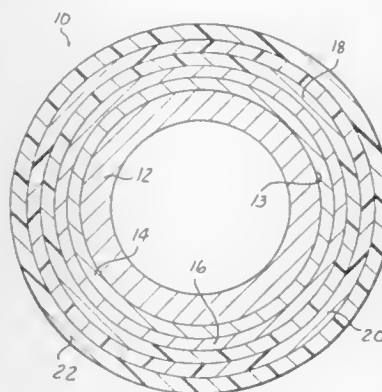
Ralph A. Iorio, Bloomfield Hills; Robert M. Davie, Lapeer; James D. McDaniel, Ortonville; Frank L. Mitchell, Rochester, and Tao Nie, Macomb, all of Mich., assignors to ITT Corporation, New York, N.Y.

Division of Ser. No. 452,329, May 26, 1995, Pat. No. 5,638,871, which is a division of Ser. No. 237,610, May 2, 1994, Pat. No. 5,590,691. This application Feb. 11, 1997, Ser. No. 797,717

Int. Cl.<sup>6</sup> F16L 7/14

U.S. Cl. 138—146

20 Claims

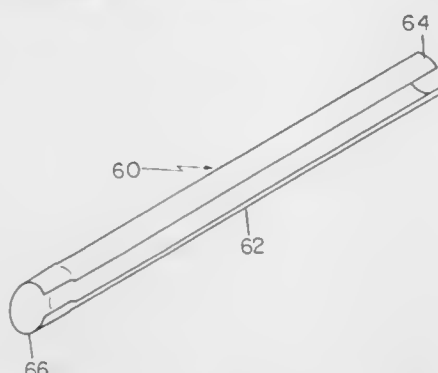


1. A multi-layer tube, comprising:
  - a metal tube having an outer surface;
  - a first polymeric layer disposed on the outer surface of the metal tube, wherein the first polymeric layer is composed of a melt-processible thermoplastic selected from the group consisting of thermoplastic elastomers, ionomers, nylons, fluoropolymers, and mixtures thereof; and
  - a second polymeric layer connected to the first polymeric layer, wherein the second polymeric layer is composed of a melt-processible thermoplastic selected from the group consisting of nylons, thermoplastic elastomers, fluoropolymers, and mixtures thereof.

5,771,941  
LONGITUDINAL OPEN TUBULAR CLAMPS FOR FIXING INSULATION ON PIPING  
Maria Eliane Almeida, Rua Candido Juca, 100 - Apto. 403, Fortaleza, CE, Brazil  
Continuation of Ser. No. 184,608, Jan. 21, 1994, abandoned.  
This application Sep. 26, 1995, Ser. No. 534,137  
Claims priority, application Brazil, Jan. 25, 1993, P19300271  
Int. Cl.<sup>6</sup> F16L 9/14

U.S. Cl. 138—149

14 Claims



1. Thermal insulation system for high and low temperature piping comprising piping on which is installed thermal insulation blankets wherein said insulation blankets are fixed to the piping by at least one tubular longitudinal clamp, said clamp comprising a unitary open tubular body having one slot extending across the entire open tubular body and a first end and a second end, said second end having a diameter larger than said first end, said clamp being adapted to fit over said insulation on said piping and to fix said insulation to said piping, and wherein the at least one tubular longitudinal clamp is connected to another tubular longitudinal clamp by the insertion of the smaller diameter end of one tubular longitudinal clamp into the larger diameter end of an adjacent tubular longitudinal clamp, wherein said clamp is produced from polyvinyl chloride.

5,771,942

# METHOD OF ATTACHING FLAT, IN PARTICULAR PLATE-LIKE, COMPONENTS TO A TEXTILE WEB

Claus Michael Bunger, Wuppertal, Germany, assignor to August Bunger Bob-Textilwerk KG GmbH & Co., Wuppertal, Germany

PCT No. PCT/EP95/03852, § 371 Date Mar. 24, 1997, § 102(e) Date Mar. 24, 1997, PCT Pub. No. WO96/12837, PCT Pub. Date May 2, 1996

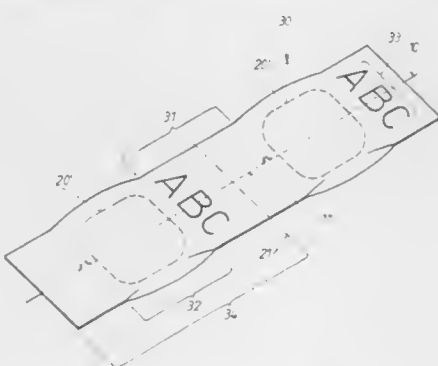
PCT Filed Sep. 29, 1995, Ser. No. 809,512

Claims priority, application Germany, Oct. 20, 1994, 44 37 477.1

Int. Cl.<sup>6</sup> D03D 41/00

U.S. Cl. 139—11

12 Claims



1. A method of arranging flat plate-like components at a prepared arrangement location within a textile web of a textile

machine, said flat plate-like components connected by a flexible carrier at a fixed distance from each other so as to form a linear arrangement of flat plate-like components, said method comprising the steps of:

providing said linear arrangement of flat plate-like components to a thread tying location on a textile machine along a longitudinal axis;

working said carrier into said textile web so that part of the carrier emerges from said prepared arrangement location of said textile web in a free-floating manner to form a free-floating loop portion, and wherein said plate is positioned at a distance upstream of the thread tying location on the textile machine;

pulling said free floating loop portion so that said plate passes through the thread tying location of the textile machine and is placed at the prepared arrangement location within the textile web; and

securing said plate in said prepared arrangement location in the textile web by tying said prepared arrangement location.

5,771,943

# METHOD AND APPARATUS FOR THE MANUFACTURE OF CARPET INCLUDING AN ADDITIONAL WEFT MATERIAL

Brian Carlson, Howick, New Zealand, assignor to Duralite Carpet Corporation Limited, Howick, New Zealand

PCT No. PCT/NZ93/00129, § 371 Date Jun. 21, 1995, § 102(c) Date Jun. 21, 1995, PCT Pub. No. WO94/15009, PCT Pub. Date Jul. 7, 1994

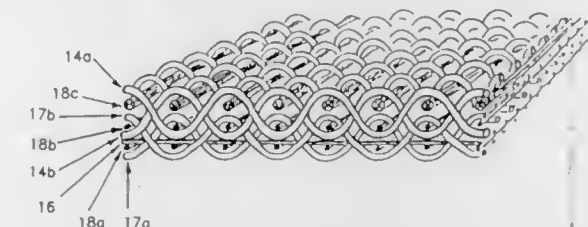
PCT Filed Dec. 21, 1993, Ser. No. 464,648

Claims priority, application New Zealand, Dec. 21, 1992, 245551

Int. Cl.<sup>6</sup> D03D 27/06; 27/02

U.S. Cl. 139—406

10 Claims



1. A method for the production of carpets comprising weaving together warp material including pile warp material, first and second weft materials and an additional weft material such that the additional weft material is held by and partially visible through the pile warp material and contributes to the pile of the carpet, and wherein said step of weaving together warp material comprises simultaneously weaving said first, second and additional weft materials.

5,771,944

# CIRCULAR WEAVING LOOM WITH TRANSVERSE HEDDLE SHIFTING APPARATUS

Chia-Shun Lin, Chang-Hua Hsien, Taiwan, assignor to Saint Hut Co., Ltd., Taiwan

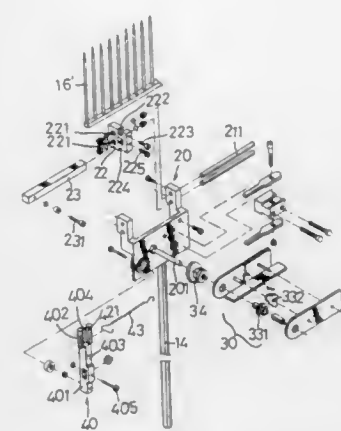
Filed Feb. 28, 1997, Ser. No. 808,358

Int. Cl.<sup>6</sup> D03D 37/00

U.S. Cl. 139—457

2 Claims

1. A circular weaving loom comprising:
  - a machine bed;
  - a heddle unit disposed movably on said machine bed and including a first heddle and a second heddle which are respectively adapted to carry an adjacent pair of warps thereon so as to form a shed between the warps;
  - means for moving said first heddle vertically and reciprocally between a top position and a bottom position which is located under the top position; and



a driving assembly for initially moving said second heddle along an N-shaped path which has a starting point from which said second heddle starts and an end point, and subsequently returning said second heddle from said end point to said starting point along a straight line which intersects said N-shaped path, said N-shaped path having a left vertical section and a right vertical section, said second heddle being located at either of upper ends of said left and right vertical sections when said first heddle is located at said bottom position, said second heddle being located at either of lower ends of said vertical sections when said first heddle is located at said top position so as to define said shed between the warps, wherein the warp carried by said second heddle is positioned on a first side of said first heddle when said second heddle is located along said left vertical section and positioned on a second side of said first heddle opposite said first side when said second heddle is located along said right vertical section so as to twist the adjacent pair of warps.

5,771,945

# WIRE PREPARATION TOOL

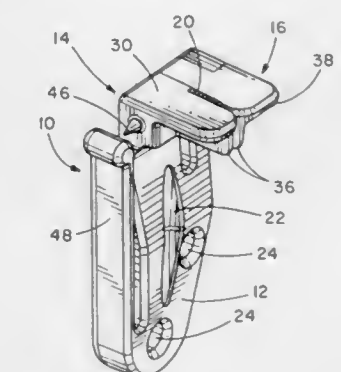
Royal Jenner, Tinley Park, and Larry A. Hillegonds, New Lenox, both of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed Mar. 26, 1997, Ser. No. 827,113

Int. Cl.<sup>6</sup> B21F 11/00

U.S. Cl. 140—123

12 Claims

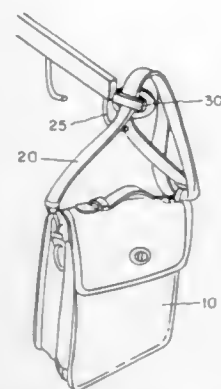


1. A tool comprising, a planar base member;
  - a pair of projections positioned in an abutting relationship disposed adjacent a distal end of the base member which extend upwardly from the base member;
  - a pair of walls formed at the distal end of the base member which extend normal from each projection;
  - a wire path defined between the projections;
  - a plurality of wire grooves transversely formed below the wire path; and
  - a cable guide formed in the base, axially aligned with the plurality of wire grooves.

# UMI

1. A handbag display comprising:
  - a handbag comprising a strap and a compartment portion;
  - a display device for shortening the effective length of said strap comprising:
    - a base comprising at least a first contact surface and a second contact surface, said first contact surface and said second contact surface disposed in a common plane;
    - a movable member comprising a contact portion, said movable member connected to said contact surfaces, wherein





said contact portion of said movable member is movably positioned between said first contact surface and said second contact surface and in spaced relation to each of said first contact surface and said second contact surface thereby defining a first space between said first contact surface and said contact portion and a second space between said second contact surface and said contact portion;

said movable member comprising a first extension portion which extends at an angle to said common plane and said movable member further comprising a second extension portion which extends from said contact portion toward said common plane;

said contact portion comprises a first end connected to said first extension portion and said contact portion extends substantially from one side of said base to an opposite side of said base;

wherein said strap of said handbag is releasably positioned through said first space and said second space with lower portions of said strap extending from said display device toward said compartment portion of said handbag;

at least one strap support upon which said handbag is suspended.

5,771,952

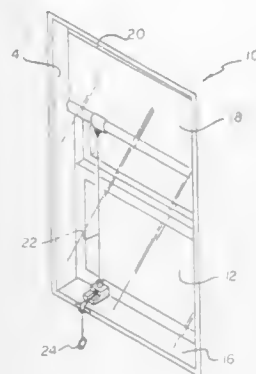
#### APPARATUS FOR ADJUSTING A WINDOW COVER SITUATED BETWEEN A WINDOW AND ASSOCIATED TRANSPARENT INSULATION

John D. Gabriel, 39056 E. Archer, Harrison Twp, Mich. 48045  
Filed Nov. 7, 1996, Ser. No. 746,168

Int. Cl.<sup>6</sup> A47H 1/00

U.S. Cl. 160—98

4 Claims



1. A new and improved apparatus for adjusting a window cover comprising, in combination:

a window surrounded by a frame and having a planar horizontally oriented window sill situated coextensive with a bottom edge thereof;

a retractable window shade with a rectangular configuration constructed from a vinyl material, the window shade further comprising a cylindrical retracting mechanism coupled coextensive with a top edge of the window and adapted to have an

extended orientation wherein the window shade covers the window and a retracted orientation wherein the window shade does not cover the window, the window shade further comprising an elongated pull chord coupled thereto at a first end thereof and with a loop connected at a second end thereof for allowing a user to transfer the window shade from the extended orientation to the retracted orientation thereof and visa-versa;

a first pull chord redirecting mechanism with a rectilinear configuration including a block including an inboard square portion having a top face with a bore formed therein and perpendicular thereto, a bottom face, and an outboard face with a bore formed therein and perpendicular thereto such that the bore is in communication with the bore of the top face, the inboard square block further including an inboard face, the inboard face abutting the frame of the window; the first pull chord redirecting mechanism further having an outboard square portion with a top face, a bottom face, an outboard face, and an inboard face formed integrally with the outboard face of the inboard portion, wherein the outboard square portion has a height half that of the inboard square portion and the bottom face of both the inboard square portion and the outboard square portion are adhered to the window sill, the top face of the outboard square block having a semi-tubular cut out formed in axial alignment with the bore of the outboard face of the outboard square block; and

a second pull chord redirecting mechanism having a tubular L-shaped configuration with a first horizontally oriented extent situated on an outer edge of the window sill in axial alignment with the bore of the outboard face of the inboard square block, the second pull chord redirecting mechanism further including a second vertically oriented extent in communication with the first extent and situated coextensive with a vertical axis orthonormal to the first extent of the second pull chord redirecting mechanism, the second extent having a plate integrally attached thereto for adhering to the window sill thereby maintaining the second pull chord redirecting mechanism in its intended position;

whereby the loop of the pull chord extends away from the window sill allowing an additional transparent insulation means which covers the frame to be utilized in conjunction with maintaining operation of the window shade, wherein the window shade is situated between the window sill and the transparent insulation means.

5,771,953

#### VERTICAL BLIND WITH A CRANK ROD

Siegfried Benthin, Bremerhaven, Germany, assignor to Benthin Aktiengesellschaft, Bremerhaven, Germany  
Filed Jul. 2, 1996, Ser. No. 674,748

Claims priority, application Germany, Jul. 11, 1995, 195 25 140.7

Int. Cl.<sup>6</sup> E06B 9/38

U.S. Cl. 160—168.1 V

4 Claims

1. A vertical blind with a crank rod for displacing and for pivoting vertical blind slats, with each slat being pivotable by approximately 180° in both directions up to a common plane.

5,771,954

#### TEMPORARY OFFICE PARTITION

Douglas D. Benner, Grand Rapids; Joylene M. Battey, Kentwood; Joyce S. Bromberg, Grand Rapids, and Greg D. Lamke, Hastings, all of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

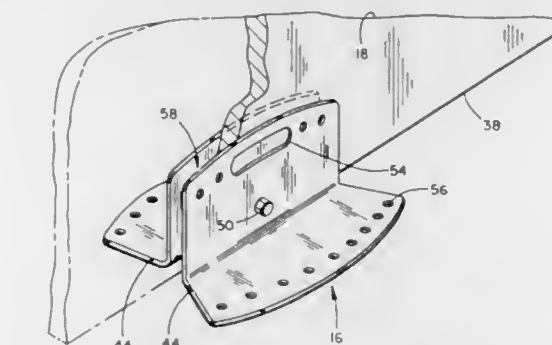
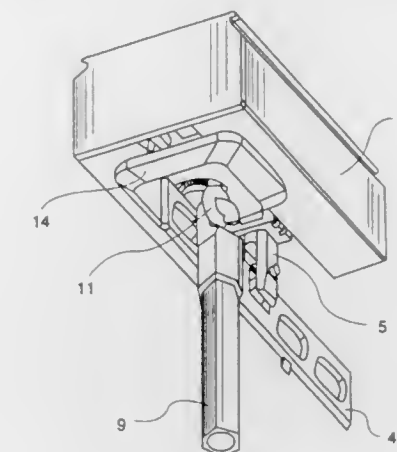
Filed Jun. 7, 1996, Ser. No. 660,040

Int. Cl.<sup>6</sup> A47G 5/00; F16M 11/00

U.S. Cl. 160—231.2

15 Claims

1. A temporary office partition for use in open office environments and the like, comprising:



a substantially flat panel having a top edge, a bottom edge, and opposite side edges;

a partition base comprising horizontally elongate L-shaped members, each L-shaped member having a vertical leg and a horizontal leg, said L-shaped members oriented in an opposite horizontally spaced back-to-back relationship supporting said panel in a freestanding, substantially vertical, upright position, wherein said vertical legs of said L-shaped members of said partition base are disposed in a horizontally spaced relationship defining a panel receiving slot therebetween in which said panel is closely received, and wherein said horizontal legs of said L-shaped members define laterally spaced-apart foot portions shaped for freestanding abutting support on a floor surface to securely retain said panel in a freestanding upright position, each said foot portion of said partition base project in opposite directions from said vertical legs and at substantially right angles to said vertical legs, said foot portions having bottom surfaces which are substantially coplanar for resting on a floor surface, and

a hinge comprising two oppositely outward facing, U-shaped channels shaped to closely receive therein a side edge of said panel, said channels are interconnected by a flexible web to permit like panels to be positioned in a mutually angular relationship.

5,771,955

#### CORE ASSEMBLY MANUFACTURING APPARATUS OF CASTING ENGINE BLOCKS AND METHOD FOR MAKING THE ASSEMBLY

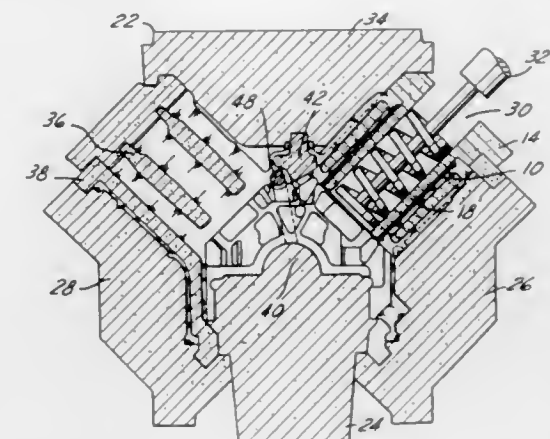
Gary Dale Helgesen, Romulus; Robert Gordon Rentschler, Dearborn, and Thomas John Heater, Milford, all of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.  
Continuation-in-part of Ser. No. 972,793, Nov. 6, 1992, Pat. No. 5,365,997. This application Aug. 5, 1994, Ser. No. 286,617

Int. Cl.<sup>6</sup> B22C 9/10; B22D 19/00

U.S. Cl. 164—9

37 Claims

1. A barrel slab core and liner in combination for use in a cylinder block mold package which is adaptable for forming an engine block casting, the combination comprising:



a slab core;

a plurality of barrel cores for forming piston cylinders extending from the slab core; and

an uncoated cylinder bore liner integral with, and surrounding each barrel core, each liner further including:

a chamfered anchoring means disposed upon each cylinder bore liner for securing each liner in relation to one of the plurality of barrel cores.

35. A method of producing a casting core assembly for use in the manufacture of a cylinder block for forming and lining a piston cylinder chamber of the block with a tubular metal liner member, said method comprising the steps of:

forming a recess on the liner member extending into an inner surface of the liner member and spaced radially from an outer surface of the liner member;

disposing the liner member within a piston cylinder core-forming cavity of a core box;

introducing refractory particulate material and binder core mixture into the core box cavity and against the inner surface of the liner member to fill the recess with a projection of the core mixture; and

curing the core mixture in situ with the liner member to produce a base portion of the piston cylinder core that engages one end of the liner member to prevent longitudinal movement of the liner member toward the base portion, and to produce an inner main body portion integral with the base portion and projection and extending longitudinally from the base portion into the liner member such that the core projection and liner recess mechanically interlock at a location wholly within the confines of the liner member to prevent the liner member from sliding longitudinally on the main body portion away from the base portion.

5,771,956

#### COOLING LINE APPARATUS FOR COOLING MOLDS FILLED WITH MOLTEN METAL

Kunimasa Kimura, Fujieda, Japan, assignor to Sintokogio, Ltd., Nagoya, Japan

Filed Jun. 27, 1996, Ser. No. 672,268

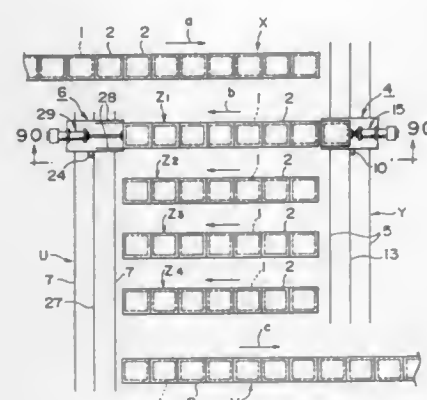
Claims priority, application Japan, Jun. 30, 1995, 7-187926  
Int. Cl.<sup>6</sup> B22D 5/00; 46/00

U.S. Cl. 164—323

2 Claims

1. An apparatus of cooling lines for cooling molds filled with molten metal that comprises a plurality of cooling lines (Z<sub>1</sub>—Z<sub>4</sub>) arranged substantially parallel to a teeming line (X) and disposed between the teeming line (X) and a mold-removing line (V), which is disposed substantially parallel to the teeming line (X), a mold sending-in line (Y) which connects an end portion of the teeming line to starting portions of the cooling lines, and a mold sending-out line (U) which connects end portions of the cooling lines to a starting portion of the mold-removing line, wherein the apparatus further comprises:

a first transfer device (4) which runs along the mold sending-in line (Y), the first transfer device including a first transfer truck



(9), a railroad (14) which is mounted on the first transfer truck and connectable to the end portion of the teeming line and the starting portions of the cooling lines, and along which a mold-carrying truck (2) runs, and a first inwardly-facing electric servo-cylinder (15) disposed rearward of the railroad (14); and  
a second transfer device (6) which runs along the mold sending-out line (U), the second transfer device including a second transfer truck (23), a railroad (28) which is mounted on the second transfer truck and connectable to the end portions of the cooling lines and the starting portion of the mold-removing line, and along which a mold-carrying truck (2) runs, and a second inwardly-facing electric servo-cylinder (29) disposed rearward of the railroad (28) of the second transfer device.

5,771,957

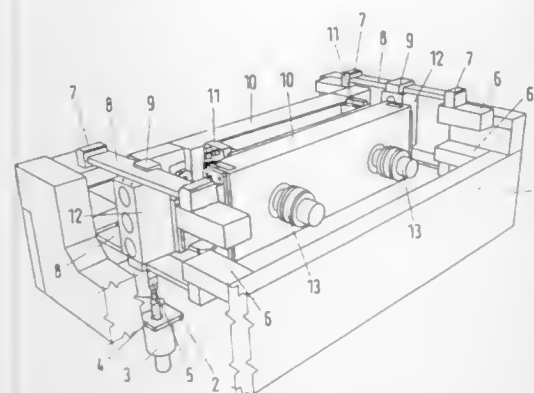
**DEVICE FOR THE CONTINUOUS CASTING OF STEEL**  
Horst Von Wyl, Duisburg; Hans-Joachim Paris, Düsseldorf; Hans Siemer, Essen; Jens Weber, Duisburg; Gerhard Böcher, Salzgitter, and Otto Alexander Schmidt, Krefeld, all of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

PCT No. PCT/DE94/01432, § 371 Date Feb. 7, 1996, § 102(e) Date Feb. 7, 1996, PCT Pub. No. WO95/15232, PCT Pub. Date Jun. 8, 1995

PCT Filed Nov. 25, 1994, Ser. No. 564,169  
Claims priority, application Germany, Dec. 3, 1993, 43 41 719.1

Int. Cl.<sup>6</sup> B22D 11/04  
U.S. Cl. 164—416

6 Claims



1. A device for continuous casting of steel in a casting direction, comprising:  
a support frame;  
springs having ends fixed to the support frame so that the springs are transverse to the casting direction;  
a continuous casting mold mounted on the spring so as to oscillate in the casting direction; and

oscillation drive means connected to the support frame for oscillating the continuous casting mold, the oscillation drive means including a servo-hydraulic cylinder fixed to the support frame in a longitudinal sectional plane which passes through the continuous casting mold laterally adjacent the continuous casting mold so that the cylinder is free of play, the continuous casting mold being fastened to the springs at one location.

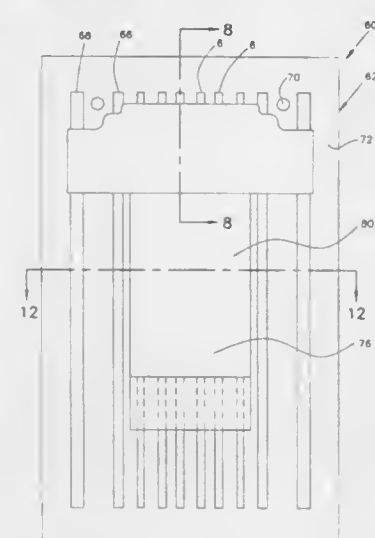
5,771,958

**MOLD FOR CONTINUOUS CASTING SYSTEM**  
James Bernard Sears, Jr., Riverview, Mich., assignor to AG Industries, Inc., Coraopolis, Pa.

Filed Sep. 14, 1995, Ser. No. 528,401  
Int. Cl.<sup>6</sup> B22D 11/04

U.S. Cl. 164—443

19 Claims



1. An improved mold for a continuous casting process, comprising:  
an outer wall, said outer wall having a plenum chamber defined in an inner surface thereof and at least one passage for communicating said plenum chamber with an external coolant conduit;  
a liner that is secured to said inner surface of said outer wall, said liner having a number of slots defined in an inner wall thereof which, together with said outer wall, define a number of passages for transporting coolant to cool said liner during operation of said mold, said inner wall further having a recessed area defined therein; and  
restrictor means situated in said recessed area of said liner for reducing a cross-sectional area of at least one of said slots, whereby a desired distribution of coolant among said slots is achieved.

5,771,959

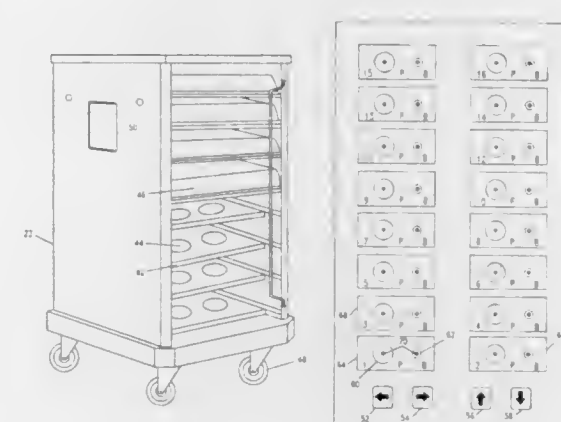
**RETHEMALIZATION SYSTEM**  
John Walter Westbrooks, Jr., Christiana, and Sara Cofield Hurt, Nashville, both of Tenn., assignors to Standex International Corporation, Murfreesboro, Tenn.

Continuation-in-part of Ser. No. 980,376, Nov. 23, 1992. This application Sep. 21, 1994, Ser. No. 310,710  
Int. Cl.<sup>6</sup> F25B 29/00

U.S. Cl. 165—11.1

4 Claims

1. A rethermalization system for heating refrigerated food on trays, maintaining the food in a refrigerated condition until heated, and heating some of the food to a desired temperature at a serving time while maintaining the rest of the food in a refrigerated condition comprising:



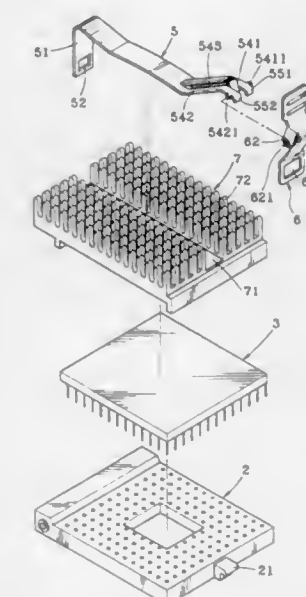
5,771,960

**CPU HEAT SINK FASTENER**  
Bob Lin, 15 Fl., No. 49, Nan-Hwa Rd., Chung-Ho City, Taipei Hsien, Taiwan

Filed Jul. 9, 1997, Ser. No. 891,621  
Int. Cl.<sup>6</sup> F28F 7/00; H05K 7/20

U.S. Cl. 165—80.3

2 Claims



at least one cart for containing the trays of food;  
at least one shelf disposed within the at least one cart, upon which the trays of food are situated;  
at least one heater disposed within the at least one shelf, for heating some of the food;  
a refrigerator adapted to receive the at least one cart for maintaining the food at a desired refrigerated temperature;  
at least one docking station disposed within the refrigerator, for receiving the at least one cart;  
at least one controller disposed within the at least one cart, having an on state and an off state, each of the at least one heater associated with one of the at least one controller, for controlling the temperature of the at least one heater, being in an on state when the at least one controller is operating to control the temperature of the at least one heater, and being in an off state when the at least one controller is not operating to control the temperature of the at least one heater;  
a power supply disposed within the refrigerator, for providing electrical current and voltage to the at least one controller and the at least one heater;  
at least one operation sensor disposed within the at least one cart, having an on state and an off state, a different one of each of the at least one operation sensor associated with a different one of each of the at least one heater, for sensing electrical current through the associated at least one heater, being in an on state when electrical current through the associated at least one heater is sensed, and being in an off state when electrical current through the associated at least one heater is not sensed;  
at least one comparator disposed within the at least one cart, a different one of each of the at least one comparator associated with a different one of each of the at least one heater;  
for comparing the state of the at least one controller associated with the at least one heater against the state of the at least one operation sensor associated with the at least one heater;  
for generating a high comparator signal associated with the at least one heater when the state of the at least one controller associated with the at least one heater is on and the state of the at least one operation sensor associated with the at least one heater is on;  
for generating a mid comparator signal associated with the at least one heater when the state of the at least one controller associated with the at least one heater is off and the state of the at least one operation sensor associated with the at least one heater is on;  
for generating a low comparator signal associated with the at least one heater when the state of the at least one controller associated with the at least one heater is off and the state of the at least one operation sensor associated with the at least one heater is off;  
at least one status indicator, a different one of each of the at least one status indicator associated with a different one of each of the at least one heater, for providing a status output based on the comparator signal associated with the at least one heater.

5,771,961

**FAN MODULE**  
Ahmad Alizadeh, Indianapolis, Ind., assignor to Valeo Thermique Moteur, Le Mesnil St. Denis, France

Filed Aug. 3, 1995, Ser. No. 511,037  
Int. Cl.<sup>6</sup> F28F 13/12

U.S. Cl. 165—121

31 Claims

1. A cooling module comprising a radiator, a condenser, a motor, a fan and a non-rotating ring extending about the fan periphery, wherein the fan is situated between the condenser and the radiator, a shaft for the motor, the condenser having condenser tubes with a through hole formed between the condenser tubes, the motor shaft having a at least a portion thereof received within the through hole, a hub portion, a first plurality of first blades extending from the hub portion radially outwardly, a first circumferentially-extending blade support member for joining together said outward extension of said first blades, a second plurality of second blades each having a respective end and extending radially outwardly from the first



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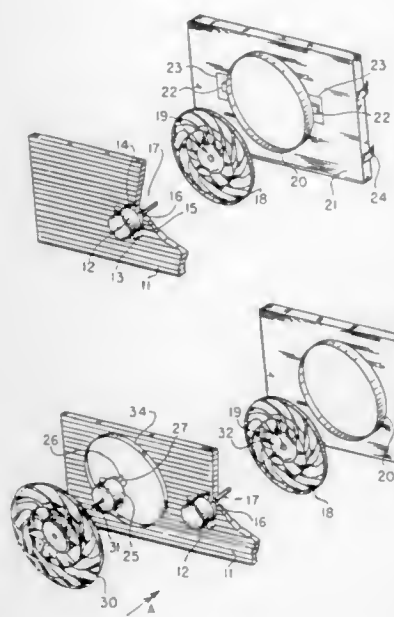
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circumferential support member, and a second circumferentially-extending second blade support member joining the ends of said second blades.

5,771,962

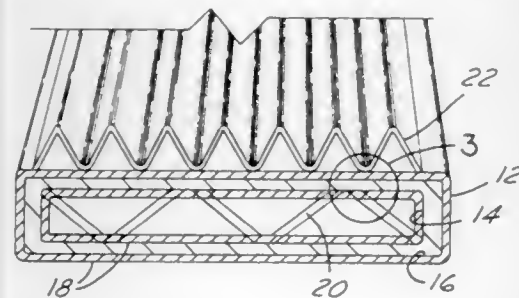
**MANUFACTURE OF HEAT EXCHANGER ASSEMBLY BY CAB BRAZING**

Timothy Van Evans, Ypsilanti; Henry Mehrabian, Northville; Matthew John Zaluzec, Canton, and Gerry A. Grab, Trenton, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 3, 1996, Ser. No. 627,871  
Int. Cl.<sup>6</sup> F28F 19/02

U.S. Cl. 165—133

16 Claims



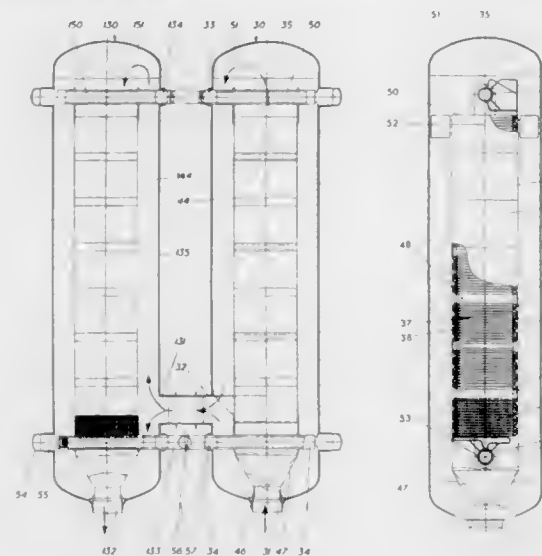
11. A method of manufacturing a heat exchanger assembly for an automotive vehicle, said method comprising the steps of: providing at least one aluminum based tube having an internal surface and an external surface; applying an aluminum based lithium-magnesium composition cladding to either one or both of the internal surface or external surface; said composition cladding further including cesium in an amount up to about 2% by weight based on the weight of the cladding; disposing at least one aluminum based component adjacent the cladding; applying a modified aluminum brazing flux to a joint between the at least one tube and the at least one component, said brazing flux comprising cesium fluoride, lithium fluoride, or their mixture; and joining the at least one tube and at least one component together using a controlled atmosphere brazing process.

**5,771,963  
CONVECTIVE COUNTERCURRENT HEAT EXCHANGER**  
Francisco Blangetti, Vaclav Svoboda, both of Baden, Switzerland, and Harald Gerhard Fuchs, Lauchringen, France, assignors to Asea Brown Boveri AG, Baden, Switzerland

Filed Nov. 18, 1996, Ser. No. 746,937  
Claims priority, application Germany, Dec. 5, 1995, 195 45 308.5

Int. Cl.<sup>6</sup> F28D 7/08  
U.S. Cl. 165—143

9 Claims



1. A convective countercurrent heat exchanger, essentially comprising a nest of pipes (36) which is arranged in a cylindrical shell (35) and is equipped with ribbed pipes (37), the pipes through which the liquid flows being connected on the inlet side and the outlet side by in each case one collector (33, 34), which collectors penetrate the shell, and the shell being provided with in each case one gas-inlet connection piece (31) and one gas-outlet connection piece (32),

wherein the nest of pipes (36), which is composed of a plurality of layered pipes, has a rectangular cross section and is mounted in a rectangular case (40), which essentially comprises four outer case walls (41, 42) which are guided in the shell and form an annular chamber (44) with the shell, wherein the pipes between the two collectors form a closed coiled pipe and are provided in their straight parts (37) with welded-on ribs, wherein the pipe bends (38) connecting the straight pipe parts are not provided with ribs and are accommodated on both sides of the straight pipe parts in compartments (45) through which the gas does not flow, wherein the compartments (45) are delimited in the longitudinal direction of the pipes by an outer (42) and an inner (39) case wall and extend over the entire height of the case (40) through which flow takes place,

wherein the case (40) through which flow takes place opens on the outlet side (50) in a dome (51) which is delimited by the shell (35), and wherein the gas-outlet connection piece (32) is arranged in the shell at that end of the annular chamber (44) which is remote from the dome (51).

7. The countercurrent heat exchanger as claimed in claim 1 in series arrangement, in which the gas-outlet connection piece (32) and the inlet-side collector (33) of a first exchanger (30) are connected to the gas-inlet connection piece (131) and the outlet-side collector (134), respectively, of a second exchanger (130), wherein the gas-outlet connection piece (32) of the first exchanger (30) and the gas-inlet connection piece (131) of the second exchanger (130) are situated in a common plane, and wherein the inlet-side collector (33) of the first exchanger (30) and the outlet-side collector (134) of the second exchanger (130) are designed as a single continuous component.

9. The use of a countercurrent heat exchanger as claimed in claim 1 in a combined gas/steam turbine process with waste-heat steam generation, the gas-inlet connection piece (31) being connected to the outlet of a gas-turbine compressor and the gas-outlet connection piece (132) being connected to a cooling air line (29), and the inlet-side and outlet-side collectors (133, 34) being connected to the steam-collecting drum (16) of a waste-heat steam generator (7).

5,771,964

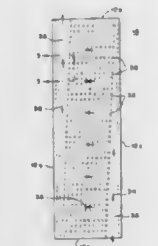
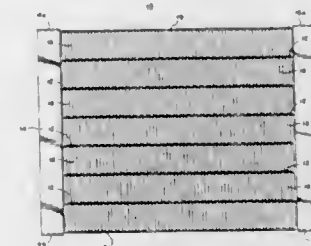
**HEAT EXCHANGER WITH RELATIVELY FLAT FLUID CONDUITS**

Young L. Bae, Grenada, Miss., assignor to Heatcraft Inc., Grenada, Miss.

Filed Apr. 19, 1996, Ser. No. 634,777  
Int. Cl.<sup>6</sup> F28F 1/02

U.S. Cl. 165—144

20 Claims



1. A heat exchanger having at least one conduit of non-circular cross-section adapted to accommodate passage of heat transfer fluid therethrough and support means for supporting said conduit, said conduit having a major dimension and a minor dimension, inlet and outlet openings, a supply channel extending generally along said major dimension and communicating with said inlet opening to direct heat transfer fluid flowing through said inlet opening into said conduit, a drain channel extending generally along said major dimension and communicating with said outlet opening to direct heat transfer fluid out of said conduit through said outlet opening, and plural heat transfer channels, each of which extends generally along said minor dimension between said supply channel and said drain channel, said major dimension being substantially greater than said minor dimension such that each heat transfer channel has a relatively short length compared to a length of said conduit along said major dimension, said supply channel and said drain channel each having a substantially greater cross-sectional area than each of said heat transfer channels, said heat transfer channels being adapted to direct heat transfer fluid from said supply channel to said drain channel in a generally transverse direction with respect to said major dimension.

5,771,965

**HEADER PIPE FOR HEAT EXCHANGER**

Hiroyuki Inaba, Tokyo, and Ryuji Yasuda, Kanagawa, both of Japan, assignors to Calsonic Corporation, Tokyo, Japan

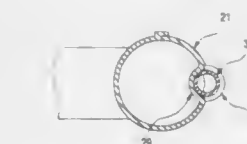
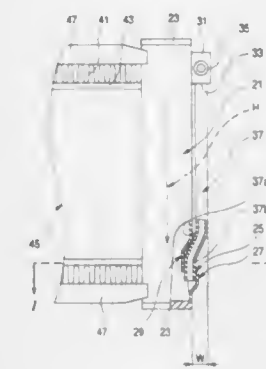
Filed Dec. 2, 1996, Ser. No. 757,093

Claims priority, application Japan, Dec. 12, 1995, 7-322769  
Int. Cl.<sup>6</sup> F28F 9/04

U.S. Cl. 165—178

10 Claims

1. A header pipe for a heat exchanger comprising: a header pipe body; and a heating medium pipe, and first end thereof being connected with said header pipe body;



wherein a connecting opening is formed on an outer circumferential surface of said header pipe body so as to be open in an axial direction of said header pipe body, said connecting opening protruding within and reducing a diameter of said header pipe body, and said first end of said heating medium pipe is inserted into and connected with said connecting opening.

5,771,966

**FOLDED CONDUCTING MEMBER HEATSINKS AND METHOD OF MAKING SAME**

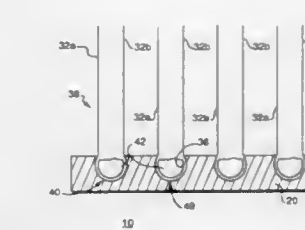
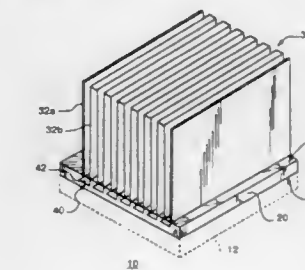
John Jacoby, P.O. Box 598, New Hampton, N.H. 03256

Filed Dec. 15, 1995, Ser. No. 573,447

Int. Cl.<sup>6</sup> H05K 7/20

U.S. Cl. 165—185

19 Claims



1. A heatsink, for dissipating heat from a heat emitting component, said heatsink comprising: at least one folded heat conducting member including at least first and second heat conducting portions extending from a fold portion, said at least one folded heat conducting member further including a base portion engaging region; a base portion, for conducting heat from said heat emitting component to said at least one folded heat conducting member, said base portion including at least first and second sides, said first side having a heat receiving region adapted to be positioned proximate said heat emitting component, and said

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second side having at least one groove for receiving and engaging said base portion engaging region of said at least one folded heat conducting member; and  
at least one folded heat conducting member securing element disposed between said at least first and second heat conducting portions and proximate said fold portion of said at least one folded heat conducting member, for securing said base portion engaging region of said at least one folded heat conducting member into engagement with said at least one groove of said base portion.

13. A heatsink for dissipating heat from a heat emitting component, said heatsink comprising:

a plurality of U-shaped folded heat conducting members including first and second heat conducting portions extending from a fold portion, each of said plurality of said U-shaped folded heat conducting members including a base portion engaging region;

a base portion, for conducting heat from said heat emitting component to said plurality of said U-shaped folded heat conducting members, said base portion including a least first and second sides, said first side having a heat receiving region adapted to be positioned proximate said heat emitting component, and said second side having a least one folded heat conducting member engaging region, for engaging said base portion engaging region of each of said plurality of U-shaped folded heat conducting members; and

at least one folded heat conducting member securing element disposed between said first and second heat conducting portions and proximate said fold portion of each of said plurality of U-shaped folded heat conducting members into engagement with said at least folded heat conducting member engaging region of said base portion.

5,771,967

**WICK-INTERRUPT TEMPERATURE CONTROLLING HEAT PIPE**

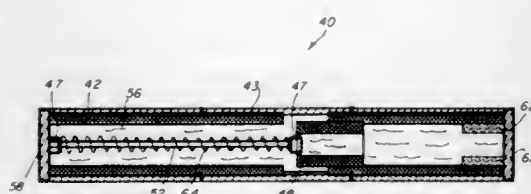
Nelson L. Hyman, Randallstown, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 12, 1996, Ser. No. 712,814

Int. Cl.<sup>6</sup> F28D 15/00

U.S. Cl. 165—274

15 Claims



14. A method for actively controlling the temperature of a heat pipe having an evaporator and condenser section separated by a discontinuity, comprising the steps of:

connecting and disconnecting, selectively, the evaporator and condenser sections by inserting and withdrawing a moving wick across a discontinuity in the heat pipe at a first and a second predetermined temperature, respectively; and  
controlling the insertion and withdrawal of the moving wick so as to control the flow of a heat transfer medium from the condenser section to the evaporator section.

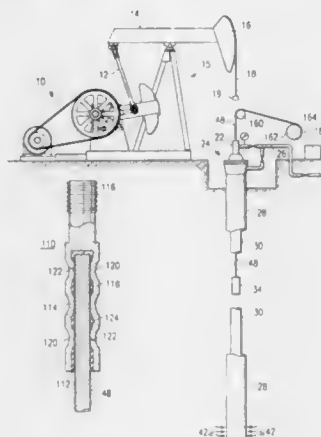
5,771,968  
**CABLE-BASED PUMPING SYSTEM**  
Edgar Danciger, 2919 Ponte Verde Blvd., Ponte Verde Beach, Fla. 32082, and George W. Todd, 9229 Coral Cove, Dallas, Tex. 75243

Filed Aug. 5, 1996, Ser. No. 693,846

Int. Cl.<sup>6</sup> E21B 17/00; F04B 47/02

U.S. Cl. 166—68

18 Claims



10. A system for interconnecting a reciprocating power source at the surface of a fluid pumping well with a one-way pump valve submerged in the fluid being pumped from the bottom of the well, the system comprising:

a cable assembled from a plurality of helically preformed wire elements that are arranged around a central axis of said cable, the assembled cable being heat treated to remove preforming and assembly stresses; and  
a pair of mechanical connectors including a first connector for connecting one end of said cable to the reciprocating power source, and a second connector for connecting the other end of said cable to said one-way pump valve.

5,771,969

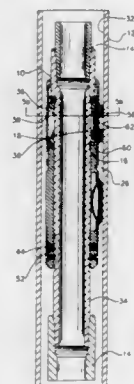
**HELICAL BEARING ANCHOR AND CATCHER**  
Thomas William Garay, Calgary, Canada, assignor to Excalibre Oil Tools Ltd., Calgary, Canada

Filed Nov. 1, 1995, Ser. No. 551,408

Int. Cl.<sup>6</sup> E21B 40/00

U.S. Cl. 166—211

14 Claims



1. An anchor catcher for insertion into a well conduit to prevent linear movement in both directions and rotational movement in one direction of well equipment, comprising:

a mandrel attached to said well equipment;  
a cone element shouldering against said mandrel and having a first conical surface;

a drag means having a friction surface which contacts an inner well conduit wall;  
a drag body having portions to accommodate the drag means and having a second conical surface;  
a plurality of slips each having opposed concave inner surfaces, gripping teeth and a recess which accommodates a spring for urging said slip inward away from the inner well conduit wall;  
a slip retaining means which retains said slips within said anchor catcher;  
a bearing element defined by an elongate helically shaped body having a plurality of longitudinally spaced holes therein;  
pins attached to the drag body and having portions inserted into respective holes in said bearing element; and  
said mandrel having portions defining a helically shaped track for slideably receiving said bearing element,  
wherein rotation of said mandrel causes said bearing element, said pins, and in turn said drag body to move towards said cone element so that the second conical surface of said drag body contacts one of the concave inner surfaces of each slip and the other inner concave surface contacts the first conical surface of said cone element to drive said slips outward toward the inner conduit wall to engage the gripping teeth with the inner well conduit wall.

5,771,970

**TUBING TIGHTENER**

William Jani, Calgary, Canada, assignor to Northwest Tech Group Inc., Alberta, Canada

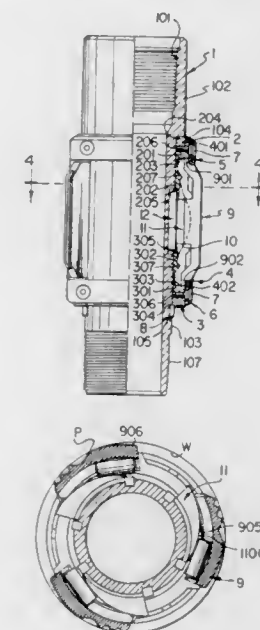
Continuation-in-part of Ser. No. 568,199, Dec. 6, 1995, Pat. No. 5,623,991. This application Jul. 2, 1996, Ser. No. 677,341

Claims priority, application Canada, Nov. 8, 1995, 2162409

Int. Cl.<sup>6</sup> E21B 23/00

U.S. Cl. 166—216

24 Claims



1. A tubing tightener adapted for insertion in a wellbore together with a tubing string, the tightener comprising:

a mandrel adapted for connection to at least an upper section of tubing by attachment of the mandrel to a lower end of the tubing section, to secure the mandrel for axial and rotational movement with the tubing string and enable the tightener to be rotated between an unlocked and locked position by manipulation of the tubing string;

a drag slip support assembly mounted upon the mandrel and means for restraining said support assembly from axial movement on said mandrel;

a plurality of drag slips peripherally mounted upon the support assembly, the drag slips each having an outer surface comprising a slip surface region and a drag surface region which are

selectively engageable with the wellbore and, located intermediate said regions, a region of contact between the drag slip surface and the wellbore in both the locked and unlocked conditions of the tightener;

means biasing the slip surface regions inwardly towards the mandrel and the drag surface regions outwardly towards the wellbore with sufficient force that, in the unlocked position of the tightener, the drag surface regions frictionally engage the wellbore and restrain relative rotational movement between the drag slips and the wellbore whilst still permitting axial movement of the tubing string; and

a booster assembly supported by and rotatable with the mandrel, and including a plurality of formations, each having an outwardly facing wall surface extending tangentially to an arc of rotation of the mandrel and engaging the respective drag slips upon rotation of the mandrel in a first direction to progressively force the slip surface regions outwardly into engagement with the wellbore with sufficient force to prevent relative movement between the drag slips and the wellbore;

the booster assembly being rotatable with the mandrel in the opposite direction to allow the drag slips to rock about their regions of contact with the wellbore to retract the slip surface regions and advance the drag surface regions under the influence of the biasing means.

5,771,971

**CLAY STABILIZING AGENT AND A METHOD OF USE IN SUBTERRANEAN FORMATIONS TO INHIBIT CLAY SWELLING**

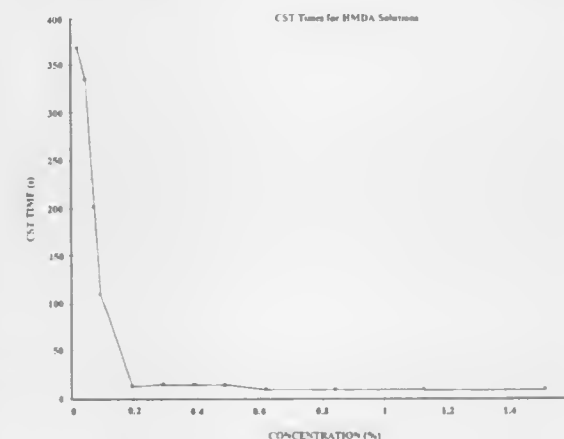
David Horton, 4031 Rundelhorn Dr. N.E., Calgary, Alberta, Canada, T1Y 2K2, and Alan Jones, 203 Silverbrook Way NW., Calgary, Alberta, Canada, T3B 3G7

Filed Jun. 3, 1996, Ser. No. 660,182

Int. Cl.<sup>6</sup> E21B 43/26

U.S. Cl. 166—283

16 Claims



1. A clay stabilizing agent to inhibit clay swelling in subterranean formations, the stabilizing agent comprising an effective amount of at least one organic amine selected from the group consisting of primary diamines with a chain length of 8 or less carbon atoms and primary alkyl amines with a chain length of 4 or less carbon atoms.



5,771,972

## ONE TRIP MILLING SYSTEM

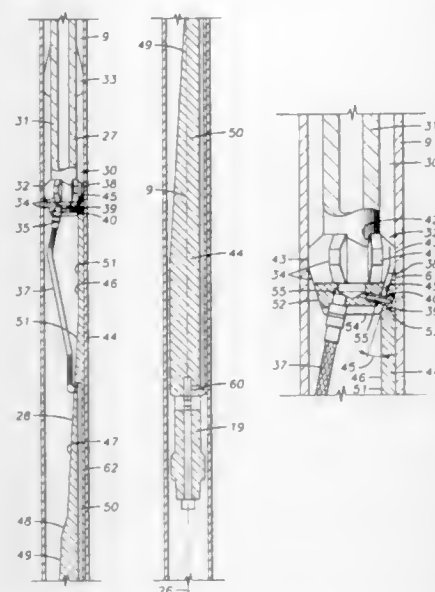
Charles H. Dewey, Houston; James E. Saylor, III, Kingwood; Bruce D. Swearingen, The Woodlands; Andrew MacDonald Robin, Aberdeen; Alexander William Dawson, Keith Banffshire, and Gregory S. Nairn, Humble, all of Tex., assignors to Smith International, Inc., Houston, Tex.

Filed May 3, 1996, Ser. No. 642,829

Int. Cl.<sup>6</sup> E21B 7/08

U.S. Cl. 166—298

44 Claims



36. A method of drilling a window in a casing disposed in a well comprising:  
releasably connecting a starter cutting member to one end of a whipstock;  
engaging a first bearing surface on the starter cutting member with an initial wedge surface on the whipstock;  
disposing the starter cutting member and whipstock within the casing;  
disconnecting the starter cutting member from the whipstock;  
deflecting the starter cutting member into engagement with the casing;  
engaging a second bearing surface on the starter cutting member with a subsequent wedge surface on the whipstock; and  
passing the center of the starter cutting member from the interior to the exterior of the casing.

5,771,973

## SINGLE WELL VAPOR EXTRACTION PROCESS

Earl M. Jensen; Kurt D. Uhrich, and David J. Hassan, all of Calgary, Canada, assignors to Amoco Corporation, Chicago, Ill.

Filed Jul. 26, 1996, Ser. No. 686,577

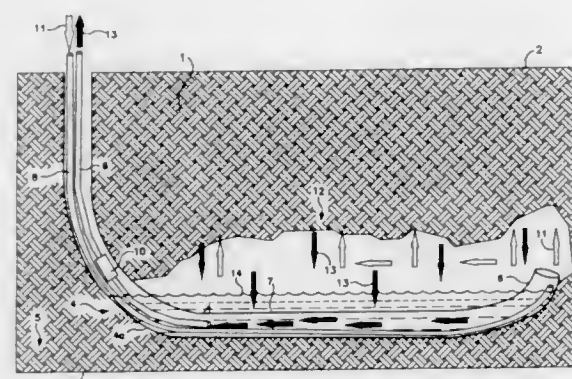
Int. Cl.<sup>6</sup> E21B 36/00; 43/24

U.S. Cl. 166—303

48 Claims

1. A method of producing hydrocarbons and associated fluids from a subterranean formation containing such hydrocarbons and fluids, comprising the steps of:

- forming a well-bore having a horizontal section that is located within the formation, between the midpoint and the bottom of the formation, and close to the bottom of the formation;
- forming one end of said horizontal section of the well-bore to be raised above the highest point of the remainder of said horizontal section of the well-bore;
- completing the well-bore so that fluids can be injected into the formation through said horizontal section of the well-bore at a point located generally adjacent to said raised one end of said horizontal section of the well-bore, and so that fluids can be produced from the formation through said horizontal section



of said well-bore along at least one position that is located below said raised one end of said horizontal section of said well-bore;

- mobilizing a portion of the hydrocarbons within the formation and inducing such hydrocarbons to move towards said horizontal section of said well-bore in response to gravity drainage by injecting a fluid through said horizontal section and into the formation using said point located generally adjacent to said raised one end of said horizontal section of the well-bore; and
- producing hydrocarbons and associated fluids from the formation through said at least one position of said horizontal section of the well-bore, such that the production of said hydrocarbons occurs simultaneously with the injection of said fluid into the formation.

48. Apparatus for producing hydrocarbons from a subterranean formation containing such hydrocarbons and associated fluids, comprising:

- a predominately horizontal well-bore located between the midpoint and the bottom of the formation and as close to the bottom of the formation as possible, said well-bore having a raised end that lies at least 2 meters above the rest of said predominately horizontal section and that is used for injecting fluids into the formation, and said well-bore having at least one completed section that is located below said raised end of said well-bore for producing hydrocarbons from the formation in response to the injection of fluids through said raised end and that is adapted to receive and withdraw from the formation mobilized hydrocarbons drawn thereto by gravity drainage; and
- means for injecting propane, butane, ethane, methane and mixtures thereof in the form of a saturated vapor through said raised end.

5,771,974

## TEST TREE CLOSURE DEVICE FOR A CASED SUBSEA OIL WELL

Adrian J. Stewart, Sommerville Park, Singapore; Christophe M. Rayssiguier, Melun, and Jean-Paul Ribeyre, Vert-Saint-Denis, both of France, assignors to Schlumberger Technology Corporation, Houston, Tex.

Filed Nov. 9, 1995, Ser. No. 555,596

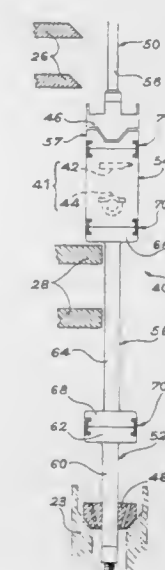
Claims priority, application France, Nov. 14, 1994, 94 13607  
Int. Cl.<sup>6</sup> E21B 7/12; 34/04

U.S. Cl. 166—336

20 Claims

1. A subsurface test tree closure device suitable for being placed in a test tree for a cased subsea well, inside a blowout preventer stack of the well which includes two total closure valves placed above two partial closure valves, and a base below the partial closure valves, comprising:

- a bottom element including an anchor part for anchoring the device to said base;
- a top element;
- a connector, said top element including at least a top portion of said connector;
- at least one closure length including a set of valves;



at least one tubular connection length; and  
dismountable assembly means for connecting either one of said lengths to said connector and the other one to said bottom element, and said closure length to said tubular connection length.

5,771,975

## COMPOSITE CYLINDER TERMINATION

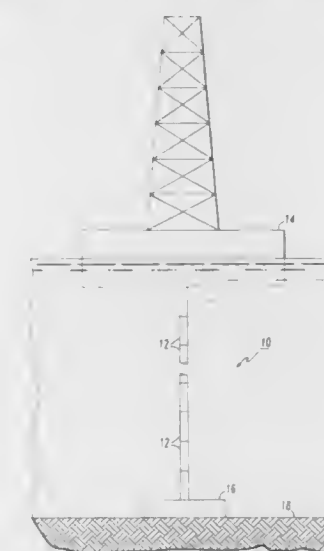
Jeffrey J. Anderson, Sunnyvale; Donald A. Nance, Mountain View, and Craig S. Mickelson, San Jose, all of Calif., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Feb. 14, 1997, Ser. No. 800,600

Int. Cl.<sup>6</sup> E21B 17/01; B29D 22/00

U.S. Cl. 166—367

28 Claims



- A composite-to-end connection arrangement comprising:  
(A) a hollow cylinder of composite material extending along a central longitudinal axis;
- (B) an end connection assembly having a plurality of segments, at least one of which is in contact with the inner surface of said cylinder at an end thereof;
- (C) said end of said cylinder being formed about said at least one segment to assume the contour thereof, said contour having a predetermined shape so as to prevent withdrawal of said segment from said cylinder; and
- (D) spacer means positioned between two of said segments separating said segments and forcing at least one of them into

intimate contact with the inner contoured surface of said cylinder, to limit axial movement of said assembly due to a predetermined load, or to chose any gaps or separation between the composite cylinder and the segments that may arise due to thermal contraction.

5,771,976

## ENHANCED PRODUCTION RATE WATER WELL SYSTEM

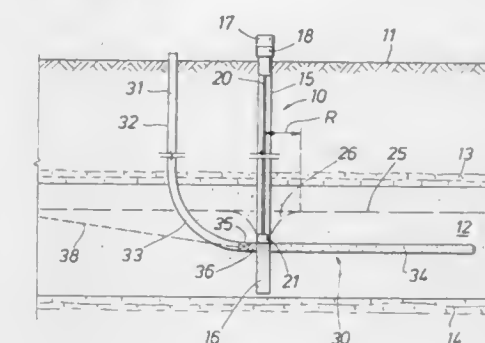
Robert R. Talley, 1806 Crutch Field, Katy, Tex. 77449

Filed Jun. 19, 1996, Ser. No. 666,014

Int. Cl.<sup>6</sup> E21B 43/00

U.S. Cl. 166—370

5 Claims



1. A method of enhancing the production of water from a substantially vertical well that extends from the surface down into an underground aquifer, comprising the steps of: forming a substantially horizontal well of substantial length along a path that passes close to said vertical well; and pumping water from said vertical well which is drawn from the aquifer primarily via said horizontal well.

5,771,977

## AUTOMATIC TRIGGER MECHANISM FOR PORTABLE FIRE EXTINGUISHERS

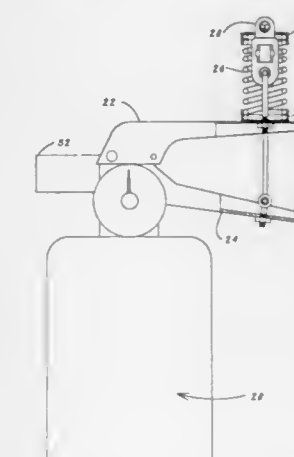
Robert A. Schmidt, 3335 North Branch Rd., North Branch, Mich. 48461, assignor to Robert A. Schmidt, Lapeer, Mich.

Filed Dec. 16, 1996, Ser. No. 767,302

Int. Cl.<sup>6</sup> A62C 13/76

U.S. Cl. 169—26

1 Claim



- An automatic fire extinguisher comprising:  
a canister filled with a pressurized fluid;  
a release mechanism mounted on said canister, said release mechanism comprising a fixed lever and a movable lever;  
a heat responsive trigger mechanism comprising.

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a first cap member mounted to said movable lever,  
a spring operatively coupled with said first cap member at a first end thereof,  
a second cap member operatively coupled with a second end of said spring,  
a fusible link extending within said spring, said fusible link being coupled at a first end thereof to said first cap member, and at a second end to said second cap member, said fusible link holding said cap members a fixed distance apart, at which distance said spring is compressed,  
means for maintaining said second cap member a fixed distance from said fixed lever,  
whereby upon the failure of said fusible link, said spring will expand, forcing said cap members apart, and thereby forcing said movable lever toward said fixed lever, thus discharging said extinguisher.

5,771,978

**GRADING IMPLEMENT ELEVATION CONTROLLER WITH TRACKING STATION AND REFERENCE LASER BEAM**

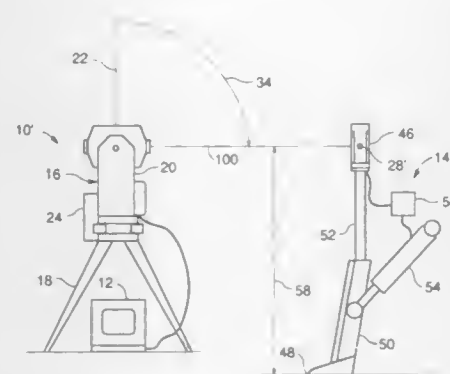
Richard W. Davidson, Danville, Calif.; Fumio Ohtomo; Kazuaki Kimura, both of Tokyo, Japan, and Satoshi Hirano, Livermore, Calif., assignors to Kabushiki Kaisha Topcon, Tokyo, Japan

Filed Jun. 5, 1996, Ser. No. 658,655

Int. Cl.<sup>6</sup> E02F 3/76

U.S. Cl. 172—4.5

21 Claims



2. A control system for controlling the position of a grading implement of a construction machine, said control system comprising:

- a tracking station that includes means for measuring a distance and an azimuth angle to a remote target, and further includes means for generating a laser beam that establishes a desired zenith angle to the remote target;
- computing means coupled to the tracking station for determining the desired zenith angle in response to the measured distance and azimuth angle of the remote target;
- the remote target coupled to the construction machine for movement therewith; and
- an implement controller coupled to the grading implement and including means for positioning the grading implement at a desired position relative to the laser beam.

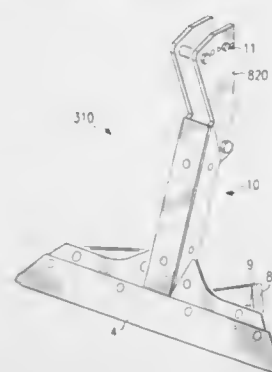
**BI-DIRECTIONAL MOLDBOARDS SUPPORTS USED IN MOLDBOARD PLOWS TO CARRY OUT CONSERVATION TILLAGE**

Omar Cantu Alanis, Nuevo Leon, Mexico, assignor to Industrias John Deere, S.A. DE C.V., Mexico  
Continuation-in-part of Ser. No. 366,325, Dec. 28, 1994, abandoned. This application Aug. 20, 1996, Ser. No. 699,919

Int. Cl.<sup>6</sup> A01B 3/40

U.S. Cl. 172—219

15 Claims



1. A tillage conservation plow for plowing soil and exposing, on the surface of the earth, weeds and past harvest residue comprising:

- a hitch frame;
- a framework connected to the hitch frame;
- a reversion mechanism for rotating the hitch frame;
- a tillage conservation bi-directional blade having an edge;
- a support configured to pass the soil returned, the support comprising:
  - an upper portion coupled to the framework, the upper portion having a plurality of holes;
  - a narrow center portion coupled to the upper portion, the narrow center portion having a minimum width sufficient to allow the soil to pass by the support returned;
  - a detachable wear section connected to the narrow center portion for reducing wear on the narrow center portion, the detachable wear section having a minimum width sufficient to allow the soil to pass by the support returned; and
  - a blade support section for connecting the support to the blade, the blade support having a rear surface;
- a honed cutting portion on the edge for penetrating the earth and providing a flat cut to place the weeds and past harvest residue on the surface of the earth;
- a stabilizing section having a regulating flange rigidly connected to the rear surface of the blade support, the stabilizing section operable to stabilize the plow; and
- wherein the support in combination with the tillage conservation bi-directional blade is operable to place the weeds and past harvest residue on the surface of the earth without turning over the soil.

5,771,980

**SOIL LEVELING APPARATUS WITH IMPROVED FRAME AND HITCH**

Orlan H. Mork, 6029 225th St. West, Farmington, Minn. 55024  
Division of Ser. No. 68,126, May 25, 1993, Pat. No. 5,511,625.

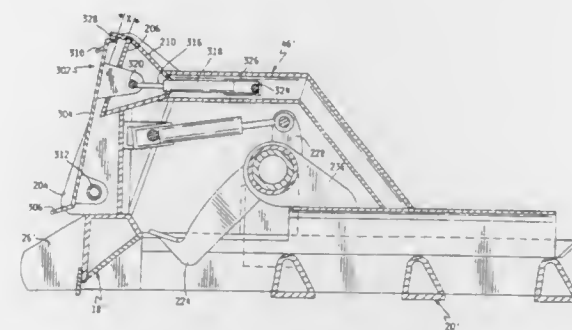
This application Apr. 30, 1996, Ser. No. 642,225

Int. Cl.<sup>6</sup> A01B 63/00

U.S. Cl. 172—501

20 Claims

1. An apparatus for working soil, the apparatus suited for being connected to a skid steer loader type vehicle having vertically movable loader arms and at least one tilt cylinder, the skid steer loader type vehicle further having an adaptor plate pivotally joined to the loader arms with the at least one tilt cylinder having one end thereof connected to the adaptor plate for pivoting the adaptor plate about the loader arms during activation of the at least one tilt cylinder, comprising:



a frame including at least one transverse ground engaging member for working soil; and  
hitch means mounted on said frame for releasable connection to the loader arms and the at least one tilt cylinder of the skid steer loader, whereby the hitch means includes selectively operable means for placing the frame into either a first rigid orientation relative to the skid steer loader where the frame can then be raised and lowered relative to the ground by the loader arms and the frame can be inclined relative to the ground by the at least one tilt cylinder or into a second floating orientation relative to the skid steer loader where the frame can move up and down relative to the loader arms and at least one tilt cylinder to follow the ground terrain, whereby the user can selectively choose either the first rigid orientation or the second floating orientation of the hitch, wherein the hitch means is configured such that the frame in its floating orientation is pivotally mounted relative to the loader, and wherein the hitch means comprises a hitch plate pivotally connected to the frame for pivotal motion such that the floating orientation of the frame is achieved by pivoting of the frame relative to the hitch plate, and wherein the hitch plate includes means for rigidly connecting the hitch plate to the adaptor plate of the loader.

5,771,981

**CONTROL SYSTEM FOR PERCUSSION DRILL**

Roger Robarts Briggs, 23 Leyes Lane, Kenilworth, Warwickshire, CU8 20D, United Kingdom, and Jarmo Uolevi Leppanen, c/o 11 Junction Road, Industries North, Germiston, 1401, South Africa

PCT No. PCT/GB94/00826, § 371 Date Oct. 20, 1995, § 102(e)  
Date Oct. 20, 1995, PCT Pub. No. WO94/24415, PCT Pub. Date Oct. 27, 1994

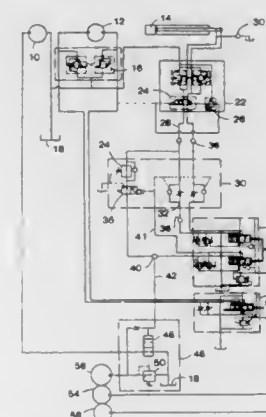
PCT Filed Apr. 19, 1994, Ser. No. 537,774

Claims priority, application South Africa, Apr. 21, 1993, 93/2779

Int. Cl.<sup>6</sup> E21B 44/00

U.S. Cl. 173—4

5 Claims



1. A control system for a percussion drill with a hydraulically actuated drill percussion mechanism, drill rotation mechanism and drill feed mechanism for a drill bit, which includes a control means

which is activated, only in reaction to an increase in the hydraulic pressure in the drill feed mechanism or the hydraulic pressure in the drill rotation mechanism or both of these hydraulic pressures, due to contact of the drill bit against a rock face, to start a percussion movement of the drill.

5,771,982  
**ROCK DRILL**

Roger Robarts Briggs, 23 Leyes Lane, Kenilworth, Warwickshire, CU8 20D, United Kingdom, and Jarmo Uolevi Leppanen, c/o 11 Junction Road, Industries North, Germiston, 1401, South Africa

PCT No. PCT/GB94/00851, § 371 Date Oct. 19, 1995, § 102(e)  
Date Oct. 19, 1995, PCT Pub. No. WO94/24403, PCT Pub. Date Oct. 27, 1994

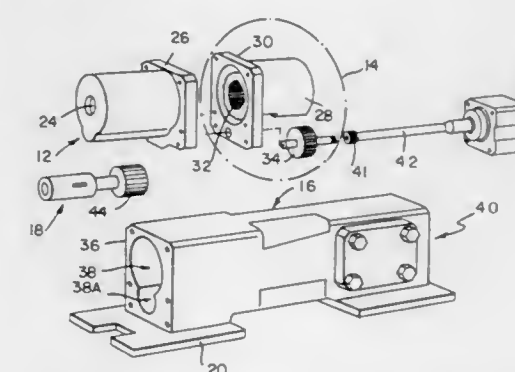
PCT Filed Apr. 21, 1994, Ser. No. 535,282

Claims priority, application Saudi Arabia, Apr. 21, 1993, 93/2778

Int. Cl.<sup>6</sup> B23B 45/02

U.S. Cl. 173—104

8 Claims



1. A percussion rock drill which includes a main body with a chamber which is formed in the main body, a rotation module which includes a gear housing which is mounted in the chamber, gear means in the gear housing, a drill shank which is engaged with the gear means and which is rotatable and reciprocable relatively to the gear housing, and a percussion module which is located in the main body, the rotation module being positioned at one end of the percussion module.

5,771,983

**SCREW CLAMP WITH U-SHAPED CLAMP PART**

Hans-Peter Rottmann, Altbach, Germany, assignor to Richard Hirschmann GmbH & Co., Germany

PCT No. PCT/EP94/01716, § 371 Date Jan. 11, 1996, § 102(e)  
Date Jan. 11, 1996, PCT Pub. No. WO95/02262, PCT Pub. Date Jan. 19, 1995

PCT Filed May 26, 1994, Ser. No. 307,705

Claims priority, application Germany, Jul. 8, 1993, 43 22 790.2

Int. Cl.<sup>6</sup> H01R 4/36

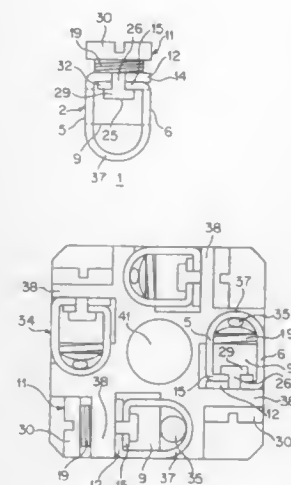
U.S. Cl. 174—84 C

7 Claims

1. A screw terminal for connecting electrical conductors comprising:

- a U-shaped sheet metal part;
- a cross nut between a first arm section and a second arm section held using side shoulders in a recess of the first arm section and a recess of the second arm section and located transversely to the first arm section and the second arm section for holding and guiding a threaded shaft of a terminal screw;
- an outer end part of the first arm section bent by 90° towards the second arm section, wherein the outer end part of the first arm section lies on the second arm section and has a central hole for penetration of the threaded shaft of the terminal screw;





an inner end part of the second arm section bent 90° towards the first arm section around a bending edge, wherein the inner end part rests flat against the outer end part and has an opening that is flush with the central hole of the outer end part for penetration of the threaded shaft of the terminal screw.

5,771,984

#### CONTINUOUS DRILLING OF VERTICAL BOREHOLES BY THERMAL PROCESSES: INCLUDING ROCK SPALLATION AND FUSION

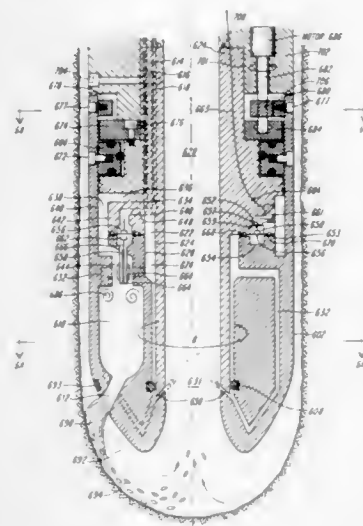
Robert M. Potter, Los Alamos, N. Mex., and Jefferson W. Tester, Hingham, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 19, 1995, Ser. No. 445,330

Int. Cl.<sup>6</sup> E21B 7/14; 7/15

U.S. Cl. 175—14

35 Claims



1. An apparatus for excavation of a borehole in a geological formation by spallation, said apparatus comprising:
- a rotationally stationary support; and
  - connected to said support and rotatable with respect thereto, a jet housing having a central axis, said housing comprising:
    - a plurality of jet nozzles, spaced circumferentially around said central axis, each arranged to emit a jet of hot fluid having a directional component that is radial with respect to said central axis and a directional component that is parallel to said central axis;
    - at least one return passage therethrough for the passage of excavated material; and
    - a plurality of cooling fluid conduits distributed throughout said jet housing.

#### 5,771,985 EARTH PENETRATING APPARATUS FOR OBTAINING SEDIMENT SAMPLES, DRIVING INSTRUMENT PROBES, PILINGS, OR SHEET PILINGS

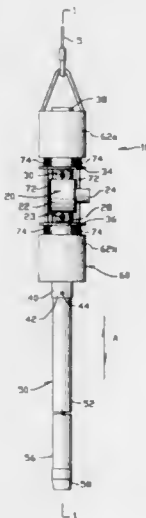
Bill L. Jaworski, P.O. Box 290, Burley, Wash. 98322

Filed Oct. 8, 1996, Ser. No. 728,285

Int. Cl.<sup>6</sup> E21B 7/24

U.S. Cl. 175—55

19 Claims



1. An earth penetrating apparatus for driving a core tube, instrument probe, piling, sheet piling or the like into the earth, which comprises:

- a housing;
- a vibrator mounted to said housing;
- a biasing mass;
- a suspension, said biasing mass being suspended from said housing by said suspension; and
- means for attaching an earth penetrating device to said housing.

5,771,986

#### BALANCE WITH SCALE ON TOP

Heinz-Gerhard Köhn, Dransfeld; Jörg Peter Martens, Boven-den; Michael Laubstein, Göttingen; Carsten Tischer, Hardegsen; Winfried Graf, Göttingen, and Eduard Bierich, Hann.-München, all of Germany, assignors to Sartorius AG, Göttingen, Germany

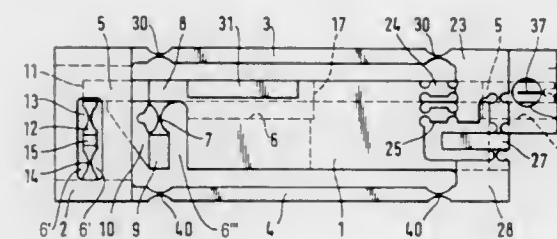
Filed Jul. 18, 1995, Ser. No. 503,484

Claims priority, application Germany, Jul. 30, 1994, 44 27 087.9

Int. Cl.<sup>6</sup> G01G 21/24

U.S. Cl. 177—210 EM

4 Claims



1. An integral one piece block means for a toploaded balance in accordance with the principle of electromagnetic compensation of force, comprising:
- spaced diverging upper guide rods (3, 3'); spaced diverging lower guide rods (4, 4'); said upper and lower guide rods having first end portions, said upper and lower guide rods having second end portions, said upper guide rods and said lower guide rods being parallelly displaced;
  - a block load receiver (2);

said divergent upper guide rods and divergent lower guide rods having their first end portions articulately connected to said block load receiver (2);

a block system carrier (1) disposed in the same plane as said block load receiver (2);

said block system carrier (1) having a first edge portion distal from said block load receiver (2);

said first edge portion of said system carrier having spaced upstanding portions;

said second end portions of said upper guide rods being articulately connected to said upstanding portions;

said first edge portion of said block system carrier having a downwardly depending portion means;

said second end portion of said lower guide rods being articulately connected to said downwardly depending portion means;

an elongated translation lever (5);

said elongated translation lever (5) having a first end and linearly displaced therefrom an intermediate portion;

said elongated translation lever terminating in a second end portion;

said load receiver (1) having an open facing recess towards said block system carrier;

said elongated translation lever (5) having said first end articulately connected in said open facing recess to said block load receiver;

said block system carrier (1) having an elongated slot extending between said first edge portion and an oppositely displaced second edge portions;

said intermediate portion of said elongated translation lever (5) being articulately connected to said second edge portion of said block system carrier (1);

said second end portion of said elongated translation lever extending in said slot in said block system carrier, between said diverging upper guide rods and between said upstanding portions of said block system carrier (1).

5,771,987

#### WHEELED VEHICLE, SPECIFICALLY A SWIMMING-POOL CLEANING ROBOT, WITH AUTOMATIC CHANGE OF TRAVEL DIRECTION WHEN MEETING AN OBSTACLE

Gerard Marbach, Cernay, France, assignor to Sweepex International S.A., Balma, France

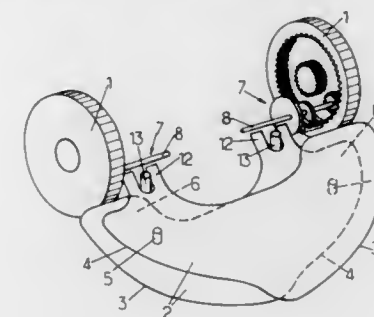
Filed Jun. 17, 1996, Ser. No. 664,828

Claims priority, application France, Jun. 19, 1995, 95 07297

Int. Cl.<sup>6</sup> B62D 11/00

U.S. Cl. 180—6.66

14 Claims



1. Wheeled vehicle which automatically changes travel direction when it meets an obstacle, this device being provided with two independent front-wheel drives and comprising:
- two obstacle-detection units located on the front of the vehicle at each side,
  - means of transmission for each driving wheel from a motor shaft, through means for reversing the direction of rotation,
  - means of connection placed between each obstacle-detection unit and means of transmission for the driving wheel located on the opposite side.

said obstacle-detection units and said means of connection arranged in such a manner that, when the vehicle meets an obstacle, the means of detection actuated by said obstacle act, through said corresponding means of connection, so as to actuate said means for reversing the direction of rotation, and to have the rotation of the driving wheel pass from the forward direction to the rear direction,

each obstacle-detection unit comprising an elongated unit constituted by the front edge, extending practically on a half-width and on the corresponding angle of the front of the vehicle which is opposite to the driving wheel with which said unit is functionally associated, an arm shaped in such manner that its opposite end is practically located in the area of the driving wheel that it controls and is supported at free rotation on a revolving axle practically vertical, and said extended unit is coupled in a selective manner to the motor shaft driving said driving wheel through the aforementioned connection means.

5,771,988

#### MOTOR-DRIVEN VEHICLE

Isao Kikutani, Yoshinori Takezawa, and Yoshinobu Ishida, all of Kobe, Japan, assignors to Nabco Limited, Chuoh-ku, Japan

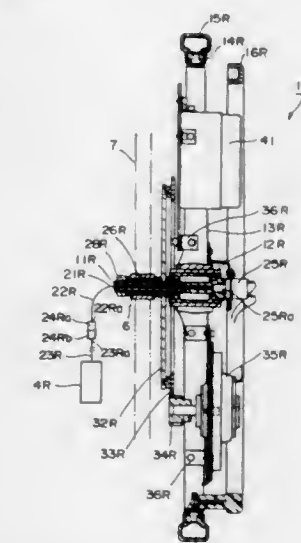
Filed May 30, 1996, Ser. No. 655,406

Claims priority, application Japan, May 30, 1995, 7-157158; May 30, 1995, 7-157159

Int. Cl.<sup>6</sup> B60K 7/00; B62D 11/04

U.S. Cl. 180—65.5

21 Claims



1. A motor-driven vehicle comprising:
- a vehicle body,
  - a wheel having an axle with a hollow therein secured to said vehicle body and having a rotary section rotatable about said secured axle;
  - a driving arrangement built in said wheel, said driving arrangement including a driving unit mounted on said rotary section and a battery for said driving unit,
  - manipulating means mounted on said vehicle body for providing an electrical signal to be supplied to said driving arrangement;
  - a signal line disposed in said hollow for interconnecting said manipulating means and said driving arrangement, and
  - a slip ring interposed in said signal line and attached to an end of said hollow.

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## POWER STEERING SYSTEM

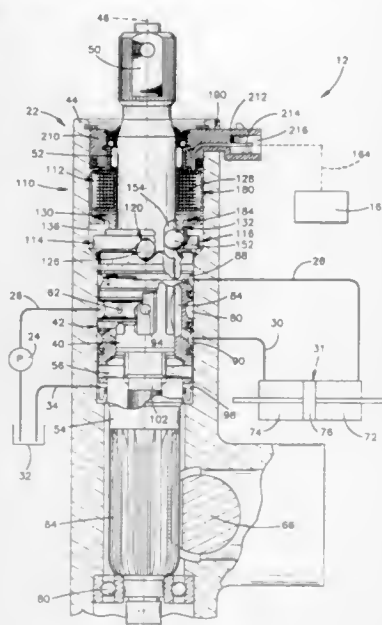
Henry C. Sangret, St. Clair Shores, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Feb. 28, 1996, Ser. No. 608,135

Int. Cl.<sup>6</sup> B62D 5/083

U.S. Cl. 180—423

16 Claims



1. An apparatus for use in a vehicle to control a flow of fluid to a power steering motor, said apparatus comprising:
- a housing adapted to be connected with a fluid supply conduit and the power steering motor;
  - first and second valve members disposed in said housing and rotatable relative to each other to control fluid flow from the fluid supply conduit to the power steering motor;
  - force transmitting means for resisting relative rotation between said first and second valve members with a force which varies as a function of variations in force applied against said force transmitting means;
  - an actuator member through which force is applied against said force transmitting means; and
  - electromagnetic means for providing a magnetic field which acts on said actuator member to vary the force transmitted through said actuator member to said force transmitting means.

5,771,990

## SHOCK ABSORBING FOOT MEANS

Shih-Tsung Liang, No. 10, Lane 31, Ta-Feng St., Lu-Chu Hsiang, Taoyuan County, Taiwan

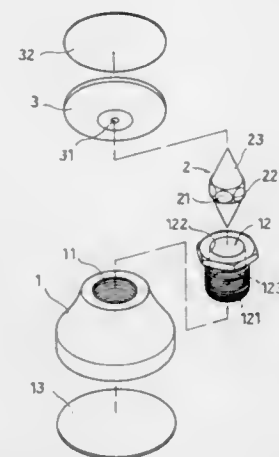
Filed Apr. 25, 1997, Ser. No. 845,403

Int. Cl.<sup>6</sup> F16F 15/00

U.S. Cl. 181—208

1 Claim

1. A shock absorbing foot adapted for supporting an audio equipment on a flat surface, comprising:
- a base shaped like a truncated cone having a bottom side adhered to a flat surface by a double-sided adhesive pad, and a vertical screw hole at the center of a top side thereof;
  - a receptacle shaped like a headed, cylindrical container and mounted on said base, said receptacle comprising an outer thread threaded into the screw hole of said base, a top open chamber having a horizontal bottom wall, and a rounded recess at the center of the horizontal bottom wall of said top open chamber;
  - a mounting plate having a top side fastened to a bottom side of an audio equipment by a double-sided adhesive pad, a bottom side facing said base, and a rounded recess at the center of its bottom side; and



a support member mounted in the top open chamber of said receptacle to support said mounting plate, said support member comprising a hexagonal flange, a plurality of projecting portions equiangularly spaced around the periphery of said hexagonal flange and disposed in contact with the periphery of the top open chamber of said receptacle, a top cone having a top point engaging the rounded recess of said mounting plate, and a bottom cone having a bottom point engaging the rounded recess of said receptacle.

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## SUPPORT DEVICE ATTACHABLE TO A BUILDING

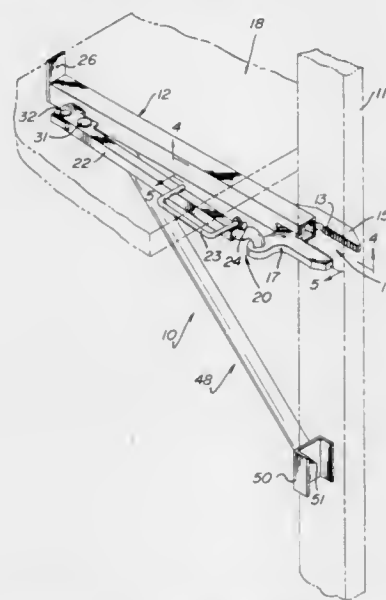
Johnny Fresco, 120 Green St., Doylestown, Pa. 18901

Filed Jul. 14, 1995, Ser. No. 502,350

Int. Cl.<sup>6</sup> E04G 3/00

U.S. Cl. 182—82

8 Claims



1. A support device for building materials and the like, for attachment to a building support member, said device comprising:
- a body having opposing first and second ends;
  - clamping means attached to the first end of said body for gripping the building support member, said clamping means having a lever mechanism means for controlling the opening and closing thereof, said clamping means further comprising skid-resistant means for maintaining said clamping means stationary with respect to an associated building support member; and
  - a brace attached to the second end of said body and having slip resistance means for maintaining said brace stationary with

respect to said associated building support member, said brace secured to said associated support member at a location spaced apart from said clamping means.

5,771,992

## SAFETY SUPPORT STRUCTURE FOR LEVELING A LADDER

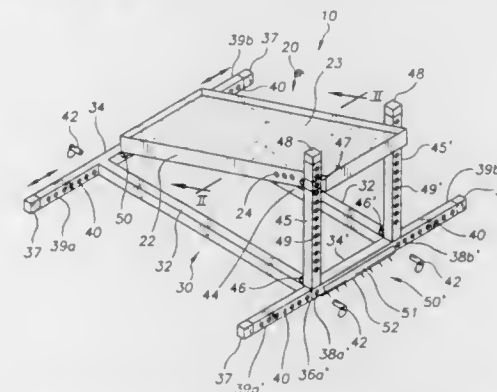
Harry A. Snyder, 800 E. Benton, Carrollton, Mo. 64633

Filed Sep. 20, 1996, Ser. No. 716,866

Int. Cl.<sup>6</sup> E06C 1/00

U.S. Cl. 182—200

3 Claims



1. A safety support structure for supporting a ladder thereon over a surface, said safety support structure comprising:
- a frame structure;
  - leveler and support surface means coupled to said frame structure for leveling said ladder and providing a support surface over said surface wherein one distal end of said leveler and support surface means is incrementally raised pivotally in accordance with a slope or unevenness of said surface;
  - a support plate formed substantially in the shape of a parallelogram and having a top surface area; and
  - a pad disposed on said top surface area wherein said pad prevents said ladder placed thereon from sliding or skidding as a user climbs up the ladder;
- said leveler and support surface means further comprising:
- support plate frame surrounding the perimeter of said support plate perpendicularly coupled in the center thereof and formed substantially in the shape of an "L" for forming a ledge extending inward from and perpendicular to the lowermost edge of a vertical surface of said support plate frame wherein the vertical surface of said support plate frame forms a stop wall for preventing the ladder from moving off said support plate.

5,771,993

## SAFETY DEVICES FOR FALL RESTRAINT

Preston L. Anderson, Seneca; Allen D. Boyd; Joseph F. Gayetty, both of Franklin; Robert A. Taylor, Oil City, and Ronald W. Adams, Franklin, all of Pa.; assignors to Dalloz Safety, Inc., Reading, Pa.

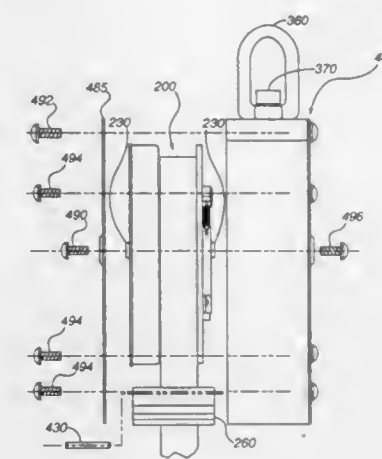
Filed Jun. 14, 1996, Ser. No. 665,088

Int. Cl.<sup>6</sup> A62B 1/10; 35/00

U.S. Cl. 182—239

10 Claims

1. A safety device for restraining an individual exposed to a risk of falling, the safety device comprising:
- a housing;
  - a drum assembly rotatably mounted within the housing, the drum assembly comprising:
  - i. a first drum flange;
  - ii. a second drum flange spaced generally parallel from the first drum flange; and
  - iii. a drum hub centrally connected between the first drum flange and the second drum flange;



the safety device further comprising:

- c. a lifeline having a first end attached to the drum hub and a second end extending outside the housing and adapted to be connected to an article outside the housing, the lifeline being wound around the drum hub when the drum hub is rotated in a retracting direction, and the lifeline being unwound from around the drum hub when the drum hub is rotated in an extending direction opposite the retracting direction;
- d. a drum biasing mechanism to bias the drum hub to rotate in the retracting direction; and
- e. a brake mechanism to brake extending rotation of the drum hub upon the extending rotation reaching a predetermined angular velocity, the brake mechanism comprising:
- i. a ratchet brake assembly fixed within the housing;
- ii. at least one pawl pivotally mounted on and substantially parallel to the first drum flange, the pawl being pivotal into engagement with the ratchet brake assembly in response to the predetermined angular velocity, the brake mechanism further comprising a pawl clip to maintain the pawl adjacent to and substantially parallel to the first drum flange, the pawl clip being attached to the first drum flange on the same side thereof upon which the pawl is pivotally mounted; and
- iii. a pawl biasing mechanism to bias the pawl out of engagement with the ratchet brake assembly when the angular velocity is less than the predetermined angular velocity.

5,771,994

Patent Not Issued For This Number

5,771,995

## LOCKING ELEVATOR CAR FRAME TO BUILDING DURING LOADING/UNLOADING HORIZONTALLY MOVEABLE CAB

Anthony Cooney, Unionville; Frederick H. Barker, Bristol; Bruce A. Powell, Canton; Samuel C. Wan, Simsbury; Paul Bennett, Waterbury; Richard C. McCarthy, Simsbury, and Joseph Bittar, Avon, all of Conn., assignors to Otis Elevator Company, Farmington, Conn.

Filed Nov. 29, 1995, Ser. No. 565,648

Int. Cl.<sup>6</sup> B66B 5/16

U.S. Cl. 187—357

21 Claims

1. A car floor lock for locking an elevator car frame to a floor landing of a building when said car frame is disposed at said landing, said lock spanning an interface having two sides between said car frame and a structure in an elevator hoistway at said landing, said lock comprising:
- a bolt disposed to extend horizontally from a first side of said interface to span said interface;
  - a strike on the other side of said interface for receiving said bolt when it is extended, engagement of said bolt with said strike



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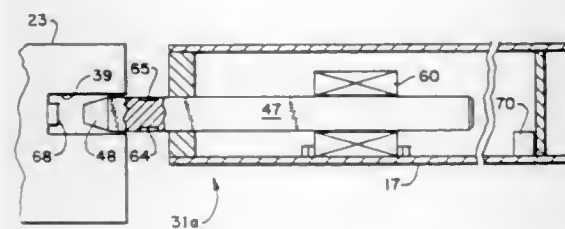
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preventing relative vertical motion between said elevator car frame and said structure;  
means for selectively extending said bolt into said strike or, alternatively, retracting said bolt so as to be clear of interface; and  
means for sensing upward or downward force exerted between said bolt and said strike and providing a signal indicative of the magnitude and direction thereof.

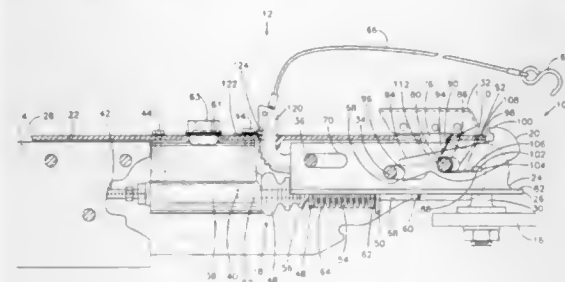
5,771,996

**LOCKOUT DEVICE FOR TRAILER BRAKE ACTUATOR**  
Albert P. Marasco, Des Moines, Iowa, assignor to DICO, Inc., Des Moines, Iowa

Filed Apr. 3, 1996, Ser. No. 627,894  
Int. Cl.<sup>6</sup> B60T 7/20

U.S. Cl. 188—112 R

18 Claims



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OFFICIAL GAZETTE

JUNE 30, 1998

each magazine entrance end portion is in engagement with a feeder system for feeding the stub portions of hop vines into the entrance end portion of the magazine to be received by the magazine gripping means; and

the exit end portions of the magazines converge towards each other;

(b) means for powering the vine gripping means of the magazines to move the hop vines received from the feeder systems along the magazines toward the exit end portions of the magazines; and

(c) a transfer conveyor having an entrance end portion and an exit end portion, with the exit end portion of the transfer conveyor in communication with the entrance of the hop picking machine, and with the entrance end portion of the transfer conveyor selectively movable to align with the exit end portions of the hop vine magazines to receive the hop vines being held in the magazines and transfer the vines to the entrance of the hop picking machine.

5,772,001

## STAR WHEEL SYSTEM

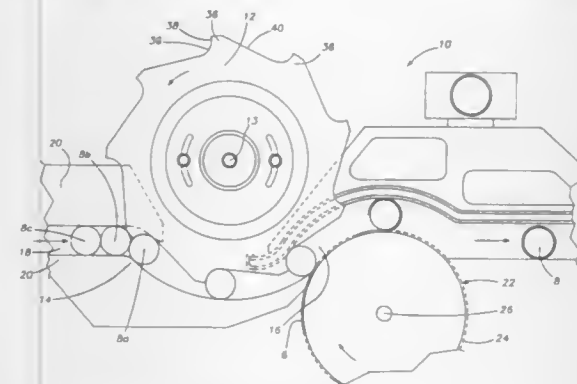
Svatoboj Otruba, Ceres; Joseph Parker, Turlock, and Gary Gomes, Winton, all of Calif., assignors to B & H Manufacturing Company, Inc., Ceres, Calif.

Filed Apr. 18, 1996, Ser. No. 634,653

Int. Cl.<sup>6</sup> B65G 47/26

U.S. Cl. 198—459.2

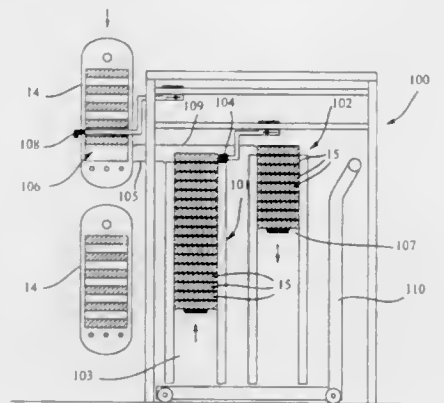
25 Claims



1. An article handling machine comprising:

a conveyor for supplying a stream of a plurality of articles to a first station with a first one of said articles positioned in front of and in physical contact with a second one of said articles and said second one of said articles positioned in physical contact with a third one of said articles, and a rotary feed apparatus for individually moving said articles from said first station to a second station downstream of said first station, said feed apparatus having at least one pocket shaped to at least partially receive one of said articles for transport of said one of said articles from said first station to said second station along a tangential path relative to said feed apparatus and a guide section configured to separate said first one of said articles from said second one of said articles and move said first one of said articles along a generally tangential path and into said pocket, to control movement of said second one of said articles during separation of said first one of said articles from said second one of said articles, and to move said second one of said articles along a generally tangential path and into said pocket upon further rotation of said feed apparatus.

5,772,002  
SUSPENDED STORAGE APPARATUS  
Hans Heiri Walser, Grösch, Switzerland, assignor to Sapal Societe Anonyme des Plieuses Automatiques, Ecublens, Switzerland  
PCT No. PCT/CH95/00095, § 371 Date Feb. 9, 1996, § 102(e) Date Feb. 9, 1996, PCT Pub. No. WO95/29861, PCT Pub. Date Nov. 9, 1995  
PCT Filed May 2, 1995, Ser. No. 571,911  
Claims priority, application France, May 3, 1994, 94 05711  
Int. Cl.<sup>6</sup> B65G 47/04  
U.S. Cl. 198—465.3 12 Claims



1. Pendant product storage device, in particular for food products and more particularly for bars of chocolate or the like, these products being placed on shelves arranged horizontally on pendant product carriers horizontally suspended on two chains moving parallel to each other in a closed circuit comprising a feed section going from a station for loading products on the shelves, to a product receiving station, arranged for unloading the shelves, and a return section in which the empty shelves are brought back from the receiving station to the loading station, in which the frame consists of at least one basic module (30) comprising four vertical columns (31a, 31b, 31c, 31d) which are connected to each other in pairs by lower longitudinal coupling members (34) and upper longitudinal coupling members (35) and by lower transversal coupling members (36) and upper transversal coupling members (37), characterised in that the vertical columns comprise at each of their ends four lower connecting members (32a, 32b, 32c, 32d) and upper connecting members (33a, 33b, 33c, 33d), in that these connecting members are provided with coupling means arranged for assuring the assembly of adjacent and/or superposed modules, and by at least one automatic shelf exchanger (100).

5,772,003  
AUTOMATIC LUBRICATION INJECTION  
SANITIZATION SYSTEM  
William C. Hunt, Norman, Okla., assignor to Bio-Cide International, Inc., Norman, Okla.  
Filed Nov. 22, 1995, Ser. No. 561,933  
Int. Cl.<sup>6</sup> B65G 45/22  
U.S. Cl. 198—495 3 Claims

1. An apparatus for sanitizing and lubricating a conveyor chain system, comprising:

an inlet water line for supplying a flow of water;

an inlet sanitizer line for supplying a flow of sanitizer;

an inlet lubricant line for supplying a flow of lubricant;

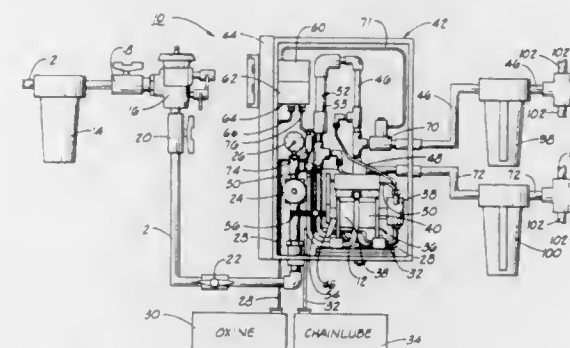
a pump means, operatively connected to the inlet sanitizer line and the inlet lubricant line, for pumping a proportionate flow of lubricant and sanitizer into the flow of water to form an outlet mixture flow having proper proportions of water, sanitizer and lubricant;

an outlet line for receiving and distributing the outlet mixture flow;

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GENERAL AND MECHANICAL

4607



means, operatively connected to the outlet line, for cycling the outlet mixture flow on for a period of time and off for a period of time, comprising:

a first timing means for timing periods when the outlet mixture flow is to be cycled off; and

means, operatively connected to the outlet line and to the first timing means, for selectively inhibiting the outlet mixture flow during periods when the outlet mixture flow is to be cycled off; and

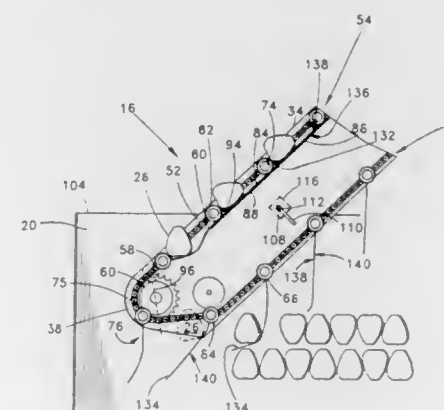
means, operatively connected to the inlet sanitizer line, for cycling the inlet flow of sanitizer on for a period of time and off for a period of time, comprising:

a second timing means for timing periods when the inlet flow of sanitizer is to be cycled off; and

means, operatively connected to the inlet sanitizer line and to the timing means, for interrupting the flow of sanitizer during period when the inlet flow of sanitizer is to be cycled off.

wherein the first timing means controls the second timing means so that timing is suspended in the second timing means during periods when the outlet mixture flow is to be cycled off.

5,772,004  
APPARATUS FOR FILLING A BIN  
Scott C. Main, 1030 Gibson Rd., Selah, Wash. 98942  
Division of Ser. No. 424,705, Apr. 18, 1995. This application  
May 16, 1996, Ser. No. 649,842  
Int. Cl.<sup>6</sup> B65G 47/44  
U.S. Cl. 198—536 18 Claims



1. A bin filler apparatus for transferring an article into a bin, which comprises:

a filling conveyor frame;

a flexible endless member mounted to the filling conveyor frame for movement along an upper run, about a first axis, along a lower run and about a second axis, the second axis spaced from and substantially parallel to the first axis;

a plurality of flaps pivotally mounted at one end thereof to the endless member for movement therewith, the flaps uniformly distributed about the endless member and having a first surface and a second surface opposed to the first surface;

a receiving means for receiving an article at a pickup location, the pickup location proximate the second axis, the receiving means able to travel between the pickup location and a drop location the drop location proximate the first axis, both the pickup location and the drop location proximate the upper run of the endless member, and the receiving means formed to pivotally drop the article at the drop location; and

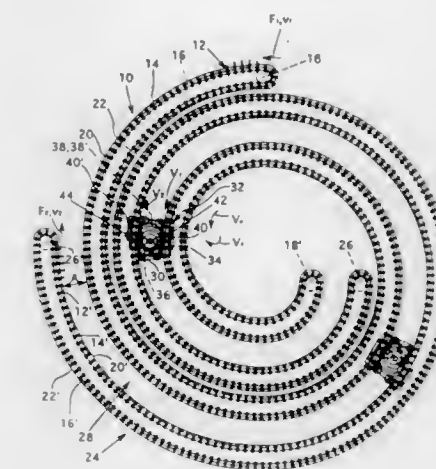
a support means for supporting each of the flaps when the flap is substantially located on the upper run of the endless member such that the first surface of the flap substantially parallel to the upper run between the pickup location and the drop location;

a base frame, the filling conveyor frame pivotally mounted to the base frame proximate the pickup location;

a catch location positioned proximate the lower run, directly beneath the drop location of the upper run; and

a catch means for catching the article proximate the catch location, the catch means pivotally attached to the endless member.

5,772,005  
APPARATUS FOR CONVEYING ARTICLES  
Egon Hänsch, Wetzikon, Switzerland, assignor to Ferag AG, Zurich, Switzerland  
Filed May 9, 1996, Ser. No. 644,002  
Claims priority, application Switzerland, May 9, 1995, 01342/95  
Int. Cl.<sup>6</sup> B65G 17/28  
U.S. Cl. 198—594 11 Claims



1. An apparatus for conveying articles comprising

a first conveyor (10) which defines an article discharge location (42) and a second conveyor (24) which defines an article receiving location (44), said conveyors being positioned to run at the same distance (A) from each other along a common section (28),

a connecting conveyor (32) positioned between the discharge location (42) and the receiving location (44) and so as to be movable along the common section (28) of the conveyors, said connecting conveyor (32) including two drive wheels (38, 38') in interengagement with respective ones of the first and second conveyors, and

coupling means for selectively

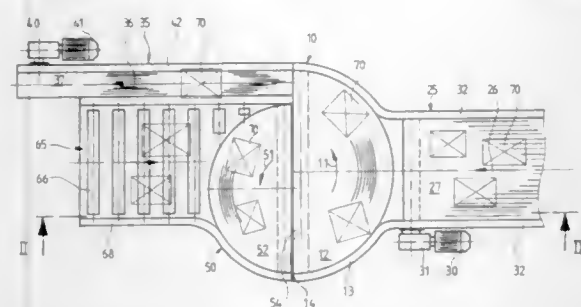
(1) coupling the drive wheels so that they are rotatable together, and such that the connecting conveyor moves in dependence on the speeds ( $v_1$ ,  $v_2$ ) of the two conveyors, and

(2) rotationally fixing either one of the drive wheels while permitting the other of the drive wheels to freely rotate, such that the connecting conveyor moves with the conveyor to which the one drive wheel is rotationally fixed.



5,772,006  
APPARATUS FOR SINGLING AND/OR SORTING  
RANDOMLY DELIVERED PARCELS  
Norbert Axmann, Sinsheim, Germany, assignor to Axmann  
Foerdertechnik GmbH, Sinsheim-Steinsfurt, Germany  
Filed May 10, 1996, Ser. No. 644,343  
Claims priority, application Germany, May 10, 1995, 195 16  
779.1

Int. Cl.<sup>6</sup> B65G 47/80  
U.S. Cl. 198—831 17 Claims



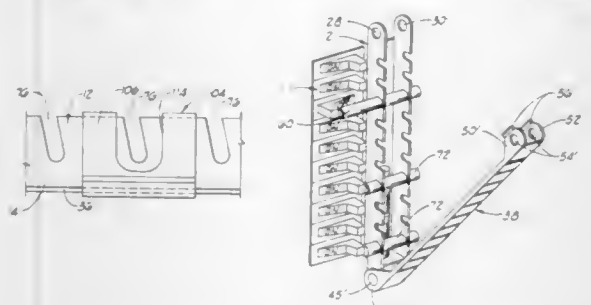
17. An apparatus for singling randomly delivered parcels, comprising:

- a first conveyor transporting a random stream of parcels, a central separator receiving the random stream of parcels from said first conveyor, and a second conveyor removing the parcels from said central separator in singled condition;
- said central separator including a rotary conveyor on which the parcels received from said first conveyor are delivered to said second conveyor, said rotary conveyor including a first semicircular belt curve having a given diameter, and a second semicircular belt curve having a diameter smaller than said given diameter approximately by a width of said second conveyor;
- said second conveyor for removing singled parcels adjoining said first belt curve at a peripheral region thereof.

5,772,007  
ELECTRIC CIRCUIT LOCK-OUT SAFETY DEVICE  
James A. Frye, 2107 Avenida De Las Alturas, Santa Fe, N. Mex.  
87501

Continuation-in-part of Ser. No. 48,422, Apr. 14, 1993, Pat.  
No. 5,270,503, which is a continuation of Ser. No. 966,319,  
Oct. 26, 1992, abandoned. This application Dec. 13, 1993, Ser.  
No. 166,187

Int. Cl.<sup>6</sup> H01H 9/28  
U.S. Cl. 200—43.14 6 Claims



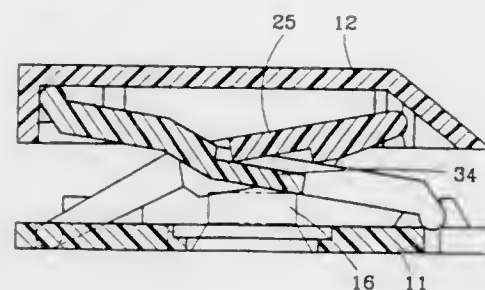
1. A lock-out safety device for electrical circuits comprising:
- a housing, including a pair of opposed, elongated side walls each defining a plurality of longitudinally spaced, open slots, with the slots in said side walls being aligned in longitudinally spaced pairs, with each pair including one slot in one of said side walls, and another transversely aligned slot in the other of the side walls;
  - at least one elongated locking pin substantially longer in its length than the distance between said side walls and including and defining a pair of longitudinally spaced grooves therein

positioned along the length of the locking pin and dimensioned so that the locking pin is engaged by two of said slots in a selected slot pair, with said slots in said selected pair of slots interlockingly mating with said grooves in said locking pin to immobilize said locking pin against movement in the direction of its longitudinal axis, and in a direction which is longitudinal and parallel with respect to said side walls, each of said locking pins having an axially extending portion projecting outwardly from said housing in a direction substantially normal to the plane of the nearest one of said side walls and adapted to limit movement of a toggle switch handle between "OFF" and "ON" positions;

- a cover subassembly connected to said housing and covering said side walls, slots and locking pins so as to prevent extrication of said locking pins from said slot pairs in which they are located; and
- a magnetic member disposed in said housing for magnetically supporting spare locking pins.

5,772,008  
KEYBOARD SWITCH ACTUATOR ASSEMBLY  
INCLUDING KEYCAP AND SCISSORS TYPE LINKAGE  
Ching-Chiang Yu, Ting-Yueh Lee, and Yong-Der Tsau, all of  
Taipei, Taiwan, assignors to Behavior Tech Computer Corporation, Taipei, Taiwan

Filed Jul. 8, 1996, Ser. No. 676,457  
Int. Cl.<sup>6</sup> H01H 3/12; 13/50  
U.S. Cl. 200—344 2 Claims



1. A keyboard switch operator for operating an elastic pad-type switch element, comprising:

- a keyseat having a first and second pair of fastening slots respectively formed adjacent opposing sides thereof and a centrally disposed orifice for receiving therethrough a portion of the elastic pad-type switch element;
- a first frame member including (a) a substantially C-shaped first body having a first predetermined width dimension and formed with a pair of first opposing arms each having an upper and a lower end, said upper ends of said first opposing arms being integrally joined one to the other and said lower ends of said first opposing arms being disposed in spaced relationship, (b) a first pivot shaft formed respectively on said lower end of each said first opposing arm and being respectively pivotally disposed in said first pair of fastening slots, (c) a lower pressing board member extending from an inner surface of said C-shaped first body between said pair of first opposing arms toward said lower ends thereof, said lower pressing board having a lower surface contacting the portion of the elastic pad-type switch element extending through said centrally disposed orifice of said keyseat, (d) a pair of protruding shafts extending in opposing directions from said pair of first opposing arms between said upper and lower ends thereof, (e) an elongate shaft having a pair of opposing ends, said shaft being integrally connected to an outer surface of said C-shaped first body and extending transversely with respect to said pair of first opposing arms;
- a second frame member including (a) a substantially C-shaped second body having a second predetermined width dimension, said second predetermined width dimension being greater than said first predetermined width dimension and formed

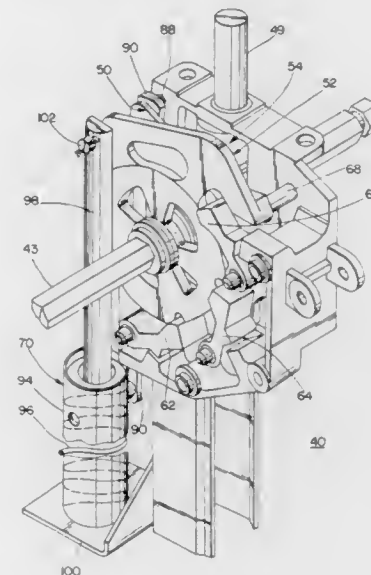
with a pair of second opposing arms each having an upper and a lower end, said upper ends of said pair of second opposing arms being integrally joined one to the other and said lower ends of said pair of second opposing arms being disposed in spaced relationship, (b) an upper pressing board member extending from an inner surface of said C-shaped second body toward said spaced lower ends of said pair of second opposing arms, said upper pressing board having a portion thereof in contiguous contact with an upper surface of said lower pressing board, each of said pair of second opposing arms having a corresponding recess formed therein between said upper and lower ends thereof, (c) a second pivot shaft formed respectively on said lower end of each of said pair of second opposing arms and disposed within said second pair of fastening slots, (d) an elongate shaft having a pair of opposing ends integrally connected to an outer surface of said C-shaped second body and extending transversely with respect to said pair of second opposing arms, said first frame member being positioned between said pair of second opposing arms of said second frame with said pair of protruding shafts of said first frame member being slidably and pivotally received within said corresponding recesses of said second opposing arms to form a substantially X-shaped interlinking element; and,

- a keycap having opposing upper and lower surfaces, said lower surface having a third and fourth pair of fastening slots respectively formed adjacent opposing sides thereof, said third pair of fastening slots receiving said pair of opposing ends of said elongate shaft of said first frame member therein and said fourth pair of fastening slots receiving said pair of opposing ends of said elongate shaft of said second frame member therein, wherein a downward force on any portion of said keycap provides a steady and balance displacement of said first and second frame members to apply a centrally disposed displacement force on the portion of the elastic pad-type switch element extending through orifice of said keyseat for actuation thereof.

5,772,009  
OPERATING MECHANISM FOR SWITCHES AND FAULT  
INTERRUPTERS

Edward J. Rogers, and Joel A. Ramos, both of Chicago, Ill.,  
assignors to S&C Electric Company, Chicago, Ill.

Filed Sep. 13, 1996, Ser. No. 713,938  
Int. Cl.<sup>6</sup> H01H 5/00  
U.S. Cl. 200—400 13 Claims



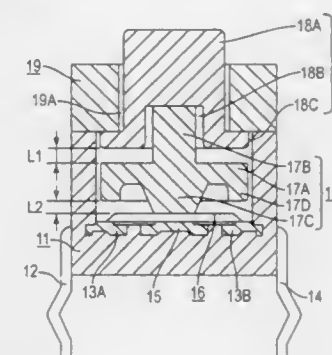
1. Apparatus comprising:
- spring means for storing operating energy;
  - drive means responsive to a drive input for charging said spring;

output member means movably mounted and arranged to be driven by said spring means; and

first means for stopping, latching and selectively releasing said output member means and defining at least three predetermined operating positions for said output member means, said first means comprising three movable latch members that are biased in a predetermined manner with respect to said output member and stop means on said output member means for defining with said three movable latch members said at least three predetermined operating positions, said first means further comprising means for selectively releasing said latch members at predetermined positions of said drive means whereby said output member is released for movement upon each of said three movable latch members being selectively released.

5,772,010  
PUSH BUTTON SWITCH  
Hisashi Watanabe, and Shoji Takeda, both of Okayama, Japan,  
assignors to Matsushita Electric Industrial Co., Ltd., Osaka,  
Japan

Filed Nov. 27, 1996, Ser. No. 753,612  
Claims priority, application Japan, Nov. 28, 1995, 7-308699  
Int. Cl.<sup>6</sup> H01H 5/18  
U.S. Cl. 200—406 4 Claims



1. A push button switch comprising:
- a resin molded box-shaped case having a terminal, a center fixed contact point and an outer fixed contact point fixed at said box-shaped case;
  - a reversal action domed movable contact point made of elastic metal plate disposed on said outer fixed contact point in said box-shaped case;
  - a pressure member made of elastic resin or rubber material, said pressure member having a top and bottom surface, said pressure member having a cylindrical body with an upper extrusion extending upwardly from a center portion of a flat top surface of said cylindrical body, a lower extrusion extending downwardly from a center portion of a bottom of said cylindrical body and a flange skirt extending downwardly from a circumference of said bottom of said cylindrical body,
  - said pressure member disposed within said box-shaped case and movable up and down along an inner wall surface of said box-shaped case, and
  - said pressure member touching the center of a top surface of said movable contact point; and
  - a push button disposed on top of the pressure member, and movable up and down through a center hole of a lid covering a top opening of said box-shaped case
- wherein a specified clearance is provided between the top flat surface of said pressure member including said circumference and said bottom surface of said push button,
- wherein a specified clearance is provided between said bottom surface of said flange skirt and an outer circumference of said movable contact point disposed at the bottom of said box-shaped case.

wherein a force for starting deformation of the upper extrusion of said pressure member is smaller than a reversal force of said movable contact point,  
wherein a force for starting deformation of the lower extrusion of said pressure member is larger than the reversal force of said movable contact point, and  
wherein a force for starting compression deformation of said flange skirt is greater than any of said forces of starting deformation with the upper and lower extrusions.

5,772,011

**SWITCH-FUSE UNIT PROVIDED WITH A CONTROL BLOCK TO ACTIVATE AUXILIARY CIRCUITS**

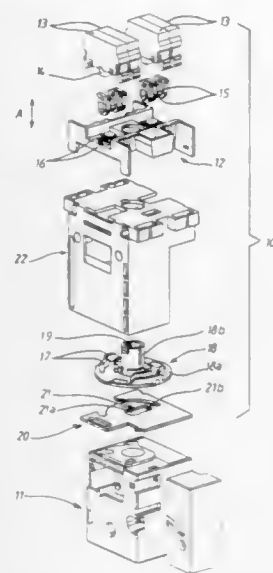
Roger Dumont, Benfeld, France, assignor to Socomec S.A., Benfeld, France

Filed Oct. 1, 1996, Ser. No. 725,185

Claims priority, application France, Oct. 3, 1995, 95 11829  
Int. Cl.<sup>6</sup> H01H 3/42

U.S. Cl. 200—573

10 Claims



1. Switch-fuse unit (1) provided with a control block (11) to activate auxiliary circuits, this control block being provided with a rotating shaft fitted with a handle for selecting the unit's functions, characterised in that it comprises an accessory device (10) mounted on the control block (11) and combined with said rotating shaft, this accessory device having a support (12) provided with at least one receptacle (16) designed to house at least one plunger (15) designed to cooperate with a mobile actuator (14) of at least one microswitch (13) associated with an auxiliary circuit and being provided with a rotating part (18) mounted on said rotating shaft, this part being fitted with at least one activation cam (17) designed to activate the said plunger (15).

5,772,012

**FLEXIBLE DECONTAMINATION APPARATUS**

Thomas F. D'Muhala, Raleigh, N.C., assignor to Corpex Technologies, Inc., Durham, N.C.

Filed May 8, 1996, Ser. No. 646,768

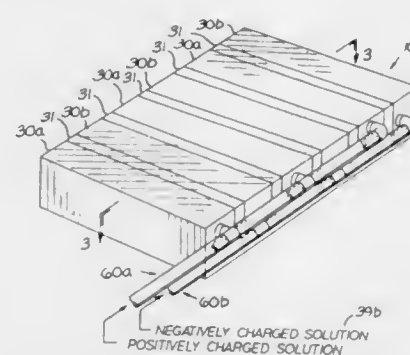
Int. Cl.<sup>6</sup> C25F 3/00

U.S. Cl. 204—224 R

49 Claims

1. An apparatus for decontaminating surfaces having contamination thereon, comprising:

at least one pair of first and second applicators spaced apart by a first insulating member positioned therebetween, said first and second applicators configured to receive respective first and second fluids and transfer said first and second fluids to a contaminated surface, said first insulating member configured



to electrically insulate said first and second applicators, and being impermeable to said first and second fluids;  
a first electrode electrically connected with said first applicator for supplying electric current of a first polarity between said first electrode and said first applicator; and  
a second electrode electrically connected with said second applicator for drawing electric current of a second polarity between said second electrode and said second applicator.

5,772,013

**METHOD AND APPARATUS FOR PRODUCING DI- AND MORE HIGHLY OXIDIZED CARBOXYLIC ACIDS**

Markwart Kunz, Worms; Andreas Schwarz, Plattling, and Jörg Kowalczyk, Bockenheim, all of Germany, assignors to Sudzucker Akiengesellschaft Mannheim/Ochsenfurt, Mannheim, Germany

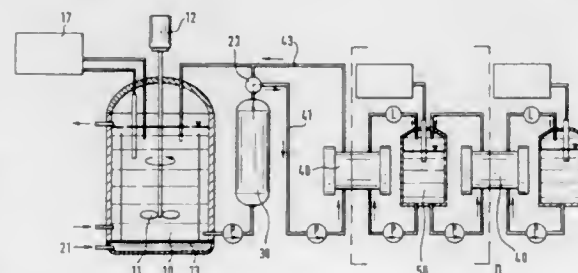
Filed Nov. 14, 1996, Ser. No. 749,092

Claims priority, application Germany, Nov. 14, 1995, 195 42 287.2

Int. Cl.<sup>6</sup> B01D 61/44

U.S. Cl. 204—520

13 Claims



1. A method for producing di- and more highly oxidized carboxylic acids from a compound selected from a first group consisting of carbohydrates, carbohydrate derivatives and carbohydrate derivatives having more than one primary alcohol group, the method comprising the steps of:

oxidizing, in an aqueous solution in a concentration between 0.1% and 60%, said compound selected from said first group and a compound selected from a second group consisting of monooxidized carbohydrates, monooxidized carbohydrate derivatives and monooxidized carbohydrate derivatives having more than one primary alcohol group, with one of oxygen and an oxygen-containing gas, on one of a noble metal catalyst and a mixed metal catalyst;

electrodialyzing the oxidized compounds in at least one electro-dialysis stage; and

removing said di- and more highly oxidized carboxylic acids in said at least one electro-dialysis stage.

5,772,014

**CONTACT LENS CARRYING CASE**

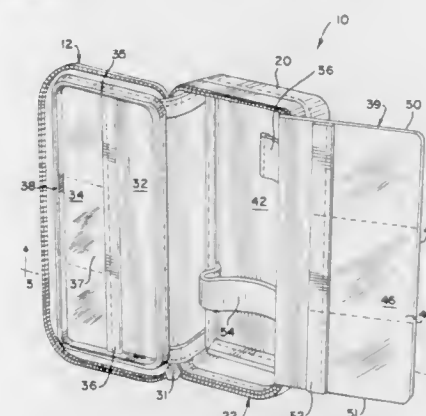
Jeffrey M. Jacober, Providence, R.I., assignor to MEDport, Inc., Providence, R.I.

Filed May 30, 1996, Ser. No. 656,860

Int. Cl.<sup>6</sup> A45C 11/00

U.S. Cl. 206—5.1

4 Claims



1. A contact lens carrying case comprising:

a top panel;

a bottom panel opposing said top panel;

a first side panel;

a second side panel opposing said first side panel;

a first end panel;

a second end panel opposing said first end panel;

an intermediate panel;

a double-hinged assembly;

a first hinge of said double-hinged assembly connecting said double-hinged assembly with said second side panel along an attachment line;

a second hinge of said double-hinged assembly connecting said double-hinged assembly with said intermediate panel;

intermittent material between said first hinge and said second hinge, the intermittent material being substantially more pliable than said intermediate panel;

the bottom panel being joined with said first and second side panels and said first and second end panels to form a first plurality of edges of said case;

the top panel being nonreleasably joined with said first side panel to form a first edge of a second plurality of edges of said case;

a zipper that releasably and selectively secures said top panel with said second side panel and said end panels to form additional edges of the second plurality of edges;

a first plurality of contact lens storage compartments on said top panel; and

a second plurality of contact lens storage compartments on said intermediate panel.

5,772,015

**COMBINED BRUSH AND STORAGE CONTAINER SYSTEM THEREFOR**

Donald J. Musiel, and Ronald G. Cramer, both of Racine, Wis., assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Mar. 3, 1997, Ser. No. 805,832

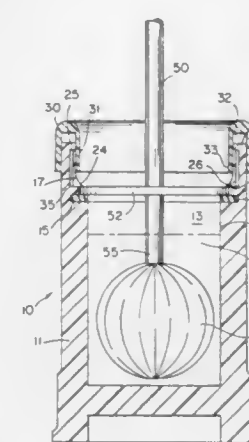
Int. Cl.<sup>6</sup> B65D 83/00

U.S. Cl. 206—209

8 Claims

1. A combined brush and storage container system, comprising:  
a container having an upper edge, an internal storage cavity extending downward from the edge to define a peripheral cavity sidewall, a ledge formed on the sidewall, and a radially resiliently movable latch positioned above the ledge along the sidewall;

a vertically movable key mounted over the container upper edge and having a portion thereof extending downward into the cavity adjacent the latch;



a brush having an upper handle, a radially extending support below the upper handle and a lower brush portion;  
wherein downward vertical movement of the key from a first position to a second position can drive the latch radially outward from a position blocking removal of the brush to a position not blocking removal of the brush, and wherein the return of the key to the first position from the second position can cause the latch to move radially inward.

5,772,016

**PACKAGE FOR A LIQUID AND A SUBSTANCE**

Jan Akerlind, Stockholm, Sweden, assignor to CD Food Technology AB, Stockholm, Sweden

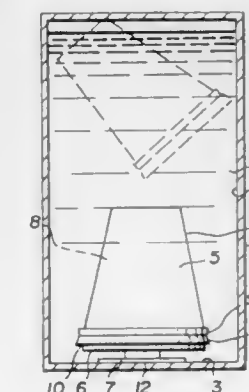
PCT No. PCT/SE94/00318, § 371 Date Oct. 10, 1996, § 102(e)  
Date Oct. 10, 1996, PCT Pub. No. WO95/27667, PCT Pub.  
Date Oct. 19, 1995

PCT Filed Apr. 11, 1994, Ser. No. 722,177

Int. Cl.<sup>6</sup> B65D 81/32

U.S. Cl. 206—221

20 Claims



1. A package for a liquid and a substance which is to be mixed with the liquid prior to use, comprising:

a container for the liquid, said container having a bottom and a top;

an openable capsule containing the substance and situated in said container, said capsule having a first separate portion, and a second separate portion which is fixed to the container adjacent said bottom of said container;

a temperature dependent bonding agent joining said first and second separate portions together to form said capsule in a closed state, said bonding agent effecting bonding at temperatures below a predetermined temperature, and terminating bonding at said predetermined temperature to allow said separate portions to separate completely from each other, as the contents of the container are heated to at least said predetermined temperature; and

said first separate portion of the capsule having a specific gravity less than that of the liquid so as to float upwardly toward said



container top after separation of said first and second portions as a result heating of said bonding agent to at least said predetermined temperature.

10. A package for a liquid and a substance which is to be mixed with the liquid prior to use, comprising:

- a container for the liquid, said container having a top and a bottom;
- an openable capsule containing the substance and situated in said container, said capsule having a first separate portion, which is floatable in the liquid, and a second separate portion, which is fixed to the container adjacent said bottom thereof;
- a temperature dependent bonding agent joining said first and second separate portions together to form said capsule in a closed state, said bonding agent effecting bonding at temperatures below a predetermined temperature, and terminating bonding at said predetermined temperatures to allow said separate portions to separate from each other, as the contents of the container are heated to at least said predetermined temperature; and
- an elongated flexible anchor interconnecting said first and second separate portions and having a length which permits said first separate portion to float upwardly a predetermined distance from said bottom of said container toward said top after separation of said first separate portion from said second separate portion.

14. A package for a liquid and a substance which is to be mixed with the liquid prior to use, comprising:

- a container for the liquid, said container having an inner surface;
- an openable capsule containing the substance and situated in the container, said capsule having a first separate portion and a second separate portion;
- a temperature dependent bonding agent joining said first and second separate portions together to form said capsule in a closed state, said bonding agent effecting bonding at temperatures below a predetermined temperature, and terminating bonding at said predetermined temperature to allow said first and second portions to separate completely from each other and releases the substance from said capsule into the liquid in said container, as the contents of said container are heated to at least said predetermined temperature; and
- said separate portions of said capsule abutting, under at least some bias, said inner surface of said container at two opposite locations when in said closed state.

5,772,017

## BEVERAGE MIXING DISPENSER DEVICE

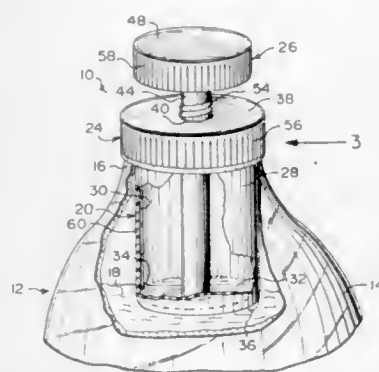
Heung Sun Kang, 157-26 Quince Ave., Flushing, N.Y. 11355

Filed Oct. 25, 1996, Ser. No. 738,297

Int. Cl.<sup>6</sup> B65D 25/08; B67D 5/00

U.S. Cl. 206—222

18 Claims



1. A beverage mixing dispenser device for a bottle having a body and a neck for holding a beverage therein, said device comprising:

- a) a container for insertion into the neck of the bottle, said container retaining a separate ingredient therein and having a bottom pop out lid therein;

b) a removable closure member connected to said container, said removable closure member adapted to close the neck of the bottle; and

c) means extending through said removable closure member and said container, for opening said bottom pop out lid of said container, so that said ingredient can drop down and mix with the beverage within the body of the bottle; said opening means including:

- i) said removable closure member having a central aperture therethrough;
- ii) said container having a central opening therethrough being in alignment with said central aperture in said removable closure member;
- iii) a shaft extending through said central aperture in said removable closure member and said central opening in said container to a top surface of said bottom pop out lid, whereby when said shaft is depressed downwardly said bottom pop out lid will open to release the separate ingredient and when said shaft is removed a drinking straw can be inserted through said central aperture in said removable closure member and said central opening in said container to extend into the beverage mixed with the separate ingredient;
- iv) said central opening in said container having an internal thread therein; and
- v) said shaft having an external thread thereon, so that when said shaft is depressed downwardly said external thread on said shaft can engage with said internal thread in said central opening in said container to form a seal therebetween and prevent leakage of the beverage mixed with the separate ingredient therefrom.

5,772,018

## PACKAGES FOR STORAGE MEDIA AND PROCESSES FOR PRODUCTION OF SAME

Herbert Walch, Pradler Strasse 49, A-6020 Innsbruck, Austria

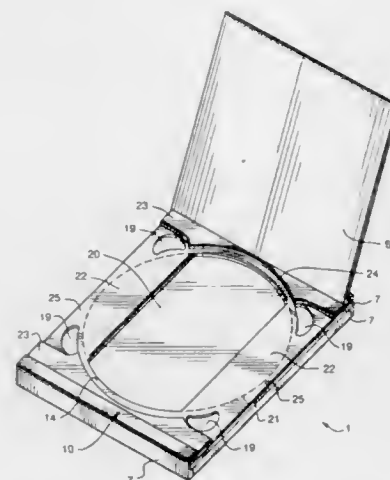
Filed Dec. 6, 1994, Ser. No. 349,789

Claims priority, application Germany, Mar. 30, 1994, 9405421 U; Austria, Sep. 13, 1994, 1742/94; Sep. 13, 1994, 1743/94

Int. Cl.<sup>6</sup> B65D 85/57

U.S. Cl. 206—308.1

9 Claims



9. A cardboard packaging for storage media wherein a carrier for a storage medium comprises a bottom portion of one or more layers of cardboard, a separate holding portion which is disposed above the bottom portion and which is provided with a depression and which also has one or more layers of cardboard, and a separate jacket portion which extends under the bottom portion and which from there is folded over upwardly around edges of the bottom portion and at least partially of the holding portion and glued; wherein the jacket portion is folded over at two oppositely dis-

posed sides of the carrier over the bottom portion and the holding portion disposed thereabove, and glued to the holding portion.

5,772,019

## PACKAGING ARRANGEMENT FOR STORAGE DISCS AND METHOD FOR MAKING THE SAME

Richard T. Reed, 2433 Garfield Dr., Pasadena, Calif. 91104

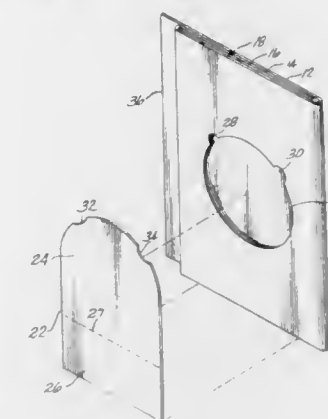
Continuation of Ser. No. 552,270, Nov. 2, 1995, abandoned.

This application Feb. 20, 1997, Ser. No. 802,718

Int. Cl.<sup>6</sup> B65D 85/57

U.S. Cl. 206—308.1

18 Claims



1. A multilayer laminated paperboard packaging arrangement for a storage disc comprising:

- a paperboard base panel for supporting the storage disc;
- a plurality of substantially identical paperboard panels laminated together and affixed by an adhesive to said base panel, said plurality of panels being formed with a substantially circular opening with said plurality of panels surrounding the entire opening, said plurality of panels being of sufficient size for receiving the storage disc flush with said base panel so that said base panel forms a support for one face of the storage disc; and
- an adhesive label removably adhered to said plurality of panels, said adhesive label having a portion covering substantially the entire opening for retaining the storage disc in said opening.

5,772,020

## SHEET FOR HOLDING INFORMATION RECORDING CARRIERS

Hiroshi Hara, 2-1-216, Shinkawa 2-chome, Chuo-ku, Tokyo 104, Japan

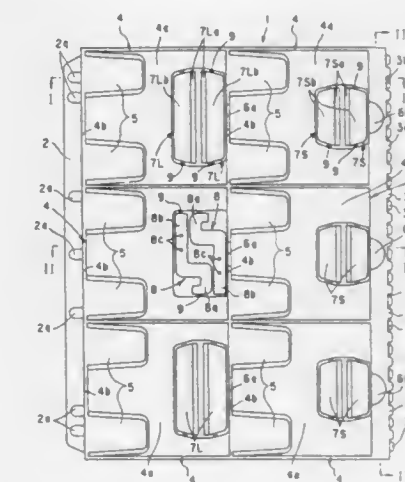
Filed Feb. 7, 1997, Ser. No. 776,766

Int. Cl.<sup>6</sup> B65D 85/57

U.S. Cl. 206—308.3

5 Claims

1. A sheet for holding information recording carriers comprising a binding margin formed on one side edge of said sheet; a plurality of holding cavities for holding information recording carriers, which are formed in the surface of said sheet; and a pressing strip for holding said information recording carrier, which extends from a side wall of each of said holding cavities into the inner region of said cavity; characterized in that a pair of hanging members for hanging said sheet in a container such as a cabinet are removably formed in bottom plate of at least one of said holding cavities utilizing a part of the bottom plate; that one or more index strips are removably formed in bottom plate of one or more of the other holding cavities; that an insertion groove for mounting the removed index strips is formed, which groove is formed on the side edge opposite to that on which said binding margin is formed; that mounting holes for inserting said pair of hanging members removed from said bottom plate are formed in the vicinities of both ends of said insertion groove; and that one or more holding



grooves for holding non-used hanging members are formed in the backside of said holding sheet.

5,772,021

## APPARATUS AND METHOD FOR PACKAGING AND STORING A COMPACT DISC

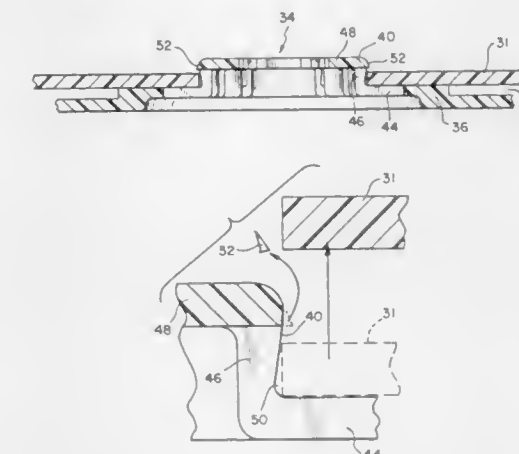
Randall E. Bolenbaugh, and Larry W. Johnson, both of Fort Wayne, Ind., assignors to International Packaging Corporation, Fort Wayne, Ind.

Filed Jul. 9, 1996, Ser. No. 680,512

Int. Cl.<sup>6</sup> B65D 85/57

U.S. Cl. 206—310

14 Claims



1. A compact disc retainer for a compact disc having a central aperture, said compact disc retainer comprising:

- a plurality of elastically deformable segments arranged in a circular pattern defining a central hub, said central hub having a diameter slightly larger than the diameter of the compact disc central aperture, said deformable segments being secured to a base; and
- at least one retaining hook integral with said deformable segments, said retaining hook adapted to initially overhang the compact disc including a contact surface adapted to contact the compact disc and resist removal of the compact disc, said retaining hook adapted to detach from one of said deformable segments when pressure is applied to said contact surface by the compact disc to thereby allow removal of the compact disc.

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5,772,022

## COMPACT DISC STORAGE CASE

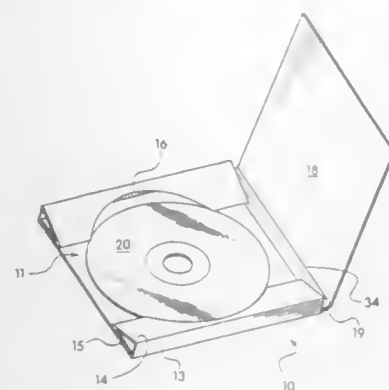
Douglas J. Renna, 131 Munro Blvd., Valley Stream, N.Y. 11581

Filed May 16, 1997, Ser. No. 857,975

Int. Cl.<sup>6</sup> B65D 85/57

U.S. Cl. 206—312

6 Claims



1. A disc storage case for storing a disc of a predetermined diameter formed from a single folded sheet, comprising: a center panel having an inside surface and an outside surface; two disc support sections, each being integrally formed with an opposite edge of said center panel, each disc support section forming a side wall, a top sloped wall and a bottom flap, wherein said side wall is connected to said center panel by a first scored hinge and to said top sloped wall by a second scored hinge, and said top sloped wall is connected to said bottom flap by a third scored hinge, each of said top sloped walls having an arcuately-shaped slit cut therethrough, said slit having two ends, each end terminating at the third scored hinge, such that the slit creates an arcuate opening for insertion of a disc;

wherein the spacing between the arcuate openings is slightly less than the diameter of the disc; and

wherein the case is assembled by folding each side wall up from the center panel and each of said top slanted walls toward the center of the inside surface of said center panel, and folding each of said bottom flaps under said top slanted walls to rest against the inside surface of said center panel.

5,772,023

Patent Not Issued For This Number

5,772,024

## GOLF CLUB ORGANIZER

Robert C. Lueders, 11103 W. 115th Ter., Overland Park, Kans. 66210

Filed Nov. 22, 1996, Ser. No. 755,492

Int. Cl.<sup>6</sup> A63B 55/00

U.S. Cl. 206—315.6

13 Claims

1. A golf club organizer comprising:

a) a top plate with a plurality of through bores extending therethrough, each said through bore being of a diameter sufficient to accept a shaft and grip of a golf club therein, each said through bore being formed by a respective aperture in said top plate and a generally cylindrical wall which forms a sleeve extending downward from a top surface of said top plate, each said sleeve including an inner diameter and an outer diameter greater than said inner diameter, each said through bore including an open top portion commencing at a top surface of said top plate, an open bottom portion terminating at a bottom of said sleeve and a middle portion between said top portion and said bottom portion, said inner diameter of each said through bore tapering inward from said



top portion to said middle portion such that said inner diameter decreases from said top portion to said middle portion, and also tapering outward from said middle portion such that said inner diameter increases from said middle portion to said bottom portion;

b) a bottom plate; and

c) a plurality of flexible tubes, each of which is connected at a first open end to a respective one of said through bore sleeves and at a second open end to said bottom plate, each said flexible tube having an internal diameter which is greater than the largest internal diameter of the respective through bore sleeve, the combination of said inward and outward taper of said through bore sleeves and the flexible nature and the diameter of said tubes allowing a large angle of entry and exit, respectively, for golf club shafts and grips relative to said sleeves as the shafts are put into and taken out of said flexible tubes.

5,772,025

## BUFFERING PAD FOR DEVICE PACKAGES

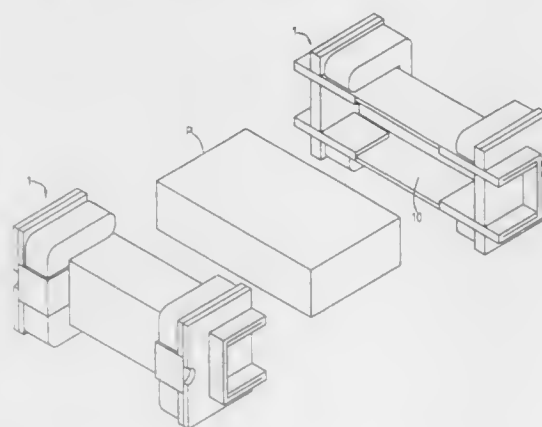
Tony Chen, and Alex Wang, both of No. 1-1, R &amp; D Road 2, Science-Based Industry Park, Hsinchu, Taiwan

Filed Jan. 28, 1997, Ser. No. 789,976

Int. Cl.<sup>6</sup> B65D 81/113

U.S. Cl. 206—320

9 Claims



1. A buffering pad for a device package, comprising: a main member, which is folded into form from a first substrate and is formed with at least two first inset slots and at least two second elongated slots; at least two lateral supporting members, each being formed with a plurality of second inset slots corresponding to said first

5,772,027

## ARRANGEMENT FOR SAFE STORAGE OF CUTLERY

Horst Pletz, Sauerbruchsrtasse 8, 21365 Adendorf, Germany

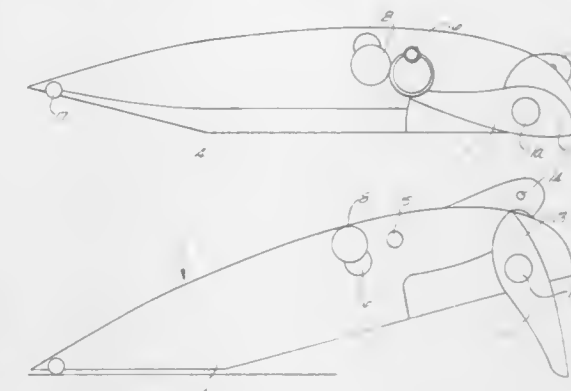
Filed May 14, 1996, Ser. No. 645,628

Claims priority, application Germany, Jul. 25, 1995, 295 12 707 U

Int. Cl.<sup>6</sup> B65D 85/28

U.S. Cl. 206—372

20 Claims



1. A storage device for cutlery having blades attached to handles, the storage device comprising a protective container having means positioned substantially entirely within the protective container for immobilizing the cutlery by engaging a blade portion of the cutlery within the protective container, the protective container and the immobilizing means being movable relative to each other from a position securing the cutlery and preventing the cutlery from being removed from the protective container to a working position allowing the cutlery to be removed from the protective container.

5,772,026

## MULTI-DECK CONTAINER FOR LAWN AND GARDEN TRACTORS

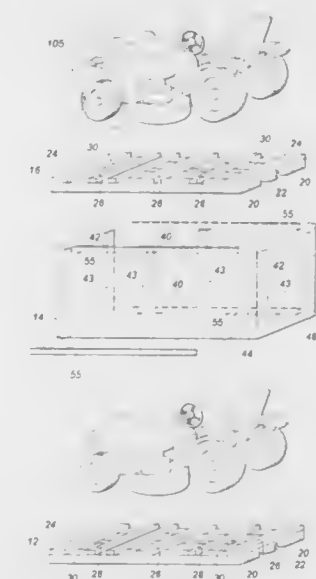
Charles F. Grigsby, Marietta, Ga., assignor to North American Container Corporation, Mableton, Ga.

Filed Dec. 9, 1996, Ser. No. 762,566

Int. Cl.<sup>6</sup> B65D 85/68

U.S. Cl. 206—335

9 Claims



1. A multi-deck container for lawn and garden tractors, comprising:

a bottom pallet configured with support members for receiving and supporting a lawn and garden tractor on the bottom pallet, whereby the tractor is restrained from movement relative to the bottom pallet;

a corrugated paperboard body defining two opposing side walls and two opposing end walls, said corrugated paperboard body attaching at a lower portion to the bottom pallet;

a plurality of cleats attached to said walls and extending from a lower portion to an upper portion thereof;

a top pallet supported on the distal ends of the cleats in the upper portion of the corrugated paperboard body, and configured with support members for receiving and supporting a second lawn and garden tractor thereon whereby the second tractor is restrained from movement relative to the top pallet,

whereby the pair of lawn and garden tractors are held in the multi-deck container for packing and shipping said tractors from a manufacturer to a sales center.

5,772,028

## VIDEO CASSETTE STORAGE CONTAINER

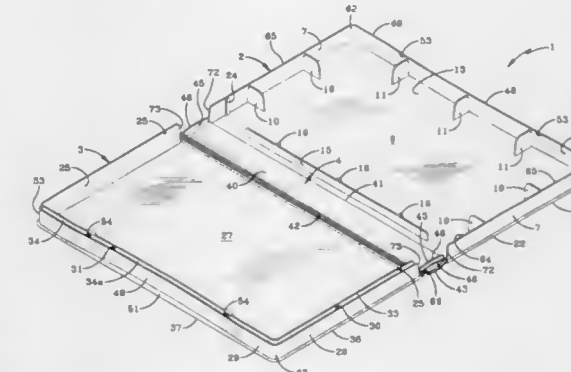
Ronald M. Marsilio, Mogador; James T. Weisburn, Massillon; Ronald K. Burdett, Strasburg, and Christopher G. Gallagher, Akron, all of Ohio, assignors to Alpha Enterprises, Inc., North Canton, Ohio

Filed Oct. 16, 1996, Ser. No. 729,355

Int. Cl.<sup>6</sup> B65D 85/672

U.S. Cl. 206—387.1

27 Claims



1. A storage container for storing an article, said storage container including:

a base having a bottom wall, a pair of spaced end walls and a front wall;

a lid having a bottom wall, a pair of spaced end walls and a front wall hingedly mounted on the base and movable between open and closed positions on said base, said base and lid forming a storage chamber therebetween, when in the closed position;

guide means formed on certain of the walls of the lid and extending into the storage chamber for guiding the article into the storage chamber, said guide means including a pair of



spaced elongated guide rails formed on the bottom wall of the lid and extending in a longitudinal direction between the end walls and a plurality of sloped ribs extending from the end walls of the lid and into the storage chamber.

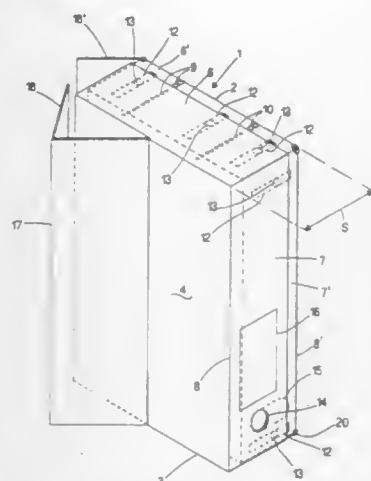
5,772,029  
FOLDABLE DOCUMENT FILE WITH AN ADJUSTABLE VOLUME

Roberto Boccacci, Via Panfeo, 41, 00125 Rome, Italy  
PCT No. PCT/IT94/00169, § 371 Date Jul. 11, 1996, § 102(e)  
Date Jul. 11, 1996, PCT Pub. No. WO95/10422, PCT Pub.  
Date Apr. 20, 1995

PCT Filed Oct. 12, 1994, Ser. No. 624,534  
Claims priority, application Italy, Oct. 15, 1993, RM93A0694  
Int. Cl.<sup>6</sup> B65D 5/355

U.S. Cl. 206—425

11 Claims



1. A document storage box having an adjustable volume, comprising:

a first sheet component and a second sheet component, each sheet component including:

a central panel having a pair of spaced parallel edges and at least one connecting edge extending between the parallel edges; and

a flap hinged to each of the parallel and connecting edges of the central panel, so that each sheet component can be oriented in a flat configuration, and so that each flap of the first sheet component and of the second sheet component can be folded relative to the respective central panel, to form respectively a first half shell and a second half shell, the flaps of the first half shell overlapping to corresponding flaps of the second half shell to provide an adjustable enclosed volume;

slidable elements disposed on the overlapping flaps hinged to the parallel edges and releasable slidable closure elements disposed on the overlapping flaps hinged to the connecting edges, for adjustably fastening the half shells to each other, and for allowing said half shells to be oriented in a flat configuration while connected by the slidable elements disposed on the flaps of the parallel edges, so that the document storage box can be placed in a flat configuration; and

complementary detents disposed on the overlapping flaps of the box, the detents having complementary projections and recesses disposed on the respective corresponding flaps, for maintaining the enclosed volume to which the first and second half shells are adjusted.

10. A document storage box having an adjustable volume, comprising:

a first sheet component and a second sheet component, each sheet component including:

a central panel having a pair of spaced parallel edges and at least one connecting edge extending between the parallel edges; and

a flap hinged to each of the parallel edges and to at least one of the connecting edges of the central panel, so that each sheet component can be oriented in a flat configuration, and so that each flap of the first sheet component and of the second sheet component can be folded relative to the respective central panel, to form respectively a first half shell and a second half shell, the flaps of the first and second half shells overlapping to provide an adjustable enclosed volume; and

slidable elements disposed on the overlapping flaps hinged to the parallel edges and releasable slidable closure elements disposed on the overlapping flaps hinged to the connecting edges, for adjustably fastening the half shells to each other, and for allowing said half shells to be oriented in a flat configuration while connected by the slidable elements disposed on the flaps of the parallel edges, so that the document storage box can be placed in a flat configuration.

5,772,030  
CARTON FOR PACKAGING TWO TIERS OF ARTICLES

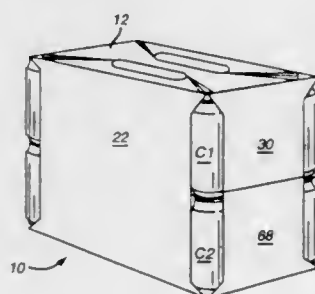
Ronald A. Baxter, Douglasville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Mar. 24, 1997, Ser. No. 823,401

Int. Cl.<sup>6</sup> B65D 71/00

U.S. Cl. 206—427

1 Claim



1. A package for containers such as cans or bottles arranged into two tiers, comprising:

a carton including

a top wall having opposed side edges and opposed end edges and defining a top wall length between said end edges;

a pair of side walls, one of the side walls connected to each said side edge of said top wall, each of said side walls defining a side wall width;

a bottom wall connected between said side walls to complete a tubular structure, said bottom wall having a pair of end edges and defining a bottom wall length substantially equal to said top wall length;

a pair of lower end flaps connected to said end edges of said bottom wall and a pair of upper end flaps connected to said end edges of said top wall, said upper and lower end flaps being glued together to close the ends of said carton;

said side wall width being smaller than said top wall length, whereby said carton includes open corners through which a portion of some of the packaged articles are exposed; and

a divider panel including

a main body portion having a pair of end edges and defining a main body length generally equal to said top wall length;

a pair of divider end flaps connected to said end edges of said main body;

said divider panel being disposed within said carton and having each of said divider end flaps glued to an inner surface of one of said upper and lower end flaps.

5,772,031  
PACKAGE FOR AN ELONGATED MEDICAL PRODUCT

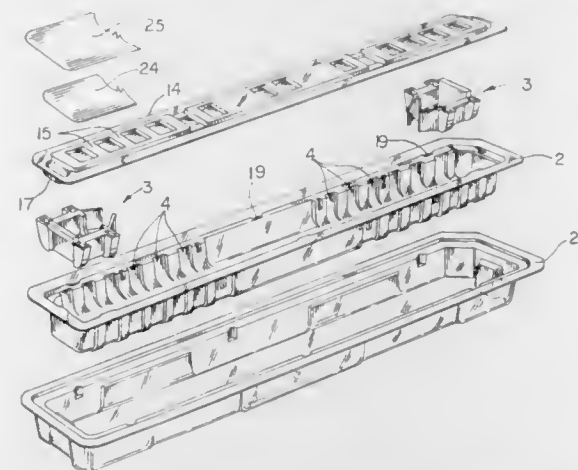
Larry R. Landis, Warsaw, Ind., assignor to Zimmer, Inc., Warsaw, Ind.

Filed Feb. 15, 1996, Ser. No. 601,932

Int. Cl.<sup>6</sup> B65D 85/24

U.S. Cl. 206—438

7 Claims



1. A package for an elongated medical product having an end, the package comprising:

a cavity having surrounding side and end walls, a bottom wall and an open top, the cavity having a longitudinal axis parallel to the side walls, a cavity slot being formed in the side walls transverse to the longitudinal axis;

a stop plug having opposed side walls, an end wall, and a bottom thus forming a partial enclosure, a lug extending from the stop plug, the lug engaging the cavity slot to restrain the stop plug from motion along the longitudinal axis, the partial enclosure formed by the stop plug being engageable with the end of the product, wherein the stop plug further includes a front opposite the end wall, at least one finger extends from the front outwardly away from the stop plug, the finger converges toward the longitudinal axis so that it is able to press against the product, the finger being elastically deformable so that it can flex away from the longitudinal axis to allow the end of the product to be positioned in the stop plug and so that it will press against the product once the product is positioned.

5,772,032  
CORRUGATED BOX WITH EXTERIORALLY SUPPORTED PRODUCT-STABILIZING FLAPS

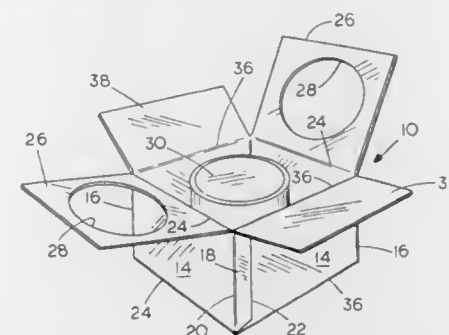
Joseph Goldman, Plymouth, Minn., assignor to Federal Industries Corporation, Plymouth, Minn.

Filed Nov. 7, 1997, Ser. No. 965,831

Int. Cl.<sup>6</sup> B65D 5/06

U.S. Cl. 206—485

7 Claims



1. A single-piece corrugated box suited for shipping one or more articles comprising,

four upright side wall panels connected together by vertical fold lines,

upper and lower pairs of full-overlap article-stabilizing flaps that extend centrally from horizontal fold lines that connect said flaps to opposing upright side walls,

said stabilizing flaps having punched openings therein that are positioned in vertical alignment with each other so that one pair of stabilizing flaps surrounds the upper end of the article and the other pair of stabilizing flaps surrounds the lower end of the article,

each pair of stabilizing flaps is supported exteriorally by at least one end flap that is folded centrally so as to enclose the ends of the article and the underlying stabilizing flaps,

the horizontal fold lines between the stabilizing flaps and opposed side wall panels form anchoring points on opposite sides of the package for the stabilizing flaps that cooperate with an interlocking of the stabilizing flaps around the article being shipped to strengthen and rigidify the box to thereby enhance protection of the article packaged therein,

the stabilizing flaps are devoid of fold lines and extend horizontally in a straight line toward the article from said horizontal fold lines to provide a shock- and pressure-resisting brace between the side wall connected thereto and the article being shipped, and

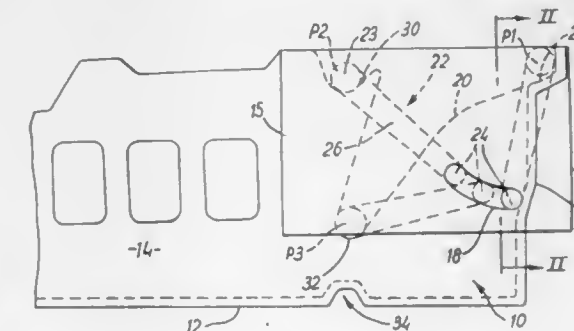
contact between the stabilizing flaps and the overlapped end flaps supports the stabilizing flaps exteriorally to strengthen and immobilize the stabilizing flaps at both the top end and the bottom end of the box.

5,772,033  
CONTAINER

Stephen Clive Loftus, Bloxwich, and Andrew Christopher Cope, Wednesbury, both of United Kingdom, assignors to McKechnie UK Limited, West Midlands, United Kingdom  
Continuation of Ser. No. 18,003, Feb. 16, 1993, Pat. No. 5,609,254. This application Aug. 29, 1996, Ser. No. 705,141  
Claims priority, application United Kingdom, Feb. 15, 1992, 9203266; Mar. 14, 1992, 9205640; Aug. 29, 1992, 9218441  
Int. Cl.<sup>6</sup> B65D 21/06

U.S. Cl. 206—506

37 Claims



1. A container for use in a stackable/nestable container assembly, said container comprising:

(a) a plurality of attached side walls, an open top, and a base;

(b) first and second elongated, spaced-apart support members extending between an opposing two of said plurality of side walls for engaging and supporting an adjacent container of like dimensions in a stacked condition;

(c) adjustable mounting means for attaching each of said first and second support members to the opposing side walls for corresponding adjustable movement between a plurality of container supporting positions; and

(d) at least two of said container supporting positions of said first and second support members being in spaced vertical alignment with each other for adjusting the vertical stacking height of the adjacent, stacked container.

5,772,034

## BAG ASSEMBLY

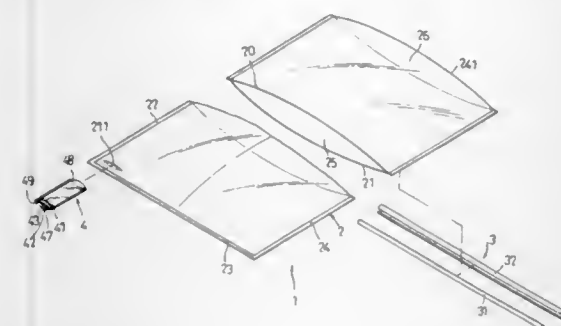
Chih-Jen Lin, No. 9, Lane 42, Te-Ming Rd., Hsi Dist., Chia-Yi City, Taiwan

Filed Jul. 15, 1997, Ser. No. 892,700

Int. Cl.<sup>6</sup> B65D 81/20

U.S. Cl. 206—522

5 Claims



1. A bag assembly comprising:  
a bag body confining a receiving space and being formed with a vent hole; and  
a valve unit provided in said vent hole of said bag body, said valve unit including an upper sheet and a lower sheet which are heat-sealed to said bag body and which cooperatively confine an air passage that is communicated with said receiving space, said upper and lower sheets having opposing inner surfaces which are electrostatically charged such that said upper and lower sheets normally adhere to each other via an electrostatic attraction at said inner surfaces thereof, thereby closing said air passage of said valve unit.

5,772,035

## ROLL AND TUCK BAGS

Grady L. Harrison, Longview, Tex., assignor to TC Manufacturing Co., Inc., Evanston, Ill.

Continuation of Ser. No. 746,929, Nov. 18, 1996, abandoned.

This application Jul. 23, 1997, Ser. No. 899,406

Int. Cl.<sup>6</sup> B65D 33/16

U.S. Cl. 206—554

10 Claims



1. A package for carrying and substantially sealing an item carried therein without the use of adhesive, seals, zippers or other fasteners comprising:  
(a) an elongated web having a top edge, a bottom edge and two side edges; and  
(b) a first bag portion positioned adjacent said bottom edge of said web and secured thereto at its sides and bottom and having a mouth opening toward said top edge of said web; and  
(c) a second bag portion spatially positioned upwardly from said first bag portion on the opposite side of said web and secured thereto at its sides and top and having a mouth opening toward said bottom edge of said web; and  
(d) said first bag portion, containing the item to be carried, having been rolled up toward said top edge to a position substantially opposite said second bag portion; and

- (e) said second bag portion having been inverted and tucked over said rolled up bag portion to provide a substantially secure package.

5,772,036

## ELECTRIC ACCESSORY BAG

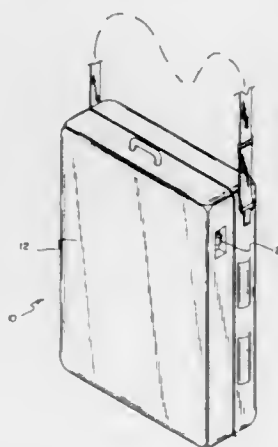
Kimberly C. Muncy; Robert B. Muncy, both of 1035 Belhaven Dr., Russell, Ky. 41169, and Walter G. Clark, 605 LaGar St., Flatwoods, Ky. 41139

Filed Sep. 24, 1997, Ser. No. 937,071

Int. Cl.<sup>6</sup> B65D 33/00

U.S. Cl. 206—581

10 Claims



1. An electric accessory bag for storing a plurality of appliances and toiletries for easy use comprising, in combination:  
a bag portion comprising a pair of sections hingedly coupled together, the pair of sections including a first section and a second section, the first section having a carrying handle secured to an upper end thereof, the second section having a shoulder strap secured to an upper end thereof;  
a retractable power cord secured to a side wall of the first section of the bag portion, the retractable power cord having a plug end coupleable to a standard electrical outlet, the retractable power cord having a cord portion extending interiorly of the bag portion;  
a power strip disposed within the first section of the bag portion, the power strip being in communication with the cord portion of the retractable power cord;  
a plurality of receiving pouches disposed within the first section of the bag portion, the receiving pouches having varying sizes and shapes, the receiving pouches adapted for holding toiletries and small appliances therein;  
a plurality of large inverted U-shaped loops secured within the first section of the bag portion, the loops adapted for holding bottles;  
a plurality of small inverted U-shaped loops secured within the first section of the bag portion, the small loops adapted for holding toothbrushes and make-up brushes;  
a light secured within the second section of the bag portion, the light being in communication with the cord portion of the retractable power cord;  
a mirror disposed within the second section of the bag portion;  
a tissue dispenser disposed within the second section of the bag portion;  
a holding clip disposed within the second section of the bag portion, the holding clip adapted for holding a plurality of cotton swabs; and  
a folding shelf secured within the second section of the bag portion, the shelf having a first orientation essentially parallel to the second section and a second orientation essentially orthogonal to the second section.

5,772,037

## SHIPPING PROTECTOR

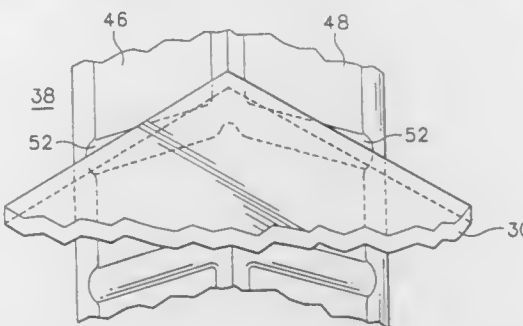
Richard D. Hurley, 3210 NW McKinley Dr., Corvallis, Oreg. 97330

Filed Nov. 15, 1995, Ser. No. 556,000

Int. Cl.<sup>6</sup> B65D 85/30

U.S. Cl. 206—586

69 Claims



1. A protector for protecting an article, comprising:  
a first edge portion having plural first lands thereon in spaced relation to one another defining a first face of said edge protector, said first lands being separated from one another by first furrows therebetween; and  
means for preventing entry of the article into ones of said first furrows.

5,772,038

## PARTS TRANSPORTING TRAY

Kentaro Murata, Yao; Norihiro Matsuzoe, Nishinomiya; Takao Emoto, Yokosuka, and Hisayoshi Kunii, Sagami, all of Japan, assignors to Gold Industries Co., Ltd., Osaka, and Kabushiki Kaisha Toshiba, Kanagawa, both of Japan

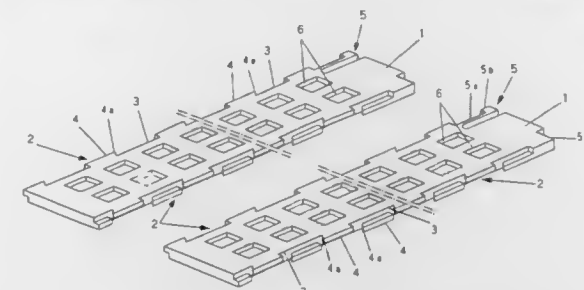
Filed Jun. 10, 1997, Ser. No. 872,076

Claims priority, application Japan, Jun. 10, 1996, 8-171874

Int. Cl.<sup>6</sup> B65D 73/02

U.S. Cl. 206—725

20 Claims



1. A parts transporting tray comprising:  
a rectangular planar body of an overall thickness and having an upper face, two opposing longitudinal sides extending longitudinally of the body in parallel with each other and transverse sides perpendicular to the longitudinal sides;  
a plurality of parts receiving compartments formed in the upper face;  
two rows of detention means respectively formed extending laterally from and integrally with the longitudinal sides such that adjacent trays are capable of firmly engaging one with another;  
each said row consisting of an upper and a lower series of alternating protrusions and recesses formed at a constant pitch, and each series being one of two complementary portions of the overall thickness of the body;  
a locking means for releasably keeping engaged the detention means of the adjacent trays;  
each recess in the upper series being defined above the corresponding protrusion of the lower series and between the adjacent two protrusions of the upper series, with each pro-

trusion of the lower series thereby serving as a bottom of the corresponding recess of the upper series;  
each protrusion having a hook portion that faces either transverse side;  
the protrusions included in both the series on each longitudinal side being staggered, with the protrusions in each series on one longitudinal side being also staggered with respect to the protrusions included in the corresponding series on the other longitudinal side,  
whereby the protrusions on one tray are allowed to loosely fit in the respective recesses on another tray and subsequently the one tray is caused to slide relative to the other until the adjacent protrusions in each series on the trays come into engagement with each other at their hook portions.

5,772,039

## THEFT-DETERRENT DISPLAY PACKAGING SYSTEM

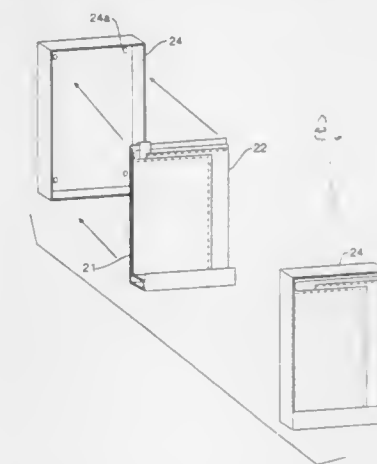
Scott P. Orr, Bolingbrook, and Thomas L. Prochut, Darien, both of Ill., assignors to Humphreys Inc., Chicago, Ill.

Filed Dec. 11, 1996, Ser. No. 764,682

Int. Cl.<sup>6</sup> B65D 73/00; A44B 21/00

U.S. Cl. 206—779

23 Claims



1. A theft-deterrent packaging system for displaying an article comprising:  
(a) a box insert and an article to be displayed, the article having at least two portions movable with respect to each other;  
(b) means for securing the article to the box insert;  
(c) a box; and  
(d) means for attaching the box insert to the interior of the box, such that at least one portion of the article can be opened to allow visual and tactile inspection of the at least two portions yet the article cannot be removed from the box without destroying the integrity of the packaging system.

5,772,040

## WORKPIECE CONVEYING APPARATUS USED WITH WORKPIECE INSPECTION DEVICE

Hiromi Tomiyama, Musashimurayama; Yoshiyuki Ogata, Fussa; Satoshi Enokido, Tachikawa, and Takeyuki Nakagawa, Akishima, all of Japan, assignors to Kabushiki Kaisha Shinkawa, Tokyo, Japan

Filed Sep. 26, 1995, Ser. No. 533,685

Claims priority, application Japan, Sep. 27, 1994, 6-256032

Int. Cl.<sup>6</sup> B07C 5/02

U.S. Cl. 209—3.3

2 Claims

1. A workpiece inspection apparatus comprising: a workpiece inspection device which inspects workpiece upon which bonding has been performed, a loader-side magazine and an unloader-side magazine which are respectively provided on either side of said



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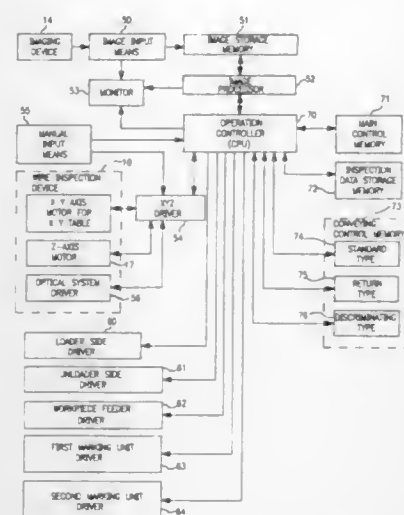
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workpiece inspection device and held by elevators that move upward and downward, and a workpiece feeder which is installed between said loader-side magazine and said unloader-side magazine so as to convey workpiece to and from an inspection position of said workpiece inspection device, said apparatus further comprising a workpiece inspection memory and an arithmetic means coupled to said workpiece inspection memory wherein,

said workpiece inspection memory stores a control procedure for controlling conveyance of inspected workpieces such that workpiece that have been inspected and found to be free of defects by said inspection device are returned to said loader-side magazine and accommodated in said loader-side magazine, while workpiece that have been inspected and found to be defective by said inspection device are conveyed by said feeder and accommodated in said unloader-side magazine, and

said arithmetic means controls said loader side magazine, said unloader side magazine and said workpiece feeder in accordance with said control procedure stored in said workpiece inspection memory.

5,772,041

## METHOD FOR RECOVERING MATERIALS

Eberhard Kertscher, Yvonand, and Bruno Bulushek, Echandens, both of Switzerland, assignors to E. Kertscher S.A., Yvonand, Switzerland

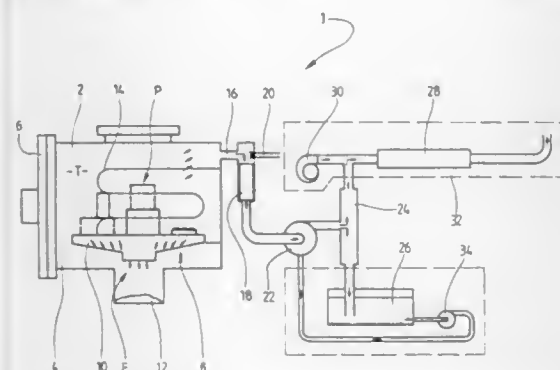
PCT No. PCT/EP94/01961, § 371 Date Jan. 23, 1996, § 102(e) Date Jan. 23, 1996, PCT Pub. No. WO95/03127, PCT Pub. Date Feb. 2, 1995

PCT Filed Jun. 16, 1994, Ser. No. 578,544

Claims priority, application France, Jul. 26, 1993, 93/09264 Int. Cl. B03B 1/02

U.S. Cl. 209—11

12 Claims



1. Method for recovering materials from parts to be processed, such as rejects or scraps of new or used sheathed cables and/or insulated wires, comprising the steps of:

- introducing said parts into an airtight enclosed space and placing them on a support provided with draining means,
- removing oxygen contained in the enclosed space to create a neutral, non-oxidising atmosphere in the latter,
- raising the temperature inside the enclosed space until it reaches a melting temperature of one of the materials forming said parts, and until said material drains through the draining means,
- collecting said melted material in a recovery tank maintained at a temperature less or equal to said melting temperature,
- further raising the temperature inside the enclosed space to cause said material, remaining on the parts to dissipate in the form of vapour or gas, and
- recovering after cooling, on the one hand, the material drained into said tank, and on the other hand, the material or materials remaining on the support, wherein, in step (b) a vacuum is created in said enclosed space, the vacuum being maintained at least during steps (c) to (e) via suction means.

5,772,042

## METHOD OF MINERAL ORE FLOTATION BY ATOMIZED THIOL COLLECTOR

Mark Cleeton Nott, Kenmore; Jonathan James Davies, and Emmanuel Manlapig, both of Chapel Hill, all of Australia, assignors to University of Queensland, Queensland, Australia

PCT No. PCT/AU94/00194, § 371 Date Dec. 18, 1995, § 102(e) Date Dec. 18, 1995, PCT Pub. No. WO94/23841, PCT Pub. Date Oct. 27, 1994

PCT Filed Apr. 15, 1994, Ser. No. 535,040

Claims priority, application Australia, Apr. 16, 1993, PL8332 Int. Cl. B03D 1/02; 1/06; 1/012

U.S. Cl. 209—166

17 Claims

1. A method for the processing of mineral ore comprising: forming ore pulp suitable for froth flotation processing, conditioning said ore pulp with a collector comprising a mixture of a thiol and the corresponding oxidized thiol, wherein said thiol and said corresponding oxidized thiol are introduced into said ore pulp by atomisation, and thereafter subjecting said pulp to flotation processing.

5,772,043

## SYSTEM AND METHOD FOR SEPARATING ELECTRICALLY CONDUCTIVE PARTICLES

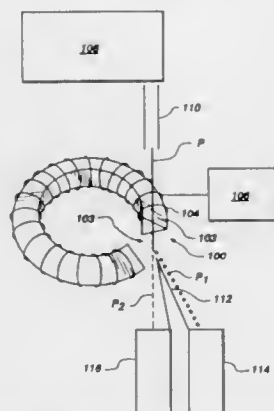
Vladimir Savilev, Almaty, Kazakhstan, assignor to Particle Separation Technologies, Woodland, Utah

Continuation-in-part of Ser. No. 172,431, Dec. 22, 1993, Pat. No. 5,439,117. This application Aug. 8, 1995, Ser. No. 516,347

Int. Cl. B03C 1/26

U.S. Cl. 209—212

25 Claims



1. A system for separating a first electrically conductive particulate material from at least a second material, the system comprising:

means for localizing a magnetic field at a first location; means for directing a material stream to the first location, the material stream comprising the first electrically conductive material and the second material; means for generating an alternating current and for applying it to the means for localizing a magnetic field at the first location, the frequency of the alternating current being set according to the resistivity of the first material and the size of the particles comprising the first material, the means for localizing the magnetic field and the means for generating the alternating current cooperating to induce an alternating magnetic field at the first location, the alternating magnetic field deflecting the path of the first electrically conductive material a different amount than the second material is deflected as the means for directing conducts the material stream into the first location; and means for gathering the first electrically conductive particles as they are separated from the material stream.

at least one stationary means for recovering at least one stream of particles with a concentration  $C_2$  of fine to broken particles wherein  $C_2 < C_0$ .

5,772,045

## SELECTOR FOR BADLY-FILLED CAPSULES

Bruno Zanarini, San Lazzaro di Savena, Italy, assignor to Macofar S.p.A., Pianoro, Italy

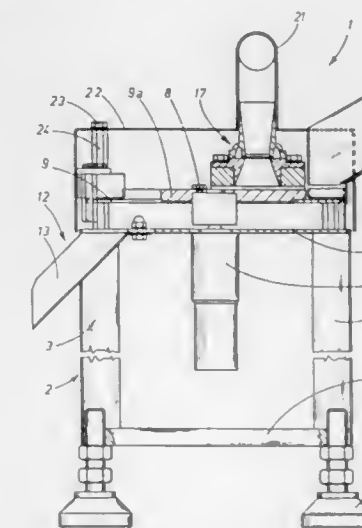
Filed Feb. 15, 1996, Ser. No. 602,025

Claims priority, application Italy, Feb. 16, 1995, B095 A 000055

Int. Cl. B07C 5/00

U.S. Cl. 209—643

2 Claims



1. A selector for badly-filled capsules, comprising: a constantly rotating ring-shaped plate for capsule transfer, having an infed for the capsules to be selected and an outfeed for the selected capsules; a compressed air supply; a substantially vertical suction mouth above said plate and designed to suck up capsules having a weight lower than a preset value, said mouth including a constricted tube operatively connected to said compressed air supply to generate a Venturi effect in the constricted tube, the suction pressure being adjustable by the compressed air supply.

5,772,046

## FOOD STORAGE BAG HOLDER

Richard A. Tercher, and June G. Tercher, both of 3960 S. Kirkwood Ave., St. Francis, Wis. 53235

Filed Aug. 24, 1995, Ser. No. 519,078

Int. Cl. A47F 5/00

U.S. Cl. 211—12

21 Claims

1. A storage bag holder, comprising in combination: (a) a main base having a pair of first side edges; (b) a first pair of parallel sides respectively mounted to the main base in a fixed spaced apart relationship along respective the first side edges with the first pair of parallel sides upwardly extending from the main base defining a first slot extending horizontally and vertically upwardly between open first slots ends of the first slot, the first pair of parallel sides having first upper edges sized for receiving and supporting a first bag in an open position with the first bag having a mouth for folded overlapping engagement with the first upper edges, the main base and the first pair of parallel sides substantially defining a main interior space therewithin; (c) a second base having a pair of second side edges; and

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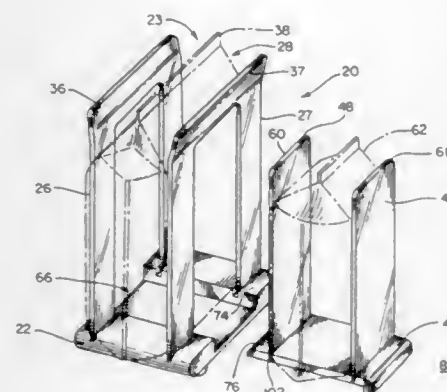
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tions, and a vertically directed hole centered between said brackets, said brackets mountable to said bottom member of said frame wherein said shelf is supported below said frame; and  
an upright stand fixedly mountable on said floor, said stand extending through said hole in said shelf and coupled to said bottom of said frame.

5,772,048  
**QUICK-RELEASE BICYCLE STAND**  
Michael Ivan Sopcisak, 4549 W. 27th Ave., Denver, Colo. 80212  
Filed Apr. 22, 1996, Ser. No. 635,662  
Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 211—20

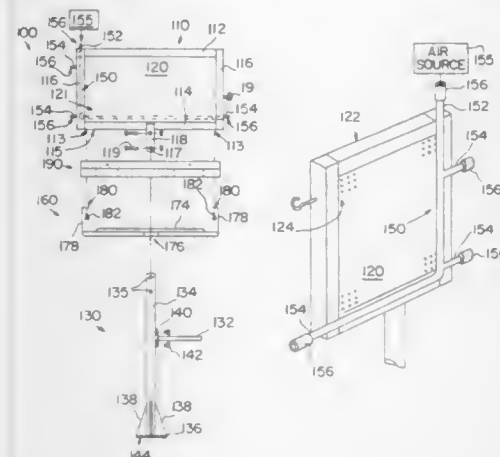
19 Claims

(d) a second pair of parallel sides respectively mounted to the second base in a fixed spaced apart relationship along the respective second side edges with the second pair of parallel sides upwardly extending from the second base defining a second slot extending horizontally and vertically upwardly between open second slots ends of the second slot, the second pair of parallel sides having second upper edges sized for receiving and supporting a second bag in an open position with the second bag having a mouth for folded overlapping engagement with the second upper edges, the second base being positionable in a storage position within the main interior space in parallel adjacency with the main base.

5,772,047  
**STATIONARY SERVICE BENCH WITH TOOL PANEL**  
Paul Bostjancic, Chicago, Ill., assignor to Ready Metal Manufacturing Company, Chicago, Ill.  
Filed Apr. 26, 1996, Ser. No. 639,130  
Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 211—13.1

12 Claims



1. An automotive tire repair tool station mountable to a floor of a servicing area, comprising:  
a frame;  
a substantially upright panel retained by said frame, said panel having multiple perforations for receiving different kinds of tool holders for holding a service technician's tools, said frame comprised of a top member, a bottom member and interconnecting side members, said bottom member having a bottom side;  
a pressurized air supply conduit located on at least one side of said frame, said conduit having an inlet port and at least one outlet port and being supported by the frame;  
a horizontally disposed shelf formed by a front portion, a back portion, and opposing side portions wherein said front and back portions interconnect with said side sections to form rounded corners and to define a shelf perimeter, said shelf having an upwardly extending bracket on opposing side por-

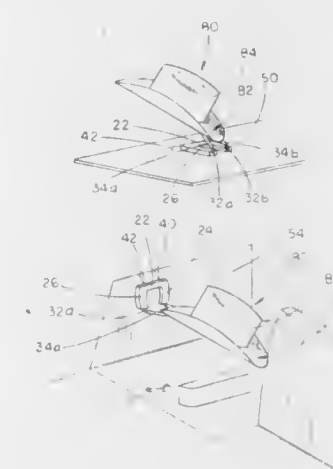
1. A bicycle storage or display rack comprising:  
a) a telescopic main body member comprised of at least two interengaging body members whereby said telescopic main body member can be telescopically extended or retracted,  
b) securing means, including a quick release clamp, whereby said telescopic main body member is rigidly and fixedly secured at any length of extension or retraction,  
c) resilient pressure end caps, positioned substantially at the opposing ends of said telescopic main body member, whereby the main body member, rigidly secured at a length that is substantially greater than the distance between two opposing mounting surfaces, is shifted into a substantially vertical position thereby compressing said resilient pressure end caps between the rigid main body and the mounting surfaces thereby allowing adequate support for suspension of one or more bicycles,  
d) at least one suspension means for efficiently storing or displaying one or more bicycles.

5,772,049  
**HAT SUPPORT APPARATUS**  
Mark J. Randone, 1223 N. Kansas Ave., Hastings, Nebr. 68901  
Filed Apr. 27, 1995, Ser. No. 429,672  
Int. Cl.<sup>6</sup> A47F 7/00

U.S. Cl. 211—30

11 Claims

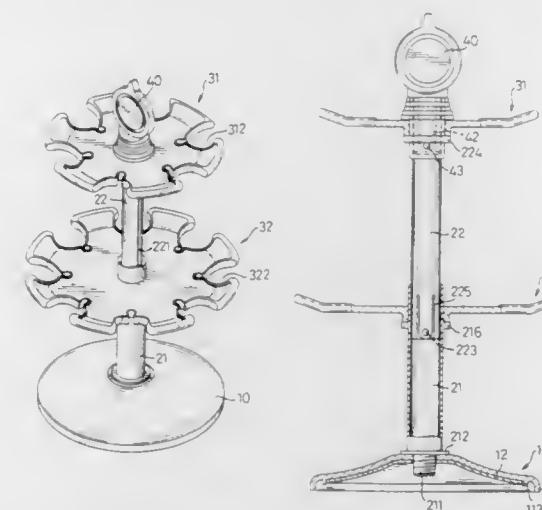
1. A collapsible hat support apparatus adapted to support a hat having a crown and brim on a support surface, the crown defining an interior portion of the hat, the support apparatus comprising:  
a base adapted for stable support on substantially flat support horizontal and vertical support surfaces;  
a continuous, elongated hat support arm pivotally connected to said base and movable between a lowered storage position adjacent said base and a raised hat support position said support arm adapted to be received within and engage the interior portion of the crown of the hat for support of said hat with said brim in spaced relation from said support surface; means for releasably securing said hat support arm in at least the raised hat support position; and



5,772,050  
**INK STAMP RACK**  
Shiny Shih, No. 31, Lane 349, Chung Cheng S. Rd., Yung Kang City, Tainan Hsien, Taiwan  
Filed Mar. 3, 1997, Ser. No. 808,464  
Int. Cl.<sup>6</sup> A47F 7/00

U.S. Cl. 211—39

6 Claims



1. A stamp rack comprising:  
a base having a first central hole defined therethrough and a skirt portion extending downwardly from a periphery thereof,  
a first post having a first end and a second end which has an annular flange extending radially therefrom and an engaging rod extending longitudinally therefrom for being received in said first central hole, said first post having a first flange extending radially from a periphery thereof near said first end of said first post and a first hole defined through said first post 21 beneath said first flange;  
a first disk having a second central hole defined therein so as to be mounted to said first end of said first post and supported by said first flange, a plurality of first recesses defined in said first disk along a periphery of said first disk;  
a second post having a first end and a second end which has a first protrusion extending radially therefrom so as to extend through said first hole of said first post via said first end of said first post, said first end of said second post having a second flange extending radially therefrom;  
a second disk having a third central hole defined therein so as to be mounted to said first end of said second post and supported

by said second flange, a plurality of second recesses defined in said second disk along a periphery of said second disk, and a cap mounted to said first end of said second post to position said second disk.

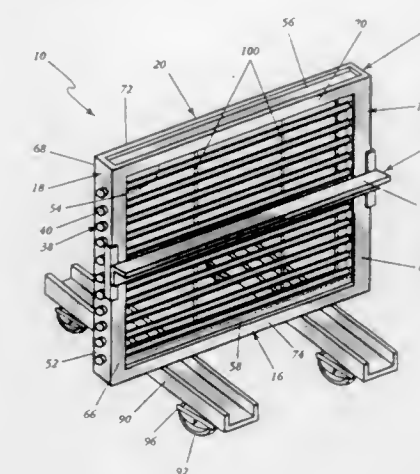
5,772,051

Patent Not Issued For This Number

5,772,052  
**RACK FOR STORING MULTIPLE ROLLS OF MATERIAL AND FOR FACILITATING THE CUTTING OF A PORTION OF MATERIAL FROM THE ROLL**  
Bill W. Campbell, 1519 Ashwood Ave., Nashville, Tenn. 37212  
Filed Dec. 21, 1995, Ser. No. 575,982  
Int. Cl.<sup>6</sup> A47F 7/17

U.S. Cl. 211—44

11 Claims



1. A rack for storing rolls of material and for facilitating the removal of a portion of material from the roll, the rack comprising:  
a. a substantially rectangular frame;  
b. a plurality of roll mounting means for mounting a plurality of rolls of material horizontally within the frame;  
c. a platform extending horizontally across the frame, wherein the platform is mounted for vertical movement along the frame relative to the roll mounting means and further comprises platform securing means for securing the platform adjacent to any one of the roll mounting means; and  
d. the platform further comprises measuring indicia mounted on a top surface of the platform.

5,772,053

Patent Not Issued For This Number

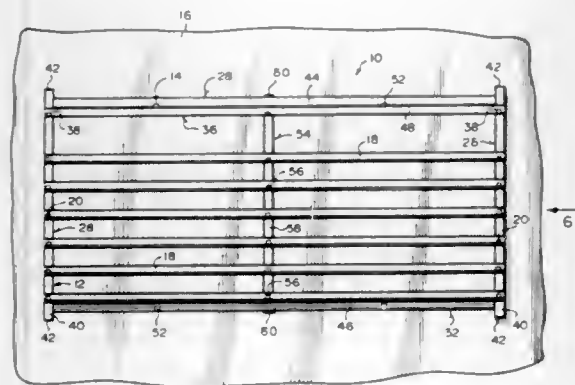
5,772,054  
**DISPLAY RACK**  
Eugene Potter, 3919 Avenue P, Brooklyn, N.Y. 11234  
Filed Aug. 19, 1996, Ser. No. 699,418  
Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 211—87.01

13 Claims

1. A display rack comprising:  
a) a support structure including:  
i) a pair of side posts;  
ii) a top rail;





- iii) two fasteners for securing opposite ends of said top rail near to top ends of said side posts, so that said top rail extends horizontally between said side posts which are positioned vertically;
- iv) a bottom rail; and
- v) two fasteners for securing opposite ends of said bottom rail near to bottom ends of said side posts, so that said bottom rail extends horizontally between said side posts;
- b) means for mounting said support structure to a flat vertical wall;
- c) a plurality of elongated J-channels;
- d) a plurality of fasteners for affixing said J-channels to said support structure in spaced apart parallel horizontal positions, so that a plurality of blister packages with toy cars therein and other small articles can be held in said J-channels and be displayed therefrom; and
- e) a back wall affixed to and extending between said side posts, so as to make said display rack portable.

5,772,055

## ROTATABLE DISPLAY TOWER

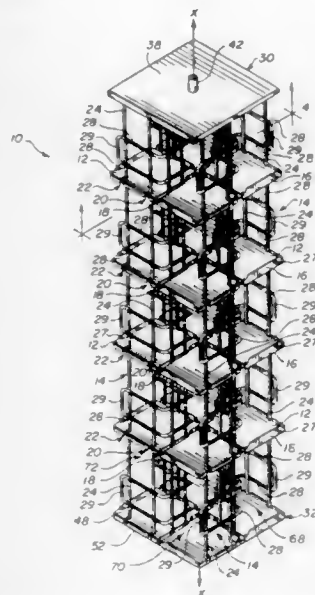
Henry C. Orr, Syracuse; James R. Dokoupil, Liverpool; Robert W. Ackley, Chittenango; Linda Lewis; Jerome A. Dubos, both of Syracuse; Donald J. Crispin, N. Syracuse, and Robert D. Lindridge, Binghamton, all of N.Y., assignors to The Croydon Company, Inc., Liverpool, N.Y.

Filed Nov. 18, 1996, Ser. No. 735,078

Int. Cl.<sup>6</sup> A47B 47/00

U.S. Cl. 211—186

32 Claims



1. A tower having a central, vertically extending axis for use in displaying video cassettes, books, and like articles, comprising:

- a) a plurality of article supporting shelves positioned in vertically spaced relation to one another and extending in respective horizontal planes, radially outwardly from said vertically extending axis, each of said shelves having opposite upwardly and downwardly facing surfaces, a predetermined periphery defined by a plurality of edges;
- b) said plurality of edges each including a respective, first elongated slot extending radially inwardly therefrom each along a respective first longitudinal axis, each of said first elongated slots being of substantially identical, first predetermined lengths, said plurality of edges each further including at least one respective notch formed therein and positioned adjacent to one side of and at respective, predetermined lateral distances from said first elongated slots, with each of said at least one notch extending along a respective, second longitudinal axis and in essentially parallel relation to said adjacent first elongated slot, each of said at least one notch being of a second predetermined length shorter than said first predetermined length; and
- c) shelf supporting means including at least one first vertically extending member each of which is physically positioned within said at least one elongated slot, and a first plurality of essentially horizontally extending members each fixedly attached in vertically spaced, perpendicularly extending relation to said at least one vertically extending members, and at least one of said first plurality of horizontally extending members being positioned in supporting relation to said downwardly facing surface of each of said shelves.

5,772,056

## PLASTIC BLOW MOLDED CONTAINER

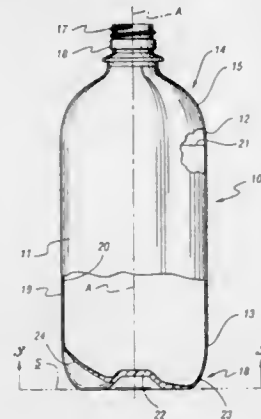
William A. Slat, Brooklyn, Mich., assignor to Plastipak Packaging, Inc., Plymouth, Mich.

Filed May 24, 1996, Ser. No. 653,485

Int. Cl.<sup>6</sup> B65D 1/02; 23/02

U.S. Cl. 215—12.2

2 Claims



1. A plastic blow molded container comprising:
- a hollow body portion that extends vertically and has upper and lower extremities;
- an upper dispensing end located above the upper extremity of the body portion and including an upper dome extending inwardly and upwardly therefrom, and the upper dispensing end also including a dispensing spout that extends upwardly from the upper dome and has a closure retainer;
- a lower freestanding base that closes the lower extremity of the body portion and includes a central hub as well as hollow legs and curved ribs positioned around the hub in an alternating relationship such that the legs support the container in an upright position on a suitable horizontal support surface; and the container being biaxially oriented and having an inner liner and an outer layer, the inner liner being a virgin resin and having a nominal wall thickness that is less than 0.25 of the total wall thickness of the container, and the outer layer being post consumer recycled, green colored polyethylene terephthalate.

5,772,057

## CRIMP TOP SEAL FOR VIALS

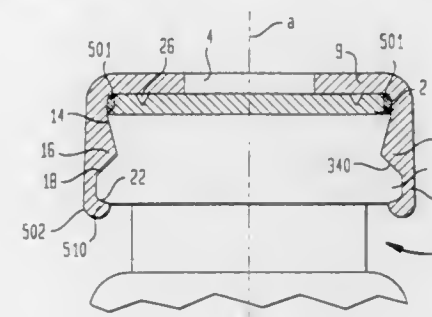
James G. Finneran, Vineland, N.J., assignor to J. G. Finneran Associates, Inc., Vineland, N.J.

Continuation-in-part of Ser. No. 477,079, Jun. 7, 1995, Pat. No. 5,662,230, which is a continuation-in-part of Ser. No. 104,727, Aug. 11, 1993, abandoned, which is a continuation-in-part of Ser. No. 960,940, Oct. 14, 1992, abandoned, which is a continuation-in-part of Ser. No. 801,674, Dec. 2, 1991, abandoned, which is a continuation-in-part of Ser. No. 553,451, Jul. 13, 1990, abandoned. This application Oct. 19, 1995, Ser. No. 545,118

Int. Cl.<sup>6</sup> B65D 41/34

U.S. Cl. 215—252

10 Claims



1. A crimp top seal having a vertical axis and an outer diameter and adapted for combination with a container which has a neck finish including an upper flange, a lower flange with a bottom, and an intermediate area disposed between the upper flange and the lower flange, said crimp top seal formed of plastic and comprising:
- (a) a top member having an underside;
- (b) a dependent skirt, said dependent skirt:

- (i) extending axially downward from said top member and having an inner surface and a lower end;
- (ii) having a first substantially flat surface adapted to engage the upper flange of the container, a second substantially flat surface located axially below said first surface and adapted to engage the lower flange of the container, and a plurality of angular locking ribs located at an axially intermediate position between said first and second surfaces and at circumferentially spaced locations around said skirt and adapted to engage the intermediate area of the neck finish of the container upon downward movement of said crimp top seal onto the container, each of said locking ribs having an angle of about 12 degrees from vertical, and
- (iii) being sufficiently stiff to effect alignment and sealing engagement with the container by contact above, at, and below said locking ribs; and
- (c) a plurality of reinforcing members vertically disposed on said inner surface of said skirt and projecting radially inward therefrom, said reinforcing members having tops that abut said underside of said top member.

5,772,058

## COLLAPSIBLE ARTICLE DIVIDER AND SUPPORT

Maria M. Staesche, 6449 N. Talman, Chicago, Ill. 60645

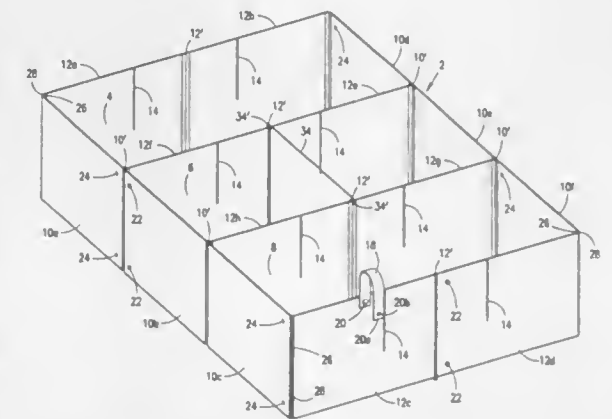
Filed Feb. 25, 1997, Ser. No. 810,147

Int. Cl.<sup>6</sup> B65D 1/24

U.S. Cl. 220—6

14 Claims

1. A collapsible article divider and support comprising a plurality of interconnected flat vertical panels having equal lengths,
- hinge means respectively interconnecting ends of adjacent ones of said plurality of panels for pivotal movement relative to each other,
- said plurality of panels being arranged to be fully opened in an interconnected configuration forming a front wall, a back wall and a pair of opposed side walls together defining an enclosed article receiving space,



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a closure adapted to fit and close said opening, said closure having a first position for releasably engaging said wall means and closing said opening, and a second position for engaging said wall means and permanently closing said opening; and hinge means secured at a first end to said wall means and detachably secured at a second end to said closure for retaining said closure in said first position, said hinge means being detachable from said closure for enabling positioning said closure in said second position.

5,772,060

## PULL-TAB FOR A LIQUID CONTAINER

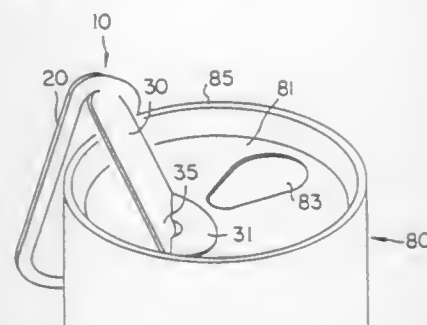
Masamichi Kaneko, Tokyo; Hidetoshi Konno, Kanagawa, and Junichi Satoyoshi, Tokyo, all of Japan, assignors to Tetra Laval Holdings & Finance S.A., Pully, Switzerland  
PCT No. PCT/US95/15454, § 371 Date Jul. 25, 1997, § 102(e)  
Date Jul. 25, 1997, PCT Pub. No. WO96/16870, PCT Pub. Date Jun. 6, 1996

PCT Filed Nov. 29, 1995, Ser. No. 836,751

Claims priority, application Japan, Nov. 29, 1994, 6-319046

Int. Cl.<sup>6</sup> B65D 5/72; 17/50

U.S. Cl. 220—259 16 Claims



1. A pull-tab for covering and sealing a pour opening of a liquid container, comprising:

a sheet having a ring-like cut therein, the cut having two ends separated by an uncut connecting portion and defining an outer tab portion and an inner body portion outside and inside the cut, respectively, the body portion having a folded end portion remote from the connecting portion and folded toward a back side of the sheet along a fold line extending obliquely relative to a line extending between a center of the end portion and a center of the connecting portion,

wherein a lower side of the folded end portion is bonded to a surface of the container such that the pour opening is covered and sealed with a sealing portion of the body portion located between the folded portion and the connecting portion.

5,772,061

## REFUSE CONTAINERS

Peter Lowe, Brieley Hill, England, assignor to Eghert H. Taylor & Company Limited, England

Filed Dec. 13, 1995, Ser. No. 571,810

Claims priority, application United Kingdom, Dec. 15, 1994, 9425307; Aug. 23, 1995, 9517201

Int. Cl.<sup>6</sup> B65D 51/18

U.S. Cl. 220—331 18 Claims

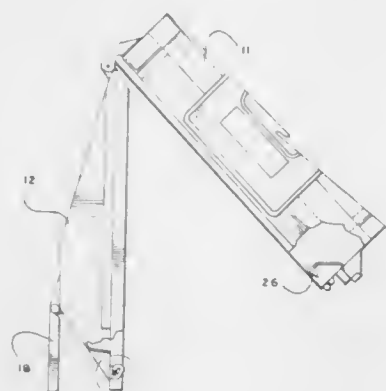
1. A refuse container comprising

a bin having a lid hinged thereon and movable between open and closed conditions;

the lid having a secondary opening therein and a catch between the bin and the lid;

the catch comprising an abutment on one of the bin and lid, and a locking member on the other of the bin and lid;

means associated with the container and defining an open surface of predetermined extent, the open space loosely receiving



the locking member so as to guide movement of the locking member by gravity between a first position in the open space when the bin is upright and a second position in the open space when the bin is upended for emptying; and the locking member in the first position engaging the abutment thereby to hold the lid in the closed condition when the bin is upright, and the locking member in the second position disengaging the abutment and thereby allowing the lid to open as the bin is upended for emptying.

5,772,062

## INLET TRAY OF A CAR TANK

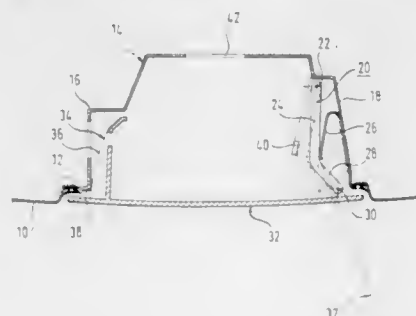
Rainer Gramss, Dorffacker, Germany, assignor to ITW-Ateco GmbH, Norderstedt, Germany

Filed Apr. 5, 1996, Ser. No. 628,425

Claims priority, application Germany, May 13, 1995, 195 17 705.3

Int. Cl.<sup>6</sup> B62D 25/00

U.S. Cl. 220—335 20 Claims



1. A system for mounting a closure member upon a support body, comprising:

a closure member;

a support body having an opening defined therein which is adapted to be covered by said closure member;

said closure member is mounted upon said support body for movement between an opened position at which said opening defined within said support body is uncovered, and a closed position at which said closure member covers said opening defined within said support body;

latching means defined between said support body and a first side portion of said closure member for maintaining said closure member in a latched state at said closed position with respect to said support body whereby said closure member covers said opening defined within said support body, and for releasing said closure member such that said closure member is disposed in an unlatched state and can be moved to said opened position; and

mounting arm means pivotally connected at one end thereof to said support body and pivotally connected at another end thereof to a second side portion of said closure member for mounting said closure member upon said support body such that when said latching means is released so as to permit said closure member to be moved from said latched closed position to said unlatched opened position, said closure member moves in a direction extending substantially from said second side portion thereof toward said first side portion thereof and then away from said closed position toward said opened position.

5,772,063

## WASTE RECEPTACLE WITH CHANGEABLE ART DISPLAY CAPABILITY

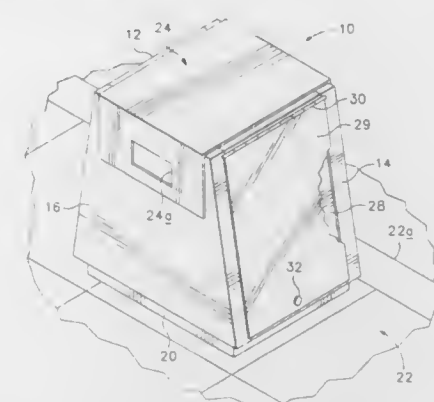
Sharon Gantz-Bloome, 4751 W. Ruffner St., Seattle, Wash. 98199

Filed Apr. 9, 1996, Ser. No. 629,742

Int. Cl.<sup>6</sup> B65F 1/00; 1/14

U.S. Cl. 220—500

3 Claims



1. A waste receptacle comprising:

a container having a chamber for receiving waste articles, said container having a plurality of laterally adjacent sides including two planar, substantially vertical sides and two planar inclined sides, said plurality of sides being disposed in an alternating vertical-inclined-vertical-inclined arrangement, the container having an opening disposed at an upper portion of the container, said opening allowing access to the chamber, and

a display-item structure joined to at least one of said vertical side and said inclined side permitting changeable viewable installation of a display item, with said display item structure including an expanse for receiving such an item, which is a flat item, and wherein the receiving expanse is parallel to said at least one of said vertical side and said inclined side, which expanse extends upwardly from closely adjacent a base of the container substantially along the entire and majority overall height of the container.

5,772,064

## WINDOW-SIDED PLASTIC BOTTLE CASE

Klaus Delbrouck, Köln, Germany, assignor to Franz Delbrouck GmbH, Menden, Germany

Filed Dec. 6, 1996, Ser. No. 761,157

Claims priority, application Germany, Dec. 7, 1995, 295 19 374 U

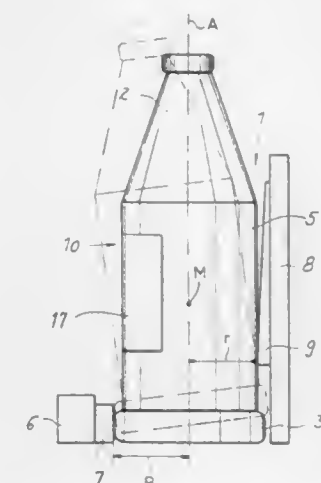
Int. Cl.<sup>6</sup> B65D 1/24

U.S. Cl. 220—515

7 Claims

1. In combination:

a plurality of substantially identical bottles each having a generally cylindrical body centered on a bottle axis and having a lower end, and



a ring on the lower end and of greater diameter than the respective body to project radially therepast;

a plastic case having

a plurality of side walls each formed by at least one lower web with a relatively large window opening,

inner walls spaced inward from the side walls and defining therewith a plurality of seats each centered on a respective normally upright seat axis,

a respective relatively short outer retaining formation projecting radially of the respective seat axis below the respective window from the respective lower web into each seat and having an inner edge spaced from the respective seat axis by a distance equal generally to half the outside diameter of the bottle ring, and

a respective inner retaining formation projecting radially of the respective seat axis to each seat and having an inner edge spaced from the respective seat axis by a distance equal generally to half the outside diameter of the bottle body, each inner formation being wholly above the respective outer formation.

5,772,065  
SHOT GLASS

Michael P. Kalamaras, Fox River Grove, Ill., assignor to Howw Manufacturing Company, Inc., Barrington, Ill.

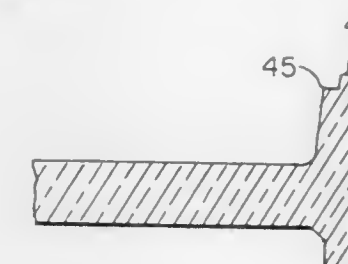
Continuation of Ser. No. 678,704, Jul. 11, 1996, abandoned.

This application Jun. 16, 1997, Ser. No. 876,265

Int. Cl.<sup>6</sup> B65D 6/28

U.S. Cl. 220—612

20 Claims



1. A molded shot glass comprising a side wall extending downward and inward to a bottom, a cup bottom extending across the bottom of the side wall spaced from a bottom edge of the side wall, the cup bottom having first and second curved surfaces, and an energy-directing bead receiving step positioned inside the bottom edge of the side wall beneath the cup bottom, a base having a disc-shaped base wall, a support ring extending downward from a peripheral portion of the base wall, a base side wall extending upward from a peripheral portion of the base wall, the base side wall having a flat upper surface and an energy directing bead formed on the flat upper surface, the flat upper surface fitting



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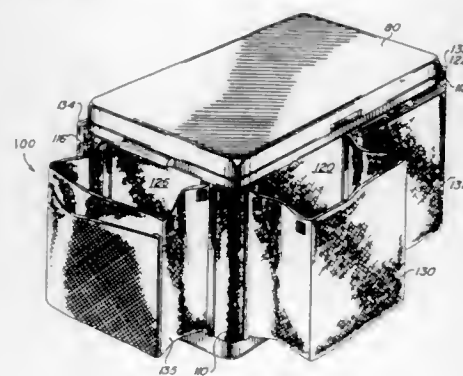
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within the step at the lower end of the shot glass side wall and the energy directing bead being welded and fused to the step to join the base and shot glass.

5,772,066  
**MULTI-POCKETED COOLER TOTE APPARATUS AND METHOD**  
Martie J. Reynolds, P.O. Box 1104, Apache Junction, Ariz. 85217  
PCT No. PCT/US96/06260, § 371 Date Jun. 13, 1996, § 102(e) Date Jun. 13, 1996, PCT Pub. No. WO96/34545, PCT Pub. Date Nov. 7, 1996  
Continuation-in-part of Ser. No. 433,839, May 4, 1995, abandoned. This PCT application May 3, 1996, Ser. No. 663,318  
Claims priority, application United Kingdom, May 4, 1995, 08/433,839

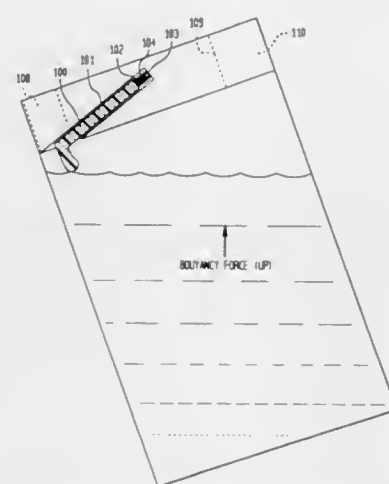
Int. Cl.<sup>6</sup> B65D 25/00; 25/20  
U.S. Cl. 220—694 7 Claims



1. A tote apparatus for a rectangular cooler having four sides and a lid, the tote apparatus comprising four panels of flexible material that is substantially non-elastic, each of the four panels substantially covering each of the four sides of the rectangular cooler; four elastic portions interposed between the four panels such that the four elastic portions are at the corners of the rectangular cooler; at least one pocket formed in at least one of the four panels for storing items external to the cooler.

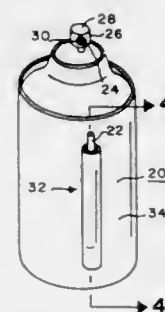
5,772,067  
**CAP SYSTEM WITH BUOYANT SLIDING COVER AND SPRING MECHANISM**  
Herbert Morewitz, II, 7 Conway Rd., Newport News, Va. 23606  
Filed May 31, 1996, Ser. No. 655,899  
Int. Cl.<sup>6</sup> A47G 19/22

U.S. Cl. 220—714 6 Claims  
1. A cap system for a container of liquid, comprising: a cap mountable at the top of said container, said cap defining a dispensing opening therethrough and a downwardly angled sleeve therein that opens into said container in proximity to said dispensing opening; and a tab of buoyant construction mounted in said sleeve for sliding engagement therewith, said tab having a first end residing in said sleeve and a second end residing out of said sleeve, wherein said tab slides down said sleeve to close off said dispensing opening when said container is in an upright



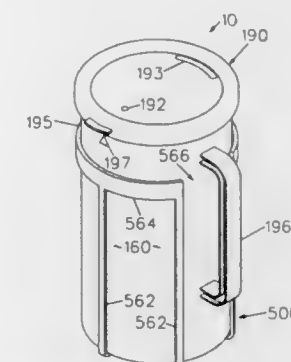
position and wherein, when said container is tipped such that said liquid is in contact with said second end of said tab, said tab slides up said sleeve away from said dispensing opening.

5,772,068  
**AEROSOL EXTENSION SPRAY TUBE HOLDER**  
Elizabeth P. Hailey, 3345 Gatewood Dr., Memphis, Tenn. 38134  
Filed Sep. 22, 1997, Ser. No. 934,702  
Int. Cl.<sup>6</sup> A47G 1/10; B65D 21/00  
U.S. Cl. 220—735 4 Claims



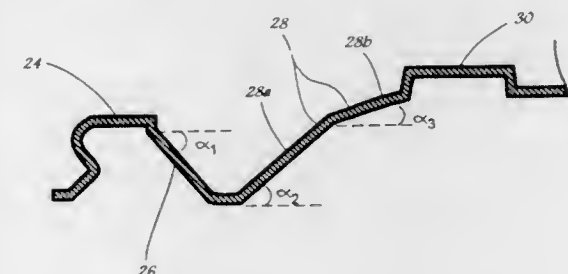
1. In combination:  
(a) a container including a nozzle and having an outside surface and an interior with contents under pressure therewithin, said nozzle being in selective communication with said pressurized interior;  
(b) an elongated spray tube adapted for communicating with said nozzle; and  
(c) a tube holder being secured to said outside surface of said container, said tube holder being generally cylindrical and having upper and lower ends and further having a bore extending longitudinally through at least a portion of said tube holder, said bore of said tube holder having an upwardly-opening mouth proximate said upper end of said tube holder; said bore of said tube holder having a constricted portion adapted for frictionally retaining said spray tube within said bore of said tube holder when said spray tube is inserted through said mouth of said tube holder and into said bore of said tube holder.

5,772,069  
**CUP HOLDER**  
Bill M. Price, 1072 NE Highway 52, Windsor, Mo. 65360  
Filed Aug. 13, 1996, Ser. No. 696,261  
Int. Cl.<sup>6</sup> B65D 25/00  
U.S. Cl. 220—737 3 Claims  
1. A drinking cup system comprising:  
a holder for receiving a cup therein, said holder comprising:



a base presenting a first surface;  
a channel depending from said base and surrounding said first surface;  
a sidewall upwardly extending from said channel and presenting an opening at a top end thereof;  
a cup comprising:  
a base;  
a sidewall upwardly extending from said base and presenting an opening;  
a handle extending from said cup sidewall and beyond said holder sidewall;  
a flange depending from said base for releasable engagement with said channel, said cup supported by at least said channel; said holder base comprising a hub; a plurality of ribs radially extending from said hub for forming a part of said first surface; an offset at an end of each rib for forming a part of said channel; said first section of each rib lying in a common horizontal plane; said cup base comprising a horizontal surface for positioning above said first rib sections; said first rib sections alternatively support a second cup having a base, the base resting atop said first rib sections; said holder sidewall comprising a plurality of ribs upwardly extending from each offset at said rib end; a band connecting an upper end of each of said upwardly extending ribs; and an opening in said band for allowing said handle of said cup to be positioned between a pair of said upwardly extending ribs and to extend beyond said holder sidewall upon said cup being inserted in said holder.

5,772,070  
**HIGH-STRENGTH GUSSETED LID FOR A FOOD CONTAINER**  
Thomas J. Hayes, Wauconda; Michael J. A. Sagan, Batavia, and James N. Gomoll, Chicago, all of Ill., assignors to Tenneco Packaging, Evanston, Ill.  
Filed Sep. 24, 1996, Ser. No. 718,862  
Int. Cl.<sup>6</sup> B65D 41/16  
U.S. Cl. 220—781 12 Claims



a first retention lever rotatably mounted so as to pivot about a first axis, the first retention lever including a first cam follower in contact with the first cam surface, wherein:

when the inventory magazine release member is positioned in the first position, contact between the first cam surface and first cam follower causes the first retention lever to be retracted from the product chute; and

when the inventory magazine release member is positioned in the second position, contact between the first cam surface and first cam follower causes the first retention lever to be extended into the product chute; and

a second retention lever rotatably mounted so as to pivot about a second axis, the second retention lever including a second cam follower in contact with the second cam surface, wherein:

when the inventory magazine release member is positioned in the first position, contact between the second cam surface and second cam follower causes the second retention lever to be extended into the product chute; and

when the inventory magazine release member is positioned in the second position, contact between the second cam surface and second cam follower causes the second retention lever to be retracted from the product chute.

5,772,073

# APPARATUS FOR DISPENSING INDIVIDUAL PLASTIC FASTENERS FROM FASTENER STOCK

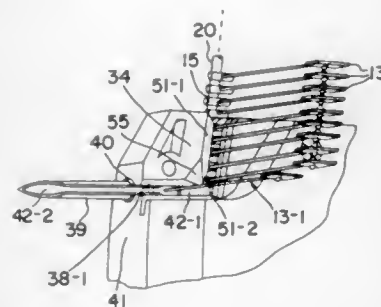
Charles L. Deschenes, North Attleboro, Mass., assignor to Avery Dennison Corporation, Pasadena, Calif.

Filed Apr. 10, 1996, Ser. No. 631,736

Int. Cl.<sup>6</sup> B65H 1/00

U.S. Cl. 221-197

7 Claims



1. An apparatus for dispensing plastic fasteners from fastener stock, each plastic fastener having a cross bar at the end of a filament, said apparatus comprising:

- a casing,
- a hollow needle mounted on said casing, said hollow needle having an inlet opening and an outlet opening,
- a guide groove in said casing for receiving the fastener stock and routing the fasteners into alignment with said hollow needle one at a time, said guide groove being in communication with said inlet opening in said hollow needle, and being at an angle with said hollow slotted needle, said guide groove including a front wall, and
- an ejector rod for pushing the cross bar of a fastener fed into said hollow needle out through the outlet opening of the needle,
- said front wall in said guide groove in said casing being bevelled to reduce the likelihood of jamming when the cross bar of a fastener passes into said hollow needle from said guide groove.

# 5,772,074 DEVICE AND METHOD FOR INDICATING THE DISPENSING OF A PREDETERMINED AMOUNT OF A MATERIAL

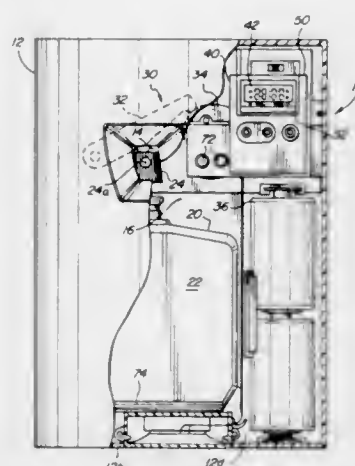
Dwain Dial, Elk Grove Village, Ill.; Joseph Chang, Hsin Tien, and Hwa Ming Huang, San Chung, both of Taiwan, assignors to Waterbury Companies, Inc., Waterbury, Conn.

Filed Mar. 31, 1995, Ser. No. 414,538

Int. Cl.<sup>6</sup> G01F 11/00

U.S. Cl. 222-1

20 Claims



1. A dispenser for a material, the dispenser having a system for indicating the dispensing of a predetermined amount of the material, comprising:

- a source of material to be dispensed;
- a housing having an internal cavity sized to permit insertion therein of the source of material to be dispensed;
- dispensing means disposed within the housing for dispensing into the environment the material from the source of material to be dispensed when the dispensing means is operational; and
- a system for indicating the dispensing of a predetermined amount of the material to be dispensed, which comprises:
  - a timer for determining the amount of time the dispensing means is operational;
  - a calculator for multiplying the time that the dispensing means is operational by a factor representative of the frequency or intensity of operation to produce a dispensing score representative thereof; and
  - signal generating means for producing a signal indicating the dispensing of the predetermined amount of the material to be dispensed when the dispensing score is at least equal to a total score required for dispensing a predetermined amount of material from the source of material to be dispensed.

18. A method for indicating the dispensing of a predetermined amount of a material in a dispenser having a dispensing means which dispenses the material during periods of operation and frequency or intensity which can be varied, the method comprising:

- determining the amount of time the dispensing means is operational;
- multiplying the time that the dispensing means is operational by a factor representative of the frequency or intensity of operation to produce a dispensing score representative thereof; and
- producing a signal indicating the dispensing of the predetermined amount of the material to be dispensed when the dispensing score is at least equal to a predetermined total score required for dispensing a predetermined amount of material.

# 5,772,075 PORTABLE SLUSH BEVERAGE DISPENSING SYSTEM

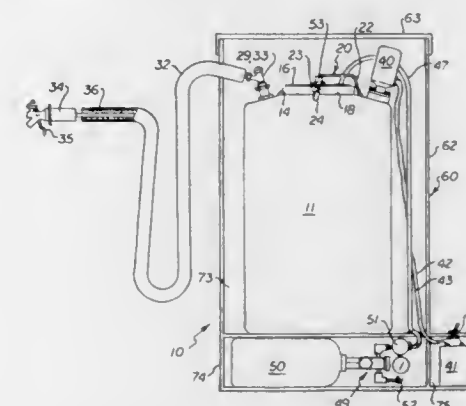
William O. Ash, Jr., and Fred L. Ash, both of 2537 S. Gessner, No. 216, Houston, Tex. 77063

Filed Feb. 14, 1996, Ser. No. 599,945

Int. Cl.<sup>6</sup> G01F 11/00

U.S. Cl. 222-1

17 Claims



1. A portable slush beverage dispensing system comprising:

a vessel having a side wall defining an interior chamber and an access opening at one end thereof;

a releasably locked closure lid removably and sealingly mounted within said vessel opening;

gas filling valve means on said side wall with a passageway in communication with said interior chamber and adapted to be connected with gas pressurizing means to effect pressurization of a slush beverage contained within said vessel;

a slush delivery conduit having a first end in communication with said interior chamber and a hose connection at a second end on said side wall adapted to be connected with a hose for dispensing said pressurized slush beverage contained within said vessel;

rotating agitator means having a shaft extending through said side wall in sealed relation with an agitator blade at a first end rotatably disposed in said chamber to swirl said slush beverage adjacent said delivery conduit first end and a second end exterior of said chamber adapted for connection to a motor for rotating said agitator blade; and

motor means exterior of said chamber connected with a power source and with said shaft second end for rotating said agitator blade.

17. A method of transporting and dispensing a slush beverage comprising the steps of;

providing a back pack adapted to be worn by a person and having a central storage compartment;

removably installing gas pressurizing means in said back pack storage compartment;

providing a vessel having a side wall defining an interior chamber, an access opening at one end thereof, a releasably locked closure lid removably and sealingly mounted within said vessel opening, gas filling valve means on said side wall with a passageway in communication with said interior chamber, a slush delivery conduit having a first end in communication with said interior chamber and a hose connection at a second end on said side wall, rotating agitator means having a shaft extending through said side wall in sealed relation with an agitator blade at a first end rotatably disposed in said chamber and a second end connected with a motor exterior of said chamber for rotating said agitator blade;

filling said vessel interior chamber with a slush beverage;

removably installing said vessel and said motor in said back pack storage compartment;

removably connecting said gas pressurizing means to said filling valve means to effect pressurization of said slush beverage contained within said chamber;

releasably connecting one end of a flexible hose to said hose connection, said hose having a selectively operable slush dispensing valve at an opposite end;

selectively activating said motor to rotate said agitator means and swirl said slush beverage adjacent said delivery conduit first end; and

selectively activating said slush dispensing valve at said opposite end of said hose to dispense said pressurized slush beverage from said chamber.

5,772,076

# HOT FILL DISPENSING CLOSURE

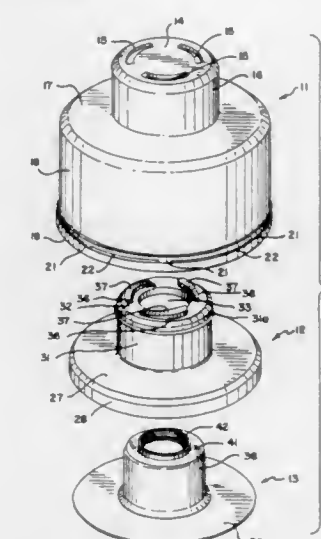
Steven Bernard Juk, Naperville, and Leo R. Imbery, Jr., Aurora, both of Ill., assignors to White Cap, Inc., Downers Grove, Ill.

Filed Jul. 26, 1996, Ser. No. 686,644

Int. Cl.<sup>6</sup> B67D 5/06

U.S. Cl. 222-153.06

68 Claims



1. A dispensing closure for a container having a cylindrical neck which terminates in an end finish that defines an open mouth, said closure comprising:

an outer cap and an inner cap, said outer cap being movable with respect to said inner cap between a closed position and a dispensing position;

said outer cap including an end panel and a generally cylindrical sidewall extending downwardly therefrom, at least one aperture in said end panel forming a passage through which the contents of said container can be dispensed, an annular shoulder integral with and radially outwardly extending from a lower portion of said cylindrical sidewall, the outer portion of said shoulder extending into an axially downwardly projecting cylindrical skirt, said skirt being dimensioned to be received in surrounding relation to the neck of said container, an inner surface of said cylindrical skirt including at least one thread;

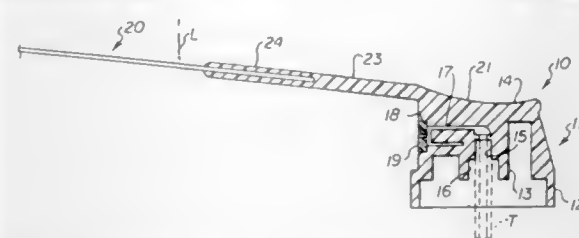
said inner cap being adapted to be secured to said container neck and including an outer annular flange adapted to overlie the open mouth of said container, the inner portion of said annular flange extending into an axially projecting tubular sidewall which terminates in an end panel having at least one aperture formed therein through which the contents of said container can be dispensed, said at least one aperture in said inner cap and said at least one aperture in said outer cap being in fluid flow communication when said outer and inner caps are in said dispensing position; and, a resilient liner on at least one of said inner cap and said outer cap for providing a fluid tight seal between the respective apertures formed therein when said outer and inner caps are in a closed position.



5,772,077  
**HAIR STYLING IMPLEMENT AND VALVE ACTUATOR  
 ATTACHMENT FOR AEROSOL AND PUMP DISPENSERS**  
 Jose J. Tafur, 2122 Haven House, Spring, Tex. 77386  
 Filed May 7, 1996, Ser. No. 646,437  
 Int. Cl.<sup>6</sup> B67D 1/07

U.S. Cl. 222—192

18 Claims



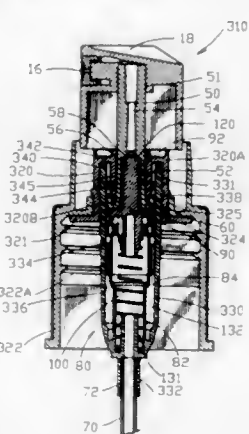
1. A combination hair styling implement and valve actuator attachment for cylindrical aerosol and pump dispenser containers of the type having a dispensing valve in an upper end and a discharge tube projecting outwardly from a top end of the aerosol or pump container parallel to a longitudinal axis of the container, the attachment comprising:

- an elongate hair styling implement having a rear portion with means for engaging and depressing said outwardly projecting discharge tube parallel to the longitudinal axis of said aerosol or pump container to open said dispensing valve and having spray nozzle means in fluid communication with said discharge tube for expelling fluid therethrough in a direction perpendicular to said longitudinal axis in a generally conical-shaped spray pattern;
- a flat portion extending forwardly a distance from said rear portion at an angle relative to an axis perpendicular to said longitudinal axis and generally parallel to the outer periphery of said conical-shaped spray pattern; and
- said flat portion terminating in a distal end portion configured to manipulate and arrange sections of hair;
- said aerosol or pump container being held in the hand of an operator while manipulating and arranging sections of hair and said hair styling implement rear portion selectively depressed by a finger of the hand holding said aerosol container to apply an amount of the contents of said container to the hair.

5,772,078  
**COMBINED TURRET AND CLOSURE SEAL**  
 Michael G. Knickerbocker, Crystal Lake, Ill., assignor to Aptar Group, Inc., Cary, Ill.  
 Division of Ser. No. 326,704, Oct. 19, 1994, Pat. No. 5,503,306.  
 This application Jul. 29, 1996, Ser. No. 681,856  
 Int. Cl.<sup>6</sup> B65D 88/54

U.S. Cl. 222—321.1

13 Claims



1. A combined turret and closure seal and a hand operated dispensing device for dispensing a fluid from a container, the improvement comprising:

- a substantially rigid pump body;
- a resilient turret having a resilient tubular portion and a resilient gasket portion;
- said resilient tubular portion of said resilient turret engaging said substantially rigid pump body;
- a boss disposed on one of said tubular portion of said turret and said pump body;
- a closure being securable to the container;
- said closure having a closure collar portion terminating in a closure shoulder engaging said boss for interlocking said pump body to said closure with said resilient turret interposed therebetween to secure said pump body to the container with said resilient gasket portion of said turret providing a seal therebetween; and
- said closure collar being completely located between said resilient gasket portion and said boss of said one of said turret and said pump body.

5,772,079  
**DEVICE FOR PACKAGING AND DISPENSING A LIQUID  
 OR SEMI-LIQUID SUBSTANCE**  
 Jean-Louis Gueret, Paris, France, assignor to L'Oreal, Paris, France

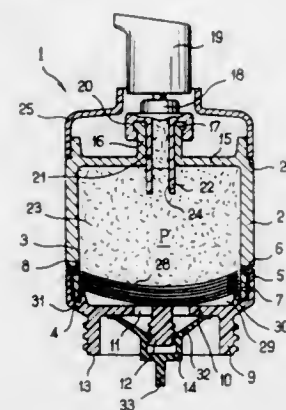
Filed May 13, 1996, Ser. No. 645,069

Claims priority, application France, May 17, 1995, 95 05845

Int. Cl.<sup>6</sup> B65D 88/54

U.S. Cl. 222—321.7

21 Claims



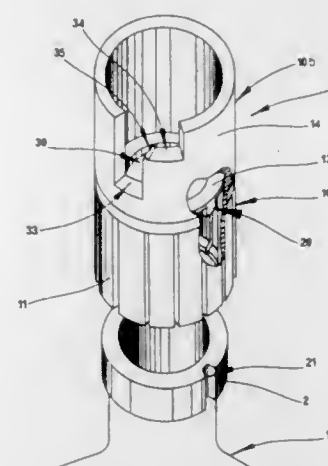
1. A device for packaging and dispensing a liquid or semi-liquid substance, the device comprising a receptacle suitable for containing said substance, the receptacle having a substance outlet orifice fitted with a pump including a valve suitable for enabling substance to be delivered without allowing ingress of air, the receptacle also including a bottom wall constituted by a bag that defines a space inside the receptacle containing said substance, said bag being capable of moving inside the receptacle in response to the substance being delivered, so as to reduce the volume of said space and to ensure that the substance stored inside the receptacle does not come into contact with air, a margin at one end of said bag being fixed to the receptacle and the bag being suitable for deforming so as to reduce the volume of said space until the bag coincides substantially with the inside shape of the receptacle, wherein said bag comprising a wall that is elastically deformable.

5,772,080  
**FIXING RING WITH DUAL INDEXING**  
 Olivier de Pous, Paris, and Claude Jouillat, La Murette, both of France, assignors to Valois S.A., Le Neubourg, France  
 Filed Jul. 30, 1996, Ser. No. 692,798  
 Claims priority, application France, Aug. 1, 1995, 95 09363  
 Int. Cl.<sup>6</sup> B65D 83/40; B67D 5/32

U.S. Cl. 222—321.7

8 Claims

1. A combination comprising: (1) a receptacle containing a substance to be dispensed and having a neck, (2) a dispenser

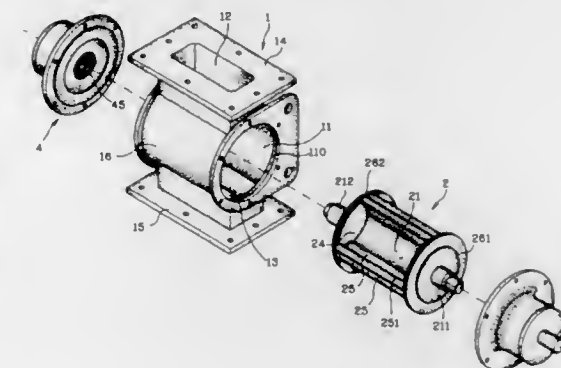


member having a top end to which is mounted an actuator member having an outlet opening, and (3) a fixing ring for fixing said dispenser member on said receptacle neck, said fixing ring including fixing means for attaching said fixing ring to said neck including a through opening for said dispenser member top end, said neck having a first indexing member, said actuator member having a second indexing member, said fixing ring further including first indexing means for cooperating with said first indexing member on said receptacle neck to fix the angular position of the ring relative to the neck, and said fixing ring further including second indexing means for cooperating with said second indexing member to fix the angular position of the actuator member relative to the ring, such that the angular position of the outlet opening of the actuator member is fixed relative to the receptacle.

5,772,081  
**LOW LEAKAGE ROTARY VALVE**  
 Shyan-Chiin Wei, and Wei-Chong Tsai, both of Hsin-chu, Taiwan, assignors to Food Industry Research and Development Institute, Hsinchu, Taiwan  
 Filed Jun. 4, 1996, Ser. No. 658,065  
 Int. Cl.<sup>6</sup> G01F 11/10

U.S. Cl. 222—368

5 Claims



1. A low leakage rotary valve comprising:  
 a rotor, which includes a rotor shaft, at least three rotor blades, a driving end disk, and a washing end disk; wherein the rotor blades, the driving end disk and the washing end disk form a holding space for containing a loading material, each of the rotor blades has a radially extended blade edge extension which is wider than the rotor blade itself, the rotor shaft extends through the driving disk to form a driving end and through the washing disk to form a washing end for allowing the rotor to rotate freely by the rotor shaft;

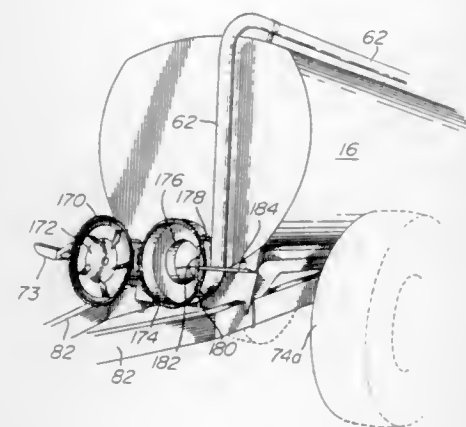
- a housing, which includes a hollow casing, a loading opening, an upper opening having an upper flange, and a lower opening having a lower flange; wherein the loading opening allows the rotor to be disposed into the housing therethrough, the upper opening allows the loading material to load therethrough and flow into the holding space of the rotor, the lower opening allows the loading material to be discharged out therethrough;
- a driving end valve cover, which includes a first hollow cylindrical end case having a first end cover attached thereto, the first end cover having a first cover opening in the center permitting a driving shaft to pass therethrough to drive the rotor; wherein the interior of the first hollow cylindrical end case has a plurality of bearings for supporting the driving end of the rotor shaft and the driving shaft, a first separating ring, which is disposed between at least two of the bearings, for supporting the driving end of the rotor and the driving shaft, and a first sealing ring, which is disposed next to the bearings and opposite the first separating ring, for supporting the driving end of the rotor shaft, and further wherein the interior of the first hollow cylinder end, together with a left end of the driving shaft, form a driving end receptacle to house the driving end of the rotor shaft to allow the rotor shaft to freely rotated therein, and the first sealing ring is disposed such that the loading material contained in the rotary valve is prevented from being contaminated by lubricating oil in the bearings and from entering into the bearings;
- a washing end valve cover, which includes a second hollow cylindrical end case having a second end cover attached thereto; wherein the interior of the second hollow cylindrical case has a plurality of bearings, a second separating ring disposed between at least two of the bearings and a second sealing ring disposed therein, and forms into a washing end receptacle to house the washing end of the rotor shaft and allow the rotor shaft to freely rotated therein, and the second sealing ring is disposed such that the loading material contained in the rotary valve is prevented from contamination by the lubricating oil in the bearings, and from entering into the bearings; and
- a three-dimensional sealing structure, which includes a first ring-groove on a circumferential edge of the driving end disk, a second ring-groove on a radial peripheral edge of the washing end disk, a plurality axially extending grooves on an axial outer edge of the blade edge extension, and a three-dimension seal integrally received by said first ring-groove, said second ring-groove, and said axially extending grooves.

5,772,082  
**METHOD AND APPARATUS FOR SPREADING A LIQUID  
 SLURRY**  
 Marcel Depault, 1337 rue Principale, St-Valérien, Co. Shefford, Quebec, Canada, J0H 2B0  
 Division of Ser. No. 328,422, Oct. 25, 1994, Pat. No. 5,595,397, which is a division of Ser. No. 903,455, Jun. 24, 1992, Pat. No. 5,357,883, which is a continuation-in-part of Ser. No. 857,426, Mar. 24, 1992, abandoned. This application Jan. 17, 1997, Ser. No. 785,598  
 Int. Cl.<sup>6</sup> B67D 5/40

U.S. Cl. 222—383.2

2 Claims

1. In an apparatus for spreading fertilizer slurry, including a vehicle and a holding tank mounted on the vehicle, wherein the holding tank includes at least a front wall and an opening located on the front wall near the bottom of the holding tank, and an annular wall defining an impeller pump area surrounds the opening and a door is hinged to the annular wall and closes on the annular wall surrounding the opening, an impeller pump wheel mounted on the door in the pump area facing the opening and an outlet pipe communicating through the annular wall with the impeller pump

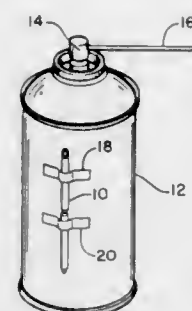


5,772,084  
STORAGE TUBE FOR SPRAY CAN EXTENDER TUBES  
William A. Yale, 600 W. Broadway, Ste. 2600, San Diego, Calif. 92101, and Max R. Yale, 4991 Mt. Helix Dr., La Mesa, Calif. 91941

Filed May 2, 1996, Ser. No. 640,545  
Int. Cl.<sup>6</sup> B65D 83/00

U.S. Cl. 222—402.1

17 Claims



area such that slurry in the holding tank can be pumped through the outlet pipe by rotating the impeller pump wheel in the door.

5,772,083  
PRESSURE RELIEF SYSTEM FOR PRESSURIZED CONTAINER

Gerard Joulia, Paris, France, assignor to L'Oreal, Paris, France

Filed Sep. 26, 1996, Ser. No. 721,381  
Claims priority, application France, Sep. 26, 1995, 95 11277  
Int. Cl.<sup>6</sup> F16K 17/02

U.S. Cl. 222—396

15 Claims

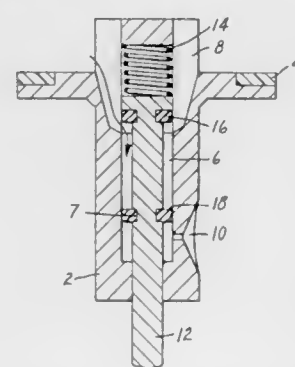


5,772,085  
FREE FLOW AEROSOL VALVES  
Andrew M. Bryant, Loughborough, Great Britain; Nicholas C. Miller, White Bear Lake, Minn., and Peter D. Hodson, Trowell, Great Britain, assignors to Minnesota Mining and Manufacturing, St. Paul, Minn.

Continuation-in-part of Ser. No. 401,965, Mar. 10, 1995, abandoned. This application Mar. 8, 1996, Ser. No. 612,593  
Int. Cl.<sup>6</sup> B65D 83/00

U.S. Cl. 222—402.2

18 Claims



1. A pressurized container containing a product to be dispensed and a propellant gas, the container comprising:

a closed reservoir; a cylindrical neck; a dispensing head mounted on the neck; and a safety device for preventing an accidental excess pressure inside the container;

wherein the safety device comprises:

annular resilient retaining means surrounding the neck of the reservoir, which is capable of tightly gripping the dispensing head on the neck of the reservoir in a leakproof manner when an internal pressure of the reservoir is below a predetermined value and, when the internal pressure exceeds said predetermined value, of moving said dispensing head away from the neck so as to create a communication between an inside of the container and atmosphere.

1. A metered dose dispensing valve for dispensing metered volumes of a pressurized aerosol formulation, the valve comprising:

a chamber;  
an outlet passage and  
a valve stem extending into the chamber and movable relative to the chamber between non-dispensing and dispensing positions, the valve stem having a configuration including an external surface and the chamber having an internal configuration including an internal surface such that a movable

metered volume of pressurized aerosol formulation is capable of being defined therebetween and such that during movement between its non-dispensing and dispensing positions the valve stem sequentially:

- allows free flow of aerosol formulation into and out of the chamber;
- defines a closed metered volume for pressurized aerosol formulation between the external surface of the valve stem and internal surface of the chamber; and
- moves with the closed metered volume within the chamber without decreasing the volume of the closed metered volume until the metered volume communicates with the outlet passage thereby allowing dispensing of the metered volume of pressurized aerosol formulation.

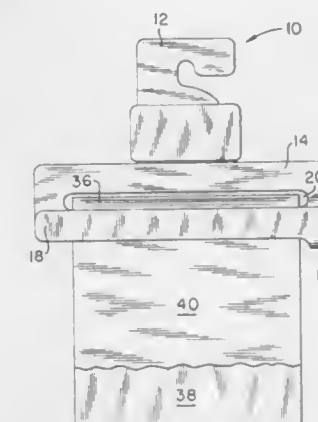
wherein the dome is rotatable relative to the lid in order to register the inlet port perforation with the particulate-receiving compartment for filling the particulate-receiving compartment with particulate, and in order to register the inlet port perforation with said blocking surface for preventing particulate from falling out of said particulate-receiving compartment; and wherein the cap is removable to allow particulate to exit the particulate-receiving compartment through the outlet port perforation.

5,772,087  
WALLET DISPLAY ASSEMBLY  
Chester Kolton, Westfield, N.J., assignor to B & G Plastics, Inc., Newark, N.J.

Filed Apr. 28, 1997, Ser. No. 848,526  
Int. Cl.<sup>6</sup> A47G 25/14; A45C 13/06

U.S. Cl. 223—1

5 Claims



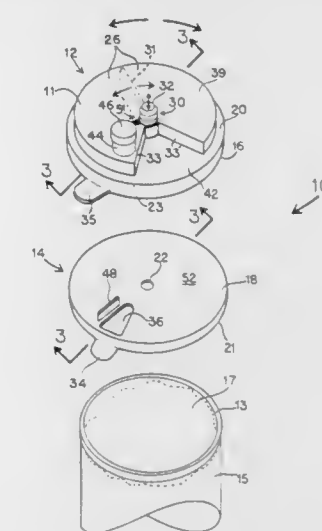
5,772,086  
PARTICULATE DISPENSER

Randall Krafft, 4951-B E. Adamo, Dr., Ste.238, Tampa, Fla. 33605

U.S. Cl. 222—438

14 Claims

Filed Apr. 9, 1997, Ser. No. 840,087  
Int. Cl.<sup>6</sup> G01F 11/46



1. A dispenser for connection to a particulate container, the dispenser comprising:

- a dome having a dome wall defining an interior space and a mouth into said interior space, and having an axis, a lower surface with an outer perimeter, an outlet port perforation; a cap for covering said outlet port perforation; and a hole through the dome wall near the dome axis;
- a generally circular lid having an axis and an upper surface with an outer perimeter, an inlet port perforation, and means for connecting the lid to the particulate container;
- means for connecting the lid to the dome substantially across the dome mouth, so that the dome is coaxial with and rotatable relative to the lid and so that the lid upper surface outer perimeter and dome lower surface outer perimeter are in slideable contact;
- a protrusion into the interior space, the protrusion having a lower blocking surface contacting the lid upper surface; and a partition comprising:
- a shaft rotatably mounted in the interior space and having a shaft upper portion rotatably extending into the dome wall hole;
- a paddle rigidly connected to and extending out from the shaft and across the interior space toward the dome wall for dividing the interior space into a particulate-receiving compartment and an empty compartment; and
- a means for locking the paddle in a desired radial position in the dome interior space to determine the relative size of the particulate-receiving and empty compartments;

5,772,088  
ADJUSTABLE INFANT CARRIER  
Elizabeth Nelson, Walpole, Mass., assignor to The First Years Inc., Avon, Mass.

Filed Nov. 9, 1995, Ser. No. 556,039  
Int. Cl.<sup>6</sup> A61G 1/00

U.S. Cl. 224—160

25 Claims

- An infant carrier comprising
- a sack of flexible material dimensioned to receive and surround an infant so that the legs of the infant are within the sack, the sack having a lower front portion and a rear portion;
- a divider, positioned at the portion of the sack surrounding the infant's legs to define a compartment for each of the infant's legs;
- an elongate crotch portion extending from the lower front portion of the sack to the rear of the sack and positioned to be placed between the infant's legs to support the infant during carrying;
- an adjustment device, positioned on said crotch portion, movable between a plurality of positions to vary the length of said elongate crotch portion, said adjustment device comprising an



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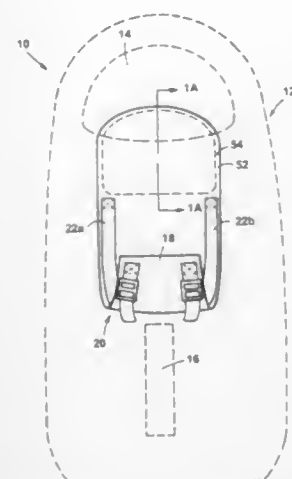
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adjustable strap extending longitudinally along said elongate crotch portion and having two opposite ends secured to two longitudinally spaced regions of said crotch portion, and a fastener capable of adjusting the distance between the two spaced regions; and  
a pair of shoulder straps mounted on the sack, said straps being dimensioned to extend over the shoulders of an adult to allow the sack to be carried.

5,772,089

## BATON CARRIER FOR EXPANDABLE BATONS

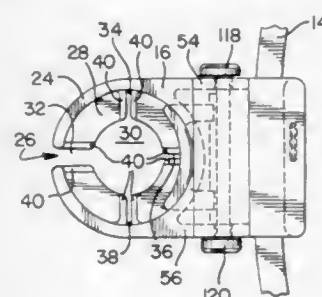
Kevin L. Parsons, and Jerome J. Weber, both of Appleton, Wis., assignors to Armament Systems and Procedures, Appleton, Wis.

Continuation of Ser. No. 401,101, Mar. 8, 1995, Pat. No. 5,617,980, which is a division of Ser. No. 216,745, Mar. 23, 1994, Pat. No. 5,449,104. This application Sep. 18, 1996, Ser. No. 715,678

Int. Cl.<sup>6</sup> A45F 5/00

U.S. Cl. 224—251

1 Claim



1. A baton carrier for use in combination with an expandable baton, the baton carrier adapted for holding an expandable baton in both an open, extended and a closed, retracted condition when the holder is secured to a user's person, the baton of the telescoping type with an enlarged handle for nesting axially aligned, successively smaller telescoping sections and an enlarged outer tip, the baton carrier comprising:

- a baton holder having an elongated cylindrical wall defining an elongated interior chamber for engaging and holding the handle of the expandable baton substantially along a longitudinal axis of the interior chamber, an open top and a substantially, closed bottom;
- the closed bottom having an opening therein, said opening sized so that the baton handle will not pass through the opening but at least one of the telescoping sections can pass through the opening, said opening in the closed bottom being slightly smaller than the enlarged outer tip of the baton to assure that the tip does not fall through the opening when the baton is seated in the holder and the baton is in the retracted position;

- at least one deformable tab in said bottom, said tab in a plane substantially perpendicular to the longitudinal axis of the interior chamber, said tab defining the opening in said bottom, said tab for supporting the enlarged outer tip of the baton when the baton is seated in the holder and the baton is in the retracted position, said tab deformable for facilitating expansion of the opening wherein the opening is adapted to enlarge sufficiently to permit the baton tip to pass therethrough when the baton is in the extended position and an axial force is applied to the baton; and
- an attachment assembly for securing the holder on a user's person.

5,772,090

## GOLF BALL CARRIER

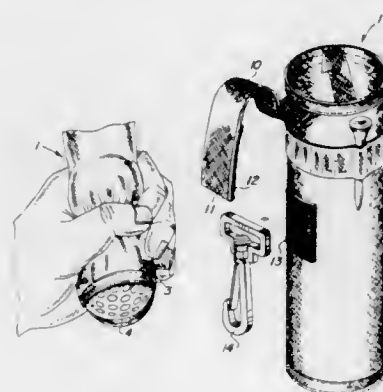
Samuel I. Rodriguez, 1304 Five Star Blvd., Cottonwood, Ariz. 86326

Filed Mar. 26, 1997, Ser. No. 824,904

Int. Cl.<sup>6</sup> B60R 9/00

U.S. Cl. 224—251

12 Claims



1. A golf ball carrier for transporting a plurality of golf balls comprising a sleeve of padded fabric having a diameter slightly greater than that of a golf ball and having first and second open ends; and elastic retaining bands attached to the sleeve and respectively positioned across the center of each of the open ends so as to retain golf balls when placed in the sleeve.

5,772,091

## SUPPORT APPARATUS FOR A MUSICAL INSTRUMENT

Carl J. Lackner, 25005 Rainbow Dr., Olmsted Township, Ohio 44138

Filed Apr. 7, 1997, Ser. No. 838,441

Int. Cl.<sup>6</sup> A45F 5/00; G10D 9/00

U.S. Cl. 224—265

15 Claims

1. An apparatus for supporting the weight of a musical instrument at least substantially on the hips and back of a musician, said apparatus comprising:

- a clip selectively engageable with a rear portion of a belt of a musician;
- at least one substantially rigid member extending from said clip for engaging said back of said musician, said at least one substantially rigid member including a curved portion opposite said clip for extending over and at least partially around a shoulder of said musician in conformity therewith such that a distal end of said at least one substantially rigid member is positioned adjacent a front portion of said musician;
- at least one strap connected to said distal end of said at least one substantially rigid member; and,

5,772,094

## CUTTING BLADE

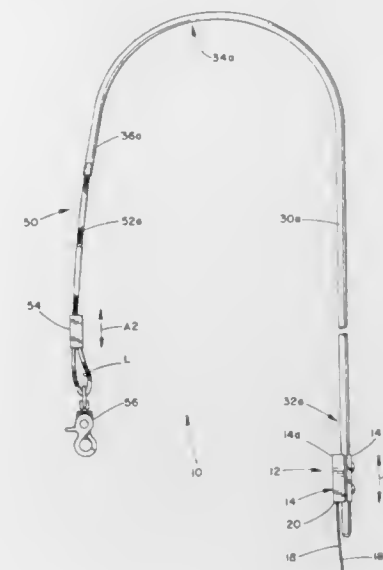
Ian R. Kaiser, La Canada; Michael C. Kaiser, and Sean A. Neiberger, both of Malibu, all of Calif., assignors to Allen-Reed Company, Inc., Los Angeles, Calif.

Filed Oct. 24, 1995, Ser. No. 547,527

Int. Cl.<sup>6</sup> B26F 3/02

U.S. Cl. 225—91

8 Claims



a clip connected to the at least one strap for releasably connecting a musical instrument to said at least one strap.

5,772,092

Patent Not Issued For This Number

5,772,093

## METHOD AND APPARATUS FOR SPLITTING A CATHODE RAY TUBE

Kouzi Kanehira, Chiba, Japan, assignor to Sony Corporation, Japan

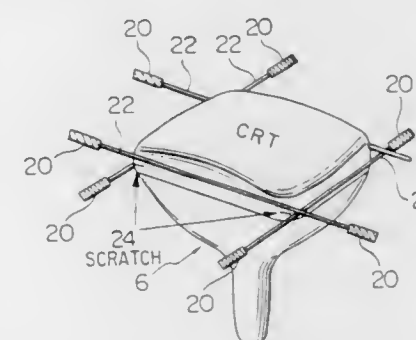
Continuation of Ser. No. 265,768, Jun. 27, 1994, Pat. No. 5,556,018. This application Mar. 19, 1996, Ser. No. 618,201

Claims priority, application Japan, Jul. 9, 1993, P05-170518

Int. Cl.<sup>6</sup> H01J 9/50

U.S. Cl. 225—2

8 Claims



1. A method for splitting a cathode ray tube comprising: making a scratch on at least one corner of a panel portion of the cathode ray tube; applying heat with heating elements in a linear manner so as to flank the scratch from both sides of the scratch; applying tension to said heating elements with springs; wherein said heating elements have slide movement capability for sliding, permitting adjustment to different size cathode ray tubes.

5,772,095

## ROLL TYPE STOCK FEED APPARATUS

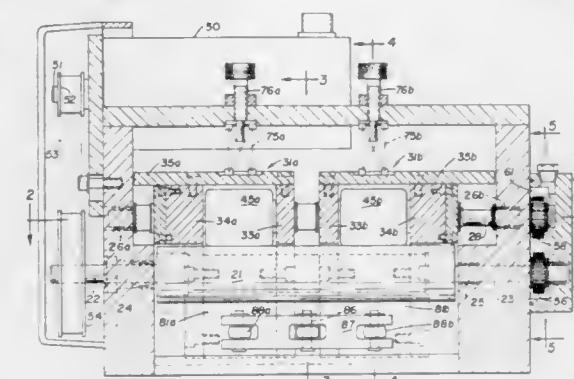
Richard D. Nordlof, Rockford, Ill., assignor to Mechanical Tool & Engineering Co., Rockford, Ill.

Filed Jan. 8, 1997, Ser. No. 779,805

Int. Cl.<sup>6</sup> B65H 20/24; 20/00

U.S. Cl. 226—109

8 Claims



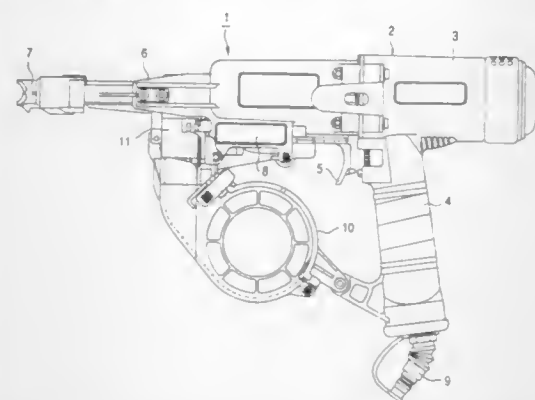
1. A roll type stock feed apparatus comprising, a rigid frame, a lower feed roll rotatably mounted for axial rotation on the frame, a cross-shaft mounted for axial rotation on the frame parallel to said lower feed roll, first and second upper roll carriers mounted for independent vertical pivotal movement on the crossshaft at spaced locations along the cross-shaft, first and second upper feed rolls respectively mounted on the first and second upper roll carriers for rotation about axes parallel to the cross-shaft, first and second means respectively engaging the first and second upper roll carriers for pressing the first and second upper feed rolls in a direction toward the lower feed roll, drive means including a drive motor for driving the lower feed roll and the cross-shaft in timed relation.

first and second upper roll gears respectively drivingly connected to the first and second upper feed rolls, and first and second upper roll drive gears mounted on the cross-shaft for rotation therewith and respectively meshing with the upper roll gears for driving the first and second upper feed rolls in response to rotation of the cross-shaft.

**5,772,096**  
**TRIGGER DEVICE FOR BOX NAILING MACHINE AND BOX NAILING MACHINE HAVING THE SAME**  
Satoshi Osuka; Noboru Ishikawa; Michiaki Adachi; Terufumi Hamano; Youichi Kimura, and Hiroshi Hanagasaki, all of Tokyo, Japan, assignors to Max Co., Ltd., Tokyo, Japan  
Filed Apr. 5, 1996, Ser. No. 628,465  
Claims priority, application Japan, Apr. 5, 1995, 7-080614  
Int. Cl.<sup>6</sup> B25C 1/06

U.S. Cl. 227—5

2 Claims



1. A trigger device for a box nailing machine, the box nailing machine including a piston driving a nail, a cylinder accommodating the piston, a main selector valve for introducing compressed air into the cylinder and discharging the compressed air from the cylinder, a start operation valve for operating the main selector valve, a trigger lever and a contact arm, said trigger device comprising:

- a trigger switch operated by the trigger lever;
- a contact switch operated by the contact arm;
- an electromagnetic valve serving as the start operation valve;
- a logical circuit for applying a drive current to said electromagnetic valve when both said trigger switch and said contact switch turn on; and
- control means including a timer having a predetermined time period that begins with a trigger signal of said trigger switch and resets upon release of said trigger switch, said control means prohibiting the drive current from applying to said electromagnetic valve when said timer counts the predetermined time period.

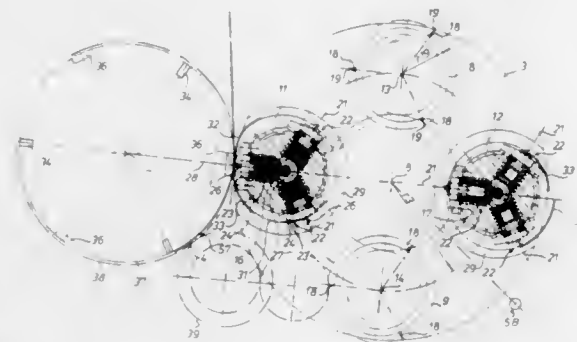
**5,772,097**  
**BINDING DEVICE**  
Bernd Anton Hillebrand, Bergheinfeld, Germany, assignor to Koenig & Bauer-Albert Aktiengesellschaft, Würzburg, Germany  
Filed May 20, 1996, Ser. No. 650,822  
Claims priority, application Germany, May 20, 1995, 195 18 652.4

Int. Cl.<sup>6</sup> B41F 13/64  
U.S. Cl. 227—81

5 Claims

1. A binding device usable for binding signatures in a folding apparatus of a rotary printing press comprising:

- a collection and counter-cylinder having a plurality of fixed closure counter supports positioned on a peripheral surface of said collection and counter-cylinder, said collection and counter-cylinder being supporting for rotation;



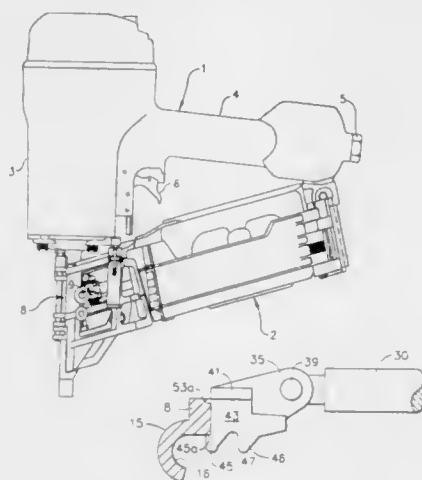
at least one binding cylinder having a plurality of stapler heads, with each of said stapler heads being engageable with a cooperating one of said closure counter supports;

- a binding cylinder support cooperatively positioned with respect to said collection and counter-cylinder, said binding cylinder support being rotatable at a first speed, said at least one binding cylinder being rotatably supported on said binding cylinder support for rotation with, and with respect to said binding cylinder support; and
- a plurality of bending horns on said binding cylinder support, said plurality of bending horns being positioned in an interior portion of said binding cylinder support and cooperating with said at least one binding cylinder.

**5,772,098**  
**FEED ASSEMBLY FOR A FASTENER DRIVING TOOL**  
John P. Crutcher, Cincinnati, Ohio, assignor to Senco Products, Inc., Cincinnati, Ohio  
Filed Mar. 29, 1996, Ser. No. 623,750  
Int. Cl.<sup>6</sup> B25C 1/04

U.S. Cl. 227—119

1 Claim

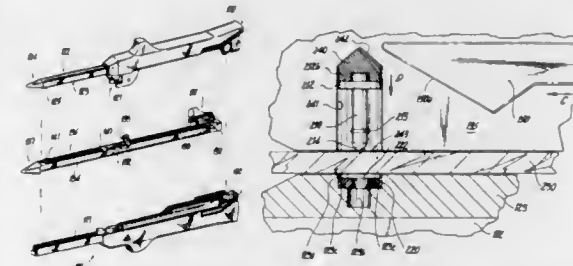


1. A pawl-type nail feed assembly for a nail driving tool of the type having a coiled strip of nails, a canister-type magazine for said coiled nails and a guide body having a drive track formed therein together with a fixed wall and a gate forming a passage between said magazine and said drive track for said nails, said nail feed assembly comprising an air cylinder with a piston rod, a feed pawl pivotally attached to said piston rod, said pawl being shiftable by said piston rod between a rearward position wherein said pawl engages a nail of said strip other than the forwardmost nail thereof and a forward position wherein said forwardmost nail of said strip is located in said drive track, ledgelike surfaces on said pawl, said ledgelike surfaces engaging said fixed wall of said guide body, when said pawl is in said forwardmost position, whereby displacement of said pawl is precluded during the nail driving part of the cycle of said tool.

**5,772,099**  
**SURGICAL FASTENING APPARATUS WITH ALIGNMENT PIN**  
Roy D. Gravener, Fairfield, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.  
Filed Apr. 1, 1996, Ser. No. 625,150  
Int. Cl.<sup>6</sup> A61B 17/068

U.S. Cl. 227—176.1

14 Claims



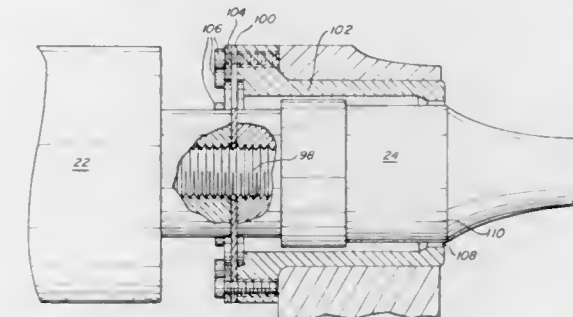
1. A surgical apparatus for sequentially applying a plurality of surgical fasteners to body tissue, which comprises:

- a) holding means for holding a plurality of surgical fasteners in at least two parallel rows oriented along a lengthwise axis of the apparatus;
- b) anvil means for closing said fasteners;
- c) drive means movable along said lengthwise axis of the apparatus between a proximal position and a distal position for sequentially driving said fasteners from said holding means and into contact with said anvil means to effect closure of said fasteners; and,
- d) alignment means located distally to said rows of fasteners for facilitating and indicating alignment between said holding means and said anvil means, said alignment means comprising at least one pin slidably mounted within a slot in one of said holding means or said anvil means and movable into engagement with an aperture in the other of said holding means or said anvil means in response to movement of said drive means from said proximal position toward said distal position.

**5,772,100**  
**ULTRASONIC WELDER WITH DYNAMIC NODAL HORN SUPPORT**  
Michael Patrikios, Stratford, Conn., assignor to American Technology, Inc., Shelton, Conn.  
Filed Mar. 22, 1996, Ser. No. 621,089  
Int. Cl.<sup>6</sup> B23K 20/10

U.S. Cl. 228—1.1

8 Claims



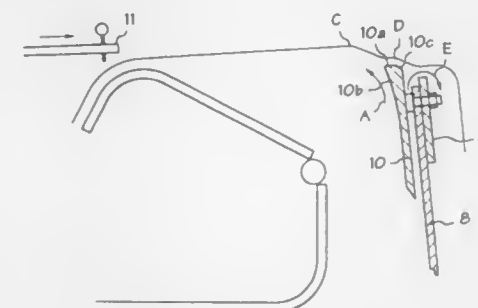
8. An ultrasonic welder having a dynamic nodal horn support for improving transmission of transducer energy to the weld, comprising:

- a base;
- an ultrasonic transducer mounted to said base;
- a horn having a weld tip said horn mounted to said base along an axis of said ultrasonic transducer;
- a collar for radially supporting said horn at its nodal point; and
- a spring for axially, movably mounting said collar to said horn.

**5,772,101**  
**WAVE SOLDERING MACHINE**  
Tetsuro Nishimura, Osaka, and Yasuo Seo, Kanagawa, both of Japan, assignors to NS Tekuno Co., Ltd., Japan  
Filed Aug. 5, 1996, Ser. No. 693,916  
Claims priority, application Japan, Aug. 7, 1995, 7-222546; Jan. 12, 1996, 8-021883; Feb. 26, 1996, 8-065460  
Int. Cl.<sup>6</sup> B23K 3/06; H05K 3/34

U.S. Cl. 228—37

6 Claims



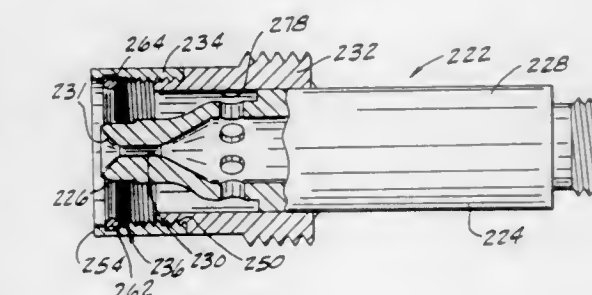
1. A wave soldering machine positioned in the middle of the transport path of a printed circuit board and welling up a solder wave upward by means of a pump, comprising:

- a nozzle formed of a front upright, a rear upright and side plates, a rear baffle plate extended from the top edge of the rear upright in a manner that the height of the rear baffle plate is adjusted, and
- a generally L-shaped front baffle plate having a large radius of curvature pivotally attached to the top edge of the front upright, whereby a solder wave formed on the top end of the rear baffle plate by surface tension of molten solder flows along the top surface of the front baffle plate, wherein the rear baffle plate is mounted to the side of the rear upright facing the front baffle plate and the rear baffle plate has a flat top support portion, and a curvature front portion for forming the solder wave.

**5,772,102**  
**GAS LENS ASSEMBLY**  
Kent Miles New, Wichita, Kans.; William Owen Mofield, O'Fallon, Mo., and Dale Robert Bervig, Wichita, Kans., assignors to Tweco Products, Inc., Wichita, Kans.  
Continuation-in-part of Ser. No. 634,796, Apr. 19, 1996, abandoned. This application Jan. 24, 1997, Ser. No. 788,773  
Int. Cl.<sup>6</sup> B23K 9/16

U.S. Cl. 228—42

21 Claims



1. A gas lens assembly for an arc welding torch, comprising a lens body having a rearward end and a forward end, a passage through the lens body from its forward end to its rearward end for receiving an electrode therethrough and for permitting flow of an inert gas in a forward direction in said passage,

- a lens housing secured to the lens body and defining a chamber around a forward end portion of the lens body,



one or more openings in the forward end portion of the lens body enabling said inert gas to flow from said passage into said chamber,

a flow control device associated with said housing through which said inert gas is adapted to flow in a forward direction, said flow control device controlling the flow of said inert gas therethrough so that the gas exits the flow control device as a laminar stream of gas moving in a forward direction, said laminar stream being adapted to blanket a weld puddle during a welding operation on a workpiece, and

a holder for said flow control device releasably and removably attached to said lens housing whereby the flow control member may readily be replaced.

5,772,103

# METHOD AND APPARATUS FOR FRICTION TORQUE WELDING

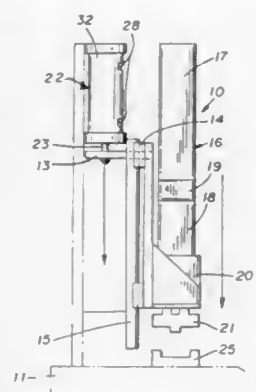
David V. Hofius, Sr., 235 Pierce Ave., and Mark W. Hofius, 429 Line St., both of Sharpville, Pa. 16150

Filed Sep. 25, 1996, Ser. No. 719,428

Int. Cl.<sup>6</sup> B23K 20/12

U.S. Cl. 228—114.5

8 Claims



1. A method of friction welding of parts comprising: providing parts to be welded, providing a source of rotation for one of said parts, providing a clamping and stabilization means for said parts, providing predetermined pressure on said parts prior to rotation, cycling said source of rotation on and off within milliseconds, providing rotational orientation of said cycle rotation source, and means for cycle and orientation of said source of rotation.

5,772,104

# METHODS OF BRAZING AND PREPARING ARTICLES FOR BRAZING, AND COATING COMPOSITION FOR USE IN SUCH METHODS

Roger Paulman, Barrington, Ill., assignor to Peerless of America Incorporated, Lincolnshire, Ill.

Filed Aug. 26, 1996, Ser. No. 703,021

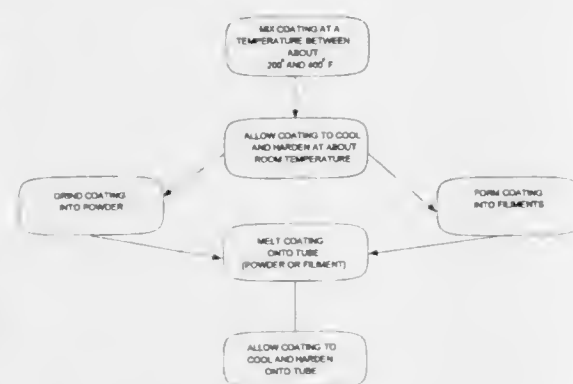
Int. Cl.<sup>6</sup> B23K 1/00; B23K 35/365

U.S. Cl. 228—175

38 Claims

28. A method of coating an article, said method comprising the steps of: providing an article for coating;

mixing a hot melt adhesive medium with at least one coating material at a temperature sufficient to melt said hot melt adhesive medium to form a coating composition of said hot melt adhesive medium and said at least one coating material;



then, applying said coating composition to said article; and thereafter, allowing said coating composition to cool and harden onto said surface of said article.

5,772,105

# CLAD SHAPE MEMORY ALLOY COMPOSITE STRUCTURE AND METHOD

Gholam Reza Zadno-Azizi, Newark; Raj Subramaniam, Fremont, and Mir A. Imran, Palo Alto, all of Calif., assignors to Surface Genesis, Inc., Menlo Park, Calif.

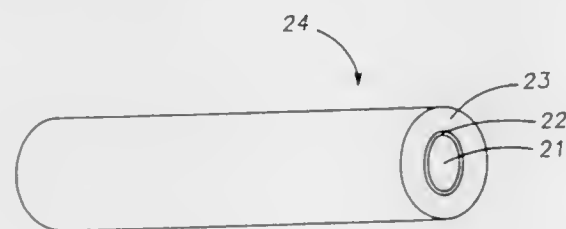
Division of Ser. No. 507,752, Jul. 26, 1995, Pat. No. 5,611,874.

This application Dec. 17, 1996, Ser. No. 767,631

Int. Cl.<sup>6</sup> B23K 31/02

U.S. Cl. 228—175

10 Claims



1. A method for forming a composite structure from first and second different materials in which at least one of the first and second different materials is a shape memory alloy having a hardness and the other of the two different materials excludes a shape memory material and has a surface hardness less than that of the shape memory alloy comprising the steps of providing a first body of one of the materials having a surface and placing a second body of the other material into contact with the surface of the first body to form an assembly, drawing down the assembly to a reduced cross-sectional area to establish intimate strong adhesive mechanical contact between the surface of the first body and the second body to provide cladding in contact with the surface.

5,772,106

# PRINthead FOR LIQUID METALS AND METHOD OF USE

Scott D. Ayers, Richardson; Donald J. Hayes, Plano; Michael T. Boldman, Murphy, and David B. Wallace, Dallas, all of Tex., assignors to MicroFab Technologies, Inc., Plano, Tex.

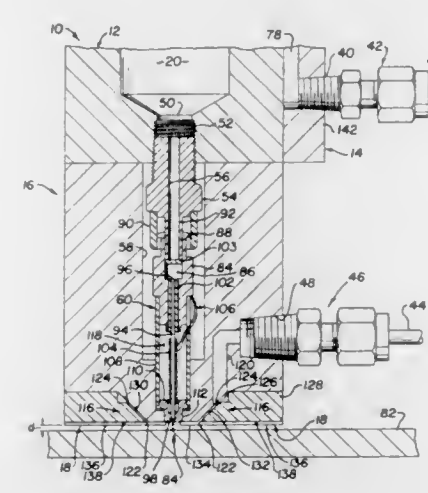
Filed Dec. 29, 1995, Ser. No. 581,273

Int. Cl.<sup>6</sup> B23K 3/06

U.S. Cl. 228—254

31 Claims

1. A compact printhead assembly adapted to operate without confinement in a controlled atmosphere chamber, the printhead being configured to eject liquid solder droplets onto a workpiece through its own controlled atmosphere designed to inhibit oxidation of the ejected droplets in a space between a working surface at one end of the printhead assembly and the workpiece, the assembly comprising:



tion of the ejected droplets in a space between a working surface at one end of the printhead assembly and the workpiece, the assembly comprising:

a heated housing having a reservoir for holding melted solder and an end having a working surface, the housing having a heating means;

the working surface being spaced apart from the reservoir by a portion of the housing containing an internal cavity extending from the reservoir to the working surface;

a solder jetting device positioned within the internal cavity of said portion of the housing, said jetting device being adapted to controllably eject droplets of melted liquid solder received from the reservoir in the housing, the jetting device comprising an electro-mechanical transducer in contact with an elongated conduit having an inlet end in communication with the melted solder and an outlet end having an exit orifice positioned adjacent said working surface, configured to emit said solder droplets outwardly away from said working surface;

said working surface being a generally flat surface surrounding the outlet of the solder jetting device extending laterally a sufficient distance to confine a blanket of flowing inert gas within a gap established between the working surface and said workpiece; and

means for uniformly distributing a flow of inert gas around the exit orifice whereby said gas flows outwardly from the working surface, traversing said gap established between the working surface and a workpiece when the printhead is positioned for soldering use over a workpiece in order to provide a sufficient protective atmosphere around solder droplets emitted from the exit orifice by the jetting device to permit solder deposition without damaging oxidation.

5,772,107

# VENTILATED BOXES

Gordon M. Younger, 3701 S. Norfolk, Seattle, Wash. 98118-5639

Continuation of Ser. No. 447,970, May 23, 1995, abandoned, which is a division of Ser. No. 235,665, Apr. 29, 1994, abandoned. This application Oct. 28, 1996, Ser. No. 738,178

Int. Cl.<sup>6</sup> B65D 5/32

U.S. Cl. 229—23 R

5 Claims

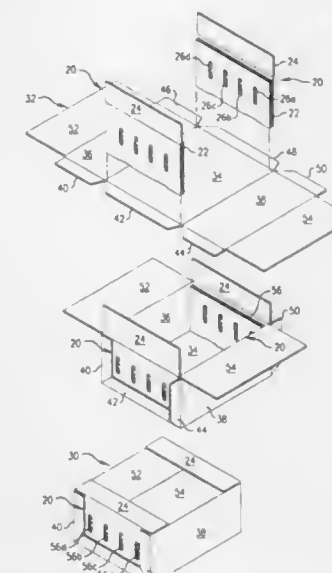
1. Ventilation panels manufactured by a method which comprises the steps of:

providing blanks with complementary ventilation openings in first, second, and third integral segments thereof;

folding the second, integral segment of each of each of said blanks over and into contact with said first integral segment;

advancing said blanks serially to a screen applicator station;

supplying to said applicator station screen stock material having openings sufficiently small to bar insects but large enough for the ingress and egress of gases;



cutting screens from said stock material at the applicator station in timed relationship to the arrival of said blanks at said applicator station;

adhesively bonding said screens to the third segments of said blanks over the ventilation openings in said third segments; and thereafter

mechanically folding the first and second, integral segments of each said blank over the screen bonded to the third segment of that blank and into adhesively bonded relationship with said third segment such that the screen is trapped between said first and third segments and the ventilation openings in the first, second, and third segments are aligned.

5,772,108

# REINFORCED PAPERBOARD CONTAINER

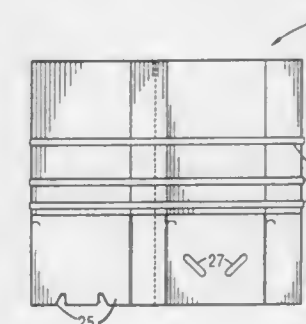
Thomas S. Ruggiere, Sr., Athens, Ga.; Marvin A. Doula, Lexington, S.C.; Thomas S. Ruggiere, Jr., Athens, and John B. Weck, Lawrenceville, both of Ga., assignors to Con Pac South, Inc., Athens, Ga.

Filed Apr. 24, 1996, Ser. No. 638,960

Int. Cl.<sup>6</sup> B65D 5/42

U.S. Cl. 229—109

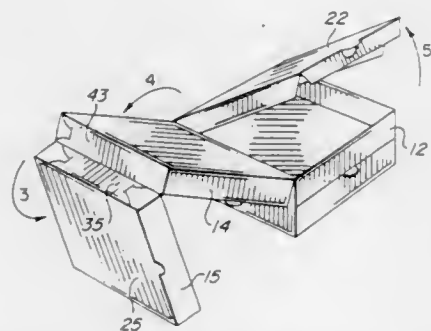
23 Claims



1. A reinforced paperboard container moveable from a flattened condition to an erected condition, the container comprising: panels formed from a flat blank of paperboard scored to form multiple parallel panels joined to one another along adjacent sides, each panel having a flap extending from an end in prolongation of the panel, each panel being creased at its juncture with its associated flap and adjacent flaps being separated from one another by a slit, whereby the panels and flaps may be folded inwardly to one another for forming a hollow body with the flaps at the panel ends overlaying one another and the panels forming container side walls;

a sealed joint connecting opposing end panels for forming a continuous panel arrangement while the container is in both a flattened condition and an erected condition, the joint being vertically disposed when the container is in the erected position; and

strap means for providing girth support to the container when in the erected position, the strap means continuously formed about an outside surface of the panels in a container wall supporting arrangement relationship thereto, the strap means providing horizontal girth support disposed longitudinally at spaced locations along the panels, each location having a greater separation from an adjacent lower location when the container is in its erected position for providing a greater support at lower portions of the container.



5,772,109

## CARTON HANDLE ASSEMBLY

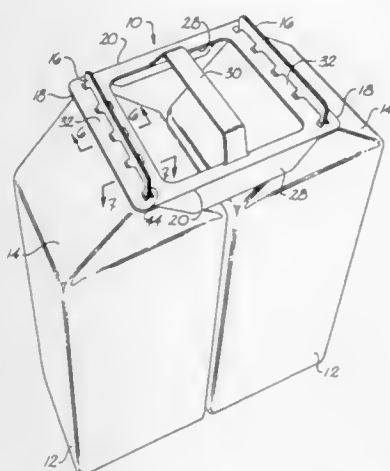
H. Scott Phipps, Easley, S.C., assignor to Package Supply & Equipment Co., Inc., Greenville, S.C.

Filed Aug. 30, 1996, Ser. No. 704,934

Int. Cl.<sup>6</sup> B65D 77/00

U.S. Cl. 229—117.23

20 Claims



1. A handle assembly for use with cartons having vertical tabs extending above the carton, said handle assembly comprising:

at least one elongated receiver structure having a longitudinal slot defined therethrough for receipt of the vertical tab, said receiver structure defining a plurality of side teeth extending into said slot transversely to the longitudinal axis thereof such that said side teeth lockingly engage the tab when the carton is suspended from said elongated receiver structure by its tab; and

a handle attached to said at least one elongated receiver structure, said handle being configured to be gripped by hand and to convey an upward force to said at least one elongated receiver structure so that said receiver structure grips the vertical tab at said longitudinal slot to lift the carton.

5,772,110

## STACKABLE SERIES OF INTERCONNECTED BOXES

John E. Garretson, 3521 E. Rose La., Paradise Valley, Ariz. 85253

Filed May 19, 1997, Ser. No. 858,855

Int. Cl.<sup>6</sup> B65D 25/04

U.S. Cl. 229—120.21

10 Claims

1. A series of interconnected parallelepiped boxes forming a stack, said series comprising:

a) a bottom box, a first intermediate box and a top box in the stack, each box having a lid, a bottom panel, first and second opposing free walls and first and second opposing interconnect walls extending therebetween;

- b) said bottom box forming the base of the stack, the lid of said bottom box facing upward when in said stack;
- c) said first intermediate box having an upward-facing lid when in said stack, the first interconnect wall of the first intermediate box being hingedly attached to the vertically-adjacent second interconnect wall of the bottom box;
- d) said top box having an upward-facing lid when in said stack, the first interconnect wall of the top box being hingedly attached to the vertically-adjacent second interconnect wall of the first intermediate box whereby the series of boxes form a vertical stack having upward-facing lids, said lids being successively accessible upon movement of the preceding boxes in the stack.

5,772,111

## CONTAINER STRUCTURE

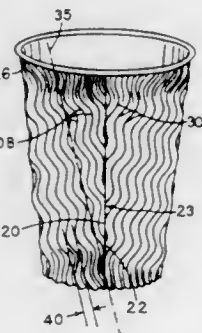
John M. Kirsch, 1720 Casimir Rd., Stevens Point, Wis. 54481

Filed May 1, 1996, Ser. No. 640,521

Int. Cl.<sup>6</sup> B65D 3/22

U.S. Cl. 229—403

51 Claims



1. A container, comprising:

(a) an enclosing sidewall surrounding and defining an opening and defining a circumference thereabout; and

(b) a bottom wall closing off the opening at one end thereof, said sidewall comprising a substrate layer, and a corrugated medium secured to said substrate layer, said sidewall having a top edge and a bottom edge, said corrugated medium including a plurality of generally longitudinal flutes extending upwardly, along flute paths, on said sidewall to a locus adjacent said top edge, the flute paths following alternating lateral divergences from respective generally upstanding axes.

5,772,112

## RECYCLING DEVICE

Ronald R. Bulcroft, 4041 Lydgate Dr., North Olmstead, Ohio 44070

Filed May 14, 1996, Ser. No. 645,529

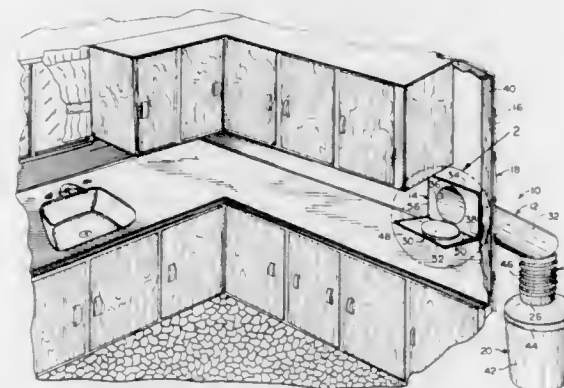
Int. Cl.<sup>6</sup> B65G 11/04

U.S. Cl. 232—44

15 Claims

1. A recycling device comprising:

a) a first chute;



- b) means for mounting an upper end of said first chute through an exterior wall of a building, so that said first chute will extend at an angle down and away from the exterior wall;
- c) a first container having an open top, said first container located on the ground under a lower end of said first chute outside the exterior wall of the building;
- d) a first lid on the open top of said container;
- e) a first collar extending up from said first lid;
- f) a first flexible coupling member attached between the lower end of said first chute and said first collar, so that said first container can receive useful recyclable materials that are inserted into said first chute from within the building and said first flexible coupling member will allow said first lid to be lifted off of the open top of said first container, when the useful recyclable materials fill up said first container;
- g) a second chute having an upper end attached into a side of said first chute adjacent said mounting means, so that said second chute will extend at an angle down and away from the exterior wall of the building;
- h) a second container having an open top; said second container located on the ground under a lower end of said second chute outside the exterior wall of the building;
- i) a second lid on the open top of said second container;
- j) a second collar extending up from said second lid; and
- k) a second flexible coupling member attached between the lower end of said second chute and said second collar, so that said second container can receive useful recyclable materials that are inserted into said second chute from within the building and said second flexible coupling member will allow said second lid to be lifted off of the open top of said second container, when the useful recyclable materials fill up said second container.

5,772,113

## TWO-PIPE HEAT PUMP SYSTEM WITH ISOLATED TANK COIL FOR DOMESTIC HOT WATER

Joseph Gerstmann, Framingham, Mass., and Paul F. Swenson, Cleveland, Ohio, assignors to Advanced Mechanical Technology, Inc., Watertown, Mass.

Continuation-in-part of Ser. No. 336,985, Nov. 10, 1994, Pat. No. 5,558,273. This application Sep. 20, 1996, Ser. No. 717,287

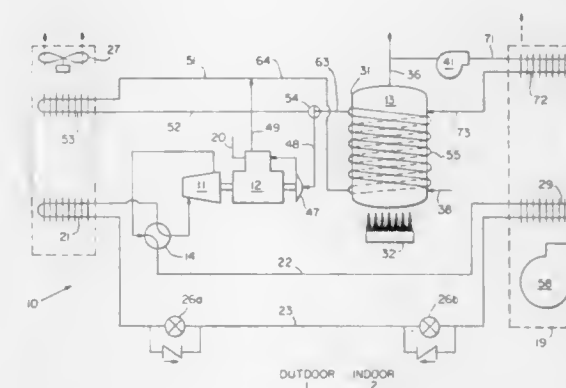
Int. Cl.<sup>6</sup> F24D 3/00

U.S. Cl. 237—8 R

23 Claims

1. A heat pump system comprising:

a compressor which supplies a refrigerant for air conditioning; an internal combustion engine which drives the compressor and passes its waste heat to an engine coolant; a water heater which supplies hot water; a coolant-to-water heat exchanger through which the engine coolant is circulated to transfer its heat to water in the water heater; and



a water-to-air coil through which water from the water heater is circulated to transfer its heat to air.

5,772,114

## INDIVIDUALLY CONTROLLED NOZZLE VALVE SYSTEM FOR APPLICATION OF LIQUID FERTILIZER/CHEMICALS

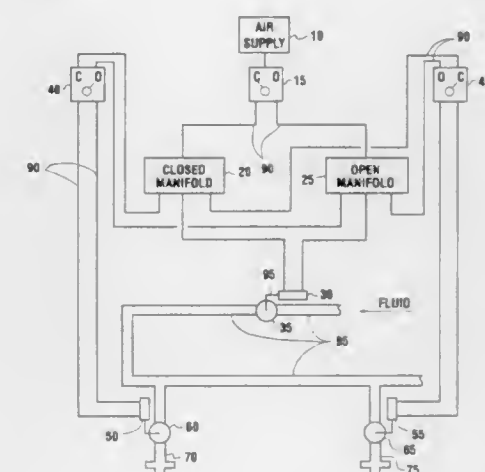
Paul Hunter, 3133 Willow, American Falls, Id. 83211

Filed May 9, 1996, Ser. No. 647,204

Int. Cl.<sup>6</sup> A01G 27/00

U.S. Cl. 239—67

24 Claims



14. A system for applying fluid to a ground surface, the system comprising:

- (a) a plurality of main valves;
- (b) a plurality of nozzle valves for each main valve;
- (c) at least one boom, wherein at least one of the main valves and the respective nozzle valves are mounted on the at least one boom;
- (d) first control means for operating each main valve and each nozzle valve so that each main valve and each respective nozzle valve close essentially concurrently;
- (e) second control means for operating each nozzle valve so that each nozzle valve is, selectively, opened or closed independently of each other nozzle valve, provided the first control means has not closed the nozzle valves; and
- (f) piping means for directing the fluid, the piping means communicating with each main valve and each respective nozzle valve, wherein the fluid is first directed to each main valve, then through each main valve which is open, then to each respective nozzle valve of each main valve which is open, then through each respective nozzle valve which is open, wherein the first control means must operate to open the main valve for the second control means to selectively open each nozzle valve.



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OFFICIAL GAZETTE

JUNE 30, 1998

5,772,115  
LAWN AND GARDEN FERTILIZER DISTRIBUTING  
SYSTEM

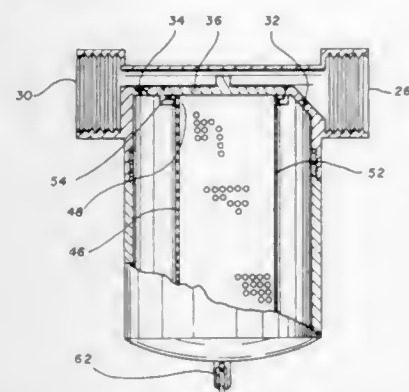
Mitchal L. Vaughn, 27722 Sutters Pointe Dr., Santa Clarita,  
Calif. 91350

Filed Oct. 11, 1996, Ser. No. 729,998

Int. Cl.<sup>6</sup> B01D 11/02

U.S. Cl. 239—69

5 Claims



2. A lawn and garden fertilizer distributing system comprising:  
a tank having an aperture through a lower end thereof;  
a tank lid adapted for removable coupling with the tank, the tank lid having a recessed aperture therethrough, the tank lid having a hose inlet port and a hose outlet port, the recessed aperture having a lid removably coupled thereto, the inlet port having a hose extending outwardly therefrom, the hose coupling with an existing main water line, the outlet port having a hose connector extending outwardly therefrom;  
a screen basket positioned within the tank through the recessed aperture of the tank lid;  
wherein the inlet port having an angularly disposed fill hole extending through the tank lid so as to be in fluid communication with the tank.

5,772,116  
RECIRCULATING PAINT SYSTEM HAVING AN  
IMPROVED SPRAY GUN

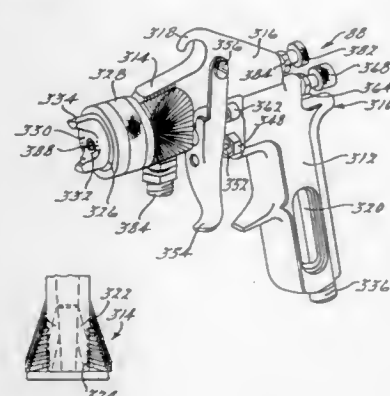
Earl R. Holt, 3738 Cherrywood Ct., Rochester Hills, Mich.  
48309

Continuation-in-part of Ser. No. 503,979, Jul. 19, 1995, which  
is a continuation-in-part of Ser. No. 161,825, Dec. 2, 1993,  
Pat. No. 5,501,397. This application Jun. 6, 1996, Ser. No.  
659,635

Int. Cl.<sup>6</sup> F16L 37/28

U.S. Cl. 239—124

31 Claims



11. A body of a spray gun for a recirculating paint supply  
system, said body comprising:  
a head having an enlarged conical portion defining a plurality of  
first air passages;

a neck defining a second air passage coupled to said plurality of  
first air passages; and  
a handle defining a third tapered cylindrical air passage having  
an entrance opening diameter of about 0.39 inches and an exit  
opening diameter of about 0.34 inches, wherein a greater  
volume of compressed air passes through said third tapered  
cylindrical air passage to provide substantially greater atomi-  
zation of a liquid coating composition out of said head.

5,772,117  
WATER SPRINKLER

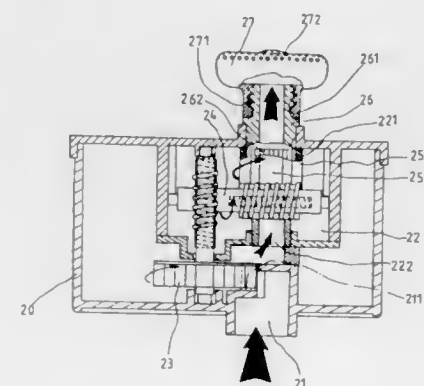
Yeong Chwan Su, No. 145, Sec. 2, Chyedong Road, Janghuah  
City, Janghuah County, Taiwan

Filed Dec. 10, 1996, Ser. No. 763,061

Int. Cl.<sup>6</sup> B05B 3/04

U.S. Cl. 239—240

4 Claims



1. A water sprinkler comprising:  
a housing provided with a water inlet and a receiving compart-  
ment having a through hole;  
a linking mechanism located in said receiving compartment of  
said housing and composed of a pump blade, a link wheel and  
an actuation wheel having a clamping device;  
a transmission rod having one end which is engaged with said  
clamping device of said actuation wheel, said transmission  
rod further having another end and a body portion which is  
put through said through hole of said receiving compartment  
of said housing; and  
a spray head having one end fastened with said another end of  
said transmission rod, said spray head further having another  
end provided with a plurality of jet nozzles for emitting a  
stream of water;  
wherein said pump blade is actuated to rotate clockwise by the  
water current entering said housing via said water inlet of said  
housing; wherein said link wheel and said actuation wheel are  
driven by said pump blade to make a 360-degree rotation so  
as to enable said transmission rod and said spray head to  
make a 360-degree rotation.

5,772,118  
SPRINKLER HEAD SHIELD

Stephen F. Fabiano, Naples, Fla., assignor to Valdemar Prince,  
Naples, Fla.

Filed Feb. 1, 1996, Ser. No. 593,144

Int. Cl.<sup>6</sup> B05B 15/06

U.S. Cl. 239—276

20 Claims

1. A sprinkler shield for protecting a sprinkler head comprising:  
a base;  
at least one sidewall extending from said base defining a body,  
said body having a recess formed therein;

JUNE 30, 1998

GENERAL AND MECHANICAL

4645

5,772,120  
MULTIFUNCTION HAND SHOWER

Roland Huber, Henschiken, Switzerland, assignor to Hansa  
Metallwerke AG, Stuttgart, Germany

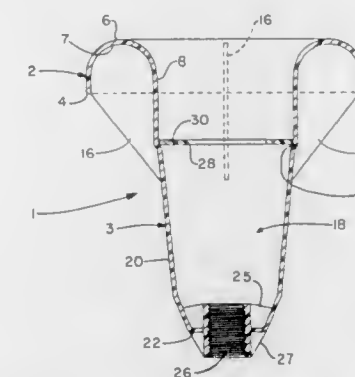
Filed Mar. 5, 1996, Ser. No. 611,101

Claims priority, application Germany, Mar. 17, 1995, 195 09  
661.4

Int. Cl.<sup>6</sup> B05B 1/18

U.S. Cl. 239—391

16 Claims



a lip extending outwardly from the top of said body;  
a sprinkler head support member positioned within said recess  
which functions only to support a sprinkler head therein, and  
an aperture disposed within said base of said body.

5,772,119  
SHOWER HEAD HAVING A MECHANISM FOR  
TREATING HOT WATER

Shinichi Someya, Takashi Toyama, and Nobuhiko Taneichi, all  
of Tokyo, Japan, assignors to Marine Bio Co., Ltd., Tokyo,  
Japan

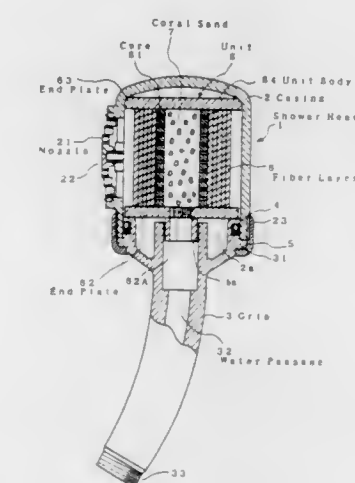
Filed Oct. 24, 1995, Ser. No. 547,405

Claims priority, application Japan, Oct. 28, 1994, 6-287124

Int. Cl.<sup>6</sup> B05B 7/26

U.S. Cl. 239—315

17 Claims



1. A shower head having a hot-water treating mechanism char-  
acterized in that it comprises said hot-water treating mechanism  
placed in a water passage in said shower head, wherein said  
hot-water treating mechanism is provided with coral sand, active  
carbon fiber and calcium sulfite, said active carbon fiber, said  
calcium sulfite and said coral sand being arranged along a water-  
flow direction in said shower head,

wherein said calcium sulfite in combination with said coral sand  
and said active carbon fiber requires a lesser overall volume  
thereof to obtain a predetermined water treatment capacity  
than a volume of only said active carbon fiber and said coral  
sand required to obtain the same said predetermined water  
treatment capacity.

5,772,121  
SPRINKLER HEAD FOR A SPRINKLER MOUNTED TO A  
GARDEN HOSE

King-Yuan Wang, Changhua Hsien, Taiwan, assignor to Yuan  
Mei Corp., Changhua Hsien, Taiwan

Filed Aug. 13, 1997, Ser. No. 910,397

Int. Cl.<sup>6</sup> B05B 7/02

U.S. Cl. 239—394

3 Claims

1. An improved sprinkler head for use on a sprinkler gun in  
connection to a garden hose, comprising a sprinkling cap, a bottom  
board and a base; said sprinkling cap and said bottom board being  
bound together by way of ultrasonic welding art; said base having  
a central mounting pole and a discharge outlet and a retaining seat  
that are linearly defined; a spring biased positioning pin being

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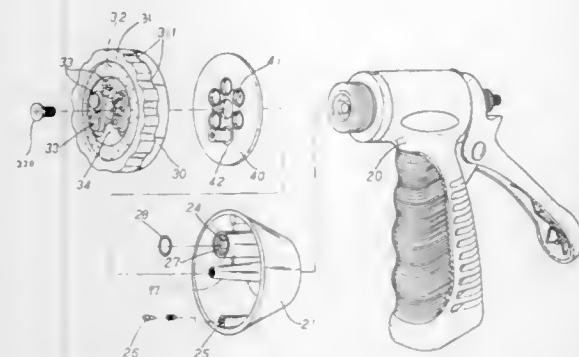
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housed in said retaining seat; an O-shaped seal ring being engaged with said discharge outlet for sealing purpose; a ring area having a plurality of tiny pores being disposed adjacent the rim of said sprinkling cap with a number of discharge openings located along a circle inside said ring area; said bottom board having a number of through holes defined in correspondence to said discharge openings each having a tubular extension in registration with said through holes so as to make the bottom board and said sprinkling cap sealedly welded together; on one side of said bottom board facing said base being provided with a number of positioning cavities that are selectively engaged with said spring biased retaining pin mounted onto said base so as to lock said sprinkling cap in place when said sprinkling cap along with said bottom board being rotated to make one of said tubular extension come in registration with said discharge outlet;

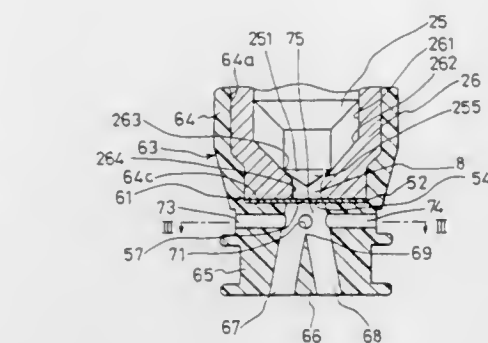
the improvement being characterized in that said tubular extensions of said discharge openings of said sprinkling cap are bridged together by a continual wall so as to define a wall-closed area; said ring area having a plurality of tiny pores being located on the outer side of said wall-closed area and one of said tubular extensions being defined in a first half tube having a cut facing externally of said wall-closed area so that when said sprinkling cap being rotated to make said first half tube register with said discharge outlet of said base, water being discharged via said ring area having a plurality of tiny pores; a second half tube being formed among the rest of said tubular extensions with the cut thereof facing internally of said wall-closed area so that water being first delivered to the interior of said wall-closed area when said second half tube being registered with said discharge outlet and then discharged via a discharge opening located inside said second half tube, permitting water to be discharged with higher intensity.

2. The improved sprinkler head as claimed in claim 1 wherein said second half tube of said sprinkling cap is in communication with a vertically oriented narrow discharge opening so as to make water discharged with force and intensity.

3. The improved sprinkler head as claimed in claim 1 wherein a ring of tiny pores is disposed in the interior of said wall-closed area so as to permit water to be collected in the interior of said wall-closed area and then be discharged via said ring of tiny pores.

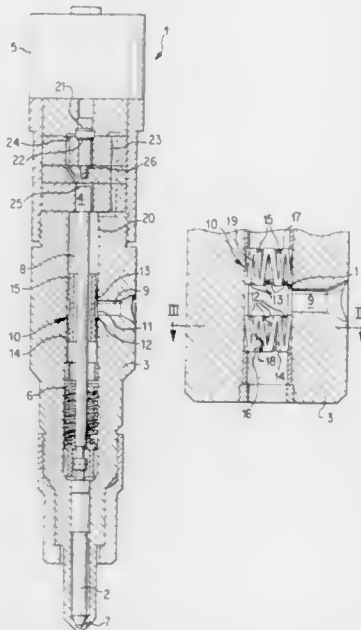
**5,772,122**  
**FUEL INJECTION APPARATUS FOR AN INTERNAL COMBUSTION ENGINE**  
Masanari Sugiura, Nukata-gun; Sinobu Hirayama, Nishio, and Kaoru Oda, Toyokawa, all of Japan, assignors to Nippon-denso Co., Ltd., Kariya, Japan  
Filed Apr. 23, 1996, Ser. No. 636,525  
Claims priority, application Japan, Apr. 27, 1995, 7-103693  
Int. Cl.<sup>6</sup> F02M 69/00  
U.S. Cl. 239—408 19 Claims

1. A fuel injection apparatus for an internal combustion engine, said apparatus comprising:  
a valve body having a cylindrical hole and a conical slant face on the inlet side of said cylindrical hole;  
a valve member having a contact portion adapted to abut on or move away from said conical slant face;



a multi-hole nozzle having a plurality of holes provided at an outlet of said cylindrical hole to control fuel injection direction; and  
an atomization mechanism provided on an outlet side of said multi-hole nozzle for atomizing fuel.  
said mechanism having a plurality of fuel holes with a diameter that is larger than that of said holes of said multi-hole nozzle and sandwiching a fuel flow from said multi-hole nozzle with an air flow formed by a plurality of first air flows after they have collided with each other and a second air flow.

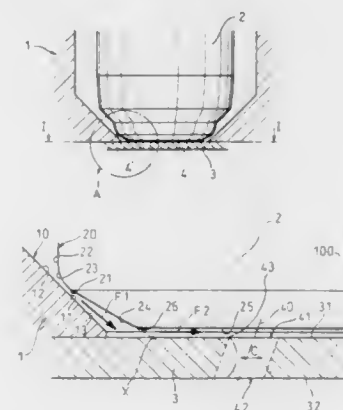
**5,772,123**  
**INJECTOR WITH SOLENOID-VALVE CONTROL FOR FUEL INJECTION INTO DIESEL INTERNAL-COMBUSTION ENGINE COMBUSTION SPACE**  
Ulrich Augustin, Kernen; Volker Schwarz, Weinstadt; Klaus-Juergen Thiele, Nuertingen; Ekkehard Koehler, Goepplingen, all of Germany; Kurt Oberklammer, Neuhofenlbb, Austria; Heinz Rathmayr, Hallein, Austria, and Peter Reisenbichler, Traun, Austria, assignors to Mercedes-Benz AG and Robert Bosch GmbH, Germany  
Filed Oct. 24, 1995, Ser. No. 547,525  
Claims priority, application Germany, Oct. 24, 1994, 44 37 927.7  
Int. Cl.<sup>6</sup> F02M 59/00  
U.S. Cl. 239—533.2 20 Claims



1. An injector with solenoid-valve control for fuel injection into a combustion space of a diesel internal-combustion engine, comprising an injector housing, a lateral fuel delivery conduit arranged in the injector housing and leading into a pressure accumulator provided between a needle seat of a nozzle needle and a piston

arranged on a rear side of the nozzle needle, a control space which is delimited by the piston and is connectable by a controllable solenoid valve to one of the pressure accumulator and to a low-pressure conduit for pressure relief, and an elongate fuel filter surrounding the nozzle needle at a distance and arranged in the pressure accumulator in a mouth region of the fuel delivery conduit, said fuel filter being arranged to filter impurities in injected fuel from both the needle seat and the solenoid valve via filter passages therein through which the injected fuel flows from one axial end of the fuel filter to another axial end of the fuel filter.

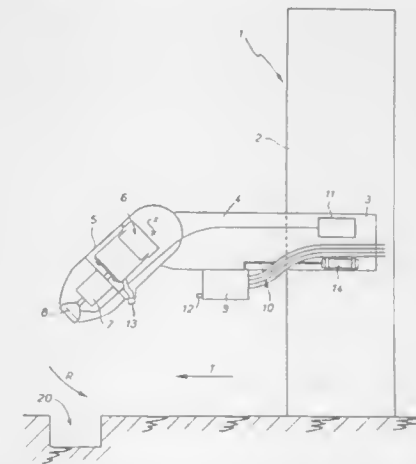
**5,772,124**  
**FUEL INJECTION VALVE**  
Yoshiyuki Tamaki; Keiso Takeda, both of Mishima, and Nobuhiko Koga, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan  
Filed Jul. 11, 1996, Ser. No. 678,673  
Claims priority, application Japan, Jul. 24, 1995, 7-187401  
Int. Cl.<sup>6</sup> F02M 61/00  
U.S. Cl. 239—533.12 3 Claims



1. A fuel injection valve having a valve body, a needle valve accommodated in the valve body for opening and closing a fuel path at a sealing portion, and a metering member provided at a front end of the valve body and having a plurality of nozzle holes for metering fuel and determining the fuel-injecting direction, comprising:

an inner wall of said valve body located downstream of said sealing portion sloping to meet an upstream side surface of said metering member; and  
an intermediate surface of said needle valve for connecting said sealing portion and a bottom surface of the needle valve with each other forming said fuel path sloped inward in the downstream direction in association with said inner wall for introducing said fuel into said nozzle holes formed in said metering member when said needle valve is in an open state, wherein said intermediate surface of said needle valve being shaped in such a manner that a virtual circle formed by circumscribing intersecting points of a virtual linear extension of a downstream end of said intermediate surface and said upstream side surface of said metering member is positioned outside of a virtual circle circumscribing upstream side openings of said nozzle holes formed in said metering member when the needle valve is in an open state.

**5,772,125**  
**MACHINE FOR SPRAYING A COATING MATERIAL**  
Pierre Ehinger, Faverged, and Djamel Merabot, Grenoble, both of France, assignors to Sames S.A., Melan, France  
PCT No. PCT/FR94/00364, § 371 Date Sep. 28, 1995, § 102(e) Date Sep. 28, 1995, PCT Pub. No. WO94/22590, PCT Pub. Date Oct. 13, 1994  
PCT Filed Mar. 31, 1994, Ser. No. 530,206  
Claims priority, application France, Apr. 1, 1993, 93 03829  
Int. Cl.<sup>6</sup> B05B 5/00  
U.S. Cl. 239—694 27 Claims

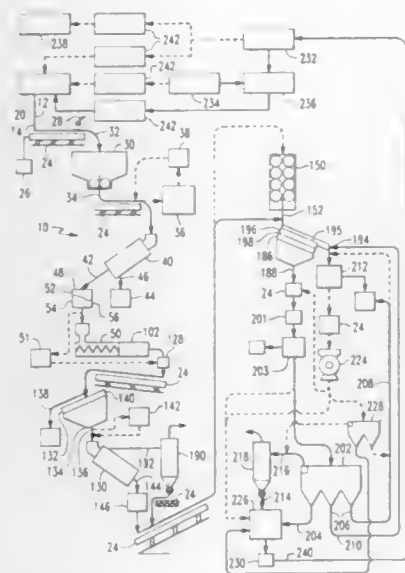


1. Machine for spraying a coating material, said machine comprising: at least one sprayer (8, 58); an on-board supply tank (6, 56) in proximity to said sprayer, said support tank having a first connection means; a coating material changing assembly (9, 59) having a second connection means; and a mobile subassembly (4, 50) carrying said sprayer, said supply tank and said coating material changing assembly, wherein at least one of said connection means is movable between a position in which said first and second connection means are coupled to place said coating material changing assembly in fluid flow connection with said supply tank and a position where said coating material changing assembly is isolated from said supply tank.

**5,772,126**  
**SYSTEM AND PROCESS FOR RECYCLING WASTE MATERIAL PRODUCED BY A GLASS FIBERIZING PROCESS**  
Curtis L. Hanvey, Jr., Boiling Springs, and Irvin L. Koelle, Shelby, both of N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.  
Filed Nov. 6, 1996, Ser. No. 746,045  
Int. Cl.<sup>6</sup> B02C 19/12;23/08  
U.S. Cl. 241—19 30 Claims

30. A process for recycling waste material produced by a glass fiberizing process, the waste material comprising scrap glass fibers, the process comprising the steps of:  
(a) shredding glass fiber waste material;  
(b) drying the glass fiber waste material to form moisture-reduced waste material;  
(c) crushing the moisture-reduced waste material in a crusher comprising:  
(1) a body comprising a cavity having a first end positioned to receive the moisture-reduced waste material from the moisture reducing device, a second end distal to the first end, and a length therebetween;  
(2) a rotatable screw auger positioned within the cavity of the body for crushing and conveying the moisture-reduced waste material from the first end of the cavity in a first direction toward the second end of the cavity, the auger having a first end proximate the first end of the cavity, a





second end proximate the second end of the cavity, and a length therebetween; and

- (3) a pressurizing device exerting a pressure ranging from about  $1.38 \times 10^5$  to about  $5.51 \times 10^6$  pascals upon at least a portion of the moisture-reduced waste material positioned about the second end of the auger in a direction generally opposite to the first direction in which the auger conveys the moisture-reduced waste material such that the portion of the scrap glass fibers in the moisture-reduced waste material are crushed to form crushed glass fibers;
- (d) drying the moisture-reduced waste material received from the crusher;
- (e) separating a first portion of dried waste material having a mean average length of less than about 5 millimeters from oversized dried waste material; and
- (f) feeding the first portion of the dried waste material to a glass melter.

5,772,127

#### SLURRYING OIL SAND FOR HYDROTRANSPORT IN A PIPELINE

Waldemar Maciejewski, Edmonton; Jim McTurk, and Derrick Kershaw, both of Fort McMurray, all of Canada, assignors to Alberta Energy Ltd; AEC Oil Sands Limited Partnership; Athabasca Oil Sands Investments, Inc.; Canadian Occidental Petroleum, Ltd.; Canadian Oil Sands Investments, Inc.; Gulf Canada Resources Limited; Imperial Oil Resources Limited, all of Alberta, Canada; Mocal Energy Limited, Tokyo, Japan; Murphy Oil Company, Ltd., and Petro-Canada, Inc., both of Alberta, Canada

Filed Jan. 22, 1997, Ser. No. 787,096

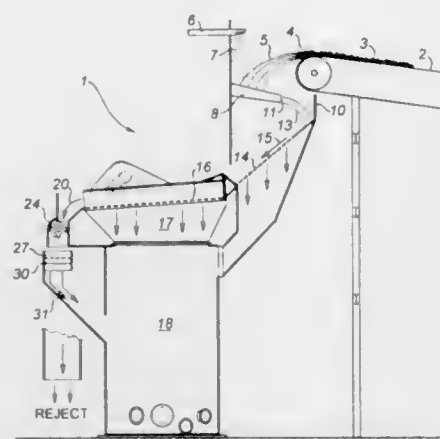
Int. Cl.<sup>6</sup> B02C 19/12

U.S. Cl. 241—21

10 Claims

1. A process for slurring oil sand, containing oversize lumps, with water to produce a slurry and removing oversize lumps from the slurry to produce slurry suitable for pumping through a pipeline, comprising:

- dropping the oil sand through air from the discharge end of a conveyor onto a downwardly slanted surface spaced below the conveyor discharge end;
- contacting the oil sand with a stream of water as the oil sand moves through the air between the conveyor discharge end and the surface, to wet the oil sand;
- mixing the oil sand and water as they move together along the surface, to form a slurry stream;



discharging the slurry stream onto first screen means and screening it to reject oversize lumps; and directing the screened slurry into a pump box prior to pumping it into a pipeline.

5,772,128

#### SYSTEM FOR ACOUSTICALLY DETECTING AND/OR REMOVING JAMS OF FLOWABLE MATERIAL IN A CHUTE, AND AIR HAMMER FOR PERFORMING THE REMOVAL

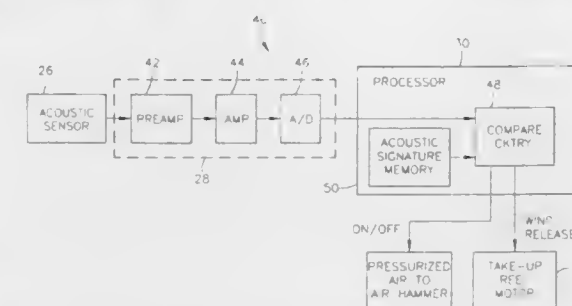
David J. McRae, Langhorne, Pa., assignor to CSI Technology, Inc., Wilmington, Del.

Filed May 17, 1996, Ser. No. 651,194

Int. Cl.<sup>6</sup> B02C 25/00

U.S. Cl. 241—30

26 Claims



1. A method for detecting the presence of and removing jams in a chute used for transporting a flowable material including solids, the chute having an entrance for receiving a flow of the material and an exit, the chute including a jam breaking device located therein for breaking up material jams which occur in the chute, the jam breaking device initially located near the chute exit, and an acoustic detector for detecting acoustic signals associated with movement of the material through the chute, the method comprising the steps of:

- (a) periodically detecting an acoustic signal in the chute with the acoustic detector;
- (b) processing the acoustic signal to determine whether material is flowing through the chute or whether material is not flowing through the chute due to a jam in the chute, and if a jam is detected;
- (c) operating the jam breaking device for a fixed period of time to attempt to break up the jam;
- (d) detecting and processing a new acoustic signal after the fixed period of time to determine whether the new acoustic signal indicates that the jam is still present;
- (e) moving the jam breaking device a predetermined distance toward the chute entrance; and
- (f) repeating steps (c), (d) and (e) as long as each new acoustic signal indicates that the jam is still present.

5,772,129

#### PROCESS AND APPARATUS FOR CONTROLLING THE CUTTER OF A SHREDDER

Tatsuo Nishio, Okazaki, and Hirotaka Iwata, Aichi-ken, both of Japan, assignors to Ricoh Elemex Corporation, Aichi-ken, Japan

Division of Ser. No. 520,766, Aug. 30, 1995, Pat. No.

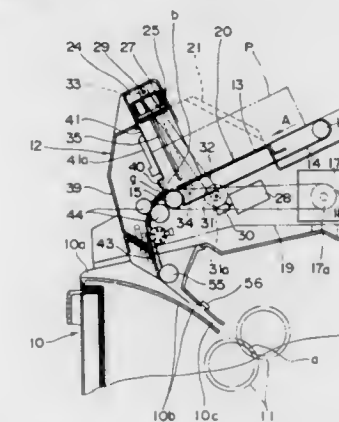
5,662,280. This application Jan. 31, 1997, Ser. No. 791,980

Claims priority, application Japan, Aug. 31, 1994, 6-230553; Jul. 13, 1995, 7-200418

Int. Cl.<sup>6</sup> B02C 25/00

U.S. Cl. 241—30

3 Claims



1. A paper feed device for a shredder for disposable paper, comprising:
  - a cutter
  - a paper feed means;
  - a paper detection sensor that detects paper and activates the cutter which then shreds the paper, the paper feed device being activated after disposable paper is loaded and set in place and feeding paper sequentially to the shredder by the paper feed means;
  - a cutter activation detection means that detects activation of the cutter; and
  - an activation control means that first intermittently activates the paper feed means and then switches and activates the paper feed means continuously when activation of the cutter is detected by the cutter activation detection means.

5,772,130

#### METHOD AND MILL FOR CRUSHING RUBBLE

Angelo Toschi, Castellano, Italy, assignor to Iperfin S.p.A., Modena, Italy

PCT No. PCT/IB95/00719, § 371 Date Mar. 5, 1997, § 102(e)

Date Mar. 5, 1997, PCT Pub. No. WO96/07481, PCT Pub.

Date Mar. 14, 1996

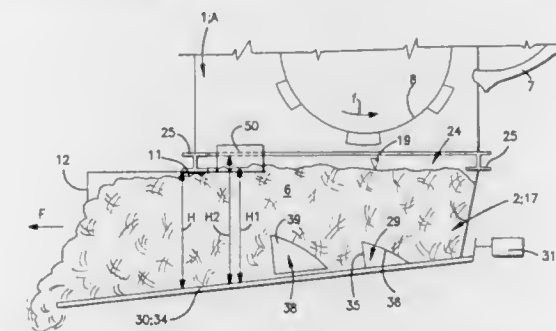
PCT Filed Aug. 31, 1995, Ser. No. 793,811

Claims priority, application Italy, Sep. 6, 1994, RE94A0069

Int. Cl.<sup>6</sup> B02C 25/00

U.S. Cl. 241—30

13 Claims



1. Method for crushing rubble in a mill or station for crushing and discharging rubble comprising the steps of:

- a) feeding an adjustable rate of the rubble flow to be crushed,
- b) crushing the rubble charged into the mill,
- c) falling/hurling the crushed rubble into an underlying discharging hopper to form a material plug,
- d) discharging the crushed rubble from a bottom of the material plug,
- e) sensing a height (h) of the material plug for adjusting purposes, and
- f) adjusting a rate of discharging the crushed rubble as a function of the sensed height of the material plug such that the height (level 19) of the plug is kept between a minimum height (H1) which is higher than a height (H) of the hopper discharging opening and a maximum height (H2) which corresponds substantially to a level of a discharging opening of the mill, so that a top of the plug acts as an obturator between the mill discharging opening and the hopper discharging opening.

5,772,131

#### KNEADER FOR PAPER STUFF

Giancarlo Dal Maso, Schio, Italy, assignor to Comer Spa, Caltrano, Italy

PCT No. PCT/EP96/02426, § 371 Date Jan. 27, 1997, § 102(e)

Date Jan. 27, 1997, PCT Pub. No. WO96/39557, PCT Pub.

Date Dec. 12, 1996

PCT Filed Jun. 4, 1996, Ser. No. 776,334

Claims priority, application Italy, Jun. 5, 1995, V195 A 0092

Int. Cl.<sup>6</sup> B02C 18/12

9 Claims



1. A kneader for processing a stream of paper stuff comprising:
  - a substantially cylindrical tank having an upstanding internal wall; inwardly extending vertical ribs formed in the wall; and
  - a rotor including a central shaft portion having a vertical axis located inside said tank and a spiral shaped blade having upper and lower ends and multiple turns extending outwardly of the shaft portion, an external edge of said blade formed with a depending holding wing oriented towards the bottom of the tank, and extending continuously along turns of the spiral blade from the upper end of the blade to about one turn from the lower end of the blade.

5,772,132

#### SELF-PROPELLED ROCK CRUSHING MACHINE

Donald W. Reid, 2004 Crest Mar Ct., El Dorado Hills, Calif. 95762

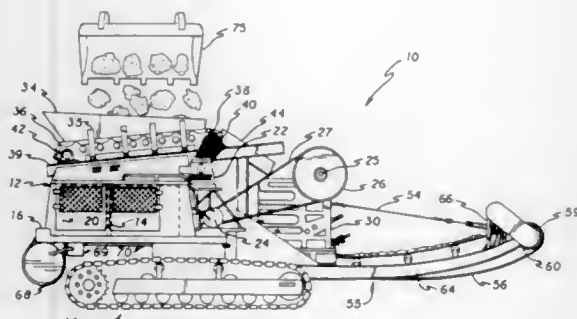
Filed Aug. 21, 1996, Ser. No. 700,872

Int. Cl.<sup>6</sup> B02C 21/02

U.S. Cl. 241—60

13 Claims

1. A self-propelled rock crushing machine, comprising:
  - a vehicular frame having a crawler type traveling device;
  - a drive unit mounted on said vehicular frame, said drive unit providing power to said crawler type traveling device;



a hopper disposed for storing the material to be crushed;  
a crushing device having at least one crushing element operable to crush the material;  
a first motor connected to said crushing device for imparting motion to said at least one crushing element to effect the crushing of the material;  
charging means for transporting the material from said hopper to said crushing device;  
discharge means for receiving the crushed material from said crushing device and transporting the crushed material away from said crushing device; and  
wherein said crawler type traveling device comprises a pair of left and right drive mechanisms, and said discharge means is located between said left and right drive mechanisms and immediately beneath said crushing device so that the discharge means has a ground clearance of at least seventeen inches to facilitate movement of the rock crushing machine while said crusher is operating.

5,772,133

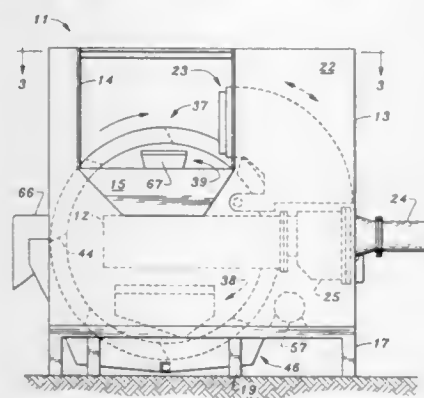
## FRAGMENT RECIRCULATING SHREDDER

John L. Hall, Tracy, Calif., assignor to Darlene Hall, Edmond, Wash.; Wilburn E. Hall, Newport, Oreg., and Vern W. Hall, Kodiak, Ak.

Filed Oct. 2, 1995, Ser. No. 537,518  
Int. Cl.<sup>6</sup> B02C 18/22; 18/40

U.S. Cl. 241-74

17 Claims



1. Recirculating shredding apparatus comprising:  
a revolvable annular trommel for intercepting large fragments of shredded material that exceed a particular size, said trommel having an inside surface at which the large fragments are collected and having an array of apertures through which smaller fragments can pass, said trommel further having a plurality of spaced apart vanes which project from said inside surface and which carry the intercepted large fragments upward as the trommel revolves;  
an arcuate member extending beneath said trommel and upwardly along the trommel in the direction of travel of the trommel in position to intercept the smaller fragments which pass therethrough and in position to guide the intercepted smaller fragments upward as the trommel revolves, said arcuate member having an upper end at which the smaller fragments are released;

a shredder disposed at a location outside of said trommel and having an intake for receiving material to be shredded and an outlet for releasing fragments of shredded material;  
a first fragment guide extending into said trommel from a location beneath said shredder outlet, and  
a second fragment guide extending from a location within said trommel to a location above said shredder intake, said second fragment guide being positioned to intercept fragments which fall from said vanes.

5,772,134

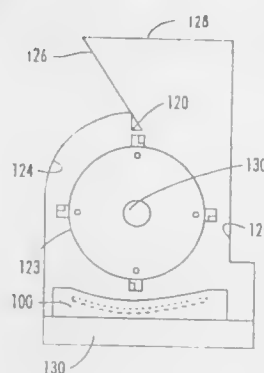
## RECYCLING AND SOLID MATERIAL CONVERSION APPARATUS AND SYSTEM

Floyd E. Bouldin, Murfreesboro, and Thomas E. Cantrell, McMinnville, both of Tenn., assignors to Bouldin & Lawson, Inc., McMinnville, Tenn.

Division of Ser. No. 353,723, Dec. 12, 1994, Pat. No. 5,558,281. This application Sep. 18, 1996, Ser. No. 715,524  
Int. Cl.<sup>6</sup> B02C 13/282

U.S. Cl. 241-79.1

12 Claims



1. A system for recycling waste material, comprising:  
grinding means for reducing the size of the waste material; and  
the grinding means further includes:

a grinding drum contained within a housing having an interior, and airfoil means attached to the interior of the housing and centered vertically above and parallel to an axis of rotation of the drum, whereby a static air curtain between the drum and a portion of the housing is established within the interior of the housing enabling air to be drawn into the housing through an inlet and expelled therefrom through an exit when the drum rotates; and  
conveyor means for carrying the waste material to and from the inlet and exit of the grinding means.

5,772,135

## JAW CRUSHERS

Kenneth Thomas Styles, Mt. Waverley, Australia, assignor to Clyde Industries Limited, Richmond, Australia

PCT No. PCT/AU95/00253, § 371 Date Feb. 24, 1997, § 102(e) Date Feb. 24, 1997, PCT Pub. No. WO95/31286, PCT Pub. Date Nov. 23, 1995

PCT Filed Apr. 27, 1995, Ser. No. 737,898

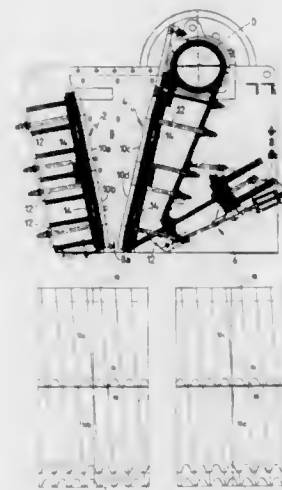
Claims priority, application Australia, May 12, 1994, PM5599/94

Int. Cl.<sup>6</sup> B02C 1/10

U.S. Cl. 241-264

6 Claims

6. A jaw crusher for crushing rocks and other mineral matter, said crusher comprising a fixed jaw and a movable jaw defining a crushing chamber of a cross-section which narrows from top to bottom, means for driving the movable jaw relative to the fixed jaw to provide a cutting action, and identical jaw faces mounted to the jaws, each face having corrugations the axes of which extend along the height of the jaw face, wherein the axes of the corrugations are



inclined to the vertical such that there is a lateral phase shift of approximately an odd number multiple of 90° of the corrugations between upper and lower end edges of the face whereby when two such jaw faces are placed in opposed relationship on the fixed and movable jaws of the jaw crusher with lower end edges of the respective faces at a lower end of the crushing chamber, the opposed corrugations in the lower end will exhibit a phase relationship wherein peaks of the corrugations of one of the faces will substantially align with troughs of the corrugations of the other face.

5,772,136

## AUTOMATIC ASSEMBLY MACHINE FOR YARNS

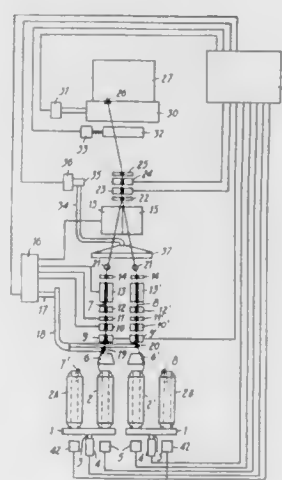
Erik Gilbos, Dikkelvenne; Emiel Rubbrecht, Iddergem; Christian Van Haute, Wannegem-Lede, and Tom Jacobs, Dendermonde, all of Belgium, assignors to Textielmachinefabriek Gilbos N.V., Belgium

Filed Oct. 15, 1996, Ser. No. 729,209

Claims priority, application Belgium, Oct. 16, 1995, 9500862  
Int. Cl.<sup>6</sup> D01H 13/26; B65H 69/00; 63/02

U.S. Cl. 242-42

5 Claims



1. Automatic assembly machine for yarns where at least two yarns are wound in parallel or in phase crosswise from at least two run-off bobbins onto a cross bobbin, comprising:

(a) joining means equipped for joining by means of winding together or splicing the yarn ends of the cross bobbin with that of the run-off bobbins, said joining means equipped to join by means of winding together or splicing one yarn end of the cross bobbin with the yarn end of one of the run-off bobbins and the second yarn end of the cross bobbin with the yarn end of a second run-off bobbin.

(b) a yarn guide for axially guiding the yarn on the receiving cross bobbin.  
(c) at least one yarn watcher for each yarn.  
(d) a yarn tensioner for maintaining said yarns under tension.  
(e) a yarn monitor disposed between the cross bobbin and a wind-off eye having means for controlling and correcting the assembled yarn bundle and rewinding the cross bobbin and for controlling gripping of the two yarn ends of the cross bobbin in phase and to automatically correct a not in phase condition into an in phase condition of the yarns to be joined.  
(f) gripper means for gripping the yarn ends on the cross bobbin, for inserting each yarn into the joining means, and for receiving and holding the yarn ends.  
(g) said wind-off eye for the shared winding-off of the assembled yarns installed above the yarn joining means.  
(h) a yarn cleaner for detecting spinning defects in the assembled yarn bundle.  
(i) a cutting device for cutting through the assembled yarn bundle, and  
(j) means for controlling said joining and cutting devices and for controlling individually the yarn monitor and the gripper means.

5,772,137

## YARN MONITOR FOR AUTOMATIC CROSS WINDING AND ASSEMBLY MACHINES

Erik Gilbos, Dikkelvenne; Emiel Rubbrecht, Iddergem; Christian Van Haute, Wannegem-Lede, and Tom Jacobs, Dendermonde, all of Belgium, assignors to Textielmachinefabriek Gilbos N.V., Belgium

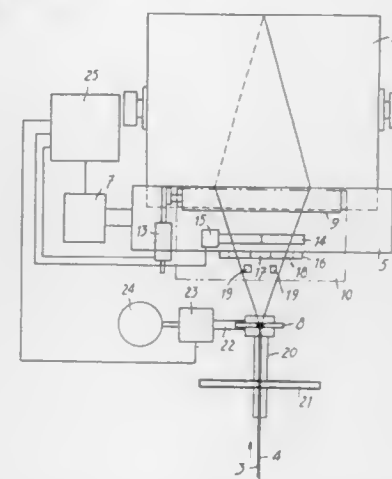
Filed Oct. 15, 1996, Ser. No. 731,440

Claims priority, application Belgium, Oct. 16, 1995, 09500861

Int. Cl.<sup>6</sup> B65H 54/00

U.S. Cl. 242-42

6 Claims



1. A yarn monitor for an automatic cross winding and yarn assembly machine in which at least two yarns are wound in parallel from two run-off bobbins onto a cross bobbin, said cross bobbin having an axis and a wind-off eye for leading the two yarns to the cross bobbin, said monitor disposed between the cross bobbin and the wind-off eye for controlling and correcting the position of the two yarns with respect to one another, including:

a drive roller for driving said cross bobbin,  
driving means for rotating said drive roller in two opposite directions,  
a yarn guide for guiding said yarns on the cross bobbin axially of the cross bobbin;  
cutting means for cutting at least one of said yarns,  
driving means for driving the cutting means to produce a cutting movement of said cutting means,  
a yarn guide for guiding said yarns in cooperation with the cutting means to guide said yarns in position to be cut by said cutting means.



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sensors for detecting said yarns in said yarn guide and for controlling said cutting means,  
guiding means for putting said yarns into the cutting means and the yarn guide,  
means for gripping and holding the yarn ends left on the cross bobbin after cutting by the cutting means when the yarns do not run in parallel, and  
a central control device for controlling all the said means.

5,772,138

## SPINNING REEL HAVING BALANCING MEANS

Yoshiyuki Furomoto, Osaka; Osamu Yoshikawa, and Kenichi Sugawara, both of Sakai, all of Japan, assignors to Shimano, Inc., Osaka, Japan

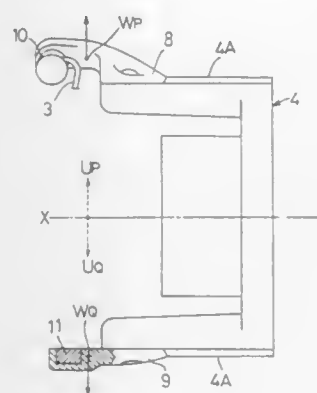
Continuation of Ser. No. 279,429, Jul. 25, 1994, abandoned, which is a division of Ser. No. 889,273, May 28, 1992, Pat. No. 5,350,129. This application Apr. 8, 1996, Ser. No. 631,628  
Claims priority, application Japan, May 31, 1991, 3-40086; Nov. 19, 1991, 3-94724

The portion of the term of this patent subsequent to May 28, 2012, has been disclaimed.

Int. Cl.<sup>6</sup> A01K 89/01

U.S. Cl. 242—231

20 Claims



## 1. A spinning reel comprising:

- a reel body;
- a handle supported on said reel body;
- a rotor supported forwardly of said reel body, said rotor being rotatable about an axis by a driving force from said handle, and said rotor including:
- a pair of arm portions extending along said axis, said arm portions being substantially on opposite sides of said axis;
- an arm cam pivotably provided on one of said arm portions, said arm cam including a line roller, said arm cam having a center of gravity;
- a pivotable arm pivotably provided on the other of said arm portions, said pivotable arm having a center of gravity;
- a bail provided between said arm cam and said pivotable arm, said bail being pivotable with said arm cam and said pivotable arm between a line winding position and a line releasing position;
- a balance weight provided on the pivotable arm to form a composite center of gravity of said pivotable arm and said balance weight, said composite center of gravity being located at a position substantially diametrically opposed from said center of gravity of said arm cam with respect to the rotor axis.

5,772,139

## BAITCASTING REEL HAVING A CLUTCH MACHANISM FOR TRANSMITTING A DRIVE FROM A HANDLE TO A SPOOL

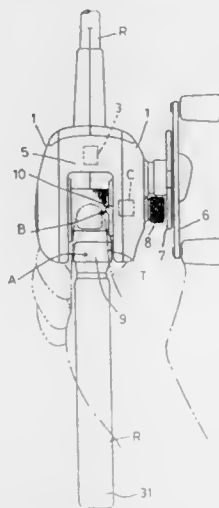
Jun Sato, Osaka, Japan, assignor to Shimano Inc., Osaka, Japan

Division of Ser. No. 248,515, May 24, 1994, Pat. No. 5,598,983. This application Sep. 24, 1996, Ser. No. 718,781  
Claims priority, application Japan, May 25, 1993, 5-122261; Aug. 3, 1993, 5-192093; Aug. 3, 1993, 5-192094

Int. Cl.<sup>6</sup> A01K 89/015

U.S. Cl. 242—261

6 Claims



## 1. A baitcasting reel comprising:

- a spool;
- right and left frames rotatably supporting said spool therebetween allowing said spool to rotate about a spool shaft, said right and left frames facing each other and having a right inner surface and a left inner surface, respectively;
- a handle rotatable supported to one of said right or left frames, for rotating said spool;
- a thumb rest interposed between said right and left frames;
- a clutch mechanism for selectively allowing, when disengaged, free rotation of said spool and transmitting, when engaged, a drive force from said handle to the spool;
- a disengaging portion movably provided to one of said right or left inner surfaces and disposed rearwardly of said spool to face said spool, said disengaging portion operatively connected to said clutch to disengage said clutch;
- an engaging portion operatively connected to said clutch to engage said clutch, said engaging portion being disposed between said disengaging portion and said thumb rest in a peripheral direction with respect to said spool, said engaging portion being removably provided to one of said right or left inner surfaces.

5,772,140

## DOUBLE-BEARING FISHING REEL WITH FISHING PARALLEL-WINDING UNIT AND DRIVE FORCE TRANSMISSION MECHANISM

Tomohiro Murayama, Kouchi, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

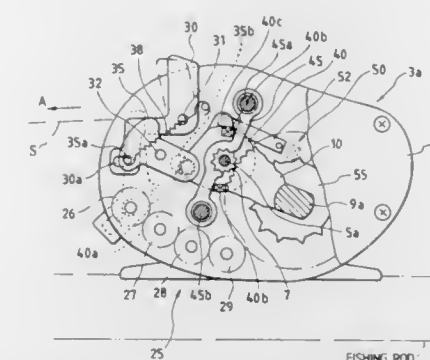
Filed Feb. 19, 1997, Ser. No. 808,966  
Claims priority, application Japan, Feb. 20, 1996, 8-032197; Sep. 26, 1996, 8-254674

Int. Cl.<sup>6</sup> A01K 89/015

U.S. Cl. 242—279

14 Claims

- 1. A double-bearing reel for fishing, comprising:
- a reel body including two side plates;
- a spool shaft supported between said two side plates;
- a spool rotatable supported by said spool shaft;



- a handle shaft rotatable supported by one of said two side plates of said reel body, and a handle connected to said handle shaft for turning said handle shaft to rotate said spool;
- a fishline parallel-winding unit supported by said reel body, said fishline parallel-winding unit including a traverse cam shaft and a fishline guide body that reciprocates along said traverse cam shaft in an axial direction of said spool in order to wind a fishline evenly on said spool, wherein said handle shaft is positioned opposite from said fishline parallel-winding unit with respect to said spool shaft; and
- a drive force transmission mechanism provided entirely within said one of said two side plates, and between said handle shaft and said fishline parallel-winding unit, said drive force transmission mechanism transmitting a drive force from said handle shaft to said fishline parallel-winding unit to make said fishline guide body reciprocate in said axial direction, wherein said drive force transmission mechanism comprises a gear train including a drive gear mounted on said handle shaft, a driven gear mounted on an end of said traverse cam shaft, and an intermediate gear between said drive gear and said driven gear.

5,772,141

## TAPE TENSION CONTROLLING/ADJUSTING DEVICE FOR USE IN A VIDEO CASSETTE RECORDER

Seong-Ick Ahn, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Rep. of Korea

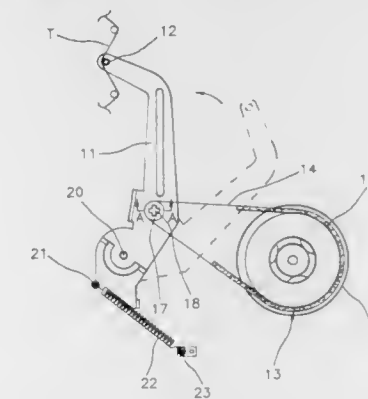
Filed Apr. 29, 1997, Ser. No. 848,201

Claims priority, application Rep. of Korea, Apr. 30, 1996, 1996-13765

Int. Cl.<sup>6</sup> G11B 15/43

U.S. Cl. 242—334.6

3 Claims



- 1. A tape tension controlling/adjusting device for use in a video cassette recorder provided with a deck on which a magnetic tape runs along a predetermined travel path and a supply reel, said device comprising:
- a tension lever rotatably mounted on the deck to be biased toward the magnetic tape by a resilient means and having a tension pole coming into a contact with the magnetic tape;

- a band holder mounted on the tension lever and including a cylindrical body and a lug shaft eccentrically extending from the cylindrical body;
- a band brake including a film and a felt portion attached to the film, wherein the band brake is retained around the cylindrical body at one side of the band brake and the other side thereof is mounted around the supply reel; and
- a fixing tool for retaining said band brake around the cylindrical body, the fixing tool including at least one series of protuberances formed on the cylindrical body along a periphery of the cylindrical body and a same number of series of perforations formed through the film.

5,772,142

## TAPE TENSION CONTROL DEVICE FOR USE IN A VIDEO CASSETTE RECORDER

Seong-Ick Ahn, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Rep. of Korea

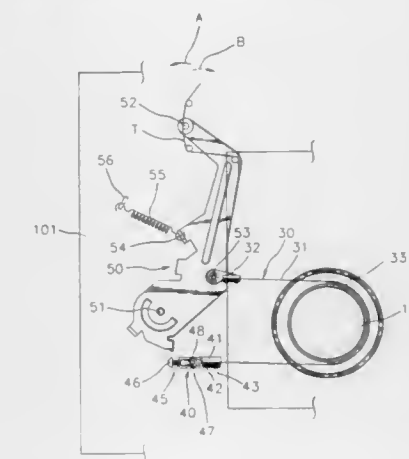
Filed May 30, 1997, Ser. No. 866,049

Claims priority, application Rep. of Korea, May 31, 1996, 96-19403

Int. Cl.<sup>6</sup> G11B 15/46; B65H 23/06

U.S. Cl. 242—334.6

6 Claims



- 1. A tape tension control device for use in a video cassette recorder incorporating therein a band brake positioned around a supply reel and a tension lever connected to one end of the band brake and rotatably mounted on a deck, said device comprising:
- a support post mounted on the deck;
- a frame provided with an elongated slot through which the support post is retained, a means for connecting the frame to the other end of the band brake, the connecting means being formed on a lead portion of the frame, and a through threaded-hole formed through a rear wall of the frame;
- a cap washer mounted to the support post for preventing the frame from vertically deviating with respect to the support post; and
- an adjusting screw engaged into the through threaded-hole and having an end inserted into the slot and contacting the support post whereby the position of the support post within the slot is adjusted by the screw.

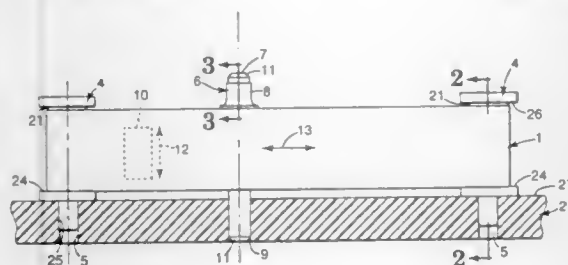
**5,772,143**  
**GUIDES FOR MAGNETIC TAPE AND METHOD OF MAKING THE SAME**

John F. Runyon, St. Paul, and Robert A. Muehlhausen, Stillwater, both of Minn., assignors to Imation Corp., Oakdale, Minn.

Filed Feb. 12, 1996, Ser. No. 605,244  
Int. Cl.<sup>6</sup> G11B 23/087

U.S. Cl. 242—346

26 Claims



1. A guidance system for tape in a cartridge, comprising:
- a baseplate;
  - first and second hubs rotatably mounted to the baseplate;
  - tape wound about and extending between the first and second hubs, the tape having first and second major surfaces, and first and second edges between the first and second major surfaces;
  - a first guide having a first edge guide surface engaging the first edge of the tape to guide the tape;
  - a second guide having a second edge guide surface engaging the first edge of the tape to guide the tape; and
  - a third guide having a third edge guide surface engaging the second edge of the tape at a position along the tape longitudinally between the first and second guides to guide the tape, the third edge guide surface being at a predetermined distance from a line between the first and second edge guide surfaces.

**5,772,144**  
**SEAT BELT RETRACTOR**

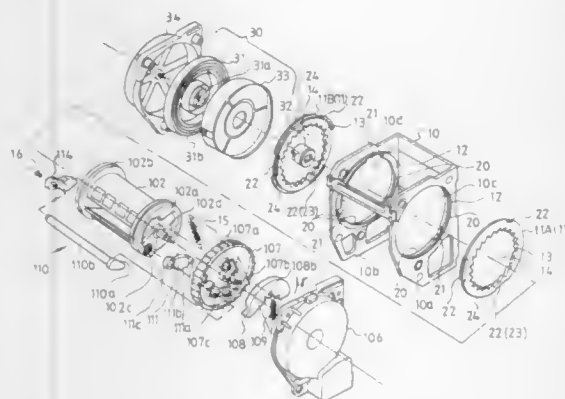
Masahiro Tanabe, Nagahama; Yutaka Yamaguchi, Hikone, and Hideo Iseki, Shiga-ken, all of Japan, assignors to Takata Corporation, Tokyo, Japan

Filed Sep. 6, 1995, Ser. No. 523,936  
Claims priority, application Japan, Sep. 7, 1994, 6-240730; Dec. 26, 1994, 6-337286

Int. Cl.<sup>6</sup> B60R 22/28

U.S. Cl. 242—379.1

6 Claims



1. A seat belt retractor comprising:
- a reel shaft around which a webbing is wound,
  - a base frame having sides and supporting said reel shaft between the sides,
  - ring members attached to said sides and each having internal teeth around the periphery thereof

locking means mounted on said reel shaft, which normally allows rotation of said reel shaft and, in operation, lock said webbing from unwinding upon stopping said reel shaft from rotating in a webbing unwinding direction by engaging with some of said teeth of said ring members.

deceleration sensing means for sensing when a deceleration exceeding a predetermined threshold acts on a vehicle, and lock operating means for operating said locking means according to an operation of said deceleration sensing means, wherein

when said locking means and said teeth of said ring members engage with each other to lock said webbing from unwinding and a tensile load exceeding a predetermined degree acts on said webbing, said ring members rotate in said webbing unwinding direction with a predetermined tensile load held on the webbing.

**5,772,145****BELT RETRACTOR FOR VEHICLE SAFETY BELTS**

Rainer Bareiss, Alldorf, and Jürgen Rink, Waldstetten, both of Germany, assignors to TRW Occupant Restraint Systems GmbH, Alldorf, Germany

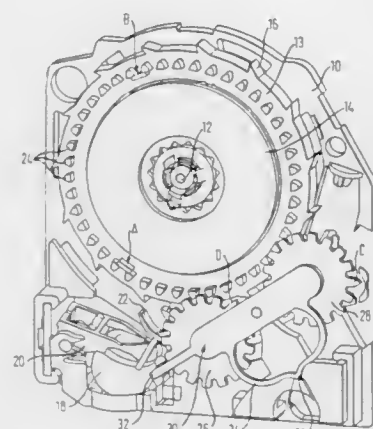
Filed Dec. 9, 1996, Ser. No. 762,388

Claims priority, application Germany, Dec. 22, 1995, 295 20 425.7 U

Int. Cl.<sup>6</sup> B60R 22/415

U.S. Cl. 242—382.2

8 Claims



1. A belt retractor for vehicle safety belts comprising:
- a belt drum rotatably mounted in a housing;
  - a locking mechanism for preventing rotation of the belt drum;
  - a tripping mechanism with a coupling disk connected with the belt drum and provided with external gear teeth;
  - a pawl, which is able to be selectively pivoted between an engagement position with the external gear teeth of the coupling disk and a normal position out of engagement with such external gear teeth;
  - a rocking member pivotally mounted on the housing and having two ends;
  - a ring of gear teeth driven by the belt drum and two gear wheels in mesh with said ring of gear teeth, said gear wheels being rotatably mounted on the ends of the rocking member;
  - an actuating arm connected with the rocking member for operation of the pawl; and
  - switching elements provided on the periphery of the gear wheels and of the ring of gear teeth, said switching elements comprising at least one switching tooth projecting beyond the

**5,772,147**  
**APPARATUS FOR PERFORMING A WORK OPERATION ON SHEET MATERIAL AND A SHEET MATERIAL FEED MECHANISM THEREFOR**

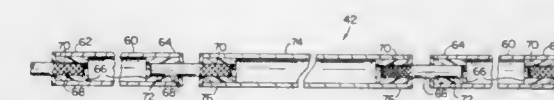
Darryl Colburn Stein, Andover, Conn., assignor to Gerber Garment Technology, Inc., Tolland, Conn.

Filed Jul. 21, 1995, Ser. No. 505,490

Int. Cl.<sup>6</sup> B65H 23/18; 20/00

U.S. Cl. 242—418.1

21 Claims



1. A segmented dancer bar for use in a sheet material feed mechanism, said dancer bar comprising a plurality of segments flexibly linked together, each of said segments having a male end and an opposite female end, each of said ends defining a socket, each male end further including a pin pressed into the corresponding socket, said pin being insertable into the socket defined by the female end of another of the plurality of segment to flexibly link the segments together to prevent bowing, such that the bar provides a uniform downward pressure along its entire length.

**5,772,148**  
**METHOD AND DEVICE FOR WINDING PRINTED PRODUCTS IN SCALED FORMATION**

Jürg Vollenweider, Fehraltorf, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

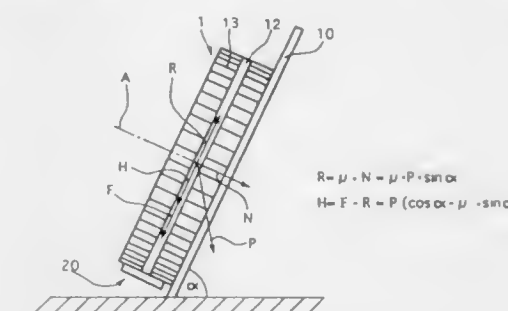
Filed Feb. 14, 1997, Ser. No. 800,757

Claims priority, application Switzerland, Feb. 16, 1996, 40414/96

Int. Cl.<sup>6</sup> B65H 18/22; 16/02; 23/08

U.S. Cl. 242—423.1

17 Claims



1. A method for unwinding a scale formation of printed products from a roll having the scale formation wound around a winding core with a winding tape, the roll having a roll axis, a peripheral surface and two axially spaced roll faces, the method comprising the steps of:

providing a supporting surface inclined relative to horizontal by an inclination angle of less than 90° and more than 0° and a support means for supporting a portion of the weight of the roll;

positioning a roll to be unwound with one of the roll faces against the supporting surface with the support means holding the roll in a defined position;

pulling the winding tape off of the roll to cause the roll to rotate about the roll axis in the defined position and to unwind the tape and the scale formation from the roll core, and

maintaining sufficient frictional engagement between the one face of said roll and the supporting surface to create resistance to rotation, thereby keeping the tape under tension force within a predetermined force range as it is pulled from the roll.

periphery of one of said ring of gear teeth and said gear wheels and a closed tooth gap on the other of said ring of gear teeth and said gear wheels, and said switching elements abutting against one another in permanently set relative angular positions of the gear wheels and of the ring of gear teeth, said rocking member being pivoted by abutment of said switching elements on each other.

**5,772,146****REEL DEVICE FOR CABLE**

Akio Kawamoto; Kiyoshi Watanabe; Yoshiaki Takano, and Kazuhiro Kaneko, all of Fuji, Japan, assignors to Nihon Plast Co., Ltd., Fuji, Japan

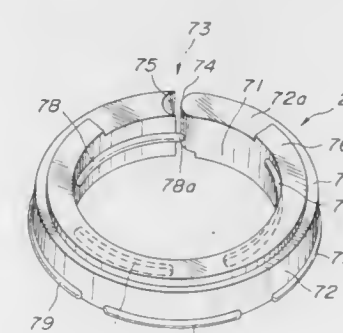
Division of Ser. No. 361,043, Dec. 21, 1994, abandoned. This application Dec. 5, 1996, Ser. No. 760,809

Claims priority, application Japan, Dec. 22, 1993, 5-324737; Dec. 22, 1993, 5-324739; Dec. 22, 1993, 5-324740; Dec. 27, 1993, 5-333070; May 26, 1994, 6-112544

Int. Cl.<sup>6</sup> B65H 75/38; H01R 39/00; 3/00

U.S. Cl. 242—388

15 Claims



1. A reel device for a cable, comprising:
- a casing including a generally cylindrical frame section, and a shaft section disposed rotatably in first and second directions relative to said frame section, said first and second directions being opposite to each other; and
  - a cable storing space between said frame section and said shaft section, the cable being stored in said cable storing space and having a first end section connected to said frame section, and a second end section connected to said shaft section, said cable being wound on an outer peripheral surface of said shaft section in a third direction and on an inner peripheral surface of said frame section in a fourth direction with a relative rotation between said frame section and said shaft section, said third and fourth directions being opposite to each other;
  - a guide member disposed in said cable storing space and located between the cable wound on the outer peripheral surface of said shaft section and the cable wound on the inner peripheral surface of said frame section to guide said cable, said guide member being generally annular and disposed around said shaft section to be rotatable in a peripheral direction of said casing, said guide member including an inner peripheral surface and a slit through which said cable passes and is turned over between said third and fourth directions, said slit including convex and concave surfaces which axially extend and face each other to define said slit therebetween; and
  - smoothing means allowing smoother movement of the cable through said slit and a rotational movement of said guide member, said smoothing means being included in said guide member, said smoothing means including a peripheral projection formed at said inner peripheral surface of said guide member, said peripheral projection being located near the concave surface of said slit and projected beyond an end portion in the peripheral direction of the concave surface to approach the convex surface.



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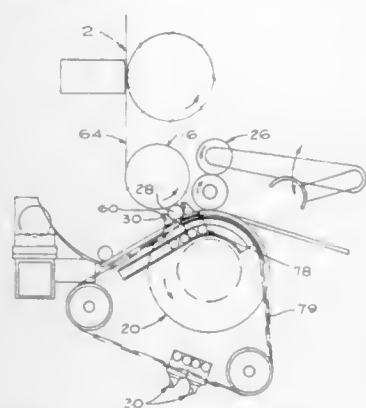
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5,772,149

**WINDING CONTROL FINGER SURFACE REWINDER**  
Tad T. Butterworth, Ashland, Wis., assignor to C. G. Bretting Manufacturing Company, Inc., Ashland, Wis.  
Filed Sep. 18, 1996, Ser. No. 715,671  
Int. Cl.<sup>6</sup> B65H 18/20; 19/30

U.S. Cl. 242—533.2

20 Claims



1. A rewinder for rewinding a web of material comprising:  
an upper winding roll, a lower winding roll and a rider roll mounted adjacent one another;  
at least one winding control finger mounted for rotation with respect to said upper winding roll for inserting a core for rewinding adjacent at least two of said rolls; and  
wherein at least one of said winding control fingers is selectively engageable with said upper winding roll to separate the web.

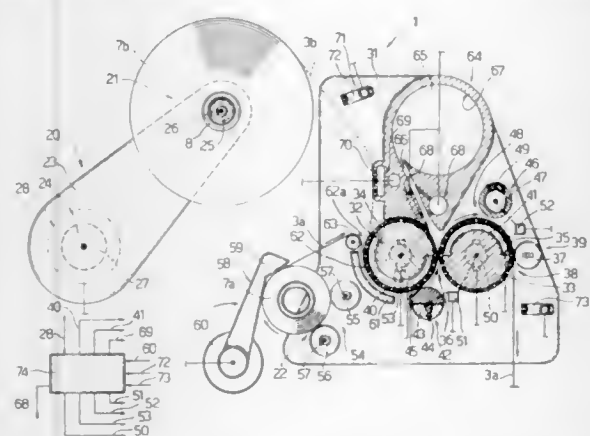
5,772,150

**REEL CHANGE DEVICE FOR FEED DEVICES SUPPLYING STRIP MATERIAL TO A USER MACHINE**  
Mario Spatafora, Bologna, Italy, assignor to Azionaria Costruzioni Macchine Automatiche A.C.M.A. S.p.A., Bologna, Italy

Continuation of Ser. No. 224,326, Apr. 7, 1994, abandoned.  
This application Jul. 15, 1996, Ser. No. 683,046  
Claims priority, application Italy, Apr. 9, 1993, B093A0141  
Int. Cl.<sup>6</sup> B65H 19/14

U.S. Cl. 242—554.1

9 Claims



1. A reel change device (1) for feed devices (2) supplying strip material (3) to a user machine; the reel change device (1) comprising a first (21) and second (22) unwinding station for a first (7b) and second (7a) reel of respectively first (3b) and second (3a) strip material; said first strip material (36) having a free end; strip guide means (34, 35) for guiding the strip material and defining a path along which the strip material (3) is fed in a given unwinding direction; and cutting means (42) and splicing means (46) located along said path, for cutting and splicing the strip material (3); the strip guide means comprising a first (34) and second (35) conveyor

in series with each other, the first conveyor upstream from the second conveyor in said unwinding direction, and closely adjacent to each other at a transfer station (36) at which the strip material (3) is transferred from the first (34) to the second (35) conveyor. The conveyors (34, 35) respectively defining substantial first and second contiguous portions of said path, and being arranged on opposite sides of said path; strip material disposing means (64) at the transfer station (36); and first (40) and second (41) selectively-activated retaining means respectively extending along said first and second path portions, for respectively retaining the strip material (3) on the first (34) and second (35) conveyor; the cutting means (42) being located along said path at a cutting station along the first (34) conveyor, the splicing means being located along said path at a splicing station along the second (35) conveyor; said disposing means (64) comprising a cavity (65) for receiving said first strip material (3b), a disposal channel (66) extending from said transfer station (36) and communicating with said cavity (65), the disposal channel being substantially tangent to the first portion of the path at the transfer station (36) and extending on the same side as the first portion in relation to the second portion of said path, and pneumatic advancement means (68) for force feeding said first strip material (3b) forwards along said disposal channel (66) and into said cavity (65); said path being shaped to enable the free end of said first strip material (3b) to be fed, in use, to said disposal channel (66) by passing between the first retaining means (40) and the second strip material (3a).

5,772,151

**UMBRELLA TYPE QUICK WIRE REMOVAL DEVICE FOR WINDING MACHINES**

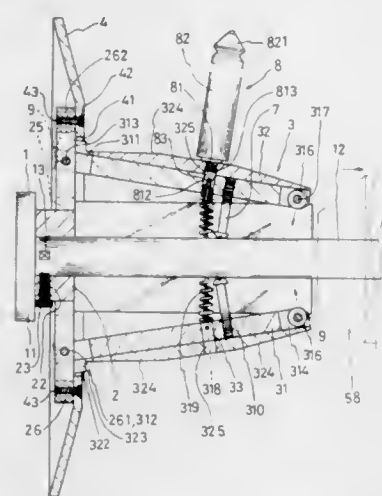
Kui-Yu Teng, Chung Ho, Taiwan, assignor to U Gear Automatic Machinery Co., Ltd., Taipei Hsien, Taiwan

Filed Jun. 13, 1997, Ser. No. 874,227

Int. Cl.<sup>6</sup> B65H 75/24; 54/00

U.S. Cl. 242—573

5 Claims



1. An umbrella type quick wire removal device for winding machines, comprising:  
a shaft, said shaft having one end thereof connected to an output shaft of a winding machine, and a main shaft extending from the other end thereof;  
a shaft collar, said shaft collar having an annular hole at a center thereof for connection with said main shaft, and a collar body, at least three shaft notches being equi-angular formed on said collar body, with each of said shaft notches radially connecting a shaft bracket, said shaft bracket having a bracket hole in a longitudinal direction;  
an umbrella type pawl means, said pawl means being comprised of base rods and curved clamp plates corresponding to said shaft brackets in number and forming a cylindrical shape, each of said base rods having a rear notch for matching said bracket hole so that a pin may pass through said rear notch and said bracket hole to hold each of said base rods and its

corresponding shaft bracket in a rotatable relationship, each of said base rods further having a rear notch for receiving a guide wheel and a guide wheel positioned therein by a pin, each of said curved clamp plates having a baffle rim and a plate groove for passage of said shaft bracket;  
an inner annular plate, being a disk structure and being locked to said shaft brackets by screw rods;  
take means, said take means being comprised of a liner, a spring, a bushing, a withdraw ring, a tightening ring, an adjusting ring, a bearing, and a securing seat, said liner having a liner ring near an outer end and a liner groove at an interior thereof for passage of said main shaft, said liner being fitted with said spring and passed through a bushing hole of said bushing, with said withdraw ring connected to an end of said liner, said liner further having a liner loop at an outer end, said liner loop having at least three liner holes each of which insertably receive a ball, said tightening ring being inserted into a rear end portion of said bushing so that a ring rake thereof is in contact with said ball in each of said liner holes, said adjusting ring having one end screwably coupled to said bushing and the other end connected to said bearing using a first fastening ring, said adjusting ring and said bearing being placed into a securing seat using a second fastening ring, said securing seat having an oblique seat cone, a planar seat ring, and a seat hole for passage of said main shaft; and  
an outer annular plate, being a disk structure and being locked to said securing seat with screw rods; whereby when said take means is being pulled outwardly along the direction of said main shaft when winding is accomplished, said adjusting ring is being turned firstly so that the tensile force and radial pressure of the wire disappear to allow pulling out of said adjusting ring, thereby disengaging said balls from said ring rake to allow removal of said take means, said guide wheels of said base rods being no longer supported by said securing seat so that said base rods may retract in a conical shape using the corresponding bracket holes as pivots.

5,772,152

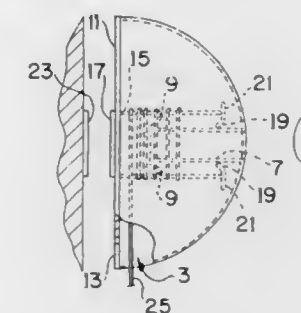
**INTERACTING SPOOLS FOR A CORD HOLDER**  
Sandra Birdsall Maldonado, 4547 Louisa Dr., New Orleans, La. 70126

Filed Aug. 29, 1996, Ser. No. 705,296

Int. Cl.<sup>6</sup> B65H 16/04

U.S. Cl. 242—597

3 Claims



1. A cord holder comprising:  
an outer housing having an inner spool extending inwardly from the housing towards a stationary support mount, said housing having a cord opening through the housing,  
said support mount having an open ended hollow cord retaining spool extending outwardly towards the housing, said cord retaining spool having a diameter larger than a diameter of the inner spool and a length substantially the same as a length of the inner spool,  
said cord retaining spool being concentrically mounted on the inner spool by placing said cord retaining spool over the inner spool, said inner spool having spool support spacer members which are disposed on a free end of the inner spool and face in a radially outward direction, said spool support spacer members engage an inner surface of said cord retaining spool

to space an outer surface of said inner spool from the inner surface of said cord retaining spool, said cord retaining spool having spool support members which face in a radially inward direction and engage the outer surface of the inner spool near an end of the inner spool opposite the free end to space the outer surface of said inner spool from the inner surface of said cord retaining spool whereby the rotation of the inner spool and the housing with respect to the cord retaining spool permits the withdrawal of stored cord through the cord opening; and means on said support mount for attaching the support mount to a fixed vertical support surface.

5,772,153

**AIRCRAFT ICING SENSORS**

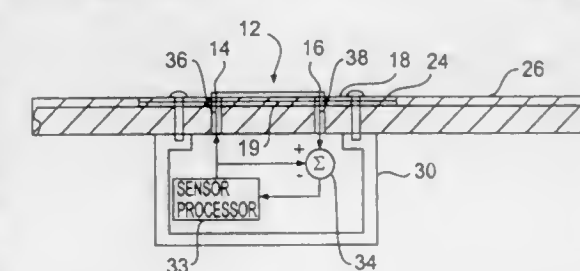
John T. Abaunza, 12619 Camden Dr., Goldvein, Va. 22720, and Nicholas C. Donnangelo, 104 Cornwall St., NE., Leesburg, Va. 22075

Filed Oct. 17, 1995, Ser. No. 544,131

Int. Cl.<sup>6</sup> B64D 15/20

U.S. Cl. 244—134 F

40 Claims



1. A method of detecting the presence of icing on a surface comprising:  
a) developing a radio frequency;  
b) transmitting the radio frequency down a surface mounted surface gap transmission line;  
c) receiving the transmitted radio frequency after transmission along said surface mounted surface gap transmission line;  
d) measuring the propagation delay of said radio frequency received from said surface mounted surface gap transmission line in said step b) of transmitting; and  
e) determining the presence of icing from a parameter directly related to the propagation delay measured in step d).

5,772,154

**LEADING EDGE HEAT SHIELD FOR WINGS OF SPACECRAFT**

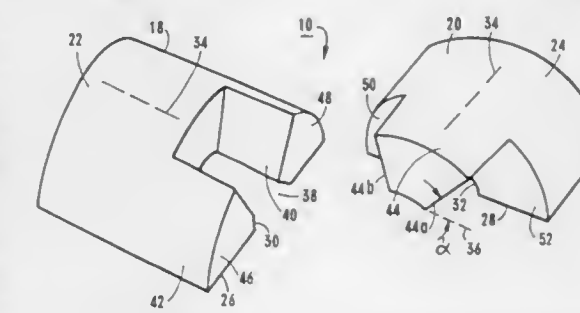
David A. Stewart, Santa Cruz, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 28, 1995, Ser. No. 563,418

Int. Cl.<sup>6</sup> B64G 1/22; 1/46; 10/50; B64C 1/12

U.S. Cl. 244—158 A

9 Claims



1. A heat shield configured for engaging the leading edge of a wing of a spacecraft, comprising:

1. In combination:

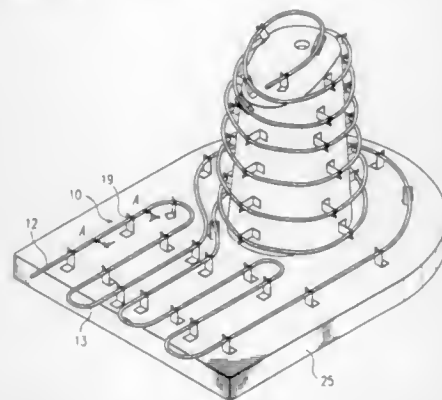
- a power steering assembly for a motor vehicle, said power steering assembly including a pair of pipes extending in spaced side-by-side parallel relationship;
- a mounting bracket carried by said pipes, said mounting bracket comprising a main body having oppositely disposed front and rear faces, resilient clips extending from the rear face of the bracket to partially encircle and resiliently grip the pipes and hold the bracket thereto, said resilient clips each having a pipe-receiving opening facing a first direction to permit the mounting bracket to be joined to the pipes by moving the bracket generally parallel to the rear face in said first direction; and,
- a pivotal latch means carried by the bracket and associated with one of the resilient clips for releasably latching to the said one of the resilient clips selectively closing the pipe-receiving opening of the said one of the resilient clips thereby preventing



ing disengagement of the mounting bracket from the pipes in a second direction opposite to said first direction.

5,772,161  
CAPILLARY BRACKET  
Douglas N. Livingston, P.O. Box 415, Cibola, Tex. 78108  
Filed May 25, 1995, Ser. No. 450,806  
Int. Cl.<sup>6</sup> F16L 3/08  
U.S. Cl. 248—74.2

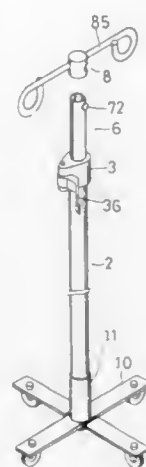
15 Claims



1. A bracket for use in a molding system comprising:  
an angled holding member having a first leg portion and a second leg portion, said first leg portion being formed of a magnetic material;  
a receptacle provided in said second leg portion of said angled holding member adapted to receive a tubular member; and  
a plurality of dimpled projections provided in said second leg portion of said angled holding member adapted to provide an adhering relationship between said angled holding member and a surrounding production mold material.

5,772,162  
DROP-BOTTLE STAND  
Chin-Liang Lin, No. 55, Chia-Tung Chiao, Chia-Fang Li, Hsin-Ying Hsieh, Tainan Hsien, Taiwan  
Filed Oct. 16, 1996, Ser. No. 730,781  
Int. Cl.<sup>6</sup> F16L 3/00  
U.S. Cl. 248—121

1 Claim



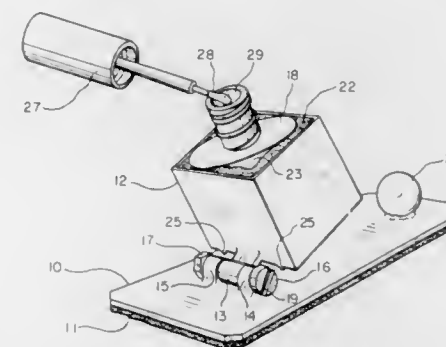
1. A drop-bottle stand comprising:  
a base consisting of two horizontal elongate plates crossing with each other at respective center portions thereof, each of said elongate plates having a centrally disposed aperture, said elongate plates being connected with a screw passing through

- said apertures, each said elongate plate having a wheel combined with each of two ends to roll freely on the ground;  
a lower connector having a cylindrical shape and having an open upper side and a lower side with a small center hole formed therein for said screw to pass therethrough from below said base;  
an outer tube having female threads formed in a bottom end thereof, said bottom end being disposed in said lower connector for engaging said screw to secure said outer tube and said lower connector to said base, said outer tube having two longitudinal grooves formed in an outer surface of opposing sides thereof and a rectangular hole formed therethrough, said two longitudinal grooves forming two longitudinal projections on an inner surface of said outer tube;  
an adjusting sleeve having (a) an inner protruding edge formed in an upper end thereof, (b) a centrally disposed hole extending longitudinally therethrough, (c) a pair of longitudinally spaced ears respectively formed adjacent said upper end and a lower end thereof, said pair of ears being positioned in line and each having a vertical hole formed therethrough, (d) a recessed opening located between said pair of ears, (e) a plate having an outer concave surface and a central vertical ridge formed on an inner convex surface and positioned within said recessed opening, (f) an eccentric arm disposed between said pair of ears and having an eccentric portion with a vertical hole formed therein, said vertical hole of said eccentric portion being in aligned relationship with said vertical holes of said pair of ears, and (g) a pin inserted through said vertical holes of said pair of ears and said vertical hole of said eccentric portion of said eccentric arm, said eccentric arm being rotatable through 90 degrees for selective engagement or disengagement of said eccentric portion with respect to said concave surface of said plate, and said adjusting sleeve being fixedly attached to an upper end of said outer tube;  
an inner movable tube telescopically disposed within said outer tube and having two longitudinal grooves formed on opposing sides thereof engaged with said two longitudinal projections of said outer tube, said inner movable tube having a positioning hole formed through a side wall thereof;  
a cylindrical member having a hole formed centrally therethrough and an inwardly protruding edge formed in an upper end thereof, said cylindrical member having a slot formed in a lower side thereof, a vertically directed recess, fixedly attached to said upper end of said outer tube, and for guiding the inner movable tube within the outer tube;  
a two-piece ring having two semicircular pieces respectively provided with a projection extending from an inner surface thereof, disposed within the outer tube and for interlocking with the inner movable tube;  
a cylindrically shaped upper connector having a closed upper end and an open lower end, said upper connector having an aperture formed through a side wall thereof, said closed upper end having a transversely directed groove formed therein and a top hanging bar positioned in said transverse groove and secured therein, said hanging bar having a hook formed on each end thereon, said open end of said upper connector is fitted around an upper end of said inner movable tube; and  
an elastic button formed by a button body and an elastic U-shaped member having one end connected to said button body, said U-shaped member being completely inserted in said upper end of said inner movable tube, said button body extending out through said positioning hole of said inner movable tube for a predetermined distance established by a flange formed in an inner side of said button body and passing through said aperture of said upper connector to prevent said

inner movable tube from rotating, and said flange being of larger diameter than said positioning hole of said inner movable tube.

5,772,163  
DEVICE FOR HOLDING AND TIPPING A CONTAINER OF LIQUID  
Robert P. Young, 7528 S. 2300 East, Salt Lake City, Utah 84121  
Filed Oct. 5, 1995, Ser. No. 539,730  
Int. Cl.<sup>6</sup> A47F 5/12  
U.S. Cl. 248—139

20 Claims

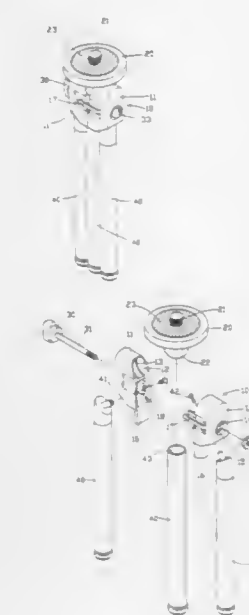


1. A device for holding and selectively tipping a container of liquid which has a top and an opening in the top into which an implement for removing a portion of the liquid contents is periodically inserted, comprising a substantially planar base to be placed on a surface; an open top receptacle having a resilient foam material therein for receiving and holding the container with the top of the container oriented with the top of the receptacle; at least one receptacle hinge element secured to the receptacle at a side of the receptacle adjacent the base; and hinge pin means extending through the respective hinge elements to hingedly and adjustably secure them together, whereby the receptacle is hingedly connected to the base so that the receptacle can be tipped with respect to the base about the hinge pin substantially along a lower side of the receptacle and the resistance to movement of the hinge means is adjustable.

5,772,164  
ANGULARLY POSITIONABLE CAMERA TRIPOD  
Wei-Hong Shen, 6F, No. 416, Sec. 4, Jen-Ai Road, Taipei, Taiwan  
Filed Sep. 25, 1996, Ser. No. 715,843  
Int. Cl.<sup>6</sup> F16M 1/38  
U.S. Cl. 248—170

1 Claim

1. A tripod for supporting a camera, comprising:  
a camera platform having an upper surface with an upright screw rod extending from a central portion thereof for coupling with a camera, said camera platform having a coupling ball extending from a lower surface thereof;  
a tripod head formed by a first half shell and a second half shell coupled together and clampingly engaging said coupling ball of said camera platform therebetween, each of said first and second half shells having a recessed opening formed therein for receiving a respective portion of said coupling ball therein and a transverse mounting hole extending therethrough, each of said first and second half shells having a semi-cylindrical rod-shaped portion extending downwardly from a bottom portion thereof and a coupling hole extending through said bottom portion, said second half shell having a hexagonally-shaped opening formed coaxially with said transverse mounting hole;

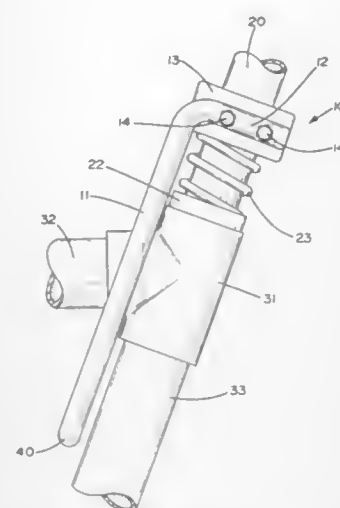


- a lock screw having a screw body with threads formed thereon and passing through said transverse mounting hole of each of said first and second half shells, said lock screw being threadedly engaged with a hexagonal nut disposed in said hexagonally-shaped opening for reversibly clamping said first and second half shells together to releasably lock said camera platform in a selected position;  
a cap nut threadedly engaged with a distal end of said screw body for maintaining said hexagonal nut within said hexagonally-shaped opening;  
a clip coupled to said first half shell through an opening formed therein for fastening said tripod to a strap of the camera;  
a first tripod leg having a hole formed in an upper end thereof for receiving said semi-cylindrical rod-shaped portions of both said first and second half shells therein; and  
a pair of second tripod legs respectively coupled to said first and second half shells, each of said pair of second tripod legs having an internally threaded coupling rod extending from an upper end thereof and passing through said coupling hole of a respective one of said first and second half shells and secured therein by a screw.

5,772,165  
EXTERNAL ROTATION STOP AND EXTENSION LIMITER FOR A SADDLE OF A CYCLE  
Günter Schröder, Schillerstrasse 7, 66780 Siersburg, Germany  
Filed Jan. 21, 1997, Ser. No. 786,763  
Claims priority, application Germany, Jan. 18, 1996, 196 01 635.5  
Int. Cl.<sup>6</sup> F16M 1/300  
U.S. Cl. 248—188.5

7 Claims

1. An arrangement for externally securing a saddle of a cycle against rotation and for limiting the distance to which the saddle can be raised in elevation relative to the cycle frame, the cycle frame including an upwardly extending frame member and the arrangement comprising:  
a support assembly including a mount for supporting said saddle and an elongated supporting member connected to said mount;  
said elongated supporting member defining a first longitudinal axis;  
said elongated supporting member extending downwardly to slideably engage said upwardly extending frame member thereby facilitating the movement of said support assembly and said saddle upwardly and downwardly in elevation relative to said cycle frame;



(c) a light holder having:

- (i.) a projection containing a plurality of apertures and the first and second tabs extending through two of the apertures wherein each of the first tab and the second tab have a stop positioned a distance away from the exterior surface such that when a light is mounted within the light holder the light will not come in contact with an object; and
- (ii.) a first gripping member at one end and a second gripping member at an opposite end, both gripping members sized and shaped to grip a socket of a decorative light.

5,772,167

## BASKETBALL-STAND

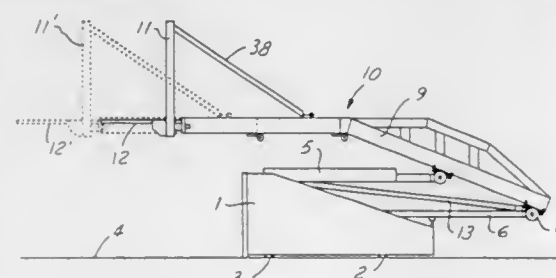
Peter Marinus F. Oole, Kloctinge, Netherlands, assignor to Schelde International B.V., Goes, Netherlands

Filed Jul. 29, 1996, Ser. No. 681,887

Int. Cl.<sup>6</sup> A63B 63/00

U.S. Cl. 248—284.1

13 Claims



1. A basketball stand comprising, in combination:

- a base;
- at least one support system carried by the base;
- a beam provided with means for attachment of a backboard and dunk-ring;
- said beam having inner and outer relatively slidable tubes;
- said inner tube being provided exteriorly with a stop member for abutment of the outer tube to define one extreme relative position of the inner tube with respect to the outer tube corresponding with the shortest effective beam length; and
- said inner tube at a short distance spaced from its free end having interiorly an abutment member for abutting a further stop member carried by the outer tube to define a second extreme relative position of the inner tube with respect to the outer tube, corresponding with the greatest effective beam length.

5,772,168

## MOUNTING BRACKET FOR PRESSURIZED FLUID BUFFER DEVICE

Chiharu Nakazawa, Kawasaki; Susumu Shinozaki, Sagami-hara; Michiya Hiramoto, Yokohama; Hiroshi Hoya, Kawasaki, and Kohtaro Shiino, Odawara, all of Japan, assignors to Unisia Jecs Corporation, Atsugi, Japan

Filed Nov. 27, 1995, Ser. No. 563,046

Claims priority, application Japan, Nov. 28, 1994, 6-292637; May 17, 1995, 7-118573; Sep. 26, 1995, 7-270634; Sep. 26, 1995, 7-270635

Int. Cl.<sup>6</sup> A47F 5/00

U.S. Cl. 248—300

11 Claims

1. A shock-absorber mounting structure for an automotive vehicle, comprising:
  - a hydraulic shock absorber having an outer cylinder, the outer cylinder having a lower portion on the peripheral surface thereof; and
  - a fixing bracket comprising:
    - a body portion partially surrounding the lower portion on the peripheral surface of the outer cylinder except a longitudinal surface portion extending in the longitudinal direction

a rod unit having first and second longitudinal end portions and said rod unit defining a second longitudinal axis parallel to said first longitudinal axis;

attachment means for fixedly connecting said first end portion of said rod unit to said support assembly so as to be laterally offset from said elongated supporting member whereby said rod unit moves in elevation with said support assembly in spaced relationship to said elongated supporting member; and, said second end portion of said rod unit being configured so as to engage said cycle frame to limit the upward movement of said support assembly and said saddle relative to said cycle frame and to prevent an unwanted disconnection thereof from said cycle frame.

5,772,166

## MOUNTING CLIP

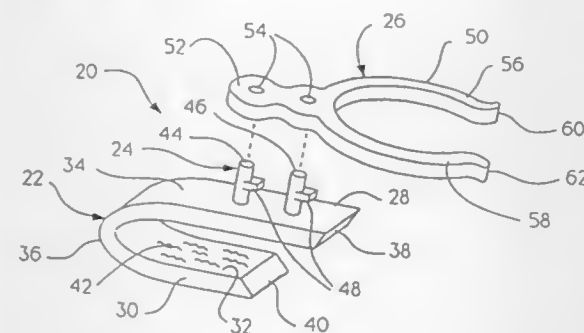
William E. Adams, Portersville, Pa., assignor to Adams Mfg. Corp., Portersville, Pa.

Continuation-in-part of Ser. No. 227,034, Apr. 13, 1994, abandoned, and Ser. No. 339,025, Nov. 14, 1994, Pat. No. 5,531,411. This application Jan. 30, 1996, Ser. No. 593,828

Int. Cl.<sup>6</sup> F21S 1/00

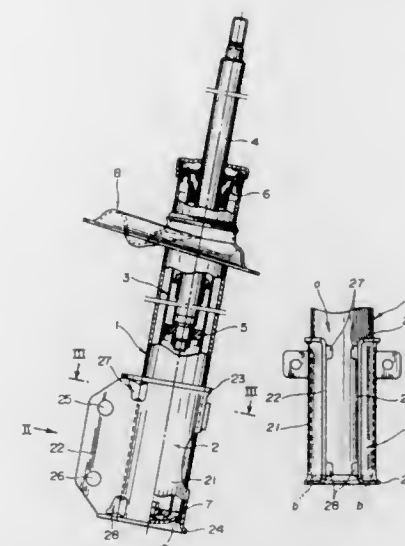
U.S. Cl. 248—231.81

14 Claims



1. A mounting clip comprising:

- (a) a generally U-shaped clip body having a first leg, a second leg, a bridge portion extending between the first leg and the second leg, an interior surface, an exterior surface, a proximate end and a distal end, the clip body made of resilient material such that the distal end and the proximate end can be sufficiently spread apart so that an object can be inserted therebetween and the clip body will grasp the object adjacent the interior surface;
- (b) a mounting extending from the clip body exterior surface and having a first tab and a second tab spaced apart and extending substantially perpendicular to the exterior surface; and



of the hydraulic shock absorber, wherein the body portion has opposed edges defining a gap, which extends in the longitudinal direction of the hydraulic shock absorber, the longitudinal surface portion being exposed at the gap;

a pair of opposed flange portions respectively extending from the opposed edges defining the gap and formed integrally with the body portion, wherein each of the pair of opposed flange portions is formed with upper and lower bolt holes separated by a first distance in the longitudinal direction of the hydraulic shock absorber; and

tooth portions on the pair of opposed flange portions, the tooth portions projecting toward each other inwardly across the gap and having contact surfaces that contact the exposed longitudinal surface portion, the tooth portions becoming firmly engaged with the exposed longitudinal surface portion when a bending moment, which tends to widen the gap, occurs between the outer cylinder and the fixing bracket, wherein the body portion has upper and lower edges spaced in the longitudinal direction of the outer cylinder, and wherein the upper bolt holes are spaced farther in the longitudinal direction of the outer cylinder from the upper edge of the body portion than the tooth portions are spaced in the longitudinal direction of the outer cylinder from the upper edge of the body portion.

5,772,169

## COMPRESSION STRUT SYSTEM FOR ACOUSTIC CEILING

William Edward Blockley, 1915 Alta Vista Dr., Bakersfield, Calif. 93305

Filed Nov. 5, 1996, Ser. No. 743,217

Int. Cl.<sup>6</sup> A47H 1/10

U.S. Cl. 248—333

7 Claims

1. An acoustic ceiling compression strut system comprising:
  - a first elongated element having means for accommodating a wire;
  - a second elongated element having means for accommodating said first elongated element; and
  - an adjustable connector operable in two modes, a first mode whereby said first and said second elongated elements are movable relative to each other, and a second mode whereby said first and said second elongated elements are locked in position relative to one another;
- said first elongated element is tubular in shape;
- said second elongated element is tubular in shape;
- said second elongated element is larger than said first elongated element;



said first elongated element is adapted to telescope within said second elongated element; and

said connector is a strip having a U-shape with a base and two arms.

5,772,170

## VACUUM-SUCTION ATTACHMENT PAD

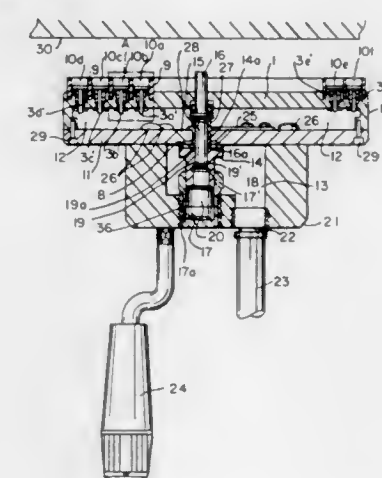
Tadaaki Tsukushi, Tokyo, Japan, assignor to Nihon Biso Co., Ltd., Tokyo, Japan

Division of Ser. No. 443,272, May 17, 1995, Pat. No. 5,685,513. This application Aug. 27, 1996, Ser. No. 703,514

Int. Cl.<sup>6</sup> B66C 1/02; E04G 3/10

U.S. Cl. 248—363

1 Claim



1. A vacuum-suction attachment pad adapted to be abutted against a surface, comprising:

- a pad body adapted to be abutted against an external pad supporting surface to which said pad is to attach by suction;
- a suction chamber provided in a rear portion of said pad body which is adapted to contact said external pad supporting surface, a fore end portion of said pad body adapted to face said external pad supporting surface being divided by a partition wall into a plurality of sucking compartments for communication with said suction chamber;
- an air flow passage provided for communication with said suction chamber;
- valve mechanisms provided in air flow paths between respective said sucking compartments and said suction chamber, said valve mechanisms being closeable by a sucked air flow occurring during the vacuum suction;
- an automatic switching valve provided in a part of said air flow passage in such a manner that said switching valve is caused to open when a vacuum is applied to the suction chamber.



to open in response to contact of said pad body against said external pad supporting surface;  
spring means normally urging said automatic switching valve to close;  
a second air flow passage provided for communication with said suction chamber;  
a second switching valve provided in said second air flow passage;  
spring means normally urging said second switching valve to close; and  
means for manually opening said second switching valve to communicate the second air flow passage with the suction chamber.

5,772,171

## ADJUSTABLE SUPPORT STAND

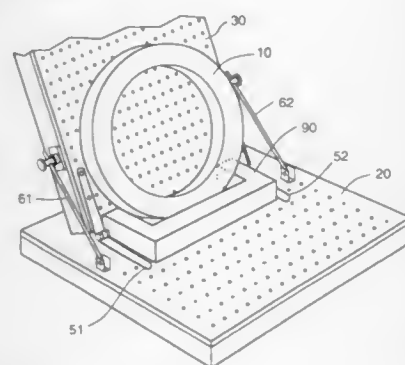
Ralph T. Masaoka, and Mary Anne Rougeux, both of 861 Erie Cir., Milpitas, Calif. 95035

Filed Apr. 9, 1996, Ser. No. 631,695

Int. Cl.<sup>6</sup> A47K 1/00

U.S. Cl. 248—397

4 Claims



4. An adjustable support stand for use in assembling wreaths and floral arrangements, said support stand having a closed position and an open position, comprising:

- a base;
- an upper member carried by said base, said upper member having a plurality of perforations;
- hinge means attached to said base and said upper member whereby said upper member may be moved between said closed and said open positions, in said closed position said upper member is generally parallel with and adjacent to said base, and in said open position said upper member forms an obtuse angle with said base;
- means for holding said upper member in its open position relative to said base member;
- a plurality of pegs readily insertable into and removable from said perforations in said upper member, whereby a wreath or floral arrangement may be supported by said pegs to allow said wreath or floral arrangement to be inspected one or more times during assembly thereof; and
- a generally U-shaped support means carried by said base.

5,772,172

## ROTATING ROADSIDE LIGHT POLE ASSEMBLY

Pablo S. Sampedro, San Jose, and Gordon L. Ritchie, Danville, both of Calif., assignors to Lockheed Martin Corporation, Bethesda, Md.

Filed Feb. 27, 1996, Ser. No. 607,615

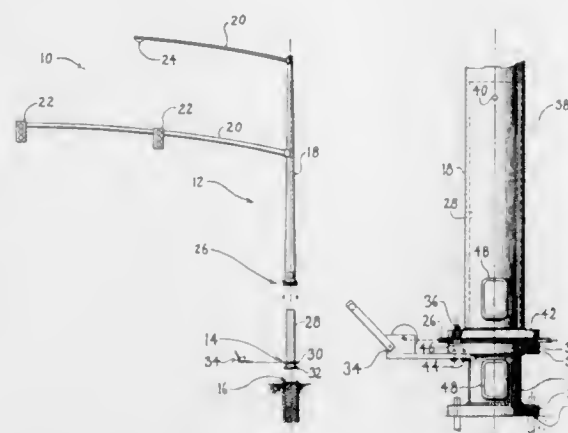
Int. Cl.<sup>6</sup> F16M 13/00

U.S. Cl. 248—415

14 Claims

1. A roadside standard assembly for use adjacent to a roadway, the assembly comprising:

- a support pole having a lower end and an inner surface which defines an opening extending upward from the lower end;



an arm extending from the pole;  
an object supported by the arm, the object disposable over the roadway when the object is in use;  
an anchoring structure rotatably engaging the pole, the structure comprising a cylinder extending upward into the opening of the pole, the cylinder engaging the inner surface of the pole to restrain the pole in an upward orientation; and  
an attachment point disposed on one of the pole and the structure, the attachment point for attaching a moment imposing mechanism to rotate the pole relative to the structure and move the object from over the roadway, wherein the cylinder extends above the attachment point.

5,772,173

## LOCKABLE SLIDE, ESPECIALLY FOR AUTOMOBILE VEHICLE SEATS

Christian Couasnon, Flers, France, assignor to Bertrand Faure Equipements S.A., Boulogne Cedex, France

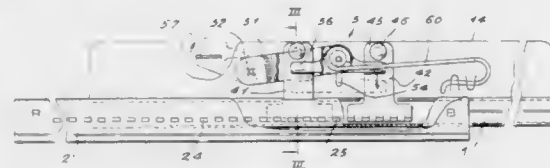
Filed Oct. 25, 1996, Ser. No. 738,359

Claims priority, application France, Nov. 8, 1995, 95 13370

Int. Cl.<sup>6</sup> F16M 13/00

U.S. Cl. 248—430

9 Claims



1. A slide for automobile vehicle seats, including a first section and a second section, sliding in relation to each other, and locking means attached to the first section and adapted to mate with one or more notches of a set of notches spaced at regular intervals in the second section, wherein the locking means include at least two elastically flexible blades each including, at one end, locking elements adapted to mate, in a locking position, with the notches, and being attached to the first section at a distance from the locking elements, in that the locking elements of the blades are offset, in relation to the notches which they engage, on one blade in relation to the other and in longitudinal sliding direction, by a distance equal to  $K \cdot p/p/n$ , "K" being a whole number, "p" being the notch pitch, and "n" being the number of blades, the slide further including unlocking means adapted to act simultaneously on the blades, by making them deflect elastically, so that the locking elements of all the blades are disengaged from the notches.

5,772,174

## ADJUSTABLE STAND FOR MOUNTING ON A WALL OR THE LIKE

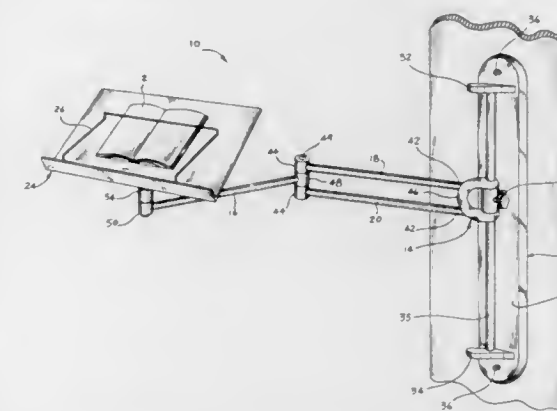
Steven Hirsch, 13040 Woodbridge St., Studio City, Calif. 91604, and Joseph Yedwab, 4915 Gaviota Ave., Encino, Calif. 91436

Filed Nov. 22, 1995, Ser. No. 562,050

Int. Cl.<sup>6</sup> A47B 23/04

U.S. Cl. 248—447.1

15 Claims



1. An adjustable stand mountable to a wall for retaining an object, comprising:

- a. an elongated mounting base having a rear side and a front side, the rear side mounted to said wall;
- b. a lower slide rod holder affixed to and extending away from said front side of said mounting base;
- c. an upper slide rod holder affixed to and extending away from said front side of said mounting base and opposite from said lower slide rod holder;
- d. a vertical sliding rod installed between said upper and lower slide rod holders and parallel to said mounting base;
- e. a generally U-shaped slidable arm base having a tube sleeve slidably installed on said vertical sliding rod such that the slidable arm base can be independently adjusted to a vertical height and held or released by tightening or loosening a thumb screw knob;
- f. two elongated horizontal spaced apart distal connecting rods, each having a distal end and a proximal hinge end, the distal ends integrally attached to said slidable arm base;
- g. an elongated horizontal proximal connecting rod having a distal hinge end and a proximal hinge end, the distal hinge end hingebly and rotatably connected between said proximal hinge ends of said two horizontal spaced apart distal connecting rods and secured therebetween by a hinge pin, where the distal hinge end of the proximal connecting rod can be independently rotated in a horizontal plane between said proximal hinge ends of said distal connecting rods;
- h. a mounting head rod assembly having an elongated rod and a lower head hinge end integrally formed with the elongated rod, the elongated rod having a bottom portion and an upper portion, the bottom portion hingebly and rotatably connected to said proximal hinge end of said proximal connecting rod such that the lower head hinge end abuts against said proximal hinge end of said proximal connecting rod, where the mounting head rod assembly can be independently rotated 360° in a horizontal plane;
- i. a pivoting bracket having a curved slotted opening and hingebly attached to said top portion of said elongated rod of said mounting head rod assembly and secured by a hinge pin such that the pivoting bracket can be independently tilted in a vertical plane in a range of approximately 0°–90° and held or released by tightening or loosening an adjustable thumb knob; and
- j. a generally rectangular shaped platform hingebly connected to said pivoting bracket;
- k. whereby said adjustable stand can be independently adjusted in the horizontal plane, the vertical plane, and the vertical height to any position a user desires, where said platform

completely retains the object, and thereby the user's hands are unoccupied to perform other functions.

5,772,175

Patent Not Issued For This Number

5,772,176

## MOTOR MOUNTING SYSTEM

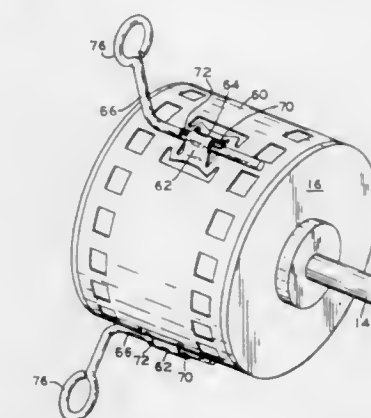
Arthur C. Keck, and Robert K. Hollenbeck, both of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Filed Mar. 7, 1996, Ser. No. 612,468

Int. Cl.<sup>6</sup> F16M 3/00

U.S. Cl. 248—638

28 Claims



1. A vibration isolating mounting system in combination with an electric motor comprising:

- a plurality of mounting arms, each of said mounting arms including a first segment extending generally parallel to an axis of the motor and a second segment extending generally perpendicular to said first segment, said second segment having an end distal from said first segment formed with a termination adapted for attaching said segment to a support, said first segment having an end distal from said second segment formed with at least a pair of spaced protrusions extending generally perpendicularly from said first segment; and
- a plurality of circumferentially spaced retainers on said motor each adapted for passage therethrough of a respective one of said ends of said first segments when each said first segment is rotationally positioned to align said spaced protrusions in a first direction, said first segment being axially retained in said retaining means after passage therethrough when said first segment is rotated to align said protrusions away from said first direction.

5,772,177

## VALVE LATCHING DEVICE FOR SINGLE HANDED OPERATION

David G. Holloway, Deefield; Kenneth Madden, Candia, and Roger Massey, Portsmouth, all of N.H., assignors to Parker & Harper Companies, Inc., Raymond, N.H.

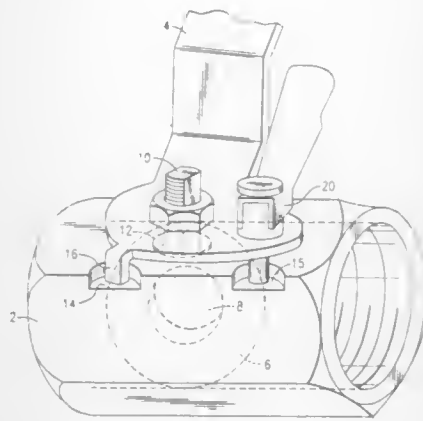
Filed Apr. 14, 1997, Ser. No. 840,122

Int. Cl.<sup>6</sup> F16K 35/00

U.S. Cl. 251—95

5 Claims

1. A fluid flow control valve having a manually rotatable valve operating control handle, a latch biased to latch the valve handle in at least one desired position and a release lever manually operable to overcome the bias to release the latch thereby allowing the



control handle to be rotated to adjust the valve, wherein the handle and lever are juxtaposed to permit simultaneous single handed manual operation of both the latch comprising:

- a latch body having a top portion, a base portion and an axial bore;
- a plunger having a head portion, and an engagement portion extending coaxially with and into the axial bore;
- a spring means contained within the latch body biasing the plunger in a downwardly engaged position; and
- the lever being a thumb release lever slidably interposed between the top portion of the latch body and the plunger head portion such that operation of the thumb release lever overcomes the bias to move the plunger to a disengaged position.

5,772,178

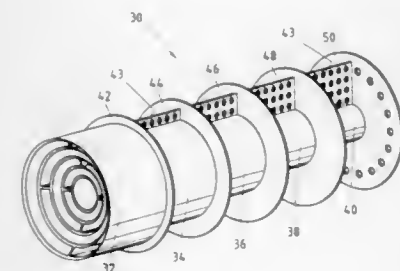
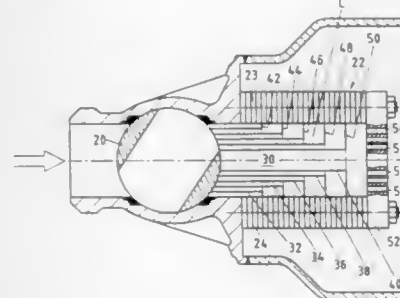
## ROTARY NOISE ATTENUATING VALVE

Roger Bey, Illzach, France, assignor to Rotatrol AG, Cham, Switzerland

Filed Dec. 22, 1995, Ser. No. 577,924  
Int. Cl.<sup>6</sup> F16L 55/207

U.S. Cl. 251—127

26 Claims



1. A valve assembly comprising:
- (a) a rotary closure element; and
  - (b) an impedance assembly disposed downstream of said rotary closure element, said impedance assembly including:
    - (i) impedance means defining a plurality of passageways;
    - (ii) interface means between said rotary closure element and said impedance means defining a plurality of passageways.

said interface means for varying access to said plurality of passageways based upon positioning of said rotary closure element such that a number of passageways through which flow passes progressively increases during opening of said rotary closure element, said interface means including a plurality of channels;

wherein said plurality of channels of said interface means each has an inlet adjacent a location of said rotary closure element to provide a plurality of inlets, and wherein at least a portion of said plurality of inlets collectively form a contour corresponding to a contour of an outer surface of said rotary closure element, each of said plurality of channels of said interface means further including an outlet disposed adjacent to said impedance means, wherein fluid flows in a portion of said interface means along a first direction, and further wherein fluid passes from said plurality of outlets and through said passageways of said impedance means in a direction substantially perpendicular to said first direction; and wherein at least a portion of said plurality of channels is defined by a plurality of walls extending in said first direction, and wherein said plurality of walls are non-perforated walls.

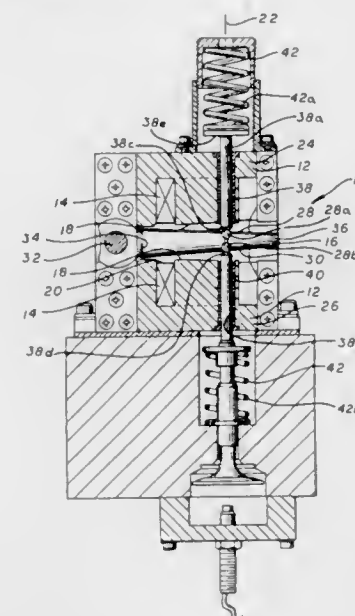
5,772,179

## HINGED ARMATURE ELECTROMAGNETICALLY ACTUATED VALVE

Fernando B. Morinigo; Carmi Goldstein, both of Los Angeles, and Dennis Bulgatz, Reseda, all of Calif., assignors to Aura Systems, Inc., El Segundo, Calif.

Continuation-in-part of Ser. No. 358,331, Nov. 9, 1994, abandoned. This application Nov. 9, 1995, Ser. No. 556,418  
Int. Cl.<sup>6</sup> F16K 31/06; H01F 7/14  
U.S. Cl. 251—129.1

5 Claims



1. An electromagnetically actuated valve comprising:
- an upper electromagnetic element and a lower electromagnetic element, each of said electromagnetic elements having a pole face, a central channel disposed in said pole face, a coil disposed in said channel and a cylindrical bore extending through each said electromagnetic element in said pole face in an area thereof within said central channel wherein said upper and lower electromagnetic elements are in a mirrored relationship to each other, said pole face of said upper electromagnetic element being in a facing relationship to said pole face of said lower electromagnetic element, said cylindrical bore of each of said electromagnetic elements being coaxially disposed along a vertical axis;
  - an armature shaft, said armature shaft being perpendicular to and spaced from said vertical axis;

5,772,181

## PIVOTING VALVE ASSEMBLY

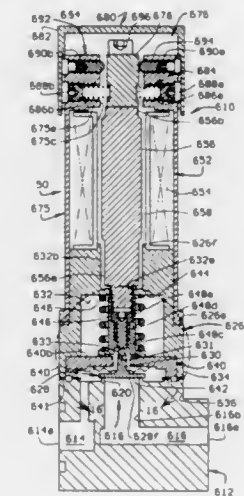
Walter D. Robertson, III, Harleysville, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Jun. 1, 1995, Ser. No. 457,402

Int. Cl.<sup>6</sup> F16K 31/02

U.S. Cl. 251—129.06

20 Claims



1. A valve assembly for use in a fluid flow system comprising:
- a valve body having an inlet, an outlet, and an orifice interposed between said inlet and outlet, said orifice defining an edge;
  - a valve seat mounted for movement relative to said orifice, said valve seat being movable between a first and valve closing position in which said valve seat rests upon said edge and a second and valve opening position;
  - a valve stem having a first end and a second end, one of said ends having said valve seat associated therewith;
  - means biasing said valve seat toward one of said first and second positions;
  - means moving said valve stem;
  - means translating movement of said valve stem into a pivoting movement of said valve seat about said orifice edge to open a fluid flow path between said inlet and said outlet through said orifice;
  - means controlling the extent of the pivoting movement of the valve stem to control the extent of movement of the valve seat relative to said orifice; and
  - means centering said valve stem, said valve seat being in its valve closing position when said valve stem is centered, said control means including a stop limiting movement of said valve stem, and said centering means comprises a spring urging said valve stem toward a centered, valve closing position.

5,772,180

## ELECTROMAGNETIC VALVE FOR AUTOMOTIVE VEHICLE

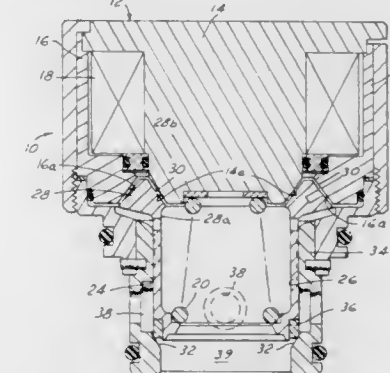
Rodolfo Palma, Canton, and Michael Benjamin Levin, Bloomfield, both of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Jan. 16, 1997, Ser. No. 784,697

Int. Cl.<sup>6</sup> F16K 31/06

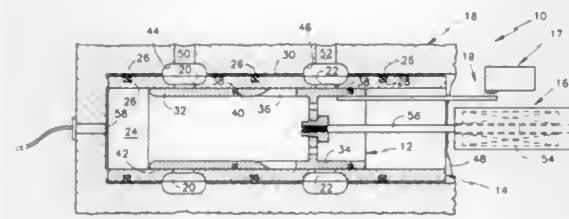
U.S. Cl. 251—129.15

6 Claims



1. An electromagnetically actuated valve for an automotive vehicle, said valve comprising:
- a pole assembly having a coil situated therein, with said pole assembly being generally cylindrical and having a generally annular relieved area formed in one end thereof;
  - an armature comprising:
    - a generally ring-shaped magnetic head having a first end attached to an end of a valve spool; and
    - a second end nested within said relieved area; and
  - an air gap defined by facing surfaces of the generally annular relieved area and the generally ring-shaped magnetic head, with said air gap comprising a continuous, biplanar annulus, with the planes of the annulus making an acute angle with each other.





wherein one of said sleeve or valve block can be selectively displaced relative to the other of said sleeve or valve block from a closed position, where said gates close said ports and thereby prevent fluid flow through said valve via said ports, to a plurality of open positions where said gates allow fluid flow through said valve via said ports;

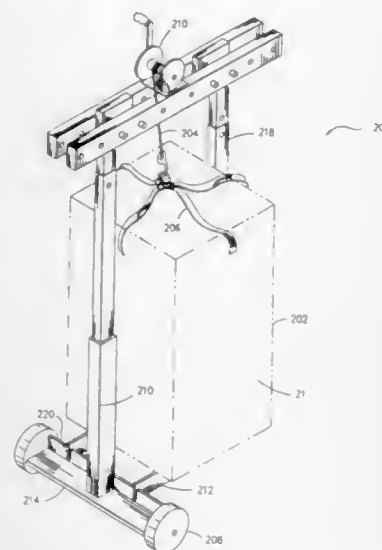
wherein in said plurality of open positions, fluid enters said valve via said inlet port and passes into said internal cavity, and fluid exits said valve via said exit port.

5,772,183  
PORTABLE LIFTING APPARATUS FOR DEMOUNTABLE  
POSITIONING IN AN OVERHEAD LOCATION  
Michael R. Sears, 22210 Acorn Valley Dr., Spring, Tex. 77389-4798

Filed Apr. 1, 1996, Ser. No. 626,025  
Int. Cl.<sup>6</sup> B66D 1/00

U.S. Cl. 254—324

16 Claims



1. A lifting apparatus comprising:

a beam assembly;

a lifting means affixed to a surface of said beam assembly, said lifting means for lifting weighted objects toward or away from said beam assembly, said lifting means having a cable extending therefrom;

a first leg pivotally connected to one side of said lifting means on said beam assembly, said first leg pivotable between a first position in parallel relationship to said beam assembly and a second position perpendicular to said beam assembly, said first leg having a foot member affixed thereto opposite said beam assembly;

a second leg pivotally connected to an opposite side of said lifting means on said beam assembly, said second leg pivotable between a first position in parallel relationship to said beam assembly and a second position perpendicular to said beam assembly, said second leg having a foot member affixed thereto opposite said beam assembly, each of the foot members of said first and second legs comprising:

a transverse beam affixed to an end of the leg opposite the beam assembly, said transverse beam being an angle bar

having an upwardly extending flange portion, said flange portion having a notch formed therein; and

a pair of wheels rotatably connected to said transverse beam; and

a cross support detachably engaging the notch of said flange portion of said angle bar and extending between the foot member of said first leg and the foot member of said second leg in generally parallel relationship to said beam assembly.

5,772,184  
LOAD SUPPORT MOUNTED CONTROL  
ARRANGEMENT FOR FLUID PRESSURE OPERATED  
HOIST

James Zaguroli, Jr., Drayton Plains, Mich., assignor to Knight Industries, Inc., Auburn Hills, Mich.

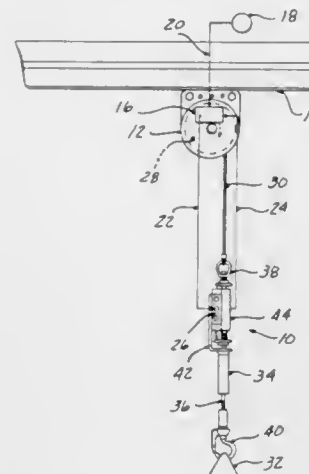
Continuation of Ser. No. 591,779, Jan. 25, 1996, abandoned.

This application May 12, 1997, Ser. No. 854,593

Int. Cl.<sup>6</sup> B66D 1/08

U.S. Cl. 254—361

4 Claims



1. In combination, a control arrangement and a fluid pressure operated hoist, said hoist including an elongated flexible element, means causing said flexible element to be held stationary, wound up, or unwound by a fluid pressure chamber in said hoist, depending on whether said chamber is blocked, has fluid pressure applied therein, or is vented, said control arrangement including means for manually controlling the fluid pressure condition in said chamber, said means comprising:

a support rod attached to said hoist flexible element to be fixed relative thereto;

a handle assembly including a tubular movable handle portion manually slidable up and down on said support rod, and a bracket attached to one end of said tubular handle portion and extending alongside and offset to said support rod at a location vertically displaced from said handle;

a three position valve mounted to said bracket and offset from said support rod, said three position valve having a valving element movable in a bore in a valve housing to be positionable in three respective positions, a centered position, a down position, and an up position, means causing said hoist fluid pressure chamber to be blocked, connected to fluid pressure, and vented when said valve element is respectively in said centered, down, and up positions;

spring means normally holding said valve element in said centered position; and,

means holding said valve element against movement relative said flexible element while allowing said valve housing to be moved with said bracket, whereby when said handle is manually pulled down, said valve element is shifted to said up position to cause lowering of a load attached to said flexible element, when said handle is manually pushed up said valve element is shifted to said down position to cause raising of

said load, and said valve element is centered when said handle is released to hold said load stationary.

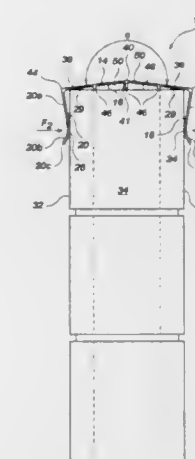
5,772,185  
RESILIENT WALL CAP  
Larry W. Pulsipher, 435 S. 1690 East, Fruit Heights, Utah 84037

Filed Sep. 24, 1996, Ser. No. 719,006

Int. Cl.<sup>6</sup> E04C 1/39

U.S. Cl. 256—59

12 Claims



1. A protective cap for covering a top of a wall, said cap comprising:

an elongate, integral cover having only an upper wall and first and second opposing side walls and being comprised of resilient material;

said cover including an elongate upper plate having a lower surface;

said first and second opposing sidewalls being coupled to the upper plate and projecting downwardly to form a three-sided channel defining an enclosure for receiving therein a top end of a free-standing wall, said sidewalls tapering inwardly toward each other in an upper-to-lower direction to first and second innermost side edges, respectively, said innermost side edges extending along substantially the entire lengths of said first and second sidewalls and cooperatively defining a lateral distance therebetween;

said cover being free of any additional attaching means other than the upper wall and first and second opposing sidewalls.

5,772,186  
FENCE EMPLOYING UNIFORM L-SHAPED FLAT SIDED  
GALVANIZED STEEL POSTS AND FLAT SIDED RAILS  
Alton B. Parker, 4141 S. Braeswood, Apt. No. 607, Houston, Tex. 77025-3339

Filed Apr. 22, 1997, Ser. No. 837,899

Int. Cl.<sup>6</sup> E04H 17/14

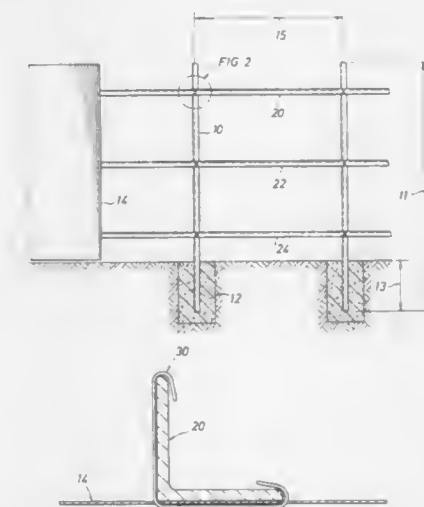
U.S. Cl. 256—65

9 Claims

1. A fence comprising:

a plurality of posts, each of said posts consisting essentially of a single vertical, elongate piece of galvanized iron having an L-shaped transverse cross section, said posts aligned with respect to one another to present in-line a flat outside surface of each of said posts for the attachment of rails,

at least a bottom and a top horizontal rail comprised of multiple sections of galvanized iron, each section having an L-shaped transverse cross section, the sections of each of said horizontal rails being in end-to-end alignment to produce a vertical outside flat surface and a horizontal flat surface, a horizontal flat surface end portion of at least one end of each of said



multiple sections being stripped to allow overlap of the resulting exposed vertical end portion with an attachment area of one of said posts, each of said exposed vertical end portions and corresponding attachment areas of said posts including aligned bolt holes,

bolts for attaching said exposed vertical end portions to said posts through said aligned bolt holes, and

a fence covering attachable to said rails.

5,772,187  
APPARATUS FOR COOLING AND PROCESSING A  
MOLTEN PRODUCT INTO A GRANULATE PRODUCT  
Abimanjoe Saroso Wirodihardjo, Hellevoetsluis; Wijnand Jacob 't Hart, Waddinxveen, and Alwin Graafland, Moordrecht, all of Netherlands, assignors to Goudsche Machinefabriek B.V., Netherlands

PCT No. PCT/NL95/00138, § 371 Date Jan. 24, 1997, § 102(e) Date Jan. 24, 1997, PCT Pub. No. WO95/28226, PCT Pub. Date Oct. 26, 1995

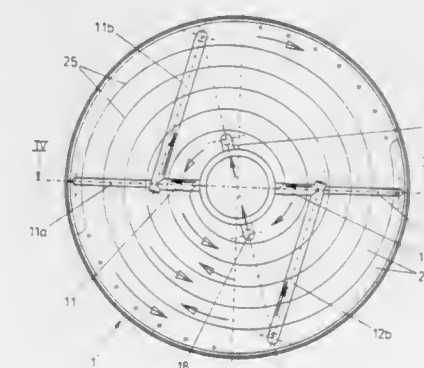
PCT Filed Apr. 18, 1995, Ser. No. 727,410

Claims priority, application Netherlands, Apr. 18, 1994, 9400618

Int. Cl.<sup>6</sup> C21C 1/00

U.S. Cl. 266—241

20 Claims



1. An apparatus for cooling and processing a molten product into a granulate product, said apparatus comprising:

a support consisting of at least one substantially horizontal, disk-shaped element, arranged for rotation about a substantially vertical shaft, the disk-shaped element having a center and an inner edge adjacent the center and an outer peripheral edge,

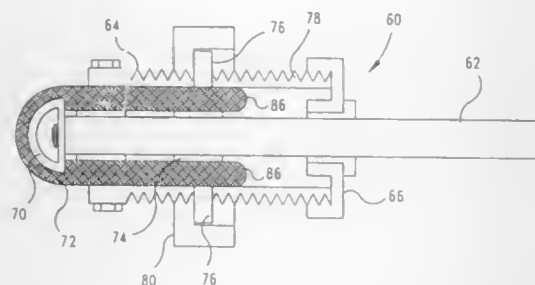
means for depositing the molten product on each disk-shaped element of the support.

cooling means for cooling the support to form a solidified product, and means for removing the solidified product from the support in granulate form, characterized in that the cooling means comprise per disk-shaped element first and second, locking, spiral-shaped cooling liquid channels closed in themselves that form part of the disk-shaped element, each spiral-shaped channel having an outer end adjacent the outer peripheral edge and an inner end adjacent the inner edge, the first spiral-shaped channel having an inlet for cooling liquid located adjacent its outer end and an outlet for cooling liquid located adjacent its inner end and the second spiral-shaped channel having an inlet for cooling liquid located adjacent its inner end and an outlet for cooling liquid adjacent its outer end, and feed and discharge means for the cooling liquid extending centrally through the disk-shaped element, the first and second channels being connected to said feed and discharge means without connection to the environment.

**5,772,188**  
**SHOCK ABSORBER WITH ELASTOMERIC STRIP**  
Ronald A. Lund, 4701 Manyell Ave., Anchorage, Ak. 99516  
Continuation of Ser. No. 556,210, Nov. 9, 1995, Pat. No. 5,613,665. This application Mar. 3, 1997, Ser. No. 811,115  
Int. Cl.<sup>6</sup> F16F 1/00

U.S. Cl. 267—69

20 Claims



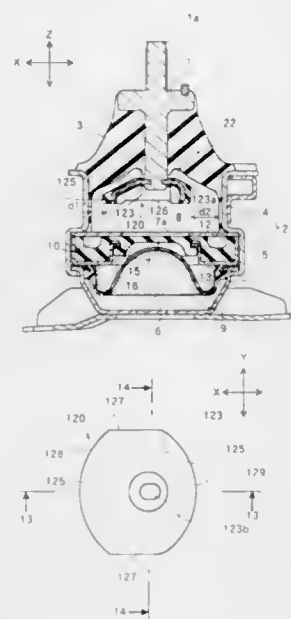
1. A combination shock absorber and suspension mount, comprising:

- a) a first suspension component having inner and outer ends, a mounting lug for attachment to a first part of a vehicle, and a first attachment unit;
  - b) a second suspension component slidably coupled to the first suspension component to allow for telescoping movement between the two components along an axis of the first suspension component, the second suspension component having a second attachment unit, and a second mounting lug for attachment to a second part of the vehicle adapted to move relative to the first part of the vehicle; and
  - c) an elastomeric section attached to said attachment units for restraining relative movement between the first and second suspension components, with a midsection of the elastomeric section extending between the attachment units,
- whereby the elastomeric section restrains movement of the first attachment unit with respect to the second attachment unit by biasing the attachment units to a neutral position and thereby resists axial movement of the first and second suspension components in an opposite direction so that a compressive movement of the mounting lugs toward each other results in a separation of the attachment units and thereby results in the elastomeric section biasing the mounting lugs apart in a tension mode of the elastomeric section and extending movement of the mounting lugs away from each other results in a movement of the attachment units toward each other and thereby results in the elastomeric section biasing the mounting lugs together in a compression mode of the elastomeric section.

**5,772,189**  
**ANTIVIBRATION RUBBER DEVICE**  
Kazutoshi Satori, and Osamu Maruyama, both of Saitama, Japan, assignors to Yamashita Rubber Kabushiki Kaisha, Saitama, Japan  
Continuation of Ser. No. 490,743, Jun. 15, 1995, abandoned.  
This application Aug. 4, 1997, Ser. No. 905,335  
Int. Cl.<sup>6</sup> F16F 5/00

U.S. Cl. 267—140.13

9 Claims

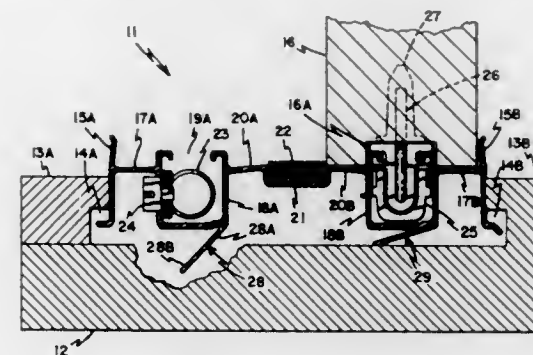


1. An antivibration rubber device comprising:
- a first connecting member capable of being secured to one side of a vibrating member;
  - a second connecting member capable of being secured to another side of the vibrating member;
  - an elastic body having an inner circumferential wall disposed between the first and second connecting members;
  - a fluid chamber provided between the elastic body and a wall portion formed by the first connecting member and the second connecting member;
  - a partition wall dividing the fluid chamber into two chambers;
  - an orifice passage communicating with the two chambers divided by the partition wall; and
  - an orifice plate provided within at least one of the divided fluid chambers to perform a relative movement integrally with the first connecting member, said orifice plate being composed of a metallic plate and an elastic portion, said orifice plate and said inner circumferential wall of said elastic body form a narrow communication passage for fluid flow wherein the orifice plate has a different projection area in each of said three input directions of vibrations to be isolated, said input directions include a principal input direction Z and two other directions X and Y which are perpendicular to the direction Z and intersect at right angles relative to each other, said orifice plate has a generally elliptical or oblong shape when viewed in the direction of an axis of a connecting shaft provided parallel to the axis Z, said orifice plate includes curved stoppers at edge portions of both ends in the projection surface of at least one of either the direction X or Y of the circumference of the orifice plate for displacement control, said stoppers being formed integrally with said elastic portion, while said orifice plate has a predetermined thickness and is provided with a transverse recess formed by said curved stopper portions, said recess is parallel to one of either the direction X or Y.

**5,772,190**  
**SPRING MEMBER**  
Michael M. May, Stillwater; Gregory S. Mitsch, Woodbury; Nidelkoff John Michael, St. Paul, all of Minn., and Les L. Pallin, Prescott, Wis., assignors to Intek Weatherseal Products, Inc., Hastings, Minn.  
Continuation of Ser. No. 591,957, Jan. 23, 1996, abandoned, which is a continuation of Ser. No. 141,114, Oct. 20, 1993, abandoned, which is a division of Ser. No. 811,083, Dec. 20, 1991, Pat. No. 5,265,308, which is a continuation-in-part of Ser. No. 630,311, Dec. 19, 1990, abandoned. This application Oct. 28, 1996, Ser. No. 739,063  
Int. Cl.<sup>6</sup> E05D 13/00; 15/16

U.S. Cl. 267—141

26 Claims



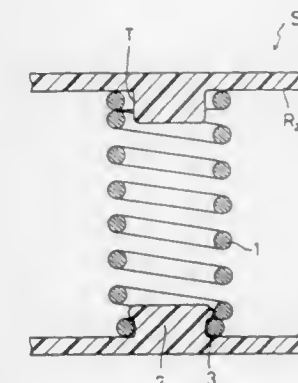
1. A spring member bendably disposable between first and second members to create a spring force therebetween, comprising:
- a base member engageable by said first member;
  - a first spring portion formed from a first thermoplastic material that is resilient and has a predetermined spring characteristic, the first spring portion being integrally formed with said base member and being tubular in transverse cross-section;
  - a second spring portion integrally formed with and extending from the first spring portion and formed from a second thermoplastic material that has a spring characteristic stiffer than that of the first spring portion, the second spring portion being engageable by said second member; and
  - the first and second spring portions being constructed and arranged so that the second spring portion is engageable by the second member and bendable thereby due to the resilience of the first spring portion to produce a desired spring force between the first and second members, and being further constructed and arranged so that the first spring portion is substantially under compressive loading when the second spring portion is bendably engaged by said second member.

**5,772,191**  
**SPRING ASSEMBLY FOR AUTOMATIC TRANSMISSION OF AUTOMOTIVE VEHICLE AND THE LIKE**  
Yoshinori Nakano, and Tetsuya Taniguti, both of Aichi-ken, Japan, assignors to Togo Seisakusyo Corporation, Aichi-ken, Japan  
Continuation of Ser. No. 322,084, Oct. 12, 1994, abandoned, which is a continuation of Ser. No. 967,229, Oct. 27, 1992, abandoned. This application Dec. 4, 1996, Ser. No. 760,419  
Claims priority, application Japan, Oct. 30, 1991, 3-314121; Aug. 21, 1992, 4-245822  
Int. Cl.<sup>6</sup> B60G 11/14; F16F 1/04

U.S. Cl. 267—287

5 Claims

1. A spring assembly for an automatic transmission comprising:
- a) a pair of generally ring-shaped spring retainers each formed from a synthetic resin material, each of said spring retainers including an annular non-perforated base;
  - b) a plurality of mounting protrusions circumferentially formed on each spring retainer wherein each mounting protrusion has at least one adjacent mounting protrusion;

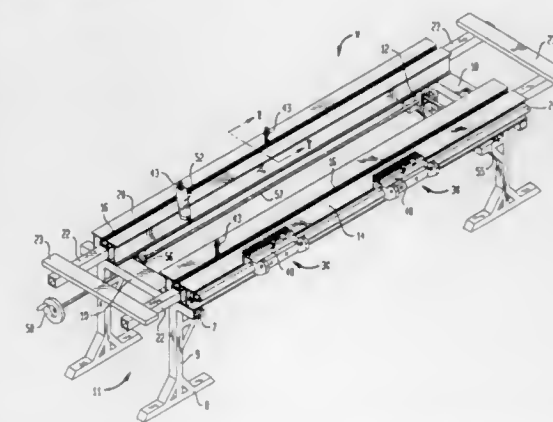


- c) a plurality of guide protrusions circumferentially formed on each spring retainer wherein each of the guide protrusions is positioned between a respective one of the mounting protrusions and one of its adjacent at least one mounting protrusion; and
  - d) a plurality of coil springs wherein:
- each coil spring includes a first end and a second end; each coil spring has its first end mounted on the base of, and around one of the plurality of mounting protrusions on, one of the spring retainers and its second end mounted on the base of, and around one of the plurality of guide protrusions on, the other of the spring retainers.

**5,772,192**  
**WORKBENCH, IN PARTICULAR FOR WELDING AND STRUCTURAL STEEL WORK**  
Gerhard Hoffmann, Brunnenstrasse 2, 79541 Lörrach, Germany  
Filed Jun. 27, 1996, Ser. No. 673,777  
Int. Cl.<sup>6</sup> B25B 1/00

U.S. Cl. 269—37

26 Claims



1. A workbench, in particular for welding and structural steel work; comprising:
- a frame assembly having opposing axial ends and including a pair of traverses respectively disposed at the axial ends, and a pair of spaced substantially parallel platforms for forming working surfaces for installation of workpieces, with a first platform being stationarily fixed on the traverses and a second platform being movably supported on the traverses for displacement in the direction of the first platform;
  - a support means secured to the frame assembly for attachment of accessories, and including at least one support having horizontal and vertical clamping surfaces formed with bores for threadable engagement of screw fasteners and a guide bar rigidly secured to the frame assembly and extending parallel to one of the platforms, said guide bar being defined by a polyhedral cross section and guiding the support for displacement in longitudinal direction, said support means having a



control means for allowing the projecting piece to project from the holding face of the holding means at selected one from plural alignment positions preset in the stapled sheaf production area according to a distance between the downstream end of the sheaf of the recording papers in the recording paper conveying direction and a stapling position of the recording papers, activating the stapling means to staple a predetermined number of recording papers to produce a stapled sheaf when the predetermined number of recording papers are held by the holding means, and driving the discharge means.

a support table which includes a generally flat upper surface, an envelope stop fixed to said upper surface so as to define a longitudinal direction and a lateral direction which is perpendicular thereto.

envelope feeder means positioned on said upper surface of said support table at a location laterally spaced from said stop so as to define an envelope receiving position therebetween, and

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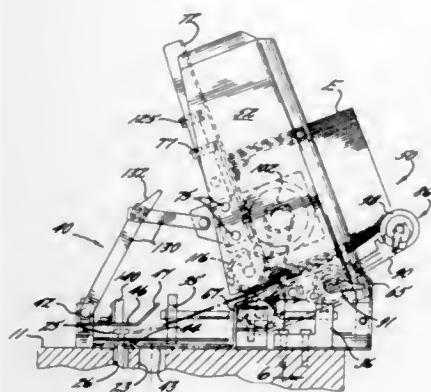
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for serially delivering envelopes in the lateral direction into engagement with the stop and so as to overlie the envelope receiving position.

envelope conveying means mounted to said support table for conveying each envelope received at the envelope receiving position along a longitudinal path of travel on the upper surface.

means adjustably interconnecting the envelope feeder means and said support table so as to permit the lateral spacing between said envelope feeder means and said stop to be adjusted to thereby vary the lateral dimension of the envelope receiving position and accommodate envelopes of varying size, said means adjustably interconnecting the envelope feeder means and the stop including adjustable linkage means directly interconnecting the stop and the envelope feeder means, with said linkage means having a variable lateral dimension and including locking means for locking the same in a selected lateral dimension, and

wherein said envelope feeder means includes a feeder having a frame which rests upon said upper surface of said support table so as to permit sliding movement of said feeder on said upper surface when said locking means is released, and such that the linkage means maintains the alignment of the feeder with the stop during such sliding movement.

5,772,200

## FEEDER FOR SHEET FORM ELEMENTS

Alan M. Sorensen, 59 Langley Ave., Worcester Park, Surrey, KT4 8PB, England

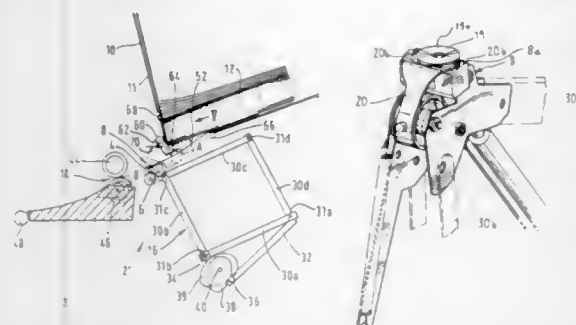
Filed Apr. 25, 1996, Ser. No. 637,395

Claims priority, application United Kingdom, Apr. 26, 1995, 9508478

Int. Cl.<sup>6</sup> B65H 5/08

U.S. Cl. 271—11

15 Claims



1. A feeder for separating sheet form elements from a stack of such sheet form elements, comprising in combination: a movable head, a suction device for pulling one of the sheet form elements away from the stack in the stacking direction and a gripper for gripping the one sheet form element and pulling it laterally from the stack, said suction device and gripper being both mounted on the movable head, the feeder further having a drive for said

movable head arranged for moving the head in a path including both movement in the stacking direction and movement laterally from the stack, said suction device having a contact surface surrounding a suction aperture which in use engages said sheet form elements, and said gripper having a gripping arm movable between a gripping position in which in use said gripping arm clamps a sheet form element against said contact surface, and a release position, said gripping arm having a pair of spaced apart gripping portions which in said gripping position lie on opposite sides of said contact surface.

5,772,201

## METHOD OF AND APPARATUS FOR DAMPENING SHEETS STACKED INTO SHEET PILE

Tomoyuki Shinozuka, Shizuoka-ken, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

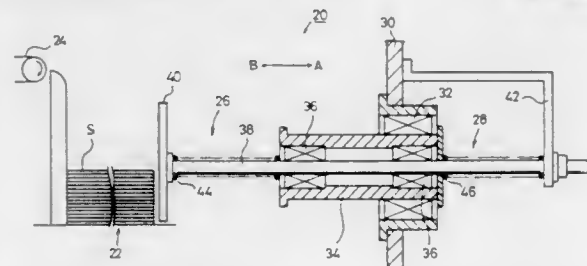
Filed Apr. 22, 1996, Ser. No. 636,188

Claims priority, application Japan, Apr. 25, 1995, 7-101074

Int. Cl.<sup>6</sup> B65H 31/36

U.S. Cl. 271—220

10 Claims



1. A method of dampening sheets by absorbing shocks applied by the sheets which are successively introduced into a sheet stacking region and stacked in the sheet stacking region, comprising the steps of:

starting to absorb shocks produced by a sheet with a first damper mechanism which moves away from the sheet stacking region when the sheet hits the first damper mechanism;

starting to absorb the shocks produced by the sheet with a second damper mechanism which is combined with said first damper mechanism and moves away from the sheet stacking region while the shocks produced by the sheet are being absorbed by said first damper mechanism; and

continuously absorbing the shocks produced by the sheet with said second damper mechanism which moves away from said sheet stacking region after said first damper mechanism starts moving back toward said sheet stacking region.

5,772,202

## METHOD AND APPARATUS FOR REGISTERING SHEETS

Karl Singer, Barrington Hills; Lawrence B. LeStange, Elgin, and Robert Allen Crimmins, Algonquin, all of Ill., assignors to D&K Custom Machine Design, Inc., Elk Grove Village, Ill.

Filed Sep. 25, 1996, Ser. No. 719,730

Int. Cl.<sup>6</sup> B65H 9/04

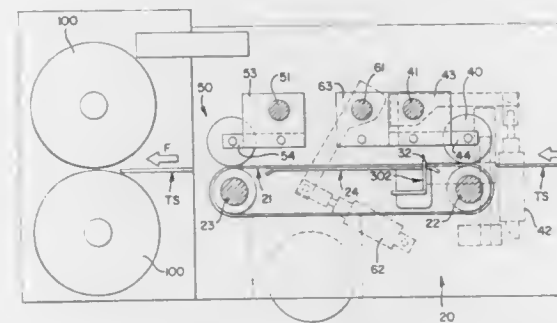
U.S. Cl. 271—246

22 Claims

1. A registration system for a sheet feeder comprising: feeder means for longitudinally feeding a plurality of sheets sequentially from an upstream position to a downstream position;

a retractable gate movable between an engaging position and a disengaging position, in the disengaging position the gate not affecting the longitudinal movement of a sheet being fed by the feeder means and in the engaging position the gate contacting a leading edge of a sheet and stopping the longitudinal movement of the sheet being fed by the feeder means;

a first roller upstream of the gate moveable between an engaging position and a disengaging position, in the disengaging position



tion the first roller not affecting the longitudinal movement of a sheet and in the engaging position the first roller contacting and placing pressure upon a sheet being fed by the feeder means while simultaneously permitting slippage between the sheet and the first roller.

a second roller upstream of the gate moveable between an engaging position and a disengaging position, in the disengaging position the second roller not affecting the longitudinal movement of a sheet and in the engaging position the second roller placing greater pressure upon the sheet than the first roller and frictionally engaging a sheet being fed by the feeder means; and

control means for engaging and disengaging the first and second rollers and the gate.

5,772,203

## METHOD AND APPARATUS FOR DESENSITIZING PRINT MEDIA ON A PRINT DRUM TO THE EFFECTS OF DEBRIS CONTAMINATION AND AIR TURBULENCE

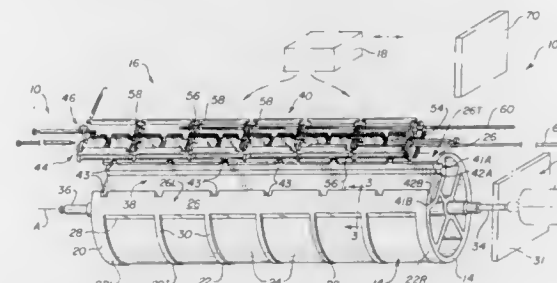
William S. Masek, North Attleboro; Walter P. Haimberger, Topsfield; George D. Whiteside, Lexington, and Richard A. Rosenthal, Winchester, all of Mass., assignors to Sterling Dry Imaging Systems, Inc., Glasgow, Del.

Filed Sep. 25, 1995, Ser. No. 533,617

Int. Cl.<sup>6</sup> B65H 5/02

U.S. Cl. 271—275

23 Claims



1. A rotatable print drum apparatus for supporting thereon a printable medium having leading and trailing edges comprising: a relieved support surface for supporting the print medium, said relieved surface being formed with a recessed surface and a plurality of ribs protruding from the recessed surface in order to minimize contact of the print medium with the support surface of the drum.

5,772,204

## TABLE TOP BOWLING GAME

Inga E. Phelps, 11232 Rainbow Woods Loop, Spring Hill, Fla. 34609

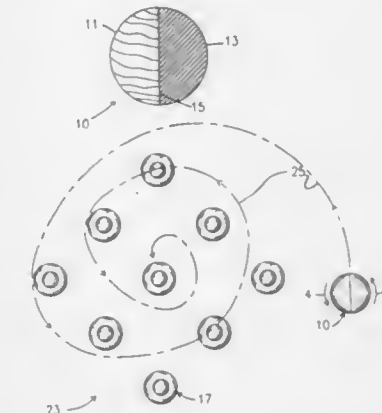
Filed Apr. 2, 1997, Ser. No. 829,362

Int. Cl.<sup>6</sup> A63D 3/00

U.S. Cl. 273—108.1

12 Claims

1. A bowling game, comprising:



a) a spherical ball including two hemispheres attached together, one hemisphere made of a relatively lightweight material, another hemisphere made of a relatively heavy material;

b) a plurality of pins arranged in an array on a flat surface and spaced from one another by a distance greater than a diameter of said ball;

c) said ball being spun toward said array in an arcuate path to knock down some of said pins leaving a pattern of pins standing, which pattern corresponds to a particular point award;

d) said game being won by a player achieving a preset total number of points achieved during a series of turns.

5,772,205

## SYSTEM TO DETECT INOPERATIVE SWITCHES IN AN AMUSEMENT DEVICE

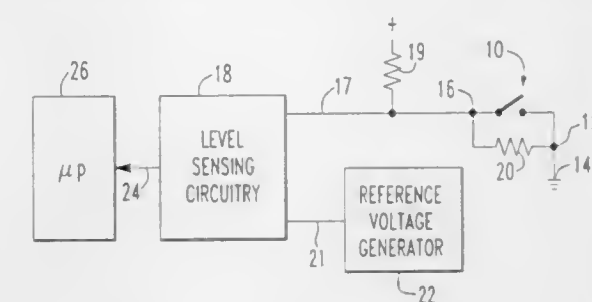
Mark J. Coldebella, 1303 Laguna Ct., Palatine, Ill. 60067; William Pfutzenreuter, 4125 N. Highland Ave., Arlington Heights, Ill. 60004, and Greg Topel, 1471 Winslow Dr. #303, Palatine, Ill. 60067

Filed Oct. 27, 1995, Ser. No. 549,060

Int. Cl.<sup>6</sup> A63F 9/24

U.S. Cl. 273—121 A

14 Claims



1. An amusement game comprising:

a playfield; an electronically connected triggering switch mounted on said playfield;

first circuit for generating a predetermined reference electrical signal;

a second circuit linked to said triggering switch for generating a predetermined condition electrical signal; and

a comparing circuit connected to said first circuit and said second circuit for comparing said predetermined condition electrical signal to said predetermined reference electrical signal and for generating an output electrical signal indicative of said switch condition based upon said comparison.



5,772,206

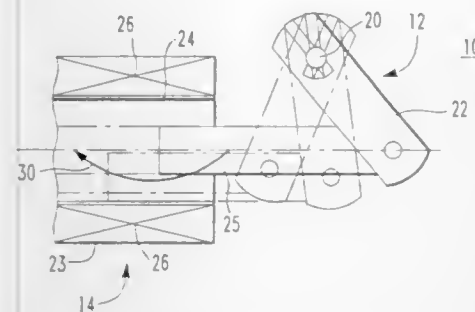
AMUSEMENT GAME HAVING A SOLENOID OPERATED  
PLAY FEATUREWilliam C. Pfitzenreuter, Arlington Heights, Ill., assignor to  
Capcom Coin-Op Inc., Arlington Heights, Ill.

Filed Sep. 11, 1996, Ser. No. 712,448

Int. Cl.<sup>6</sup> A63F 7/22

U.S. Cl. 273—129 S

16 Claims



1. An amusement game, comprising:  
a rotating play feature;  
a solenoid comprising a bobbin having a bore around which is disposed electrical windings for use in creating an electromagnetic force; and  
a plunger disposed within said bore and linked to said rotating play feature, said plunger being movable in response to said electromagnetic force;  
wherein said bore and said plunger are sized and arranged to allow said plunger to move laterally as said plunger moves in response to said electromagnetic force.

5,772,207  
BOARD GAME

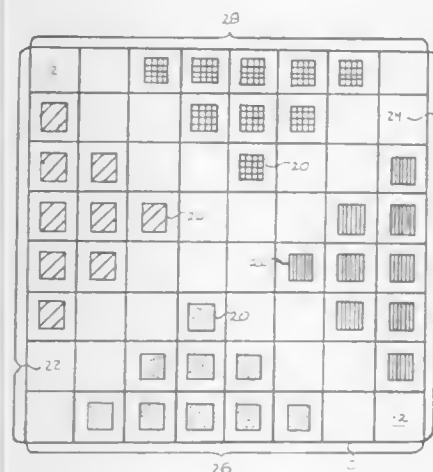
Stephen J. Caseila, 192 Herbert Ave., Closter, N.J. 07624

Filed Mar. 29, 1997, Ser. No. 827,515

Int. Cl.<sup>6</sup> A63F 3/02

U.S. Cl. 273—260

2 Claims



1. A board game for two, three or four players comprising:  
(a) a flat, square game board consisting of 64 alternating squares of contrasting colors;  
(b) four sets of nine playing pieces of which each set is colored or shaded to distinguish those of one player from the set of another player;  
(c) nine homogenous playing pieces setup in the shape of a pyramid along the perimeter or home region of said game board with the possibility of a two, three or four player setup;  
(d) said playing pieces being movable, in turn, one space forward or in a sideways direction on said game board;

- (d) said playing pieces of one color or shading capturing an opponent's piece of a different color or shading by moving one space forward or sideways on top of the opponent's piece with resultant stacked playing piece now being able to move one space forward, sideways and also backward;  
(e) the requirement that one piece on its turn must capture an opponent's piece if an opportunity to capture exists;  
(f) said playing piece reaching the opposite end of the home region and thus being crowned with an additional single piece of the same color or shading with resultant stacked playing piece now being able to move one space forward, sideways as well as backward;  
(g) where the game is won when one set of pieces captures all opponent's pieces and is the last remaining piece standing.

5,772,208

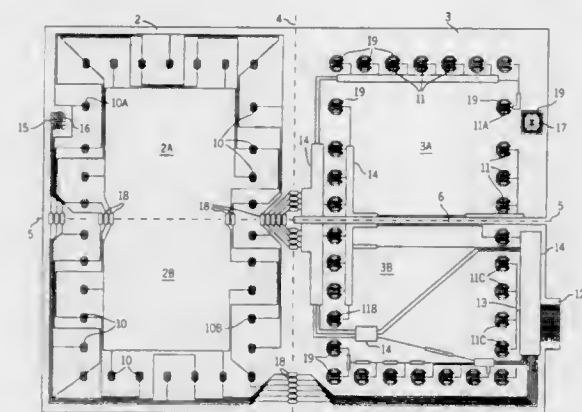
GAME BOARD INCORPORATING APPARATUS FOR  
SELECTIVELY PROVIDING SENSORY GAME  
ENHANCEMENT AND METHOD FOR MAKING THE  
SAMEStephen I. McTaggart, 12037 N. 62nd Pl., Scottsdale, Ariz.  
85254

Filed Nov. 7, 1995, Ser. No. 554,734

Int. Cl.<sup>6</sup> A63F 3/00

U.S. Cl. 273—237

117 Claims



1. A game board incorporating means for selectively providing sensory game enhancement comprising:  
A) a foldable sheet having first and second sides, each said side of said foldable sheet being divided into first and second sections;  
B) said first and second sections of said first side of said foldable sheet having overlaid thereon a conductive printed circuit including a plurality of switch contact pads;  
C) said switch contact pads overlaid on said first section of said first side of said foldable sheet comprising a plurality of upper contacts;  
D) said switch contact pads overlaid on said second section of said first side of said foldable sheet comprising a plurality of lower contacts;  
E) said upper and lower contacts being positioned, respectively, on said first and second sections of said first side of said foldable sheet such that, when said foldable sheet is folded along a predetermined line to bring said first and second sections of said first side of said foldable sheet into face-to-face relationship, each of said upper contacts registers with one of said lower contacts to effect a switch pair;  
F) spacer means adapted to juxtapose said upper and lower contacts of each said switch pair in a normally spaced-apart relationship to define a normally-open condition such that finger pressure applied to said second side of said foldable sheet above a given upper contact and on the opposite side thereof urges said given upper contact into conductive contact with the said lower contact with which it registers, thereby effecting a momentary closure of the switch pair.

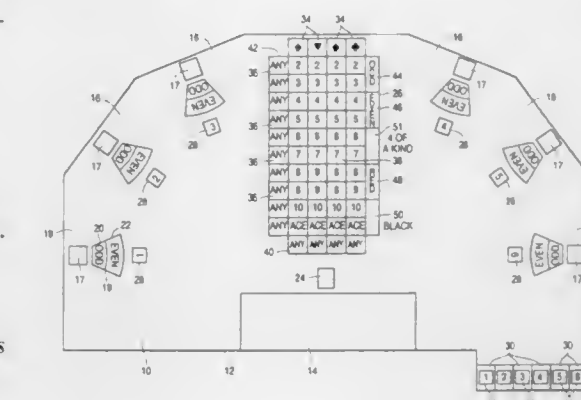
5,772,211

## WAGERING GAME

Anahit Nazaryan, Los Angeles, Calif., and Vahan Alexanian,  
8440 Westcliff Dr., #1126, Las Vegas, Nev. 89102, assignors to  
Vahan Alexanian, Las Vegas, Nev.Continuation-in-part of Ser. No. 682,994, Jul. 18, 1996. This  
application Nov. 21, 1996, Ser. No. 754,757Int. Cl.<sup>6</sup> A63F 1/00

U.S. Cl. 273—292

31 Claims



1. A method of playing a wagering game with a number of players and a dealer, utilizing a deck of game cards formed by combining a plurality of standard decks of playing cards from which all kings and queens have been removed so as to leave only numbered cards, jacks, and aces, with the numbered cards having a number value equal to their number, with jacks having a number value of zero, and with the aces having a number value of eleven, said method comprising the steps of:

- (a) having each player place a first wager identifying a type of a game hand selected from a group of game hands including:  
(i) odd, wherein "odd" is defined as a game hand in which the total number value of the game cards making up the game hand is an odd number; and  
(ii) even, wherein "even" is defined as a game hand in which the total number value of the game cards making up the game hand is an even number;  
(b) dealing face up to each player a game hand comprising a plurality of game cards from the deck;  
(c) identifying as a first wager loser any player who in step (b) was dealt a single jack;  
(d) identifying as a first wager winner any player who in step (c) was not a loser and who in step (a) placed a first wager identifying a game hand of the type dealt to that player, and  
(e) awarding to any player identified as a first wager winner an award based on the wager placed by such player in step (a) and the odds of the game hand of the type identified by the first wager of such player being dealt to such player in step (b).

5,772,212

MULTI-FUNCTIONAL ALPHABET CARDGAME  
W/OPTIONAL DIAMONOIDAL CARDS

Rhonda Faye Hagedorn, 14052 Yucca St., Jamul, Calif. 91935

Continuation of Ser. No. 441,424, May 15, 1995, Pat. No.

5,524,899. This application Mar. 6, 1996, Ser. No. 611,568

Int. Cl.<sup>6</sup> A63F 1/00

U.S. Cl. 273—299

14 Claims

13. A card game employing a plurality of playing-cards imprinted with special alphabet learning indicia, said playing-cards comprising:  
a set of characters from A to Z represented individually upon two discrete suits of 26-cards apportioning into a deck of 52-cards;  
each of said playing-cards having an identical conventional four cornered perimeter parallelogram configuration;

5,772,210

Patent Not Issued For This Number

- G) said printed circuit further including traces coupling all said upper contacts and all said lower contacts to decoder means, said decoder means being adapted to sense if a switch pair is closed and, if so, which switch pair;  
H) at least one section of said second side of said foldable sheet having emplaced thereon a game board layout; and  
I) signal producing means coupled to said decoder means, said signal producing means being adapted to issue a predetermined sensible sequence in response to the detection by said decoder means that a specific contact pair has been momentarily closed.

5,772,209

## MATH GAME

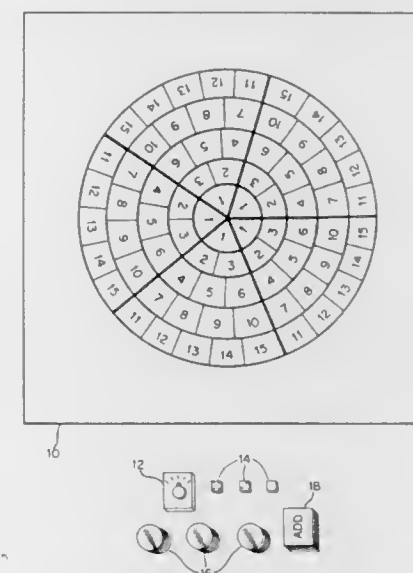
Patrick A. Thompson, 2650 E. 32nd St., Suite 220, Joplin, Mo.  
64804

Filed Jun. 25, 1997, Ser. No. 881,953

Int. Cl.<sup>6</sup> A63F 3/00

U.S. Cl. 273—268

11 Claims



1. A method of playing a math game comprising the steps of:  
(a) providing a game board having imprinted thereon a plurality of sections, wherein each section comprises a first set of integers assigned to a particular player and wherein the first set of integers comprises 1-n where n is an integer;  
(b) providing a set of dice having indicia imprinted thereon representative of integers;  
(c) rolling the set of dice by a player so that the set of dice indicate a second set of integers;  
(d) calculating by the player, using the second set of integers and at least one math function within a predetermined calculation time, a single solution integer corresponding to one integer of the first set of integers;  
(e) indicating on the game board the single solution integer as calculated in step (d); and  
(f) repeating steps (c)-(e) for each player until one of the players successfully calculates each or a predetermined number of the integers of his or her first set of integers.

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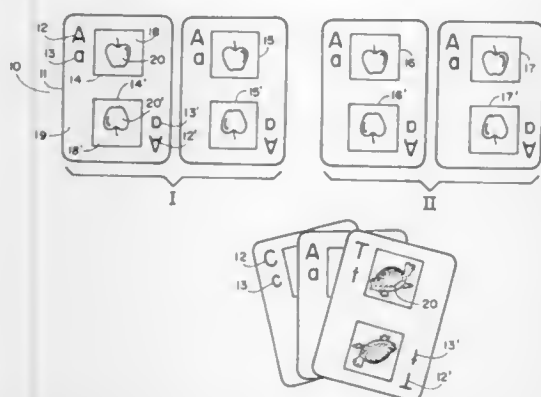
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said characters respectively formed in at least one corner of said playing cards;

each of said playing-cards graphic format including a first clue object pictograph portraying any familiar object which spelling begins with one of said set of characters, thereby serving to provide player visual word association to that respective character;

a second clue object pictograph being formed on said playing-card, said second clue object pictograph being identical to said first clue object pictograph formed on said-playing card, said second clue object being formed inverted relative to said first clue object pictograph.

5,772,213

**GAME BASED ON DATA BASE OF CHARACTERS OF DIFFERENT GEOGRAPHIC REGIONS**

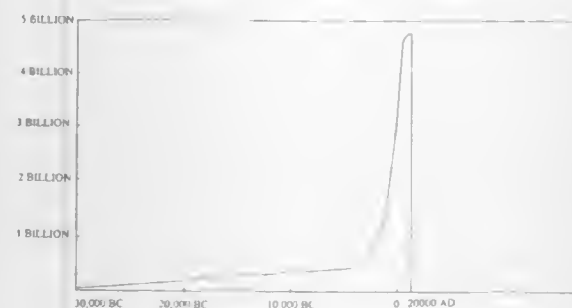
John James McGlew, 653 Scarborough Rd., Briarcliff Manor, N.Y. 10510

Continuation-in-part of Ser. No. 478,613, Jun. 7, 1995, Pat. No. 5,618,043. This application Jan. 23, 1997, Ser. No. 787,869

Int. Cl.<sup>6</sup> A63F 1/00

U.S. Cl. 273—308

16 Claims



1. A game, comprising:

- a data base with geographic location information data including a plurality of geographic locations;
- a data selector for selecting geographic location information data from said data base based on the population distribution for the geographic locations and the birth rate of the geographic locations for a time period; and
- a presentation medium for presenting the data selected to the player of the game.

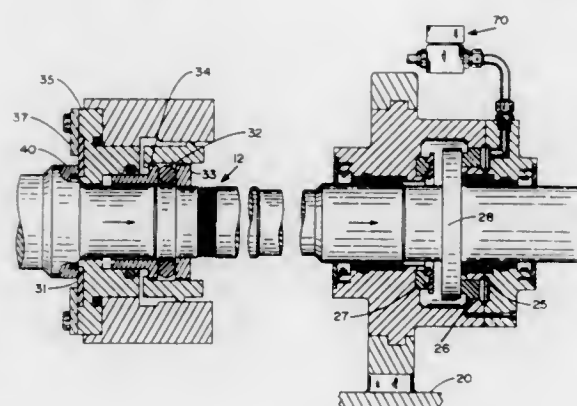
**5,772,214  
AUTOMATIC SHUT DOWN SEAL CONTROL**  
Michael A. Stark, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 12, 1996, Ser. No. 631,358

Int. Cl.<sup>6</sup> F16J 15/34

U.S. Cl. 277—28

5 Claims



1. Apparatus for automatically closing a shutdown seal for an open-drive centrifugal compressor that compresses a fluid that includes

- a seal housing encompassing a rotor shaft, said housing containing a shutdown seal and a running seal;
- said rotor shaft driven by a motor and axially moveable between a first and second position, said first position defined by said shutdown seal in the closed position and said running seal in the open position, said second position defined by said shutdown seal in the open position and said running seal in the closed position;
- means for applying a hydraulic pressure against said shaft to move said shaft from said first position to said second position;
- first sensing means to determine when said motor is operating;
- second sensing means to measure the oil pressure applied to said shaft;
- relief means responsive to said first sensing means and said second sensing means for removing hydraulic pressure from said shaft when said sensing means determines said motor has been inoperative for a given period of time and the oil pressure determined by said second sensing means has fallen below a given pressure;
- whereby said shaft is forced by compressed fluid from said second position to said first position.

5,772,215

**HEAD GASKET WITH IMPROVED ARMORING AND METHOD OF MAKING SAME**

Gregory C. West, Kenosha, Wis., assignor to Fel-Pro Incorporated, Skokie, Ill.

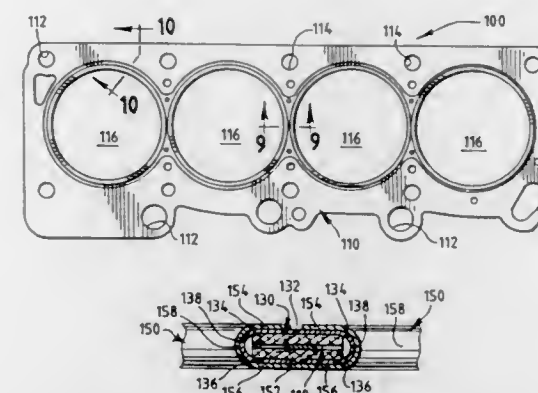
Filed Dec. 8, 1995, Ser. No. 569,968

Int. Cl.<sup>6</sup> F16J 15/12

U.S. Cl. 277—235 B

9 Claims

1. A head gasket comprising:
- a main gasket body having a core and on said core at least one facing layer of one of a compressed expanded graphite layer and a fiber-elastomeric layer and defining a plurality of apertures, said apertures including liquid passageways and at least one pair of adjacent combustion openings, and said main gasket body having first and second main surfaces;
  - a first armor assembly comprising armors and having a joining shim portion covering the zone of adjacency of the pair of adjacent combustion openings on one of said main surfaces, each said armor surrounding and embracing the peripheral edge of a combustion opening and having a first leg formed



a load member maintaining the sealant in the reservoir at a pressure greater than the fluid pressure and ambient pressure causing the sealant to tend to flow towards the valve body cavity and towards the ambient.

5,772,217

**LIQUID PUMP SEAL**

Gerhard W. Poll, Elgin, Ill., assignor to SKF USA Inc., Elgin, Ill.

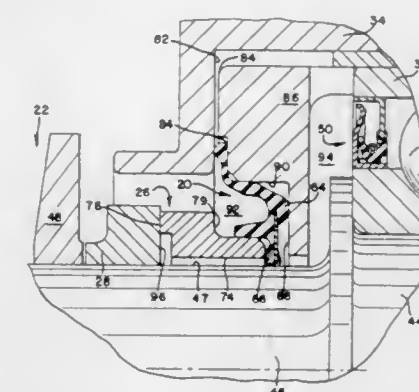
Division of Ser. No. 524,481, Sep. 7, 1995, Pat. No. 5,605,338.

This application Feb. 24, 1997, Ser. No. 806,837

Int. Cl.<sup>6</sup> F16J 15/36

U.S. Cl. 277—383

9 Claims



5,772,216

**SEALING SYSTEM**

Lindsey D. Bredemeyer, Missouri City, Tex., assignor to Cooper Cameron Corporation, Houston, Tex.

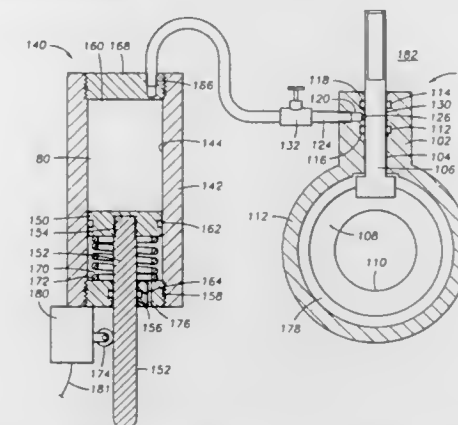
Division of Ser. No. 486,358, Jun. 7, 1995, Pat. No. 5,607,165.

This application Oct. 9, 1996, Ser. No. 731,071

Int. Cl.<sup>6</sup> F16J 15/48

U.S. Cl. 277—318

13 Claims



1. An apparatus for sealing a moving element extending from the ambient into a cavity in a valve body having a fluid flowing under pressure comprising:

- an internal seal disposed in the valve body between the valve body and moving element proximate the fluid under pressure;
- an external seal disposed in the valve body between the valve body and moving element proximate the ambient end of the moving element;
- a space in the valve body around the moving element for disposing sealant between said internal and external seals, said sealant sealingly engaging the moving element and valve body and placing a load on said internal and external seals;
- a reservoir for the sealant, said reservoir communicating with said space; and



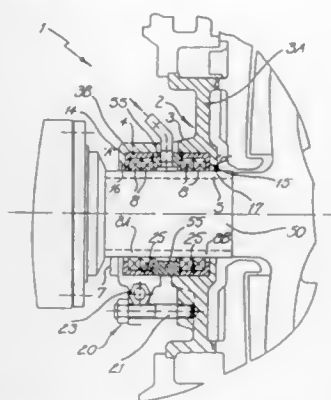
5,772,218

**UNIFORM COMPRESSION GLAND SEAL ASSEMBLY**  
Kevin Edward Burgess, Carlingford, Australia, assignor to Warman International Limited, Artarmon, Australia  
Continuation of Ser. No. 525,703, Sep. 12, 1995, abandoned.  
This application Dec. 12, 1996, Ser. No. 764,352  
Claims priority, application Australia, Mar. 12, 1993, PL7757/93

Int. Cl.<sup>6</sup> F16J 15/18

U.S. Cl. 277—516

12 Claims



1. A gland seal assembly suitable for use in a slurry pump, the assembly including:  
a main body having a bore therethrough for receiving a rotatable shaft;  
a packing receiving zone within the bore;  
a packing including at least two groups of packing rings;  
a lantern ring disposed between at least two of the groups of packing rings;  
at least two packing sleeves, a single packing sleeve surrounding each respective group of packing rings, each packing sleeve comprising a single elastomeric ring disposed between the packing rings and the inner surface of the bore;  
means for applying a selected axial force to the packing sleeves in the general longitudinal direction of the shaft; and  
the arrangement being such that axial compression of the packing sleeves is translated at least in part into radial generally uniform compression onto and across the packing rings.

5,772,219

**COLLET STOP**

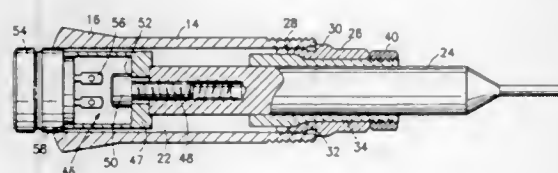
Hubert L. Vossen, 25 Francis J. Clarke Cir., Bethel, Conn. 06801

Filed Dec. 13, 1996, Ser. No. 766,707

Int. Cl.<sup>6</sup> B23B 13/12

U.S. Cl. 279—156

2 Claims



1. A work piece positioning mechanism comprising:  
a collet having a cylindrical body and a flared outer end;  
said collet having a cylindrical bore passing through and a plurality of longitudinal slots passing transversely through the said flared outer end whereby a work piece may be positioned within said bore a predetermined distance from the outer flared end;  
a work piece stop mechanism comprising a cylindrical body having external threads at the outer end thereof to secure to the inner end of said collet and a conical inner surface at the outer end thereof;

a cylindrical locking collet received within said body having an outer conical surface adapted to engage the said inner conical surface of the body;  
said locking collet having a plurality of longitudinal slots passing transversely therethrough toward the outer end thereof;  
the inner end of said locking collet being externally threaded;  
a locking nut threaded to the inner end of the locking collet and abutting the inner end of said body;  
stop rod means slidably located within a cylindrical bore passing through said locking collet and being adapted to be axially positioned at a predetermined location within said collet;  
said body conical surface and said locking collet conical surface cooperating upon rotation of the locking nut to selectively compress and release the outer end of the locking collet to selectively grip and release said stop rod means;  
said body conical surface and said locking collet conical surface each having an angle with respect to the axis of the stop mechanism within the range of 20 to 45 degrees.

5,772,220

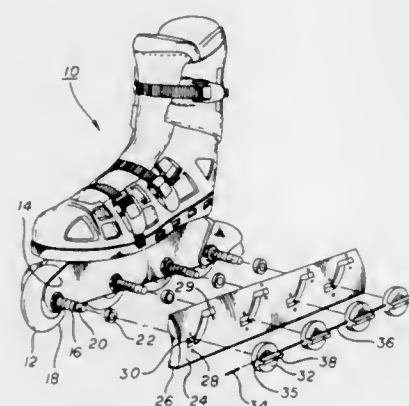
**IN-LINE SKATE CONVERSION APPARATUS**

Richard S. Gaster, 2702 Motor Ave., Los Angeles, Calif. 90064  
Filed Jun. 7, 1995, Ser. No. 480,011

Int. Cl.<sup>6</sup> A63C 17/04; 17/20

U.S. Cl. 280—7.1

18 Claims



1. An in-line skate conversion apparatus for converting an in-line skate having an upper, a plurality of wheels and a wheel support member attached to said upper and adapted to support said plurality of wheels at a predetermined position below said upper such that said plurality of wheels freely rotate at said predetermined position, the apparatus comprising:  
a plurality of bolt members for attachment to said wheel support member;  
at least one walking member having a corresponding plurality of slots formed therein for receiving and slidably engaging the plurality of bolt members; and  
means for securing the plurality of bolt members at selected positions in said plurality of slots, wherein the plurality of bolt members are securable at a first position in said plurality of slots such that the walking member extends below a predetermined portion of the plurality of wheels, and at a second position where the walking member is raised relative to the first position;  
wherein the walking member secured at said first position in said plurality of slots provides a stable platform to allow a skater to walk in a normal fashion.

5,772,221

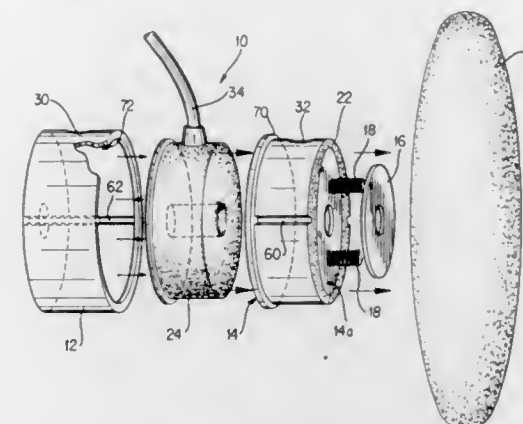
**SKATE BRAKE**

Peter A. Daley, Box 881587, Steamboat Springs, Colo. 80488  
Filed Nov. 20, 1995, Ser. No. 560,966

Int. Cl.<sup>6</sup> A63C 17/14; F16D 55/18

U.S. Cl. 280—11.2

20 Claims



1. A skate brake, for a skate having multiple wheels comprising:  
an extendable reservoir,  
means for expanding said expandable reservoir,  
a brake pad attached to said expandable reservoir, and  
a braking rotor attachable to one of said multiple wheels of said skate brake by means for retaining said rotor to said one of said multiple wheels, said braking rotor being detachable from said one of said wheels and reattachable to another of said wheels upon interchanging of position of said multiple wheels,  
said brake pad contacts said braking rotor so that said brake pad moves parallel to an axis of said wheel.

5,772,222

**CONVERTIBLE VEHICLE**

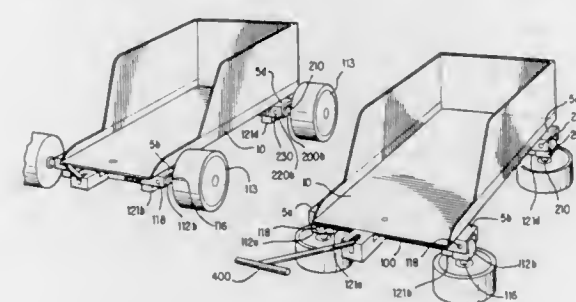
Richard J. Sim, 841 12th Ave., Prospect Park, Pa. 19076, and George T. Zuzulock, Jr., 406 Lakehurst Ave., National Park, N.J. 08063

Filed Aug. 22, 1995, Ser. No. 517,644

Int. Cl.<sup>6</sup> B62B 3/02

U.S. Cl. 280—30

18 Claims



1. Apparatus which is convertible between a multi-wheeled vehicle and a multi-legged stationary structure, comprising:  
a pair of front wheels and a pair of rear wheels;  
a main body;  
means for attaching said wheels to said body, said attaching means being constructed and arranged so that said wheels are independently reciprocable between a first position in which they support said body in the manner of a vehicle and a second position in which they support said body in the manner of a legged structure;  
said attaching means comprising means which axially support each of said wheels, each said support means being in a substantially horizontal position when said wheels are in said

first position and in a substantially vertical position when said wheels are in said second position;  
means for restraining said axial support means from pivoting above said horizontal and beyond said vertical positions; and  
said attaching means further comprising a T-shaped steering yoke pivotally attached to the body at a first end, the yoke comprising:  
an axle at each of a first and a second side, supporting the pair of front wheels, and  
a forwardly extending portion at a second end, including upstanding sideways defining a longitudinally extending slot, the sidewalls pivotally supporting a steering handle therebetween.

5,772,223

**SELECTIVELY ATTACHABLE WHEEL ASSEMBLY FOR A CHAIR**

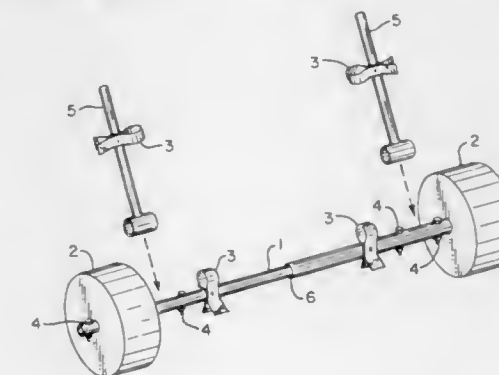
Ellen A. Letourneau, 261 Maple Hill Ave., Newington, Conn. 06111

Filed Jun. 18, 1996, Ser. No. 665,717

Int. Cl.<sup>6</sup> B62B 1/04

U.S. Cl. 280—47.131

1 Claim



1. An attachable wheel assembly for a lawn chair having a horizontal rail comprising:  
an adjustable elongated support bar having an outer pole slidably engaging an inner pole, said support bar having a first end portion and an opposite second end portion;  
a wheel rotatably mounted to each said first and second end portions;  
clamp means mounted to said support bar for clamping to a horizontal chair rail oriented generally parallel to said support bar, said clamp means comprising a plurality of spring clamps; and  
a plurality of mutually parallel arms selectively detachably mounted generally orthogonally to said support bar, and second clamp means mounted to each said arm for clamping to a chair leg, said second clamp means comprising a spring clamp.

5,772,224

**VEHICLE SUSPENSION SYSTEMS**

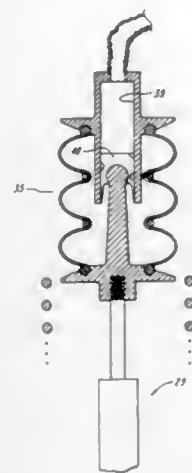
Chi-Kwan Tong, Kowloon, Hong Kong, assignor to Common Engineering Company Limited, Hong Kong, Hong Kong  
Filed May 15, 1996, Ser. No. 648,328

Int. Cl.<sup>6</sup> B60G 21/00

U.S. Cl. 280—112.2

8 Claims

1. A vehicle suspension system including a vehicle chassis extending along a length of a vehicle, the chassis having sides and a front end and a rear end, supporting linkage mechanisms respectively connecting between the chassis and wheels mounted at opposite sides of the chassis that allow a relative movement of the chassis with respect to rotational axes of the wheels, in which the chassis is normally supported in a mean plane parallel to the axes of the wheels by the linkage mechanisms, a lateral force sensor



mounted to the chassis that is arranged to respond to centrifugal forces applied to the chassis during cornering that occur in a direction of a lateral plane parallel to the axes of the wheels, and a prime mover arranged to be controlled by the sensor cause the chassis to tip from its mean horizontal position to the left or right so that the chassis leans into a corner during cornering.

5,772,225

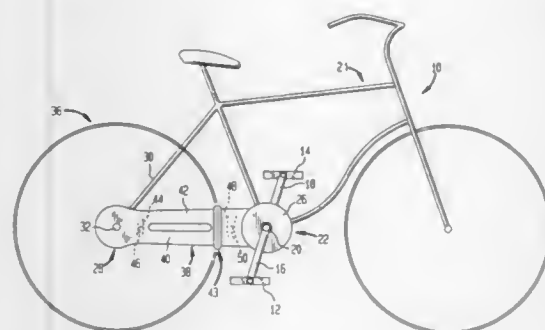
**HYDRAULIC BICYCLE WITH CONJUGATE DRIVE MOTORS**

Douglas C. Brackett, 2535 Mason Oaks Dr., Valrico, Fla. 33594

Filed Apr. 8, 1996, Ser. No. 629,368  
Int. Cl.<sup>6</sup> B62M 19/00

U.S. Cl. 280—216

27 Claims



1. A transmission for transmitting power between a first mechanical movement and a second mechanical movement, comprising:

- (a) a fluid pump coupled to said first mechanical movement for pumping a fluid;
- (b) a fluid motor coupled to said second mechanical movement; and
- (c) a manifold connecting said fluid pump and said fluid motor, said manifold capable of conducting fluid output from said fluid pump to said fluid motor to drive said fluid motor and recirculating said fluid back to said fluid pump, at least one of said fluid pump and said fluid motor incorporating a conjugate drive motion translator.

5,772,226

**LIFTING DEVICE FOR A STAND-UP WHEELCHAIR, AND A WHEELCHAIR USING THE SAME**

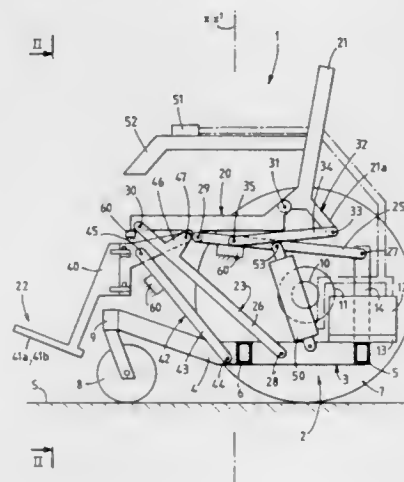
Gérard Bobichon, Lemp, France, assignor to International Diffusion Consommateurs - I.D.C., Bourg de Peage, France  
PCT No. PCT/FR95/00330, § 371 Date Mar. 25, 1996, § 102(e)  
Date Mar. 25, 1996, PCT Pub. No. WO95/25497, PCT Pub. Date Sep. 28, 1995

PCT Filed Mar. 17, 1995, Ser. No. 545,569

Claims priority, application France, Mar. 18, 1994, 94 03439  
Int. Cl.<sup>6</sup> A61G 5/00

U.S. Cl. 280—250.1

12 Claims



1. A lift device mounted to a wheelchair including a chassis extending longitudinally and transversely relative to the wheelchair, wheels carried by the chassis defining a support polygon, the chassis also supporting hinged structures including at least a seat, a leg piece carrying a foot rest and a back rest, said seat, leg piece and back rest each being movable between a folded sitting position and an unfolded standing position, wherein the lift device comprises:

- a first quadrilateral device comprising a first pair of linkages having opposed ends extending between the chassis and the seat, each linkage pivotally connected at a first end to the seat and at a second end to the chassis, the connections between said first ends and the seat and between said second ends and the chassis being longitudinally spaced apart along the seat and chassis, respectively;
- a second quadrilateral device comprising a second pair of linkages each having opposed ends connected respectively to the leg piece at first ends thereof and to the chassis at second ends thereof, said connections between said first ends and the leg piece and between the second ends and the chassis being longitudinally spaced apart along the leg piece and chassis, respectively;
- said first and second quadrilateral devices sharing a common linkage and said leg piece being supported by the second quadrilateral device for motion that is independent of the motion of the seat;
- a device for moving at least one linkage of the quadrilateral devices pivotally about an end of the one linkage connected to the chassis to move the quadrilateral devices, the seat and the leg piece simultaneously between folded and unfolded positions relative to the chassis;
- said seat and foot rest at said unfolded position being located in general upright alignment within the support polygon.

5,772,227

**ARTICULATED, FOLDING AND SECTIONAL BICYCLE WITH SPECIAL SUSPENSION SYSTEM**

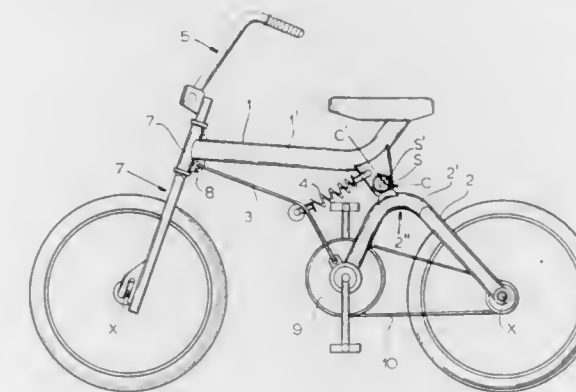
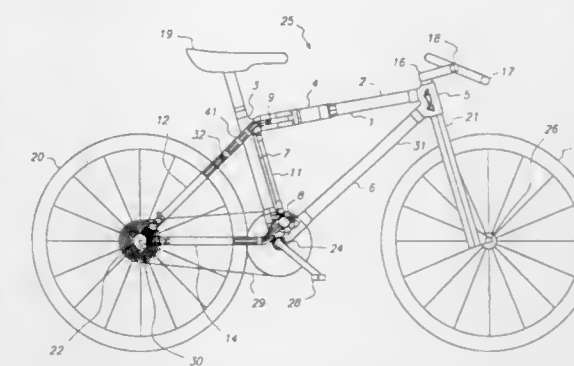
George Michail, 8, Karaoli+Dimitriou, 15125 Paradissos Amaraoussiou, Greece  
PCT No. PCT/GR95/00011, § 371 Date Jan. 26, 1996, § 102(e)  
Date Jan. 26, 1996, PCT Pub. No. WO95/33646, PCT Pub. Date Dec. 14, 1995

PCT Filed Jun. 2, 1995, Ser. No. 602,829

Claims priority, application Greece, Jun. 6, 1994, 940100271  
Int. Cl.<sup>6</sup> B62K 19/02; 3/02

U.S. Cl. 280—275

3 Claims



1. A folding bicycle comprising:
- a front frame provided with:
    - an elongated front frame bar formed with opposite ends, steering means for driving the bicycle and connected with one end of the front frame bar and including a front wheel and a handle bar operatively connected with the front wheel, and
    - a saddle spaced from the steering means and mounted on the other end of the front frame bar;
  - a rear frame provided with:
    - a rear frame bar having opposite ends,
    - a rear wheel on one of the ends of the rear bar,
    - a sprocket on the other end of the rear frame bar, and
    - driving means for driving the bicycle and including a pair of pedals and an endless transmission element running between the sprocket and the rear wheel; and
  - suspension means for absorbing impacts produced by irregularities of a terrain and including:
    - a joint between the elongated bar and the rear bar and formed with bearings operatively connecting with the front and rear bars, so that said frames are articulated to one another and said joint,
    - a flexible element having respective opposite ends thereof connected with said sprocket and said steering means, and
    - tension means suspended between the joint and the flexible element for pretensioning the element thereby forming a bend therein between the opposite ends of the element to absorb the impact.

a down tube having a first and second end, said first end attached to said head tube at an acute angle relative to said top tube; a seat tube having a top end comprising a seat post opening and a bottom end comprising a foot crank opening member, said seat tube attached to said rear tube component at a point adjacent to said top end of said seat tube and attached to said down tube at said foot crank opening member of said bottom end such that said seat tube is positioned at an acute angle relative to said down tube;

a pivot member positioned between said down tube and said seat tube adjacent to said seat tube opening;

a linear lower tube having a first and second end, said first end pivotally connected to said pivot member and said second end integral with a rear wheel drop out;

a rear wheel support tube having a first and second end, said first end integral with said rear wheel drop out; and

a shock absorber assembly comprising:

- a rigid shock body, a forward shock end connection member, and a rear shock end connection member;
- a releasable connection to the forward tube component at said forward shock end connection member; and
- a releasable connection to said rear tube component at said forward shock end connection;

wherein said shock absorber assembly is removable from said linear top tube and replaceable in said linear tube, and wherein replacement of said shock absorber assembly rigidly joins said rear tube component and said forward tube component of said linear top tube.

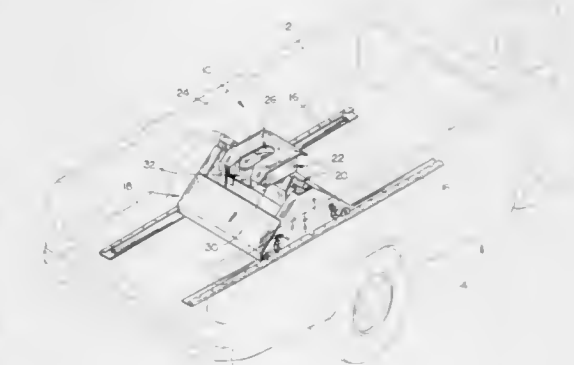
5,772,229

**SLIDING HITCH**

Lyle L. Cattau, 2900 "O" Plaza, Omaha, Nebr. 68107  
Filed Jun. 21, 1996, Ser. No. 667,505  
Int. Cl.<sup>6</sup> B62D 53/08

U.S. Cl. 280—438.1

21 Claims



1. A slidable hitch, comprising:
- a pair of spaced apart runners oriented in spaced apart parallel relationship and extending forwardly and rearwardly;

5,772,228

**INTEGRATED REAR SUSPENSION FOR A BICYCLE FRAME**

Mon Spencer Owyang, Capitola, Calif., assignor to BeYond Beryllium Fabrications, San Jose, Calif.  
Filed Sep. 8, 1995, Ser. No. 525,863  
Int. Cl.<sup>6</sup> B62K 25/20

U.S. Cl. 280—284

6 Claims

1. A bicycle frame, comprising:
- a linear top tube having a forward tube component and a rear tube component, each tube component having a first and a second end;
  - a head tube connected at a substantially perpendicular angle to said first end of said forward tube component;



each of said runners including a back portion extending the length of the runner, and a leg portion projecting over the top of and parallel to the back portion and extending the length of the runner;

each said runner back portion having a transverse width greater than the overlying leg portion, to form a rail surface extending the length of the runner oriented inwardly of the leg portion, a pedestal having a plurality of wheels, operably mounted on the runners with the wheels in operable contact with the runner rail surfaces for rolling movement in forward and rearward directions along the runners;

said wheels having a diameter greater than the height of the runner back portions, such that the wheels roll on the rail surfaces laterally and adjacent the runner leg portions;

said pedestal including means for preventing vertical movement of the pedestal off of the runners while permitting forward and rearward movement of the pedestal on the runners;

said means for preventing vertical movement of the pedestal including:

said pedestal having opposing generally vertical side plates extending forwardly and rearwardly;

each side plate having a flange formed along a lower edge which projects outwardly orthogonally between an associated runner back portion and leg portion;

lock means for selectively preventing forward and rearward movement of the pedestal in a selected position on the runners; and

hitch means on the pedestal for selectively connecting a trailer to the pedestal.

5,772,230

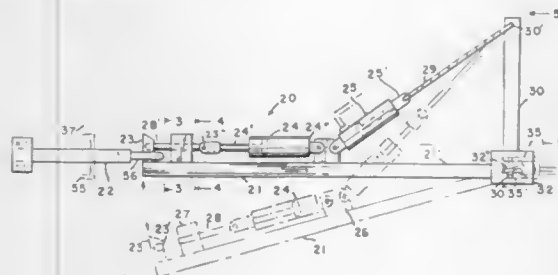
## TOWING APPARATUS

Myron A. Kemnitz, R. R. #1, Cavalier, N. Dak. 58220  
Continuation-in-part of Ser. No. 298,598, Aug. 31, 1994, abandoned. This application Dec. 29, 1995, Ser. No. 581,461

Int. Cl.<sup>6</sup> B62D 13/00

U.S. Cl. 280—491.3

5 Claims



1. A towing arm device for attachment between a tractor having a tractor hitch and a vehicle having a front bumper comprising an elongated towing arm and a front bumper attachment means, said arm having tractor attachment means at a forward end for attachment of said arm to said hitch at the rear of said tractor to pivot said arm about a horizontal axis on said hitch, said front bumper attachment means having an eyelet at a forward end and attachment means at a rearward end for attachment to the front bumper of the vehicle with the eyelet extending horizontally forward therefrom, said arm extending rearward in length and having a spike fixed at the rearward end of the arm and projecting laterally and upwardly therefrom, a first fluid actuated piston and cylinder means adapted to be connected between said tractor and said arm to raise said arm upward at the rearward end about a pivotal mounting to said tractor, whereby said spike at said rearward end of said arm may be raised in an arc about said pivotal mounting up through said eyelet on said bumper attachment means, said spike having a generally horizontal bore in an upper end whereby said spike when raised upward through said eyelet will have said horizontal bore beyond said eyelet with said arm on the other side of said eyelet, a second fluid actuated piston and cylinder means mounted on said arm and a rod slidably mounted on said arm on the side of the eyelet opposite the spike, said second fluid actuated

piston and cylinder means being adapted on actuation to project said rod across said eyelet on the side of the eyelet opposite the arm and into the bore in the spike to lock the rearward end of the arm to the eyelet on the bumper in a pivotal relation for towing the vehicle by the tractor.

5,772,231

Patent Not Issued For This Number

5,772,232

Patent Not Issued For This Number

5,772,233

## EXPANDABLE PAINTING WAGON

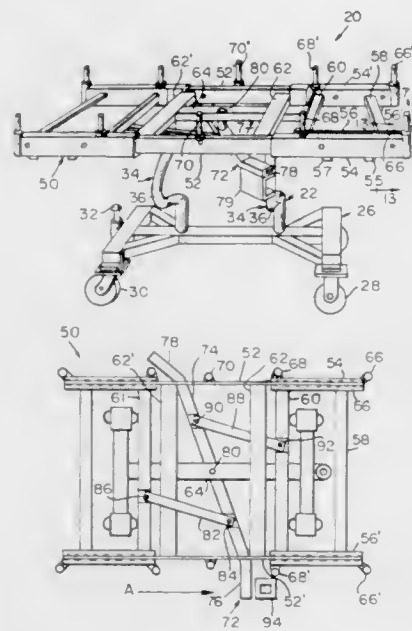
Gerd R. Papendick, Bradford, Canada, assignor to Decoma International Inc., Canada

Filed Apr. 9, 1996, Ser. No. 629,434

Int. Cl.<sup>6</sup> B23Q 3/08

U.S. Cl. 280—638

12 Claims



1. A painting wagon for carrying a plurality of components to be painted and translating said plurality of components through a painting facility, said painting wagon comprising:

a component supporting assembly having a plurality of component mounting structures each constructed and arranged to permit an associated one of said plurality of components to be mounted thereon, so that said components can be mounted in side by side relation to one another along a given direction, said component supporting assembly being constructed and arranged to be movable between: (1) an expanded configuration in which the component mounting structures are positioned in spaced apart relation with respect to one another along said given direction so that a number of components are mounted per unit length in said given direction; and (2) a contracted configuration in which said component mounting structures are positioned in closer proximity to one another relative to the spaced apart relation so that the number of components mounted per unit length in said given direction is greater than when the component supporting assembly is in the expanded configuration;

an actuating assembly operatively connected with said component supporting assembly and constructed and arranged to move the component supporting assembly between the contracted configuration and the expanded configuration, said actuating assembly including an actuating member constructed and arranged to activate said actuating assembly to move the component supporting assembly between the contracted and expanded configurations so that (1) the component supporting assembly can be positioned in the expanded configuration to facilitate mounting of the components on the component mounting structures, (2) said actuating member will activate said actuating assembly in response to engagement with a wagon-contracting structure to position the component supporting assembly in said contracted configuration while said painting wagon is translated through at least a portion of the painting facility, and (3) said actuating member will activate said actuating assembly in response to engagement with a wagon-expanding structure to position the component supporting assembly in said expanded configuration to facilitate dismounting of the components from the component mounting structures; and

a base structure constructed and arranged to support the component supporting assembly and the actuating assembly and to permit translation of the painting wagon through the paint facility.

5,772,234

## CONFIGURING FRAME OF WALKER

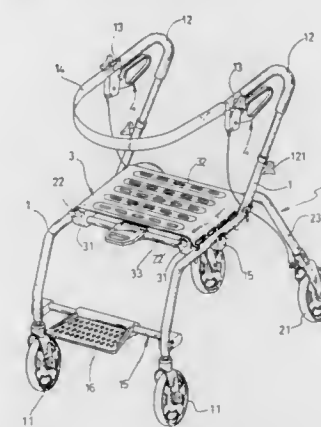
Chung-I Luo, 9F, No. 108, Kuan-Chian E. Rd., Pan-Chiao City, Taipei Hsien, Taiwan

Filed Sep. 23, 1997, Ser. No. 935,734

Int. Cl.<sup>6</sup> B62B 3/02

U.S. Cl. 280—642

6 Claims



1. A configuring frame for walker, comprising:

a pair of front tubes which has a S-shape configuration and being provided with a caster in the lower end, the upper end of said front tube being telescopically connected with a hand grip and which has a belt socket in the end portion, a back belt being bridged between said two belt sockets such that a backrest is formed, the middle portion of said front tube being disposed horizontally when the front tube is assembled, said two front tubes being interconnected by means of a first traverse tube which is located adjacent to said caster and a second traverse tube which is located at the middle or horizontal portion of said front tubes, a pedal being pivotally mounted at said first traverse tube; and

a pair of rear tubes and which has a horizontal portion and an inclined portion which extends downward and rearward, the end of said inclined portion being mounted with a caster, said two rear tubes being interconnected by means of a chair bracket in said horizontal portions of said rear tubes, said chair bracket defining a mounting groove for receiving and retaining the horizontal portion of said rear tube, the rear portion of said chair bracket being pivotally attached to the

rear end of said front tube and the front portion of said chair bracket being rested and supported onto said second traverse rod which is attached onto said middle portion of said front tube, said chair bracket being mounted with a seat having a straps configuration.

5,772,235

## CONVERTIBLE STROLLER

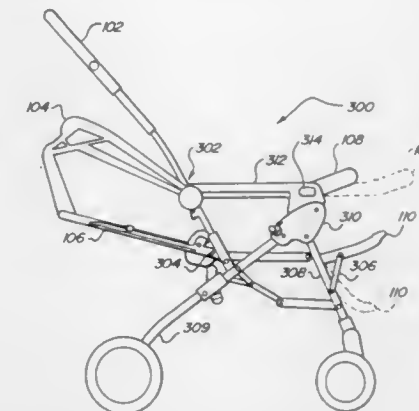
Gregg R. Espenshade, Bowmansville, Pa., assignor to Graco Children's Products Inc., Elverson, Pa.

Filed Nov. 9, 1995, Ser. No. 556,056

Int. Cl.<sup>6</sup> B62B 7/12

U.S. Cl. 280—643

11 Claims



1. A convertible stroller for convenient conversion between a plurality of configurations, comprising:

a frame structure;  
a back rest portion connected to the frame structure at a first pivot point to allow the back rest portion to recline between an upright and a reclined position;  
a foot rest portion connected to the frame structure at a second pivot point to allow the foot rest portion to rotate between a lowered position and an elevated position;  
an arm bar slidably connected to the frame structure to allow the arm bar to move between a closed position and an extended position, the arm bar comprising a generally U-shaped tube including a first and a second side portion each having a longitudinal direction and a center portion, the first and second side portions having a plurality of indentations; and  
a button for engaging with the plurality of indentations on the arm bar to lock the arm bar in selected position, said button being disposed transverse to the longitudinal direction of the first and second side portions.

5,772,236

## FOLDABLE LAUNDRY CART

Annette Clark, R.R. 3, Box 204, Booneville, Miss. 38829

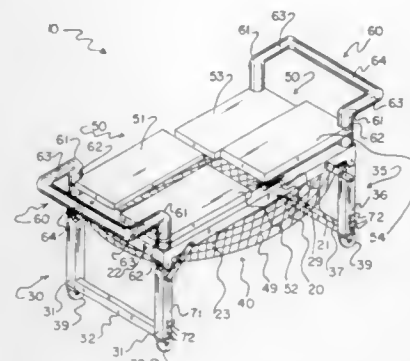
Filed Mar. 5, 1997, Ser. No. 812,344

Int. Cl.<sup>6</sup> B62B 3/02

U.S. Cl. 280—651

13 Claims

8. The laundry cart comprising:  
a frame assembly having an opening therein;  
a basket fitted within said opening of said frame assembly and attached to said frame assembly;  
a first leg assembly pivotally attached to one end of said frame assembly;  
a second leg assembly pivotally attached to an opposite end of said frame assembly;  
a tray assembly swivelly attached to said frame assembly above said opening of said frame assembly;  
said tray assembly swiveled to reveal said opening in said frame assembly and said basket;



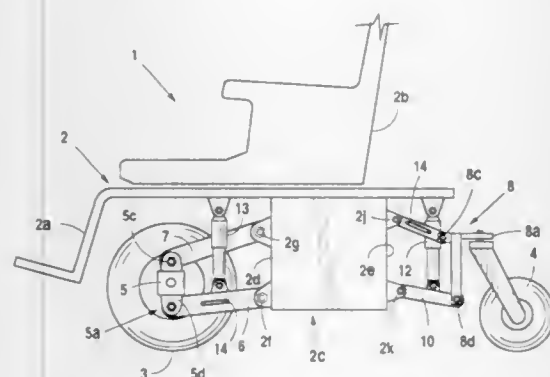
a handle assembly extending from each end of said frame assembly;  
said first leg assembly comprises a first pair of vertically adjustable legs and wherein said second leg assembly comprises a second pair of vertically adjustable legs;  
a first cross-member interconnecting said first pair of vertically extendable legs; and  
a second cross-member interconnecting said second pair of vertically extendable legs.

5,772,237

**SUSPENSION SYSTEM FOR POWERED WHEELCHAIR**  
Thomas E. Finch, and James A. Finch, both of Spring Branch, Tex., assignors to Teftec Corporation, Spring Branch, Tex.  
Filed Nov. 5, 1996, Ser. No. 744,204  
Int. Cl.<sup>6</sup> B60G 11/26

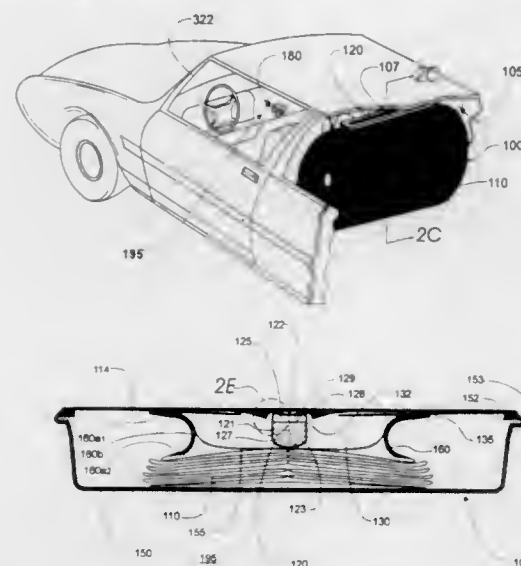
U.S. Cl. 280—704

8 Claims



I. A suspension system for a powered wheelchair having an elongated frame supporting an occupant seat comprising:  
a transaxle housing having a pair of power driven wheels mounted on opposite ends of said transaxle housing;  
a first linkage means for connecting said transaxle housing in transverse relation to the length of said elongated frame with said transaxle housing being freely tiltable in a vertical plane transverse to said elongated frame;  
said first linkage means including universal pivot bearings on said elongated frame and said transaxle housing, whereby said power driven wheels may separately follow the contour of the ground traversed by said power driven wheels;  
a fluid pressure cylinder operatively connected between said first linkage means and said frame for vertically positioning said elongated frame relative to said ground engaging power wheels; and  
operator controlled means for supplying and withdrawing fluid from said fluid pressure cylinder.

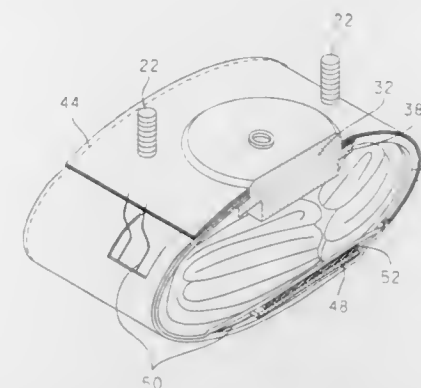
5,772,238  
**EFFICIENT AIRBAG MODULE**  
David S. Breed, Boonton Township, and W. Thomas Sanders, Rockaway Township, both of N.J., assignors to Automotive Technologies International Inc., Denville, N.J.  
Filed Dec. 12, 1995, Ser. No. 571,247  
Int. Cl.<sup>6</sup> B60R 21/20  
U.S. Cl. 280—728.2 29 Claims



I. In a vehicle having a passenger compartment, an airbag module to protect an occupant in the passenger compartment in the event of a crash of the vehicle, the module comprising:  
an elongate housing having a length in the longitudinal direction which is substantially larger than a width or thickness of said housing in a direction transverse to the longitudinal direction, said housing having a base and comprising cover means for releasably retaining at least one airbag;  
said at least one airbag situated within said housing;  
mounting means for mounting said base in engagement with a mounting surface of the vehicle;  
inflater means arranged in said housing for producing pressurized gas to inflate said at least one airbag, said inflater means comprising a member arranged in opposed relationship to said base and defining a passageway between said member and said base for the pressurized gas to flow from said inflater means toward said at least one airbag; and  
initiation means for initiating said inflater means to produce the pressurized gas in response to the crash of the vehicle.

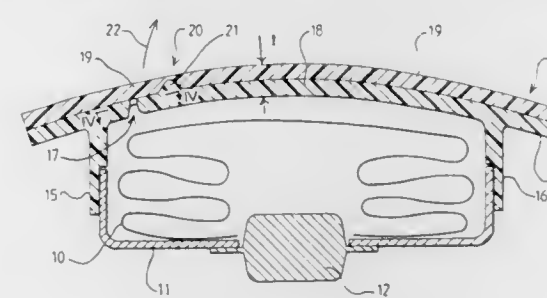
5,772,239  
**AIRBAG SUB-MODULE HAVING FABRIC ENVELOPE WITH HORN SWITCH**  
Brian T. Seymour, Bloomfield, Mich., assignor to Takata, Inc., Auburn Hills, Mich.  
Filed Jun. 24, 1996, Ser. No. 669,616  
Int. Cl.<sup>6</sup> B60R 21/20  
U.S. Cl. 280—728.3 9 Claims

I. A supplemental restraint sub-module for assembly with a vehicle steering wheel assembly forming a well portion and having a mounting plate for enclosing the well portion, the sub-module comprising:  
an air bag;  
an inflater positioned inside of said air bag;  
at least one fastener for fastening said sub-module to the steering wheel assembly;  
a fabric envelope having a deployment failure area, said envelope configured to enclose said air bag and said inflater when said air bag is in a folded uninflated condition, wherein said enclosed air bag and inflater are configured for insertion into the steering wheel assembly well portion, said deployment



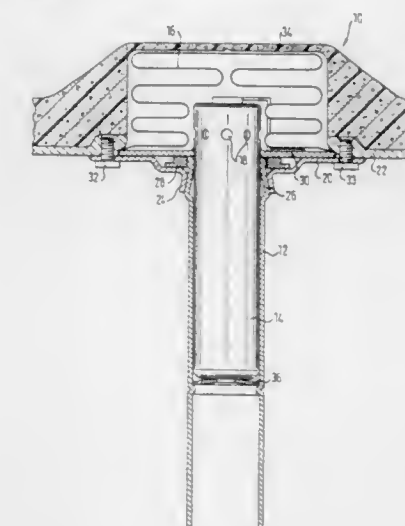
failure area fails upon inflation of said air bag allowing said air bag to expand outside of said sub-module; and  
a membrane horn switch positioned inside said fabric envelope, said horn switch configured to deform upon pressing on a portion of the vehicle steering wheel causing current to flow to a horn.

5,772,240  
**AIR-BAG ARRANGEMENT**  
Kyriakos Vavalidis, Ferrieres-En-Bray, France, assignor to Autoliv Development AB, Vargarda, Sweden  
PCT No. PCT/SE95/00184, § 371 Date Oct. 23, 1996, § 102(e)  
Date Oct. 23, 1996, PCT Pub. No. WO95/24328, PCT Pub. Date Sep. 14, 1995  
PCT Filed Feb. 22, 1995, Ser. No. 700,480  
Claims priority, application United Kingdom, Mar. 10, 1994, 9404748  
Int. Cl.<sup>6</sup> B60R 21/16  
U.S. Cl. 280—728.3 15 Claims



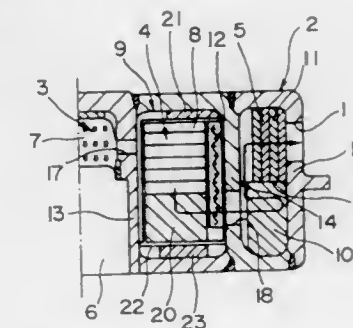
I. A cover for an air-bag comprising a laminate including an inner layer of polymer material and an outer layer of polymer material, each layer defining a line of mechanical weakness, the line of mechanical weakness in the outer layer being laterally displaced by at least 2 millimeters relative to the line of mechanical weakness in the inner layer such that the lines of mechanical weakness in the outer layer and in the inner layer do not overlie one another, the lines of mechanical weakness in the outer layer and in the inner layer together defining a door in the cover adapted to open when a predetermined pressure is provided from the air-bag, the lines of mechanical weakness in the outer layer and in the inner layer further being constituted by lines of reduced thickness.

5,772,241  
**ASSEMBLY COMPRISING A STEERING WHEEL, A STEERING SHAFT AND A GAS BAG MODULE**  
Alexander Heilig, Wissgoldingen, Germany, assignor to TWX Occupant Restraint Systems GmbH, Alldorf, Germany  
Filed Apr. 9, 1997, Ser. No. 833,777  
Claims priority, application Germany, Apr. 15, 1996, 296 06 830 U  
Int. Cl.<sup>6</sup> B60R 21/26  
U.S. Cl. 280—731 12 Claims



I. An assembly comprising a steering wheel, a steering shaft connected non-rotatably to said steering wheel, a gas bag arranged within said steering wheel and having an inflation opening provided with a rim, and a device adapted for furnishing compressed gas for deployment of said gas bag, said device for furnishing compressed gas being arranged in said steering shaft and being fixed against movement in an axial direction of said steering shaft by means of a carrier plate arranged within said steering wheel, said carrier plate securing said gas bag rim to said steering wheel.

5,772,242  
**AIR BAG GAS GENERATOR**  
Masayuki Ueda, Hyogo, and Nobuyuki Katsuda, Tokyo, both of Japan, assignors to Daiel Chemical Industries, Ltd., Osaka, Japan  
Filed May 8, 1997, Ser. No. 836,187  
Int. Cl.<sup>6</sup> B60R 21/28  
U.S. Cl. 280—741 1 Claim



I. An air bag gas generator comprising:  
a housing having gas outlet ports;  
an ignition means accommodation chamber defined in the center of said housing;  
a combustion chamber defined outside said ignition means accommodation chamber;  
a coolant/filter chamber defined outside said combustion chamber;



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an ignition means provided inside said ignition means accommodation chamber;  
a canister provided in said combustion chamber and filled with a gas generating agent for generating gas upon ignition by said ignition means; and  
a coolant and a filter, provided in said coolant/filter chamber to cool and purify combustion gas generated in said canister, wherein another coolant is provided in said canister to cool said combustion gas and to collect combustion residue.

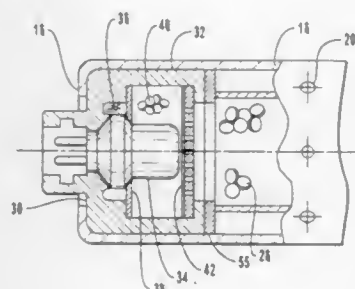
5,772,243

## IGNITER FOR GAS BAG INFLATOR

David J. Green, 632 W. 300 North, Brigham, Utah 84302, and  
Donald R. Lauritzen, 948 W. 3rd North, Hyrum, Utah 84319  
Continuation of Ser. No. 566,761, Dec. 4, 1995, abandoned.  
This application Aug. 22, 1997, Ser. No. 916,558  
Int. Cl.<sup>6</sup> B60R 21/26

U.S. Cl. 280—741

16 Claims



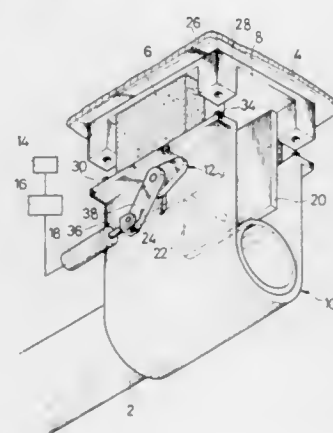
1. A low pressure igniter for a gas bag inflator having a gas generant material in the form of pellets or wafers that is characterized by providing, when functioning, a large diameter flame front producing hot gas and particles, and which is projectile free, comprising,

an igniter housing including a base having a skirt extending from the periphery of said base, said base and said skirt of said housing being a single piece of material,  
an end plate perforated over substantially the whole area thereof, said perforated end plate being attached to said skirt to form a chamber within said housing,  
an initiator having an initiating portion, said initiator being mounted in the base of said housing with the initiating portion thereof extending into said chamber,  
an ignition compound in said chamber, and  
sealing means having a predetermined low rupture pressure positioned within said chamber and sealing said perforated end plate to retain said ignition compound in said chamber until said igniter begins to function,  
whereby, upon initiation of said igniter, the flame front produced by said igniter does not eject the ignited flame at great force and velocity on a front of little width into the gas generant material of said inflator but instead is expelled into the gas generant material of said inflator under a force of significantly less power as a flame having a wide diameter that weaves itself into the space between the gas generant pellets or wafers and around them and smoothly ignites them without crushing them.

5,772,244  
AUTOMOBILE STEERING SHAFT MOUNTING SYSTEM  
Chun Woo Park, Ulsan-si, Rep. of Korea, assignor to Hyundai Motor Company, Seoul, Rep. of Korea  
Filed Oct. 9, 1996, Ser. No. 727,929  
Claims priority, application Rep. of Korea, Oct. 18, 1995, 95-36012

U.S. Cl. 280—780

7 Claims



1. An automobile steering shaft mounting system comprising:  
a bracket which supports a steering shaft;  
elastic members which elastically connects said bracket with a car body and which absorbs resonance transmitted from the car body; and  
means for directly connecting the bracket to the car body according to RPMs of an engine.

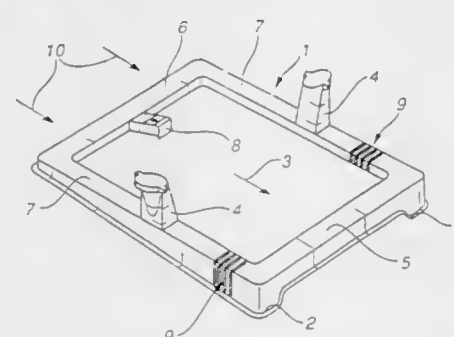
5,772,245

## VEHICLE BODY

Mark Mühlhausen, Stuttgart, Germany, assignor to Mercedes-Benz AG, Stuttgart, Germany  
Continuation of Ser. No. 620,560, Mar. 25, 1996, abandoned.  
This application Oct. 27, 1997, Ser. No. 958,874  
Claims priority, application Germany, Mar. 24, 1995, 195 10 763.2

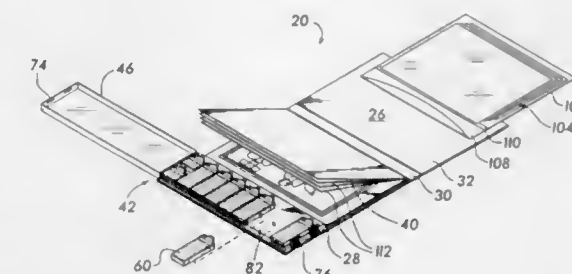
U.S. Cl. 280—784

16 Claims



1. A vehicle body assembly connectible to a vehicle floor frame, comprising:  
a first crossmember;  
a second crossmember;  
a pair of side members connected to the first and second crossmembers to thereby form a rectangular subframe composed of said side members and crossmembers, said subframe being configured to support a vehicle subassembly comprising one of a vehicle engine, a vehicle transmission and a vehicle axle assembly when said subframe is in an in use position on a vehicle.

mounting points provided on said side members for mounting the vehicle subassembly to the subframe,  
said first crossmember being formed as a vehicle bumper support member which in use is disposed on a vehicle end,  
support points provided on said subframe at a position located adjacent said second crossmember for connecting the subframe to a vehicle floor frame,  
and deformation regions disposed in the side members at a position intermediate the mounting points and the support points, whereby collision impact forces against said first crossmember are absorbed by said deformation regions while said vehicle subassembly is protected from damage by being carried with the first crossmember, the mounting points, and portions of said side members at a side of the deformation regions opposite said second crossmember.



a plurality of removable color creating dispensers positioned within the container.

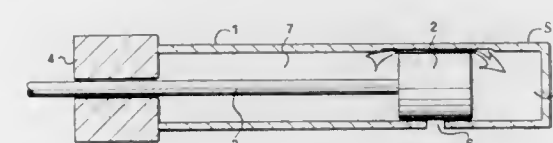
5,772,246

## MECHANICAL SHOCK REDUCTION IN PRETENSIONERS

Ian Gordon, Carlisle, United Kingdom, assignor to Allied Signal Ltd., Carlisle Cumbria, England  
Filed Jul. 18, 1996, Ser. No. 683,398  
Claims priority, application United Kingdom, Jul. 20, 1995, 9514938

U.S. Cl. 280—806

9 Claims



1. A pretensioner for a vehicle safety restraint comprising a cylindrical hollow tube having a first and a second, opposing, end;  
a piston member located within the tube;  
a cable connected between said piston member and a part of the vehicle safety restraint; and  
a pyrotechnic charge which is activated in the event of a collision to evolve a volume of gas within said tube to move said piston from the first end of said tube toward the second end;  
a pressure relief port provided in said tube at a point along the tube's length which point is close to the second end of the tube, toward which the piston is moved on activation of the pyrotechnic charge;  
wherein the position of the pressure relief port in the tube is such that it vents to atmosphere the high pressure gas driving the piston when or slightly before the piston reaches the second end of the tube; and further comprising an axially extending channel in the inner wall of the tube opposite the port.

5,772,247

## ART KIT IN BOOK FORM

Christian Legrand, Nonthaburi THX, assignor to International Book Marketing Ltd., Princeton, N.J.  
Filed Apr. 25, 1996, Ser. No. 635,178  
Int. Cl.<sup>6</sup> B42D 3/18

U.S. Cl. 281—31

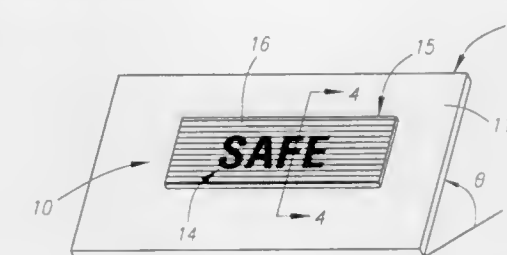
13 Claims

1. A kit for creating artwork comprising:  
a front cover, a back cover, and an interposed spine, the front and back pivotably secured to the spine so as to be foldable into a book form, the back cover extending farther from the spine than the front cover,  
a booklet mounted to the inside of one of the covers, the booklet having a series of pages,  
a container mounted to the portion of the back cover extending farther from the spine than the front cover, and

5,772,248  
DOCUMENT WITH TAMPER AND COUNTERFEIT RESISTANT RELIEF MARKINGS  
George K. Phillips, Paso Robles, Calif., assignor to Verify First Technologies, Inc., Paso Robles, Calif.  
Filed Dec. 7, 1995, Ser. No. 568,587  
Int. Cl.<sup>6</sup> B42D 15/00

U.S. Cl. 285—91

9 Claims



1. A tamper and counterfeit resistant document comprising:  
a substrate; and  
a security tamper resistant overlay marker applied to said substrate, said security tamper resistant overlay marker comprising a first latent image, said first latent image comprising an image relief structure, said image relief structure comprising a flat portion and a ridge portion, said ridge portion comprising a first series of ridges, said flat portion defining a first plane; each of said ridges of said first series of ridges having a top, said tops of said ridges of said first series of ridges defining a second plane, said second plane located above said first plane with respect to said substrate; and  
a second latent image comprising an internal image relief structure comprising a second series of ridges;  
said second series of ridges formed in said flat portion of said internal image relief structure, each of said ridges of said second series of ridges having a bottom, said bottom of said ridges of said second series of ridges defining a third plane, said third plane below said first plane with respect to said substrate.

5,772,249

## METHOD OF GENERATING A SECURITY DESIGN WITH THE AID OF ELECTRONIC MEANS

Lan Guex, Belmont, and Laurent Mathys, Plan-les-Quates, both of Switzerland, assignors to De La Rue Giori S.A., Switzerland

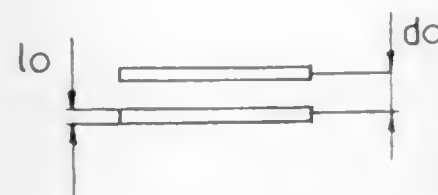
Filed Sep. 27, 1995, Ser. No. 534,663

Claims priority, application Switzerland, Nov. 1, 1994, 3264/94

U.S. Cl. 283—93

10 Claims

1. A method for generating, with the aid of electronic means, a security design intended to be printed on paper securities, espe-



cially banknotes and currency papers, and composed of multiple lines, wherein the following steps are carried out:

- a) a uniform background is generated, consisting of parallel straight lines such that the distance between the longitudinal mid-axes of two consecutive lines, designated as the spacing  $d_0$  between two lines, is constant and such that the width  $l_0$  of the line strokes is also constant, thus determining a constant ratio  $r_0 = l_0/d_0$ ;
- b) the background is modified by modulating the spacing  $d_0$  between the lines according to a nonprogressive modulation function whose parameters are chosen beforehand;
- c) the width of the line strokes is modified such that the ratio of the width  $l_n$  of the stroke of a line to its spacing  $d_n$  with the following line is equal to the constant ratio  $l_n/d_n = r_0$ .

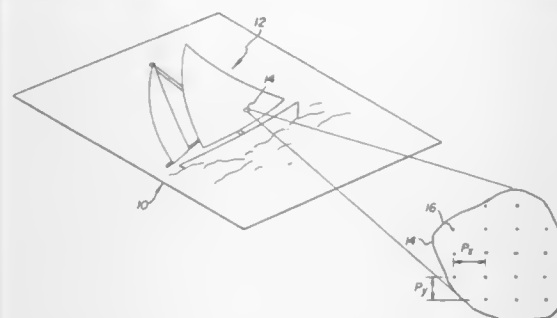
5,772,250

**COPY RESTRICTIVE COLOR-REVERSAL DOCUMENTS**  
John Gasper, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 11, 1997, Ser. No. 835,976  
Int. Cl.<sup>6</sup> B42D 15/00

U.S. Cl. 283—114

27 Claims



1. A color-reversal copy restrictive medium comprising:  
a support layer;  
at least one image-forming layer supported by said support layer; and  
at least one of said at least one image-forming layers capable of forming a pattern of microdots of diminished optical density from a latent image of a pattern of microdots.

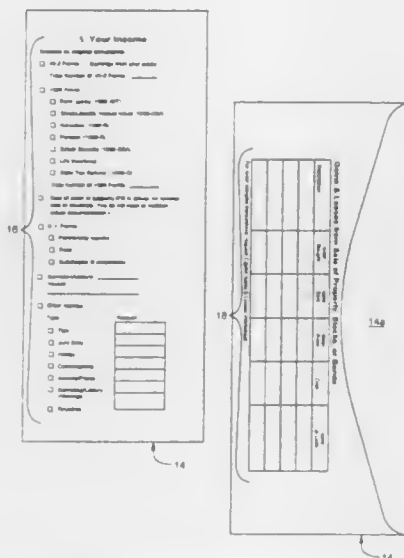
5,772,251

**INCOME TAX INFORMATION ORGANIZER**  
Gordon P. Fleck, 20 S. Clay, Hinsdale, Ill. 60521  
Filed Oct. 15, 1996, Ser. No. 730,228  
Int. Cl.<sup>6</sup> B42D 15/00

U.S. Cl. 283—115

10 Claims

1. An arrangement for organizing, recording and collecting information for preparation and filing of an income tax return by an income tax return preparer, said arrangement comprising:  
an instruction sheet for a taxpayer with directions regarding the use of the arrangement;  
a first personal information form for the entry of personal data by the taxpayer;  
first envelope means including first and second data entry forms for holding documentation relating to information entered on



said first and second data entry forms, wherein said first and second data entry forms include respective first and second lists of the types of documents to be placed in said first envelope means and are adapted to record data relating to income and to sales gains/losses, respectively;

second envelope means including a third data entry form for holding documentation relating to information entered on said third data entry form, wherein said third data entry form includes a third list of the types of documents to be placed in said second envelope means and is adapted to record data relating to deductions;

third envelope means including fourth and fifth data entry forms for holding documentation relating to information entered on said fourth and fifth data entry forms, wherein said fourth and fifth data entry forms include respective fourth and fifth lists of the types of documents to be placed in said third envelope means and are adapted to record data relating to other deductions and credits and to proposed tax law changes, respectively; and

a second personal information form containing information relating to the tax preparer for forwarding to the taxpayer with a completed income tax return.

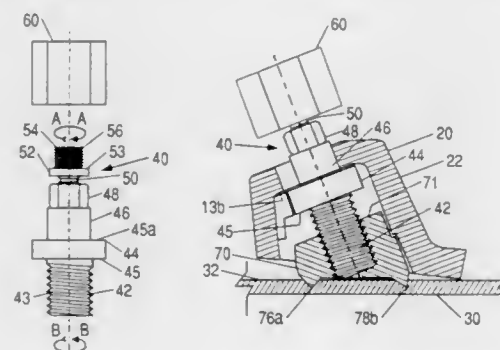
5,772,252

**PIPE JUNCTION HOLDER WITH A NOVEL TORQUE-LIMITING DEVICE**

Jugal K. Malani, 15102 Berkshire Green, Houston, Tex. 77083  
Filed Jun. 16, 1995, Ser. No. 491,270  
Int. Cl.<sup>6</sup> F16L 35/00

U.S. Cl. 285—4

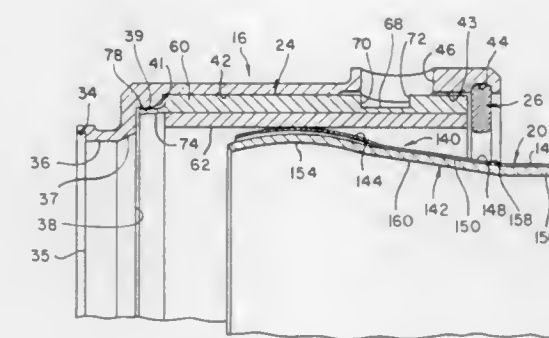
5 Claims



3. A torque-limiting bolt for use in cooperation with an apparatus having a threaded aperture, comprising:  
(a) a first threaded shank at an upper end and a second threaded shank at a lower end for engagement with the threaded

aperture of the apparatus, said threaded shanks being threaded in opposing directions, whereby the rotation of the bolt in the direction of the first threaded shank causes the apparatus to disengage from the second threaded shank thereby moving away from the bolt to a maximum threshold distance whereby further rotation of the bolt in the same direction causes the bolt to break at the weak spot;

- a third shank between the first shank and the second shank, said third shank having a provision for rotating the bolt;
- a first flange between the first shank and the third shank and a second flange between the second shank and the third shank; and
- a weak point between the first flange and the third shank.



5,772,253

**PIPE REPAIR OR JOINTING COLLAR**

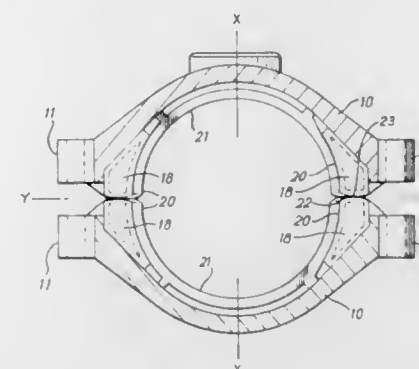
Ian Stuart Hodge, Dukinfield, United Kingdom, and Jens Sonderby Madsen, Svendborg, Denmark, assignors to AVK Manufacturing Limited, Cheshire, England  
Filed Sep. 24, 1996, Ser. No. 719,273

Claims priority, application United Kingdom, Mar. 5, 1996, 9604697

Int. Cl.<sup>6</sup> F16L 55/172

U.S. Cl. 285—15

12 Claims



1. A pipe repair or jointing collar comprising a plurality of arcuate segments with clamping means for drawing the segments together to form the collar around a pipe or around a plurality of pipe ends, with interposition of corresponding deformable sealing means, each arcuate segment having an associated sealing member, each sealing member comprising a pair of longitudinally spaced arcuate sealing strips between the respective ends of which extend a pair of longitudinal sealing strips, rigid wedge-like members being provided within the segments in the regions of the clamping means and adapted to progress generally inwardly with respect to the segments as the latter are drawn together thus to force the sealing members radially inwards in said regions; characterised in that the wedge-like members are non-removably embedded within the sealing members and in that lugs are formed integrally with the sealing members with means on the lugs engaging a part of a respective arcuate segment during assembly of the collar.

5,772,254

**MODULAR JOINT, WITH A REPLACEABLE SEALING SLEEVE**

Kevin R. Felber, Bowie; Robert A. Barrett, Crofton, and Jeffrey E. Swensen, Eldersburg, all of Md., assignors to Eg&G Pressure Science, Inc., Beltsville, Md.

Filed Dec. 20, 1995, Ser. No. 575,636

Int. Cl.<sup>6</sup> F16L 27/06; 9/14

U.S. Cl. 285—16

37 Claims

1. A fluid-tight modular joint for conduits having a high-pressure fluid flowing therethrough, comprising:

- a first tubular housing having a first open end for attachment to a first conduit, a second open end for movably receiving a first end of a tubular sealing member therein, and a tubular inner surface extending between said first and second open ends;
- a first replaceable sealing sleeve removably secured within said tubular housing via a tool engaging an extraction portion formed thereon, said sealing sleeve having a first open end, a second open end, a tubular outer surface extending between said open ends of said sealing sleeve, and a tubular inner surface extending between said open ends of said sealing sleeve, said outer surface of said sealing sleeve being concentrically arranged and slidably received within said inner surface of said tubular housing to form an annular interface therebetween; and
- a first annular sealing element located at said annular interface and configured to seal and hold said sealing sleeve and said housing together.

5,772,255

**TUBING CONNECTOR**

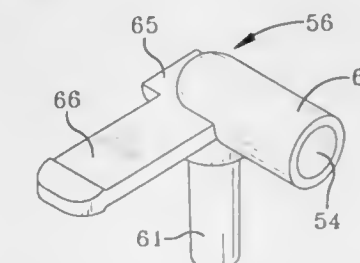
Robert Scott Osborne, Gahanna; Carl Joseph Piontek, Powell; Robert Donald Clegg, Pickerington; Bradford Lynn Buck, Gahanna; Matthew Scott Fleming; Joseph Anthony Juratovac, both of Columbus; William Edward Patton, Dublin, and Kathryn Elizabeth Alexander, Columbus, all of Ohio, assignors to Abbott Laboratories, Abbott Park, Ill.

Filed Sep. 21, 1995, Ser. No. 531,690

Int. Cl.<sup>6</sup> F16L 43/02

U.S. Cl. 285—38

3 Claims



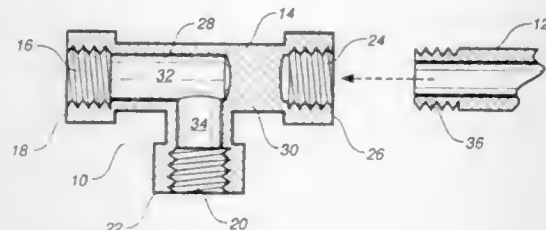


retention tab from said tubing connector and at an angle of about 90° relative to said first longitudinal axis and at an angle of about 90° relative to said second longitudinal axis, said handle having a length longer than a length of said retention tab.

5,772,256  
PIPE SUPPORT SYSTEM  
Lavon Martin, 909 S. Fourth St., LaPorte, Tex. 77571  
Filed Jul. 15, 1996, Ser. No. 680,142  
Int. Cl.<sup>6</sup> F16L 3/00

U.S. Cl. 285—61

11 Claims



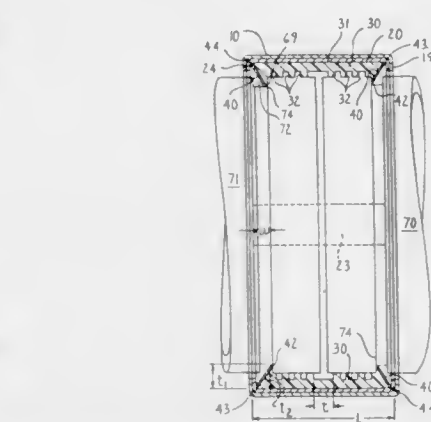
1. A pipe fitting comprising:  
a T-shaped connector having a first opening at a first end of said connector, a second opening at a second end of the connector, and a third opening at a third end of said connector, said connector having a fluid passageway extending between said first and second openings, said third opening being blocked from fluid communication with said fluid passageway, each of said first, second and third openings being internally threaded so as to threadedly receive pipe sections therein, said first end being offset by 90° from said second end, said fluid passageway having a first portion extending to said first opening transverse to a second portion extending to said second opening, said third end being 180° opposite said first end, said third opening being axially aligned with said first opening, said third opening having a pathway extending and opening to said first portion of said fluid passageway, said connector comprising:  
a dead leg receptacle affixed within said third opening at said third end, said dead leg receptacle having a closed portion extending into said third opening so as to block fluid flow through said pathway, said dead leg receptacle having an orifice formed thereon so as to open outwardly of said third end.

5,772,257  
PIPE COUPLING  
Ian Richard Webb, Buckinghamshire; William Taylor, Middlesex, and Neil John Thornton Taylor, Hertfordshire, all of United Kingdom, assignors to Taylor Kerr (Couplings) Limited, London, United Kingdom  
PCT No. PCT/GB94/02329, § 371 Date Jun. 3, 1996, § 102(e) Date Jun. 3, 1996, PCT Pub. No. WO95/11402, PCT Pub. Date Apr. 27, 1995  
PCT Filed Oct. 24, 1994, Ser. No. 635,920  
Claims priority, application United Kingdom, Oct. 22, 1993, 9321834

U.S. Cl. 285—112

19 Claims

1. A pipe coupling for connection in a fluid-tight manner to an end of a pipe having a radial abutment surface facing away from the pipe end on an outer surface thereof, the pipe having an additional surface adjoining a radially inner edge of the abutment surface to form a corner therebetween, said coupling comprising:  
a tubular casing;  
a tubular sealing sleeve disposed within the casing;  
tensioning means for tightening the said casing about said sealing sleeve; and

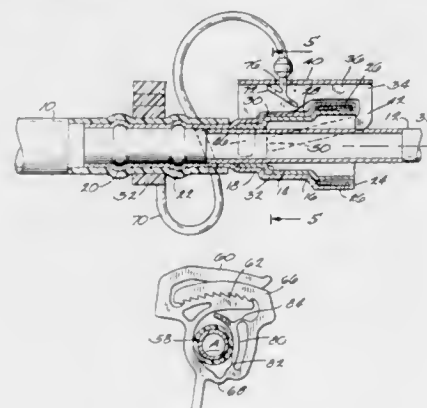


- a frusto-conical gripping ring located within said tubular casing at an end of said sealing sleeve, the arrangement being such that, in use, tightening the tensioning means causes the sealing sleeve to be pressed into sealing engagement with the outer surface of the pipe end;  
said tubular casing comprising a tubular web portion and a radially inwardly projecting flange at an end of said web portion, said flange and said web portion being disposed to form a corner therebetween;  
said gripping ring having an inner edge and an outer edge, the outer edge of the gripping ring making contact with said corner formed between the flange and web portion of the tubular casing;  
the inner edge of the gripping ring being plain and smooth and projecting inwardly beyond an inner surface of the sealing sleeve when the casing is tightened around the sleeve;  
the inner surface of the sealing sleeve being configured and disposed to engage the outer surface of the pipe end, and the inner edge of the gripping ring being configured and disposed to engage the abutment surface upon the coupling being fitted around the pipe end; and  
the gripping ring disposed between the pipe and the coupling being compressed between the corner formed in the tubular casing and the corner formed at the radially inner edge of the abutment surface upon the pipe and coupling being under axial tension.

5,772,258  
CONDUIT CLAMP AND TETHER  
Edward P. Dyer, Germantown, and Kenneth A. Christian, Milwaukee, both of Wis., assignors to Tyton-Hellermann Corp., Milwaukee, Wis.  
Filed Dec. 20, 1995, Ser. No. 575,938  
Int. Cl.<sup>6</sup> F16L 3/08; B65D 63/00

U.S. Cl. 285—114

7 Claims



1. In a fuel line connection wherein releasable bushings establish a connection between two fuel line segments and a connector spans

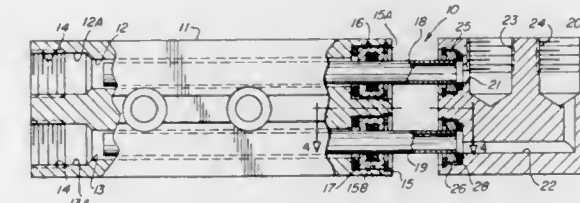
the bushings and releasably engages both bushings to establish the connection therebetween, a clamp assembly comprising, in combination,

- a clamp having a flexible band and first and second jaws, said jaws connected one to each end of said band,  
said jaws having interfitting teeth configured to permit insertion of one jaw into the other and to oppose separation of said jaws once engaged,  
an elongated flexible strap connected at one end to said band and extending from said band,  
a linear tab oriented obliquely relative to said strap and attached to said strap in an area spaced from the connection of said strap to said band for angular movement relative to said strap, and  
a knot in said strap having a cross-section greater than that of said strap and located in said strap adjacent said tab, said tab being connectable to the connector so that said clamp is attachable to the fuel line and said strap is attachable to the fuel line when the connector is separated from the bushings.

5,772,259  
SLIDE ASSEMBLY WITH TELESCOPING FLUID CONDUITS WITH IMPROVED SEALING ARRANGEMENT  
James Geary, Fairfield, and Charles Smart, Brookfield, both of Conn., assignors to Robohand, Inc., Monroe, Conn.  
Filed Sep. 20, 1996, Ser. No. 718,280  
Int. Cl.<sup>6</sup> F16L 27/12

U.S. Cl. 285—145.1

11 Claims



1. A slide assembly for use on a tool machine comprising:  
a slide body having a counterbore,  
a passageway extending through said slide body defining a first conduit for directing a fluid medium therethrough disposed in alignment with said counterbore,  
a second conduit slidably mounted relative to said first conduit, said second conduit adapted to slide between a protracted position and a retracted position relative to said slide body, said second conduit having a free outer end,  
an end block having a counterbore forming a seat which receives said free outer end,  
a first sealing means circumscribing an intermediate circumferential portion of said second conduit within said counterbore of said slide body to form a fluid tight seal thereat,  
and a second sealing means disposed within said counterbore of said end block forming a fluid tight seal between said free outer end of said second conduit and said end block,  
said respective counterbores having a diameter slightly greater than said respective first and second sealing means disposed in said respective counterbores defining a space therebetween for allowing for a predetermined amount of play of said first and second sealing means relative to said slide body and said end block respectively without effecting the efficacy of said first and second sealing means.

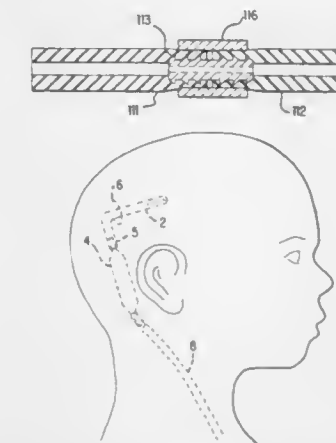
5,772,260

Patent Not Issued For This Number

5,772,261  
CANNULA CONNECTOR AND METHOD OF CONNECTING MEDICAL TUBES  
Gary Magram, Greenville, Del., assignor to The Nemours Foundation, Jacksonville, Fla.  
Filed Jul. 21, 1995, Ser. No. 505,807  
Int. Cl.<sup>6</sup> F16L 33/20

U.S. Cl. 285—256

8 Claims



1. A cannula for draining cerebrospinal fluid from a ventricle of a brain comprising:  
an elastically deformable, flexible tube having a distal end, a proximal end opposite the distal end, and a lumen defining a lumen diameter;  
fluid conveyance means at the distal end for admitting cerebrospinal fluid from the ventricle into the lumen; and  
a tube connector including:  
a rigid, tubular body having an outer body diameter and two body ends, the tubular body defining an internal bore communicating between the body ends and wherein the tubular body comprises at least one elbow bend between the body ends;  
a first nipple proximal to one of the body ends, at least a portion of the first nipple having an outer nipple diameter larger the outer body diameter;  
a second nipple on the tubular body between the elbow bend and the first nipple, at least a portion of the second nipple having an outer nipple diameter larger than the lumen diameter,  
wherein the elbow bend is positioned within the lumen to form a lap joint between the proximal end of the flexible tube and the second nipple with the first nipple protruding from the lumen at the proximal end of the flexible tube, thereby establishing an open fluid passageway through the lumen at the elbow bend; and  
a nonelastically deformable sleeve having a cavity adapted to receive the lap joint, the sleeve disposed around the lap joint at a radial distance apart therefrom;  
wherein the sleeve is radially deformable to clamp the flexible tube between the second nipple and the sleeve without damaging the flexible tube.

5,772,262  
QUICK CONNECTOR FOR PLASTIC TUBING  
Paul Robert Dupont, Andover, and Richard B. Schwarz, Lincoln Park, both of N.J., assignors to Rubber-Fab, Inc., Andover, N.J.  
Filed Apr. 3, 1997, Ser. No. 833,027  
Int. Cl.<sup>6</sup> F16L 33/00

U.S. Cl. 285—257

5 Claims

1. A connector for plastic tubing comprising:  
a collar (40) adapted to be first fitted over the end of said tubing, said collar having an end-wall (42) opening (43) to permit access to the lumen of said tubing and an elongated skirt

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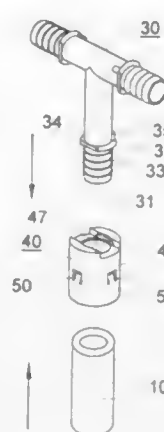
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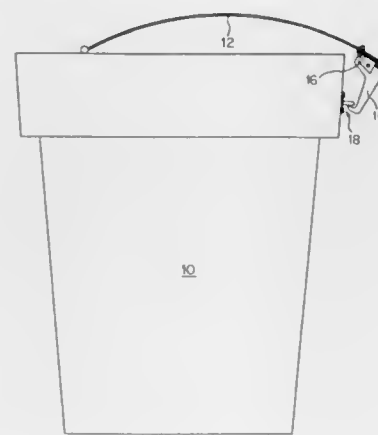
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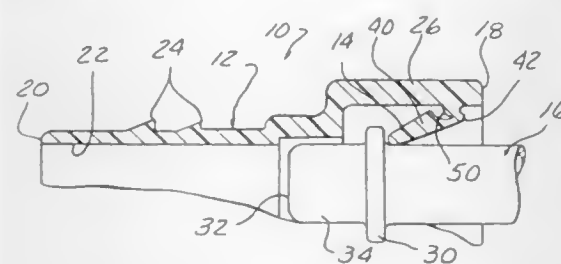
5,772,264  
GRAVITY OPERATED LATCH FOR A REFUSE  
CONTAINER LID  
Shane Bettenhausen, Box 396, Baker, Mont. 59313  
Continuation of Ser. No. 621,405, Mar. 25, 1996, abandoned.  
This application Jun. 4, 1997, Ser. No. 868,975  
Int. Cl.<sup>6</sup> E05C 19/10  
U.S. Cl. 292—130 8 Claims



portion (48), said end-wall being relatively thicker than said skirt portion, said opening (43) having annular recess (44) therein, said skirt portion bearing a plurality of tines (50) for grasping the outer surface of said tubing; and  
a barb (31) adapted to be inserted through said end wall opening, said barb being sized to snugly penetrate the lumen (11) of said tubing; said barb having an interrupted flange (32) for twistably engaging said annular recess (44) of said opening (43), said interrupted flange being adapted to lock said barb into said collar after said collar has been fitted over said tubing end.

5,772,263  
ONE PIECE QUICK CONNECTOR AND INTEGRAL  
RETAINER

J. Gordon Lewis, Bloomfield Hills, Mich., assignor to ITT  
Automotive, Inc., Auburn Hills, Mich.  
Filed Dec. 20, 1996, Ser. No. 770,663  
Int. Cl.<sup>6</sup> F16L 39/00  
U.S. Cl. 285—319 18 Claims

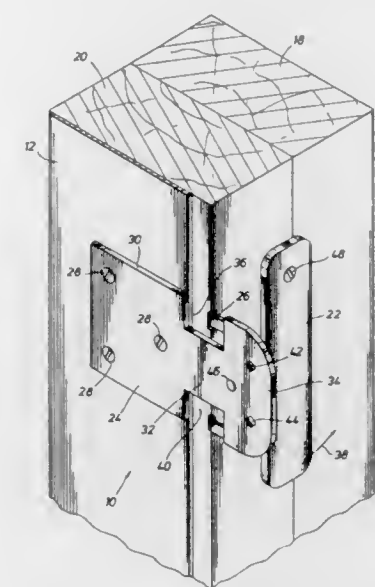


1. A quick connector adapted for selective locking engagement with a male connector part having a radially extending abutment surface, the quick connector comprising:

- a housing having a through bore extending from a first end to a second end of the housing; and
- at least one bendable retainer finger integrally formed as a one piece extension of the housing;
- a flexible web connecting the at least one bendable retainer finger to the housing allowing the at least one retainer finger to be returnably moved from a first manufactured position incapable of locking engagement with the male connector part to a second position in the through bore in the housing to engage the abutment surface on the male connector part upon insertion of the male connector part into the through bore in the housing.

5,772,265  
DOOR SECURITY LOCK  
Anthony Odell Gilbert, 7246 Skybright La., Houston, Tex. 77095  
Filed Oct. 20, 1993, Ser. No. 139,574  
Int. Cl.<sup>6</sup> E05C 3/04  
U.S. Cl. 292—207 11 Claims

1. A drop bolt system for door security comprising:
- a. a doorjamb restraint mounted to a doorjamb and a cripple underlying the doorjamb such that the restraint protrudes from the doorjamb;
  - b. an elongate central metal plate having an upper edge and a mid-point along the length of the plate, rotatably mounted to a doorjamb frame, that releasably engages the doorjamb restraint at the mid-point of the plate; and

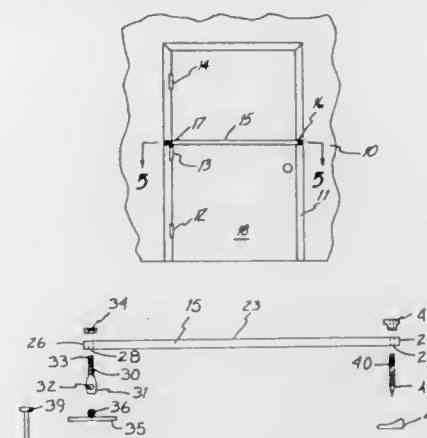


a frame attachment member having a first end for securing to a door frame and a second end for extending through the second hole in said rigid member sufficiently far so as to form a securable end thereon; and  
a second fastener for securing to said securable end to hold said rigid member on said frame attachment member so that when the hinge pin attachment member and the frame attachment member are secured, the rigid member prevents the door from being opened.

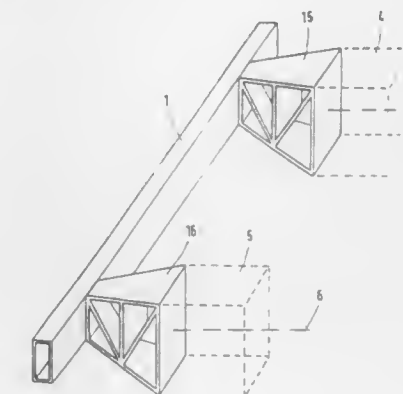
5,772,267  
COLLISION DAMPER FOR MOTOR VEHICLES  
Gunther Heim, Mainhausen; Stephan Schütt, Rüsselsheim, and Jürgen Hock, Aschaffenburg, all of Germany, assignors to Ymos Aktiengesellschaft Industrieprodukte, Obertshausen, Germany  
Filed Jul. 24, 1996, Ser. No. 685,872  
Claims priority, application Germany, Jul. 24, 1995, 195 26 707.9  
Int. Cl.<sup>6</sup> B60R 19/06  
U.S. Cl. 293—133 19 Claims

c. a central plate latch that engages the upper edge of the central plate to releasably secure the central plate in engagement with the doorjamb restraint to prevent rotational movement of the central metal plate.

5,772,266  
DOOR SECURITY KIT  
Wayne Skiba, 222 105th Ave. N.W., Coon Rapids, Minn. 55448  
Filed Oct. 28, 1996, Ser. No. 738,189  
Int. Cl.<sup>6</sup> E05C 19/18  
U.S. Cl. 292—259 R 12 Claims



1. A security kit for attachment to a door frame comprising:
- a rigid member, said rigid member having an exterior surface and a first end and a second end with said rigid member having sufficient length so as to extend beyond the width of a door to enable the rigid member to be secured on opposite sides of said door, said rigid member having a first hole extending through one end of said rigid member and a second hole extending through the opposite end of said rigid member;
  - a hinge pin attachment member having a first end for securing to a hinge pin on a door frame, said hinge pin attachment member having a second end for extending through the first hole in said rigid member;
  - a first fastener for securing to the second end of the hinge pin attachment member to hold said rigid member in a rotatable condition on said hinge pin attachment member;



1. A collision damping arrangement for absorbing energy in a possible head-on and/or rear end collision of a motor vehicle, comprising a bumper-side cross member; a plurality of longitudinal members arranged on the cross member and connectable to a corresponding passenger compartment of a motor vehicle; and at least one collision damper for absorbing energy arranged on each longitudinal member; and wherein each collision damper comprises an extruded section whose constant cross-sectional profile extends transversely to the longitudinal axis of the associated longitudinal member for the motor vehicle, with at least one outer dimension of the damper decreasing in a direction toward the cross member.

5,772,268  
PAPER HANDLING AID  
Alicia Chabrier, 2909 Rd. 76, Pasco, Wash. 99301  
Filed Oct. 17, 1995, Ser. No. 544,025  
Int. Cl.<sup>6</sup> B25J 1/02; B65H 3/20  
U.S. Cl. 294—1.1 3 Claims

2. A paper handling aid comprising:
- A. a suction cup having a suction cup extension; handle means affixed to the suction cup extension; the suction cup having a suction surface; adhesive affixed by adhesion to the suction surface;
  - B. the suction cup is a first suction cup; the extension is a first suction cup extension; the handle means is a second suction





cup having a second suction cup extension; a tube joins the first suction cup extension to the second suction cup extension;

C. the adhesive is reusable adhesive.

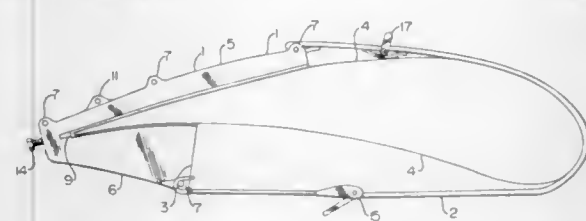
#### 5,772,269 HOISTING TOOL

Arnold W. Henning, Jr., Claremont; Marion R. Watkins, Collinsville; Walter M. Wright, Skiatook, and James A. Battle, Broken Arrow, all of Okla., assignors to McConnell Douglas Corporation, Long Beach, Calif.

Filed Oct. 9, 1996, Ser. No. 728,028  
Int. Cl.<sup>6</sup> B66C 1/10

U.S. Cl. 294—67.22

21 Claims



1. A lifting apparatus for lifting structural components comprising:

- a bracket having an upper section and a lower section joined together in spaced-apart relation to define a slot therebetween adapted to receive a portion of the component to be lifted;
- a flexible strap releasably engaging at least one of said sections and adapted to at least partially encircle the component to be lifted; and
- an adjustment mechanism disposed within said slot and adapted to engage the component to bias the component in a direction to cause tightening of said flexible strap around the component.

#### 5,772,270 PIVOTAL EXTENSION APPARATUS FOR MOTOR HOMES AND RECREATIONAL VEHICLES

Paul E. Hanser, Tipton; Stacy M. Hanser, Davenport, both of Iowa, and Jeffrey W. Hogue, East Moline, Ill., assignors to HWHI Corporation, Moscow, Iowa

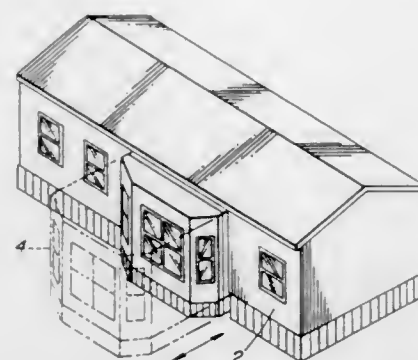
Filed Aug. 4, 1995, Ser. No. 511,477  
Int. Cl.<sup>6</sup> B60P 3/34

U.S. Cl. 296—26

8 Claims

1. A room extension apparatus for mobile homes having a fixed structure and a structural member to be moved between a retracted position and an extended position, comprising:

- (a) first and second pivot bases secured to the fixed structure;
- (b) first and second inner pivot assemblies pivotally connected to said pivot bases;
- (c) first and second outer pivot assemblies pivotally connected to said inner pivot assemblies and pivotally connected to said structural member to be moved;



- (d) actuator means connected to said pivot bases for extending and retracting said inner and outer pivot assemblies; and
- (e) a torsion bar extending between said outer pivot assemblies whereby the movement of the pivot assemblies is synchronized.

#### 5,772,271 VERSATILE, MULTIPURPOSE TRUCK BODY

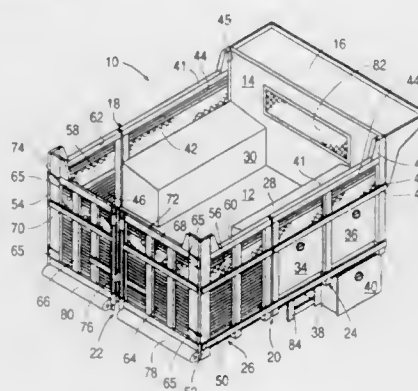
Jerome F. Sanders, 760 Mundis Mill Rd., York, Pa. 17402

Filed Oct. 13, 1995, Ser. No. 543,181

Int. Cl.<sup>6</sup> B62D 33/00

U.S. Cl. 296—32

15 Claims



13. A versatile, multipurpose truck body for mounting on the chassis of a truck with a passenger cab above a front axle and a rear axle spaced behind the cab from the front axle that is adaptable for multiple end uses, wherein said truck body comprises:

- (a) a substantially rectangular floor mounted to extend from the cab to a selected distance beyond the rear axle;
- (b) a cab wall section fixedly mounted perpendicularly along the perimeter of the floor adjacent to the cab, wherein said cab wall section includes a cab protector extension mounted to the cab wall section to extend a substantial distance over the roof of the cab and a window section positioned in said cab wall section at a location selected to provide optimum visibility;
- (c) a pair of opposed side walls positioned along the perimeter of the floor perpendicular to the cab wall, wherein each said side wall includes a fixed section fixedly mounted to the floor and to the cab wall and a removable section removably mounted to the floor adjacent to the fixed section, wherein each fixed section includes a fixed portion and a removable upper panel;
- (d) a rear gate wall removably mounted perpendicularly between the removable sections of each side wall to define with said cab wall section and said side walls a cargo area, wherein said rear gate wall comprises a pair of gates, each gate being hingedly mounted on a support member on an adjacent removable side wall section to pivot through an angle of at least 270° between a fully closed position perpendicular to said removable side wall section and a fully open position parallel to said removable side wall section, wherein each of

said side walls and said rear gate wall includes a see-through section which extends around the perimeter of the truck body at a distance from the floor corresponding to the distance of the cab wall window from the floor to provide optimum visibility; and

- (e) at least one storage compartment having the configuration of a substantially rectangular solid formed integrally with the floor to extend above the floor surface into the cargo area with an open side adjacent to the fixed portion of said fixed side wall section, wherein said fixed portion includes a selected number of door panels to cover said open side and provide access to said storage compartment.

#### 5,772,272 COMBINATION GOLF CART SUN VISOR AND STORAGE DEVICE

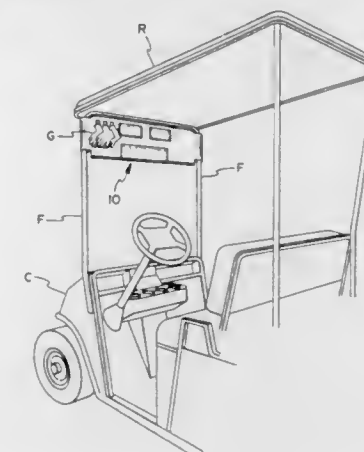
Thomas D. Faddis, Main Post Office 379 N. Oats St., Donthan, Ala. 36302

Filed Dec. 1, 1995, Ser. No. 566,090

Int. Cl.<sup>6</sup> B60R 9/04

U.S. Cl. 296—97.5

14 Claims



1. A combination golf cart sun visor and storage device, comprising:

- a) a visor body configured for being installed on a golf cart;
- b) at least one storage element provided on said visor body;
- c) a fastening member;
- d) said fastening member being configured for fastening said visor body to a pair of spaced opposed upwardly extending elongated frame members of a golf cart; and
- e) wherein said fastening member attaches said visor body to the pair of frame member of a golf cart in the position of a sun visor, and said at least one storage element retains objects to be stored.

#### 5,772,273 SPRING CLIP FOR RETAINING SNAP FASTENERS ON A TONNEAU COVER RAIL

Donald E. Wheatley, 1119 Wright St., Ann Arbor, Mich. 48105

Filed Jul. 3, 1996, Ser. No. 675,685

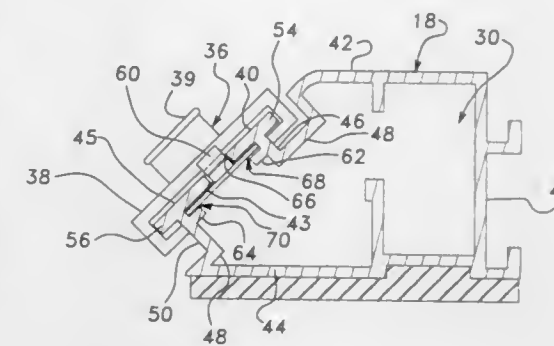
Int. Cl.<sup>6</sup> B60P 7/02

U.S. Cl. 296—100

5 Claims

1. A tonneau cover for covering a cargo box of a pick-up truck, the cargo box having spaced side walls, a front wall and a tailgate, each of which has a top surface, said tonneau cover comprising:

- a generally rectangular frame having a plurality of elongated rails each having two ends, said rails being joined to one another at said ends thereof to form said rectangular frame, said frame being disposed upon the top of said cargo box;
- a cover of a flexible sheet material for covering the cargo box;
- snap fastener means for attaching said cover to said frame, said snap fastener means including a plurality of snap fasteners,



each said snap fastener having a first snap portion fixed to said cover and a second snap portion carried by one of said rails and being slidable longitudinally along the length of said one rail along a path of travel; and

- a spring retainer mounted to said one rail adjacent one end thereof having a stop portion thereof disposed in said path of travel of said second snap portions mounted on said one rail to block the sliding movement of said second snap second portions beyond said one end of said one rail, said stop portion of said spring retainer being deflectable out of said path of travel by application of a predetermined force on said stop portion whereby said second snap portions can be selectively removed from said one rail.

#### 5,772,274 MOTORIZED DRIVE SYSTEM FOR A CONVERTIBLE ROOF OF AN AUTOMOTIVE VEHICLE

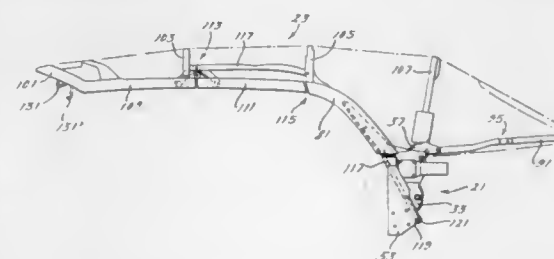
Stephen P. Tokarz, Flat Rock, Mich., assignor to ASC Incorporated, Southgate, Mich.

Filed Jan. 31, 1995, Ser. No. 381,505

Int. Cl.<sup>6</sup> B60J 7/12

U.S. Cl. 296—707

44 Claims



1. An apparatus for an automotive vehicle, said apparatus comprising:

- a retractable convertible roof;
- a drive mechanism including a first electric motor operable to move a portion of said convertible roof between a first position and a second position, said drive mechanism further being operable to substantially maintain said portion of said convertible roof in a predetermined stopped position when said convertible roof is at least partially raised, an armature of said first electric motor always being drivably coupled with said convertible roof when installed in said vehicle;
- a first sector gear being rotatably driven by said first motor;
- a member extending from and moving concurrent with said first sector gear;
- a second sector gear being journaled upon said member; and
- a second electric motor having an output gear enmeshing with said second sector gear.

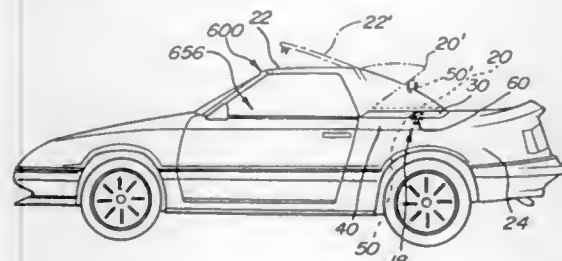
5,772,275

APPARATUS AND METHOD FOR SECURING A CONVERTIBLE ROOF TO AN AUTOMOBILE VEHICLE  
Stephen P. Tokarz, Flat Rock, Mich., assignor to ASC Incorporated, Southgate, Mich.

Continuation of Ser. No. 220,294, Mar. 30, 1994, Pat. No. 5,624,149, which is a continuation-in-part of Ser. No. 940,570, Sep. 4, 1992, Pat. No. 5,301,987. This application Sep. 13, 1996, Ser. No. 714,007  
Int. Cl.<sup>6</sup> B60J 7/185

U.S. Cl. 296—121

22 Claims



1. An apparatus for securing a convertible roof to a body of an automotive vehicle, said apparatus comprising:

- a first striker affixed to a rear portion of said roof and having a solid cross-sectional substantially horizontal member;
- a first catch mechanism disposed on said body of said automotive vehicle, said first catch mechanism being only pivotable about a single fixed and substantially horizontal pivot axis;
- a drive mechanism coupled with said first catch mechanism providing pivotal movement to said first catch mechanism for selectively and automatically engaging said substantially horizontal member of said first striker by said first catch mechanism, said first catch mechanism being substantially vertically pivotable for engaging a substantially horizontal member of said first striker;
- a second striker affixed to said roof, said second striker being transversely displaced from said first striker; and
- a second catch mechanism disposed on said body of said automotive vehicle and being transversely displaced from said first catch mechanism, said second catch mechanism movably engaging said second striker.

5,772,276

COMPOSITE FLOOR

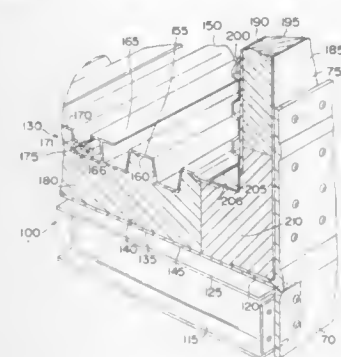
Charles R. Fetz; Daniel J. McCormack, both of Savannah; John M. Jones, Bloomingdale; Michael I. Thomas, Savannah, all of Ga., and James T. Colling, Memphis, Tenn., assignors to Great Dane Limited Partnership, Chicago, Ill.

Filed Aug. 22, 1995, Ser. No. 517,944

Int. Cl.<sup>6</sup> B62D 25/20

U.S. Cl. 296—181

24 Claims



1. A composite floor for an insulated trailer, said floor comprising:

- a unitary subfloor member, said subfloor member having an upper surface and a lower surface;
- a unitary top floor member, said top floor member having an upper surface and a lower surface;
- a rigid foam core extending substantially uniformly across the lateral width of the floor, said core being sandwiched between the upper surface of the subfloor member and the lower surface of the top floor member wherein said foam core has sufficient strength to transfer a cargo load from the top floor member to the subfloor member without additional support structure interconnecting the top floor member and subfloor member; and
- wherein said subfloor member is configured without defining any holes therein to prevent fluid from entering the foam core.

5,772,277

FRONT PORTION OF VEHICLE BODY STRUCTURE FOR AUTOMOBILE

Makoto Fukuda, Wako, Japan, assignor to Honda, Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 526,248, Sep. 11, 1995, abandoned.

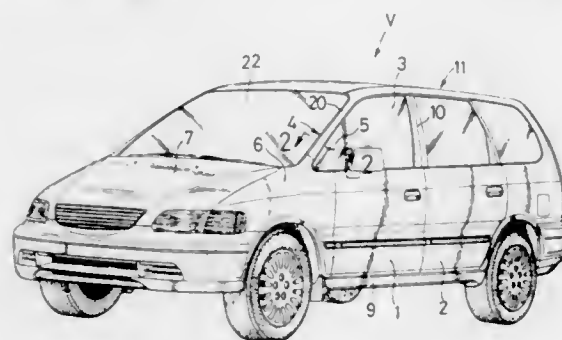
This application Nov. 12, 1996, Ser. No. 747,992

Claims priority, application Japan, Sep. 12, 1994, 6-217113

Int. Cl.<sup>6</sup> B60J 7/00

U.S. Cl. 296—201

4 Claims



1. A front portion of a vehicle body structure comprising:

- a front pillar including an inner upper member and a triangular windshield support frame means which are formed from a single piece of material, said triangular windshield support frame means having a triangular opening formed therein, said inner upper member having a predetermined width and said triangular windshield support frame means having a width which is wider than the predetermined width of said inner upper member;
- a side door window; and
- a front side windshield positioned between said front pillar and said side door window;
- wherein said triangular windshield support frame means supports said front side windshield in said triangular opening.

5,772,278

RECLINER CHAIR HAVING WALL-AVOIDING LINKAGE ARRANGEMENT

Jerome R. Kowalski, Hickory, N.C., assignor to Hickory Springs Manufacturing Company, Hickory, N.C.

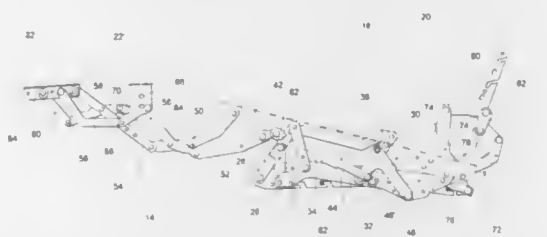
Filed Sep. 30, 1996, Ser. No. 723,003

Int. Cl.<sup>6</sup> A47C 1/038

U.S. Cl. 297—85

6 Claims

1. A recliner chair comprising a chair base, a seat, and means mounting the seat on the base for movement between a first position wherein the seat is disposed for sitting, a second position wherein the seat is partially reclined relative to the base, and a third position wherein the seat is extended relative to the base beyond the partially reclined second position, the mounting means



comprising a carrier element, a first linkage arrangement mounting the seat on the carrier element, and a second linkage arrangement mounting the carrier element on the base, the first linkage arrangement being pivotable with respect to the carrier element for moving the seat from the first sitting position to the partially reclined second position substantially without movement of the carrier element and the second linkage arrangement relative to the base, and the second linkage arrangement being pivotable with respect to the base when in the partially reclined second position for moving the carrier element, the seat and the first linkage arrangement from the partially reclined second position to the extended third position substantially without movement of the carrier element and the first linkage arrangement relative to the seat, wherein the second linkage arrangement comprises a pair of support links pivoted to the base at spacings therealong, a pair of swing links each pivoted between a respective one of the support links and respective spaced locations along the carrier element, and a connector linkage assembly extending between the support links for stabilization thereof, the support links, the swing links and the connector linkage assembly providing generally translators horizontal motion of the seat between the partially reclined second position and the extended third position.

5,772,279

COUPLING SYSTEM FOR INFANT CARRIER TO SECOND SUPPORT DEVICE

Edward M. Johnson, Jr., Park Forest, Ill., assignor to Kolcraft Enterprises, Inc., Chicago, Ill.

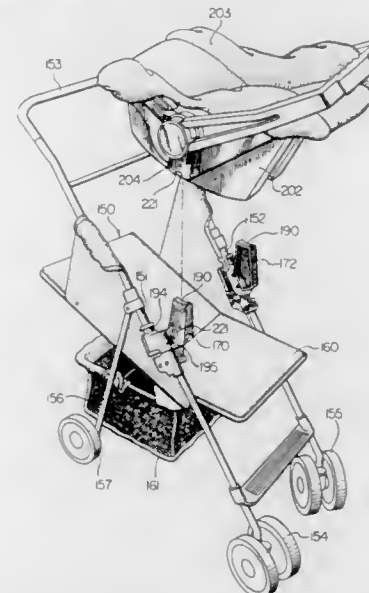
Continuation of Ser. No. 522,135, Aug. 31, 1995, abandoned.

This application May 27, 1997, Ser. No. 863,135

Int. Cl.<sup>6</sup> A47C 13/00

U.S. Cl. 297—130

13 Claims



1. A system for releasably mounting an infant carrier to a separate infant carrier support device disposed below the carrier, the system comprising:

- a carrier which includes a head end, foot end and a pair of spaced sides connecting said ends;
- a coupling member extending outward from and for a portion of the length of each side of said carrier, said member being integrally formed in said carrier and sized and configured to form a discrete pocket located substantially centrally of said carrier sides; and
- said second support device including a pair of spaced mounting posts extending upward from said second device, each post having a length, width, and depth and sized and configured to be received within a pocket in said carrier coupling member, each pocket comprising means for receiving a post and having an open end through which said post is inserted into said pocket;
- said post and pocket being dimensioned and configured so that said post substantially fills said pocket to provide a snug fit; said pocket open end having an area substantially corresponding to the cross-sectional area of the pocket adjacent said open end whereby said carrier is adapted to be coupled to said second support device solely by disposing said mounting posts into the corresponding pockets in the carrier coupling members whereby said infant carrier is coupled to the second support device and said coupling members each permit said carrier to be freely lifted vertically from said bases; and
- said coupling member posts and pockets being free of any positive latching means.

5,772,280

DYNAMIC ACTUATION SYSTEM FOR AN ARTICULATED HEADREST PORTION OF AN AUTOMOTIVE SEAT

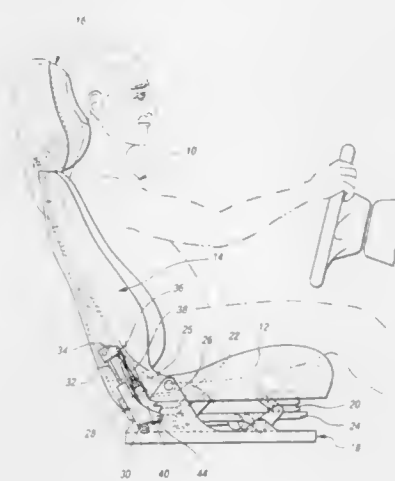
Andrew J. Massara, Vargön, Sweden, assignor to Lear Corporation, Southfield, Mich.

Filed May 8, 1997, Ser. No. 852,957

Int. Cl.<sup>6</sup> B60N 2/42

U.S. Cl. 297—216.12

8 Claims



1. A seat assembly for a passenger compartment of an automotive vehicle comprising a seat track, a seat portion supported by said seat track, a seat back pivotally mounted on said seat track, and a head restraint mounted at the uppermost margin of said seat back;

said seat back comprising a structural shell, a plate secured to said shell in spaced relationship therewith, said head restraint being secured to said plate;



a ram supported by said shell having an upper portion near a thoracic region of said seat assembly and a lower portion near a lumbar region of said seat assembly;  
a force-transmitting strut connecting said lower ram portion to said seat track; and  
linkage means for connecting said upper ram portion to said head restraint;  
said strut, upon pivotal movement of said seat back on said track, transmitting an upward force on said ram whereby said ram is shifted upwardly;  
said linkage means being activated by said ram upon upward movement thereof, thereby moving said head restraint forward relative to said seat back.

**5,772,281**  
**DUAL SPRING BACK SUSPENSION SYSTEM FOR AN AUTOMOTIVE SEAT**

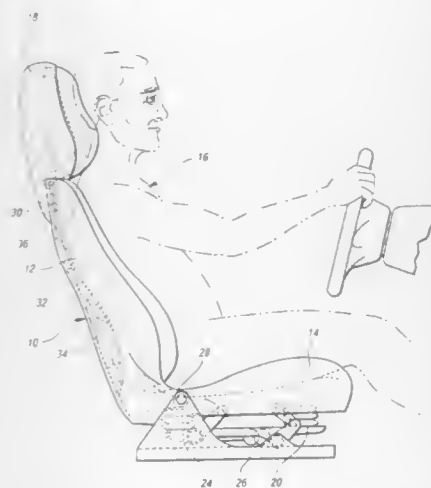
Andrew J. Massara, Vargön, Sweden, assignor to Lear Corporation, Southfield, Mich.

Filed May 19, 1997, Ser. No. 858,256

Int. Cl.<sup>6</sup> A47C 3/025

U.S. Cl. 297—284.4

9 Claims



1. A seat assembly for a passenger compartment of an automotive vehicle comprising an upright seat back portion, a seat portion, and a seat support structure for said seat portion;  
said seat back portion having a rigid frame connected at its lower margin thereof to said support structure;  
a cushion carrier member forming a part of said upright seat back portion;  
a back support plate disposed adjacent said carrier member and connected to said carrier member at a location intermediate the upper and lower margins thereof;  
said carrier member being pivotally connected to said rigid frame at one margin thereof;  
a suspension spring means between said carrier member and said rigid frame at a location intermediate said upper and lower margins;  
at least one cushion disposed between said carrier member and said back support plate, whereby said carrier member and said back support plate define a floating suspension for a seat occupant with respect to said rigid frame.

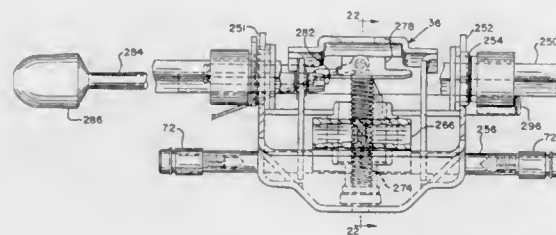
**5,772,282**  
**TILT CONTROL MECHANISM FOR A CHAIR**  
William E. Stumpf; Rodney C. Schoenfelder, both of Minneapolis, Minn.; Donald Chadwick, Los Angeles, Calif.; Carolyn Keller, Holland, Mich.; Timothy P. Coffield, Grand Rapids, Mich.; Randy J. Sayers, Belding, Mich.; Jeffrey W. Bruner, Greensboro, N.C.; George A. Miles, West Olive, Mich.; Eric Cammenga, Holland, Mich., and Philip Crossman, Grand Rapids, Mich., assignors to Herman Miller Inc., Zeeland, Mich.

Division of Ser. No. 347,475, Dec. 15, 1994, abandoned, which is a continuation-in-part of Ser. No. 898,907, Jun. 15, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 484,781

Int. Cl.<sup>6</sup> A47C 7/60

U.S. Cl. 297—302.3

55 Claims



1. An apparatus for controlling the tilt range of a chair and the resistance to tilting of the chair, comprising:  
an elastomeric torsion spring mounted to an axle;  
a tilt rate adjustment mechanism including an outer sleeve member mounted to the spring, a screw having an axis positioned generally tangentially relative to the sleeve member, a block member threadably attached to the screw, an arm extending radially outward from the sleeve and operably engaging the block member, a first gear attached to one end of the screw, and a second gear meshing with the first gear, whereby said second gear is actuated to rotate the first gear and screw, thus moving the block member in a linear direction along the axis of the screw to move the arm a desired amount and adjust the initial return torque of the spring;  
a forward tilt limiter mechanism including an arm extending outwardly from the axle, said arm being operably engageable with a pivot member which is rotatable between a forward tilt position and a standard tilt position; and  
a rearward tilt limiter mechanism including an arm extending outwardly from the axle, said arm being operably engageable with a cam member which is rotatable to a desired maximum rearward tilting position.

**5,772,283**  
**TILT-UP AUTOMOBILE SEAT**  
Masami Yoshida, Tochigi-ken, and Tetsuya Kayumi, Saitama, both of Japan, assignors to Tokyo Seat Co., Ltd., Saitama-Ken, and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of Japan

Filed Oct. 4, 1996, Ser. No. 726,458

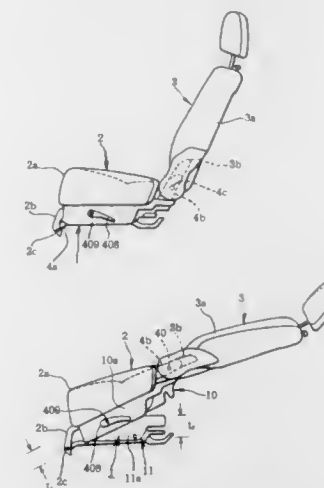
Claims priority, application Japan, Oct. 8, 1995, 7-286430; Sep. 25, 1996, 8-274017

Int. Cl.<sup>6</sup> A47C 7/02

U.S. Cl. 297—452.38

3 Claims

1. A tilt-up automobile seat comprising:  
a seat cushion;  
a seat back;  
tilt-up means positioned under said seat cushion for tilting said seat cushion and said seat back upwardly around a pivot at the front side of said seat cushion;  
an upper cover covering an upper part of the tilt-up means and attached to the upper part of the tilt-up means for movement therewith; and  
an under cover covering a lower part of the tilt-up means, said upper cover and said under cover having mutually overlapping portions such that the tilt-up means is covered by



the upper and under covers so as to be invisible when the tilt-up automobile seat is in a normal position in which said seat is not tilted upwards and the tilt-up means remains covered by the upper and under covers so as to be invisible when the tilt-up automobile seat is tilted upwards.

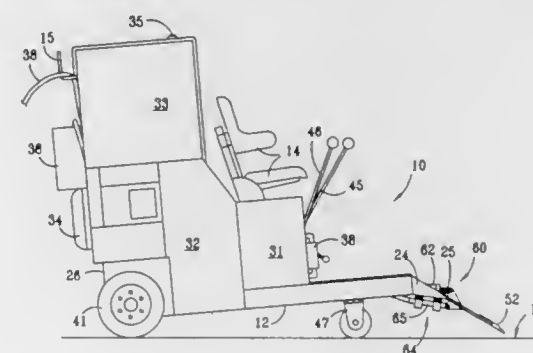
**5,772,284**  
**MULTIPURPOSE HORIZONTAL SURFACE STRIPPER**  
Stephen B. Lindsey, Mesquite, and Randy D. Lindsey, Dallas, both of Tex., assignors to Blast Off Floor Preparation, Inc., Mesquite, Tex.

Filed Sep. 26, 1996, Ser. No. 717,228

Int. Cl.<sup>6</sup> B32B 31/18; E21C 47/00

U.S. Cl. 299—36.1

16 Claims



12. A stripping assembly for removing covering from a supporting surface, comprising:  
a frame;  
a blade mount connected to the frame;  
a stripping blade mounted on the blade mount, said stripping blade having a scraper edge; and  
a means for automatically allowing the roll of the blade to change with respect to the supporting surface to allow the edge of the blade to adjust to the contour of the supporting surface.

**5,772,285**  
**HUB AND ROTOR COMBINATION**  
Jon A. Bigley, Canton, Mich., and Evan R. Baker, Camas, Wash., assignors to Warn Industries, Inc., Milwaukie, Oreg.

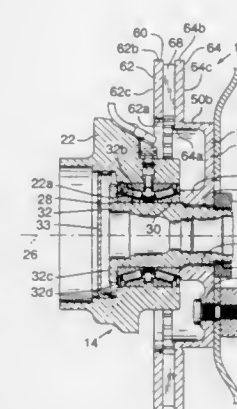
Filed Nov. 21, 1996, Ser. No. 752,849

Int. Cl.<sup>6</sup> B60B 27/00

U.S. Cl. 301—6.8

7 Claims

1. A wheel mounting system for a vehicle having a knuckle adapted to rotatable support a spindle, said system comprising



a hub and rotor combination wherein said hub has a bore extending axially therethrough and a plurality of axially extending splines projecting radially into said bore, and a rotatable spindle on which said hub and rotor combination is mounted, said spindle having outer and inner ends and a mounting portion on its outer end which extends into said bore, said mounting portion having a plurality of axially extending splines projecting radially outwardly therefrom complementary with and adapted to mesh with the splines of said bore;  
said inner end of said spindle rotatably supported by the knuckle and a coupling connection at said inner end for selectively coupling the spindle to a vehicle's axle for rotatable driving the spindle and the hub and rotor combination mounted thereto.

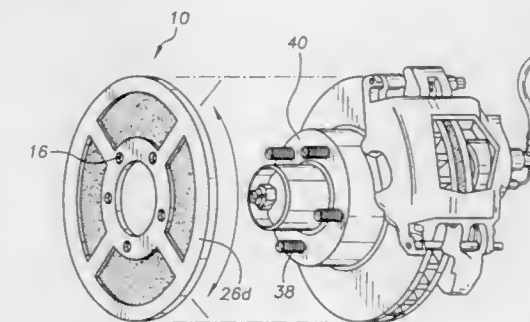
**5,772,286**  
**WHEEL DUST FILTER**  
Jimmy Jordan, 228 Dodgen Pl., Mabelton, Ga. 30059

Filed Feb. 14, 1997, Ser. No. 800,790

Int. Cl.<sup>6</sup> B60B 7/00

U.S. Cl. 301—37.1

16 Claims



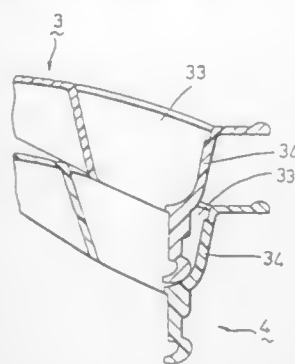
1. A wheel dust filter comprising:  
a central mounting plate having a central mounting hole formed therethrough and a plurality of lug apertures formed through said mounting plate and spaced around said central mounting hole;  
a circular frame rim having four sequentially spaced, rim filter receiving channels;  
four radially projecting frame rim supports each having two rim support filter receiving channels, each rim support being in connection between said frame rim and said central mounting plate in a manner to define four filter apertures; and  
four filter elements constructed from open cell foam, each filter element being positioned within one of said four filter apertures in a manner such that edge portions of the perimeter edge of each filter element are positioned within a said rim filter receiving channel and two of said rim support filter receiving channels.

5,772,287  
WHEEL RIM COVER

Lih-Ching Sheu, Tainan Hsien, Taiwan, assignor to Kuan Hsieng Industrial Co., Ltd., Tainan, Taiwan  
Filed Jul. 25, 1996, Ser. No. 686,975  
Int. Cl.<sup>6</sup> B60B 7/12

U.S. Cl. 301—37.32

2 Claims



1. A wheel rim cover comprising a circular disc having a front surface, a rear surface, an outer edge, a plurality of through holes extending separately and entirely through the disc from the front surface to the rear surface, a plurality of continuous reinforcement lining walls extending from the rear surface, each reinforcement wall surrounding each separate through hole, a plurality of mounting bases extending from the rear surface, each mounting base being positioned adjacent to a separate reinforcement lining wall and along an outer edge of the disc, and a plurality of clasps, each clasp extending from a separate mounting base and having a blunt gripping end; wherein the mounting bases and clasps extend toward the center of the disc sufficiently such that when the wheel rim cover is placed on a second, identical wheel rim cover, each of the clasps of the wheel rim cover extends through a separate through hole of the second wheel rim cover sufficiently to be encircled by the reinforcing wall surrounding the through hole on the rear side of the second wheel rim cover.

5,772,288  
VEHICLE WHEEL

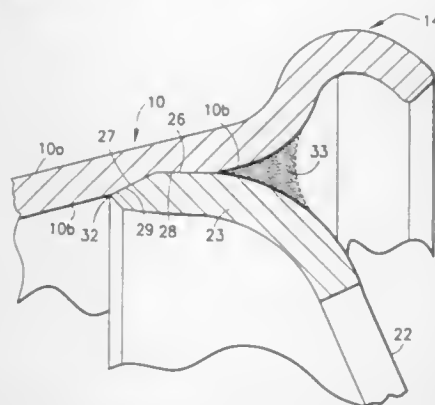
Ratko Cvijanovic, Henderson, Ky., assignor to Accuride Corporation, Henderson, Ky.

Filed Jun. 11, 1996, Ser. No. 661,818

Int. Cl.<sup>6</sup> B60B 3/04

U.S. Cl. 301—63.1

14 Claims



1. A vehicle wheel, said wheel having a rim extending about a central wheel axis and comprising an interior rim section and first and second rim beadseat sections generally extending in opposite directions from the interior section to terminate in rim flange sections, said wheel further having a mounting means attached to the rim; said first rim beadseat section having radially outward and

radially inward surfaces in respect to the wheel central axis, both the said radially outward and radially inward surfaces being angled radially outward from the wheel axis in a direction away from the interior rim section; the said angled radially inward surface of the first beadseat section having a groove formed therein extending circumferentially about the wheel axis, said groove including an inwardly facing cylindrical first surface; said mounting means having a skirt flange about its outer circumference, the skirt flange having an outwardly facing cylindrical first surface; said groove cylindrical first surface and said skirt cylindrical first surface engaging each other when the mounting means is attached to the rim.

## 5,772,289

## VEHICLE BRAKING FORCE CONTROLLER

Masao Nakazawa; Osamu Isobe; Sadahiro Takahashi, and Ikuro Notsu, all of Ageo, Japan, assignors to Nissan Diesel Co., Ltd., Ageo, Japan

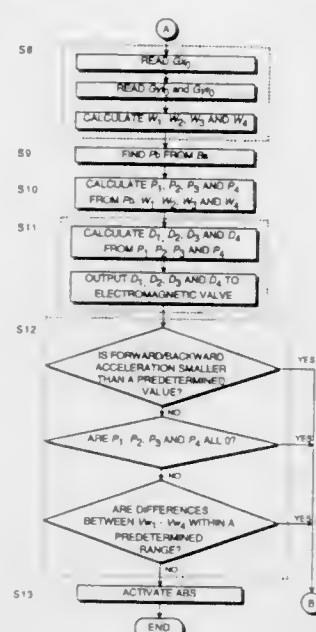
Filed Aug. 30, 1995, Ser. No. 521,536

Claims priority, application Japan, Oct. 11, 1994, 6-245389; Oct. 14, 1994, 6-249380; Nov. 28, 1994, 6-293106

Int. Cl.<sup>6</sup> B60T 8/18

U.S. Cl. 303—9.69

9 Claims



1. A braking force controller for a vehicle, said vehicle having a front axle and a rear axle each of which supports wheels, comprising:

- a brake pedal,
- means for detecting a depression amount of said brake pedal,
- means for setting a static load on each of said wheels,
- means for computing a target vehicle deceleration from a sum of said static loads on said wheels and said depression amount,
- means for calculating a vehicle braking force required to obtain said target deceleration,
- means for allocating said vehicle braking force to each of said wheels based on said static load on each of said wheels, and
- means for respectively applying a braking force allocated by said allocating means to each of said wheels.

5,772,290  
VEHICLE BRAKE SYSTEM HAVING AN ELECTRONICALLY CONTROLLED BOOSTER

Helmut Heibel, Moschheim; Hans-Werner Renn, Andernach; Erwin Michels, Kail; Jens-Peter Kohrt, Koblenz; Werner Dieringer, Vallendar, and Kurt Mohr, Halsenbach-Ehr, all of Germany, assignors to Lucas Industries public limited company, United Kingdom

PCT No. PCT/EP94/02481, § 371 Date Jan. 5, 1996, § 102(e) Date Jan. 5, 1996, PCT Pub. No. WO95/03966, PCT Pub. Date Feb. 9, 1995

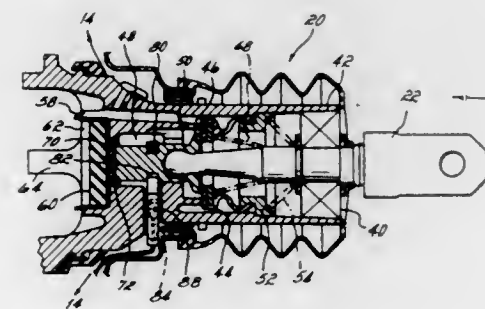
PCT Filed Jul. 27, 1994, Ser. No. 578,633

Claims priority, application Germany, Jul. 27, 1993, 43 25 198.6; Oct. 5, 1993, 43 33 986.7; Jan. 12, 1994, 44 00 688.8

Int. Cl.<sup>6</sup> B60T 2/34

U.S. Cl. 303—113.4

17 Claims



1. A vehicle brake system comprising:

an electronically adjustable brake booster (10) which is adapted to terminate an automatic braking operation of a motor vehicle when the braking operation is initiated automatically by a control unit in response to the actuation of a brake pedal in the direction of an operative position, the automatic braking operation being terminated once an interruption criterion is fulfilled, and

switch means (88, 90) composed of an actuating element (90) and a switching element (88) movable relative to the actuating element (90), wherein one of the two elements (88, 90) is connected with an actuator (22) which is operatively connected to the brake pedal and wherein the other of the two elements (88 or 90) performs a relative movement with respect to the actuator (22) within a defined play for movement (S) upon a movement of the brake pedal in the direction of its inoperative position;

whereby said relative movement of said other of the two elements (88 or 90) initiates a switching process of the switch means (88, 90) and the switching process causes the interruption criterion of the automatic braking operation.

## 5,772,291

## HANDS-FREE PAPER TOWEL DISPENSERS

Dannie D. Byrd, Willmore; Alain P. Cotnoir, Danville; Adam T. Elliott, Lexington, and Victor Mendelsberg, Louisville, all of Ky., assignors to Mosinee Paper Corporation, Mosinee, Wis.

Filed Feb. 16, 1996, Ser. No. 603,051

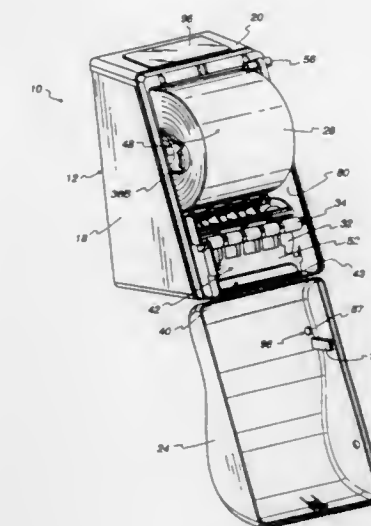
Int. Cl.<sup>6</sup> B65H 61/00

U.S. Cl. 312—34.22

12 Claims

1. A hands-free towel dispenser comprising:

- (a) a housing means for containing towels;
- (b) a sensing means for detecting an object;
- (c) a dispensing means for dispensing a predetermined length of towel when said sensing means detects the object;
- (d) an electric power source for powering said dispensing means;



(e) a control circuitry for controlling the dispensing means, providing a delay between cycles of towel dispensing, and controlling said predetermined length of towel; and

(f) an array of one or more photovoltaic cells for energizing said control circuitry.

## 5,772,292

## MOVABLE SHELF ASSEMBLY AND COMBINATOR MOVABLE SHELF ASSEMBLY AND COMPUTER DESK

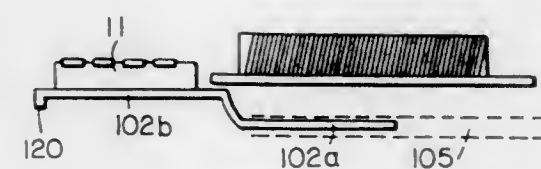
William Nabil Touzani, and Ouadie Touzani, 52 BD. Abdelmoumen Flat #161, both of Casablanca, Morocco, assignors to Ouadie Touzani, Casablanca, Morocco

Continuation-in-part of Ser. No. 506,075, Jul. 24, 1995, abandoned. This application Jan. 3, 1996, Ser. No. 582,460

Int. Cl.<sup>6</sup> A47B 81/00

U.S. Cl. 312—208.1

16 Claims



16. A computer desk which comprises an upper shelf for receiving a primary computer component, a movable lower shelf positioned below said upper shelf for receiving a computer keyboard, and means for movably supporting said movable lower shelf so that it moves outwardly from the desk such that at least a portion of the lower shelf is in a position which is longitudinally forward of and sufficiently closely adjacent to said upper shelf, so as to extend the total desktop surface of said computer desk, wherein said movable lower shelf comprises a first horizontally aligned section and a second horizontally aligned section adjacent said first section which is forward of and elevated above said first section, and a sloping section interconnecting said first and second horizontally aligned sections, the first horizontally aligned section being dimensioned so as to accommodate said keyboard for storage when the movable shelf is in an unextended state inside the computer desk, and the second horizontally aligned section being dimensioned so as to accommodate said keyboard when the movable shelf is moved into its extended state outwardly of the computer desk so that said keyboard is positioned for use in front of said primary computer component, whereby said keyboard can be moved from the first horizontally aligned section to the second horizontally aligned section.



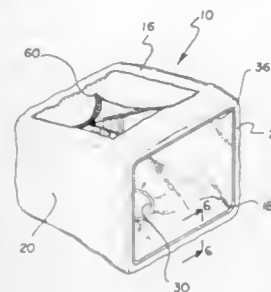
5,772,293

## DUST COVER FOR COMPUTER COMPONENTS

Renee J. Hughes, 17 14th Ave., San Francisco, Calif. 94118  
Filed Feb. 27, 1997, Ser. No. 807,589Int. Cl.<sup>6</sup> A47B 81/06

U.S. Cl. 312—208.3

2 Claims



1. A new and improved dust cover for computer components such as a monitor and remaining positioned around the monitor when in use comprising in combination:

a generally rectangular cover member adapted for being supported around a computer component, the cover member being formed of a stretch material capable of being expanded to cover at least four panels of the computer component, the cover member when covering the computer component having a top panel, a bottom panel, and a pair of side panels, each panel of the cover member having a common and continuous front end edge that defines an opening, each panel of the cover member having a common and discontinuous rear end edge, the rear end edge defining a slit within the bottom panel of the cover member, the front end edge and the rear end edge each having a hem, the hem of the front end edge having a semi-rigid framing member therein, the hem of the rear end edge having a draw string therein, the cover member being positioned around the computer component allows the front end edge to frame a screen of the computer component and the slit of the bottom panel to be positioned around a pedestal of the computer component, the cover member being positioned around the computer component allows the rear end edge to frame a back of the computer component when the draw string is pulled tight and tied and the front end edge is framing the screen; and

the top panel having a generally rectangular ventilation opening therethrough, the ventilation opening having peripheral edges forming a front edge, a back edge and a pair of side edges, the top panel having a flap fixedly attached to the back edge of the ventilation opening, the flap being sized for covering the ventilation opening, the flap capable of rolling back and forth over the ventilation opening to open and close the ventilation opening when the cover member is positioned over the computer component.

5,772,294

## MULTI-DRAWER CABINET HAVING A DRAWER LOCK-OUT MECHANISM

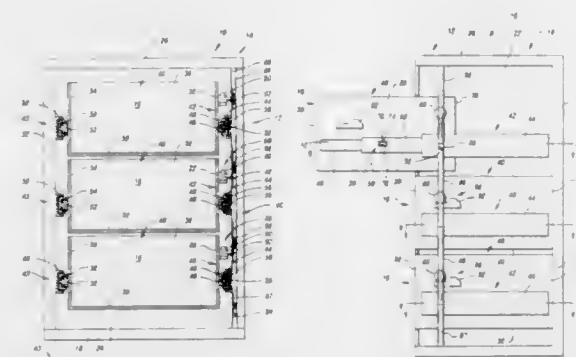
Ronald D. Hendrich, 3632 Saint Joseph Rd., New Albany, Ind. 47150, and Ghosn S. Ziady, 10807 Turfland Way, Louisville, Ky. 40241

Continuation of Ser. No. 298,996, Aug. 31, 1994, Pat. No. 5,634,701. This application Jun. 3, 1997, Ser. No. 868,115  
Int. Cl.<sup>6</sup> E05C 7/06; A47B 88/00

U.S. Cl. 312—221

13 Claims

1. A multi-drawer cabinet comprising:  
a cabinet housing having a first side wall, a second side wall spaced from and parallel to the first side wall, a top wall, a bottom wall, and an open front;  
a plurality of drawers disposed one above the other in the cabinet housing, each drawer having a bottom, a first side wall, and a second side wall spaced from and parallel to the first side wall;



a plurality of slide mechanisms with at least one slide mechanism slidably mounting each of the plurality of drawers in the cabinet housing for individual slidable movement between an open position extending outwardly through the open front of the cabinet and a closed position received within the cabinet housing;

a drawer lock-out mechanism operatively associated with the plurality of slide mechanisms for binding the slide mechanisms of the closed drawers against slidable movement when any one of the other drawers is open, the drawer lock-out mechanism including

a. a plurality of generally axially aligned movable locking rods with at least one locking rod being associated with each of the plurality of drawers, the plurality of locking rods having a collective length which is less than the distance between the top and bottom walls of the cabinet housing providing a clearance space above the uppermost locking rod;

b. a plurality of cams each having a ramp structure formed thereon with at least one cam being associated with each of the plurality of drawers; and

c. a plurality of cam followers with at least one cam follower being attached to each of the plurality of locking rods associated with each of the plurality of drawers, each of the plurality of cam followers having a surface which momentarily engages the ramp structure of one of the plurality of cams when a selected drawer is opened to cause the cam follower, the attached locking rod, and the locking rods above the attached locking rod to raise up forming a gap between adjacent locking rods and filling the clearance space sufficiently to prevent any other drawers from being opened; and

a plurality of spacer pins with at least one spacer pin being associated with each of the plurality of slide mechanisms, the plurality of spacer pins cooperating with a slide mechanism to shift into the gap between adjacent locking rods in order to maintain the pair of adjacent locking rods spaced apart after being separated by the cam and the cam follower while the selected drawer is opened.

5,772,295

## CONCEALABLE STORAGE CABINET

Daniel S. Sundmark, 8 Langer Cir., West St. Paul, Minn. 55118

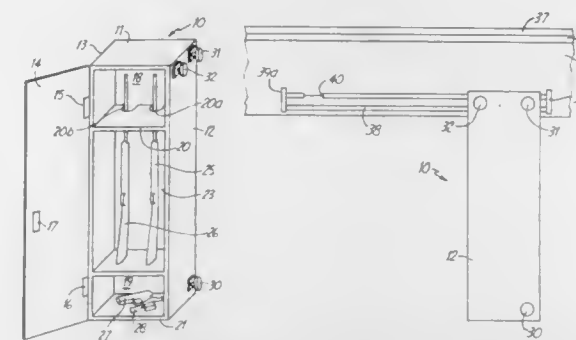
Filed Sep. 16, 1996, Ser. No. 714,378

Int. Cl.<sup>6</sup> A47F 5/08

U.S. Cl. 312—246

6 Claims

1. In combination:  
a first joist and a second joist with said first joist and said second joist located in a spaced apart condition and defining a space therebetween;  
a first elongated track extending along said first joist, said first elongated track having a bottom portion forming a roller support;  
a second elongated track extending along said second joist, said second elongated track having a bottom portion forming a roller support;  
a cabinet for storing articles therein, said cabinet having a top and a bottom, said cabinet having a first side and a second



side, said cabinet having a door therein, said cabinet sufficiently narrow for mounting in a horizontal condition in the space between said first joist and said second joist with said cabinet having a length sufficiently shorter than said elongated tracks;

a first set of top rollers, said set of top rollers located on opposite sides of said cabinet, said first set of top rollers engageable with said first elongated track and said second elongated track to permit moving of said cabinet along said first elongated track and said second elongated track, said first set of top rollers disengageable from said elongated tracks by pivoting said cabinet;

a second set of top rollers spaced from said first set of top rollers, said second set of top rollers located on opposite sides of said cabinet with said first set of top rollers and said second set of top rollers simultaneously engageable with said tracks for movably supporting said cabinet in a vertical condition whereby the door in said cabinet can be opened or closed to allow placement of articles in or to allow removal of articles from said cabinet;

a set of bottom rollers, said set of bottom rollers located on opposite sides of said cabinet, said set of bottom rollers engageable and disengageable with said tracks, said set of bottom rollers cooperating with said second set of top rollers so that when said first set of top rollers is disengaged from said tracks said set of bottom rollers and said second set of top rollers can simultaneously engage said track to enable said second set of top rollers and said bottom rollers to hold said cabinet in a horizontal condition whereby said second set of top rollers and said bottom rollers permit said cabinet to be horizontally moved along said track to an out-of-the-way condition and in the event access to the cabinet is needed, said set of bottom rollers disengageable from said track to enable the cabinet to be swung from a horizontal condition where the cabinet is located within a space defined between the first and the second joist to a vertical hanging position wherein said first set of top rollers is engageable with said track so that said first set of top rollers and said second set of top rollers hold said cabinet in a vertical condition so articles can be placed in or removed from said cabinet.

5,772,296

## SWITCHGEAR CABINET

Marc Hartel, Reiskirchen, and Jürgen Zachrai, Dillenburg, both of Germany, assignors to Rittal-Werk Rudolf Loh GmbH &amp; Co. KG, Herborn, Germany

PCT No. PCT/EP95/03962, § 371 Date Dec. 11, 1996, § 102(e) Date Dec. 11, 1996, PCT Pub. No. WO96/14681, PCT Pub. Date Mar. 17, 1996

PCT Filed Oct. 7, 1995, Ser. No. 750,519

Claims priority, application Germany, Nov. 5, 1994, 44 39 692.9

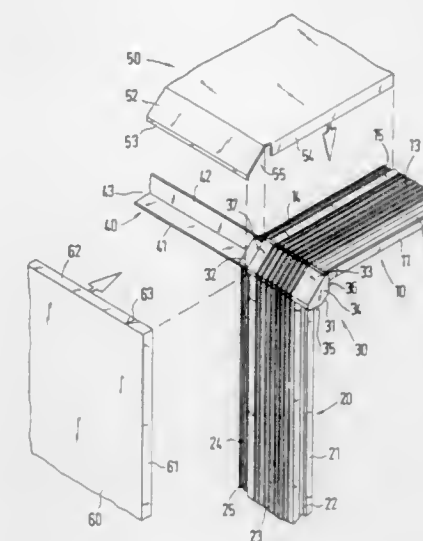
Int. Cl.<sup>6</sup> A47B 96/00; 47/03

U.S. Cl. 312—265.1

12 Claims

1. In a switchgear cabinet with a cabinet frame having frame legs and which can be closed by a cover, a side wall, a rear wall and a cabinet door, the improvement comprising:

a plurality of depth struts (40) each having a profile section forming a recess opening toward an exterior, and at least one



of the cover (50) and the side wall (60) having a beveled edge (52) which at least partially covers the recess (43) of the profile section and bridges at least two outer ends of the profile section, the beveled edge (52) and the recess forming a receptacle into which is inserted a plug-in neck (32) of a corner element (30); and

the corner element (30) having a base element (33) adjoining the plug-in neck (32), and a shoulder (37) formed at a transition between the plug-in neck (32) and the base element (33).

5,772,297

## 3D GRAPHICS LIBRARY

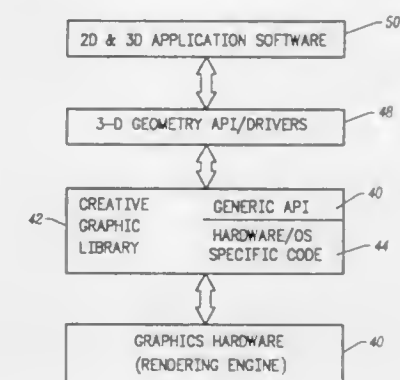
Chian Yi Loo, Tur Wei Chan, and Poh Huat Teo, all of Singapore, Singapore, assignors to Creative Technology, Ltd., Singapore, Singapore

Filed Nov. 15, 1995, Ser. No. 555,992

Int. Cl.<sup>6</sup> G06T 15/00

U.S. Cl. 345—419

10 Claims



1. A program storage device readable by a computer having hardware for performing 3D graphics operations, including at least one buffer, comprising:

a library of functions for performing 3D graphics operations, said functions being callable in a platform independent manner, said functions provided in groups including a screen/window initialization group of functions, a primitive operation group of functions, a primitive property group of functions, a buffer management group of functions, a color management group of functions, and a query control group of functions.

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JUNE 30, 1998

5,772,298

HAND-HELD TYPE EYE EXAMINING APPARATUS,  
AUXILIARY APPARATUS ON WHICH THE HAND-HELD  
TYPE EYE EXAMINING APPARATUS IS MOUNTED,  
AND OPHTHALMOLOGIC APPARATUS HAVING THE  
HAND-HELD TYPE EYE EXAMINING APPARATUS AND  
THE AUXILIARY APPARATUS

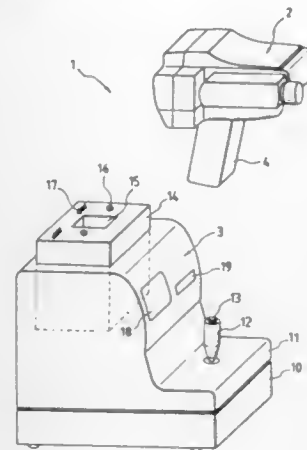
Nobuyuki Miyake, Hiratsuka, Japan, assignor to Nikon Corporation, Tokyo, Japan

Filed Feb. 24, 1997, Ser. No. 806,234

Claims priority, application Japan, Feb. 29, 1996, 8-043017  
Int. Cl.<sup>6</sup> A61B 3/10

U.S. Cl. 351—205

17 Claims



1. An ophthalmologic apparatus comprising:  
an eye examining apparatus of the hand-held type;  
an auxiliary apparatus on which said eye examining apparatus is removably mounted;  
a discrimination circuit for discriminating whether said eye examining apparatus and said auxiliary apparatus are connected together or separated from each other; and  
a controller for operating associating said eye examining apparatus and said auxiliary apparatus with each other when said discrimination circuit discriminates that said eye examining apparatus is connected.

5,772,299

OPTICAL APPARATUS FOR LIQUID CRYSTAL DISPLAY  
PROJECTOR

Hee-Sool Koo, Seoul, and Man-Ho Na, Kyungki-Do, both of Rep. of Korea, assignors to LG Electronics Inc., Seoul, Rep. of Korea

Filed Nov. 21, 1995, Ser. No. 561,023

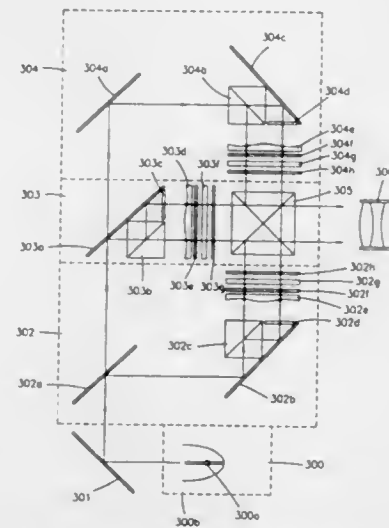
Claims priority, application Rep. of Korea, Nov. 25, 1994, 31278/1994

Int. Cl.<sup>6</sup> G03B 21/28

U.S. Cl. 353—20

38 Claims

1. An optical apparatus for a liquid crystal display projector, comprising:  
a white light source for emitting a light having a wave length distribution in a visible ray region;  
first polarizing means for:  
separating a red color component from said light from said white light source,  
polarizing said red color component into a red P-wave component light, and  
evenly transmitting said red P-wave component light on a first LCD panel having a 16:9 format display ratio by correcting a brightness non-uniformity of said red P-wave component light;  
second polarizing means for:  
separating a green color component from said light from said white light source,



- polarizing said green color component into a green P-wave component light, and  
evenly transmitting said green P-wave component light on a second LCD panel having a 16:9 format display ratio by correcting a brightness non-uniformity of said green P-wave component light;  
third polarizing means for:  
separating a blue color component said light from said white light source,  
polarizing said blue color component into a blue P-wave component light, and  
evenly transmitting said blue P-wave component light on a third LCD panel having a 16:9 format display ratio by correcting a brightness non-uniformity of said blue P-wave component light;  
color mixing means for mixing said red, green, and blue color components obtained by said first through third polarizing means, respectively; and  
projection means for projecting a mix of said red, green, and blue color components mixed by said color mixing means.

5,772,300

LIQUID CRYSTAL PANEL AND LIQUID CRYSTAL  
PROJECTOR

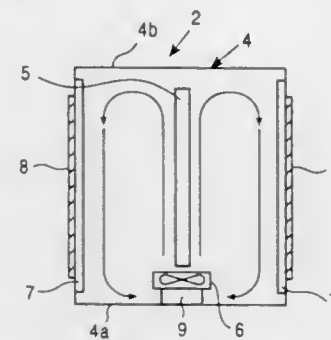
Hisao Kitai, Kanagawa, Japan, assignor to Sony Corporation, Japan

Filed Oct. 10, 1996, Ser. No. 720,962

Claims priority, application Japan, Oct. 18, 1995, 7-269713  
Int. Cl.<sup>6</sup> G03B 21/14

U.S. Cl. 353—57

12 Claims



1. A liquid crystal panel unit, comprising:  
a sealed container, made of a material with high thermal conductivity, having a light-transmission window;  
a liquid crystal panel accommodated in said sealed container so as to allow light being transmitted to leave the light transmission window;

JUNE 30, 1998

GENERAL AND MECHANICAL

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5,772,301

DISPLAY COMBINED WITH SLIDE PROJECTOR AND  
LIQUID CRYSTAL PROJECTOR

Soon Hyung Kwon, and Keun Bae Kim, both of Seoul, Rep. of Korea, assignors to LG Electronics Inc., Seoul, Rep. of Korea

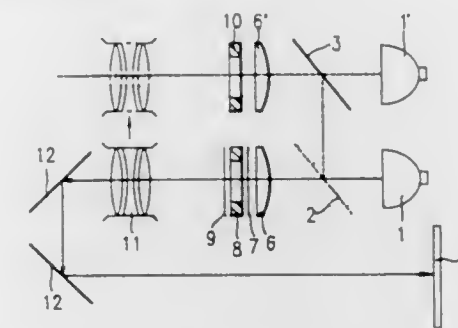
Filed Sep. 13, 1995, Ser. No. 526,958

Claims priority, application Rep. of Korea, Sep. 15, 1994, 23428/1994

Int. Cl.<sup>6</sup> G03B 21/14

U.S. Cl. 353—122

18 Claims



10. A projector for a slide film and a liquid crystal display comprising:  
a light source for emitting a light for projecting an image onto a screen;  
a first display for receiving and converting electrical image information into the image;  
a second display having the image recorded thereon in a form of optical image information;  
a display selecting means for selecting one of the displays by moving the light source to one of the first display or the second display; and  
a projecting lens part for diverged projection of the image on the selected display.

5,772,302

STROBE DEVICE

Tuyoshi Ishikawa; Shinichi Kusakawa, and Yuji Ogawa, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 30,879, Mar. 12, 1993. This application Mar. 24, 1995, Ser. No. 410,367

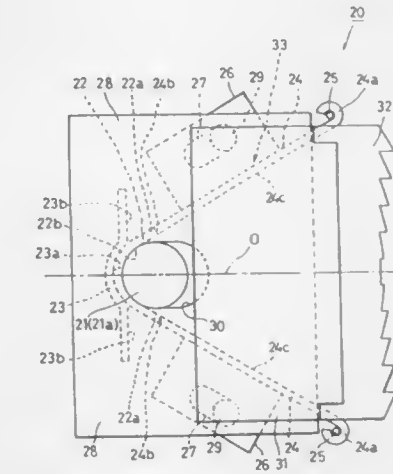
Claims priority, application Japan, Mar. 12, 1992, 4-53344; Apr. 6, 1992, 4-89310; Jun. 18, 1992, 4-159243; Aug. 10, 1992, 4-212764; Aug. 28, 1992, 4-230212; Sep. 14, 1992, 4-245105; Feb. 18, 1993, 5-28778

Int. Cl.<sup>6</sup> P21V 2/16

U.S. Cl. 362—3

27 Claims

1. A strobe device, comprising:  
a light source;  
a stationary reflecting plate that is arranged to be in close contact with a rear portion of said light source, said stationary reflecting plate having first and second ends;  
a pair of reflecting plates provided on opposite sides of an optical axis of said light source, each of said reflecting plates having a free end located adjacent to said light source and a remote end located remotely from said light source; and  
reflecting plate supports which rotatably support said reflecting plates at said remote ends.



- said reflecting plates being rotatable, at said remote ends supported by said reflecting plate supports, to move said free ends of said reflecting plates towards and away from said light source and said first and second ends of said stationary reflecting plate, to thereby vary an illumination angle substantially defined between said reflecting plates, said reflecting plates defining an opening at said ends located remotely from said light source, so that when the reflecting plates are rotated, no change in size of the opening occurs.

5,772,303

Patent Not Issued For This Number

5,772,304

OPTICAL FIBER-TO-PLANAR LIGHTPIPE GROOVED  
OPTICAL COUPLER

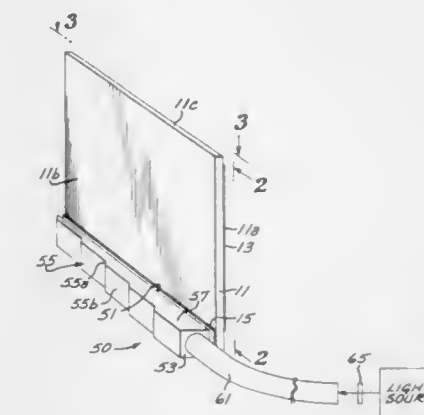
Ronald T. Smith, Corona Del Mar, Calif., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 2, 1996, Ser. No. 720,657

Int. Cl.<sup>6</sup> F21V 8/00

U.S. Cl. 362—31

5 Claims



1. An exterior vehicle lamp, comprising:  
an optical fiber for providing an optical fiber light output;  
an optical coupler responsive to the optical 5 fiber light output for providing an optical coupler light output, said optical coupler comprised of a transparent substrate having an input side for receiving said optical fiber light output, an output surface and a plurality of internally reflecting surfaces opposite said output surface for internally reflecting light that enters said input surface toward said output surface; and



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a light panel responsive to the optical coupler light output for providing an exterior lamp output.

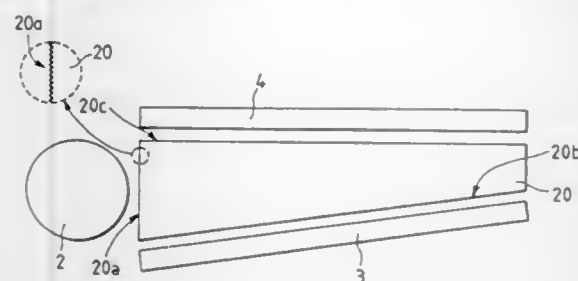
5,772,305

## SURFACE ILLUMINANT DEVICE

Tsuyoshi Ishikawa, and Kayoko Watal, both of Kawaguchi, Japan, assignors to Enplas Corporation, Japan  
Continuation of Ser. No. 289,316, Aug. 11, 1994, abandoned.  
This application Oct. 24, 1996, Ser. No. 736,274  
Int. Cl.<sup>6</sup> F21V 8/00

U.S. Cl. 362—31

2 Claims



1. A surface illuminant device comprising:  
a light transmitter having an upper surface acting as an exit surface, a lower surface, and a single entrance end face substantially perpendicular to said exit surface;  
a single linear light source disposed adjacent to said entrance end face of said light transmitter; and  
a reflecting sheet disposed below said lower surface of said light transmitter,  
wherein said light transmitter is constructed so that said lower surface thereof is inclined to approach said exit surface thereof in going from said entrance end face thereof to another end face thereof opposite to said entrance end face, such that the thickness of said light transmitter gradually decreases in going from said entrance end face to said another end face, and wherein said entrance end face of said light transmitter is a rough surface for diffusing light entering therein.

5,772,306

## ILLUMINATING DEVICE WITH A LIGHT DISTRIBUTING LENS

Hiroaki Okuchi, Anjo, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

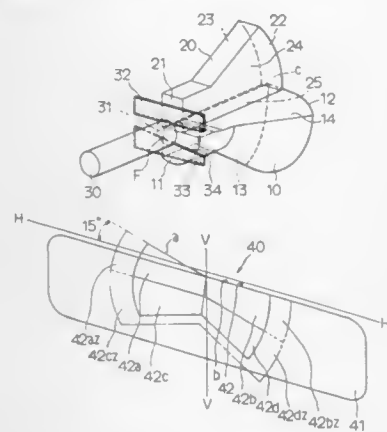
Filed Jun. 11, 1996, Ser. No. 660,740

Claims priority, application Japan, Jun. 12, 1995, 7-144997

Int. Cl.<sup>6</sup> B60Q 1/02

U.S. Cl. 362—61

21 Claims



1. An illuminating device for a vehicle comprising:  
an optical fiber for providing light;

a cone-type lens for light distribution having an incident surface and an exit surface, the incident surface being smaller than the exit surface and disposed to receive the light from the optical fiber,  
the exit surface being an aspheric lens surface defined by horizontal and vertical outer peripheries having different radii of curvature so that an aberration in a horizontal direction can be larger than an aberration in a vertical direction of the exit surface,  
wherein outgoing light emitted from said exit surface has a distribution in which a peripheral portion in a horizontal direction is blurrier than a peripheral portion in a vertical direction.

5,772,307

## AUTOMOBILE SPEAKER COVER

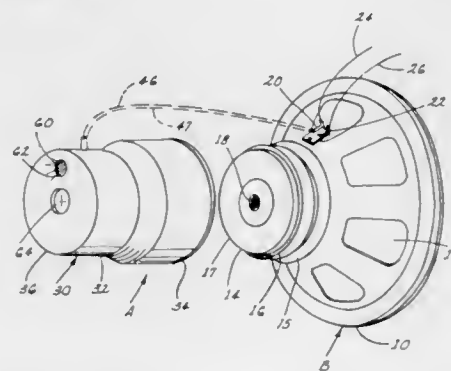
Michael L. Philyaw, Williamston, S.C., assignor to Rogers Stereo, Greenville, S.C.

Filed Jun. 18, 1996, Ser. No. 666,648

Int. Cl.<sup>6</sup> F21V 33/00

U.S. Cl. 362—86

20 Claims



1. A speaker cover for attachment to a rear hub of a speaker basket of an automobile speaker, said rear hub including a housing carrying an annular magnet, a lead and ground wire operatively connected to said speaker for operating said speaker, said cover comprising:  
a hollow cap placed over an outer periphery of said rear hub at least along a general length of said rear hub;  
a cover plate included in said cap covering a rear side of said rear hub;  
a peripheral sidewall integral with and extending from said cover plate terminating at an outer edge defining an open cap end receiving said outer periphery of said rear hub;  
an engaging element carried by said peripheral sidewall engaging said rear hub and retaining a portion of said rear hub within said hollow cap;  
a light source carried by said cap; and  
electrical connections electrically connecting said light source with said lead and ground wires of said speaker for illuminating said light source when said automobile speaker is operating.

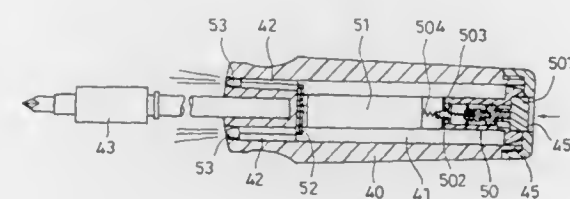
5,772,308

LAMP CIRCUIT ASSEMBLY OF A SCREWDRIVER  
Chang-Ming Lin, No. 331, Chang-Chun St., Chiu-Te Tsun, Wu-Jih Hsiang, Taichung County, Taiwan  
Filed Feb. 20, 1997, Ser. No. 803,507  
Int. Cl.<sup>6</sup> B25B 23/18

U.S. Cl. 362—119

1 Claim

1. An apparatus comprising:  
a screwdriver having a handle with a hollow interior, said handle having an end cap at one end thereof, said end cap having a hole formed therein, said screwdriver having lamp holes formed at an opposite end of said handle; and



5,772,310

## DISCHARGE LAMP CAP AND METHOD FOR FIXING THE DISCHARGE TUBE

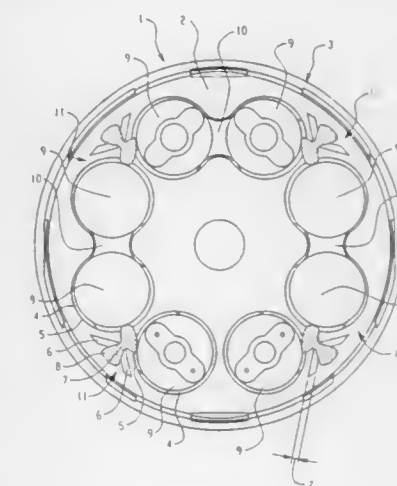
Erzsebet Cserteg; Jozsef Fulop; Jozsef Tokes, and Istvan Wursching, all of Budapest, Hungary, assignors to General Electric Company, Schenectady, N.Y.

Filed Jun. 28, 1996, Ser. No. 672,792

Claims priority, application Hungary, Jul. 5, 1995, 19635/95  
Int. Cl.<sup>6</sup> F21S 3/00; F21K 27/00; H01J 5/48

U.S. Cl. 362—225

15 Claims



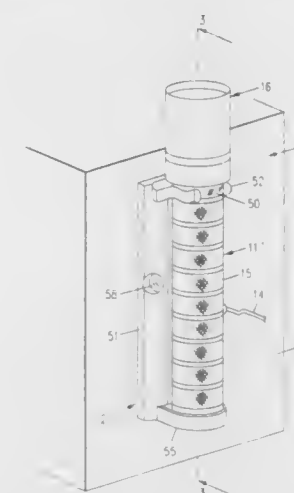
5,772,309  
FLASHLIGHT AND CHARGING SYSTEM  
Steven J. Groben, Escondido, Calif., assignor to Sunbrite Industries, Rohnert Park, Calif.

Filed Nov. 15, 1995, Ser. No. 559,775

Int. Cl.<sup>6</sup> F21L 7/00

U.S. Cl. 362—183

9 Claims



7. A flashlight, comprising:  
a body member having a rearward end portion and a forward end portion;  
a lightbulb assembly removably mounted on the forward end portion of the body member; and  
a switch assembly removably mounted on the rearward end portion of the body member;  
the switch assembly including means in the form of an electrically conductive button member in an exposed position on the rearward end portion of the body member for enabling a user to close the switch by depressing the button member and for

1. A discharge lamp cap for securing one or more discharge tubes to a housing, the cap comprising:  
a base plate having at least one pair of openings therein, each opening for receiving a corresponding leg of the discharge tubes;  
the at least one pair of openings defining a space portion therebetween, the space portion extending outward to the perimeter of the base plate;  
a rib pair on the at least one space portion for guiding adhesive from an outer edge of the base plate towards one or more of the openings.

5,772,311

## OVERHEAD ANIMATED LIGHT DISPLAY

John S. Williams; Dennis R. Harrison, and James Blake Gover, all of Las Vegas, Nev., assignors to Young Electric Sign Company, Salt Lake City, Utah

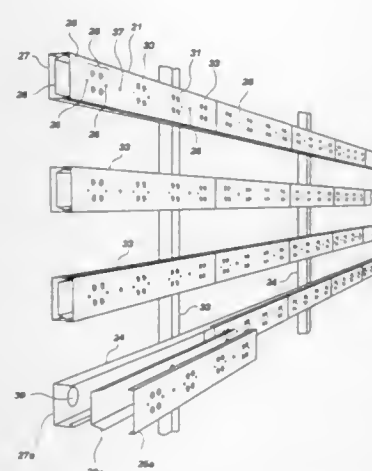
Filed Nov. 20, 1995, Ser. No. 559,616

Int. Cl.<sup>6</sup> F21V 19/00

U.S. Cl. 362—238

9 Claims

1. An outdoor, electrical-lamp display structure comprising:  
an elongated, elevated open-frame support structure;  
linear raceway members attached closely adjacent to each other in substantially parallel relationship on said frame structure to run substantially the length of said structure, said raceway members having a box-like cross section and being structured and adapted to house internally electrical wiring and having a



plurality of groups of closely spaced bulb openings on the same surface of a raceway, said openings structured and adapted to hold electrical lamps.

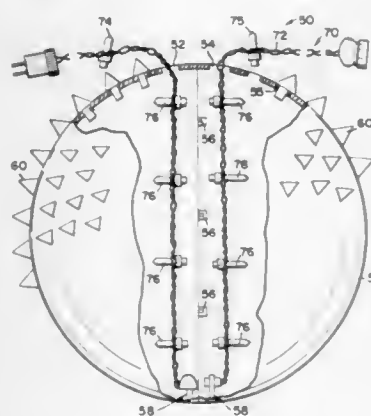
5,772,312

## LIGHTED HOLIDAY ORNAMENT

Susan M. Pihl-Niederman, 405 Brockton La. North, Hollyanne M. Pihl, 430 Brockton La. North, and Sharon P. Frederickson, 845 Brockton La. North, all of Plymouth, Minn. 55447  
Filed Oct. 30, 1996, Ser. No. 739,637  
Int. Cl.<sup>6</sup> F21V 21/00

U.S. Cl. 362—249

18 Claims



1. An ornament for use with a string of lights of the type including a plurality of light bulbs disposed on a common cord, the ornament comprising:

- (a) a hollow shell configured to house a portion of the string of lights with multiple light bulbs disposed within the shell such that the light bulbs housed within the hollow shell illuminate the ornament; and
- (b) at least one cord aperture defined in an exterior surface of the shell and configured to receive opposing ends of the portion of the string of lights housed within the shell.

5,772,313  
OPTICAL MEANS FOR ANNULAR ILLUMINATION OF A SPOT

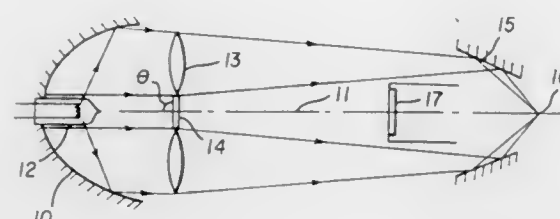
Nicholas John Taylor, Harrow Weald, United Kingdom, assignor to Eastman Kodak Company, Rochester, N.Y.  
PCT No. PCT/GB93/01595, § 371 Date Jan. 25, 1995, § 102(e)  
Date Jan. 25, 1995, PCT Pub. No. WO94/03829, PCT Pub. Date Feb. 17, 1994

PCT Filed Jul. 28, 1993, Ser. No. 374,678

Int. Cl.<sup>6</sup> F21V 9/00

U.S. Cl. 362—298

2 Claims



1. An optical system operable to focus an annular beam of light onto a spot, the system comprising a light source having a diameter and means for optically forming light emitted by the light source into a convergent annular beam, said means for optically forming comprising means forming a beam of light emitted by the light source and an annular converging lens mounted along a path formed by the beam of light and converging said beam of light into said convergent annular beam, convergent reflecting means arranged in a path defined by the annular convergent beam and positioned so as to be impinged by the light before it has focused to form a narrow annular image, the convergent reflecting means deflecting the convergent annular beam so as to form a single spot image on an axis defined by the annular beam.

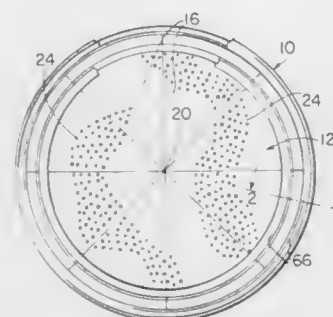
5,772,314

## CEILING ORNAMENT SYSTEM

Daryl J. Brumer, 1704 W. Shore Dr., Delafield, Wis. 53018  
Filed Sep. 15, 1995, Ser. No. 528,812  
Int. Cl.<sup>6</sup> F21V 11/14

U.S. Cl. 362—360

26 Claims



24. A ceiling ornament system, comprising:
- a light source adapted for mounting to a ceiling;
  - a non-translucent member mounted to the ceiling and having an opaque surface which prevents emission of light from the light source to a location below the non-translucent member; and
  - a series of irregularly located light-transmissive openings formed in the opaque surface of the non-translucent member, wherein the openings function to emit light through the non-translucent member.

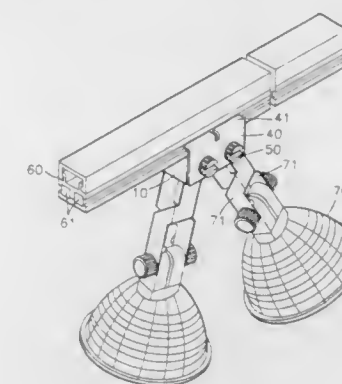
5,772,315

## LAMP TRACK CLAMP STRUCTURE

Wei-Hong Shen, 6F, No. 416, Sec. 4, Jen-Ai Rd., Taipei, Taiwan  
Filed Oct. 22, 1997, Ser. No. 955,927  
Int. Cl.<sup>6</sup> F21V 21/00

U.S. Cl. 362—396

3 Claims



1. A type of lamp track clamp structure, comprising:
- two first fixing pieces, made of a conductive material, each of the two first fixing pieces being accommodated in a niche at the front and back sides in the main unit, each of the first fixing pieces having a screw hole that is located to match the through hole on the main unit, each of the two first fixing pieces having a conductive wire hole for optional connection of conductive wires, there being a screw hole and a fixing screw that serve to fasten the conductive wire;
  - two second fixing pieces, being respectively accommodated in the niches at the front and back sides of the main unit, each of said second fixing pieces having a screw hole that is located to match the through hole on the main unit;
  - two clamp pieces, made of a conductive material, with top edges forming the clamping parts, on the clamp pieces being through holes that are located to match the through holes on the main unit, the two clamp pieces are respectively fixed onto the front and back sides of the main unit, there being a clearance between the clamping parts and the top of the main unit; and
  - four conductive screws, being inserted through the through holes on the clamp pieces, the through holes on the main unit, to the screw holes on the first fixing pieces and the second fixing pieces, so the two clamp pieces are fastened onto the front and back sides of the main unit, the two first fixing pieces and the two second fixing pieces being fastened in the four niches in the main unit, to compose a lamp track clamp structure.

5,772,316

## LIGHT HANDLE ADAPTER

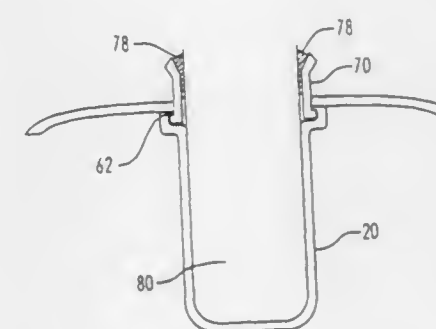
Mike M. Hoftman, Calabasas, and Eli Marmor, Los Angeles, both of Calif., assignors to DeRoyal Industries, Inc., Powell, Tenn.

Continuation of Ser. No. 320,007, Oct. 7, 1994, Pat. No. 5,599,093, which is a continuation of Ser. No. 963,200, Oct. 19, 1992, Pat. No. 5,355,292, and a continuation-in-part of Ser. No. 843,144, Feb. 28, 1992, Pat. No. 5,156,456. This application Jun. 3, 1996, Ser. No. 662,702  
Int. Cl.<sup>6</sup> F21L 15/12

U.S. Cl. 362—400

3 Claims

1. A method of maintaining the sterility of an operating room light fixture to be adjusted manually by a user, the method comprising the steps of:
- a coupling a handle means to the light fixture, the handle means for controlling the adjustment of the light fixture;
  - covering the handle means with a first sterile disposable cover, the first sterile disposable cover covering the handle means such that the user contacts only the sterile disposable cover; and



covering the first sterile disposable cover with a second sterile disposable cover so that the second sterile disposable cover is not easily removed from the light fixture handle when the light fixture is adjusted by the user.

5,772,317

## COUNTERFLOW DRUM MIXER FOR MAKING ASPHALTIC CONCRETE AND METHODS OF OPERATION

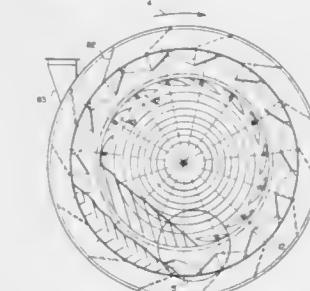
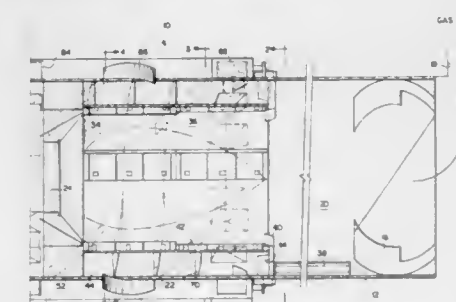
Theodore G. Butler, Orlando, Fla., assignor to Gencor Industries, Inc., Orlando, Fla.

Filed Aug. 27, 1996, Ser. No. 703,780

Int. Cl.<sup>6</sup> B28C 5/46

U.S. Cl. 366—7

18 Claims



8. A method for making asphaltic concrete comprising the steps of:
- introducing aggregate adjacent a first end of a drum mixer for flow toward a second, opposite end of said drum mixer;
  - locating a burner head within said drum mixer intermediate said drum ends and defining a drying zone for the aggregate between said burner head and said first end of said drum mixer and a mixing zone between said burner head and said second end of said drum mixer;
  - providing a plurality of flights circumferentially spaced from one another, extending axially towards said first end of said drum from adjacent said burner head and surrounding a combustion volume generated by said burner head, said flights defining a substantially circumferentially continuous annular chamber between said flights and an interior wall portion of said drum mixer and about said combustion volume;



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generating hot gases of combustion in said combustion volume for flow through said drying zone countercurrently to the flow of aggregate through said drum mixer;  
flowing the aggregate into the combustion volume onto the flights whereby the aggregate lies radially inwardly of the flights;  
flowing the aggregate in the combustion volume lying radially inwardly of and on the flights through spaces between said circumferentially spaced flights into said annular chamber; and  
introducing recycle asphaltic material into said annular chamber adjacent an upstream end thereof for mixing and lying in heat transfer relation with the aggregate flowing into the annular chamber from said combustion volume through said spaces whereby the recycle material is heated prior to introducing the aggregate and recycle material into the mixing zone.

5,772,318

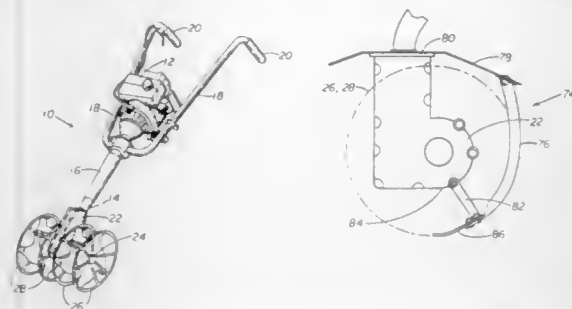
**PORTABLE HAND-HELD CONCRETE AND MORTAR MIXER**

Kenneth Vadnais, 28995 Sunnyside, Livonia, Mich. 48152  
Continuation-in-part of Ser. No. 147,978, Nov. 5, 1993, Pat. No. 5,401,098. This application Mar. 28, 1995, Ser. No. 412,080

Int. Cl. B28C 5/08

U.S. Cl. 366—64

11 Claims



1. A portable hand-held mixer comprising handle means having a plurality of handles to support the mixer in a generally upright position, an engine, drive means extending generally downwardly from the engine, the drive means being attached to the handle means, a lower end on the drive means, a transverse shaft in engagement with the drive means at the lower end and extending outwardly from the lower end, a plurality of mixing blades mounted on the transverse shaft, the plurality of mixing blades having openings therethrough for transverse movement of material being mixed, at least one of the mixing blades having a contiguous periphery forming a full circle, all portions of said at least one mixing blade limited radially and outwardly transversely by the contiguous circular periphery, and means for moving and re-positioning at least one of said handles relative to the mixer.

5,772,319

**MATERIAL LOADER FOR INJECTION MOLDING PRESS**

Paul A. Pemberton, 303 20th St., and Darren E. Tipton, R.R. #14 Box 1065, both of Bedford, Ind. 47421

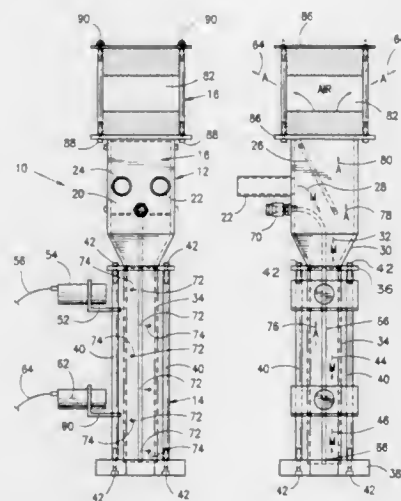
Filed Feb. 12, 1997, Ser. No. 800,216

Int. Cl. B29C 31/02

U.S. Cl. 366—76.2

6 Claims

1. A loading system for feeding plastic material to an injection molding machine, said loading system comprising:  
a hopper having two inlets for receiving two different plastic materials;  
a hopper support having a collection tube for receiving plastic material from said hopper at one end and for dispensing plastic material to an injection molding machine at an opposite end.



an air assist tube extending through said collection tube and including a plurality of holes for releasing air into plastic material collected in said collection tube so as to agitate the plastic material for flow into the injection molding machine, and  
a control device for regulating timing and sequence of conveyance of plastic materials to said two inlets and release of air from said air assist tube.

5,772,320

**METHOD AND APPARATUS FOR MIXING A METAL MATRIX COMPOSITE**

Patrick James Hayes, South Wirral, Great Britain, assignor to EA Technology Limited, Chester, Great Britain

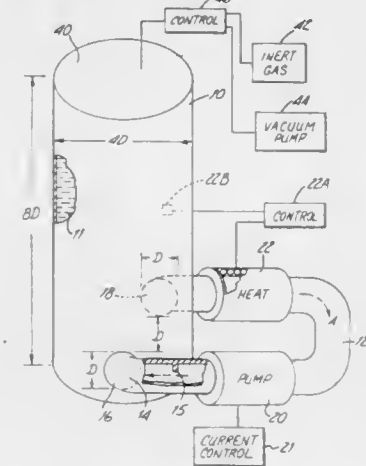
PCT No. PCT/GB95/00071, § 371 Date Sep. 4, 1996, § 102(e) Date Sep. 4, 1996, PCT Pub. No. WO95/19455, PCT Pub. Date Jul. 20, 1995

PCT Filed Jan. 16, 1995, Ser. No. 676,192

Claims priority, application United Kingdom, Feb. 17, 1994, 9400757

Int. Cl. B01F 15/02; C21C 7/00; C22C 1/00; C21B 15/00  
U.S. Cl. 366—137

24 Claims



1. An apparatus for mixing solid particulates in a molten metal matrix to form a metal matrix composite, the apparatus comprising a refractory vessel for containing the metal matrix in a molten state and defining an inlet and an outlet; refractory conduit means in communication with both the said inlet and said outlet so as to define with said vessel a closed loop flow path, said inlet and outlet being so spaced as to encourage mixing within said vessel; and pump means disposed within said flow path and operative to circulate the metal matrix and particulates around said closed loop

path so as to effect a mixing thereof, said vessel containing a filling of the metal matrix having a head with a vertical dimension in excess of four times the cross-sectional width of said conduit means.

5,772,321

**COMPENSATION FOR SPACIAL AND TEMPORAL TEMPERATURE VARIATIONS IN A THERMAL CONDUCTIVITY DETECTOR**

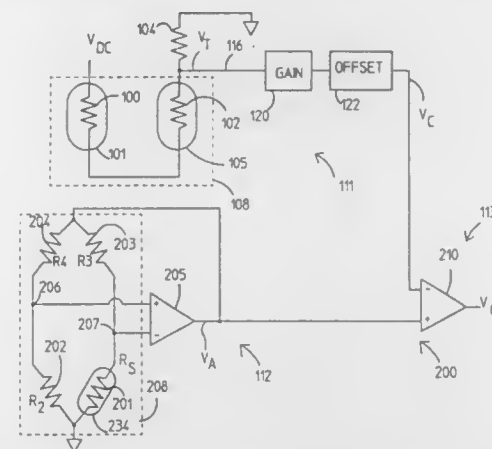
Robert P. Rhodes, Lincoln University, Pa., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 25, 1995, Ser. No. 548,037

Int. Cl. G01N 25/18

U.S. Cl. 374—44

10 Claims



1. A thermal conductivity detector for detecting the thermal conductivity of a sample fluid, comprising:  
a detector block having a cavity wall that defines a sensor resistor cavity for receiving a quantity of the sample fluid, said cavity wall being subject to a cavity wall temperature, and said cavity wall temperature being subject to spatial and temporal variations;

a sensor resistor located in the sensor resistor cavity and away from the cavity wall, said sensor resistor exhibiting a sensor resistance that is dependent on the temperature of said sensor resistor;

first signal providing means including reference signal means responsive to at least one of said temporal and spatial variations for providing a temperature compensation signal representative of said one of the spatial and temporal temperature variations wherein the reference signal means is located proximate to said cavity wall so as to be responsive to at least one of said temporal and spatial variations in the cavity wall temperature and wherein the reference signal means further comprises first and second reference resistors located in respective first and second reference resistor cavities separated from the sensor resistor cavity by the cavity wall, said first and second reference resistors being located proximate to said cavity wall, and said first and second reference resistors exhibiting respective first and second reference resistances the amounts of which are dependent on said cavity wall temperature, wherein said temperature compensation signal is provided in accordance with the amounts of said first and second reference resistances;

second signal providing means, connected to the sensor resistor, for providing a temperature sense signal that is related to the sensor resistance; and

third signal providing means for receiving the temperature sense signal and the temperature compensation signal, and, in accordance with the temperature compensation signal, providing a detector output signal that is representative of the thermal conductivity of the sample fluid, said detector output signal being compensated for the effect of at least one of said spatial and temporal temperature variations.

5,772,322

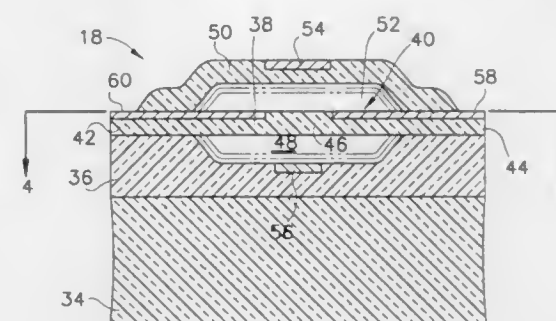
**RESONANT MICROBEAM TEMPERATURE SENSOR**  
David W. Burns, Minneapolis, and Thomas G. Stratton, Roseville, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed May 31, 1996, Ser. No. 656,501

Int. Cl. G01K 11/26

U.S. Cl. 374—118

23 Claims



1. A strain-responsive temperature sensing device, comprising:  
a support structure including a substrate of a first material having a first thermal expansion coefficient and a layer of a second material having a second thermal expansion coefficient different than the first thermal expansion coefficient, the layer of a second material being in intimate contact with the substrate so as to induce strain in said support structure with changes in temperature;  
a vibratory element having opposite first and second end portions, and a means for fixing the first end portion and the second end portion to the support structure, to maintain the vibratory element for oscillation at a natural resonant frequency that varies with changes in induced strain in the vibratory element; and  
a resonant frequency sensing means for detecting the natural resonant frequency of said vibratory element and for generating an output representing temperature in the region of the vibratory element, based on the natural resonant frequency.

5,772,323

**TEMPERATURE DETERMINING DEVICE AND PROCESS**

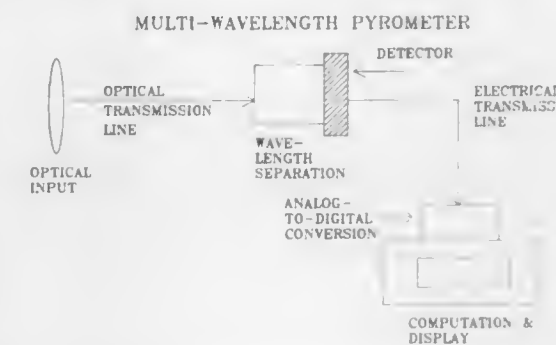
Ralph A. Felice, 1532 Newport Dr., Macedonia, Ohio 44056

Filed Oct. 26, 1994, Ser. No. 329,456

Int. Cl. G01J 5/00; 5/08

U.S. Cl. 374—127

17 Claims



1. A process for determining the temperature of a radiating body, comprising:

- quantifying the radiation intensity emitted by a radiating body at no less than 4 distinct wavelengths;
- generating a mathematical function which represents said quantified radiation intensities at the corresponding wavelength at which said radiation intensity was quantified;
- selecting no less than two specific wavelengths;

- d) generating a spectral intensity using said mathematical function for each of said wavelengths; and  
e) determining an individual two-wavelength temperature value of said radiating body utilizing the radiation equation

$$T_{12} = \frac{C(1/\lambda_1 - 1/\lambda_2)}{\ln R - 5 \ln(\lambda_2/\lambda_1)}$$

where  $T_{12}$ =individual two-wavelength temperature,  $\lambda_1, \lambda_2, \dots$   
 $\lambda_n$ =specific wavelengths selected

$C$ =second radiation constant, and

$R$ =ratio of the generated spectral intensity  $I_1$ , calculated using said mathematical function at  $\lambda_1$ , to the generated spectral intensity  $I_2$ , calculated using said mathematical function at  $\lambda_2$ .

**10. A temperature determining device, comprising:**

- a) an optical input system which receives a portion of the emitted radiation of a radiating body;  
b) a wavelength dispersion device which separates said emitted radiation according to wavelength;  
c) a transducer which senses said separated radiation and provides a quantified output corresponding to radiation intensity for each wavelength of said emitted radiation;  
d) means for generating a mathematical function to represent said quantified output of said radiation transducer as a function of wavelengths;  
e) means for selecting no less than two specific wavelengths;  
f) means for generating a spectral intensity value at each of said selected specific wavelengths, utilizing said mathematical function; and  
g) means for determining an individual two-wavelength temperature value utilizing no less than two of said spectral intensity values and the radiation equation

$$T_{12} = \frac{C(1/\lambda_1 - 1/\lambda_2)}{\ln R - 5 \ln(\lambda_2/\lambda_1)}$$

where  $T_{12}$ =individual two-wavelength temperature,  $\lambda_1, \lambda_2, \dots$   
 $\lambda_n$ =specific wavelengths selected,

$C$ =second radiation constant, and

$R$ =ratio of the generated spectral intensity  $I_1$ , calculated using said mathematical function at  $\lambda_1$ , to the generated spectral intensity  $I_2$ , calculated using said mathematical function at  $\lambda_2$ .

5,772,324

**PROTECTIVE TUBE FOR MOLTEN METAL IMMERSIBLE THERMOCOUPLE**

Richard A. Falk, Hartland, Wis., assignor to Midwest Instrument Co., Inc., Hartland, Wis.

Filed Oct. 2, 1995, Ser. No. 537,011

Int. Cl.<sup>6</sup> G01K 7/04; 1/12

U.S. Cl. 374—140

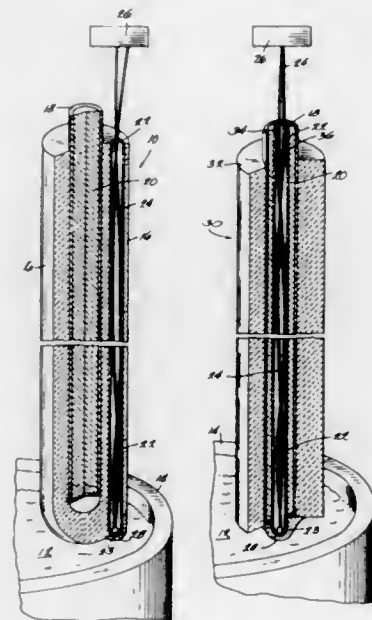
8 Claims

6. A protective tubular device for a thermocouple for immersion into a molten metal bath having a distal end for immersion into said bath and a proximal end adapted to be supported out of said bath, comprising:

an elongated exterior protective body having an axis and being formed of a refractory composition including refractory fibers embedded in a refractory cement or binder,

an interior reinforcing member extending substantially along the length of the central axis of said elongated protective body, said reinforcing member imparting a resistance to bending or bowing of said device when immersed in molten metal, said reinforcing member including a bend resistant tube filled with refractory cement,

at least one hollow refractory tube closed at its distal end and having an open proximal end, said refractory tube being positioned within said exterior protective body parallel and exterior to said reinforcing member, portion of said tube protruding through a wall of said protective body, said protruding portion being coated with a refractory material,



said hollow refractory tube being adapted to receive a thermocouple for measuring temperatures in a molten metal bath.

5,772,325

**APPARATUS FOR PROVIDING SURFACE IMAGES AND METHOD FOR MAKING THE APPARATUS**

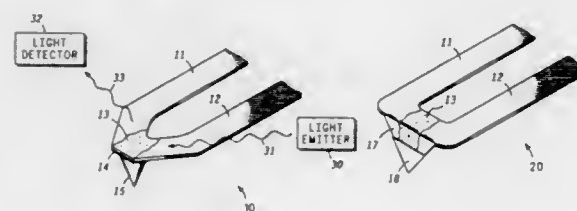
Theresa J. Hopson, Mesa, and Ronald N. Legge, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 20, 1995, Ser. No. 560,600

Int. Cl.<sup>6</sup> G01K 7/04; 3/06; G01B 9/04

U.S. Cl. 374—142

13 Claims



1. An apparatus having a light emitter and a light detector coupled to a probe, the probe comprising:

a first ribbon of material, wherein at least a portion of the first ribbon of material is a first planar surface and the first planar surface is reflective;

a second ribbon of material forming a thermocouple junction with the first ribbon of material, wherein the thermocouple junction has a second planar surface that reflects an optical signal from the light emitter to the light detector, and the optical signal that is reflected is coupled to movement of the probe;

a point region formed from at least a portion of the thermocouple junction; and

a coating on at least a portion of the point region such that the coating and the point region form a probe tip.

8. A method for forming an apparatus comprising the steps of: providing a light emitter; providing a light detector;

providing a first ribbon of material and a second ribbon of material, at least a portion of the first ribbon of material having a first planar surface and a second planar surface; joining the first ribbon of material and the second ribbon of material such that a thermocouple junction is formed, wherein the second planar surface is coupled to the light detector and to the light emitter by an optical signal and optical signal that is reflected is coupled to movement of the probe, bending at least a portion of the thermocouple junction to form a point region; and coating the point region with a thermally conductive material.

5,772,326

**TEMPERATURE AND PASSIVE INFRARED SENSOR MODULE**

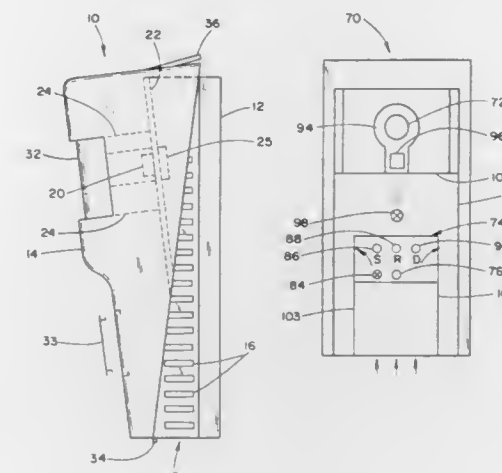
Thomas J. Batko, Wallingford, and David P. Eckel, Wethersfield, both of Conn., assignors to Hubbell Incorporated, Orange, Conn.

Filed Aug. 30, 1996, Ser. No. 705,778

Int. Cl.<sup>6</sup> G01K 13/02; 1/14; G08B 13/19

U.S. Cl. 374—142

24 Claims



1. A temperature and passive infrared sensor module comprising:

a. a sensor module housing having air flow vents therein to allow air to circulate through the sensor module housing;

b. a temperature sensor mounted in the sensor module housing in a position which is exposed to air circulating through the sensor module housing;

c. a passive infrared sensor mounted in the sensor module housing, with a layer of insulating material surrounding the passive infrared sensor such that the passive infrared sensor is not exposed to air circulating through the sensor module housing and is not adversely affected thereby.

5,772,327

**AUTOMATIC FUSION-TEMPERATURE CONTROL FOR OPTICAL FIBER SPLICERS**

Wenxin Zheng, Solna, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Apr. 26, 1996, Ser. No. 638,147

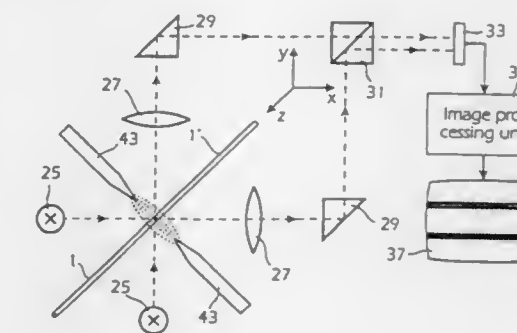
Claims priority, application Sweden, Apr. 28, 1995, 9501589

Int. Cl.<sup>6</sup> G01K 11/06

U.S. Cl. 374—160

4 Claims

1. A method for determining a temperature of a heated region, including a temperature of a piece of material placed inside the heated region, comprising the steps of:



introducing into a heated region a piece of material having a melt temperature adapted to make it melt and/or turn to a viscous liquid state by the heat of the heated region, the piece of material having a shape so that when melting or when turning to a liquid state the piece of material is deformed due to surface tension thereof,

determining a velocity of deformation from a change of the surface of the piece of material, and

determining from the determined velocity of deformation the temperature of the piece of material and a temperature of the heated region.

5,772,328

**OPTICAL TEMPERATURE SENSOR USING THERMOCHROMIC SEMICONDUCTORS**

James W. Kronberg, Aiken, S.C., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

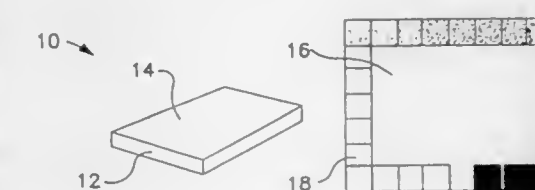
Division of Ser. No. 332,068, Nov. 1, 1994, Pat. No. 5,547,283.

This application Jun. 20, 1996, Ser. No. 667,058

Int. Cl.<sup>6</sup> G01K 11/12; 11/14; 1/14

U.S. Cl. 374—162

10 Claims



1. An optical temperature sensor comprising:

a thermochromic semiconductor material having a refractive index;

said thermochromic semiconductor material being embedded within a lead-silicate vitreous enamel matrix, said enamel matrix having a refractive index between 1.8 and 2.6, said enamel index approximating the thermochromic semiconductor material index so as to provide a true absorption edge value, said enamel matrix containing said thermochromic semiconductor material being carried by a carrier in the form of a chip,

said thermochromic semiconductor material changing color in response to changes in temperature.



5,772,329

**PROCESS AND DEVICE FOR TRANSIENT MEASURING OF SURFACE TEMPERATURES AND HEAT FLUX**

Jean-Pierre Bardon, Nantes, and Yvon Jarny, Orvault, both of France, assignors to Universite De Nantes, Nantes Cedex, France

PCT No. PCT/FR95/00202, § 371 Date Aug. 22, 1996, § 102(e) Date Aug. 22, 1996, PCT Pub. No. WO95/22746, PCT Pub. Date Aug. 24, 1995

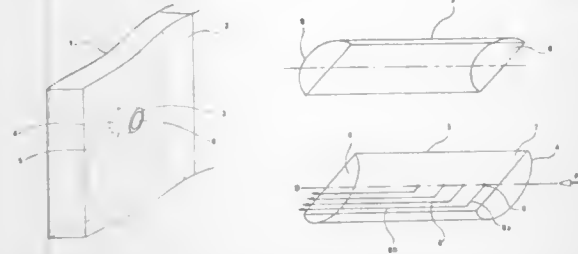
PCT Filed Feb. 21, 1995, Ser. No. 696,949

Claims priority, application France, Feb. 22, 1994, 94 01996

Int. Cl.<sup>6</sup> G01K 7/04; 17/00; 3/06

U.S. Cl. 374—179

9 Claims



1. Process for measuring interfacial flux and temperatures of two media, one of which is solid, said two media being selected from the group consisting of solid/solid, solid/liquid, and solid/gas, the process comprising:

providing in a solid wall member made of a material and traversed by the flux, a cut which opens onto the interface of said wall member with the other medium, and which has a longitudinal axis parallel to said flux, by forming a recess opening onto the interface;

providing a detector, and dividing said detector in two portions in at least one cutting plane parallel to the flux so as to obtain an exposed face;

positioning on at least one portion of the exposed face of said cutting plane an insulation;

implanting at least a first microthermocouple in the cutting plane immediately adjacent said interface;

implanting at least one other microthermocouple in said cutting plane at a predetermined distance from the first microthermocouple; said microthermocouples being implanted in said cutting plane along a direction normal to said flux by removing the insulation at a junction point of the microthermocouples with the axis of the cutting plane;

assembling said portions of the detector;

positioning the detector in said recess opening where measurements are to be taken, said recess being of a volume substantially identical to that of the detector such that the detector is immobilized within the recess and perfect continuity is ensured between the detector and the wall member; and

covering said cut tightly with the material of said solid wall member or a material having thermal characteristics similar to those of the wall material.

5,772,330

**TAMPER-EVIDENT BAG FOR PROTECTING LUGGAGE AND METHODS THEREOF**

Scott M. Bang, Pillager; Kenneth E. Carney, Eden Prairie; Bruce M. Ancel, Bloomington; Thomas S. Everett, Burnsville, and Lance M. Swenson, Bloomington, all of Minn., assignors to Strout Plastics (div. of Great Pacific Enterprises (II)), Bloomington, Minn.

Filed Nov. 13, 1996, Ser. No. 747,888

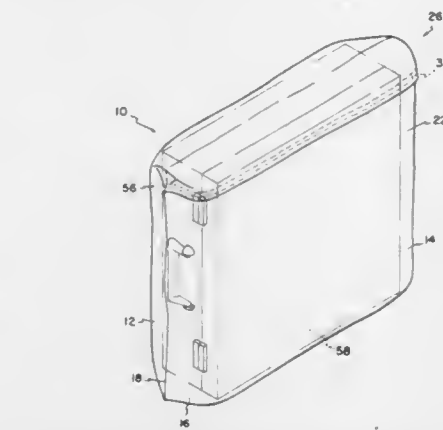
Int. Cl.<sup>6</sup> B65D 33/18

U.S. Cl. 383—87

14 Claims

1. A flexible bag for protecting luggage, the bag comprising: (a) first and second opposing panel sections joined by a gusset at a first end;

(b) the first and second panel sections being secured together along first and second opposite edges with the gusset therebetween,



tween, to form a containment region between the first and second panel sections and bordered by the first and second edges and the gusset;

(c) a mouth defined by the first and second panel sections at a second end opposite to the first end;

(i) the mouth being movable from an open position to a closed position;

(ii) the mouth providing access to the containment region when in the open position;

(d) a closure arrangement at the mouth for securing the mouth in the closed position, the closure arrangement including:

(i) an adhesive region held by the second panel section; the adhesive region including an adhesive strip extending between first and second seal regions; and

(ii) a flap arrangement integral to the first panel section; the flap arrangement including a plurality of flaps sealed to the first and second edges at the first and second seal regions; the flap arrangement being constructed and arranged to: fold over the mouth;

engage the adhesive region; and completely secure the mouth in the closed position closing all access voids to the containment region, and completely enclose the first and second seal regions and the adhesive strip; and

(e) a perforated line in at least one of the first and second panel sections, and extending at least partially between the first and second edges.

5,772,331

**OVEN OR MICROWAVE SAFE FREEZABLE PACKAGE WITH RECLOSURE**

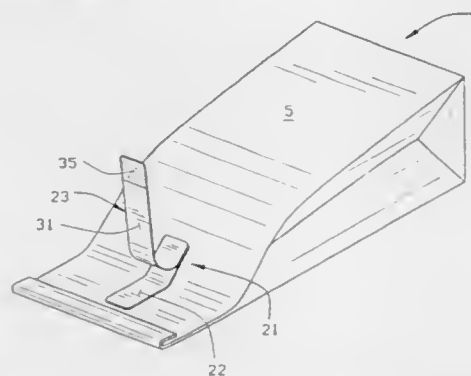
John J. Irace, and Terry E. Maffit, both of St. Louis County, Mo., assignors to Packaging Concepts, Inc., St. Louis, Mo.

Filed Aug. 23, 1996, Ser. No. 702,285

Int. Cl.<sup>6</sup> B65D 33/24

U.S. Cl. 383—90

3 Claims



1. A bag adapted to contain a food item and which is leak proof, resistant to grease and oil, and may be placed in an oven or microwave to reheat the food item when it is contained therein; the

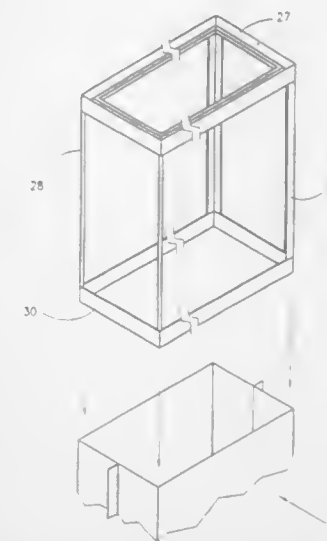
bag including an openable bag top, a front panel, a back panel, side panels and a closed bag bottom comprising a bottom panel, the front and back panels each having a top adjacent the bag top and a bottom adjacent the bag bottom, the tops of said front and back panels being adapted to be folded over each other to define a top closure for the bag, said panels defining an enclosure in which the food item is receivable; and a nonmetallic closure for maintaining the bag in a closed condition; the closure comprising:

an elongate inner portion which is adhered to the bag front panel and spaced from the top of the front panel, said inner portion having a bottom end and a top end that is closer to the top of the front panel than is the bottom end, said inner portion of said closure extending generally parallel to the side panels of said bag, and generally arranged, relative to the side panels, centrally of said front panel;

an elongate outer portion, which is longer than the inner portion, and which directly overlies both the inner portion of the closure and a part of said front panel beyond the extent of the inner portion of the closure, the outer portion having a fixed end, a free end, and inner and outer surfaces, said fixed end of said outer portion having adhesive on its inner surface such that the fixed end is permanently adhered to the said bottom end of said inner portion, said outer portion having a length sufficient for said outer portion free end to extend beyond the top end of said inner portion, and to extend beyond the top of said bag when the front and back panels are folded over each other, to provide for the outer portion free end to extend beyond the top of said bag and to wrap about the top of said bag and to be removably adhered to one of said panels of said bag; and

adhesive applied to the inner surface of the outer portion at the free end of said outer portion, said adhesive being of a material which may be repeatedly adhered to and removed from said bag panels, said inner surface of said outer portion being devoid of adhesive between the adhesive applied to the inner surface of the outer portion at its free end and the adhesive applied to the fixed end of said outer portion where it attaches to the inner portion such that part of said outer portion that overlies the inner portion and part of the outer portion that directly overlies said portion of said front panel beyond the extent of the inner portion is devoid of adhesive, said adhesive applied to the inner surface of the outer portion at the free end being an adhesive formed of a material which may be repeatedly adhered to and removed from said bag panels; said closure outer portion being of the same or lesser width than the closure inner portion, the closure outer portion being flexible;

said bag being resistant to leakage of grease, oil, and liquids, said bag comprising a heat resistant polymer film and/or paper, to provide a reopenable bag adapted to contain the food item.



front sheet having a bottom edge, a top edge and lateral edges, a rear sheet having a bottom edge, a top edge and lateral edges, and a bottom sheet; the bottom sheet being foldable along a midline thereof with first and second flaps extending downwards from the midline, said flaps each having a bottom edge and lateral edges, and wherein the bottom edge of the first flap is joined to the bottom edge of the front sheet and the bottom edge of the second flap is joined to the bottom edge of the rear sheet; wherein the lateral edges of the front sheet and the rear sheet are welded to one another with bottom portions of the lateral edges of the front and rear sheets sandwiching lateral edges of the first and second flaps; wherein the bottom sheet is unfoldable into a substantially rectangular shape to form said base, with central parts of the bottom edges of the flaps of the bottom sheet forming the front and rear edges of the base and with peripheral portions of the bottom sheet forming two overlapping triangular portions having lower edges thereof defining the side edges of the base, and side walls extending from said side edges of said base with the welded lateral edges of the front and rear sheets being at about a midline of the side walls; said container being fixed by welding the two overlapping triangular portions; and stiff elongated studs composed at least in part of a heat weldable material, said studs being welded to the walls of the container and projecting from a reinforcement element welded to a region of said container, said region being selected from the group consisting of a top of said container or a bottom of said container, and wherein the studs extend substantially an entire length of the container.

5,772,332

**CONTAINER HAVING A RECTANGULAR BASE AND ITS MANUFACTURING**

Avner Geller, Tel-Aviv, Israel, assignor to Atifon Ltd., Holon, Israel

PCT No. PCT/US95/12264, § 371 Date Jun. 20, 1996, § 102(e) Date Jun. 20, 1996, PCT Pub. No. WO96/10524, PCT Pub. Date Apr. 11, 1996

PCT Filed Oct. 2, 1995, Ser. No. 666,279

Claims priority, application Israel, Sep. 30, 1994, 111114

Int. Cl.<sup>6</sup> B65D 30/18; 33/02

U.S. Cl. 383—119

6 Claims

1. A container having a base with a front edge, a rear edge and side edges, and walls extending upwardly therefrom; the base being generally rectangular and being made of a film having an inner face and an outer face, said inner and outer faces being heat weldable, and the walls being made of a film having an inner face and an outer face, with at least said inner face being heat weldable; said base and said walls of the container being constructed from a

5,772,333

**LINEAR GUIDE APPARATUS LUBRICATED WITH LUBRICANT-CONTAINING POLYMER**

Toshikazu Yabe, and Fumio Ueki, both of Kanagawa, Japan, assignors to NSK Ltd., Tokyo, Japan

Division of Ser. No. 614,273, Mar. 12, 1996, Pat. No.

5,678,927. This application Jul. 11, 1997, Ser. No. 892,847

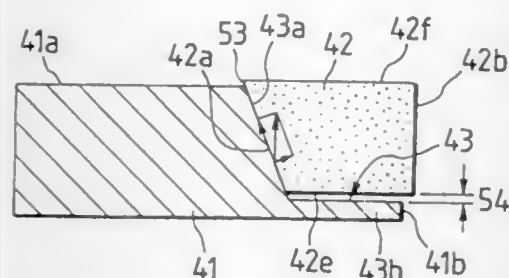
Claims priority, application Japan, Mar. 15, 1995, 7-55916

Int. Cl.<sup>6</sup> F16C 29/06

U.S. Cl. 384—13

6 Claims

1. A linear guide apparatus comprising: a guide rail including a first rolling groove which axially extends on an outer surface of the guide rail; a slider fitted movably to the guide rail and including a second rolling groove confronted with the first rolling groove, a curved path formed at an end of the second rolling groove, and a return path coupled to the second rolling groove through the curved path to form a circulation passage; a plurality of rolling elements loaded in the circulation passage to move the slider relative to the guide rail; and

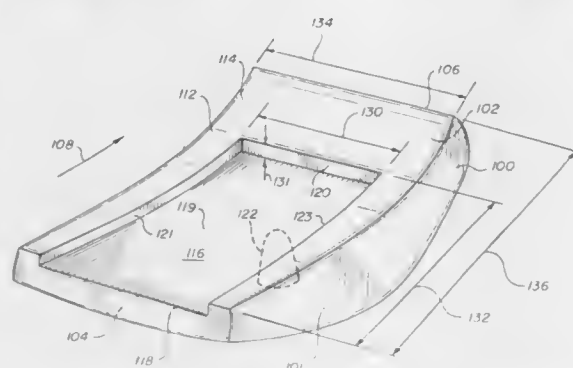


5,772,335  
**SELF-STABILIZING, TRUE-TILTING PAD WITH ABRUPTLY-STEPPED POCKET FOR JOURNAL BEARING**  
William Miller, Albany, N.Y., assignor to WHM Holding Company, Loudonville, N.Y.  
Filed Mar. 31, 1997, Ser. No. 828,979  
Int. Cl.<sup>6</sup> F16C 17/03  
U.S. Cl. 384—117 26 Claims

a seal device mounted on a side of the slider and including an opening corresponding to the guide rail to seal a clearance existing between the guide rail and the slider, the seal device comprising

a reinforcement member that includes a contact surface fixed to the slider and an inclined inner surface surrounding the outer surface of the guide rail and being inclined to increase the opening toward the slider in a thickness direction of the reinforcement member, and

a lubricant-containing polymer member that includes an inclined outer surface engaging the inclined inner surface and an inner sealing portion slidably contacting the guide rail opposed to the inclined outer surface, wherein the lubricant-containing polymer member is formed of two parts which are symmetric to each other.



1. A true-tilting pad pivotally supported by a pivot and adapted to cooperate with one or more other pads and fluid within a housing to hydrodynamically and mechanically support a shaft that is adapted to be rotated by a prime mover and has a convex surface, comprising:

a leading portion adapted to be positioned upstream relative to rotation direction of the shaft;

a trailing portion adapted to be positioned downstream relative to the rotation direction of the shaft;

the leading and trailing portions tiltable free of mechanical engagement with the other pads; and

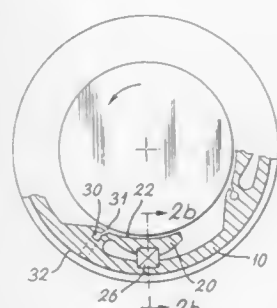
a face including a border region and extending longitudinally between the leading and trailing portions, the border region including an engagement surface and defining a pocket with longitudinal sidebars, a bottom, and an abrupt step for hydrodynamically increasing pressure on the convex surface during rotation of the shaft.

5,772,334  
**FLUID FILM BEARINGS**  
David Walter Parkins, and James Keith Martin, both of Milton Keynes, England, assignors to British Technology Group Limited, London, England  
PCT No. PCT/GB95/00955, § 371 Date Oct. 25, 1996, § 102(e) Date Oct. 25, 1996, PCT Pub. No. WO95/29346, PCT Pub. Date Jan. 21, 1995  
PCT Filed Apr. 26, 1995, Ser. No. 732,269  
Claims priority, application United Kingdom, Apr. 27, 1994, 9408485

Int. Cl.<sup>6</sup> F16C 32/06; 25/02

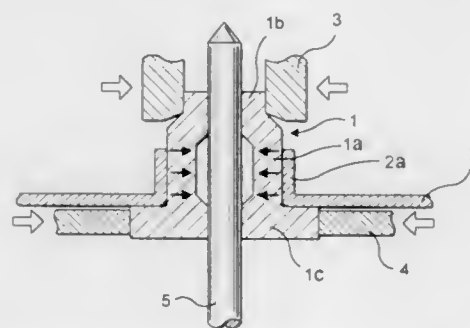
U.S. Cl. 384—117

17 Claims



1. A hydrodynamic bearing having means for supporting a rotating part of the bearing in operation on a film of lubrication fluid, said means comprising a plurality of circumferentially spaced bearing elements having respective bearing surfaces defining areas of support for the rotating part, at least some of the bearing elements being adjustable during operation to vary lubrication conditions in the fluid film, wherein the adjustable bearing elements are of sufficiently high stiffness that the position of the entire bearing surface of a bearing element is essentially independent of the pressure in said fluid film encountered during operation.

5,772,336  
**SLIDING BEARING AND A METHOD FOR MOUNTING SAME**  
Masayuki Katagiri, Nagano, Japan, assignor to Sankyo Seiki Mfg. Co., Ltd., Nagano-ken, Japan  
Filed Jan. 30, 1997, Ser. No. 792,153  
Claims priority, application Japan, Feb. 2, 1996, 8-017660  
Int. Cl.<sup>6</sup> F16C 17/02  
U.S. Cl. 384—129 4 Claims



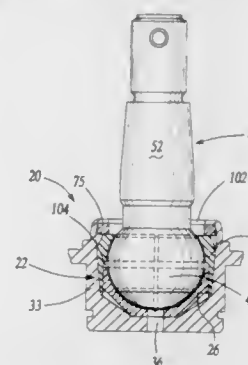
1. A method for mounting a sliding bearing, comprising the following steps:

holding a position different in an axial direction from that of a shaft sliding portion of said bearing by a bearing holding member;

inserting a sizing bar having almost the same outer diameter as that of a shaft supported by said sliding bearing, into a bearing hole of said bearing; and

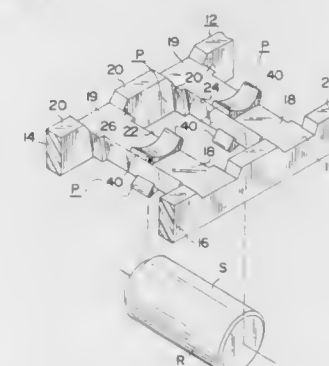
pressing the outer circumference onto said shaft sliding portion of said sliding bearing in a radial direction while said sizing bar is inserted into said bearing hole.

5,772,337  
**POLYWEDGE BEARING FOR USE WITH BALL AND SOCKET**  
Garth B. Maughan, Delta, and Terry D. Peppers, Columbus, both of Ohio, assignors to Dana Corporation, Toledo, Ohio  
Filed May 1, 1997, Ser. No. 847,238  
Int. Cl.<sup>6</sup> F16C 11/06  
U.S. Cl. 384—206 22 Claims



1. An annular bearing for use in a ball and socket joint comprising an outer peripheral surface, two opposing axial surfaces, a spherical inner seat face, and a plurality of wedge shaped slots extending about said bearing between said outer peripheral surface and one of said outer axial surfaces, each of said slots including opposing parallel side walls and a floor defined between and generally perpendicular to said side walls and extending at a generally constant angle between said outer peripheral surface and said one of said outer axial surfaces.

5,772,338  
**FLANGE OR RACEWAY GUIDED PLASTIC CAGE FOR BEARING ASSEMBLY**  
Reinhart Hillmann, Schweinfurt, and Rut Heemskerk, Kützberg, both of Germany, assignors to SKF GmbH, Germany  
Filed Aug. 26, 1996, Ser. No. 702,964  
Claims priority, application Germany, Aug. 30, 1995, 195 31 905.2  
Int. Cl.<sup>6</sup> F16C 19/00; 33/46; 33/56  
U.S. Cl. 384—470 3 Claims



1. A roller bearing assembly comprising inner and outer annular races (Ri and Ro) having confronting raceways spaced apart to define an annular space for a plurality of rollers (R);

a cage (12) having a pair of axially spaced circumferentially extending side rings (14 and 16);

a plurality of webs (18) extending axially between said side rings and circumferentially spaced apart to define a plurality of pockets (P) for the rollers;

the outer peripheral surface of said side rings adapted to be closely adjacent one of said races to guide said cage (12) radially;

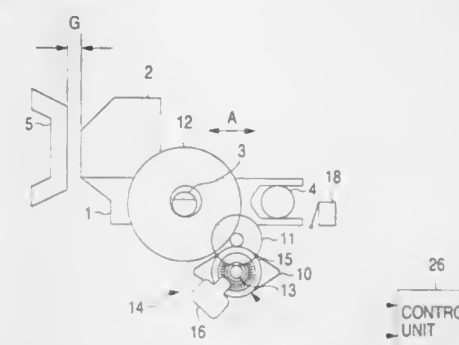
the webs (18) having side surfaces confronting the rollers including guide surfaces (26) extending inwardly a predetermined distance from the side rings providing only a small clearance between the guide surface (26) and the peripheral surface of the rollers;

the confronting side surfaces (30 and 32) of the webs between the guide surfaces (26) being cut back to provide a gap of a greater clearance between the rollers and the web than at said guide surfaces (26);

each of said webs (18) having projections (40) facing one another at the central portion of the web to embrace the rollers, the space between the adjacent projections (40) being less than the diameter of the roller to retain the rollers in the pocket; and

means defining a plurality of circumferentially-spaced recesses aligned with the webs to promote circulation of lubricant.

5,772,339  
**AUTOMATIC ADJUSTING DEVICE FOR ADJUSTING PLATEN GAP**  
Naoto Yamaguchi, Nagano, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan  
Filed Jun. 6, 1997, Ser. No. 867,426  
Claims priority, application Japan, Jun. 6, 1996, 8-166836; Jan. 8, 1997, 9-013376  
Int. Cl.<sup>6</sup> B41J 11/20  
U.S. Cl. 400—55 25 Claims



1. An automatic platen gap adjusting device for adjusting a gap between a platen and a recording head of a printer, comprising:

a step motor for moving a carriage, on which said recording head is mounted, in a direction perpendicular to a platen surface;

moving distance detecting means for detecting drive signals output from said step motor and for outputting pulse signals, the number of which corresponding to a moving distance of said carriage;

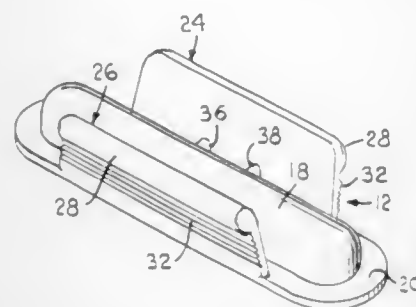
pulse width detecting means for detecting a pulse width of a pulse signal when said carriage is moved from a reference position in a direction toward said platen surface;

a memory for storing a reference position of said carriage and reference pulse width data corresponding to movement of said carriage toward said platen surface when a recording medium is not positioned on said platen surface;

difference calculating means for calculating a difference between pulse width data output from said pulse width detecting means corresponding to movement of said carriage toward said platen surface when a recording medium is positioned on said platen surface, and said reference pulse width data and outputting a difference signal;







a porous element covering the pocket so that liquid flows through the porous element when the ampule is fractured, the porous element being laminated with a material that does not stretch in the first direction, the laminate material being secured directly to the side walls of the body to prevent the side walls from pulling apart from one another when the lever is pivoted.

5,772,347

**DISPENSER FOR A PRODUCT WITH A LIQUID-TO-PASTY CONSISTENCY**

Jean-Louis Gueret, Paris, France, assignor to L'Oreal, Paris, France

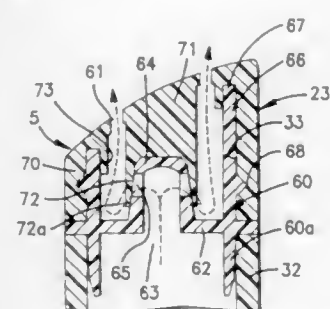
Filed Dec. 6, 1995, Ser. No. 568,324

Claims priority, application France, Dec. 6, 1994, 94-14652

Int. Cl.<sup>6</sup> A45D 40/00; 40/06; 40/08

U.S. Cl. 401—263

9 Claims



1. An applicator tip for dispensing a product with a liquid-to-pasty consistency from a container, the tip comprising: an oblique applicator surface of a resilient elastomeric material and with a continuous peripheral spreading board for application of the product to a person's lips; plural one-way closures, each comprising a resilient closure means for flexibly closing a rigid opening which provides a passageway for the product from the container to said applicator surface, each said closure means flexing under pressure of the product being expelled through the associated said opening to dispense the product; and plural grooves in said applicator surface, each of said grooves in communication with at least one of said one-way closures for spreading the dispensed product across said applicator surface.

5,772,348

**RING BINDER**

Simon Chun Yuen To, Kowloon, Hong Kong, assignor to World Wide Stationary Company Limited, Kwai Chung, Hong Kong

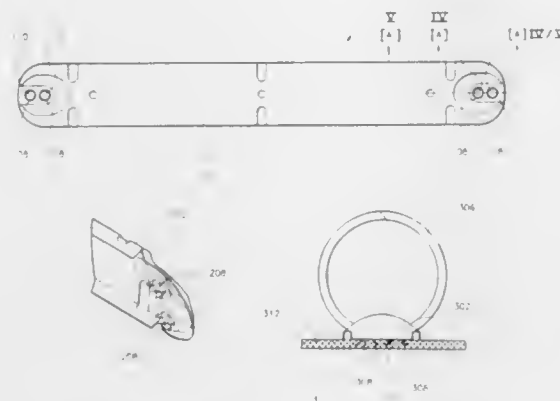
Filed Oct. 20, 1995, Ser. No. 546,127

Int. Cl.<sup>6</sup> B42F 13/16

U.S. Cl. 402—36

9 Claims

1. A ring binder adapted to be secured to a base member, said ring binder comprising



a substantially rigid upper structure, a pivotable lower structure supported by said upper structure; a plurality of ring members mounted on said pivotable lower structure; at least one securing means integrally formed with said upper structure and adapted to extend into at least part of the base member and thereby to secure the ring binder to the base member.

5,772,349

**GREETING CARD ALBUM**

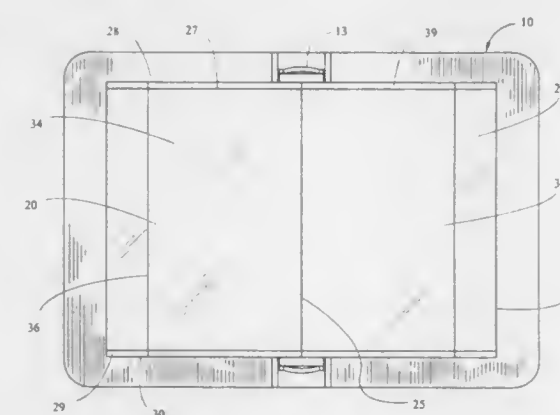
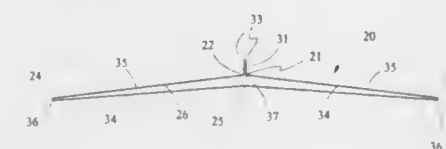
Matthew Alan Tubergen, 8491 Whipporwill, Apt. F., Indianapolis, Ind. 46256

Filed Aug. 15, 1995, Ser. No. 515,508

Int. Cl.<sup>6</sup> B42F 3/00

U.S. Cl. 402—79

17 Claims



1. A holder for a folded card comprising: a sleeve of transparent plastic forming front and back panels; said front panel having a center fold adapted for alignment with the fold of the card; said back panel having a vertical center opening defined by a pair of opposing flaps; and said panels having top and bottom edges and an opening between said top edges, said opening being transverse to said center fold.

5,772,350

**PROTECTED SWIVEL**

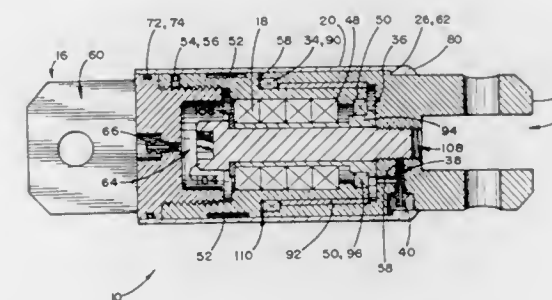
Robert C. Ferguson, P.O. Box 365, Eau Claire, Mich. 49111-0365, and Todd Sutton, 2176 Timberview NE., Grand Rapids, Mich. 49505

Filed Dec. 8, 1995, Ser. No. 569,621

Int. Cl.<sup>6</sup> F16D 1/12

U.S. Cl. 403—78

19 Claims



1. A swivel comprising: a swivel body that has opposing first and second body ends; a first member connected in swiveling engagement with said first body end; a bearing interposed between said first body end and said first member; a second member connected with said second body end; and a sleeve, said sleeve overlaying and enclosing said swivel body and overlaying and enclosing at least a portion of each of said first member and said second member.

5,772,351

**PIVOT JOINT**

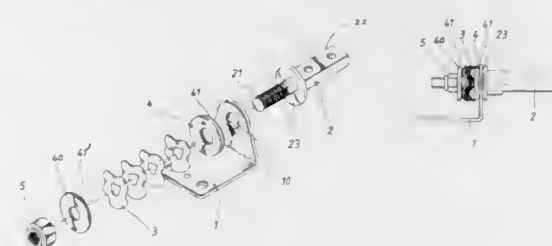
Fu-Gen Ching, Pan Chiao City, Taiwan, assignor to Chih Ching Industry Ltd., Taipei Hsien, Taiwan

Continuation-in-part of Ser. No. 379,199, Jan. 24, 1995, abandoned. This application Nov. 4, 1996, Ser. No. 743,489

Int. Cl.<sup>6</sup> F16C 11/00

U.S. Cl. 403—111

2 Claims



1. A pivot joint having a mounting frame, a pivot bolt inserted through a hole in said mounting frame, and a lock nut threadably engaged with said pivot bolt to hold said mounting frame and said pivot bolt together, permitting said pivot bolt to be turned about its longitudinal center axis, wherein said pivot bolt has a collar stopped against said mounting frame at one side opposite to said lock nut; two washers are mounted around said pivot bolt and retained between said mounting frame and said lock nut; a plurality of corrugated plate springs are mounted around said pivot bolt and retained between said washers; and said collar of said pivot bolt having an outer diameter that becomes gradually smaller toward said washers and said corrugated plate springs.

5,772,352

**BALL JOINT HAVING EXTENDED SERVICE LIFE**

Yasutaka Fukumoto, Toyota; Junichi Kato, Nishikamo-Gun; Yukio Okamura, Toyota; Yasuhiro Ishikawa, Nishio; Tetsuo Kondo, Nishio; Yoshimi Suzuki, Nishio, and Hidetomi Nagai, Nishio, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, and Otis Corporation, both of Aichi-Ken, Japan

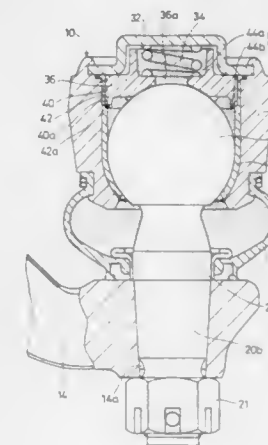
Filed May 6, 1996, Ser. No. 642,061

Claims priority, application Japan, Jun. 2, 1995, 7-136902; Jun. 14, 1995, 7-147810

Int. Cl.<sup>6</sup> F16C 11/00

U.S. Cl. 403—144

11 Claims



1. A ball joint comprising: a ball stud having a spherical portion on one end thereof, wherein the spherical portion defines an equator dividing the spherical portion into upper and lower halves at a maximum diameter of the spherical portion; a first ball sheet and a second ball sheet having said spherical portion interposed therebetween said first ball sheet being displaceable toward said second ball sheet when said second ball sheet has been worn due to sliding of said spherical portion, wherein said first ball sheet extends along the upper half of the spherical portion and does not cross the equator; and displacement restricting means for restricting displacement of said first ball sheet toward said second ball sheet so that said first ball sheet is held at a predetermined position relative to said second ball sheet, wherein a lubricant chamber is defined by said first ball sheet, said second ball sheet and said spherical portion so as to retain a lubricant therein, and wherein said second ball sheet extends from an upper end adjacent to said first ball sheet to a lower end spaced from said first ball sheet and wherein said second ball sheet has, on an inner surface thereof, at least one groove extending between said lubricant chamber and the lower end of said second ball sheet, and wherein said groove comprises lubricant restricting means for restricting flow of lubricant in said groove.

5,772,353

**HOUSING FOR JOINT FORMING DEVICES**

Jerry D. Grieser, Archbold; Richard A. Nelson, Napoleon; Steven R. Munday, Stryker, all of Ohio, and William E. T. Vallance, Marlow, England, assignors to Titus International PLC, Buckinghamshire, England

Filed May 30, 1996, Ser. No. 657,931

Claims priority, application United Kingdom, May 31, 1995, 9511021

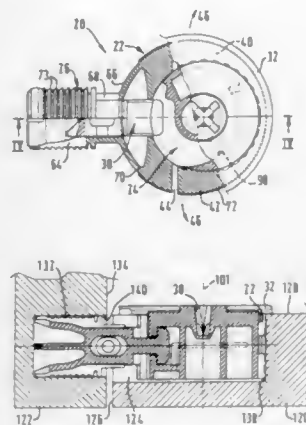
Int. Cl.<sup>6</sup> F16B 12/00

U.S. Cl. 403—231

22 Claims

7. A device for use in forming a joint between two members, the device comprising a housing to be fitted in a recess in one of said





members, a tightening element to be housed by said housing and an elongate fastening element having a longitudinal axis to be fitted to the other of said members, said tightening element having at least one camming surface cooperably engageable with a respective engaging surface of said fastening element whereby movement of said tightening element causes axial movement of said fastening element to cause said joint formed between said two members with said device to tighten, said housing comprising a sleeve for housing said tightening element, said housing having at least one moveable portion adapted to move outwardly of the outer periphery of the sleeve, in use, in response to tightening of said joint by said movement of the tightening element housed therein for forceably engaging with a wall of said recess in which the sleeve is fitted.

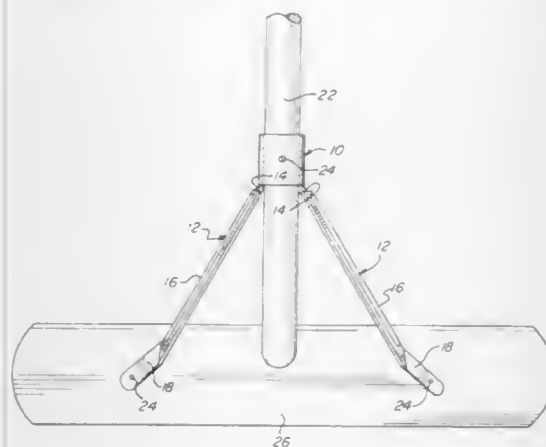
#### 5,772,354 HANDLE SUPPORT

Arnold H. Finn, Farmington, Conn., assignor to Taco Fasteners Inc.

Filed Mar. 19, 1996, Ser. No. 617,543  
Int. Cl.<sup>6</sup> B25G 3/00

U.S. Cl. 403—262

20 Claims



1. A one-piece brace for use in constructing an implement that is comprised of an elongate head and an elongate handle extending perpendicularly to the head, said brace comprising a body portion and a pair of elongate leg portions integrally formed therewith as a single piece, said body portion having a length extending generally on a first axis and being constructed for attachment to the implement handle, said body portion being open ended and of generally U-shaped cross-section along its entire length, in planes perpendicular to said first axis, to permit insertion of the implement handle laterally into said body portion and extension of the handle therethrough, said body portion including a pair of confronting elements lying generally in lateral planes that are spaced to opposite sides of said first axis and that extend generally parallel

thereto; said leg portions extending in the same general direction from said confronting elements of said body portion and having attaching elements at the free outer ends thereof for attachment to portions of the operating head that extend laterally to opposite sides of the handle, said brace having a limited area of relative flexibility at the juncture of each of said leg portions with said body portion confronting elements, said areas of relative flexibility providing joints about which said leg portions can turn for displacement laterally away from one another, relative to said first axis, said joints lying substantially in said lateral planes and in a plane that extends transversely of said first axis.

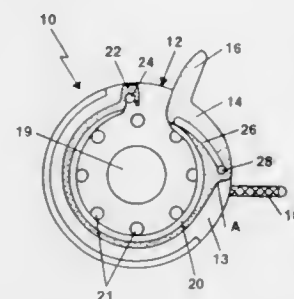
#### 5,772,355

QUICK ATTACH/RELEASE ADAPTER MECHANISM  
Robert N. Ross, Fitchburg; Michael P. Clark, Lunenburg, and Randall J. Deary, Littleton, all of Mass., assignors to Precision Optics Corporation, Gardner, Mass.

Filed Dec. 19, 1996, Ser. No. 769,954  
Int. Cl.<sup>6</sup> B25G 3/00

U.S. Cl. 403—322

12 Claims



1. An adapter mechanism for enabling an image transmitted along an optical axis from a first device to be received by a second device, said adapter mechanism comprising:  
back plate having a first end portion which is securable to said second device, and a second end portion spaced along an adapter mechanism axis for attaching to said first device;  
said back plate including at said second end portion a radially extending cylindrical chamber;  
retaining means positioned within said cylindrical chamber for securing said first device within said back plate;  
said retaining means having a lever extending through an outer wall of said cylindrical chamber for enabling said first device to be released from said adapter mechanism; and  
said back plate comprises a guide post and said retaining means comprises a slot for receiving said guide post into said slot, thereby limiting the radial movement of said retaining means when said lever is moved in a direction to release said first device.

#### 5,772,356

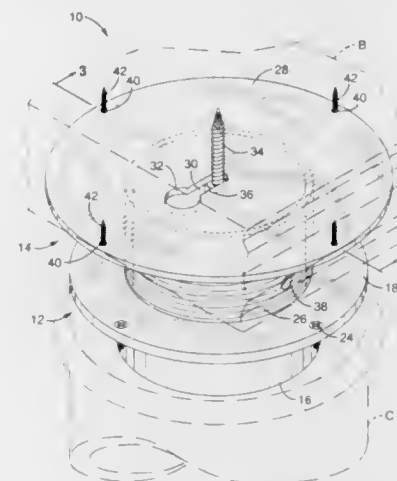
ADJUSTABLE COLUMN CONNECTOR APPARATUS  
Samuel W. Collins, 1028 Robertson Way, Sacramento, Calif. 95818

Filed Feb. 21, 1997, Ser. No. 804,340  
Int. Cl.<sup>6</sup> B25G 3/00

U.S. Cl. 403—343

9 Claims

1. A column connector apparatus, comprising:  
(a) an inner connector member, said inner connector member including means for fixedly coupling to a column;  
(b) an outer connector member, said outer connector member including a top plate, said outer connector member including means for fixedly coupling to an external structure, said outer connector member including means for rotatably attaching to said external structure, said rotatably attaching means comprising a slotted opening in said top plate, said rotatably



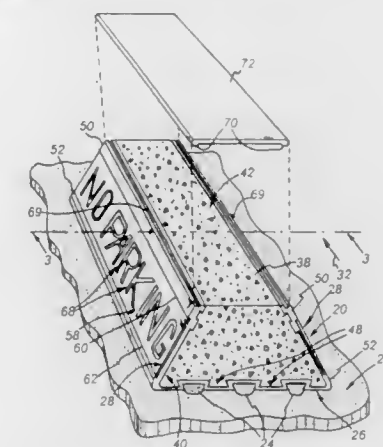
#### 5,772,357 CURBING

Harold A. Evans, Swampscott, Mass., assignor to Partners In Innovation, LLC, Manchester, N.H.

Filed Nov. 9, 1995, Ser. No. 556,017  
Int. Cl.<sup>6</sup> E01F 15/02

U.S. Cl. 404—7

18 Claims



1. A curbing system comprising:  
an outer shell constructed of a durable synthetic material comprising a U-shaped continuous channel defining a base and a pair of sidewalls that extend upwardly from the base, the base and the sidewalls constructed from a single continuous synthetic material piece and defining an enclosure that extends from the base to respective upper edges of the sidewalls;  
a securing medium that interconnects the base with a ground surface;  
a rigid filler material, contained within the enclosure defined by the base and the sidewalls, the filler material being a hardenable filler that changes from a liquid to a solid phase at predetermined times, the upper edges being constructed and arranged to allow location of the filler in the liquid phase into the enclosure; and  
wherein the U-shaped channel includes a pair of opposing ends and wherein only the rigid filler material is in contact with the

sidewalls within the enclosure between the base and the upper edges at locations between each of the opposing ends.

#### 5,772,358 FOOTHOLD

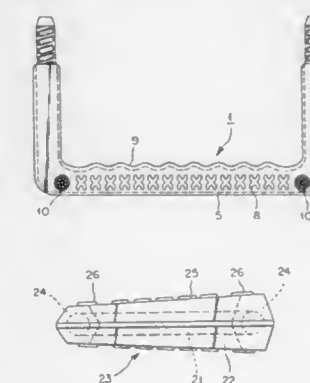
Eizo Takahashi, Soka, Japan, assignor to Miyama Kogyo Kabushiki Kaisha, Saitama-ken, Japan

Filed May 16, 1996, Ser. No. 648,663

Claims priority, application Japan, May 22, 1995, 7-145127  
Int. Cl.<sup>6</sup> E01C 11/24; E00G 3/00

U.S. Cl. 404—19

6 Claims



5. A foothold, comprising an elongate tread having first and second ends, legs cantilevered from the tread and means for fixing the legs to a vertical support surface, the tread increasing in thickness from the first end to the second end, and a first surface of the tread extending from the first end to the second end being inclined at an angle in the range of one to five degrees.

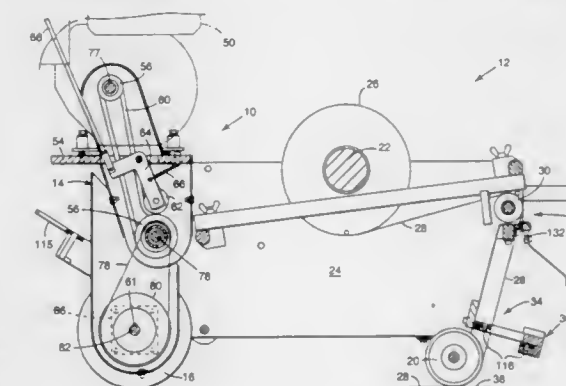
#### 5,772,359 SELF-PROPELLED PAVEMENT MARKING TAPE APPLICATOR

John L. Marty, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 28, 1996, Ser. No. 704,196  
Int. Cl.<sup>6</sup> E01C 23/16

U.S. Cl. 404—94

10 Claims



1. A self-propelled tape applicator comprising:  
(a) a frame supported by at least one roller and at least one drive wheel;  
tape support means for supporting a roll of pressure sensitive adhesive tape;  
(b) tape guide means for guiding tape toward a leading edge of at least one roller;  
(c) tape advance means for advancing the tape to an advanced position near the leading edge of the at least one roller, whereby the tape is pressed against a pavement surface by the at least one roller;

(d) motor means engaged with the at least one drive wheel by a clutch means for propelling the marking tape applicator; and  
(e) one-way clutch bearing means interposed between the at least one drive wheel and the frame so that the marking tape applicator can be driven only in a forward direction, wherein the one-way clutch bearing means operates as a differential gear so that one of the drive wheels can revolve faster than the other.

5,772,360

# TOPLESS WATERCRAFT LIFTING APPARATUS WITH A DIFFERENTIAL GEARING SYSTEM

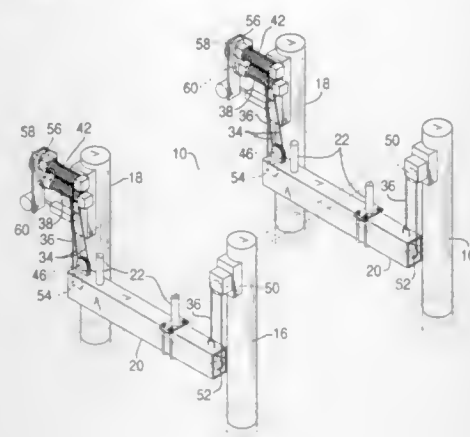
Donald M. Wood, II, P.O. Box 2737, Stuart, Fla. 34995

Filed May 19, 1997, Ser. No. 848,721

Int. Cl.<sup>6</sup> E63C 3/06

U.S. Cl. 405—3

27 Claims



1. A topless watercraft lifting apparatus comprising:

A. a main frame means defining a watercraft receiving slot means therewithin for receiving a watercraft for lifting thereof;

B. a lifting beam means movably mounted within said main frame means and extending laterally across said watercraft receiving slot means therebelow and being vertically movable upwardly, said lifting beam means including:

(1) a watercraft support means positionable below a watercraft positioned within said watercraft receiving slot means and adapted to be in abutment therewith for facilitating lifting thereof;

(2) a proximate beam end on said lifting beam means;

(3) a distal beam end on said lifting beam means spatially disposed from said proximate beam end, said watercraft support means being located on said lifting beam means between said proximate beam end and said distal beam end thereof;

C. a main drive means secured to said main frame means;

D. a lifting means attached to said main frame means and operatively attached with respect to said lifting beam means and with respect to said main drive means for facilitating vertical movement of said lifting beam means responsive to operation of said main drive means, said lifting means including:

(1) an inner cable means operatively attached with respect to said proximate beam end of said lifting beam means to facilitate lifting thereof;

(2) an outer cable means operatively attached with respect to said distal beam end of said lifting beam means to facilitate lifting thereof;

(3) an inner winching means operatively attached to said inner cable means for selectively winding and unwinding thereof to facilitate control of lifting of said proximate beam end of said lifting beam means;

(4) an outer winching means operatively attached to said outer cable means for selectively winding and unwinding thereof

to facilitate control of lifting of said distal beam end of said lifting beam means; and

E. a differential gearing means operatively connected to said main drive means and also being operatively connected separately to each of said inner winching means and said outer winching means for facilitating driving thereto, said differential gearing means being responsive to operation of said main drive means to drive said outer winching means at an outer cable winding speed and to drive said inner winching means at an inner cable winding speed, said inner cable winding speed being different than said outer cable winding speed.

5,772,361

# EXTENDABLE ANCHOR BASE SEPTIC TANK

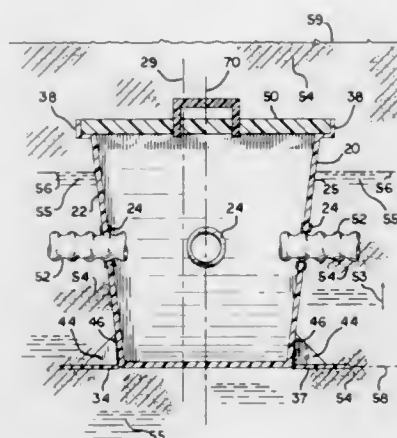
Norman W. Gavin, 2545 Ridge Rd., North Haven, Conn. 06473

Filed Mar. 11, 1996, Ser. No. 615,344

Int. Cl.<sup>6</sup> E02B 11/00

U.S. Cl. 405—36

6 Claims



1. A molded plastic septic tank adapted for burial in soil, comprising:

a top, a bottom, a vertical line within said tank, a generally horizontal bottom first wall, a generally vertical second wall extending from said top and attached to said first wall an arm and hinge integrally molded with said tank at the bottom of said tank so that said arm is rotatable by said hinge on said tank toward and away from said vertical line,

rigid brace means connected to said arm and said second wall configured to prevent upward rotation of said arm to said second wall.

5,772,362

# RACING RAIL POLE DRIVER APPARATUS AND THE METHOD OF USE THEREOF

Anthony McGregor Sims, Mt. Barker, Australia, assignor to Aclis Pty Ltd, Australia

Filed Mar. 8, 1996, Ser. No. 613,961

Claims priority, application Australia, Mar. 10, 1995, PN 1611; Jan. 25, 1996, PN 7760

Int. Cl.<sup>6</sup> E02D 11/00; E21B 7/02; E21C 11/00

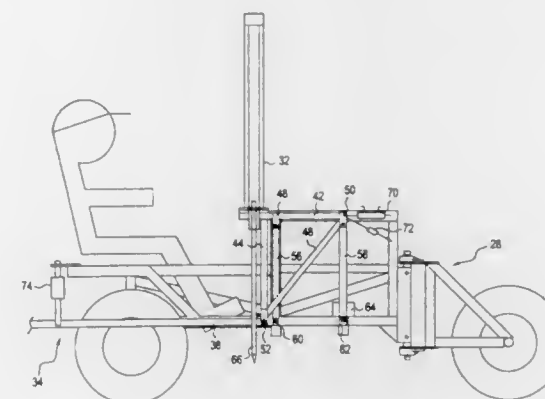
U.S. Cl. 405—232

10 Claims

1. A pole locating apparatus for locating in the ground two or more poles for supporting a racing rail assembly comprising:

a transportation means for carrying a plurality of poles, a pole driver means pivotally fixed to said transportation means and operable to drive a pole into the ground, and

a first measurement means located on said transportation means operable for measuring a predetermined distance between a previously driven pole and said pole driver means, wherein as said transportation means moves along the intended path of said racing rail assembly said first measurement means measures a predetermined distance between a previously driven



pole and said pole driver means, said pole driver means being actuated so as to drive a pole into the ground which is a predetermined distance from said previously driven pole.

5,772,363

# PILING REMOVER

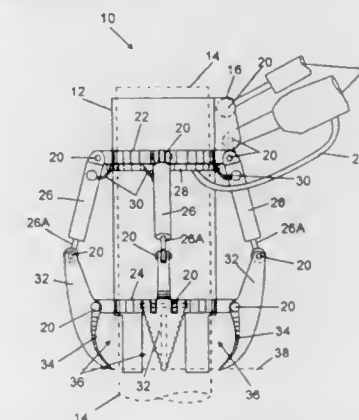
John G. Larson, 378 E. 23rd St., Chico, Calif. 95928

Filed Dec. 5, 1996, Ser. No. 760,729

Int. Cl.<sup>6</sup> E02D 37/00

U.S. Cl. 405—232

4 Claims



1. A pile remover for a short pile having a tube body sized to fit over said pile, said tube body having an upper and a lower end, said upper end equipped for attachment to operational auxiliary equipment, said lower end equipped with at least one cutter, said cutter arranged pivotal to rock over inserting a sharpened end into said pile when activated by a powering means, said powering means affixed at a first end by attachment adjacent said upper end of said tube with said powering means affixed by a second end to an end of said cutter in a manner to cause said cutter to rock inserting said sharpened end into said pile, said powering means reversible to return said cutter to an original position, said powering means controllable by said operational auxiliary equipment, movement of said pile remover controllable by said auxiliary equipment.

5,772,364

# CHIP CUTTING TOOL

Amir Satran, Kfar Vradim, and Yuri Men, Haifa, both of Israel, assignors to Iscar Ltd., Migdal Tefen, Israel

Continuation of Ser. No. 360,522, Dec. 21, 1994, Pat. No. 5,622,460, This application Nov. 8, 1996, Ser. No. 746,363

Claims priority, application Israel, Dec. 21, 1993, 108115

Int. Cl.<sup>6</sup> B23C 5/22

U.S. Cl. 407—42

41 Claims

1. A chip cutting insert for use in a cutting tool assembly, the insert comprising:

top and base surfaces,

first and second major side surfaces and a minor side surface, the second major side surface and the minor side surface having an upper portion inclined with respect to said insert base surface at a respective internal angle which is acute at least along a part of the length of a corresponding side surface,

a cutting edge defined between the first major side surface and said top surface, said cutting edge comprising leading and trailing sections, a relief flank surface of the first major side surface being inclined with respect to said insert base surface at an acute internal angle, adjacent said trailing section;

said minor side surface being disposed adjacent the trailing section and the second major side surface and said minor side surface converging in a direction away from the cutting edge.

5,772,365

# INSERT FOR BALL NOSE END MILL

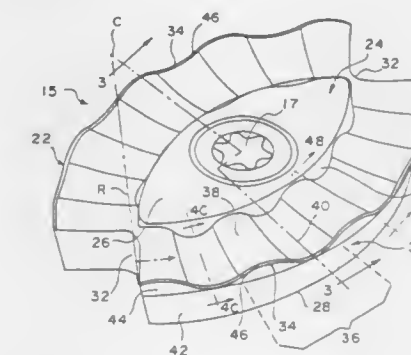
Scott W. Vogel, Raleigh, N.C., and Robert L. Shomaker, Little Rock, Ark., assignors to Kennametal Inc., Latrobe, Pa.

Continuation of Ser. No. 411,031, Mar. 27, 1995, Pat. No. 5,562,370, This application Sep. 12, 1996, Ser. No. 712,242

Int. Cl.<sup>6</sup> B23C 5/14

U.S. Cl. 407—42

19 Claims



1. An insert for use in a ball nose end mill for making a rounded cut in a workpiece by removing chips therefrom when rotated about an axis, comprising:

an insert body including a top wall, a bottom wall, an arcuate side wall, and an arcuate cutting edge defined at an intersection between said top and side walls, a portion of said top wall including a plurality of sinusoidal undulations extending to said arcuate cutting edge for reducing cutting forces, reducing vibration, and enhancing the breaking and removal of chips from a workpiece.



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OFFICIAL GAZETTE

JUNE 30, 1998

5,772,366

## DIAMOND COATED BODY

Jörgen Wiman, Sandviken, and Ingrid Reineck, Huddinge, both of Sweden, assignors to Sandvik AB, Sandviken, Sweden

Continuation of Ser. No. 401,123, Mar. 9, 1995, abandoned.

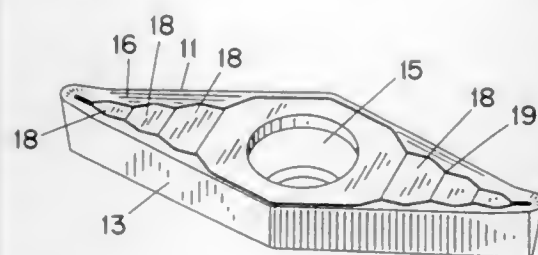
This application May 9, 1997, Ser. No. 853,869

Claims priority, application Sweden, Mar. 18, 1994, 9400909

Int. Cl.<sup>6</sup> B23B 27/20; 27/22

U.S. Cl. 407—119

5 Claims



1. A cutting insert for the machining of Al-alloys comprising a compound body consisting of a sintered cemented carbide substrate with a surface coating, said body including top and bottom surfaces and at least on peripheral wall extending therebetween, the intersection of said peripheral wall and at least said top surface forming cutting edges, said top surface located below said cutting edges, said coating being a diamond coating with a thickness of 1–20  $\mu\text{m}$  deposited directly from a gas phase in a reactor by CVD or PVD technique in a manner so as to ensure rigid bonding to said substrate, the top surface being provided with a plurality of curved projections and an integral chipformer so as to provide chips formed during machining into a desired and controllable configuration, the chipformer including a sloping flank that slopes away from said cutting edge and intersecting said plurality of curved projections, the intersection of said sloping flank and said plurality of curved projections including a wave-shaped line.

5,772,367

## SUCTION/BLOWER ATTACHMENT FOR POWER TOOLS

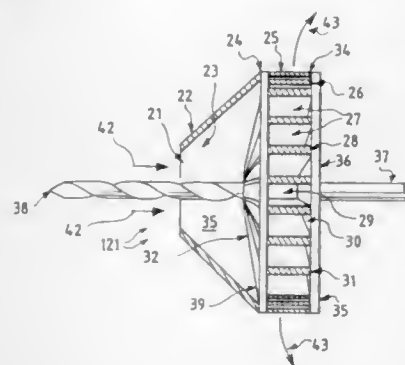
Elie C. Daniel, P.O. Box 147, Mendota, Ill. 61342

Filed Jun. 4, 1996, Ser. No. 658,028

Int. Cl.<sup>6</sup> B23B 47/34

U.S. Cl. 408—67

12 Claims



1. An attachment for a rotary power tool having an elongate rotating tool bit for operating on a work area, said attachment comprising:

- a casing defining an interior cavity and including an airflow opening communicating with the interior cavity for permitting air flow into and out of the interior space;
- a base assembly attached to the casing and including:
  - means for mounting the base assembly on the tool bit for rotary movement therewith;

(ii) a plurality of impellers for causing air flow within the casing when the attachment rotates; whereby rotation of the tool bit results in air flow to remove debris from the work area.

5,772,368

## FULL-SIZE ROUTER TILT BASE

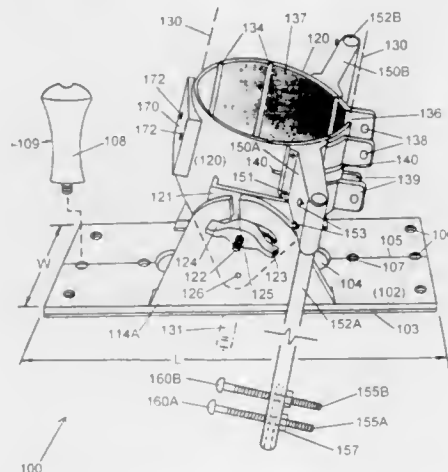
Ransom D. Posh, 31249 Six Mile Rd., Livonia, Mich. 48152

Filed Apr. 19, 1995, Ser. No. 425,184

Int. Cl.<sup>6</sup> B23C 3/12; B27C 5/10

U.S. Cl. 409—182

11 Claims



1. A universal tilt base for a general-purpose router, comprising: a table base having upper and lower surfaces and a longitudinal aperture formed therethrough, the upper surface including a pair of slidably connected chip deflectors; a collar having a cylindrical bore having a diameter of approximately 3½ inches and including structural facilities to receive one of a variety of full-size router motor housings supplied by various manufacturers, including:

- those which slide without rotating to effectuate depth adjustment,
- those which rotate to effectuate depth adjustment,
- those having an at least one layer outward protrusion associated with rack-and-pinion depth adjustment, and
- those having six smaller, spaced-apart outward protrusions,

the collar being tiltingly attached to the upper surface of the table base so that when the router motor, with a cutting bit attached thereto is received by the collar, the bit protrudes through the aperture to effect a workpiece; and means to adjust both the depth and tilt angle of the cutting bit with respect to the lower surface of the table base.

5,772,369

## AIR CARGO RESTRAINT SYSTEM AND FITTINGS THEREFOR

Shmuel Lerman, Ramat Gan; Oded Freedman, Tel Aviv, and Adi Shargil, Gedera, all of Israel, assignors to S.F.A. Engineering 92 Ltd., Ramat Gan, Israel

Filed Dec. 19, 1994, Ser. No. 370,572

Claims priority, application Israel, Jun. 24, 1992, 102308

Int. Cl.<sup>6</sup> B65D 19/00

U.S. Cl. 410—96

31 Claims

- A cargo restraint system comprising:
  - a planar pallet having edge portions and mounting means located along said edge portions;
  - a wrap around tensionable flexible covering placed tightly around in movement restraining contact with the cargo located on said pallet; and

JUNE 30, 1998

GENERAL AND MECHANICAL

4729

5,772,371

## CARGO NETS AND FITTINGS THEREFOR

David Ackerman, Dorchester, Great Britain, assignor to Bridport-Gundry plc, Bridport, England

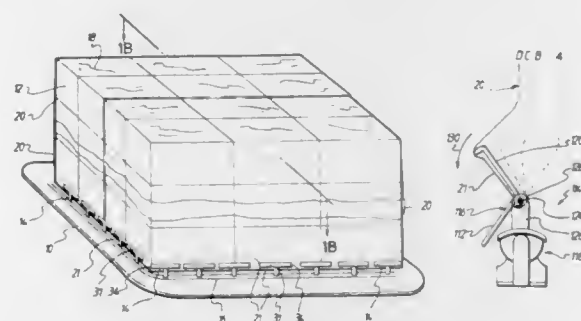
Filed Nov. 20, 1995, Ser. No. 559,639

Claims priority, application United Kingdom, Nov. 22, 1994, 9423513

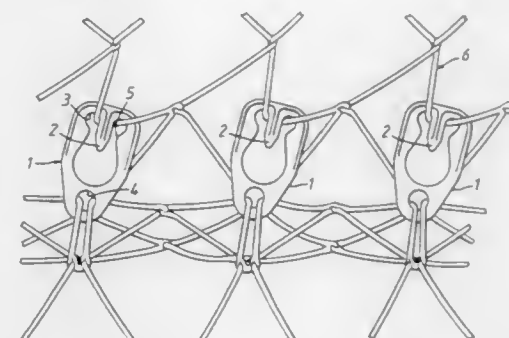
Int. Cl.<sup>6</sup> B61D 45/00; B60P 7/16

U.S. Cl. 410—118

4 Claims



a plurality of anchors adapted for mating engagement with said mounting means of said pallet, and having at least one grip surface shaped to directly grip a lower edge portion of said tensionable covering wrapped around the cargo and extended across said anchors after said anchors have been placed in mating engagement with said mounting means thereby to anchor said covering to said pallet, so as to maintain the cargo in a preselected position on said pallet.



1. A cargo net comprising a plurality of interconnected strands having a surrounding border, wherein there is provided a plurality of net tensioning fittings attached to the net adjacent its border, and wherein each said fitting is formed with a closed ring portion having at least one integral prong which projects inwardly of such ring portion defining a gape on each side of said prong to provide a mouth, and a necked down constriction between said prong and said ring portion over which prong a said net strand is positioned whereby said fitting is engaged with such net strand to tension the net, such prong terminating in a tip which lies substantially on a mid plane of said ring portion, thereby inhibiting unintended engagement of said prong with a strand of said cargo net, and wherein said ring portion of a said tensioning fitting includes a closed eyelet opposite said prong through which another of said strands extends.

5,772,370

## RETRACTABLE AND/OR REMOVABLE NET TYPE CARGO RESTRAINING SYSTEM

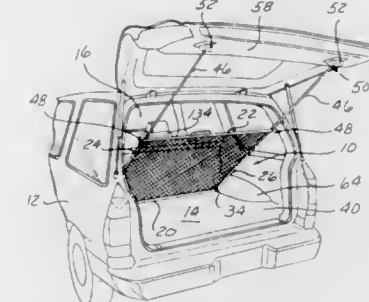
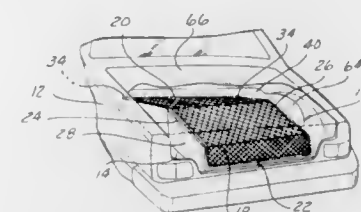
Donal Moore, 2190 Northlawn, Birmingham, Mich. 48009

Filed Nov. 22, 1995, Ser. No. 561,926

Int. Cl.<sup>6</sup> B60P 7/04

U.S. Cl. 410—100

16 Claims



1. A motor vehicle having a passenger compartment, a cargo floor with a front area, a hinged exterior door which opens from outside the vehicle to provide access to the cargo floor, and a net type cargo restraining system, the restraining system comprising: a net member having a length, the net member being detachably connected between a first point proximate the front area of the cargo floor and a second point on the door, whereby the net member is raised and lowered with the door to provide access to the cargo floor for loading and unloading purposes and to capture cargo on the floor when the door is closed; means for varying the length of the net member between the first point and the second point, thereby to accommodate cargo of varying size; and means for maintaining significant tension in the net member, thereby to closely conform the net member to the cargo and to positively restrain the cargo from entering the passenger compartment.

5,772,372

## SPREADING ANCHOR

Reinhard Lins, Sevelen, Switzerland; Erich Wisser, Bregenz, Austria; Helmut Gassner, Triesenberg, Liechtenstein; Susanne Kossian, Feldkirch, Austria; Rainer Kussmaul, Thüringen, Austria; Hermann Beck, Feldkirch-Tisis, Austria, and Markus Hartmann, Feldkirch, Austria, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Mar. 19, 1997, Ser. No. 822,568

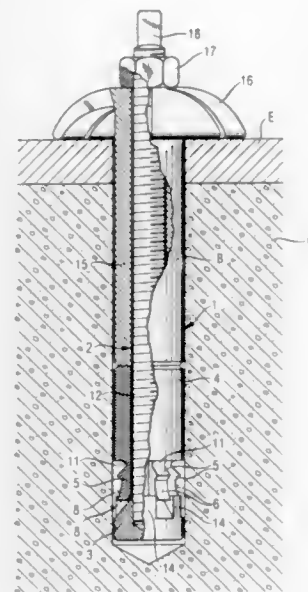
Claims priority, application Germany, Jun. 5, 1996, 196 22 544.2; Jul. 1, 1996, 196 26 308.5

Int. Cl.<sup>6</sup> F16B 13/06

U.S. Cl. 411—55

8 Claims

1. A spreading anchor, comprising an anchor rod (2) having a stem (12) provided, at a front end thereof when viewed in a setting direction, with a cone (3) widening outwardly towards a free end thereof; and a longitudinally displaceable sleeve (4) pushed over the anchor rod (2) and having at a front end (8) cutting tabs (5) which are provided with cutters, are separated from each other by gaps, extend from a plastic hinge (11) toward the cone (3), and are spread radially upon sliding of the sleeve (4) over the cone (3), the sections of the cutting tabs (5), which extend from free ends thereof in a direction toward the plastic hinge (11), having an outer surface (6) remote from the cone (3) and formed at least in a cutting region thereof as a substantially toroidal surface, the toroidal surface (6) has a curvature center (M), which lies on an intersection of a symmetry line of a section (1) of the outer surface (6) of the cutting tab (5), which extend into a base material into which the spreading anchor is inserted, and a symmetry line of an angle formed by a transition of the stem (12) to the cone (3), and wherein the toroidal surface (6) has a radius (R) of curvature in an as spread condition determined from an equation:



$$R = [X^2 + (t/2 \sin \alpha)^2]^{1/2}$$

where

x—is a length of the symmetry line of the section (1) from the center (m) to its intersection with a line defining a longitudinal extent of the section (1) of the toroidal surface (6).  
t—is a depth of the undercut measured in a direction transverse to an axis (A) of the anchor, and  
 $\alpha$ —is an angle of a mean inclination of the section (1) of the outer surface (6), which is located in the ground, to the axis (A).

5,772,373

## NUT AND LOCKING DEVICE

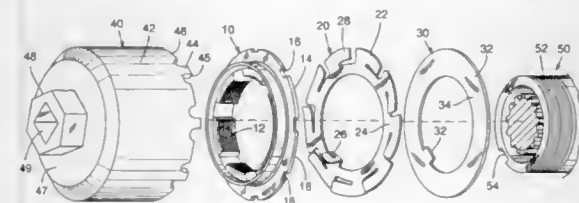
Philip J. Cronin, II, Gladstone; Lonnie G. Williams, Jr., Portland; Thomas F. Dunlap, West Linn, all of Oreg.; David C. Wood, Vancouver, Wash.; Jon A. Bigley, Canton, Mich.; Stuart Miller, Carlton, and James D. Hensley, Clackamas, both of Oreg., assignors to Warn Industries, Inc., Milwaukie, Oreg.

Continuation-in-part of Ser. No. 333,500, Nov. 2, 1994, Pat. No. 5,618,143. This application Nov. 20, 1995, Ser. No. 560,629

Int. Cl.<sup>6</sup> F16B 39/10

U.S. Cl. 411—120

19 Claims



1. A nut and locking device for securing a nut in position on a threaded shaft comprising:

- a nut having a threaded aperture for engaging the threads on the shaft whereby rotation of the nut in one direction moves the nut onto the shaft and reverse rotation moves the nut off of the shaft, the nut having at least one notch formed therein;
- a spring having an aperture for receiving the shaft and mated to the shaft to permit axial movement and prevent rotation of the spring relative to the shaft, the spring defining a plane against which the nut is received as the nut is rotated onto the shaft;
- at least one resilient spring finger integrally formed in the spring and resiliently biased out of the plane toward the nut so as to engage the notch and prevent reverse rotation of the nut relative to the shaft.

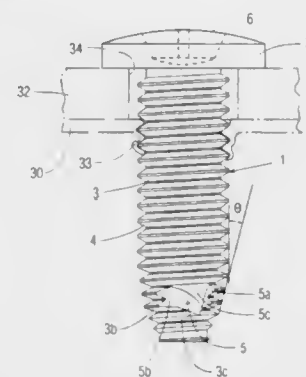
5,772,374  
TAPPING SCREW AND MECHANISM OF ENGAGING MEMBER TO BE ENGAGED USING THE SAME  
Masaaki Ide, and Hiroyuki Matsubara, both of Aichi-ken, Japan, assignors to Aoyama Seisakusho Co., Ltd., Aichi-ken, Japan

Filed Dec. 18, 1996, Ser. No. 768,999

Claims priority, application Japan, Jan. 8, 1996, 8-000976  
Int. Cl.<sup>6</sup> F16B 25/00; 35/04

U.S. Cl. 411—386

2 Claims



1. A tapping screw for engaging a member to be engaged with a base plate made of metal by tapping a burring hole formed on said base plate, said tapping screw comprising:

- a main body having a shank and a head formed at a base end of the shank;
- a reduced diameter shank portion having a taper angle  $\theta$  of 9° to 14° and a substantially rounded triangle shaped cross-section, said reduced diameter shank portion extending from a fore end portion of said shank of the main body; and
- recesses having no thread, said recesses being formed at three faces of said reduced diameter shank portion so that a circumferential width of each recess is gradually reduced toward a tip end of the reduced diameter shank portion, and each recess being formed by a steep face facing a screwing direction of said tapping screw and a gentle face oppositely facing the steep face to form a groove.

5,772,375

## MULTI-WALL TIE APPARATUS AND METHOD

Robert Ian Paterson, London, and Brian Alan Breeze, Wallsend, both of England, assignors to Helifix Ltd., Buckinghamshire, United Kingdom

Division of Ser. No. 721,827, Sep. 27, 1996, Pat. No. 5,687,801, which is a continuation-in-part of Ser. No. 204,465, Feb. 28, 1994, abandoned. This application Jun. 6, 1997, Ser. No. 870,708

Int. Cl.<sup>6</sup> F16B 35/04

U.S. Cl. 411—389

2 Claims



1. A two-step tie for use in securing multiple walls together comprising, in combination,

- a helical body portion having helical portions;
- said helical body portion having a central core in which the helical portions are joined at a mid-point; and
- one helical portion having a diameter smaller than the other, both helical sections having a pitch in the same direction, and one end of the tie being characterized by a cutting configuration.

tion, the two helical portions which are joined at the mid-point have the same pitch in opposite directions away from the mid-point.

5,772,376

## COUNTERSUNK HEAD SCREW

Gottfried König, Bad Laasphe, Germany, assignor to Ejot Verbindungstechnik GmbH & Co. KG, Bad Laasphe, Germany

PCT No. PCT/EP96/02203, § 371 Date May 15, 1997, § 102(e) Date May 15, 1997, PCT Pub. No. WO96/38676, PCT Pub. Date Dec. 5, 1996

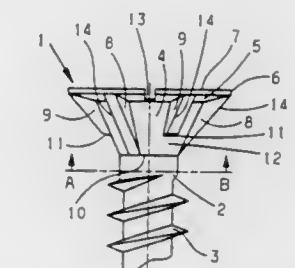
PCT Filed May 22, 1996, Ser. No. 776,732

Claims priority, application Germany, May 29, 1995, 295 08 852.4

Int. Cl.<sup>6</sup> F16B 23/00; 35/06

U.S. Cl. 411—399

14 Claims



1. A countersunk head screw having ribs which are arranged on the conical underside of its screw head, project relative to the underside, are present in an even number and have countersinking cutting edges, wherein every second rib, at its end facing the screw shank, has a step which is formed by shortening said every second rib relative to the adjacent ribs.

5,772,377

## CAPPED WHEEL FASTENER

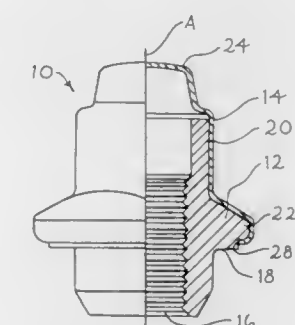
Theodore J. Bydalek, Buffalo Grove, Ill., assignor to MacLean-Fogg Company, Wheeling, Ill.

Filed May 8, 1997, Ser. No. 852,896

Int. Cl.<sup>6</sup> F16B 37/14; 43/00

U.S. Cl. 411—429

13 Claims



1. A flanged wheel fastener comprising:

- a fastener body comprising a threaded portion, flange extending outwardly from the threaded portion, an out-of-round surface adapted to receive torques from a wrench, and a load-bearing surface formed on the flange, said flange extending radially outwardly from the out-of-round surface, said out-of-round surface and said load-bearing surface positioned on opposite sides of said flange; and
- a cap disposed over the out-of-round surface and the flange, wherein the cap comprises an edge, wherein a portion of said

cap adjacent said edge is bent around the flange to retain the cap on the fastener body, and wherein said edge is axially spaced away from all portions of the load-bearing surface; said cap being free of welding attachment to the fastener body.

5,772,378

## PRE-TENSIONING DEVICE FOR FASTENING ELEMENTS AND METHOD FOR PRE-TENSIONING A FASTENING ELEMENT

Jyrki Matti Keto-Tokoi, Tampere, Finland, assignor to Kvaerner Tamturbine Oy, Tampere, Finland

PCT No. PCT/FI94/00539, § 371 Date Aug. 1, 1996, § 102(e) Date Aug. 1, 1996, PCT Pub. No. WO95/15442, PCT Pub. Date Jun. 8, 1995

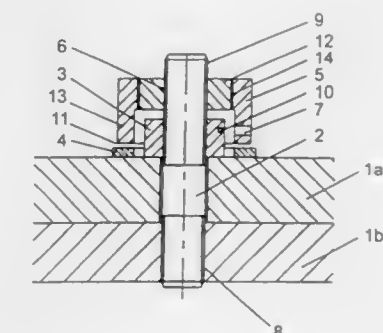
PCT Filed Nov. 30, 1994, Ser. No. 647,915

Claims priority, application Finland, Nov. 30, 1993, 935329; Nov. 30, 1993, 935330

Int. Cl.<sup>6</sup> F16B 35/00; 37/08

U.S. Cl. 411—432

17 Claims



1. A pre-tensioning device for use with a fastening element for fastening pieces together, said fastening element having a tightening element movable longitudinally along a first region thereof, which fastening element is to be subjected to a pre-tensioning expansion, said device comprising:

- a locking piece fixedly attachable to said first region of said fastening element and extending over said tightening element; said tightening element being movable with respect to a piece to be fastened independently of said locking piece; and
- an annular sleeve made of a shape memory metal and positioned between said locking piece and said piece which is to be fastened to another piece, whereby when said annular sleeve is heated it undergoes an expansion due to a phase transformation and forces said locking piece upwards such that said fastening element is stretched and said tightening element can be tightened against said piece to be fastened.

5,772,379

## SELF-FILLING STAPLE FASTENER

Kenneth Evensen, 1429 Fremont, Bartlett, Ill. 60103

Filed May 24, 1996, Ser. No. 652,944

Int. Cl.<sup>6</sup> F16B 15/08

U.S. Cl. 411—442

10 Claims

1. A staple fastener comprising:

- at least two longitudinally extending leg portions, said leg portions being interconnected at one end thereof, said leg portions being separated and defining a space therebetween;



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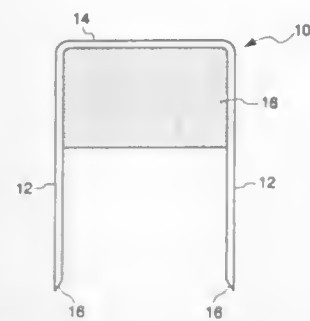
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receiving sockets when said receptacle half elongated fastener receiving slot aligns with said plug half elongated fastener receiving slot.

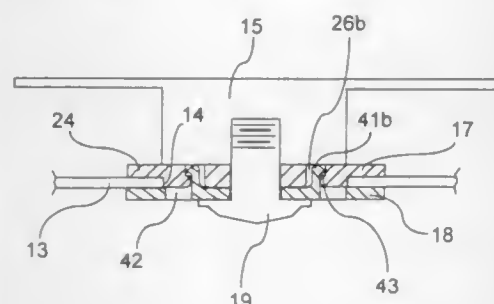
an extrudable filler means for filling an indentation made in a substrate by installation of the staple, wherein said filler means at least partially fills said space between said leg portions.

**5,772,380**  
**ROTO-SLOT ADJUSTABLE ATTACHMENT DEVICE**  
Mark L. Cloud, Seattle, and Christopher L. Schwitters, Everett, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 20, 1996, Ser. No. 771,104  
Int. Cl.<sup>6</sup> F16B 19/00; 21/00

U.S. Cl. 411—508

9 Claims



1. An adjustable attachment device for placement in a part having a circular receiving aperture for facilitating attachment of said part to adjacent structure, said adjustable attachment device comprising:

a receptacle half defining a periphery having a size selected to overlap the edges of said circular receiving aperture on a first side of said part, and defining a raised circular plateau having a height corresponding to the thickness of said part at said circular receiving aperture, said raised circular plateau being positioned relative to said receptacle half periphery and having a size selected for cooperative engagement of said circular receiving aperture for restraining said receptacle half to rotational motion in the plane of said circular receiving aperture, said receptacle half further defining a plurality of projection receiving sockets positioned on said raised circular plateau, and an elongated fastener receiving slot extending across said raised circular plateau; and

a plug half having a periphery sized to overlap the edges of said circular receiving aperture on a second side of said part, and defining an elongated fastener receiving slot dimensionally corresponding to said elongated fastener receiving slot in said receptacle half, said plug half further defining a plurality of resilient retaining projections, said resilient retaining projections corresponding in number and relative position to said plurality of projection receiving sockets, each resilient retaining projection having an angled tip surface and including a latching feature for one way insertion and retention of said resilient retaining projection within one of said plurality of receptacle half projection receiving sockets, each resilient retaining projection being positioned relative to said plug half elongated fastener receiving slot so as to align with a corresponding one of said plurality of receptacle half projection

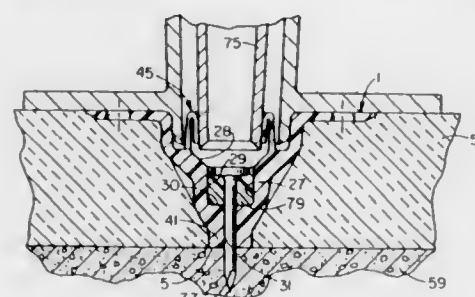
**5,772,381**  
**ATTACHMENT PLATE FOR INSULATION PANELS**  
Gilbert Olvera, Chicago, and Michael C. Dill, Elk Grove Village, both of Ill., assignors to Illinois Tool Works Inc., Glenview, Ill.

Division of Ser. No. 369,354, Jan. 6, 1995, Pat. No. 5,607,272.  
This application Sep. 5, 1996, Ser. No. 708,444

Int. Cl.<sup>6</sup> F16B 43/00

U.S. Cl. 411—533

20 Claims



1. Apparatus for attaching an insulation panel to a building substrate, comprising:

tool means, having a magazine for housing at least one strip of collated fasteners, and a nosepiece portion, for inserting at least one of said collated fasteners into a building substrate so as to attach an insulation panel to said building substrate; and an attachment plate having first and second ends disposed along a longitudinal axis and comprising a washer having a central opening of a predetermined diametrical extent provided at said first end of said attachment plate, and a tubular member joined to said washer and extending concentrically along said longitudinal axis between said first and second ends of said attachment plate;

said tubular member comprising a first section adjacent to said washer and including an inner peripheral wall which defines a first inner diametrical extent which is substantially the same as said diametrical extent of said washer central opening, said inner peripheral wall of said first section terminating in a first transverse surface; a second section adjacent to said first section and including an inner peripheral wall defining a second inner diametrical extent which is less than said first inner diametrical extent of said first section, said inner peripheral wall of said second section terminating in a second transverse surface that cooperates with said inner peripheral wall of said second section so as to define a recess for accommodating a head portion of a fastener which is adapted to be inserted into said building substrate so as to secure said insulation panel to said building substrate; an end section adjacent to said second section and defining a passage there-through for accommodating a shank portion of said fastener for securing said insulation panel to said building substrate; and finger means, spaced radially inwardly from said inner peripheral wall of said first section and mounted upon said first transverse surface of said first section, for forming an annular chamber with said inner peripheral wall of said first section so as to accommodate said nosepiece portion of said tool means and thereby enable said attachment plate to be mounted upon said nosepiece portion of said tool means, and for closing a central bore portion of said first section of said tubular member of said attachment plate so that said head portion of said fastener is substantially covered after said tool means has been fired and said fastener has been inserted into said building substrate so as to thereby install said insulation panel upon said building substrate as a result of said insulation panel being clamped between said attachment plate washer and said building substrate.

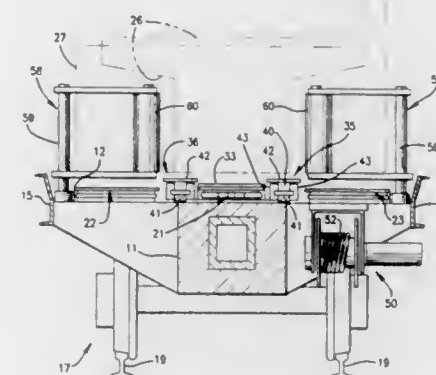
**5,772,382**  
**UNLOADING CONCRETE BEAMS FROM RAILROAD CARS**  
W. Eddie Raymer, Louisville, Ky., assignor to Lincoln Industries Corp., Louisville, Ky.

Filed Oct. 23, 1995, Ser. No. 547,018

Int. Cl.<sup>6</sup> B60P 1/02

U.S. Cl. 414—339

20 Claims



1. A railroad car for transporting heavy elongated structures, comprising:

a frame including a generally planar top surface, first and second ends, and first and second sides;  
railroad wheels mounting said frame for movement on rails;  
a plurality of lifting bladders mounted on said top surface for lifting a heavy elongated structure to move it away from said top surface;  
stationarily mounted roller means mounted adjacent at least one of said first and second ends;  
movable roller means for movement underneath a heavy elongated structure lifted by said lifting bladders; and  
powered linear moving means for moving a heavy elongated structure which is supported by said movable roller means along said surface, and into association with said stationarily mounted roller means.

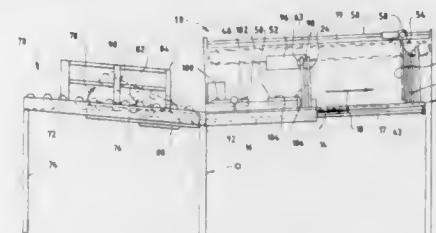
**5,772,383**  
**PIVOTAL MAIL TRAY UNLOADER**  
Joseph Kalika, Niles; David Fillicicchia, Schaumburg; Stelian Jurma, Arlington Heights; George Rabindran, Morton Grove, and Mathai P. Easo, Des Plaines, all of Ill., assignors to Bell & Howell Postal Systems Inc., Lincolnwood, Ill.

Filed Oct. 16, 1996, Ser. No. 729,348

Int. Cl.<sup>6</sup> B65G 65/23

U.S. Cl. 414—403

15 Claims



1. A tray unloader for unloading an associated mail tray, the tray having a bottom wall and upstanding side walls defining an open top, one of the side walls being a leading wall, the tray being configured for receiving therein a plurality of horizontally oriented, stacked items, the unloader being adapted to receive the tray and pivotally unload the tray and to reorient the items therein to a generally vertical orientation, the unloader comprising:

a frame having an elongated, inclined support surface defining a mail travel path;  
a carriage slidably mounted to said frame, the carriage having

a first support member pivotally forwardly from said support surface about 75° between an orientation generally coplanar with said support surface and an orientation generally transverse thereto, said first support member adapted to receive the tray with the bottom wall thereon, and rotate the tray about 75° therewith;

a second support member pivotally from said support surface, said second support member being adjacent to and forward of said first support member, said second support member being pivotally about 66° between an orientation generally coplanar with said support surface and an orientation generally transverse thereto, said second support member adapted to receive the tray with the leading wall thereon, and rotate the tray about 66° therewith;

a third pivotal support member adjacent to and pivotal with said second support member, said third support member being forward of said second support member, said third support member being pivotally about 66° from an orientation generally transverse to said support surface, said third support member being formed from a plurality of plate-like elements having a fan-like configuration pivotal about an axis of rotation parallel to said mail travel path and in spaced relation with said support surface, said third support member being adapted to support thereagainst the stacked items in a generally vertical orientation, rotate forward about 66° to reorient the stacked items in a generally transverse orientation, and subsequently rotate rearward about 66° to reorient the stacked items in the generally vertical orientation; and

a retaining member mounted to said frame and slidable along said frame in a first direction parallel with said mail travel path, said retaining member being rotatable in a direction generally perpendicular to said first direction, said retaining member being configured to cooperate with said third support member to retain the stacked items therebetween when said items are in a generally vertical orientation, and further adapted to slidably move along said frame with the stacked items thereon.

**5,772,384**  
**SIDE-LOADING REFUSE VEHICLE**  
Idwall Charles Richards, 48 Terranora Road, Banora Point, New South Wales, 2486, Australia

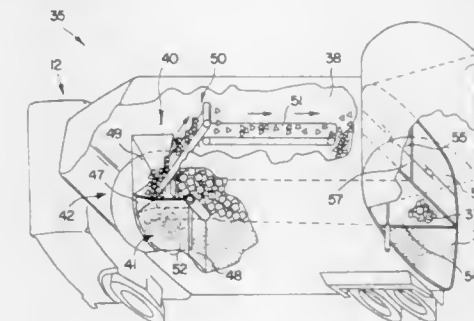
PCT No. PCT/AU93/00052, § 371 Date Aug. 9, 1994, § 102(e) Date Aug. 9, 1994, PCT Pub. No. WO93/15982, PCT Pub. Date Aug. 19, 1993

PCT Filed Feb. 10, 1993, Ser. No. 284,675

Claims priority, application Australia, Feb. 10, 1992, PL0792; Feb. 28, 1992, PL1123; Apr. 3, 1992, PL1150; Apr. 13, 1992, PL1884; Aug. 26, 1992, PL4326; Oct. 22, 1992, PL5467  
Int. Cl.<sup>6</sup> B65F 3/20

U.S. Cl. 414—408

13 Claims



1. A side loading refuse vehicle having a forward end, opposed sides and a rearward end, comprising:

a driver's cab;  
an elongated storage tank for storing refuse, the storage tank provided behind said driver's cab and having an upper storage region and a lower storage region, said upper storage region

having a forward end and a rearward end, and said lower storage region having a forward end and a rearward end, said forward end of said lower storage region including a relatively narrow entrance leading into a relatively wide rear storage area;

receiving means for receiving refuse from a bin, including an entrance passageway provided behind said driver's cab and in front of said upper storage region and said lower storage region, said entrance passageway having separating means for separating the refuse into a first refuse stream and a second refuse stream;

loading means for loading the bin, said loading means including an arm located adjacent one of the opposed sides of the refuse vehicle and extendable sideways therefrom under control from said driver's cab, said loading means further including engaging means for engaging the bin and emptying refuse from the bin into said storage tank through said entrance passageway, wherein said arm is supported at a first end by the opposed side, and said engaging means is supported by another end of said arm;

a first refuse transfer mechanism provided downstream of said entrance passageway and including first moving means moving the first refuse stream into said upper storage region; and a second refuse transfer mechanism provided downstream of said entrance passageway and including second moving means, confined in its operation to said forward end of said lower storage region, receiving the second refuse stream and moving the second refuse stream to said lower storage region by pushing the second refuse stream through said narrow entrance, and compacting the second refuse stream within said rear storage area.

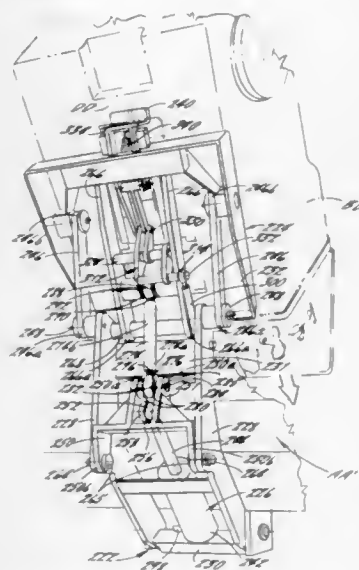
5,772,385  
LIFT MECHANISM FOR LIFTING REFUSE  
CONTAINERS

Russell Curtis Huntoon, and Thomas Frederick Dickman, both of Sparks, Nev., assignors to Automated Refuse Equipment, Inc., Reno, Nev.

Continuation-in-part of Ser. No. 349,625, Dec. 5, 1994, Pat. No. 5,513,937. This application May 6, 1996, Ser. No. 646,750 Int. Cl.<sup>6</sup> B65F 3/02

U.S. Cl. 414—408

10 Claims



1. A lifting apparatus for use with a refuse collection vehicle for lifting and dumping a refuse cart, said apparatus comprising: a frame adapted for mounting to the refuse collection vehicle; a pan assembly adapted to engage the refuse cart; a reciprocating actuator having a first end and a second end movable relative to said first end between an extended position and a retracted position; and

a plurality of arms pivotally connected between said pan assembly and said reciprocating actuator for moving said pan assembly along a predetermined path between a receiving position for engaging the refuse cart and a dumping position for emptying the refuse cart, said arms being cooperatively linked so as to accelerate said pan assembly from the receiving position along an initial portion of said predetermined path and to decelerate said pan assembly along a terminal portion of said predetermined path in response to a predetermined constant velocity of said second end of said reciprocating actuator, said arms comprising two four bar linkages connected to each other in series.

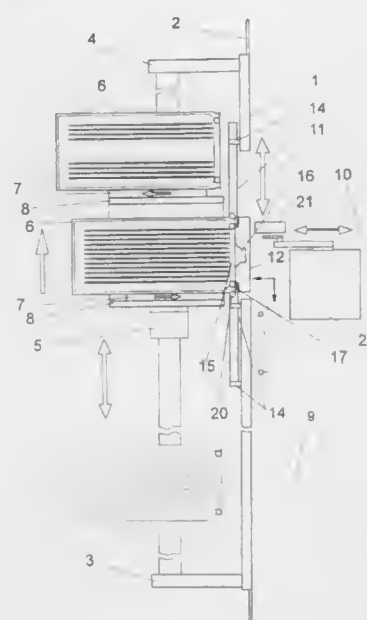
5,772,386  
LOADING AND UNLOADING STATION FOR  
SEMICONDUCTOR PROCESSING INSTALLATIONS  
Andreas Mages; Werner Scheler, both of Jena; Herbert Blaschitz, Munich; Alfred Schulz, and Heinz Schneider, both of Jena, all of Germany, assignors to Jenoptik AG, Jena, Germany

Filed Mar. 14, 1996, Ser. No. 615,386  
Claims priority, application Germany, Mar. 28, 1995, 195 11 024.2; Nov. 15, 1995, 195 42 646.0

Int. Cl.<sup>6</sup> B65G 49/07

U.S. Cl. 414—411

14 Claims



1. A loading and unloading station for semiconductor processing installations having a charging opening through which disk-shaped objects can be loaded, unloaded and reloaded comprising: a removable closure for said charging opening; a transporting container for accommodating said disk-shaped objects from which said objects can be loaded, unloaded and reloaded; a container cover which is provided with said transporting container; means for coupling said container cover of said transporting container with said closure by adhering engagement; means for effecting a simultaneous opening of said charging opening and transporting container by jointly moving said container cover and closure into a semiconductor processing installation; a manipulating device being arranged in said semiconductor processing installation for carrying out the loading and unloading of the disk-shaped objects through the charging opening and into said transporting container; and a vertically and horizontally adjustable first platform for supporting the transportable container, said platform being pro-

vided with means for aligning and securing the transporting container for the purpose of coupling the container cover with the closure.

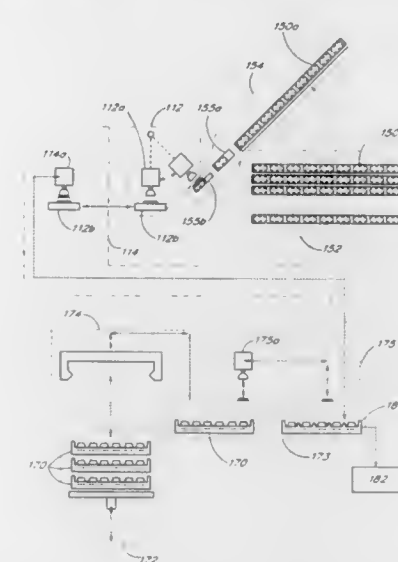
5,772,387  
DEVICE TRANSFER APPARATUS AND DEVICE  
REINSPECTION METHOD FOR IC HANDLER  
Hiroyo Nakamura, Kazuo; Yoshihito Kobayashi, Gyoda, and Katsuhiko Suzuki, Meiwa-mura, all of Japan, assignors to Advantest Corp., Tokyo, Japan

Filed Jun. 30, 1995, Ser. No. 497,223  
Claims priority, application Japan, Jun. 30, 1994, 6-171911; Mar. 23, 1995, 7-090376

Int. Cl.<sup>6</sup> B65B 21/02

U.S. Cl. 414—416

8 Claims



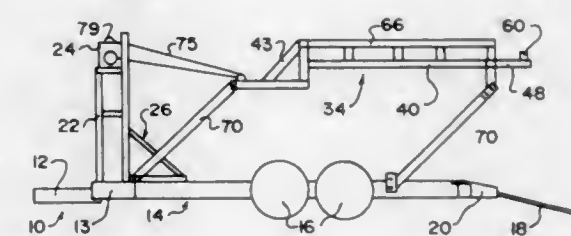
1. A device transfer apparatus to be used in an IC handler for transferring IC devices to be tested from a device loading area to a test area of said IC handler through a test tray (180), comprising: a tray supply section (172) in said device loading area for storing a plurality of user trays (170), each of said user trays (170) carrying IC devices to be tested on a horizontal plane; a tray conversion section (173) for replacing said user trays (170) with test trays (180); a supply tray transfer mechanism (174) for transferring said user tray (170) from said tray supply section (172) to said tray conversion section (173) so that said IC devices in said user trays (170) are picked therefrom and placed on said test trays (180) by said tray conversion section (173); a supply magazine transfer mechanism (154) for allowing a downward movement of IC devices to be tested stored in rod-shaped magazines (150) by means of own weight of said IC devices; a pick carrier section (112) for picking said IC devices from said supply magazine transfer mechanism (154) during said downward movement and converting said downward movement of said IC devices to a horizontal movement and placing said IC devices on carriers (112b) which are aligned in a horizontal direction; and a device transfer section (114) for transferring said IC devices on said carriers (112b) to said tray conversion section (173) and placing said IC devices on said test trays (180).

5,772,388  
COMBINATION HAULER FOR VEHICLE AND  
TRAILERED BOAT

Richard J. Clark, R.R. 1, Box 155, Gilman, Ill. 60938  
Filed May 28, 1996, Ser. No. 654,236  
Int. Cl.<sup>6</sup> B60P 3/08; 3/10

U.S. Cl. 414—484

28 Claims



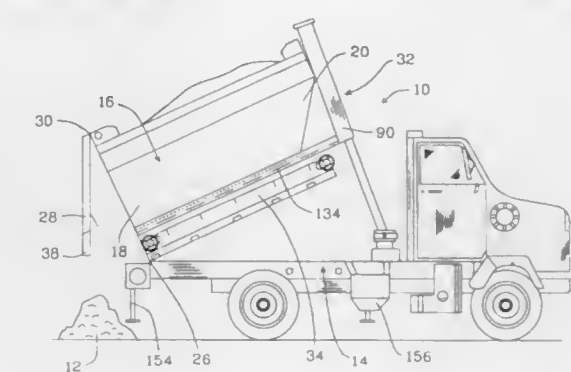
1. A combination hauler for hauling a vehicle and at least a boat trailer, the hauler comprising a wheeled horizontal flatbed to which a horizontal trailer engaging cradle is pivotably mounted, the cradle including a boat trailer wheel engaging dolly at one end thereof and a removable cross bar elevated above the level of the dolly for supporting a forward end of the boat trailer at an opposite end thereof, the cradle pivoting from a predetermined elevated position above a front end of the flatbed to a lowered position where the cradle rests on a rear end portion of and extends beyond a rear end of the flatbed, the cradle and the boat trailer at all times maintaining a position parallel to the flatbed.

5,772,389  
COMBINED DUMP TRUCK AND SPREADER  
APPARATUS  
Richard L. Feller, Monroe, Wis., assignor to Monroe Truck Equipment Inc., Monroe, Wis.

Filed Sep. 20, 1996, Ser. No. 717,511  
Int. Cl.<sup>6</sup> B60P 1/36

U.S. Cl. 414—489

12 Claims



1. A combined dump truck and spreader apparatus for selectively dumping and spreading materials, said apparatus comprising: a truck chassis; a dump body for receiving and dispensing the materials, said body having a first and a second end and a first and a second side wall, said body being pivotally secured to said chassis about a pivotal axis; hoist means extending between said body and said chassis for selectively pivoting said body about said pivotal axis; a tailgate pivotally secured to said first end of said body about a further pivotal axis for selectively permitting dumping of the materials therethrough when said body is pivoted about said pivotal axis; endless conveyor means trained over drive means, said conveyor means being disposed at a bottom of said walls and within said body and extending between said first and second ends thereof for conveying the materials along said body; spreader means cooperating with said conveyor means for spreading the materials;



said tailgate defining an opening which co-operates with said conveyor means for permitting the flow therethrough of the materials, the arrangement being such that selective spreading and dumping of the materials from said opening is permitted; and

said side walls curving downwardly and inwardly towards said conveyor means such that said dump body defines a substantially semi-circular cross sectional configuration for guiding and evenly deflecting all of the materials within said body towards said conveyor means along the entire length of said conveyor means.

5,772,390

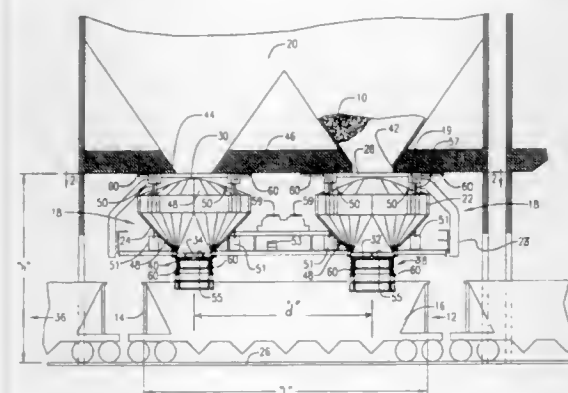
## COAL LOADING SYSTEM AND METHOD

Harold A. Walker, 3406 Stoneridge Dr., Johnson City, Tenn. 37604

Filed Jun. 6, 1997, Ser. No. 870,862  
Int. Cl.<sup>6</sup> B65G 67/22

U.S. Cl. 414—786

17 Claims



1. The method for loading a moving railroad car from front to back with a target weight of particulate material from a loading unit having a silo means and first and second weigh bin means, which bin means have a combined material weight capacity of less than said target weight, said method comprising the steps of:

- (a) making a first charge of material into said first bin means;
- (b) discharging a first quantity of material from said first bin means into a forward portion of said car;
- (c) making a second charge of material into said first bin means;
- (d) discharging a second quantity of material from said first bin means into a rearward portion of said car, wherein the weights of said first and second quantities are determined and, as a combined weight, is less than said target weight;
- (e) making a charge of material into said second bin means;
- (f) discharging from said second bin means into said car a topping quantity of material equal in weight, to within about 0.5%, to said target weight less said combined weight, to thereby attain, within very close limits, the target weight of material in said car; and
- (g) wherein either or both of the charging step of (e) and the discharging step of (f) may be initiated at any convenient time during the car loading operation.

5,772,391

## STACKER FOR COUNTING AND STACKING SIGNATURES DELIVERED BY A GRIPPER CONVEYOR

Christer A. Sjogren, Miami, and Medardo Espinosa, Hialeah, both of Fla., assignors to Quipp Systems, Inc., Miami, Fla.

Filed Nov. 22, 1995, Ser. No. 561,694

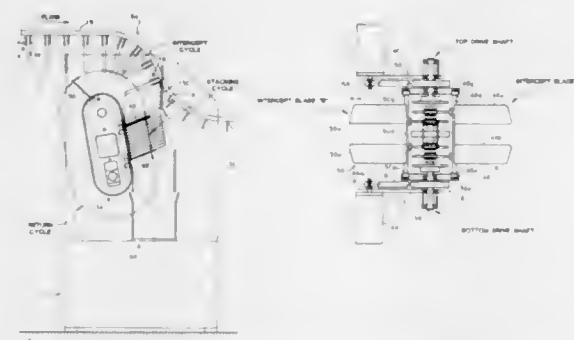
Int. Cl.<sup>6</sup> B65H 29/04

U.S. Cl. 414—790.9

28 Claims

1. Apparatus for stacking signatures comprising:

a stacking platform for receiving signatures;



means for guiding said stacking platform along a closed-loop path including a first substantially linear path portion defining a stacking region for guiding said stacking platform downwardly therealong, a second linear path portion arranged substantially parallel to said first linear path portion, and substantially semi-circular path portions linking said linear path portions at their upper and lower ends;

drive means including a motor for moving said stacking platform about said closed-loop path;

gripper conveyor means for conveying signatures comprising a plurality of grippers arranged at spaced intervals and guide means for guiding said grippers to move towards said stacking apparatus, and to pass over said stacking apparatus and along a downwardly curved path toward said stacking region; said stacking platform having intercept blade means with a free end for moving between adjacent signatures guided along said path by said grippers in a region generally above the upper end of said closed-loop path and as said stacking platform moves along the upper semi-circular path portion;

said grippers being movable between a gripping and a releasing position; and

release means for causing a gripper to release a gripped signature to fall toward said stacking platform as the gripper being released passes a given location along said curved path.

5,772,392

## OBJECT PICKING SYSTEM

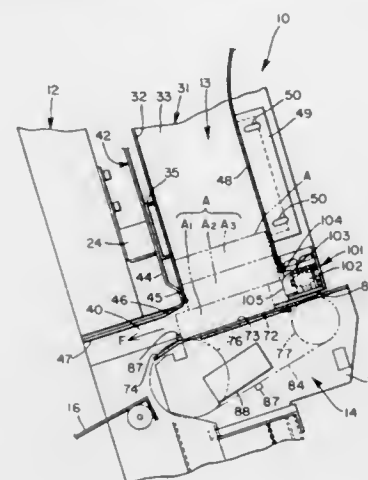
Ryoichi Okura, and Yutaka Saeki, both of Kakogawa, Japan, assignors to Okura Yusoki Kabushiki Kaisha, Hyogo, Japan

Filed Aug. 20, 1996, Ser. No. 699,985

Int. Cl.<sup>6</sup> A01C 9/00

U.S. Cl. 414—797.9

21 Claims



1. An object picking device for storing at least one stack of a first object and at least a second object and discharging said first object of said at least one stack onto an object conveyor, comprising:

said first object being a lowest object in said stack;

said at least a second object being supported on said first object;

at least a first object storage/discharge device;

said at least first object storage/discharge device having an object storage section;

said object storage section having a front panel and a side panel at an angle to each other;

first means for supporting said object storage section inclined toward said front panel, whereby said objects are gravity urged toward said front panel;

second means for supporting said object storage section inclined toward said side panel, whereby said objects are gravity urged toward said side panel;

each of said at least first object storage/discharge devices each including a bottom platform on which said first object is supported;

said bottom platform having a longitudinal slot;

a discharge port at an end of said bottom platform;

an object lifter movably mounted on each of said plurality of object discharge devices;

said object lifter movable between a retracted position, whereat said object lifter does not raise any of said objects, and an advanced position whereat said object lifter raises said at least a second object; and

means for pushing said first object along said bottom platform through said discharge port when said object lifter raises said at least a second object to reduce the friction on said first object and thereby enabling discharge of said first object while retaining said at least a second object against discharge.

5,772,393

## LOW NOISE FUEL PUMP UNIT

Takehide Nakamura, Shinichi Fujii, Koichi Iwata, and Satoru Ikeda, all of Obu, Japan, assignors to Aisan Kogyo Kabushiki Kaisha, Obu, Japan

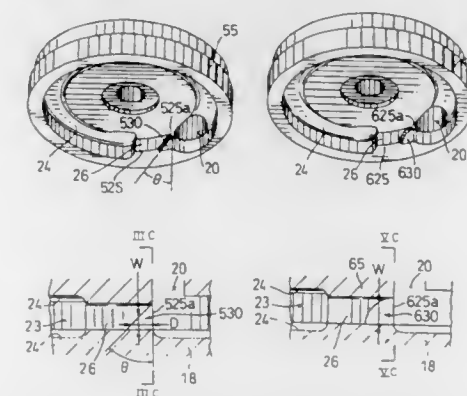
Filed Oct. 17, 1996, Ser. No. 732,925

Claims priority, application Japan, Oct. 27, 1995, 7-280749

Int. Cl.<sup>6</sup> F01D 1/12

U.S. Cl. 415—55.4

6 Claims



1. In a low impeller noise fuel pump unit including;

a substantially disc-shaped rotatable impeller having an axis;

a pump casing for accommodating said impeller, said pump casing having a pressurizing passage surrounding an outer peripheral edge of said impeller and extending along said outer peripheral edge from an upstream end to a downstream end, an inlet hole communicating with the upstream end of said pressurizing passage, an outlet hole communicating with the downstream end of the pressurizing passage, and a partition wall formed at a location circumferentially upstream of the upstream end and downstream of the downstream end of the pressurizing passage;

the improvement comprising:

a cutout slot formed at an end of said partition wall facing said outlet hole, the width of said cutout slot in the direction of the impeller axis being gradually reduced as said cutout slot extends from an end of said partition wall in a circumferentially downstream direction.

6. In a low impeller noise fuel pump unit including:

a substantially disc-shaped rotatable impeller having a rotating axis;

a pump casing for accommodating said impeller, said pump casing formed with a pressurizing passage having an upstream and a downstream end, said pressurizing passage surrounding an outer peripheral edge of said impeller and extending along said outer peripheral edge from the upstream end to the downstream end, an inlet hole communicating with the upstream end of said pressurizing passage, an outlet hole communicating with the downstream end of the pressurizing passage, and a partition wall formed at a location circumferentially upstream of the upstream end and downstream of the downstream end of the pressurizing passage;

the improvement comprising:

a cutout slot formed at an end of said partition wall facing said outlet hole, the circumferential length of said cutout slot changing in the direction of the rotating axis.

5,772,394

## SELF-PRIMING CENTRIFUGAL PUMP

Hiroshi Yokota, 11-11-302, Midori 1-Chome, Minami-ku, Hiroshima-shi, Hiroshima-ken, and Shingo Yokota, 17-27, Midori 3-Chome, Minami-ku, Hiroshima-shi, Hiroshima-ken, both of Japan, assignors to Kabushiki Kaisha Yokota Seisakusho, Hiroshima-ken; Hiroshi Yokota, and Shingo Yokota, both of Hiroshima-ken, all of Japan

PCT No. PCT/JP94/01824, § 371 Date Feb. 5, 1997, § 102(e) Date Feb. 5, 1997, PCT Pub. No. WO95/12760, PCT Pub. Date May 11, 1995

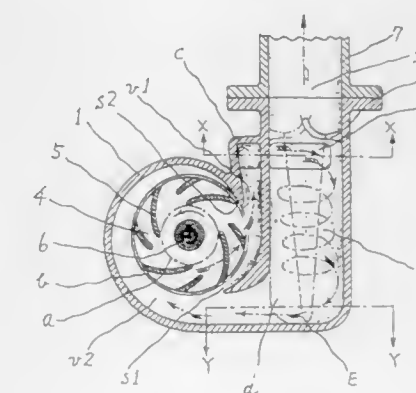
PCT Filed Oct. 28, 1994, Ser. No. 632,408

Claims priority, application Japan, Nov. 1, 1993, 5-273361

Int. Cl.<sup>6</sup> F04D 29/66

U.S. Cl. 415—56.1

3 Claims



1. A self-priming centrifugal pump comprising: an impeller (4); and a pump casing (1) having a smaller volute (v1) and a larger volute (v2); a space (s1) being formed between the outer circumference of the impeller (4) and a starting end of the smaller volute (v1), said space being greater than a space (s2) between the outer circumference of the impeller (4) and a starting end of the larger volute (v2); a circulating current of self-priming water flowing from the smaller volute (v1) to the larger volute (v2); a diffusing part of the larger volute (v2) being formed so as to guide a current of the self-priming water spouted through a spouting passage (c) of the smaller volute (v1) so that the current of the self-priming water flows tangentially to an upright, cylindrical self-priming water separating chamber (e) to generate a whirling current of the self-priming water;

characterized in that guide passage means (F) for lowering the rising head of the whirling current of the self-priming water is provided on a cylindrical wall of the self-priming water separating chamber (e) in an upper area of said cylindrical wall toward a discharge side than said spouting passage (c).

VOL

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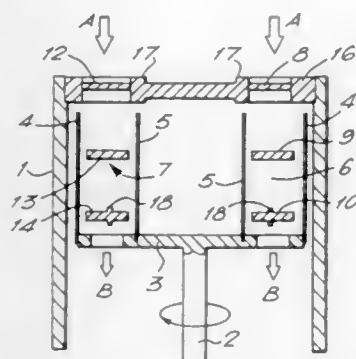
5,772,395  
VACUUM PUMPSNigel Paul Schofield, Horsham, Great Britain, assignor to The BOC Group plc, Wilndlesham Surrey, England  
Filed Dec. 9, 1996, Ser. No. 762,571

Claims priority, application United Kingdom, Dec. 12, 1995, 9525337

Int. Cl.<sup>6</sup> F01D 1/36

U.S. Cl. 415—90

10 Claims



1. A vacuum pump assembly comprising:  
at least two cylinders of different diameters and arranged coaxially relative to each other to define an annular space therebetween;  
a helical member positioned within the annular space, the helical member formed by individual helical components positioned to define individual, part-helical gas paths within the annular space; and  
means for effecting relative rotation of the at least two cylinders and the helical member about their longitudinal axes.

5,772,396  
PUMP HAVING FLUSH SYSTEM FOR SEAL ARRANGEMENT

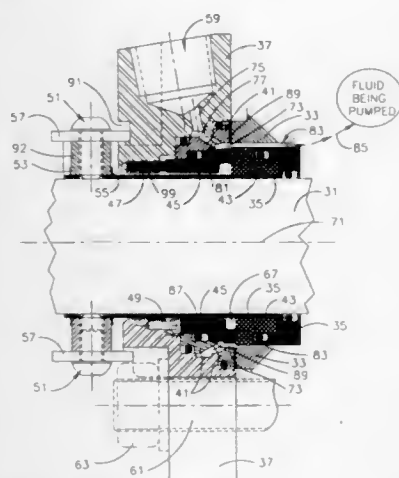
Robert E. Rockwood, Windham, N.H., assignor to Environamics Corporation, Hudson, N.H.

Filed May 15, 1996, Ser. No. 695,660

Int. Cl.<sup>6</sup> F04D 29/12

U.S. Cl. 415—112

19 Claims



1. A centrifugal pump for pumping a fluid, the pump having a flush system, the centrifugal pump comprising:  
a motor;  
a fluid pumping impeller;  
a shaft disposed between said motor and said impeller so that said motor can drive or rotate said shaft and said impeller;  
at least one seal having an annular rotating sealing member affixed to said shaft for rotation therewith and an annular

stationary sealing member, said rotating and stationary sealing members working together to form a fluid sealing interface therebetween;

a gland encircling at least a portion of said at least one seal and said shaft, said gland including a fluid port therein for allowing a flush liquid to flow therethrough toward said sealing interface;

an annular removable insert flush ring that is not part of said at least one seal, said flush ring being disposed around said shaft, said flush ring being located between said gland and said at least one seal; and

wherein said flush ring has a plurality of radially spaced flush apertures defined therein adjacent said at least one seal, said plurality of flush apertures being radially spaced from one another around said shaft for permitting the flush liquid from said port to flow through said flush apertures in said flush ring into an annular flush chamber that surrounds said at least one seal, so that the flush liquid flows by said sealing interface thereby cleaning said seal; and

wherein said apertures defined in said flush ring include means for enabling the flush liquid to flow into said annular chamber from a plurality of different directions at the same time.

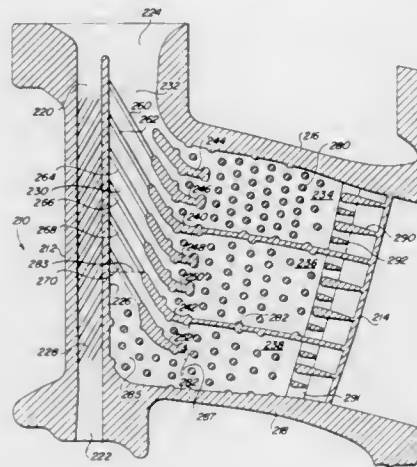
5,772,397  
GAS TURBINE AIRFOIL WITH AFT INTERNAL COOLING

Mark C. Morris, Phoenix; Nnawuihe A. Okpara, Peoria, and Michael K. Bischoff, Mesa, all of Ariz., assignors to Allied-Signal Inc., Morris Township, N.J.

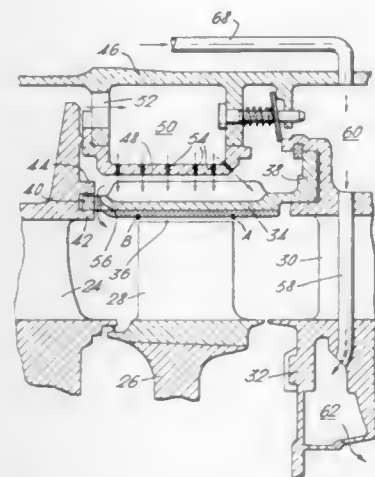
Continuation-in-part of Ser. No. 647,079, May 8, 1996, Pat. No. 5,601,399. This application Oct. 23, 1996, Ser. No. 740,037  
Int. Cl.<sup>6</sup> F04D 29/38

U.S. Cl. 415—115

13 Claims







of a cooling fluid and a heating fluid onto the stator disc to selectively change a size of the clearance between the rotor blades and the shroud.

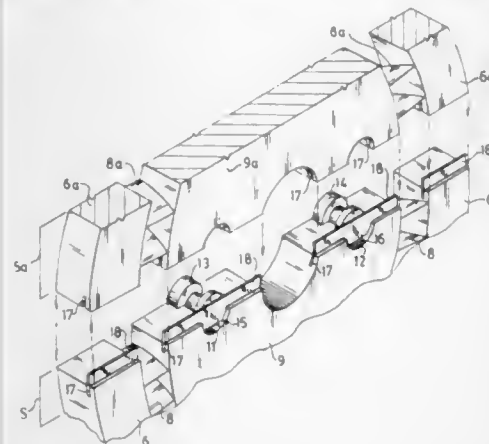
**5,772,401**  
**DIAPHRAGM CONSTRUCTION FOR TURBOMACHINERY**

Fred Canova, Moneta, Va., assignor to Dresser-Rand Company, Corning, N.Y.

Filed Oct. 13, 1995, Ser. No. 543,066  
Int. Cl.<sup>6</sup> F01D 9/04

U.S. Cl. 415—189

28 Claims



1. A method for machining a diaphragm for a turbomachine comprising:

- providing the diaphragm having axially-spaced first and second sides with an opening extending along a first axis and through said first and second sides;
- drilling at least one hole of a first diameter through the diaphragm from an entry point at the first side to an exit point at the second side of the diaphragm along a second axis substantially parallel to the first axis;
- cutting the diaphragm into first and second pieces along a line intersecting the at least one hole to form matching edges in the first and second diaphragm pieces with matching axially extending positioning channels at the edges of the first and second pieces;
- placing a positioning pin into each axially extending positioning channel of the first diaphragm piece, said positioning pin being configured to conform to the positioning channel dimensions; and
- joining the second diaphragm piece together with the first diaphragm piece with each positioning channel of the second diaphragm piece aligned with the positioning pin in each positioning channel of the first piece.

13. A diaphragm for use in a turbomachine comprising: an outer annular supporting structure and an inner annular supporting structure with an annular blade row positioned therebetween, said inner annular supporting structure having an axial shaft opening with a diameter sufficient to receive a turbine shaft which extends along a first axis, wherein said diaphragm is cut into first and second pieces having adjoining edges extending through the outer and inner annular supporting structures, the annular blade row, and the opening; axially extending positioning channels formed at the adjoining edges of the first and second pieces, through the diaphragm, and extending along a second axis substantially parallel to the first axis; and at least one positioning pin positioned in and conforming to the positioning channels of the first and second pieces.

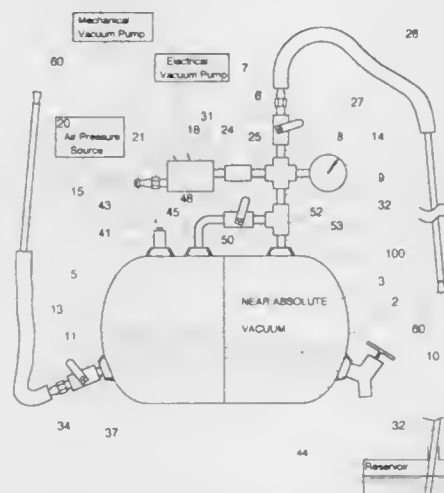
**5,772,402**  
**PRE-CHARGED VACUUM FLUID CHANGE/ DISPOSAL APPARATUS**

Lowell R. Goodman, Waterman Beach Rd., Box 632, So. Thomaston, Me. 04858

Division of Ser. No. 913,650, Jul. 13, 1995, Pat. No. 5,405,247, which is a continuation of Ser. No. 545,078, Jun. 29, 1990, abandoned. This application Feb. 28, 1995, Ser. No. 395,805  
Int. Cl.<sup>6</sup> F16N 33/00

U.S. Cl. 417—118

32 Claims



10. An apparatus for transferring fluid from an external reservoir and back to the same or another reservoir, said apparatus comprising: a prechargeable, sealable canister which may be evacuated to form a vacuum to be captured in the canister when the canister is disconnected from a vacuum source and which may also be pressurized to capture and hold a positive pressure in said canister when the canister is disconnected from a pressure source; one or more fluid conducting means in valved fluid conducting relationship with said canister and further in communication externally with an external reservoir; valve means for capturing said vacuum in said canister when the canister is disconnected from the vacuum source such that the vacuum may be controllably exposed to a fluid in another location;

means for controllably releasing the captured vacuum in the canister so that the released vacuum suctions fluid from a reservoir through the fluid conducting means into the canister with the fluid thereby partially replacing the vacuum in the canister; pressurized fluid capturing means for capturing and holding fluid in said canister under pressure when the canister is disconnected from a pressure source, which pressurized fluid can be controllably transferred from the canister to an external reservoir; and means controllably releasing the pressurized fluid from within the canister for transferring fluid under positive pressure from said canister to a reservoir.

**5,772,403**  
**PROGRAMMABLE PUMP MONITORING AND SHUTDOWN SYSTEM**

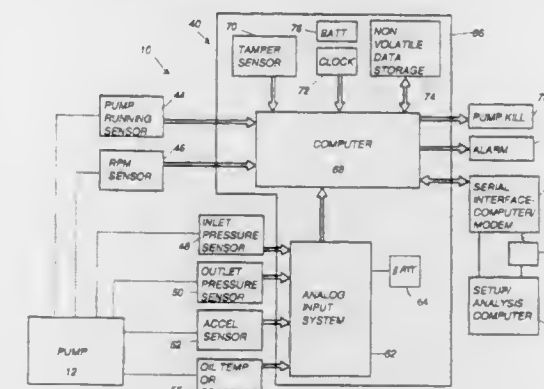
Charles B. Allison; Christopher C. Ginn; I. Michael Ginn, and Amos Pacht, all of Houston, Tex., assignors to Butterworth Jetting Systems, Inc., Houston, Tex.

Filed Mar. 27, 1996, Ser. No. 624,891

Int. Cl.<sup>6</sup> F04B 49/06

U.S. Cl. 417—44.2

22 Claims



1. A system for monitoring the operation of a high pressure pump including one or more plungers each movable within a respective pumping chamber during a pressurizing pump cycle and a return pump cycle, the pump including a fluid inlet for receiving low pressure fluid, a fluid outlet for discharging high pressure fluid, a fluid inlet check valve for preventing fluid flow from the pumping chamber to the fluid inlet during the pressurizing pump stroke, and a fluid outlet check valve for preventing flow from the fluid outlet to the pumping chamber during the return pump stroke, the system comprising:

- an inlet fluid pressure sensor for sensing instantaneous fluid pressure upstream from the pumping chamber and generating an electrical signal corresponding to the sensed inlet fluid pressure; and
- a controller responsive to the inlet fluid pressure sensor for generating a fault signal in response to variations between a plurality of instantaneous pressure signals.

**5,772,404**  
**COMPACT GETTER PUMP WITH NESTED THERMALLY INSULATING SHIELDS**

Sergio Carella, Varese; Andrea Conte, Milan, and Fortunato Belloni, Villastanza Di Parabiago, all of Italy, assignors to SAES Getters S.p.A., Milan, Italy

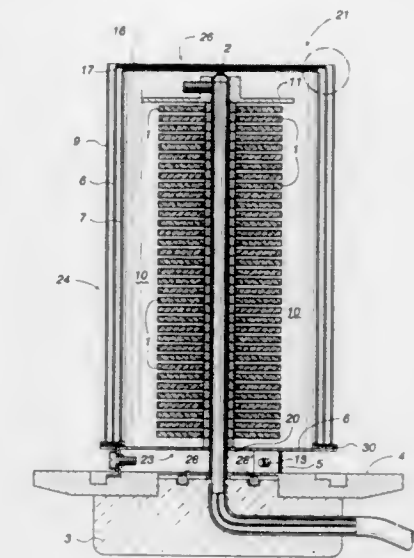
Filed Jul. 2, 1996, Ser. No. 678,395

Claims priority, application Italy, Jul. 10, 1995, MI950486 U  
Int. Cl.<sup>6</sup> F04B 37/02

U.S. Cl. 417—51

18 Claims

1. A compact getter pump, comprising a getter device contained within a thermally insulating housing, said housing including a plurality of nested thermally insulating shields, a particle trap coupled with at least one of said plurality of nested thermally insulating shields, and a heating apparatus for heating said getter device to a desired temperature, wherein each of said thermally insulating shields includes an open end, said particle trap comprises a wire mesh screen substantially covering said open end of



at least one of said plurality of nested thermally insulating shields, and said plurality of nested thermally insulating shields are effective to reduce heat dissipation from said heating apparatus and said getter device.

**5,772,405**  
**WATER SYSTEM WITH A PEDAL POWERED RECIPROCATING PUMP**

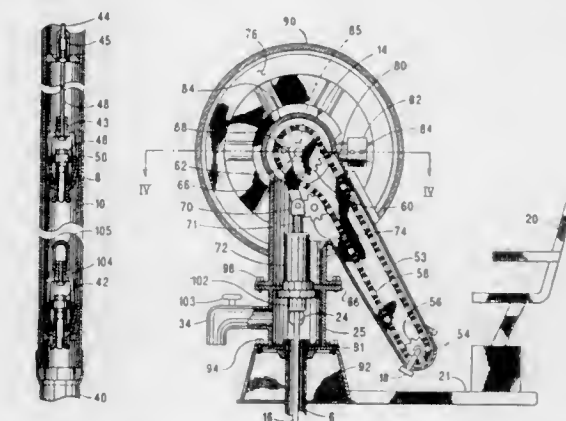
James David Eller, Deerfield Beach, Fla., assignor to MWI Corporation, Deerfield Beach, Fla.

Filed Apr. 3, 1995, Ser. No. 415,483

Int. Cl.<sup>6</sup> F04B 17/06

U.S. Cl. 417—233

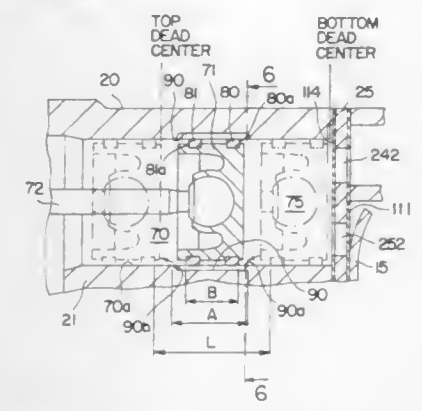
20 Claims



1. A pumpstand for driving a pumprod in a vertically reciprocating motion, said pumpstand comprising:

- a housing;
- a drive shaft rotatably mounted within said housing, with a driven sprocket and a flywheel attached to said drive shaft;
- transmission means for converting rotary motion of said drive shaft into said vertically reciprocating motion of said pumprod;
- a counterweight turning with said drive shaft, wherein said counterweight is raised as said pumprod is lowered, and wherein said counterweight is lowered as said pumprod is raised;
- a foot pedal rotatably mounted within said housing, with a driving sprocket attached to said foot pedal; and
- a chain extending between said driving sprocket said driven sprocket, said chain engaging said sprockets so that rotation of said driving sprocket causes rotation of said driven sprocket.

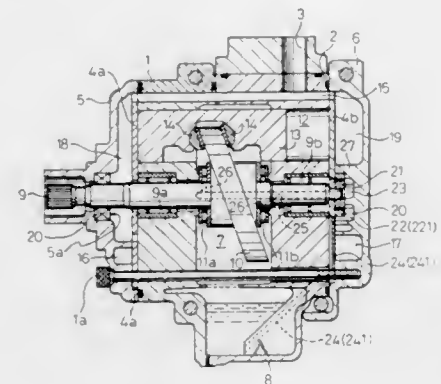
5,772,406  
**PISTON-TYPE COMPRESSOR WITH A LUBRICATING SYSTEM**  
 Kazuhiko Takai, Gunma, Japan, assignor to Sanden Corporation, Gunma, Japan  
 Filed Mar. 15, 1995, Ser. No. 404,376  
 Claims priority, application Japan, Mar. 18, 1994, 6-048406  
 Int. Cl.<sup>6</sup> F04B 1/12  
 U.S. Cl. 417—269 21 Claims



1. A compressor comprising:  
 a compressor housing having a cylinder block, a front end plate disposed on one end of said cylinder block and a rear end plate disposed on an opposite end of said cylinder block, said rear end plate having a discharge chamber and a suction chamber formed therein, said cylinder block having a plurality of cylinders formed therein, said cylinder block defining a crank chamber between said front end plate and said cylinders;  
 a valve plate disposed between said cylinder block and said rear end plate, said valve plate having a plurality of discharge ports for passage of a compressed fluid from said plurality of cylinders into said discharge chamber and a plurality of suction ports for passage of a fluid from said suction chamber into said plurality of cylinders;  
 a plurality of discharge valve members disposed adjacent said valve plate for opening and closing each of said plurality of discharge ports;  
 a plurality of suction valve members disposed adjacent said valve plate for opening and closing each of said plurality of suction ports;  
 a plurality of pistons, one of which is slidably fitted within each of said plurality of cylinders, each of said cylinders defining a piston chamber between said one of said pistons and said valve plate;  
 a driving mechanism at least partially disposed within said crank chamber and coupled to said plurality of pistons to move said pistons in a reciprocating motion; and  
 a passage means formed in an inner surface of each of said plurality of cylinders for passage of a fluid from said piston chambers to said crank chamber and along an entire axial length of said one of said pistons.

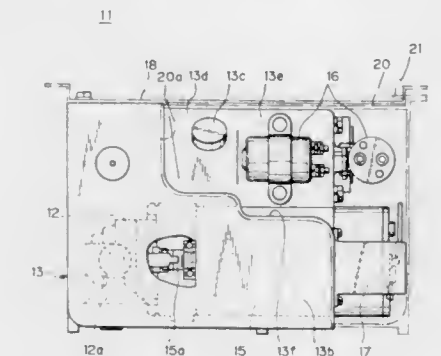
5,772,407  
**RECIPROCATING PISTON TYPE COMPRESSOR IMPROVED TO DISTRIBUTE LUBRICATING OIL SUFFICIENTLY DURING THE STARTING PHASE OF ITS OPERATION**  
 Ryo Kato, Atsushi Fukaya, Naoya Yokomachi, and Masanori Iwadou, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan  
 Filed Apr. 23, 1996, Ser. No. 638,995  
 Claims priority, application Japan, Apr. 28, 1995, 7-106569  
 Int. Cl.<sup>6</sup> F04B 1/16  
 U.S. Cl. 417—269 8 Claims

1. A reciprocating piston type compressor for compressing refrigerant gas including:



- a cylinder block with a plurality of axially extending cylinder bores arranged around the longitudinal axis of the cylinder block; a plurality of pistons slidably provided within the cylinder bores for reciprocation between the top and bottom dead centers;
- housing means sealingly mounted to ends of the cylinder block with valve plates therebetween, the housing means including at least a refrigerant gas suction chamber which is fluidly connected to the cylinder bores and an external refrigerating circuit, to introduce the refrigerant gas from the external refrigerating circuit into the cylinder bores when the pistons move toward the bottom dead center;
- an axially extending drive shaft for driving the motion of the reciprocating pistons;
- an oil sump for containing lubricating oil;
- an oil pump, which is driven by the drive shaft, for distributing the lubricating oil to the compressor elements, the oil pump including an oil suction chamber which is fluidly connected to the oil sump through an oil suction passage; and
- means for introducing pressure in the refrigerant gas suction chamber into the oil suction chamber to direct the lubricating oil in the oil sump into the oil suction chamber during the initial stage of the starting of the compressor.

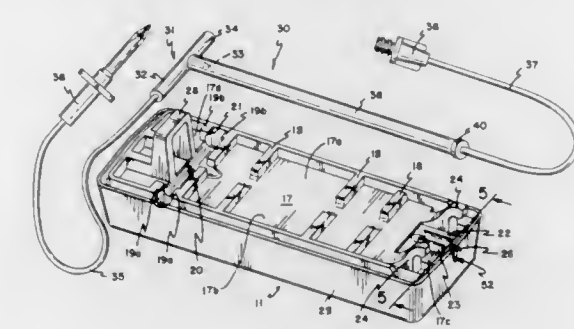
5,772,408  
**POWER UNIT HOUSING A PUMP**  
 Kimio Hada, and Hirotake Hanamura, both of Tokyo, Japan, assignors to Nikko Electric Industry Co., Ltd., Tokyo, Japan  
 Filed Jun. 7, 1996, Ser. No. 659,252  
 Claims priority, application Japan, Nov. 27, 1995, 7-307399  
 Int. Cl.<sup>6</sup> F04B 23/02  
 U.S. Cl. 417—313 7 Claims



1. A power unit housing a pump, comprising: a hydraulic oil tank having an approximately L-shaped configuration and including a pump housing portion which houses a hydraulic pump and an oil reservoir portion which is integrally formed with and arranged approximately perpendicular to said pump housing portion; an electric motor juxtaposed alongside said oil reservoir portion, said electrical motor operates said hydraulic pump through a direct coupling; and a switching valve for switching the supply and

discharge flow of the hydraulic oil between said hydraulic pump and an external load, said switching valve being positioned proximate to said electric motor.

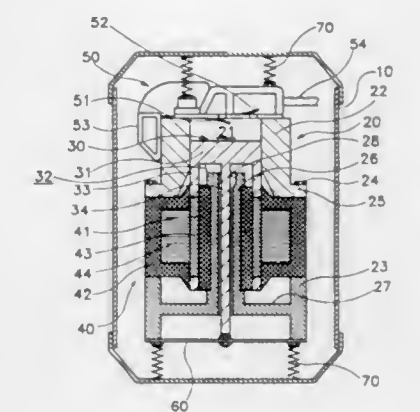
5,772,409  
**DRUG INFUSION DEVICE WITH PRESSURE PLATE**  
 Jay Gregory Johnson, Maple Plain, Minn., assignor to SIMS Deltec, Inc., St. Paul, Minn.  
 Continuation of Ser. No. 156,040, Nov. 22, 1993, abandoned.  
 This application Jun. 6, 1995, Ser. No. 465,729  
 Int. Cl.<sup>6</sup> F04B 43/08  
 U.S. Cl. 417—360 4 Claims



1. A pressure plate for use with a control module of a pump comprising:  
 a body having a main surface facing in a first direction and including first and second longitudinal sides, and first and second transverse ends;  
 a pair of hook-shaped pump-securing extensions extending from the main surface adjacent to the first transverse end;  
 a loop-shaped pump anchor extending from the main surface adjacent to the second transverse end;  
 a plurality of tube-positioning rib pairs extending from the main surface and spaced apart to receive an infusion tube in a direction generally parallel to the first and second longitudinal sides; and  
 a retaining lip extending from the main surface and having a retaining lip surface spaced from the main surface and sized to retain the infusion tube releasably held by the retaining lip surface to the main surface, the hook-shaped pump-securing extensions and the loop-shaped pump anchor engageable with the control module to mount the body to the control module.

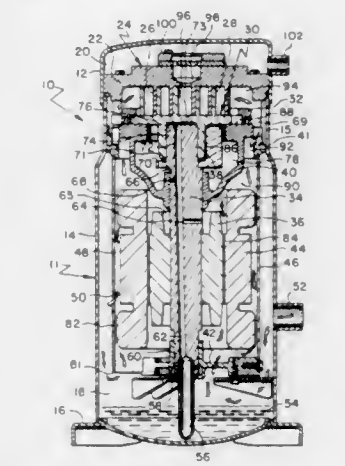
5,772,410  
**LINEAR COMPRESSOR WITH COMPACT MOTOR**  
 Chang Keun Sik, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea  
 Filed Sep. 26, 1996, Ser. No. 722,845  
 Claims priority, application Rep. of Korea, Jan. 16, 1996, 1996-716  
 Int. Cl.<sup>6</sup> F04B 17/03  
 U.S. Cl. 417—363 18 Claims

1. A linear compressor comprising:  
 a casing;  
 a cylinder member mounted in the casing and forming a cylindrical compression chamber having an axis;  
 a piston including a piston head disposed for reciprocation in the compression chamber along the axis for compressing a fluid; valves for admitting uncompressed fluid to the compression chamber, and exhausting compressed fluid therefrom;  
 an elastic member elastically supporting the piston; and  
 a linear motor for causing the piston to reciprocate, the motor including:  
 a magnet fixed to the piston,  
 a first stator disposed inside of the piston,



- a second stator disposed outside of the piston and opposite the first stator, with the magnet situated between the first and second stators, and  
 a coil disposed between the first and second stators for generating a magnetic field between the first and second stators and across the magnet to cause the magnet and piston to reciprocate.

5,772,411  
**GAS FLOW AND LUBRICATION OF A SCROLL COMPRESSOR**  
 Daniel R. Crum; Bill P. Simmons, both of La Crosse; Arlo F. Teegarden, Stoddard; Jerry A. Rood, and Peter A. Kotlarek, both of Onalaska, all of Wis., assignors to American Standard Inc., Piscataway, N.J.  
 Division of Ser. No. 418,340, Apr. 7, 1995, Pat. No. 5,533,875.  
 This application Mar. 6, 1996, Ser. No. 611,586  
 Int. Cl.<sup>6</sup> F04B 17/00  
 U.S. Cl. 417—368 3 Claims



1. A method for cooling the motor of a low-side scroll compressor and for delivering relatively oil-free suction gas to the scroll compression mechanism thereof comprising the steps of:  
 dividing the shell of said compressor into a suction pressure portion and a discharge pressure portion;  
 defining an oil sump in the suction pressure portion of the shell;  
 mounting a sleeve-encased drive motor to a frame in the shell, the sleeve of said sleeve-encased drive motor being open-ended, the frame cooperating with the sleeve-encased motor to define a flow path for suction gas through the interior of the sleeve-encased motor to the scroll set, the flow path so defined causing such suction gas to cool the motor, suction gas being delivered into the suction pressure portion of the shell of the compressor exterior of the sleeve-encased motor prior to flowing into the flow path for suction gas defined interior of the sleeve-encased motor;



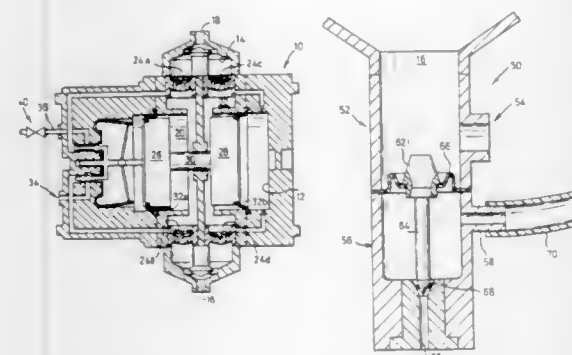
driving one of the scroll members with the drive shaft of the sleeve-encased drive motor;  
delivering oil, through the flow path defined by the drive shaft of the sleeve-encased motor, from the sump to the bearing surfaces in which the drive shaft is rotatably accommodated and to the surface of the drive shaft which drives the one of the scroll members;  
collecting oil, subsequent to its use in the delivering step, in a cavity defined by the frame, the cavity being isolated from the suction gas flow path internal of the sleeve-encased motor; and  
returning oil from the cavity to the sump via a flow path which is external of the sleeve-encased motor and which is isolated from the flow path for suction gas defined interior of the sleeve-encased motor.

5,772,412  
PUMP INCORPORATING PRESSURE-REGULATED  
VENTING MEANS

Zbigniew Janusz Zytynski, Forest Row, United Kingdom, assignor to Shurflo Limited, Crawley, United Kingdom  
PCT No. PCT/GB94/02560, § 371 Date Aug. 14, 1996, § 102(e)  
Date Aug. 14, 1996, PCT Pub. No. WO95/17596, PCT Pub. Date Jun. 29, 1995

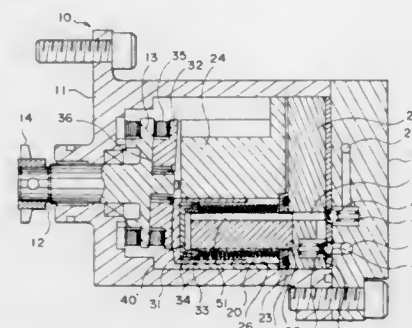
PCT Filed Nov. 22, 1994, Ser. No. 666,551  
Claims priority, application United Kingdom, Dec. 22, 1993, 9326153; Jan. 28, 1994, 9401633

Int. Cl.<sup>6</sup> F04B 43/00; 43/073  
U.S. Cl. 417—393 11 Claims



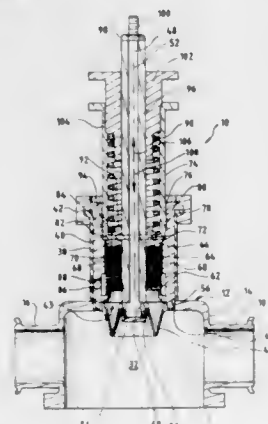
1. A pump comprising:  
a chamber having an inlet and an outlet, the inlet and the outlet being opened and closed by valve means for the passage of a pumped fluid;  
at least one piston movable in a reciprocating manner within said chamber;  
sealing means located between the piston and the interior wall of the chamber;  
introduction means for introducing a working fluid into a portion of the chamber bounded by the interior wall of the chamber, the piston and the sealing means; and  
venting means for venting the portion of the chamber so that alternate introduction of the working fluid into, and venting of the working fluid from, the portion of the chamber causes the piston to move in a reciprocating manner to transport the pumped fluid through the chamber from the inlet to the outlet, wherein the venting means incorporates pressure regulating means to regulate, in dependence upon the pressure of the pumped fluid, the pressure to which the said portion of the chamber is vented such that, in use, the pressure of the working fluid in the said portion of the chamber is prevented from falling, during venting, below the pressure of the pumped fluid in the chamber.

5,772,413  
BELLOWS TYPE PUMP  
Toshikazu Oshidari, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa, Japan  
Filed Mar. 13, 1997, Ser. No. 816,535  
Claims priority, application Japan, Mar. 21, 1996, 8-064641  
Int. Cl.<sup>6</sup> F04B 45/02  
U.S. Cl. 417—472 13 Claims



1. A bellows type pump comprising:  
a cylindrical bellows capable of elongating and contracting, a fixing member to which one end of said bellows is connected, a mechanism for moving the other end of said bellows backwards and forwards with respect to said fixing member in the direction of elongation and contraction,  
a pump chamber formed inside the bellows which expands and contracts with the elongation and contraction of said bellows, a suction passage for aspirating a liquid to the pump chamber, a suction check valve for preventing outflow of liquid from said pump chamber into said suction passage,  
a discharge check valve for preventing inflow of liquid to said pump chamber from said discharge passage, and  
a fill member for eliminating a dead space in said pump chamber, wherein said fill member is fixed to the fixing member.

5,772,414  
PUMP HEAD PRESSURE EQUALIZER WITH BIASING  
MEMBER LIMITED MOVEMENT DIAPHRAGM  
Yutaka Kaneko, Wheeling, Ill., assignor to Tetra Laval Holdings & Finance, S.A., Buffalo Grove, Ill.  
Filed Jan. 24, 1997, Ser. No. 789,150  
Int. Cl.<sup>6</sup> F04B 11/00  
U.S. Cl. 417—540 21 Claims

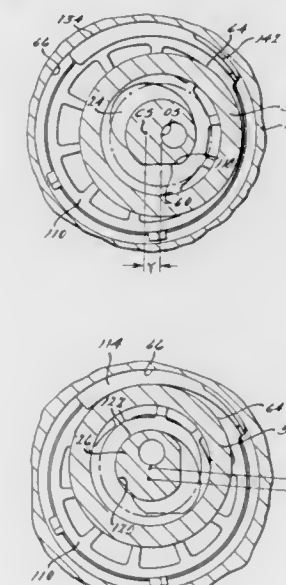


1. A pressure equalizer for use with a reciprocating pump, the pump having a body defining a pressure region in fluid communication with a reciprocating piston, the piston reciprocating between a discharge stroke wherein the pressure region is subjected to an increased pressure therein and a suction stroke wherein the pressure region is subjected to a decreased pressure therein, the pump

including an inlet port for fluid suction and a discharge port for discharging the pumped fluid therefrom, the pressure equalizer comprising:

- an equalizer housing mountable to the pump body, the equalizer housing being in fluid communication with the pressure region;
- a variable volume assembly carried by the equalizer housing, the variable volume assembly including an isolation member in fluid communication with the pressure region, the isolation member being adapted to expand outwardly of the pressure region and contract inwardly of the pressure region in conjunction with the increase and decrease in pressure in the pressure region, each the outward expansion and inward contraction being within a predetermined range of movement;
- a retaining member engagable with the isolation member; and
- a first biasing element positioned on the retaining member operably connected to the isolation member for adjustably setting the inward contraction range of movement of the isolation member, and a second biasing element positioned on the retaining member in spaced relation to the first biasing element, the second biasing element being operably connected to the isolation member for adjustably setting the outward expansion range of movement of the isolation member, wherein the isolation member expands outwardly of the pressure region within the range of movement in response to an increase of pressure in the pressure region to accumulate a predetermined amount of liquid, and wherein the isolation member contracts inwardly of the pressure region within the range of movement in response to a decrease of pressure in the pressure region to discharge a predetermined amount of accumulated liquid.

5,772,415  
SCROLL MACHINE WITH REVERSE ROTATION SOUND  
ATTENUATION  
Kenneth Joseph Monnier; Frank Shue Wallis, and Randall Joseph Velikan, all of Sidney, Ohio, assignors to Copeland Corporation, Sidney, Ohio  
Filed Nov. 1, 1996, Ser. No. 742,918  
Int. Cl.<sup>6</sup> F04C 18/04; 29/00  
U.S. Cl. 418—14 39 Claims

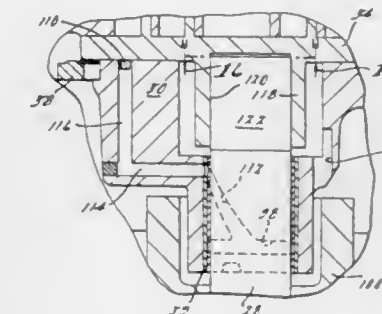


1. A scroll compressor comprising:  
a first scroll member having a spiral wrap thereon;  
a second scroll member having a spiral wrap thereon;  
a housing for mounting said scroll members so that said second scroll member orbits with regard to said first scroll member with the respective spiral wraps of each scroll member engaging one another in such a way that pockets of progressively

changing volume are created between said scroll members in response to said orbital movement in a forward direction;  
a powered rotatable shaft normally rotating in a forward direction to cause said orbital movement in said forward direction; and  
a device journaled on said shaft for separating said spiral wraps during extended operation of said compressor in a reverse direction, said device being responsive to an initial reverse rotation of said shaft.

5,772,416  
SCROLL-TYPE MACHINE HAVING LUBRICANT  
PASSAGES

Jean-Luc M. Caillat, Dayton, and James W. Bush, Sidney, both of Ohio, assignors to Copeland Corporation, Sidney, Ohio  
Division of Ser. No. 486,981, Jun. 7, 1995, which is a division of Ser. No. 194,121, Feb. 9, 1994, Pat. No. 5,427,511, which is a continuation of Ser. No. 998,557, Dec. 30, 1992, abandoned, which is a division of Ser. No. 884,412, May 18, 1992, Pat. No. 5,219,281, which is a division of Ser. No. 649,001, Jan. 31, 1991, Pat. No. 5,114,322, which is a division of Ser. No. 387,699, Jul. 31, 1989, Pat. No. 4,992,033, which is a division of Ser. No. 189,485, May 2, 1988, Pat. No. 4,877,382, which is a division of Ser. No. 899,003, Aug. 22, 1986, Pat. No. 4,767,293. This application Feb. 18, 1997, Ser. No. 801,673  
Int. Cl.<sup>6</sup> F01C 1/04; 21/04  
U.S. Cl. 418—55.6 11 Claims



1. A scroll-type machine comprising:  
an outer shell;  
a lubricant sump provided in a lower portion of said outer shell;  
a first scroll member having a spiral wrap thereon;  
a second scroll member having a spiral wrap thereon, said second scroll member being mounted with respect to said first scroll member such that said spiral wraps intermesh with one another so that orbiting of said second scroll member with respect to said first scroll member will cause said wraps to define moving fluid chambers;  
a stationary body having a bearing surface and a thrust surface supporting said second scroll member for orbital movement with respect to said first scroll member;  
a drive shaft rotatably supported by said bearing surface of said stationary body and having one end drivingly coupled to said second scroll member, the other end of said drive shaft extending into said lubricant sump;  
a first fluid passage provided in said drive shaft for supplying lubricant from an inlet which opens into said sump at said other end to an outlet opening which faces said bearing, said outlet opening being positioned intermediate the ends of said first fluid passage;  
a second fluid passage provided in said stationary body for directing lubricant from said bearing surface to said thrust surface, said second fluid passage being axially spaced from said outlet opening; and  
a third fluid passage for conducting lubricant from said outlet opening to said second fluid passage, said third fluid passage including a portion extending helically between said outlet opening and said second fluid passage.

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**5,772,417**  
**GEAR PUMP FOR CONVEYING VISCOUS FLUID MEDIA**  
**AND METHOD OF MAKING SAME**

Roger Stehr, Bülach, and Peter Blume, Zürich, both of Switzerland, assignors to Maag Pump Systems Textron AG, Zurich, Switzerland

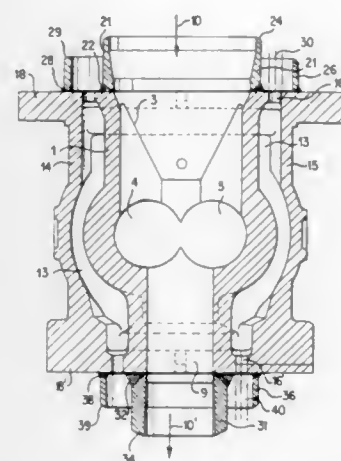
Filed Sep. 3, 1996, Ser. No. 707,253

Claims priority, application European Pat. Off., Sep. 18, 1995, 95114623

Int. Cl.<sup>6</sup> F04C 2/18; 15/00

U.S. Cl. 418—83

9 Claims



1. Gear pump for conveying viscous fluid media, comprising a pump housing having a pump suction side and a pump discharge side, and at least one collar operatively joined at at least one of the pump suction side and the pump discharge side, said at least one collar being configured and arranged to connect said pump in a gastight manner to at least one associated system component supplying fluid medium for heating and tempering the pump housing between the pump suction side and the pump discharge side; wherein the pump housing has an at least partially double-walled portion for receiving and the flowing of the heating and tempering fluid medium through a tempering space formed between the double-walled portion for feeding and removing of the heating and tempering fluid medium; and wherein the at least one collar is tube-shaped and is butt welded to the pump housing such that a correspondingly dimensioned tube shaped opening of the at least one adjoining system component is connectable therewith.

**5,772,418**  
**SCREW TYPE COMPRESSOR ROTOR, ROTOR**  
**CASTING CORE AND METHOD OF MANUFACTURING**  
**THE ROTOR**

Masao Tateno, and Koji Tomita, both of Tochigi-ken, Japan, assignors to Tochigi Fuji Sangyo Kabushiki Kaisha, Tochigi-ken, Japan

Filed Apr. 1, 1996, Ser. No. 626,017

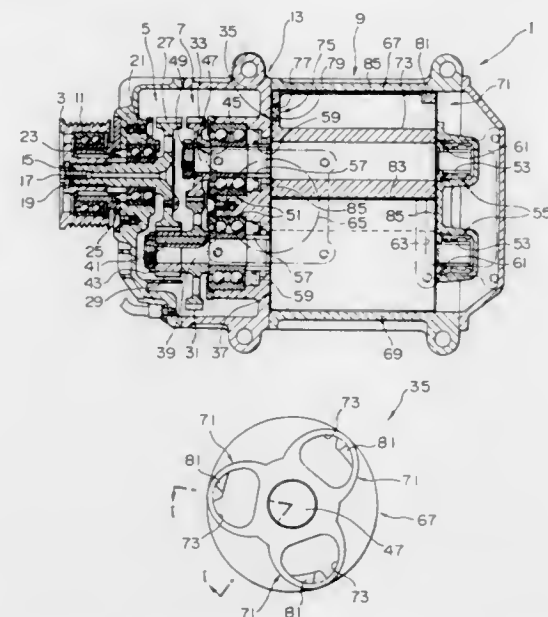
Claims priority, application Japan, Apr. 7, 1995, 7-082484; Jul. 25, 1995, 7-189219

Int. Cl.<sup>6</sup> F01C 1/18

U.S. Cl. 418—206.5

7 Claims

1. A screw-type compressor comprising: male and female rotors which engage with each other at screw-shaped tooth trace portions formed on the rotor bodies; a compressor casing which houses these rotors and has a suction port on one side in the axial direction and a discharge port on the other side in the axial direction; hollow portions which are provided in the tooth trace portions of either or both of the screw rotors and communicate with the suction port; and



partition walls which are provided at the end on the discharge port side of the tooth trace portions and block the hollow portions.

**5,772,419**  
**HYDRAULIC MACHINE COMPRISING A GEARWHEEL**  
**AND ANNUAL GEAR HAVING TROCHOID TOOTH**  
**SECTIONS**

Gunnar Lyshøj Hansen, and Hans Christian Petersen, both of Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

PCT No. PCT/DK94/00127, § 371 Date Dec. 5, 1995, § 102(c) Date Dec. 5, 1995, PCT Pub. No. WO94/23208, PCT Pub. Date Oct. 13, 1994

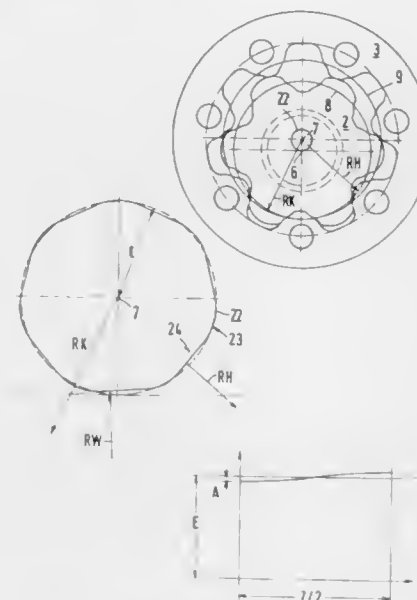
PCT Filed Mar. 25, 1994, Ser. No. 535,008

Claims priority, application Germany, Apr. 5, 1993, 43 11 168.8

Int. Cl.<sup>6</sup> F01C 1/10

U.S. Cl. 418—61.3

13 Claims



1. A hydraulic machine with two displacement elements rotatably movable relative to one another, said elements comprising a

gearwheel having a plurality of teeth and an annular gear having a plurality of teeth, the number of teeth of the annular gear being one more than the number of teeth of the gearwheel, in which machine the form of the teeth of at least one displacement element being defined at least over sections by a trochoid-type curve  $T=f(RC, E, RT)$  as the function of parameters comprising a reference circle radius RC, an eccentricity E and a generating circle radius RT, and in which at least one of the parameters varies in a circumferential direction periodically with the period of a pitch of a tooth.

**5,772,420**  
**GREASELESS MOLD CARRIER AND ALIGNMENT**  
**SYSTEM**

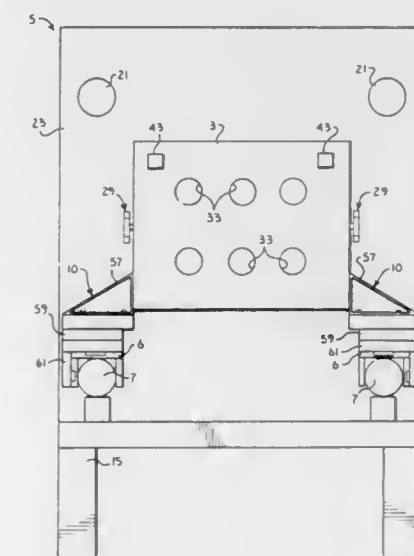
Henry T. Holmes, 4400 Wimbledon Dr., Lawrence, Kans. 66049

Filed Dec. 16, 1996, Ser. No. 767,388

Int. Cl.<sup>6</sup> B29C 45/64

U.S. Cl. 425—588

18 Claims



1. A support structure for a movable mold of a molding machine including a stationary mold mounted on a stationary platen; a movable platen; a generally cylindrical tie rod extending between said stationary platen and said movable platen, connected to one of the platens, and slidably engaging the other of said platens; and said movable mold being supported between said movable platen and said stationary mold and engaged with said movable platen in such a manner that movement of said movable platen causes corresponding movement of said movable mold; and said support structure comprising:

- a bearing plate with a substantially flat bearing surface positioned on one of said tie rod and said movable mold;
- a bearing roller rotatably supported on the other of said movable mold and said tie rod so as to engage said bearing plate bearing surface; and
- said plate and said roller engaging to movably support said movable mold during movement toward and away from said stationary mold and to maintain alignment of said movable mold with said stationary mold during said movement.

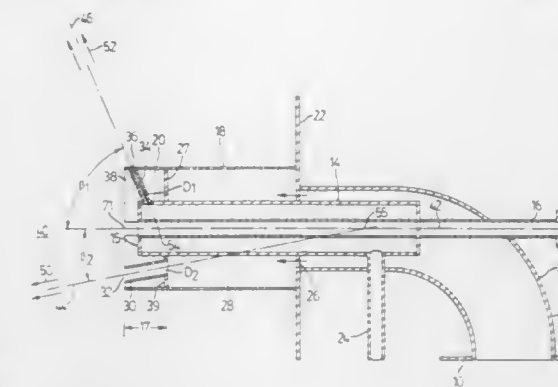
**5,772,421**  
**LOW NOX BURNER**  
Ferdinand K. Besik, Mississauga; Shahrzad Rahbar, Thornhill; Henry A. Becker, and Andrzej Sobiesiak, both of Kingston, all of Canada, assignors to Canadian Gas Research Institute, Ontario, Canada

Continuation-in-part of Ser. No. 451,471, May 26, 1995, abandoned. This application Nov. 27, 1995, Ser. No. 562,999

Int. Cl.<sup>6</sup> F23C 5/00

U.S. Cl. 431—8

21 Claims



1. A burner, for combusting a gaseous fuel, the burner comprising: an oxidant supply duct; a fuel supply duct; an oxidant port means connected to the oxidant supply duct and comprising a plurality of oxidant ports for discharging a plurality of oxidant jets; a fuel port means connected to the fuel supply duct and comprising a plurality of fuel ports for discharging a plurality of fuel jets and arranged around the oxidant ports; wherein the oxidant port means and the fuel port means are arranged such that the oxidant and fuel jets diverge from one another, the divergence being such that each of the oxidant or fuel jets entrain a substantial quantity of surrounding furnace gases to effect recirculation of the furnace gases and thereafter the oxidant jets eventually entrain the fuel jets, causing the oxidant jets, the fuel jets and the entrained furnace gases to mix with one another to form a stable combustion zone, wherein the entrainment of furnace gases effects dilution of the oxidant and the fuel in the combustion zone, thereby lowering temperatures in the combustion zone and wherein the fuel jets undergo pyrolysis during the course of their trajectories creating a reducing zone.

**5,772,422**  
**BURNER ARRAY FOR WATER HEATING APPARATUS**  
Mark A. Ferguson, Watauga, Tex., assignor to PVI Industries, Inc., Fort Worth, Tex.

Filed Aug. 27, 1996, Ser. No. 703,847

Int. Cl.<sup>6</sup> F24H 1/20; F22B 5/00

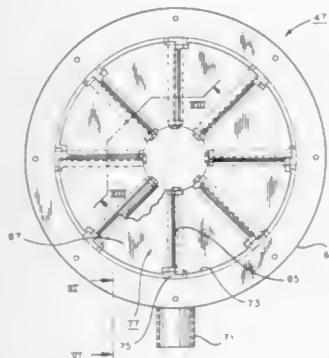
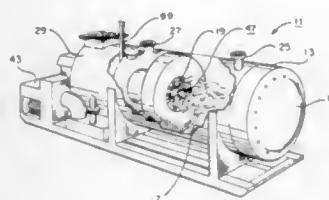
U.S. Cl. 431—185

20 Claims

1. A burner array for supplying a mixture of natural gas and air to the combustion region of a burner used to fire a water heater or boiler, the burner array comprising:

- a collar member having a hollow interior which communicates with a source of natural gas, the collar member having a peripheral interior surface with a plurality of mounting openings;
- a ring-like arrangement of wing-shaped elements mounted on the peripheral interior surface of the collar member, each element having a cylindrical tube member with an interior and with an end opening which communicates with a respective mounting opening on the collar member for supplying natural gas to the interior of the tube member, each cylindrical tube member also having a tube slit along one side thereof and an outwardly extending flange portion; and





wherein each of the tube slits has a fixed opening area through which natural gas can pass, the opening area being varied by varying the position of the flange portions of adjacent wing-shaped elements mounted within the collar member.

5,772,423

## RELATING TO THE CONTROL OF GAS FIRES

Kulwant Mandir, Hail Green, Great Britain, assignor to Valor Limited, Erdington, Great Britain

PCT No. PCT/GB95/00848, § 371 Date Jun. 3, 1996, § 102(e) Date Jun. 3, 1996, PCT Pub. No. WO95/28603, PCT Pub. Date Oct. 26, 1995

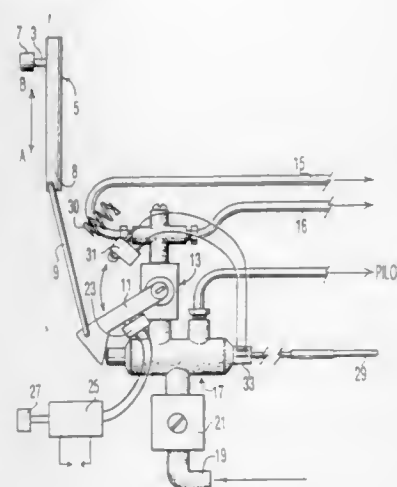
PCT Filed Apr. 13, 1995, Ser. No. 557,180

Claims priority, application United Kingdom, Apr. 13, 1994, 9407266

U.S. Cl. 431—254

Int. Cl.<sup>6</sup> F23Q 1/04

9 Claims



1. A control for a gas fire, the control comprising a slide member (5) connected via a linkage (9,35) to a gas burner control lever (11) whereby movement of said slide member (5) causes said slide member (5) to move said gas burner lever control lever (11) between two end regions of available movement, to control a valve (13) and the feed therethrough of gas from a gas inlet (19) to at least one burner (15,16), one microswitch (23) being operable by the control lever (11) to activate an igniter (25) towards one end region of the available movement of the control lever (11), and another microswitch (31) being operable by the control lever (11)

towards the other end region of available movement to activate an interrupter (17) which can close off the supply of gas.

5,772,424

## CANDLE COMPRISING A FORM PIECE AND A SHIELD ELEMENT

Erkki Nokelainen, Ikaalinen, Finland, assignor to Heikki Nokelainen, Tampere, Finland

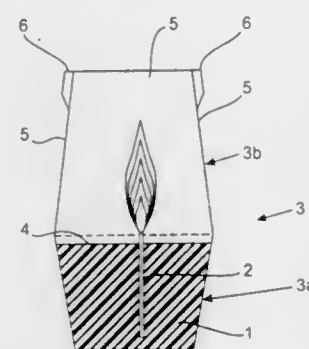
PCT No. PCT/FI95/00075, § 371 Date Sep. 30, 1996, § 102(e) Date Sep. 30, 1996, PCT Pub. No. WO95/22716, PCT Pub. Date Aug. 24, 1995

PCT Filed Feb. 16, 1995, Ser. No. 696,989

Claims priority, application Finland, Feb. 17, 1994, 940741 Int. Cl.<sup>6</sup> F23D 3/02

U.S. Cl. 431—291

17 Claims



1. A candle comprising:

a formed piece manufactured of a meltable material, a burning wick placed inside the formed piece, and a shield element covering the formed piece and provided with an opening in the upper edge of the candle in its position of use, the shield element including an upper part and a lower part, said upper part being connected with said lower part, and extending above the formed piece in the position of use of the candle, and in its non-functional position the upper part of the shield element being placed over at least one of the lower part of the shield element and the wick surface of the formed piece,

the upper part of the shield element being formed of at least two pieces which are folded in the non-functional position over at least one of the lower part of the shield element and over the wick surface, said pieces being joined by a joint to the upper edge of the lower part of the shield element,

whereby the candle in its non-functional position has substantially the same outer dimensions as the formed piece, and in the functional position of the candle, the upper part of the shield element is placed at the edge of the wick surface.

5,772,425

## DEVICE FOR PREVENTING FLAREUP IN LIQUID FUEL BURNERS BY CONTAINING SUMP VAPORS

Richard W. Henderson, P.O. Box 12681, Florence, S.C. 29504

Filed Jul. 19, 1996, Ser. No. 684,132

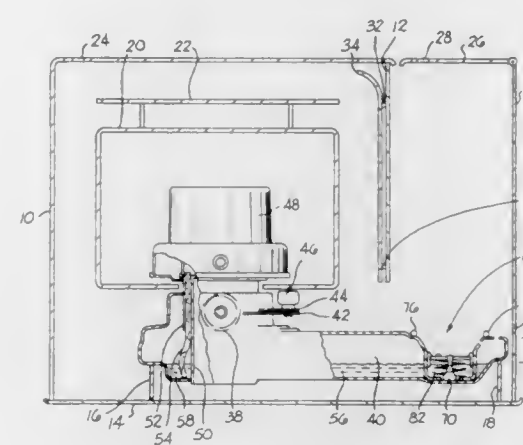
Int. Cl.<sup>6</sup> F23D 3/02

U.S. Cl. 431—319

8 Claims

1. In an apparatus for preventing flareup in a liquid fuel burner of the type comprising:

- (a) a removable liquid fuel tank for holding liquid fuel,
- (b) a fuel chamber for receiving said fuel from said tank,
- (c) a sump opening in said fuel chamber through which said fuel in said fuel tank is transferred to said fuel chamber,
- (d) a combustion cylinder having a wick, and
- (e) a thermal barrier for isolating said tank from the heat of said combustion chamber.



(f) said fuel chamber being arranged to supply said liquid fuel from said fuel tank to said wick of said combustion chamber, the improvement comprising:

(g) a fuel vapor containment gasket that contains vapors in said sump opening when said tank is seated in said sump opening, said gasket comprising a flexible material.

5,772,426

Patent Not Issued For This Number

5,772,427

## BURNER AND UTILIZATION OF SUCH A BURNER IN A GLASS FURNACE

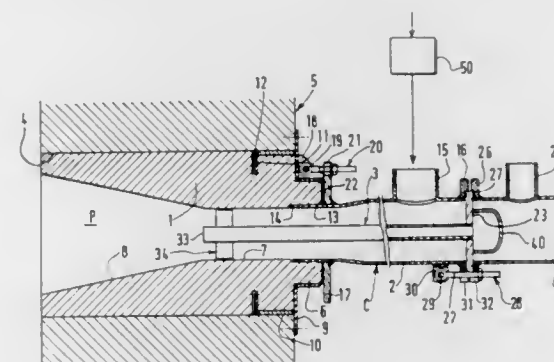
Serge Laurenceau, Versailles, France; Louis Philippe, Oakbrook Terrace, Ill.; Jean-Yves Iatrides, St Maur des Fosses, and Michel Verlhac, Chatillon, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etudes et l'Exploitation des Procédes Georges Claude, Paris, France

Filed Jan. 5, 1996, Ser. No. 583,509

Int. Cl.<sup>6</sup> F23D 11/36

U.S. Cl. 431—154

12 Claims



1. A burner comprising:

a burner body capable of being mounted on a tap-hole block made of a refractory material, the tap-hole block defining a burner cavity, the burner body including a tubular element; at least one internal injection pipe fastened at a first end to a supporting structure; spacing and centering means provided at a second end of the internal injection pipe; quick mounting means for quickly mounting the supporting structure of the internal injection pipe on the tubular element of the burner body; and

a rear cap forming a feed chamber for the internal injection pipe, the rear cap including means for connection to a fluid circuit and means for connection to a portion of the first quick mounting means.

5,772,428

METHOD AND APPARATUS FOR HEAT TREATMENT INCLUDING H<sub>2</sub>/H<sub>2</sub>O FURNACE REGION CONTROL

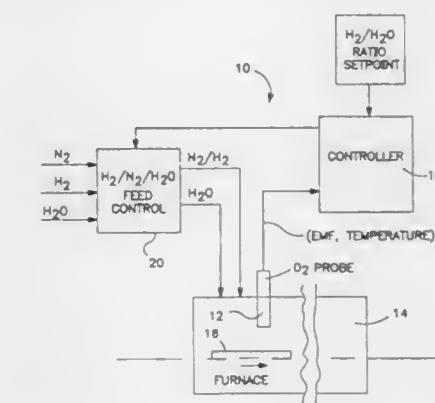
Jaak Stefaan Van Den Syde, Scarsdale, and Richard Bruce Vankempema, Hopewell Junction, both of N.Y., assignors to Praxair Technology, Inc., Danbury, Conn.

Filed Feb. 9, 1996, Ser. No. 599,204

Int. Cl.<sup>6</sup> F27B 9/04; F27D 7/00

U.S. Cl. 432—23

12 Claims



1. Apparatus for controlling introduction of either water or hydrogen into a furnace region where a part is subjected to an elevated temperature to accomplish a heat treatment process, said heat treatment process causing said part to cooperate in reduction and/or oxidation reactions which remain in balance at said elevated temperature so long as a hydrogen/water ratio set point is maintained, said apparatus comprising:

oxygen probe means in communication with said furnace region for providing an oxygen output indicative of sensed oxygen concentration within said furnace region and a temperature output indicative of temperature therein;

controller means for determining from said oxygen output and temperature output, a measured ratio of hydrogen/water within said furnace region, for comparing said measured ratio with said hydrogen/water ratio set point, and for providing a correction signal output in accordance with a determined difference between said measured ratio and said ratio set point; and

flow control means responsive to said correction signal output for providing a flow of at least one of hydrogen and water to said furnace region to move said hydrogen/water ratio towards said ratio set point.

5,772,429

## PORTABLE OVEN FOR HEATING OF TILES

Michael James Fehrenbach, and Carol Mawyer Fehrenbach, both of 15 Fox Creek Dr., Rehoboth, Del. 19971

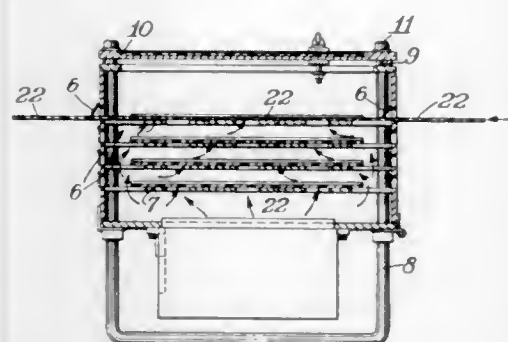
Filed Dec. 18, 1995, Ser. No. 754,182

Int. Cl.<sup>6</sup> F27B 3/18

U.S. Cl. 432—162

3 Claims

1. An oven for heating at least one floor tile comprising a substantially rectilinear cabinet having front and back sides, and a top and a bottom; a plurality of perforated substantially horizontal shelves for receiving floor tiles within the cabinet; apertures in the front and back sides of the cabinet adjacent to two opposite ends of each of the shelves; heating means mounted at the bottom of the cabinet, beneath the shelves; and at least one substantially vertical



passageway communicating from the heating means to each shelf and further comprising a means to measure and cut a tile.

5,772,430

**COOLING DEVICE WITH PANELS FOR ELECTRIC ARC FURNACES**

Milorad Pavlicevic, Udine; Gianni Gensini, Buia; Alfredo Poloni, Fogliano Di Redipuglia, and Romano Sellan, Trieste, all of Italy, assignors to Danieli & C. Officine Meccaniche SpA, Buttrio, Italy

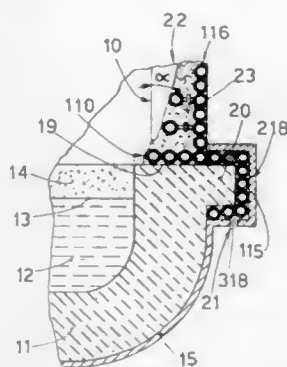
Filed Feb. 13, 1997, Ser. No. 798,728

Claims priority, application Italy, Feb. 14, 1996, UD96A0019

Int. Cl.<sup>6</sup> F27D 1/12; C21B 7/10

U.S. Cl. 432—238

27 Claims



1. Cooling device for an electric arc furnace comprising, an outer layer and at least one inner layer of cooling tubes adjacent to one another forming a substantially continuous wall, wherein said outer layer and at least one inner layer of cooling tubes are separated by an interspace which is filled with slag during furnace operation, and wherein said outer layer of cooling tubes is positioned vertically along a vertical sidewall of the furnace, above a refractory edge of a lower shell of a furnace.

5,772,431

**THIN-FILM SOLAR CELL MANUFACTURING APPARATUS AND MANUFACTURING METHOD**

Takeshi Ikeya; Kenji Sato; Kazuhiro Toyoda, and Takeshi Kamliya, all of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed May 22, 1996, Ser. No. 651,610

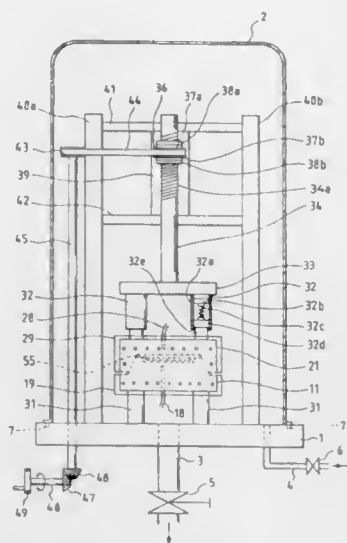
Claims priority, application Japan, May 22, 1995, 7-122493; Jun. 5, 1995, 7-137668

Int. Cl.<sup>6</sup> C21D 9/00; F27D 11/10

U.S. Cl. 432—254.2

7 Claims

1. A thin-film solar cell manufacturing apparatus comprising: a vacuum system including a base having an evacuating pipe and a gas inlet pipe,



a bell jar disposed on top of the base with an O-ring interposed between them, and valves respectively provided in the evacuating pipe and the gas inlet pipe;

a lower heating jig which is disposed on the base within the bell jar, which has a recess in an upper part of the lower heating jig so as to receive a thin-film solar cell to be treated, and which has a heater and a temperature sensor disposed in a lower part of the lower heating jig;

an upper heating jig which has a heater and a temperature sensor disposed in an upper part of the upper heating jig, and which forms a tight seal between the upper and lower heating jigs when it is rubbed against a top portion of the lower heating jig; and

a mechanism for vertically moving the upper heating jig by external manipulation.

5,772,432

**DENTAL IMPRESSION TRAY WITH IMPROVED ADHESION TO IMPRESSION MATERIAL**

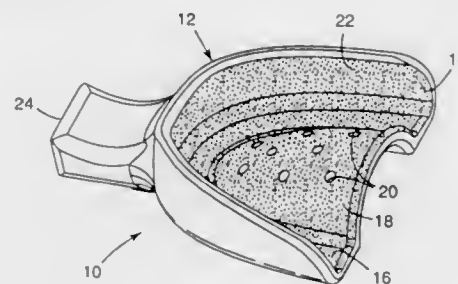
Russell A. Jordan, Rancho Cucamonga, and James F. Forbes, Monrovia, both of Calif., assignors to Minnesota Mining & Manufacturing Co., St. Paul, Minn.

Filed Oct. 18, 1996, Ser. No. 733,588

Int. Cl.<sup>6</sup> A61C 9/00

U.S. Cl. 433—37

14 Claims



1. A dental impression tray assembly including an impression tray having wall portions defining a receptacle for receiving a quantity of impression material, said tray including an adhesive extending across at least some of said wall portions for enhancing the bond between said wall portions and the impression material, said assembly including a container receiving said tray, said channel being devoid of impression material when said tray is received in said container, and wherein at least a majority of said adhesive is uncovered and spaced from said container.

5,772,433

**DISPOSABLE DENTAL SYRINGE TIP**

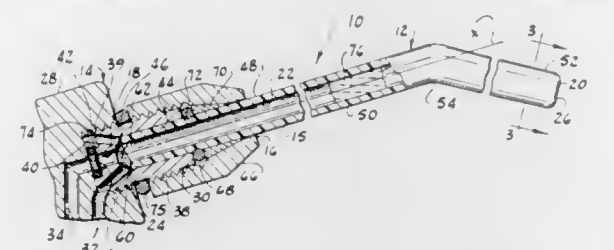
Bernard S. Esrock, 320 Dugate Dr., Chesterfield, Mo. 63017

Filed Apr. 18, 1995, Ser. No. 423,994

Int. Cl.<sup>6</sup> A61C 17/02

U.S. Cl. 433—80

34 Claims



1. For use with a hand-piece of an air-water syringe comprising air and water conduits for delivering air and water to a discharge end of the hand-piece, a dental syringe tip releasably engageable with the discharge end of the hand-piece comprising a single unitary tube having an intake end, a discharge end and an axis, the tube defining a fluid passageway having an intake port for fluid communication with the air and water conduits of the hand-piece and a discharge port for pressurized delivery of the air, water, or a combination of air and water through the passageway to the mouth of a patient, a viscous liquid within the fluid passageway for discharge from the discharge port into the mouth of the patient when air or water is delivered to the mouth of the patient via the hand-piece and fluid passageway, the intake end of the tube having an intake end face circumscribing and defining the intake port, the intake end face being asymmetrical to the axis such that a portion of the intake end is rearward of at least a portion of the intake port so that at least a portion of the intake end of the tube is spaced from the hand-piece to form a chamber when said portion of the intake end of the tube engages the discharge end of the hand-piece, said chamber providing fluid communication between the air conduit of the hand-piece and intake port and providing fluid communication between the water conduit of the hand-piece and the intake port so that air and water flowing through the air and water conduits flows through the passageway of the syringe tip via the chamber.

5,772,434

**ULTRASONIC TOOTH CLEANER**

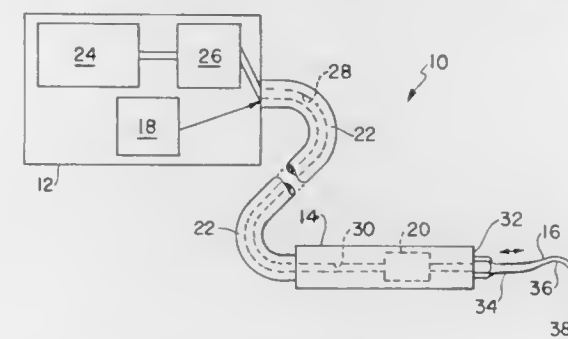
Ronald H. Winston, 256 Griffen Ave., New York, N.Y. 10583

Filed Nov. 28, 1995, Ser. No. 563,293

Int. Cl.<sup>6</sup> A61C 1/07

U.S. Cl. 433—119

20 Claims



17. An ultrasonic tooth cleaner for removing deposits from a tooth surface, comprising: a handle having an ultrasonic driver; and means coupled to said ultrasonic driver for transmitting ultrasonic vibrations to the tooth surface and for cleaning said tooth surface, said means comprising a cleaner tip formed of a reinforced composite polymer resin.

5,772,435

**DENTAL AND SURGICAL HANDPIECE WITH DISPOSABLE CARTRIDGE**

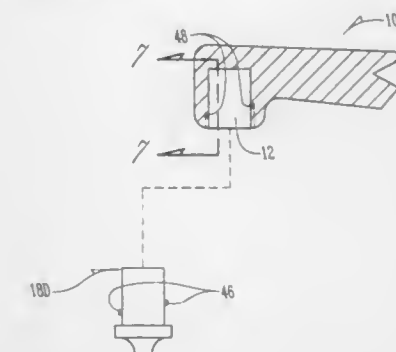
Paul Dorman, Fort Worth, Tex., assignor to Healthpoint, Ltd., San Antonio, Tex.

Filed Dec. 5, 1995, Ser. No. 567,473

Int. Cl.<sup>6</sup> A61C 1/14; 1/05

U.S. Cl. 433—126

8 Claims



1. A dental tool having fluid powered moving parts comprising: a handpiece having a head portion, the head portion having a cavity formed therein, a fluid passageway formed between the cavity and a source of fluid power; and a cartridge removably coupled to the handpiece at least partially within the cavity, said cartridge housing said fluid powered moving parts, said fluid powered moving parts also being at least partially within the cavity and being in communication with the fluid passageway to provide fluid power to the moving parts, said handpiece further comprising at least one L-shaped slot formed in the cavity, said cartridge further comprising at least one projection adapted to fit within the at least one L-shaped slot when the cartridge is inserted within the cavity to secure the cartridge to the handpiece.

5,772,436

**ODONTOTHERAPEUTIC HAND PIECE**

Akira Matsui, 28-44, Tenjugaoka-cho, Hanazono, Ukyo-ku, Kyoto, 616; Fuminori Satoji, Yokkaichi; Yoshinori Morita, Hikone, and Shigeo Kobayashi, Kuwana, all of Japan, assignors to Akira Matsui; J. Morita Manufacturing Corp., both of Kyoto, and NTN Corporation, Osaka, all of Japan

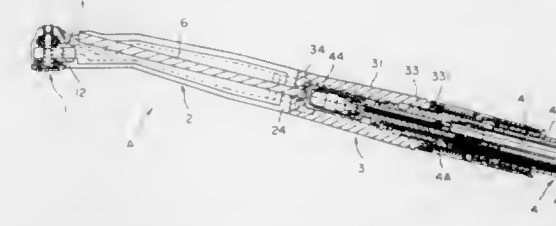
Filed Jul. 3, 1996, Ser. No. 675,344

Claims priority, application Japan, Jul. 5, 1995, 7-191031

Int. Cl.<sup>6</sup> A61C 1/08

U.S. Cl. 433—126

13 Claims



1. An odontotherapeutic hand piece formed of a head portion, in which a rotary member provided with turbine blades is accommodated, a handle portion connected to said head portion and a coupling portion arranged in continuation with said handle portion, said odontotherapeutic hand piece having a working medium conduit arranged in an internal space of said coupling portion and detachably engaged with said coupling portion for supplying a working medium to said odontotherapeutic hand piece, wherein: said head portion, said handle portion and said coupling portion are made of a material which permits integral molding; said head portion, said handle portion and said coupling portion are integrally joined together;



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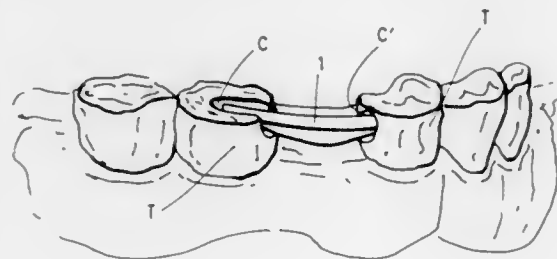
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said head portion, said handle portion and said coupling portion are formed of plural split members molded of a material which permits integral molding, and said split members are integrally joined together; and

said handle portion is formed of a pair of left-hand and right-hand half-split members, one of said paired left-hand and right-hand half split members is formed of a split member having a portion of said head portion integrally molded therewith, said handle portion having a shielding plate between said paired left-hand and right-hand half-split members, and said paired left-hand and right-hand half-split members are integrally joined together at joining surfaces thereof.



5,772,437  
SECURING ELEMENT

Bo Rangert, Mölnlycke, Sweden; Burton Langer, New York, N.Y., and Ulf Johansson, Onsala, Sweden, assignors to Nobel Biocare AB, Gothenburg, Sweden

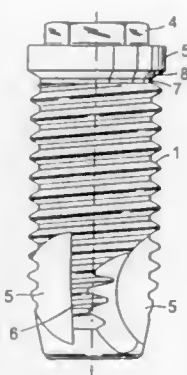
PCT No. PCT/SE94/01226, § 371 Date Oct. 5, 1995, § 102(e) Date Oct. 5, 1995, PCT Pub. No. WO95/17135, PCT Pub. Date Jun. 29, 1995

PCT Filed Dec. 20, 1994, Ser. No. 507,257

Claims priority, application Sweden, Dec. 20, 1994, 9304208 Int. Cl.<sup>6</sup> A61C 8/00

U.S. Cl. 433—174

6 Claims



1. A screw-type securing element, made of titanium, for permanent anchoring in bone tissue, the securing element having:  
a lower, threaded outer portion and an upper smooth outer portion, said threaded outer portion merging into said smooth outer portion via a cylindrical groove, said cylindrical groove having a profile corresponding to that of the threads of the threaded portion at a point of connection to the smooth outer portion substantially along the periphery of the securing element.

5,772,438  
METHOD FOR INSTALLING A PERMANENT BRIDGE BETWEEN A PAIR OF ABUTMENT TEETH

Guy Deom, Laval, Canada, assignor to Deom Design Inc., Laval, Canada

Filed Mar. 7, 1997, Ser. No. 813,196  
Int. Cl.<sup>6</sup> A61C 13/12

U.S. Cl. 433—181

17 Claims

1. A method for installing a permanent bridge over a gingival crest between a pair of abutment teeth posterior to the canines, said method comprising:

- providing a rigid infrastructure having a central portion and two opposite flat wings, said infrastructure being in the form of an elongated gondola-shaped bar sized to extend in between and inside the abutment teeth;
- processing the abutment teeth to form dental cavities large enough to receive and retain the wings of the infrastructure;

- applying a layer of a primer adhesive to the infrastructure, applying a resistant composite to the central portion of the infrastructure, curing the resistant composite that is so applied so as to fix said resistant composite to the infrastructure and thus to form a bridge, processing said bridge to remove imperfections, and placing each of said flat wings of the infrastructure into the corresponding cavity to ensure that the so formed bridge fits over the gingival crest;
- removing the bridge, inserting dental floss through the sides of the cavity and reinserting the bridge to make it sure that said dental floss may pass between the bridge and the abutment teeth once the installation is completed;
- fixing the wings of the infrastructure embedded into the formed bridge to the dental cavities of the abutment teeth by means of a dual cure composite; and
- filling the occlusal portion of the bridge with an additional resistant composite and finishing the bridge to give said bridge the contours of a real tooth.

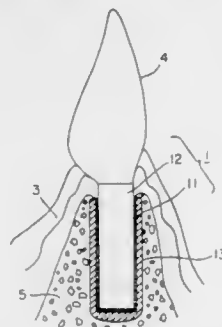
5,772,439  
HYBRID DENTAL IMPLANT  
Akira Yamaoka, Osaka; Kazuaki Nishimura, Sakai; Tomomi Nakanishi, Osaka, and Naho Michie, Sakai, all of Japan, assignors to Kanebo Limited, Tokyo, Japan

Filed Mar. 27, 1996, Ser. No. 624,871

Claims priority, application Japan, Mar. 28, 1995, 7-096215 Int. Cl.<sup>6</sup> A61C 8/00

U.S. Cl. 433—201.1

16 Claims



1. A hybrid dental implant having cementum particles on a surface of a dental implant substrate, wherein the dental implant substrate is formed of at least one material selected from the group consisting of titanium, hydroxyapatite, silica, alumina, zirconia, and bioglass.

5,772,440  
BINARY INFORMATION DISPLAY DEVICE  
Takashi Ida, Omiya, Japan, assignor to Mitsubishi Materials Corporation, Japan

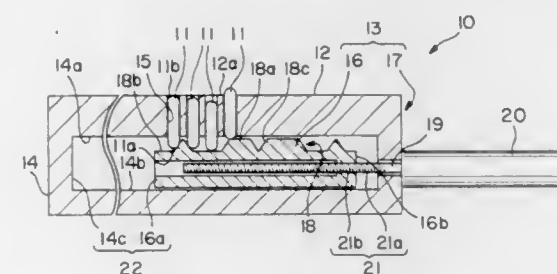
Filed Sep. 29, 1995, Ser. No. 537,238

Claims priority, application Japan, Sep. 30, 1994, 6-238196 Int. Cl.<sup>6</sup> G09B 27/00

U.S. Cl. 434—114

3 Claims

1. A binary information display device, comprising:

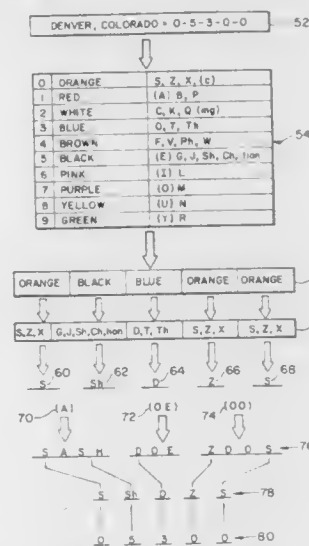


a plurality of pins, each said pin having opposed first and second ends and a longitudinal axis extending between said ends, said pins being arranged at regular intervals with their axes being parallel;  
a support member for supporting said pins so that said pins can move separately and linearly along; and  
a drive mechanism for pushing the second end of each of said pins to extrude and retract the second end of said pin from and into the display surface on said support member, said drive mechanism comprising a linear cam having an uneven cam surface with recesses and projections and being in sliding contact with the first end of each said pin, said linear cam being movable in a direction orthogonal to the axes of said pins to move said pins in their respective axial directions, and a linear movement mechanism for moving said linear cam linearly, said linear movement mechanism having a shaft extending in the direction orthogonal to the axes of the pins, a stepper motor for rotating the shaft, conversion means located between said shaft and said linear cam for converting rotation of said shaft into a linear motion of said linear cam, and reset means located near a moving area of said linear cam to set an original position of said stepper motor when said linear cam reaches a reference position.

5,772,441  
VISUALLY REINFORCED LEARNING AND MEMORIZATION METHODS  
Henry Allen Wilson, 7461 W. Belvedere Rd., West Palm Beach, Fla. 33411

Filed Dec. 24, 1996, Ser. No. 773,669  
Int. Cl.<sup>6</sup> G09B 19/00; 25/06; 27/08; 29/10  
U.S. Cl. 434—236

12 Claims



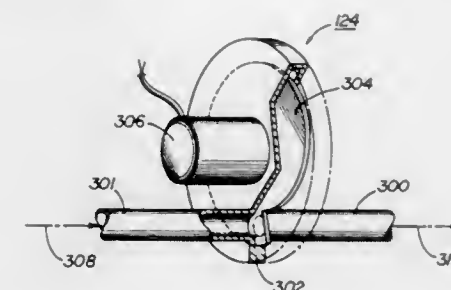
8. A method for visually reinforcing memorization of alphanumeric information, said method process comprising the step of displaying alphanumeric information on a visually perceptible medium, wherein each letter and number of the alphanumeric information bears a corresponding color according to the table of mnemonic sets:

Digit	Color	Phonetics
0	Orange	S, Z, X (c);
1	Red	(A), B, P;
2	White	C, K, Q (ing);
3	Blue	D, T, Th;
4	Brown	F, V, Ph, W;
5	Black	(E), G, J, Sh, Ch, tion;
6	Pink	(I), L;
7	Purple	(O), M;
8	Yellow	(U), N; or
9	Green	(Y), R.

5,772,442  
APPARATUS AND METHOD FOR SIMULATING BRONCHIAL RESISTANCE OR DILATION  
Samsun Lampotang; Willem L. van Meurs; Michael L. Good; Joachim S. Gravenstein, and Ronald G. Carovano, all of Gainesville, Fla., assignors to University of Florida Research Foundation, Inc., Gainesville, Fla.  
Division of Ser. No. 188,383, Jan. 27, 1994, Pat. No. 5,584,701, which is a continuation-in-part of Ser. No. 882,476, May 13, 1992, Pat. No. 5,391,081. This application Dec. 17, 1996, Ser. No. 767,948  
Int. Cl.<sup>6</sup> G09B 23/28

U.S. Cl. 434—265

10 Claims



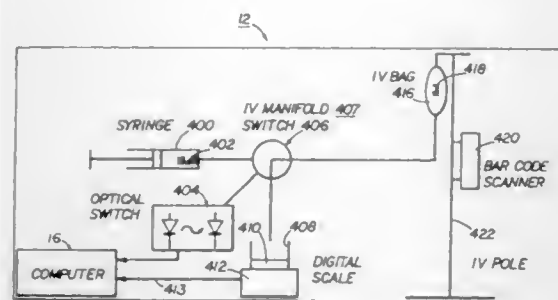
1. An apparatus for simulating bronchial resistance or dilation in real time in an integrated patient simulator during simulated medical procedures, comprising:  
a. a manikin with a simulated trachea and a simulated lung;  
b. a conduit interconnecting the simulated trachea and the simulated lung for propagating a flow of gas; and  
c. means for variably restricting the flow of gas through the conduit whereby a bronchial opening is simulated.

5,772,443  
APPARATUS AND METHOD FOR DETECTING AND IDENTIFYING A DRUG  
Samsun Lampotang; Willem L. van Meurs; Michael L. Good; Joachim S. Gravenstein, and Ronald G. Carovano, all of Gainesville, Fla., assignors to University of Florida Research Foundation, Inc., Gainesville, Fla.  
Division of Ser. No. 188,383, Jan. 27, 1994, Pat. No. 5,584,701, which is a continuation-in-part of Ser. No. 882,467, May 13, 1992, Pat. No. 5,391,081. This application Dec. 17, 1996, Ser. No. 768,144  
Int. Cl.<sup>6</sup> G09B 23/28

U.S. Cl. 434—272

15 Claims

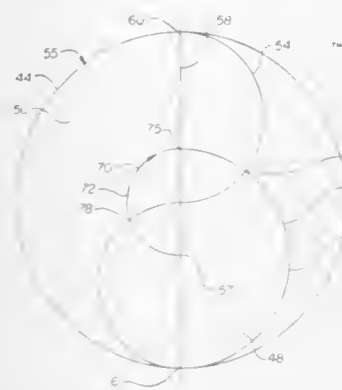
1. An apparatus for detecting and identifying a drug administered in real time in an integrated patient simulator during simulated medical surgery, comprising:  
a. a manikin for receiving the administration of a drug;  
b. bar code scanning means for detecting and identifying the drug administered by scanning a bar code affixed to an imple-



ment for administering the drug to said manikin, wherein the bar code includes information identifying the drug administered by the implement; and  
c. computer control means for receiving from said code scanning means the information identifying the drug and effecting a response in said manikin, the response being dependant upon drug administered.

**5,772,444**  
**METHOD AND ARTICLE FOR TEACHING THE CORE CONSTRUCTION OF THE SINGULARITY MOTION**  
James M. DeFee, 2300-24th Ave. South, Minneapolis, Minn. 55406

Filed Feb. 14, 1997, Ser. No. 799,229  
Int. Cl.<sup>6</sup> G09B 23/06  
U.S. Cl. 434—300 18 Claims

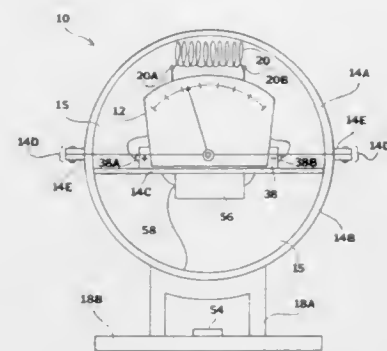


1. A method of representing a path of motion derived from the predicted motion of a point of singularity, comprising the steps of:  
a) providing template means including a template device for fixing one of a plurality of selectable rotation points of the template relative to a surface to be marked;  
b) operatively connecting a marking object to the template device;  
c) rotating the template device sequentially about a plurality of the selectable rotation points to guide the marking object to create a representation on the surface which represents the predicted motion of a point of singularity.

**5,772,445**  
**ELECTROSTATIC METER**  
Victor Roland Mousaa, 250 Riverside Dr., Apt. 62, New York, N.Y. 10036

Filed Jul. 12, 1996, Ser. No. 679,257  
Int. Cl.<sup>6</sup> G09B 23/18; G01R 31/02; 29/12; 1/04  
U.S. Cl. 434—301 8 Claims

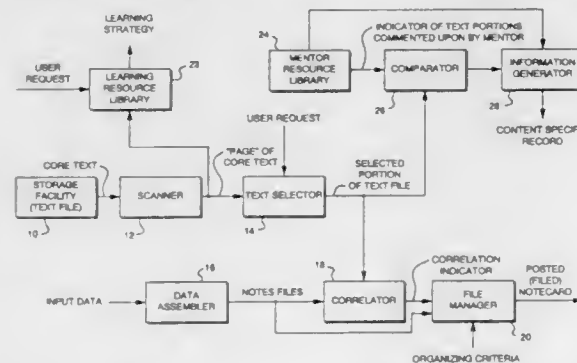
1. An apparatus for detecting and measuring disturbances in an electromagnetic field caused by an electrostatic potential of an electrically charged object within a region occupied by the electromagnetic field, the apparatus comprising:



(a) a DC source having a positive terminal and a negative terminal and capable of supplying a DC power;  
(b) a loop/solenoid coil having a first terminal and a second terminal, and embodied from an insulated conductor forming a plurality adjacently positioned coils of insulated wire, the loop/solenoid coil connected across the DC source with the positive terminal of the DC source connected to the first terminal of the loop/solenoid coil and the negative terminal of the DC source connected to the second terminal; thereby providing a DC potential to charge the loop/solenoid coil and establish the electromagnetic field within the region; and  
(c) a metering unit capable of sensing low level DC currents, the metering unit having a first terminal means connected to the positive terminal of the DC source and a second terminal means connected to the negative terminal, the metering unit provided to detect and measure disturbances in the electromagnetic field of the loop/solenoid coil by indicating a change in a current flow through the loop/solenoid coil.

**5,772,446**  
**INTERACTIVE LEARNING SYSTEM**  
Leonard J. Rosen, 199 Babcock St., Brookline, Mass. 02146

Filed Sep. 19, 1995, Ser. No. 529,986  
Int. Cl.<sup>6</sup> G09B 5/00; 7/00  
U.S. Cl. 434—307 R 6 Claims



1. An apparatus for providing information relating to a text file, said apparatus comprising:  
A. scanner means for interruptably and selectively scanning through said text file;  
B. selection means, coupled to said scanner means, for selecting a portion of the text file being scanned by said scanner means;  
C. mentor means, coupled to said selection means, for providing information relating to said selected portion of said text;  
D. means for identifying target sections of said text file deemed appropriate for providing information relating thereto;  
E. means for supplying information relating to each of said identified target sections of said text file;  
F. means for associating each of said target sections of said text file with its respective related information;  
G. means for operating said scanner means and said selection means as a foreground process characterized by a known activation sequence generated by a user; and

means for operating said mentor means as a background process characterized by an unknown activation sequence generated by a user;

wherein said mentor means comprises:

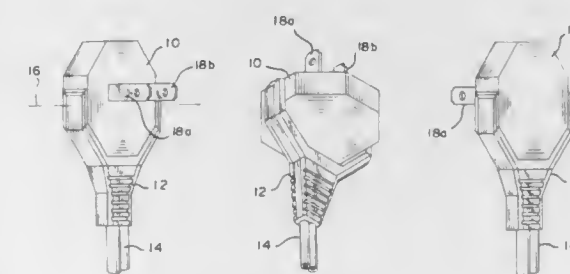
- means for determining whether said selected portion of said text file represents one of said target sections of said text file; and
- transfer means, responsive to an affirmative determination from said determining means, for transferring into a viewing space, suitable for viewing by a user, the information associated with the particular target section of said text file that is represented by said selected portion of said text file; and

wherein information related to a target section of said text file is content-specific to the text within said target section; and wherein said determining means and said transfer means comprises:

- database means including a plurality of knowledge files each representing a content-specific record pertaining to the text within a respective one of said target sections of said text file, each of said knowledge files being correlated with a text descriptor that is sufficient to identify said respective target section of said text file;
- comparator means for comparing the selected portion of said text file with each text descriptor associated with the knowledge files of said database means;
- means, coupled to said comparator means, for determining which comparison satisfies a match criteria; and
- output means for providing the content-specific record that corresponds to the knowledge file correlated with the particular text descriptor which satisfies said match criteria.

**5,772,447**  
**PIVOTING ELECTRICAL PLUG**  
Tat Kwong Cheung, Kowloon, Hong Kong, assignor to Koontat Development Co. Ltd., San Po Kong Kowloon, Hong Kong  
Continuation-in-part of Ser. No. 607,007, Feb. 26, 1996. This application Jun. 6, 1996, Ser. No. 659,649

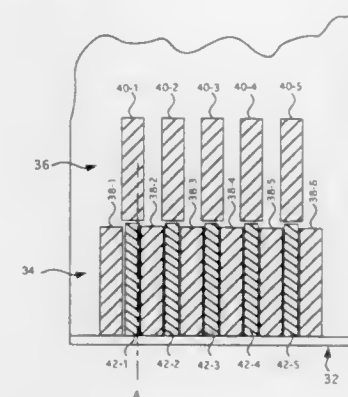
Int. Cl.<sup>6</sup> H01R 39/00 9 Claims  
U.S. Cl. 439—31



1. A pivoting electrical plug comprising:  
a) a plug body having a face and opposite side edges electrically conductive pin extending therefrom;  
b) an attachment body pivotally connected to the plug body such that the plug body and attachment body may pivot with respect to each other about a pivot axis extending through the opposite side edges of the plug body;  
c) first and second electrically conductive pins extending from the face of the plug body;  
d) a first electrically conductive wire located in the attachment body, passing into the plug body through one of the opposite side edges along the pivot axis and connected to the first electrically conductive pin; and  
e) a second electrically conductive wire located in the attachment body, passing into the plug body through another of the opposite side edges along the pivot axis and connected to the second electrically conductive pins.

**5,772,448**  
**EDGE CARD CIRCUIT BOARD**  
Alexander Craig Ekrot, Humble, and Bassam Nakhle Elkhoury, Spring, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

Filed Apr. 2, 1996, Ser. No. 631,606  
Int. Cl.<sup>6</sup> H01R 9/09 19 Claims  
U.S. Cl. 439—60



1. A printed circuit board for use with an edgecard connector, said printed circuit board comprising:  
a connection edge for insertion into an edgecard connector in an insertion direction;  
a first row of metal conductive pads disposed on one or both sides of said printed circuit board adjacent to said connection edge and extending away therefrom in a direction opposite the insertion direction;  
a second row of metal conductive pads disposed on one or both sides of said printed circuit board adjacent to said first row of metal conductive pads and extending away therefrom in a direction opposite the insertion direction, the metal conductive pads of said second row being staggered with respect to the metal conductive pads of said first row; and  
a row of solder mask regions disposed on one or both sides of said printed circuit board adjacent to said connection edge and extending away therefrom in a direction opposite the insertion direction, the solder mask regions being discrete regions interposed between the metal conductive pads of the first row so that each of the solder mask regions are in line with one of the metal conductive pads of said second row in the direction opposite the insertion direction, and the solder mask regions having a substantially uniform height a long the direction opposite the insertion direction.

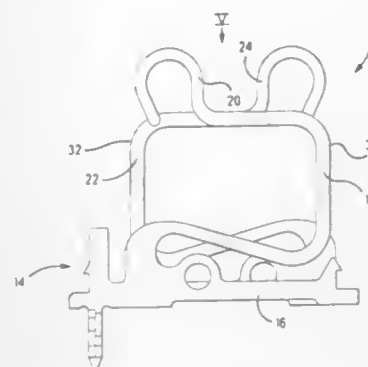
**5,772,449**  
**ELECTRICAL INSTALLATION BUS CONNECTOR**  
Günter Feldmeier, Lorsch, and Manfred Schaarschmidt, Bensheim, both of Germany, assignors to The Whitaker Corporation, Wilmington, Del.

Continuation of Ser. No. 709,458, Sep. 5, 1996, abandoned.  
This application Sep. 26, 1997, Ser. No. 938,498  
Claims priority, application United Kingdom, Sep. 20, 1995, 9519204

Int. Cl.<sup>6</sup> H01R 23/72 6 Claims  
U.S. Cl. 439—66

1. An electrical connector for connection to an electrical bus line, the connector comprising an insulative housing having an outer mating face and further having a plurality of terminals, each terminal having a base section, first and second spring sections and first and second contact sections extending respectively therefrom, the first and second contact sections protruding beyond a common outer mating face of the housing, and being deflectable into the housing toward the base section upon abutting engagement with the bus line conductor along the outer





mating face, when the common outer mating face is abutted against a common bus line conductor associated with the first and second contact sections during mating.

5,772,450

**ELECTRICAL CONNECTORS HAVING EXTERNAL CIRCUIT CONNECTIONS**

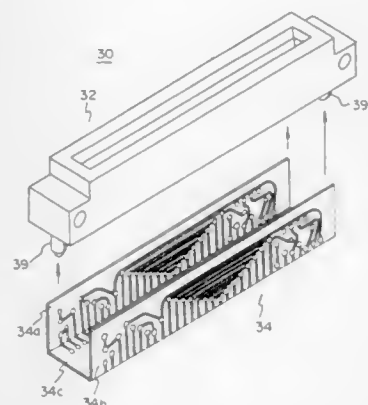
Allen J. Bernardini, Southbury, Conn., assignor to Litton Systems, Inc., Watertown, Conn.

Filed Jul. 23, 1996, Ser. No. 685,168

Int. Cl.<sup>6</sup> H01R 9/09

U.S. Cl. 439—70

32 Claims



1. An electrical connector structure comprising:
  - a rigid electrical connector body having a receptacle opening in one longitudinal surface and having a first external surface and a second external surface;
  - a plurality of first conductive traces being formed along the first external surface;
  - a plurality of second conductive traces being formed along the second external surface;
  - electrical components mounted on the body and electrically to one of the plurality of first conductive traces and the plurality of second conductive traces;
  - a plurality of first surface pads arranged on the first surface and connected to the plurality of first conductive traces, said plurality of first surface pads for connection to a second electrical connector structure; and
  - a second plurality of surface pads arranged on the second surface and connected to the plurality of second conductive traces, said plurality of second surface pads for connection to a third electrical connector structure.

5,772,451

**SOCKETS FOR ELECTRONIC COMPONENTS AND METHODS OF CONNECTING TO ELECTRONIC COMPONENTS**

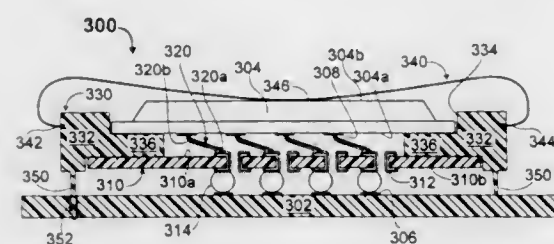
Thomas H. Dozier, II, Carrollton, Tex.; Benjamin N. Eldridge, Hopewell Junction, N.Y.; Gary W. Grube, Pleasanton, Calif.; Igor Y. Khandros, Orinda, Calif., and Gaetan L. Mathieu, Dublin, Calif., assignors to Form Factor, Inc., Livermore, Calif.

Continuation-in-part of Ser. No. 526,246, Sep. 21, 1995, and Ser. No. 452,255, May 26, 1995, which is a continuation-in-part of Ser. No. 340,144, Nov. 15, 1994, and Ser. No. 152,812, Nov. 16, 1993, Pat. No. 5,476,211, said Ser. No. 340,144 is a continuation-in-part of Ser. No. 152,812. This application Oct. 18, 1995, Ser. No. 533,584

Int. Cl.<sup>6</sup> H01R 9/09

U.S. Cl. 439—70

92 Claims



28. Solder-down socket for releasably connecting an electronic component to a circuit board, comprising:
  - a support substrate;
  - a plurality of resilient contact structures extending upward from a top surface of the support substrate; and
  - a plurality of solderable raised contact structures disposed on a bottom surface of the substrate, selected ones of said solderable raised contact structures being electrically connected to selected ones of the resilient contact structures;wherein:
  - the support substrate comprises a plurality of plated through holes extending through the support substrate from the top surface to the bottom surface of the support substrate;
  - each of selected ones of the through holes comprise a top contact area exposed on the top surface of the support substrate and a bottom contact area exposed on the bottom surface of the support substrate;
  - selected ones of the resilient contact structures are mounted to selected ones of the top contact areas;
  - selected ones of the solderable raised contact structures are mounted to selected ones of the bottom contact areas; and
  - interconnections between selected ones of the resilient contact structures and selected ones of the solderable raised contact structures comprise selected ones of the plated through holes.

5,772,452

**CONNECTOR FOR A CIRCUIT BOARD**

Masahiko Aoyama, Yokkaichi, Japan, assignor to Sumitomo Wiring Systems, Ltd., Japan

Filed May 24, 1996, Ser. No. 653,286

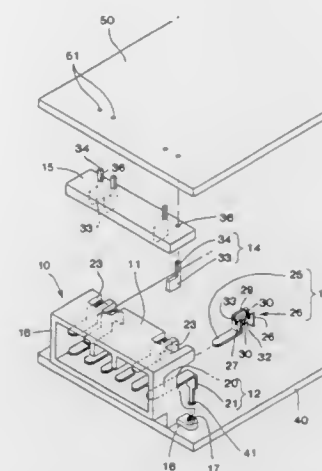
Claims priority, application Japan, May 31, 1995, 7-158347

Int. Cl.<sup>6</sup> H01R 9/09

U.S. Cl. 439—74

10 Claims

1. A connector for a main circuit board (40) and an auxiliary circuit board (50), comprising:
  - at least one main board side terminal (12) having a first portion (21) connected with circuitry on the main circuit board (40) and a second portion (20) extending from the main circuit board (40);
  - a holding plate (15) having a first surface engaged against the auxiliary circuit board (50) and an opposed second surface, at



- least one positioning hole (36) extending through said holding plate (15) between the first and second surfaces thereof;
- at least one auxiliary board side terminal (14) having a mount portion (34) extending through the positioning hole (36) and at least to the first surface of the holding plate (15) for connection with circuitry on the auxiliary circuit board (50), said auxiliary board side terminal (14) further having a connection portion (33) projecting from the second surface of the holding plate (15);
- a housing (11) mounted to the main circuit board (40) and detachably disposed adjacent said second surface of said holding plate (15), said housing (11) being formed with at least one cavity (23) for receiving the connection portion (33) of the auxiliary board side terminal (14), at least one mount hole (19) for receiving the second portion (20) of the main board side terminal (12) and a mating portion (18) for mating with another connector; and
- at least one housing side terminal (13) secured to the housing (11), said housing side terminal (13) having a mating portion (25) in proximity to the mating portion (18) of the housing (11) for mating with the other connector, said housing side terminal (13) further comprising a connection portion (26) aligned with said cavity (23) of said housing (11) and detachably connected to said connection portion (33) of said auxiliary board side terminal (14).

5,772,453

**SIDE-BY-SIDE DUAL PORT USB CONNECTOR**

Haw-Chan Tan, Diamond Bar, and Joel J. Yeh, San Gabriel, both of Calif., assignors to Hon Hai Precision Ind. Co., Ltd., Taipei Hsien, Taiwan

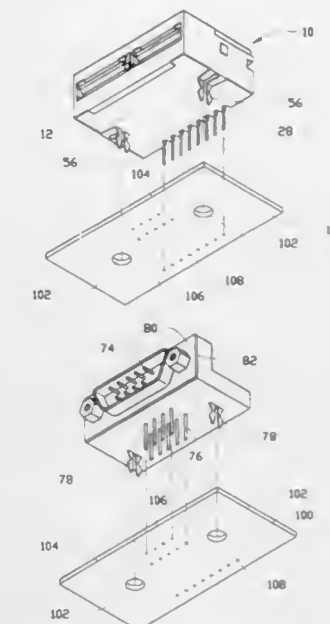
Filed Oct. 1, 1996, Ser. No. 720,807

Int. Cl.<sup>6</sup> H01R 13/648

U.S. Cl. 439—79

6 Claims

1. An arrangement for optionally utilizing an updated USB connector assembly or a traditional D-Sub connector on a mother board, comprising:
  - said mother board including a first set of plural contact holes positioned in a first distance from an edge of the mother board, and a second set of plural contact holes positioned in a second distance from the edge of the mother board wherein the second distance is substantially larger than the first distance;
  - pair of boardlock retaining holes disposed adjacent two sides of the first set of contact holes;
  - said USB connector assembly including a pair of boardlocks adapted to be received within the boardlock retaining holes, respectively, and a plurality of first contacts wherein contact tail sections of said first contacts extend downward in alignment with the corresponding contact holes of the second set, respectively; and



said D-Sub connector including a pair of boardlocks also adapted to be received within the boardlock retaining holes, respectively, and a plurality of second contacts wherein contact tails of said second contacts extend downward in alignment with the corresponding contact holes of the first set, respectively, so that said USB connector assembly and said D-Sub connector can be mutually exclusively mounted on the mother board for different rank models usage.

5,772,454

**WIRE TO BOARD CONTACT TERMINAL**

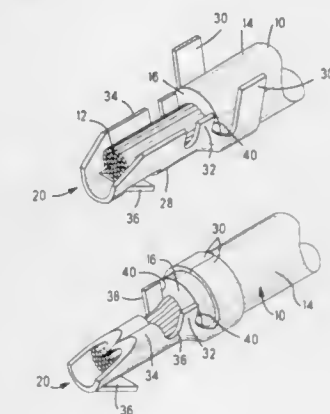
Kenneth Wade Long, Jr., Winston-Salem, N.C., assignor to The Whitaker Corporation, Wilmington, Del.

Filed Aug. 29, 1996, Ser. No. 705,504

Int. Cl.<sup>6</sup> H01R 9/09

U.S. Cl. 439—83

18 Claims



1. A contact terminal, comprising:
  - a body having a forward end and a rearward end, the body having an insulation crimping section along the rearward end, a conductor crimping section, and a latch member toward the forward end, a stop section being disposed along the body between the insulation crimping section and both the conductor crimping section and the latch member, the stop section having a forwardly facing shoulder and a rearwardly facing shoulder, the body being adapted to be crimped to a wire having an insulative jacket surrounding a conductor of a wire, the rearwardly facing shoulder providing a stop for an end of the insulative jacket adjacent a stripped end of the wire so that the insulative jacket is not received into the body forward of

the stop section, the insulation crimping section being adapted to be secured to the insulative jacket and the conductor crimping section being adapted to be crimped to the conductor, the conductor crimping section being received through a hole in a circuit board to provide electrical connection there-with upon soldering, the circuit board having a first surface and a second surface, the latch member engaging the second surface and the forwardly facing shoulder engaging the first surface, thereby positioning the insulative jacket away from the circuit board during soldering to protect the insulative jacket from heat.

5,772,455

## COMBINATION MESSENGER STRAND GROUND AND CABLE LASHING WIRE CLAMP

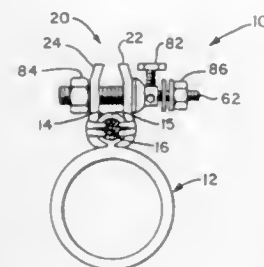
William T. Auclair, Winsted, and Randolph L. Auclair, New Hartford, both of Conn., assignors to Electric Motion Company, Inc., Winsted, Conn.

Continuation-in-part of Ser. No. 453,828, May 30, 1995, abandoned. This application Feb. 20, 1997, Ser. No. 802,520

Int. Cl.<sup>6</sup> H01R 4/66

U.S. Cl. 439—100

21 Claims



1. A ground clamp for connecting a ground lead to a cable or self-support innerduct having a grounding messenger strand, the messenger strand having an insulated conductor, the ground clamp comprising:

- jaw means for gripping the messenger strand, said jaw means comprising penetration means for penetrating the messenger strand insulation and engaging the messenger strand conductor, wherein said penetration means provides an electrical connection with the messenger strand,
- clamp means engageable with said jaw means for clamping said jaw means to the messenger strand, said clamp means providing an electrical connection with said jaw means; and
- ground connection means for connecting said clamp means with a ground connector, said ground connection means defining an axis and comprising bolt means and intersecting first and second bores, said first and second bores each defining an axis that is transverse to said axis of said ground connection means, said first bore receiving the ground lead, said bolt means being threadably positionable within said second bore whereby said bolt means is engageable with the ground lead to clamp the ground lead in said first bore.

5,772,456

## HOUSING STRUCTURE FOR ROTARY CONNECTORS

Hiroshi Ohishi, Tokyo, Japan, assignor to Niles Parts Co., Ltd., Japan

Filed Mar. 1, 1996, Ser. No. 609,384

Claims priority, application Japan, Mar. 28, 1995, 7-094499

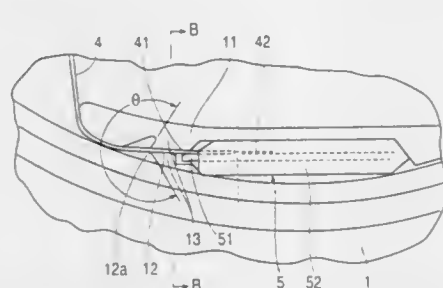
Int. Cl.<sup>6</sup> H01R 35/04

U.S. Cl. 439—164

4 Claims

1. A rotary connector for supplying a power source current to an electrical component, comprising:

- a stator housing;



a rotor housing connected to said stator housing and rotatable with respect to said housing;

a flexible cable held spirally in a space formed by said stator housing and said rotor housing, said cable having a first end connected to said stator housing and a second end connected to said rotor housing;

a supporter provided on at least one of said stator housing and said rotor housing, a terminal being supported on said supporter, and a conductive wire in said flexible cable being electrically connected to said terminal; and

a barrier means provided on at least one of said stator housing and said rotor housing for preventing said flexible cable from entering an inside of said supporter after said flexible cable is broken and separated from said supporter;

wherein said barrier means comprises a pair of barriers formed on either side of a passage through which said flexible cable passes into said supporter, said barriers defining an inlet surface facing away from said terminal, said inlet surface having a generally convex shape for guiding said flexible cable away from an opening of said passage.

5,772,457

## CONVERTIBLE DRY-MATE TO WET-MATE SUBMERSIBLE ELECTRICAL CONNECTOR SYSTEM

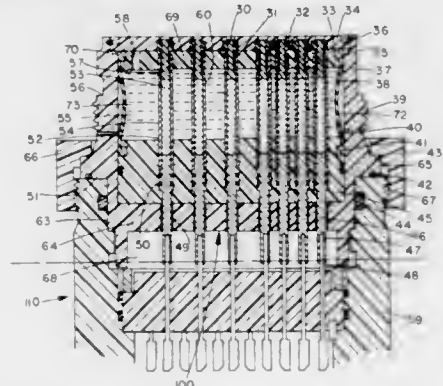
James L. Cairns, Ormond Beach, Fla., assignor to Ocean Design, Inc., Ormond Beach, Fla.

Filed May 15, 1995, Ser. No. 441,057

Int. Cl.<sup>6</sup> H01R 4/60

U.S. Cl. 439—201

17 Claims



1. An adapter for connecting a first electrical connector to a second electrical connector, comprising:

- an adapter shell having an interior chamber, a first engagement at a proximal end of said shell engageable with said first electrical connector, a second engagement at a distal end of said shell engageable with said second electrical connector, and a plurality of openings between said interior chamber and an external environment;

a plurality of socket assemblies disposed at least partially in said chamber, each having a distal end and a proximal end, each socket assembly comprising in said chamber a piston and a conductive tube, said piston slideably disposed in said conductive tube at said distal end of said socket assembly, a first electrical contact at said proximal end of said socket assembly electrically connected to said tube, and a second electrical

contact at said distal end of said socket assembly electrically connected to said tube, said piston movable into sealing engagement with one of said openings for sealing said second electrical contact against exposure to said external environment; and

at least one bladder containing dielectric fluid disposed in said chamber, at least a portion of said bladder enclosing at least one of said socket assemblies.

5,772,458

## ELECTRICAL PLUG COMPRISING TWO HALVES

Lucas Soes, Rosmalen, Netherlands, assignor to The Whitaker Corporation, Wilmington, Del.

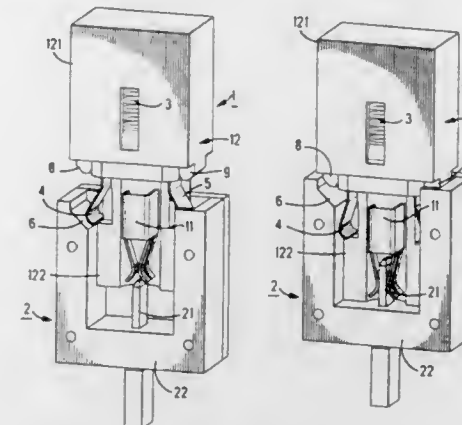
Filed May 5, 1997, Ser. No. 851,595

Claims priority, application Netherlands, May 20, 1996, 196 20 177.2

Int. Cl.<sup>6</sup> H01R 13/62

U.S. Cl. 439—310

5 Claims



1. An electrical plug comprising a first and a second plug half, the first plug half having at least one first electric contact and a first housing, and the second plug half having at least one second contact, which is complementary to the first contact, and a second housing, the first housing having two part-housings which are movable relative to one another in the plug-in direction, and between which a spring is arranged in such a way that the part-housings can be moved towards one another counter to the spring force,

the first part-housing bearing the first contact and having at least one spring arm,

the second housing having at least one stop positioned in such a way that the spring arm runs against the said stop when the two plug halves are initially connected thereby preventing further insertion,

the second part-housing having at least one cam which is arranged in such a way that the cam moves the spring arm away from the stop when the first part-housing and the second part-housing are pushed together during insertion, which loads the spring, and that the first part-housing, which then becomes freely movable, is inserted automatically into the second plug half by the force of the spring.

5,772,459

## ROTATIONALLY ACTUATED COMPLIANT ELECTRICAL CONNECTOR

Mark A. Swart, Anaheim Hill, Calif., assignor to Delaware Capital Formation, Inc., Wilmington, Del.

Filed Mar. 15, 1996, Ser. No. 622,317

Int. Cl.<sup>6</sup> H01R 9/09

U.S. Cl. 439—341

21 Claims

1. A compliant electrical connector comprising:

- a male connector member having an elongated body with a head at one end, wherein the head is positioned perpendicular to



the body and includes at least one electrical contact fixedly disposed therein that projects from a surface of the head adjacent a tip portion;

a female connector member having a hollow body and an internal cavity therein, wherein the internal cavity includes at least one electrical contact disposed therein to connect with and impose a force against the electrical contact of the male connector member when the head is placed within the cavity and rotated therein;

a latch disposed along a frontside surface of the female connector member; and

a latch catch disposed along a frontside surface of the male connector member adjacent the head, wherein the internal cavity includes a stop projecting therein to limit rotational movement of the head inside of the internal cavity, and wherein the latch catch is adapted to accommodate placement of the latch therein when the head contacts the stop to provide a releasibly locking attachment between the male connecting body and the female connecting body.

5,772,460

## ELECTRICAL CONNECTOR

Anja Baumann, Heilbronn, Germany, assignor to Amphenol-Tuchel Electronics GmbH, Germany

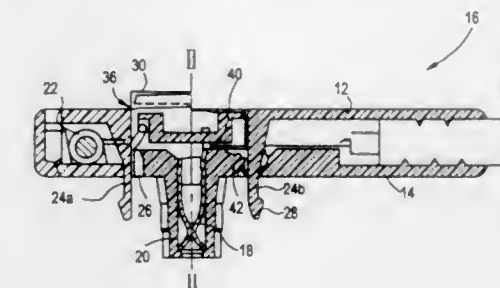
Filed Sep. 13, 1996, Ser. No. 713,359

Claims priority, application Germany, Sep. 15, 1995, 195 34 205.4

Int. Cl.<sup>6</sup> H01R 13/627

U.S. Cl. 439—352

8 Claims



1. An electrical connector, particularly for use between a receptacle and an electrical control unit for inflatable restraint systems in motor vehicles, comprising:

- a shell consisting of a lower part of the shell and an upper part of the shell for receiving electrical cables as well as contact springs connectable to them for receiving contact pins of the associated receptacle with squib,



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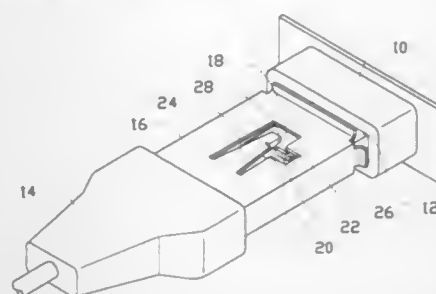
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resilient catch pins on the shell for securing the shell to the receptacle, wherein the catch pins extend from the upper part of the shell, and the lower part of the shell has openings through which the catch pins pass in the closed condition of the shell, and

a U-shaped locking member having legs which are guidable through openings behind the catch pins to secure the catch pins against accidental detachment in the mounting position.

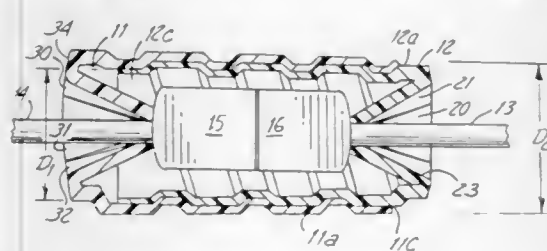
5,772,461  
**LOCKING MECHANISM FOR INTERCONNECTING TWO MATED CONNECTORS**  
Nobbert N. H. Yu, Tao-Yuan Hsien, Taiwan, assignor to Hon Hai Precision Ind. Co., Ltd., Taiwan  
Filed Sep. 13, 1996, Ser. No. 713,773  
Int. Cl.<sup>6</sup> H01R 13/627  
U.S. Cl. 439—352 8 Claims



1. An arrangement for combining two connectors together, comprising:

a first connector having a first projecting section with a first tang having an upward tag at a distal end thereof; and  
a second connector having a second projecting section with a second tang having a downward tag at a distal end thereof; whereby when the first connector and the second connector are mated with each other, the upward tag of the first tang of the first connector can be latchably engaged with a locking edge of the second connector, and the downward tag of the second tang of the second connector is substantially positioned above the first tang and ready to actuate the first tang to deflectably move downward wherein the first tang extends in a first direction perpendicular to a second direction in which the second tang extends.

5,772,462  
**CORD CONNECTOR**  
Frederick F. Osten, 11633 239th St. North, Scandia, Minn. 55073  
Filed Aug. 19, 1996, Ser. No. 699,500  
Int. Cl.<sup>6</sup> H01R 13/62  
U.S. Cl. 439—367 10 Claims

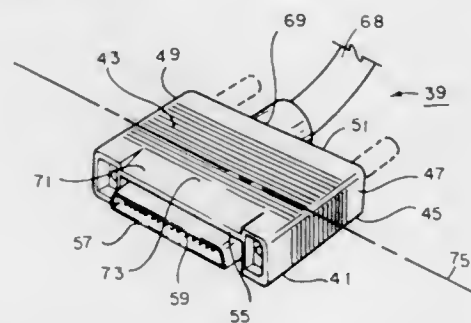


1. An electrical cord connector for holding together a male electrical plug connected to a first electrical cord and a female electrical plug connected to a second electrical cord, comprising:  
a first substantially hollow receptacle-like member, said first member having a side wall and a first end with a plurality of

resilient fingers cantilevered from said first end, said plurality of resilient fingers positioned at an acute angle to said side wall so that axial displacement of the male electrical plug into said first substantially hollow receptacle-like member can force said plurality of resilient fingers radially outward to permit passage of said electrical plug past said resilient fingers and into the first substantially hollow receptacle-like member and thereby allow the resilient fingers to flex radially inward and engage a rear portion of the male elliptical plug, said resilient fingers having sufficient stiffness so that when the electrical cord connected to said male electrical plug is pulled, the resilient fingers engage the male electrical plug and prevent withdrawal of said male electrical plug from the first substantially hollow receptacle-like member; and

a second substantially hollow receptacle-like member, said second member having a side wall and a first end with a plurality of resilient fingers cantilevered from said first end, said plurality of resilient fingers in said substantially hollow receptacle-like member positioned at an acute angle to said side wall of said substantially hollow receptacle-like member so that axial displacement of the female electrical plug into the second substantially hollow receptacle-like member, forces said plurality of resilient fingers in said substantially hollow receptacle-like member radially outward to permit passage of said female electrical plug past said resilient fingers into said second substantially hollow receptacle-like member and thereby allow the resilient fingers in said substantially hollow receptacle-like member to flex radially inward and engage a rear portion of the female electrical plug, said resilient fingers in said substantially hollow receptacle-like member having sufficient stiffness so that when the electrical cord connected to said female electrical plug is pulled the resilient fingers engage a rear portion of the female electrical plug and prevent withdrawal of said female electrical plug from the second substantially hollow receptacle-like member so that when said first substantially hollow receptacle-like member and said second substantially hollow receptacle-like member are in engagement with each other the male electrical plug and the female electrical plug are secured therein so that a pulling force on either electrical cord will not dislodge the female electrical plug from the male electrical plug.

5,772,463  
**ELECTRICAL CABLE WITH IMPROVED CONNECTOR**  
Lawrence Carl Kleppe, Elgin; Rolland Dean O'Groske, Rochester; Glenn Ray Oldenburg, Rochester; Sandra Jeanne Shirk/Heath, Rochester, all of Minn.; Keith Franklin Tharp, San Jose, Calif., and Randall Vincent Tointon, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.  
Filed Oct. 2, 1996, Ser. No. 724,812  
Int. Cl.<sup>6</sup> H01R 13/64  
U.S. Cl. 439—374 16 Claims



an insulative housing containing the signal contacts and defining the plug-receiving cavity, and further including an additional connection face, where said plug-receiving cavity is complementary to both said first and said second plug connectors, a conductive member affixed to said insulative housing isolated from signal contacts, and

at least one detection contact mounted to the housing at least adjacent the plug-receiving cavity and having a contact section exposed within the plug-receiving cavity and disposed in a clearance associated with said larger dimension of said first plug connector, and cooperable with a respective tab of said conductive member disposed within the plug-receiving cavity, and further having a second contact section exposed at said additional connection face, and an additional second contact section exposed at said additional connection face and defined on either said conductive member or a second said detection contact,

each said tab being positioned proximate a said clearance such that said tab is engageable by said first plug connector at said larger dimension thereof when said plug connector is insertable into the plug-receiving cavity, such that said tab is deflectable into engagement with a contact section of said detection contact, and such that said tab is not deflectable by said second plug connector into engagement with said contact section upon insertion of said second plug connector into the plug-receiving cavity,

whereby each detection contact becomes commoned with said conductive member upon insertion of said first plug connector, generating a signal detectable by the electronic apparatus to which the receptacle connector is connected through said second contact section and said additional second contact section at said additional connection face to configure circuitry to correspond with transmissions through said first plug connector.

5,772,467

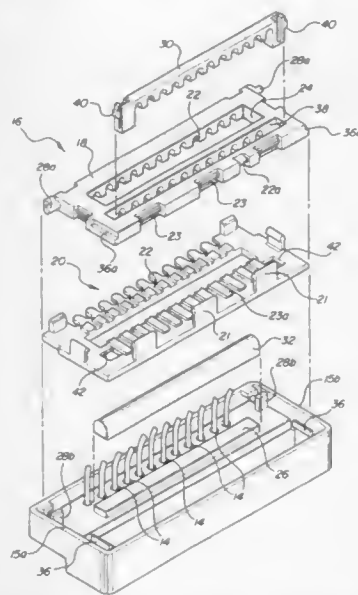
**TERMINAL FREE CONNECTOR AND METHOD**  
James P. Burgess, Troy, Mich., assignor to Alcoa Fujikura Ltd., Brentwood, Tenn.

Filed Jun. 4, 1996, Ser. No. 658,218

Int. Cl.<sup>6</sup> H01R 9/07

U.S. Cl. 439—493

4 Claims



1. A terminal free electrical connector comprising:  
a housing including opposed side and opposed end walls and a bottom surface, said walls and surface together forming a hollow enclosure, said bottom surface having a plurality of arrayed apertures formed therethrough for introducing a plurality of electrical leads through said apertures;

a rectangular wire holder having hinge means, said holder being pivotally insertable into said enclosure, said wire frame including a plurality of aligned throughbores for receiving said plurality of electrical leads, said throughbores being alignable with said apertures of said housing, said wire frame further comprising a slot formed therein oriented normal said throughbores, said leads passing through said slots so as to expose portions of said leads therein, said exposed portions forming contact surfaces for contact with a mating connector to establish electrical paths therebetween;

a boss formed on the bottom surface of said housing at a location thereon such that, when said wire frame is retained in said housing, said boss is received in said slot;

a resilient member configured to be received in said slot and disposed therein between said boss and said exposed portions of said leads so as to position said leads in said slot; and

a guide wall formed on a rear surface of said housing said guide wall surrounding said plurality of apertures for retaining a sealing grommet thereon.

5,772,468

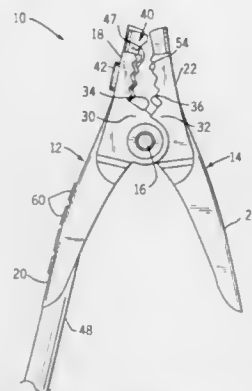
**CLAMP ASSEMBLY FOR A BATTERY BOOSTER CABLE**  
Wayne J. Kowalski, Buffalo Grove, and Robert J. Holpuch, Arlington Heights, both of Ill., assignors to Coleman Cable System, Inc., Savannah, Ga.

Filed Sep. 27, 1996, Ser. No. 723,218

Int. Cl.<sup>6</sup> H01R 11/00

U.S. Cl. 439—506

27 Claims



1. A clamp assembly for a battery booster cable for removable attachment to a battery terminal, comprising:

a pair of clamp members each including a jaw portion and a handle portion, one of said jaw portions being configured with an electrically conductive edge portion, and the other of said jaw portions being configured with a non-conductive edge portion, said electrically conductive edge portion and non-conductive edge portion cooperating to securely mount the clamp to the battery terminal;

a pivot member joining the clamp members together between the respective jaw and handle portions thereof to allow pivotal movement of the clamp members relative to one another about the pivot member; and

a biasing member disposed on the clamp members for normally urging the handle portions apart and the jaw portions together about the pivot member.

5,772,469

**FLOATING PANEL MOUNTING SYSTEM FOR ELECTRICAL CONNECTORS**  
Gary E. Polgar, Bolingbrook, and Rupert J. Fry, Mount Prospect, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

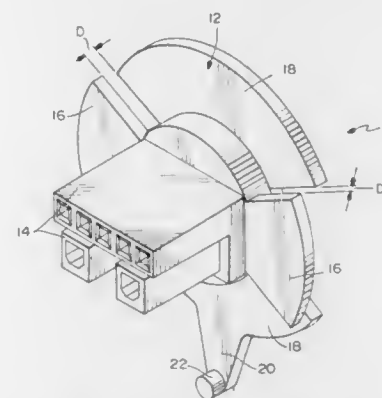
Filed May 2, 1996, Ser. No. 642,007

Int. Cl.<sup>6</sup> H01R 13/73

U.S. Cl. 439—546

15 Claims

1. An electrical connector panel mounting system, comprising:



a panel having a given thickness between two surfaces and including a first opening formed with at least one radially extending locating portion and a second opening spaced from the first opening;

a connector having a dielectric housing insertable from one surface of the panel along an axis to an insertion position into the first opening in the panel, the housing having at least one radially extending locating flange for passing through the locating portion of the first opening as the housing is inserted thereto and at least one radially extending stop flange spaced axially and angularly from the locating flange for abutting the one surface of the panel when the locating flange clears the opposite surface of the panel, the housing being rotatable about said axis from its insertion position to a mounted position whereat the locating flange can abut the opposite surface of the panel to prevent axial removal of the housing back out of the first opening, and the cross-sectional configuration of the housing being smaller than the first opening and when in the mounted position to provide rotational and lateral floating of the connector relative to the panel;

the locating flange being slightly less in angular circumferential direction than the radially extending locating portion of the panel first opening, the stop flange being greater in angular circumferential direction than the locating flange, and the locating and stop flanges positioned so that one does not overlap the other in the direction of the insertion axis; and  
a locking arm projecting radially of the housing and including a locking protrusion for engagement in the second opening in the panel when the housing is in its mounted position and for preventing rotation of the connector from the mounted position back to the insertion position, the second opening being larger than the locking protrusion to allow for said rotational and lateral floating of the connector relative to the panel.

5,772,470

**COAXIAL CONNECTOR**  
Kouji Togashi, Tokyo, Japan, assignor to SMK Corporation, Tokyo, Japan

Filed Dec. 6, 1996, Ser. No. 761,241

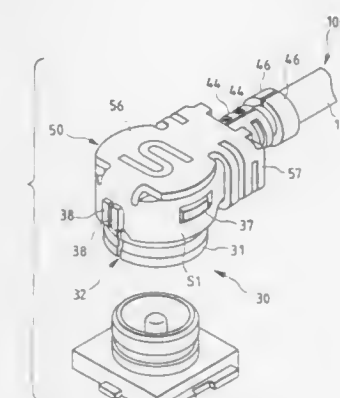
Claims priority, application Japan, Jun. 3, 1996, 8-139799; Jun. 3, 1996, 8-139800

Int. Cl.<sup>6</sup> H01R 9/07

U.S. Cl. 439—582

4 Claims

1. A coaxial connector comprising:  
a contact having a vertically-extending, central terminal portion and connected to a central conductor of a horizontally-extending coaxial cable;  
an insulator surrounding and holding said contact; and  
a casing having a vertically-extending external terminal portion of a tubular shape, connected to an outer conductor of said coaxial cable, and surrounding and holding said insulator; and wherein:  
said casing comprises an inner casing and an outer casing connected together by means of convex and concave engagement portions engaged with each other;



said inner casing of an integral construction includes said external terminal portion,  
insulator holder portions extending upwardly respectively from opposite sides of an upper end of said external terminal portion,  
a connecting plate portion extending rearwardly from a rear upper end portion of said external terminal portion, and  
outer conductor clamping piece portions extending upwardly from opposite side edges of said connecting plate portion, respectively; and  
said outer casing has an upper plate portion closing an upper side of said insulator holder portions.

5,772,471

**PANEL MOUNT BRACKET FOR ELECTRICAL CONNECTOR**

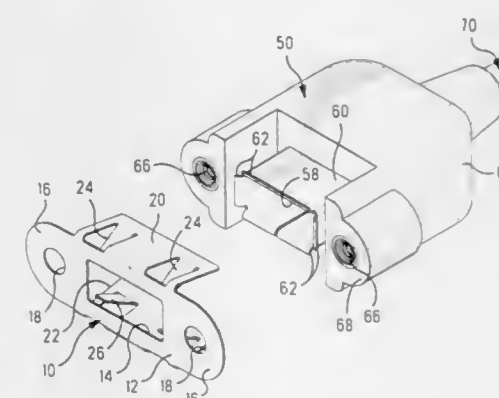
Jonathan Earl Buck, Santa Clara, Calif., assignor to The Whitaker Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 742,008, Oct. 31, 1996, Pat. No. 5,709,569. This application Apr. 30, 1997, Ser. No. 846,604

Int. Cl.<sup>6</sup> H01R 13/648

U.S. Cl. 439—607

5 Claims

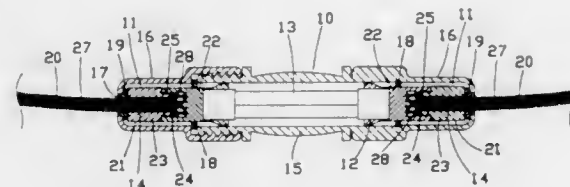


1. A bracket for securing a shielded electrical connector to a panel at an input/output port of an electronic apparatus where the connector shield includes rearwardly facing surfaces at least along upper and lower surfaces at least proximate leading ends thereof, comprising:

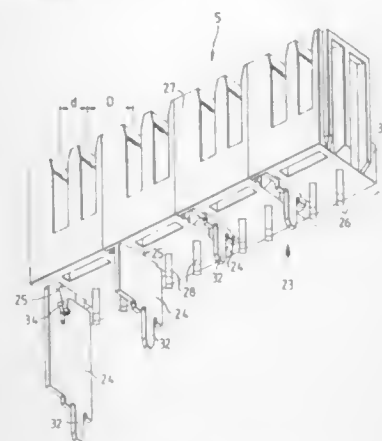
an integral member having a panel mount body through which extends a cutout for aligning with the input/output port and having flanges on either side of said cutout with fastener-receiving apertures therethrough for aligning with mounting apertures of said panel; and  
said integral member further having upper and lower wall sections extending rearwardly from edges of said panel mounting body defining therebetween a connector-receiving region, each said upper and lower wall section including at least one



stiffly resilient locking tab extending forwardly and inwardly from a rearward edge thereof, whereby a shielded connector is affixable to said bracket by urging the connector forwardly against the bracket body until the locking tabs latch behind the rearwardly facing surfaces of the connector shield.



**5,772,472**  
**TERMINAL BLOCK FOR HIGH TRANSMISSION RATES**  
Petra Beutler, Sabine Zimmer, Dieter Gerke, Ferenc Nad, and Frank Mössner, all of Berlin, Germany, assignors to Krone Aktiengesellschaft, Berlin-Zehlendorf, Germany  
Filed Sep. 27, 1996, Ser. No. 722,357  
Claims priority, application Germany, Sep. 29, 1995, 195 37 532.7; Apr. 4, 1996, 196 14 788.3  
Int. Cl.<sup>6</sup> H01R 13/648  
U.S. Cl. 439—608 25 Claims



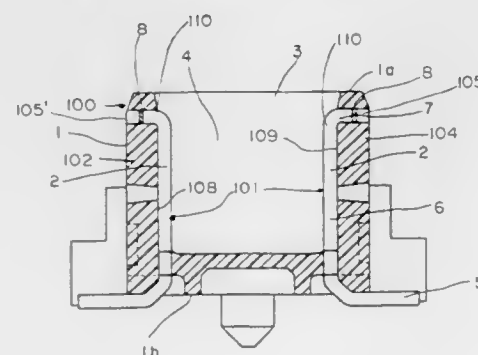
1. A telecommunications and data transfer terminal block for high transmission rates, comprising:  
a plastic body with chambers disposed substantially in a row, slots defined in transverse walls between said chambers and extending with parallel axes thereto and grooves in a bottom of said plastic body;  
insulation displacement contact elements, each element being disposed in one of said chambers;  
shield plates, each of said shield plates being disposed in one of said slots;  
a web inserted in one of said grooves, said web connecting one of said shield plates adjacent to one of said chambers to another of said shield plates adjacent to another of said chambers, three of said shield plates of two adjacent pairs of chambers being connected to each other by said web and by an additional web to form a shield plate cage.

**5,772,473**  
**FUSE HOLDER**  
Wen-Tzung Cheng, No. 422, Fu-Hsing Rd., and Wen-Hunh Cheng, No. 424, Fu-Hsing Rd., both of Tao Yuan City, Tao Yuan Hsien, Taiwan  
Filed Jan. 2, 1997, Ser. No. 778,029  
Int. Cl.<sup>6</sup> H01R 13/66  
U.S. Cl. 439—621 4 Claims

1. A fuse holder comprising an electrically insulative transparent shell, two jacks mounted inside said transparent shell at two opposite ends and respectively connected to conductors of two electric wires, and a cartridge fuse mounted inside said transparent shell and connected between said jacks, wherein:  
each of said jacks is comprised of a first connector disposed at an inner side, a second connector disposed at an outer side, and a clamp connected between said first connector and said second connector, said first connector being a stepped, cylin-

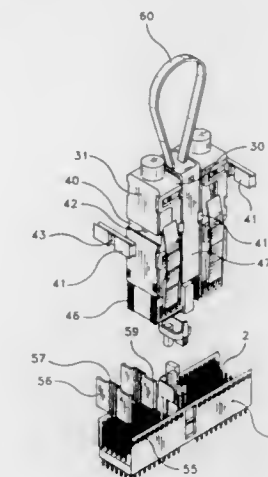
drical element having a center through hole, which receives one electric wire, an embossed outside wall, and a screw rod at an inner end, said second connector comprising an inner thread at one end threaded onto the screw rod of said first connector, and an expanded split coupling portion at an opposite end plugged onto one end of said cartridge fuse, said clamp being connected between said first connector and said second connector and mounted around one electric wire, permitting the conductor of the corresponding electric wire to be firmly retained between an outside wall of said clamp and an inside wall of said second connector.

**5,772,474**  
**ELECTRICAL CONNECTOR WITH EMBEDDED TERMINALS**  
Masanori Yagi, Ebina, and Kazunobu Saito, Machida, both of Japan, assignors to Molex Incorporated, Lisle, Ill.  
Filed May 2, 1996, Ser. No. 642,240  
Claims priority, application Japan, Sep. 7, 1995, 7-010434 U  
Int. Cl.<sup>6</sup> H01R 17/00  
U.S. Cl. 439—660 29 Claims



1. In an electrical connector having an insert-molded housing and a plurality of terminals therein, said connector comprising:  
an elongated insulative housing having opposed spaced apart sidewalls each providing a top edge and an outer side surface, a plurality of conductive terminals arranged along said housing, each of said terminals including an elongated terminal body which includes a contact portion, a solder tail portion and an end portion, the solder tail and end portions being disposed at opposite ends of said terminal body such that said contact portion lies therebetween, said end portion including a mold engagement portion for abutting against a portion of a mold during molding of said housing in order to accurately locate said end portion and a housing engagement portion adjacent said mold engagement portion, said mold engagement portion extends to the outer side surface of said sidewall of said housing, and  
said housing engagement portion and said housing having complementary interengaging means for embeddably securing said housing engaging portion within said housing to thereby retain said terminal contact portion in place relative to said housing, said complementary interengaging means including a surface interruption along at least one surface of said terminal and a complementary shaped portion of said housing engaging said surface interruption.

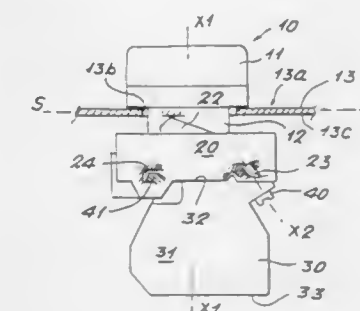
**5,772,475**  
**PLUG-IN CABLE CONNECTOR**  
Eric Lindeberg, Hovilles Franreich; Uwe Mischlich, Naheim, and Reinhard Lotz, Erzhausen, all of Germany, assignors to Thomas & Betts Corporation, Memphis, Tenn.  
Filed Jul. 14, 1995, Ser. No. 502,623  
Claims priority, application Germany, Jul. 19, 1994, 44 25 466.0  
Int. Cl.<sup>6</sup> H01R 13/502  
U.S. Cl. 439—701 12 Claims



1. A plug-in cable connector for multi-lead cables comprising:  
a strip casing (1,2) having a housing defining an inner cavity including a plurality of blade contacts (2) positioned therein;  
at least one contact carrier module (3) for receiving a plurality of conductors from the multi-lead cable, the contact carrier module including a plurality of contact receiving chambers (6) and a contact having a conductor termination and a blade contact receiving end positioned within each chamber;  
a module carrier casing (14) having an internal cavity for receiving the at least one contact carrier module (3); and  
an outer plug casing having a front wall rear wild side walls the plug casing receiving and housing the module carrier casing (14), wherein external surfaces of said sidewalls each include a dove-tail shaped groove (40) for receiving a double-groove cooperating coupling member for mechanically coupling a series of plug casings together to form a block he block being insertable into the strip casing so that the blade contact and the blade contact receiving ends of the at least one contact carrier module are electrically connectable.

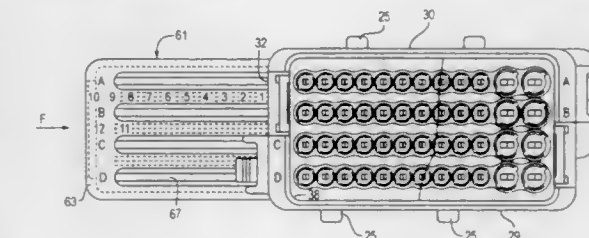
**5,772,476**  
**ELECTRICAL CONTROL OR SIGNALLING DEVICE FITTED WITH A DETACHABLE UNIT**  
Patrick Cuingnet, Sochaux, France, assignor to Schneider Electric SA, Boulogne Billancourt, France  
PCT No. PCT/FR96/00928, § 371 Date Feb. 20, 1997, § 102(e) Date Feb. 20, 1997, PCT Pub. No. WO97/01205, PCT Pub. Date Jan. 9, 1997  
PCT Filed Jun. 17, 1996, Ser. No. 776,608  
Claims priority, application France, Jun. 20, 1995, 95 07462  
Int. Cl.<sup>6</sup> H01R 9/22  
U.S. Cl. 439—717 7 Claims

1. An electrical device for mounting on a wall, comprising:  
a body including a push-button to be inserted into an orifice in said wall from a first side;  
a supporting baseplate detachably joined to said body on a second side of said wall so as to firmly attach said body and said baseplate to said wall;  
said baseplate being provided on a side away from said wall with a tapped hole and a recess; and



a contact block mounted on said side of said baseplate away from said wall, said contact block having on a fixing surface adjacent to said baseplate a fixing screw which engages said tapped hole and a rigid positioning and holding beel having a complementary shape to said recess, wherein said heel is inserted into said recess and the contact block pivoted to bring said fixing screw into alignment with said tapped hole.

**5,772,477**  
**ELECTRICAL CONNECTOR**  
Sylvain Cloarec, Viroflay, and Fabrice Durand-Cochet, Rambouillet, both of France, assignors to Connecteurs Cinch, Montigny Le Bretonneaux, France  
Filed Jul. 19, 1996, Ser. No. 684,180  
Claims priority, application France, Aug. 22, 1995, 95 09984  
Int. Cl.<sup>6</sup> H01R 13/436  
U.S. Cl. 439—752 11 Claims



7. Electrical connector comprising a female member including electrical contact members and a male member including electrical contact members complementary to those of the female member inserted in conduits of the male member disposed in rows and in transverse lines, wherein said complementary electrical contact members have a shoulder part-way along their length, said male member has a channel extending perpendicularly to said conduits, a locking key being guided in said channel and is formed by a flat plate having a series of slots that open onto a free end, said slots are disposed so as to be in line with said rows of conduits in order to oppose withdrawal of the complementary electrical contact members by cooperating with shoulders thereof, each slot includes at least one notch part-way along its length, said notches are disposed to correspond to said transverse lines and have dimensions corresponding to those of said complementary electrical contact members so that the latter can be withdrawn from said conduits when the notches are in line therewith, said male member includes row markers and transverse line markers, each row marker identifying a respective row and each transverse line marker identifying a respective transverse line, and said key is provided with corresponding row markers and transverse line markers, each row marker identifying a respective row and each transverse line marker identifying a respective transverse line, so that, by withdrawing said key partially from said male member, the row and the chosen transverse line can easily be identified, the chosen transverse line being aligned with the notches, wherein said key has along two edges parallel to said slots rims guided in slideways of said male member and including, at the same end as said free end of said key, an elastic lug having a hook adapted to cooperate with said shoulders of said male member, one of said shoulders corresponding to a locked

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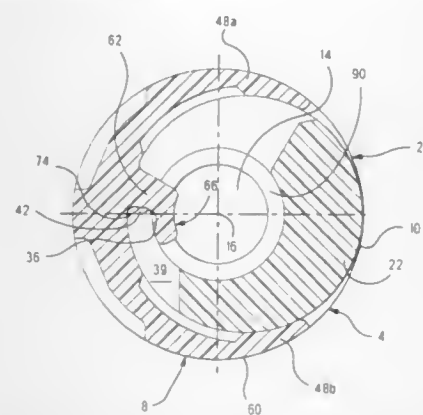
position of said key and the other, in a withdrawn position of said key, opposing its withdrawal from said male member, wherein said slideways include notches corresponding to the various lines of conduits with which said hook can selectively operate.

5,772,478  
CONNECTOR HOUSING HAVING SECONDARY  
LOCKING FEATURE

Dietrich Wilhelm Kuempel, Rüsselsheim; Patrik Mueller, Frankenthal, and Andreas Krull, Langen, all of Germany, assignors to The Whitaker Corporation, Wilmington, Del.  
PCT No. PCT/IB95/00416, § 371 Date Dec. 10, 1996, § 102(e)  
Date Dec. 10, 1996, PCT Pub. No. WO96/01508, PCT Pub. Date Jan. 18, 1996

PCT Filed May 31, 1995, Ser. No. 765,008  
Claims priority, application United Kingdom, Jul. 1, 1994, 9413305

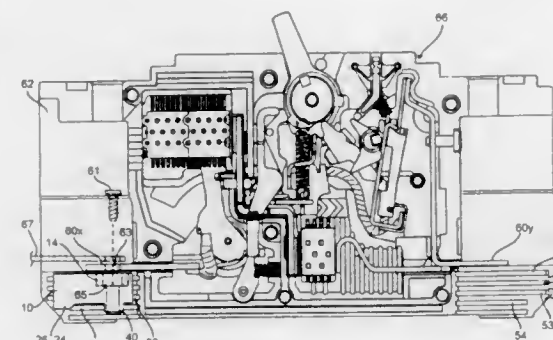
Int. Cl.<sup>6</sup> H01R 13/436  
U.S. Cl. 439—752 14 Claims



1. An electrical connector housing for housing an electrical terminal, said housing comprising a body having a channel for receiving the terminal and a locking member cooperating with a latch that is movable between an unlocked position outside of said channel and a locked position extending into and blocking at least a portion of said channel such that when the terminal is housed therein, the terminal is blocked from exiting the channel by the latch, said latch being movable as a result of eccentric rotation of the locking member relative the longitudinal axis of the channel, characterized in that the latch is formed integrally with the locking member and the locking member is formed as an eccentric, such that in the locked position the outer surface of the locking member is flush with the outer surface of the housing.

5,772,479  
CIRCUIT BREAKER WITH TERMINAL NUT RETAINER  
Dennis William Fleege, 20 26th St. SW., Cedar Rapids, Iowa 52404; Donald Charles Francis, Jr., 2941-18 Sixth St. SW., Cedar Rapids, Iowa 52404, and Randall Luther Siebels, 4219 Dalewood Ave. SE., Cedar Rapids, Iowa 52403  
Filed May 10, 1996, Ser. No. 644,508  
Int. Cl.<sup>6</sup> H01R 4/30

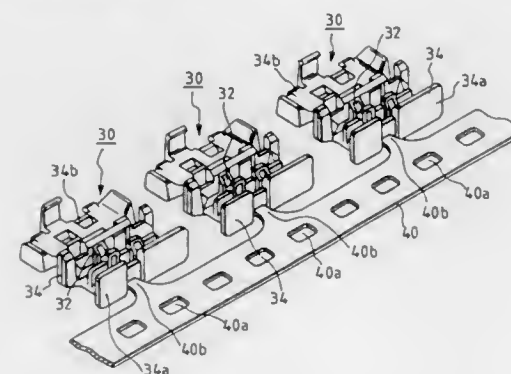
U.S. Cl. 439—801 16 Claims  
1. A circuit breaker for interrupting power in a circuit path between a source and a load, comprising:  
an electro-mechanical assembly including first and second contacts cooperatively arranged in the circuit path for providing current from the source to the load, wherein at least one of the contacts is moveable for interrupting the power provided to the load;  
a terminal connected to the first contact;  
a casing for enclosing the electro-mechanical assembly;



a terminal nut retainer engaged with the casing proximate to the terminal the terminal nut retainer having a body and a cavity in the body for holding a nut and wherein the body has first opposing sides, the first opposing sides having a tenon and a mortise adjacent the tenon for sliding engagement with the casing and a projection for locking engagement with the casing.

5,772,480  
PRESS-CONNECTING JOINT CONNECTOR  
Hiroshi Yamamoto, and Akira Kato, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan  
Division of Ser. No. 597,151, Feb. 6, 1996. This application  
Jul. 22, 1997, Ser. No. 898,246  
Claims priority, application Japan, Feb. 9, 1995, 7-21773; Mar. 9, 1995, 7-49957

Int. Cl.<sup>6</sup> H01R 13/02  
U.S. Cl. 439—885 4 Claims



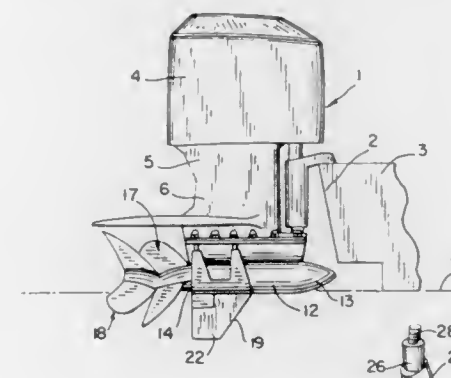
1. A plurality of press-connecting joint connectors, comprising: a plurality of press-connecting terminal groups connected to each other via a linkage plate, each one of said groups including a housing, and a plurality of press-connecting terminals molded in said housing, wherein said linkage plate is integral with said press-connecting terminals such that said press-connecting terminals of adjacent groups are interconnected via said linkage plate and wherein said groups are separable from one another by severing said linkage plate.

5,772,481  
SKEG CONSTRUCTION FOR A MARINE PROPULSION  
UNIT  
Charles F. Alexander, Jr., Austin, Tex., and Daniel E. McCormick, Oshkosh, Wis., assignors to Brunswick Corporation, Lake Forest, Ill.

Filed Sep. 25, 1996, Ser. No. 718,917  
Int. Cl.<sup>6</sup> B63H 1/18  
U.S. Cl. 440—66 19 Claims  
1. In a marine propulsion unit for a watercraft, a housing including a generally torpedo-shaped lower section, a propeller

5,772,483  
MONO-MOORING METHOD AND SYSTEM FOR  
BERTHING SHIPS IN OPEN SEA  
Paolo Vielmo, Venice, and Vincenzo Di Tella, Padua, both of Italy, assignors to Tecnomare S.p.A., Venice, Italy  
Filed Mar. 12, 1997, Ser. No. 815,579  
Claims priority, application Italy, Mar. 21, 1996, M196A0555  
Int. Cl.<sup>6</sup> B63B 22/02

U.S. Cl. 441—5 5 Claims



shaft journaled for rotation in said lower section, a propeller secured to an outer end of said propeller shaft, drive means disposed in said housing and operably connected to said propeller shaft to drive said shaft and said propeller, a generally wedge-shaped skeg extending downwardly from said lower section and having a sharp leading edge and a trailing edge and an upper end, said skeg also having a pair of opposite side surfaces, at least one of said side surfaces having a water intake port bordered rearwardly by a laterally projecting shoulder having a relatively sharp forwardly facing edge and bordered forwardly by an inwardly curved surface, said skeg having a water passage therein, said water passage having a first end communicating with said intake port and having a second end disposed at said upper end of the skeg, and water passage means disposed in said housing and communicating with the water passage in said skeg for delivering water to the cooling system of the propulsion unit.

5,772,482  
DESIGNER DELUXE BOBBERS  
Michael L. Duncan, 511 Glenn Rd., Greenville, S.C. 29607, assignor to Michael L. Duncan, Greenville, S.C.  
Filed Aug. 15, 1996, Ser. No. 610,088  
Int. Cl.<sup>6</sup> B63B 22/00

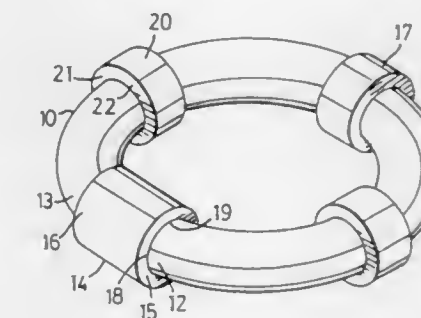
U.S. Cl. 441—1 1 Claim



1. A deluxe designer bobber cap floatation device comprising:  
a thermoplastic blow molded hollow animal shaped float of sufficient buoyancy to float a cap, the animal shaped float including a body and a head;  
a rectangular mounting plate attached to the back of the float, the plate being smaller in shape than the body of the animal shaped float in order to be concealed there behind, the rectangular mounting plate also having rounded off edges;  
a pin clasp having a pin with a sharp tip, a pivot, and a retaining hook, the hook retaining the sharp tip in a closed position, the clasp being attached to the mounting plate, and the pin being almost the same length as the animal shaped body; and,  
the clasp attaching the float to a cap in order to provide floatation to the cap and to be seen in as a decorative ornament.

5,772,484  
FLOATATION TOY DEVICE  
Marek Sikorski, 3400 The Credit Woodlands #7, Mississauga, Ontario, Canada, L5C 3A4  
Filed Jan. 13, 1997, Ser. No. 785,156  
Int. Cl.<sup>6</sup> B63C 9/08

U.S. Cl. 441—81 16 Claims



1. A floatation toy device comprising: a solid cylindrical elongated member having a first end and a second end, a variable buoyancy means, and a buoyant connection means wherein said first end of said solid cylindrical elongated member and said second end of said solid cylindrical elongated member are frictionally fit to said buoyant connection means.



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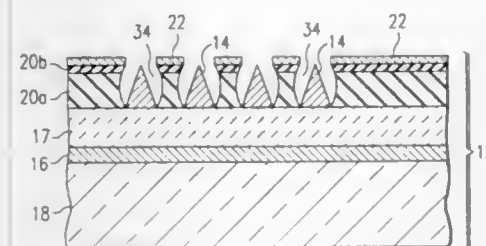
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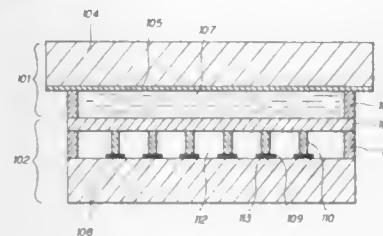
UMI

5,772,485  
**METHOD OF MAKING A HYDROGEN-RICH, LOW DIELECTRIC CONSTANT GATE INSULATOR FOR FIELD EMISSION DEVICE**  
Shin-Puu Jeng, Plano, and Bruce E. Gnade, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.  
Division of Ser. No. 625,051, Mar. 29, 1996, Pat. No. 5,684,356. This application Mar. 20, 1997, Ser. No. 821,128  
Int. Cl.<sup>6</sup> H01J 9/00; 19/24; 9/38; C01B 3/00  
U.S. Cl. 445—24 9 Claims



1. A method of fabricating an emitter plate for use in a field emission device, said method comprising the steps of: providing a substrate having a first conductive layer patterned on a surface thereof; providing an insulating layer over said first conductive layer, said insulating layer comprising hydrogen silsesquioxane (HSQ); depositing a second conductive layer on said insulating layer; forming a plurality of apertures in said second conductive layer and extending through said insulating layer; and forming microtip emitters on said first conductive layer, each emitter formed within a corresponding aperture in said second conductive layer.

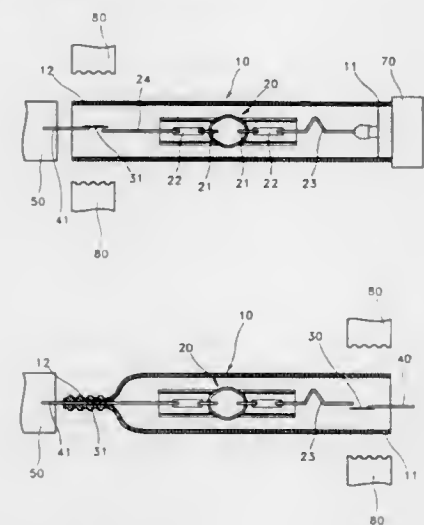
5,772,486  
**METHOD FOR MANUFACTURING A PLASMA-ADDRESSED DISPLAY DEVICE**  
Atsushi Seki, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan  
Division of Ser. No. 504,415, Jul. 20, 1995, Pat. No. 5,684,361.  
This application Jun. 6, 1997, Ser. No. 871,134  
Claims priority, application Japan, Jul. 21, 1994, 6-169782; Sep. 9, 1994, 6-241912  
Int. Cl.<sup>6</sup> H01J 9/02  
U.S. Cl. 445—24 6 Claims



1. A plasma-addressed display device manufacturing method for a plasma-addressed display device having a flat panel structure with a display cell and a plasma cell being overlaid, comprising the steps of: printing a first glass paste, conductive paste and second glass paste successively onto a substrate;

sintering the conductive paste, the first glass paste and the second glass paste so as to form discharge electrodes, underlying layers and barrier ribs, respectively; bonding the top ends of the barrier ribs to a dielectric sheet so as to form plasma cells; and injecting an electro-optical material into a space so as to form display cells after a further substrate formed with display electrodes is bonded to the dielectric sheet via a prescribed space.

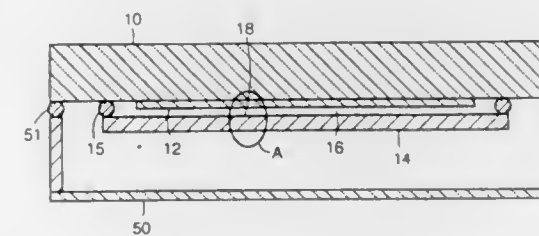
5,772,487  
**METHOD FOR MANUFACTURING METAL HALIDE LAMP**  
Seong-ho Lee, Taejeon, Rep. of Korea, assignor to Samsung Display Devices Co., Ltd., Kyungki-do, Rep. of Korea  
Filed Jun. 27, 1996, Ser. No. 673,203  
Claims priority, application Rep. of Korea, Dec. 18, 1995, 51370  
Int. Cl.<sup>6</sup> H01J 9/32  
U.S. Cl. 445—26 1 Claim



1. A method for manufacturing a metal halide lamp comprising the steps of: positioning and fixing an arc tube having an electrode and an internal lead wire connected to said electrode inside a cylindrical case; positioning and fixing an external lead wire with a metal lamina affixed to one end thereof in said case so that said metal lamina contacts an outer surface of said internal lead wire at the end thereof; and fixing said internal lead wire and said external lead wire by sealing an end of said case, thereby connecting said metal lamina and internal lead wire to each other.

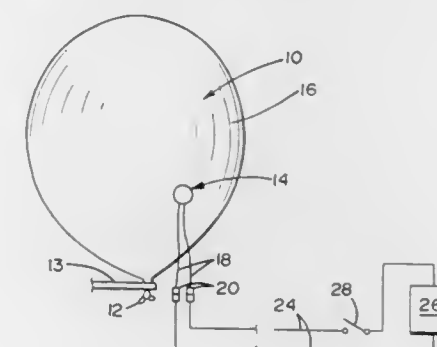
5,772,488  
**METHOD OF FORMING A DOPED FIELD EMITTER ARRAY**  
David A. Cathey, Boise; Surjit S. Chadha, Meridian, and Behnam Moradi, Boise, all of Id., assignors to Micron Display Technology, Inc., Boise, Id.  
Filed Oct. 16, 1995, Ser. No. 543,819  
Int. Cl.<sup>6</sup> H01J 9/02  
U.S. Cl. 445—50 14 Claims

1. A process for manufacturing an FED comprising the steps of: forming an emitter tip so that the tip has an electropositive element in the body of the tip; contacting the emitter tip with a solution for a time sufficient to cause doping of  $10^{21}$  atoms/cm<sup>3</sup> of electropositive material to



penetrate the emitters comprising propan-1-ol as the solvent, and NaCl as the solute; assembling the emitter tip with a phosphor display screen; and causing the electropositive element to migrate to the surface of the emitter tip after the assembling step.

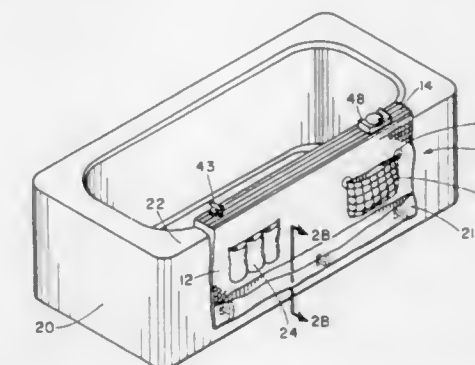
5,772,489  
**BALLOON DETONATORS**  
Ronald B. Sherer, 103 S. Shaffer Dr., New Freedom, Pa. 17349, and James O. Watkins, 14920 Mt. Nebo Rd., Poolesville, Md. 20837  
Continuation-in-part of Ser. No. 515,276, Aug. 15, 1995, Pat. No. 5,538,451. This application Jul. 23, 1996, Ser. No. 685,308  
Int. Cl.<sup>6</sup> A63H 37/00  
U.S. Cl. 446—14 20 Claims



1. A detonator for exploding an amusement balloon comprising: (a) a pair of lead wires having first and second ends; (b) a staple extending between said lead wires in stapled electrical contact with each of said lead wires at said first ends, said staple having a first side for attachment to a balloon; and (c) a planar layer of material covering said first side of said staple.

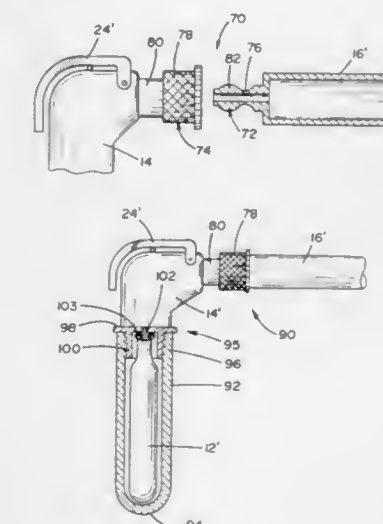
5,772,490  
**BATH ENTERTAINMENT CENTER**  
Sheryl S. Leach, 23 Cobb Island Dr., Greenwich, Conn. 06830  
Continuation-in-part of Ser. No. 9,769, Jan. 27, 1993, Pat. No. 5,551,101. This application Aug. 1, 1996, Ser. No. 690,764  
Int. Cl.<sup>6</sup> A47K 3/02; A63H 3/00  
U.S. Cl. 446—71 22 Claims

1. A device used in the bathing of a child, said device comprising: a section traversing a portion of a width of said device, said section positionable over a top rim of a bathtub; an external flap attached to said section and extending down on the exterior of said bathtub; and



an interior flap attached to said section and extending down on the interior of said bathtub, said interior flap having an exchangeable interactive surface, said interactive surface including a means for removably affixing a plurality of objects to said surface.

5,772,491  
**CONTROLLABLE CONFETTI LAUNCHER**  
James O. Watkins, 14920 Mt. Hebo Rd., Poolesville, Md. 20837  
Continuation-in-part of Ser. No. 490,406, Jun. 14, 1995, Pat. No. 5,634,840, and Ser. No. 111,608, Aug. 25, 1993, Pat. No. 5,529,527. This application Dec. 1, 1995, Ser. No. 566,147  
Int. Cl.<sup>6</sup> A63H 37/00  
U.S. Cl. 446—475 9 Claims



1. A confetti launcher comprising in combination: (a) a cylinder of compressed gas at high pressure; (b) an on-off valve having an inlet and an outlet, said inlet being connected to said cylinder; (c) trigger means for manually actuating said valve to on and off positions; (d) a barrel filled with confetti, said barrel having first and second ends; (e) said confetti in said barrel comprising a plurality of tetragonal pieces of confetti having lengths and widths, said pieces of confetti being aligned in at least one stack with their lengths parallel to each other and to the longitudinal axis of said barrel; and (f) quick-disconnect coupling means for rapidly connecting and disconnecting said first end of said barrel to and from said valve outlet for rapidly changing barrels after discharging the confetti therefrom by opening said valve; said quick-disconnect coupling means comprising a male fitting and a female fitting, the size and shape of said male fitting being such as to be received in and removable from said female fitting.

fitting, and said female fitting being connected to said valve outlet and said male fitting being connected to said first end of said barrel.

5,772,492

## LADY'S UNDER UNDERGARMENT

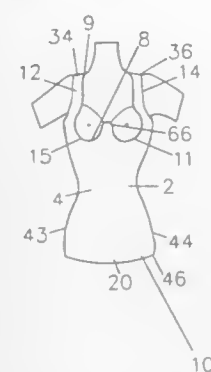
Doris Diann Erwin, Onalaska, Tex., assignor to Jane D. Hufstedler, Dallas, Tex.

Continuation-in-part of Ser. No. 734,192, Oct. 21, 1996, which is a continuation-in-part of Ser. No. 459,179, Jun. 2, 1995, which is a continuation-in-part of Ser. No. 425,981, Apr. 17, 1995, Pat. No. 5,667,422. This application Apr. 30, 1997, Ser. No. 846,548

Int. Cl.<sup>6</sup> A41B 9/06; 9/16

U.S. Cl. 450—30

18 Claims



1. A lady's undergarment to be worn on an upper portion of a person's body having an upper portion, a lower portion and a pair of arms, said body having a circumference as measured closely beneath the pair of arms referred to as an arm's eye line, said undergarment being formed from a tubular fabric material defining a front side, a back side, a left side, a right side, an upper opening and a lower opening,

wherein the lower opening of said undergarment is in the form of a single opening for receipt of the lower portion of the body, said lower opening defined by a generally bevel front hem positioned on the front side of the undergarment, and a generally straight back hem positioned on the back side of the undergarment, said front hem extending from a lower edge of the right side to a lower edge of the left side and having a lowermost portion which passes to a point below the back hem, and

wherein a neck hole forms the upper opening, said neck hole being defined by a neck hole seam having a front neck hole seam positioned on the front side of the undergarment, and

a back neck hole seam positioned on the back side of the undergarment,

wherein the back neck hole seam is generally U-shaped and a lowermost portion of the back neck hole seam passes to a point about even with the back arm's eye line, and

wherein the front neck hole seam is generally W-shaped in order to include a raised middle portion that divides the undergarment into two scoops and that falls in between breasts of the person to maximize lining effect of the undergarment by minimizing movements of the undergarment, and a lowermost portion of the front neck hole seam passes to a point below at least 2 inches below the front arm's eye line.

5,772,493

## METHOD AND APPARATUS FOR CONTROLLING THE LAPPING OF MAGNETIC HEADS

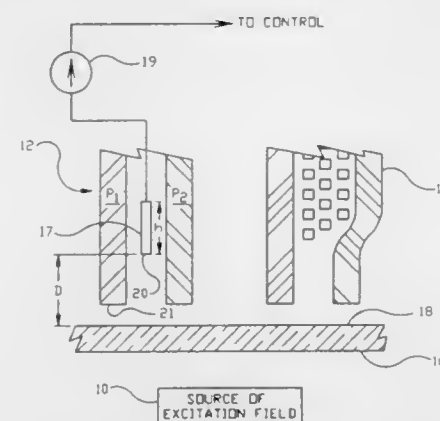
Robert Rottmayer, Fremont, and George Tang, Saratoga, both of Calif., assignors to Read-Rite Corporation, Milpitas, Calif.

Filed Jul. 31, 1995, Ser. No. 509,118

Int. Cl.<sup>6</sup> B24B 49/04; 49/10

U.S. Cl. 451—5

15 Claims



1. A lapping control apparatus having a lapping plate for obtaining an accurate height of a magnetoresistive stripe of a magnetic head which includes magnetic shield elements comprising:

a source for inducing a magnetic excitation field;

a pre-patterned magnetoresistive element having a height and a major plane perpendicular to the direction of said height formed between said magnetic shield elements disposed in said magnetic excitation field;

a sensor for monitoring the resistance of said magnetoresistive element in response to variations in said magnetic excitation field; and

means responsive to said monitored resistance of said magnetoresistive element for controlling the lapping process;

whereby said magnetoresistive element is lapped to a predetermined distance of said magnetic shield elements from said lapping plate.

5,772,494

## ECCENTRIC ORBITING TYPE PLANETARY GEAR DEVICE, AND ITS MANUFACTURING METHOD

Shigehisa Muraki, Jun Hirose, both of Mie, and Shotaro Kodaka, Tochigi, all of Japan, assignors to Teijin Seiki Co., Ltd., Osaka, Japan

Filed Jun. 20, 1996, Ser. No. 667,130

Claims priority, application Japan, Jul. 3, 1995, 7-191085

Int. Cl.<sup>6</sup> B24B 5/12

U.S. Cl. 451—52

4 Claims

1. A method of manufacturing an eccentric orbiting type planetary gear device in which a supporting block is made up of a supporting member having a plurality of pillar-like portions, and a disk, and said supporting member and said disk are fastened to each other with a fastening member with an external gear set between said supporting member and said disk in such a manner said external gear is engaged with an internal gear, said method comprising a step of:

5,772,496

## DEVICE AND METHOD FOR FINISHING SURFACES

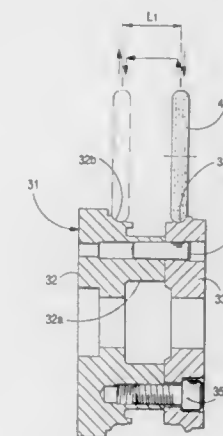
Kevin Kurtz, Burlington, and William Richard Kunkel, Union, both of Ky., assignors to Enerfab, Inc., Cincinnati, Ohio

Filed Mar. 7, 1997, Ser. No. 813,112

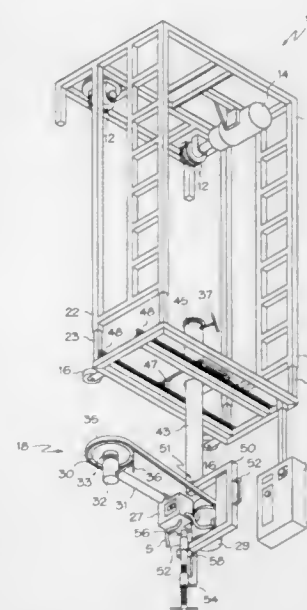
Int. Cl.<sup>6</sup> B24B 23/00; 27/08

U.S. Cl. 451—296

5 Claims



machining said supporting member and said disk under a condition that said supporting member and said disk have been abutted against each other through end faces thereof and fastened to each other to form said supporting block, to thereby form, at a predetermined interval, a pair of bearing rolling surfaces corresponding to inner races respectively in said supporting member and said disk.



1. A finishing apparatus adapted to finish the wall of an erected workpiece, comprising:

(a) a frame, the frame including upper and lower components, the lower frame component being selectively vertically movable with respect to the upper frame component;

(b) an interface member connected to the upper frame component, the interface member being operative to interface with a top surface of an erected workpiece and to support the frame alongside of a substantially vertically oriented wall of the workpiece, the interface member being operative to move the frame horizontally relative to the workpiece;

(c) a support member secured to the lower frame component;

(d) a finishing apparatus supported on the lower frame component by the support member, the finishing apparatus being operative to perform finishing work on the vertically oriented wall of the erected workpiece as the frame is supported on the workpiece and the support member being operative to vertically adjust the finishing apparatus relative to the lower frame component independently of the movement between the upper and lower frame components.

5,772,495

## METHOD AND APPARATUS FOR PRODUCING PHOTO FILMSTRIP

Akihiro Sanda, Fujio Kuwabara, and Naoki Sakai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

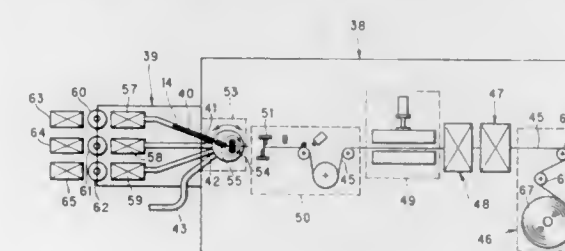
Filed Sep. 13, 1996, Ser. No. 713,487

Claims priority, application Japan, Sep. 22, 1995, 7-244772

Int. Cl.<sup>6</sup> B24B 7/12; 9/00

U.S. Cl. 451—69

13 Claims



1. A photo filmstrip producing apparatus for producing a photo filmstrip of a regular length from photo film web having a predetermined width, said photo filmstrip and said photo film web having a back surface, an emulsion surface, a pair of lateral edge faces, and four corner edges defined between said back surface, said emulsion surface, and said lateral edge faces, said photo filmstrip producing apparatus comprising:

a photo film web supplier for supplying said photo film web;

a photo film web abraded for abrading at least one of said lateral edge faces and at least one of said corner edges of said photo film web at a predetermined angle while said photo film web is conveyed;

a cleaning apparatus for eliminating photo film dust from said photo film web, said dust having been created in said abrading of said photo film abraded;

a perforator for forming perforations in said photo film web; and a cutter for cutting said photo film web by said regular length into said photo filmstrip, in order to wind said photo filmstrip into a cassette shell.

5,772,497

## MOVABLE SURFACE TREATMENT DEVICE

Paul Dummermuth, Zunzgen, Switzerland, assignor to Pamag AG, Switzerland

Filed Sep. 11, 1996, Ser. No. 712,124

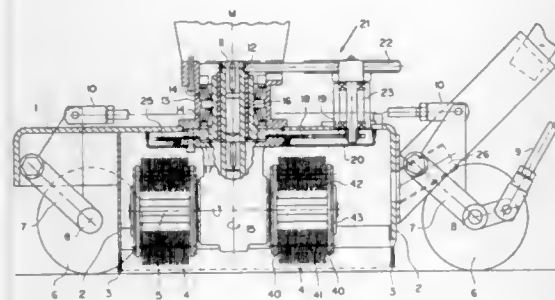
Int. Cl.<sup>6</sup> B24B 23/03

U.S. Cl. 451—350

10 Claims

1. In a movable surface treatment device for abrasive treatment of a surface, the device having two rotor cages (4) driven by a motor (M) and arranged on two aligned horizontal rotor shafts (5), on cage bars (41) of the rotor cages (4) a plurality of abrasive beating treatment disks (42) are lined up, a protective housing (1) adjustable to a height of the rotor cages (4) with respect to the ground to be treated, wherein the motor (M) is flanged on and fixed against relative rotation with respect to the protective housing (1), a vertical power take-off shaft (11) driving the horizontal rotor shafts (5) via a gear, the improvement comprising: the rotor shafts (5) seated in a gear housing (15), the gear housing (15) relative to the protective housing (1) seated and rotatable around the vertical





power take-off shaft (11), and the gear housing (15) capable of a forced rotating movement by the motor (M) wherein one of the rotor cages (4) is driven in a same direction and another of the rotor cages (4) is driven in an opposite direction with respect to the same direction, in a horizontal rotation; and

a power take-off pulley (12) on the vertical power take-off shaft (11) acting in a step-down manner via a first transmission (21) on a belt wheel (22), which is mounted fixed against relative rotation on a transmission shaft (23) and driving the transmission shaft (23) and moving a power take-off wheel (19) fastened on the transmission shaft (23) via a second transmission (18, 19) on the drive wheel (18) connected to and fixed against relative rotation with respect to the gear housing (15).

5,772,498

## ELECTRICAL HAND GRINDER

Werner Neubert, Stuttgart, and Rudolf Fuchs, Neuhausen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

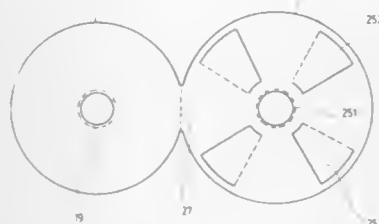
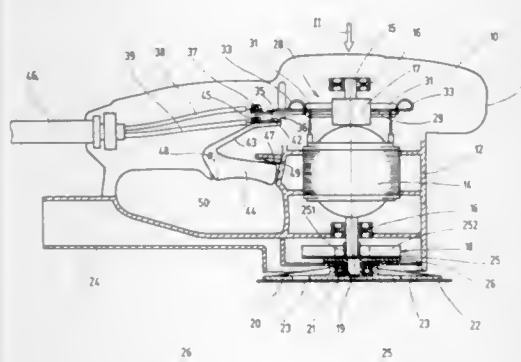
Filed Feb. 14, 1997, Ser. No. 799,243

Claims priority, application Germany, Mar. 8, 1996, 196 08 969.7

Int. Cl.<sup>6</sup> B24B 23/00

U.S. Cl. 451—357

15 Claims



15. An electrical hand grinder, comprising a machine housing having a housing axis and composed of two housing shells which are assembled with one another along a separating joint located in a plane of said housing axis; an electric motor having a driven shaft and received in said machine housing; an eccentric pin

extending outwardly of said machine housing and driven by said driven shaft of said electric motor; a grinding disk arranged on said eccentric pin and having a lower side for receiving a grinding element; a ventilator wheel for cooling said electric motor, said ventilator wheel and said eccentric pin being formed as parts which are assembled with eccentrically oriented axes, one of said parts which forms said ventilator wheel being provided with a one-piece sleeve arranged on said driven shaft of said electric motor for joint rotation with said driven shaft, said electric motor being formed as a commutator motor having a commutator and a brush holder with at least two axially displaceably held carbon brushes pressed at diametrical sides of a commutator by brush pressing springs; at least one capacitor and at least one choke for spark suppression; at least one connecting screw for fixing a connecting conduit on said brush holder, said brush holder being formed as a synthetic plastic supporting plate with at least two one-piece brush shoes for receiving said carbon brushes; a brass stamped part mounted on said synthetic plastic supporting plate so that said carbon brushes, said choke and said capacitor are connected with said brass stamped part and said connecting screw is screwed into said brass stamped part, said housing shells being provided with grooves which correspond to one another and arranged so that said synthetic plastic supporting part during assembly of said machine housing is received by said grooves.

5,772,499

## ARRANGEMENT OF SAUSAGE SUSPENSION LOOPS

Frank Niedecker, Bad Soden, Germany, assignor to Poly-Clip System GmbH & Co. KG, Frankfurt, Germany

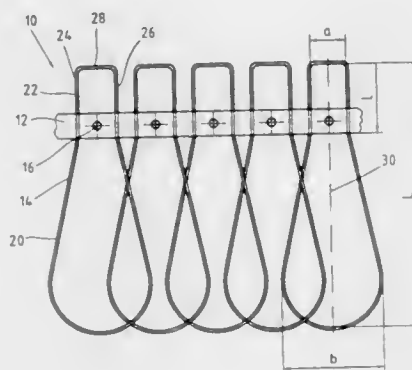
Filed Apr. 25, 1996, Ser. No. 638,007

Claims priority, application Germany, Apr. 28, 1995, 195 15 605.6

Int. Cl.<sup>6</sup> A22C 15/00

U.S. Cl. 452—185

5 Claims



1. Arrangement of a plurality of individual, closed sausage suspension loops, which are held beside each other by a belt, so that from each side of the belt a partial loop protrudes, where the first partial loop is designed for being inserted in a closing member for the end of the sausage, and in the second partial loop a smoking skewer or the like can be introduced,

characterized in that the sausage suspension loops (14) of uniform and flat shape consist of an elastic plastic material in the form of a strand and are dimensionally stable, and that the first partial loop (22) comprises two mutually parallel portions (24, 26) of the plastic strand, which are connected with each other by a horizontally extending transverse portion (28) of the plastic strand.

5,772,500

## COMPACT VENTILATION UNIT FOR ELECTRONIC APPARATUS

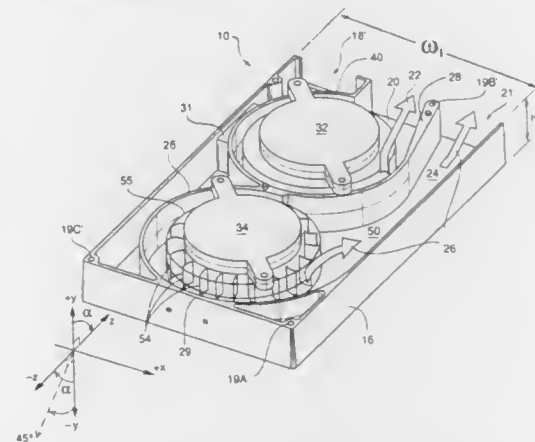
Robert T. Harvey, and Tina M. Reintjes, both of Wichita, Kans., assignors to Symbios, Inc., Fort Collins, Colo.

Filed Dec. 20, 1996, Ser. No. 770,890

Int. Cl.<sup>6</sup> H05K 7/20

U.S. Cl. 454—184

27 Claims



22. A method of venting thermal energy generated within an electronic apparatus through an exterior side of a ventilation unit operating within the apparatus, comprising the steps of drawing air in through a first incoming passageway from an interior bottom side of the unit and out a first exhaust port of the exterior side, separately from drawing air in through a second incoming passageway from said interior bottom side, said second incoming passageway located further from said exterior side than, generally in the same plane as, and at least partially behind, said first incoming passageway; said air drawn in through said second incoming passageway, then, being directed by a baffle extending between said first and second passageways and out a second exhaust port of said exterior side.

5,772,501

## INDOOR ENVIRONMENTAL CONDITIONING SYSTEM AND METHOD FOR CONTROLLING THE CIRCULATION OF NON-CONDITIONED AIR

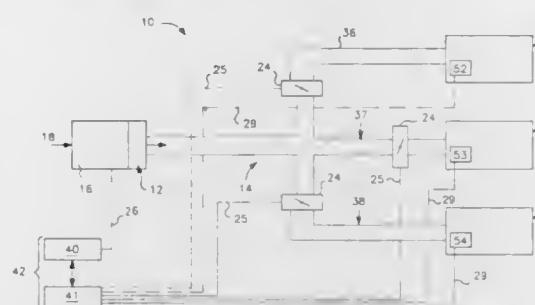
Nir Merry, Mountain View; Robert M. Russ, Los Altos Hills; Larry A. Lincoln, Milpitas, and Thomas L. Webster, Piedmont, all of Calif., assignors to Gas Research Institute, Chicago, Ill.

Filed Oct. 12, 1995, Ser. No. 542,310

Int. Cl.<sup>6</sup> F24F 11/00

U.S. Cl. 454—256

15 Claims



1. An indoor environmental conditioning system for regulating the circulation of non-conditioned air to at least two locations, the indoor environmental conditioning system comprising:

a source for selectively providing conditioned or non-conditioned air;

an air distribution conduit operatively communicating the source with the at least two locations;

air distribution means operably associated with the air distribution conduit for distribution of air to the at least two locations at independent and selectively variable flow rates;

air propulsion means associated with the source and the air distribution conduit for selectively distributing air to the at least two locations;

the air propulsion means being operably configured for propelling air through the air distribution conduit at at least two possible flow rates;

control means, operably associated with the air propulsion means and the air distribution means for controlling actuation of the air distribution means and the air propulsion means, and for enabling the selective circulation of non-conditioned air by the air propulsion means and the air distribution means to the at least two locations at substantially independent flow rates,

including means for actuating the air propulsion means and air distribution means to cause the controlled circulation of non-conditioned air substantially without altering the condition of the air in the at least two locations at substantially independent flow rates.

5,772,502

## ADJUSTABLE PITCH ROOF VENT WITH ACCORDION-SHAPED END PLUG

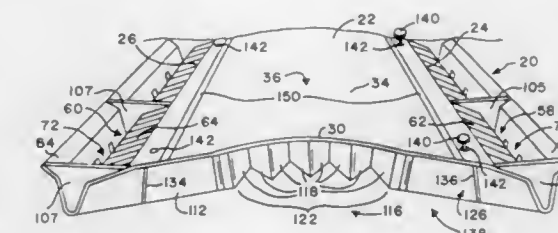
Joe E. Smith, Jacksonville, Ark., assignor to Lomanco, Inc., Jacksonville, Ark.

Filed Jul. 23, 1997, Ser. No. 898,922

Int. Cl.<sup>6</sup> F24F 7/02

U.S. Cl. 454—365

9 Claims



1. A ridge vent for covering an opening at a peak of a roof, said ridge vent comprising:

(a) a top panel portion having first and second opposed lateral edges and having first and second opposed ends; said top panel portion having an underside and further having a mid-section substantially parallel to said first and second opposed lateral edges;

(b) support means for supporting said top panel portion above the roof, said support means comprising a plurality of support members depending downwardly from said underside of said top panel portion;

(c) first and second ventilation means respectively disposed adjacent said first and second opposed lateral edges;

(d) an endwall portion respectively disposed adjacent said first opposed end and sealingly joined thereto and extending downwardly from said first opposed end, said endwall portion having a pleated midportion adjacent to said midsection of said top panel portion; said pleated midportion of said endwall portion comprising a plurality of adjacent pleats sealingly joined in sequence to each other and to said midsection of said top panel portion.

5,772,503

**CROP FEEDING APPARATUS FOR ROTATING CONCAVE THRESHING MECHANISM**

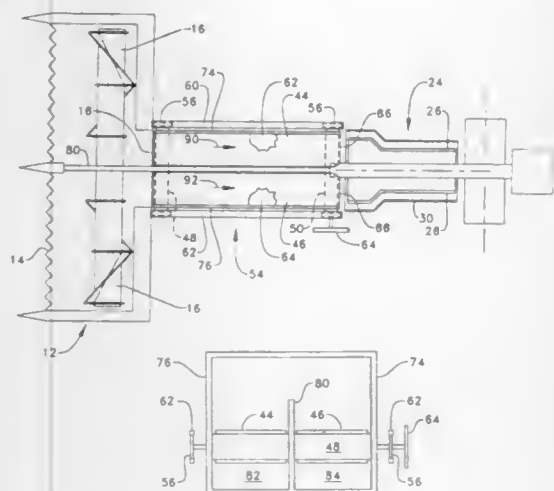
Dave C. Janzen, Metamora; Ronald L. Satzler, Princeville, and Edward E. Schmillen, Metamora, all of Ill., assignors to Caterpillar Inc., Peoria, Ill.

Filed Sep. 3, 1996, Ser. No. 706,757

Int. Cl.<sup>6</sup> A01F 12/10

U.S. Cl. 460—70

6 Claims



1. In a grain combine having a header for receiving cut crops, a means for moving the cut crops into and through a header discharge port into a feederhouse for transporting the cut crops from the header into a rotating concave threshing system, the improvement comprising:

said feederhouse having first and second laterally spaced apart endless conveyors adapted to be rotated in a common direction;

a floor spaced from the first and second endless conveyors and extending from the header discharge port to a location immediately adjacent an intake end of the concave threshing system, said floor and endless conveyors defining a cut crop passageway from the header discharge port to the intake end of the concave; and

a vertical dividing wall connected to the feederhouse and positioned in the cut crop passageway between the first and second endless conveyors and extending from the intake end of the concave through the header discharge port, defining separate first and second discrete cut crop passageways from the header to the intake end of the concave.

5,772,504

**DRIVING GAME MACHINE**

Hiroyasu Machiguchi, Kobe, Japan, assignor to Konami Co., Ltd., Hyogo-ken, Japan

Filed Sep. 10, 1996, Ser. No. 711,824

Claims priority, application Japan, Sep. 12, 1995, 7-233908

Int. Cl.<sup>6</sup> A63F 9/14

U.S. Cl. 463—6

5 Claims

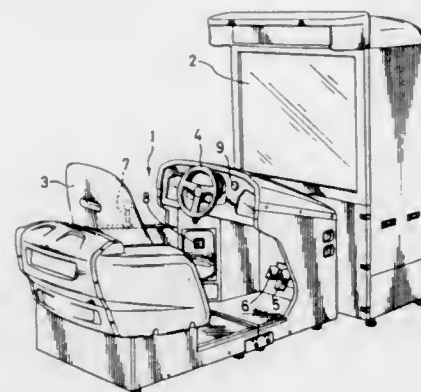
1. A driving game machine comprising:

three-dimensional data memory means for storing coordinate data of a three-dimensional road established in a game space in a three-dimensional coordinate system;

two-dimensional data memory means for storing coordinate data of a straight road established in a two-dimensional coordinate system in association with said three-dimensional road;

player's automobile control means for controlling a player's automobile on said three-dimensional road as instructed by a player;

general automobile control means for controlling general automobiles on said straight road;



two-dimensional coordinate transforming means for transforming coordinate data of said player's automobile on said three-dimensional road into coordinate data on said straight road in said two-dimensional coordinate system; and position deciding means for determining the positional relation between said player's automobile and said general automobiles based on the coordinate data on said straight road in said two-dimensional coordinate system.

5,772,505

**DUAL CARD SCANNER APPARATUS AND METHOD**

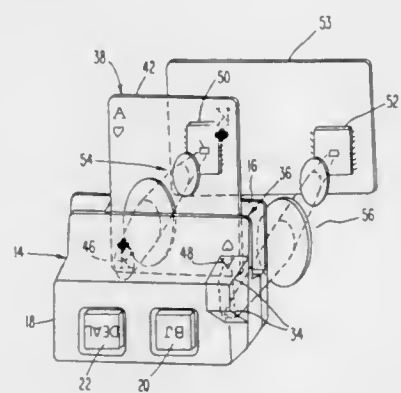
John S. Garczynski, Norristown, and John J. Dobson, Oreland, both of Pa., assignors to Peripheral Dynamics, Inc., Plymouth Meeting, Pa.

Continuation-in-part of Ser. No. 496,355, Jun. 29, 1995, Pat. No. 5,632,483. This application Apr. 2, 1997, Ser. No. 831,189

Int. Cl.<sup>6</sup> A63F 1/06

U.S. Cl. 463—12

23 Claims



1. A dual card scanning module for announcing when the symbols on a face-up standard playing card and a face-down standard playing card achieve a desired combination, said scanning module comprising:

a) a scanner for illuminating and scanning at least a portion of a symbol on the face-up standard playing card and at least a portion of a symbol on the face-down standard playing card and storing the scanning results thereof in first and second devices, respectively;

b) a guide for receiving and positioning the playing cards such that the face-up standard playing card is above and aligned with the face-down standard playing card, and said symbol portions are scannable by said scanner;

c) memory for storing a plurality of references representing respective symbols of the standard playing cards; and

d) analyzing means for determining and reporting if the symbols comprise the desired combination based on a comparison of said scanning results and said references.

5,772,506

**VIDEO POKER GOLD CARD GAME AND COMPUTER SYSTEM FOR IMPLEMENTING SAME**

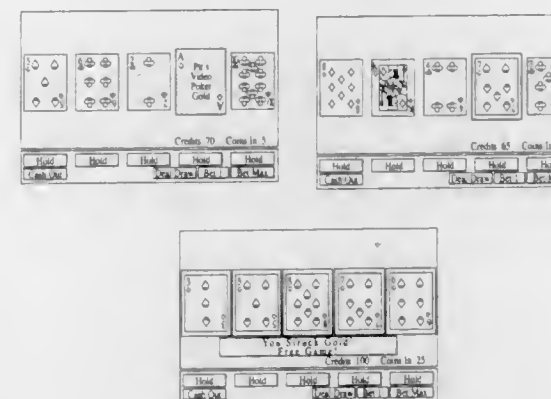
Howard M. Marks, Westport, Conn., and Anthony M. Singer, Brooklyn, N.Y., assignors to PTT, LLC, Westport, Conn.

Filed Nov. 8, 1996, Ser. No. 747,800

Int. Cl.<sup>6</sup> A63F 1/00

U.S. Cl. 463—13

18 Claims



14. A method of playing a game wherein a player becomes sequentially eligible for a bonus round of play, comprising the steps of:

(a) playing the game having positions including winning and non-winning positions for a game award, the player being eligible for a game award for each game played;

(b) randomly assigning a first winning position with an indicator;

(c) repeating said steps (a)–(b) until a predetermined number of the winning positions has been assigned with the indicator;

(d) when the predetermined number of the winning positions have been assigned with the indicator, the player becoming eligible for the bonus round of play, and the player playing the bonus round of play for a bonus award.

5,772,507

Patent Not Issued For This Number

5,772,508

**GAME OR PLAY FACILITIES CONTROLLED BY PHYSIOLOGICAL INFORMATION**

Tohru Sugita, and Tsutomu Ochiai, both of Maebashi, Japan, assignors to Amtex Co., Ltd., Kiryu, Japan

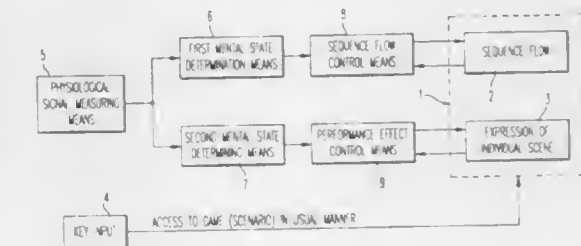
Filed Nov. 6, 1995, Ser. No. 554,568

Claims priority, application Japan, Sep. 28, 1995, 7-274645

Int. Cl.<sup>6</sup> A63F 9/24

U.S. Cl. 463—36

17 Claims



1. A game or play facilities controlled by physiological information, the game or play facilities comprising: physiological signal measuring means for measuring a physiological signal of a player; mental state determination means for determining a mental state of the player by comparing the physiological signal with a reference value determined by a sequence of play or a game, and control means for controlling a contents of game progress of the game or play based on the mental state determined by the mental state determination means.

5,772,509

**INTERACTIVE GAMING DEVICE**

Steven A. Weiss, Las Vegas, Nev., assignor to Casino Data Systems, Las Vegas, Nev.

Filed Mar. 25, 1996, Ser. No. 621,223

Int. Cl.<sup>6</sup> A63F 3/06

U.S. Cl. 463—16

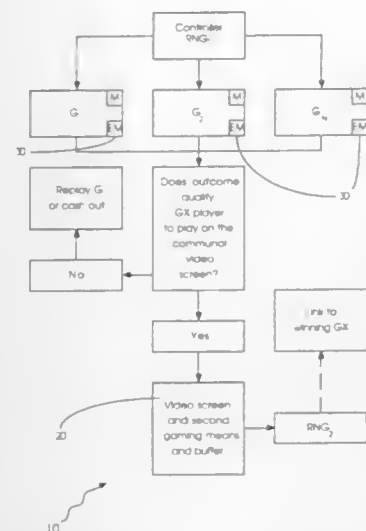
23 Claims

1. A player interactive gaming device comprising:

a plurality of player interactive first chance means each having a plurality of outcomes,

at least one second chance means coupled to said first chance means and having means to interact with all of said plural players who become eligible to partake in said second chance means based on qualifying via said first chance means,





certain of said plurality of outcomes from said plurality of first chance means triggering an input to said second chance means.

5,772,510

## LOTTERY TICKET AND SYSTEM

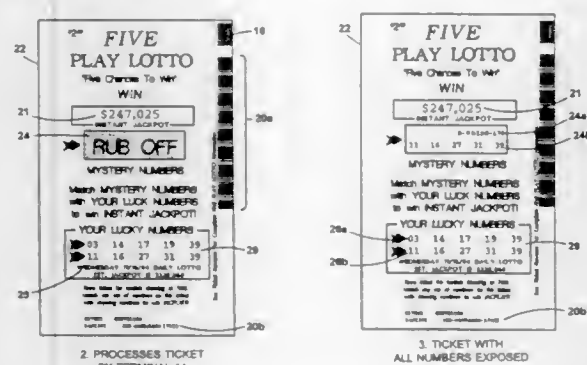
Brian J. Roberts, Carlsbad, Calif., assignor to Loto Mark Incorporated, East Providence, R.I.

Filed Oct. 26, 1995, Ser. No. 548,494

Int. Cl.<sup>6</sup> A63F 3/06

U.S. Cl. 463—17

33 Claims



29. A method for providing a completed lottery ticket from a vending machine comprising the steps of: storing in the vending machine a partially printed, non-completed lottery ticket, the lottery ticket having a first area and a second area, one of the first and second areas being concealed, wherein the first area has pre-printed data; and, completing the non-completed lottery ticket when a lottery ticket is purchased from the vending machine, by printing additional data onto the second area, wherein after said one of the first and second areas being concealed is revealed, such additional data, if matched with the pre-printed data indicates the ticket as a winning ticket.

5,772,511

## METHOD FOR THE CONDUCT OF LOTTERIES

Walter M. Smeltzer, Oklahoma City, Okla., assignor to Webcraft Games, Inc., Winnipeg, Canada

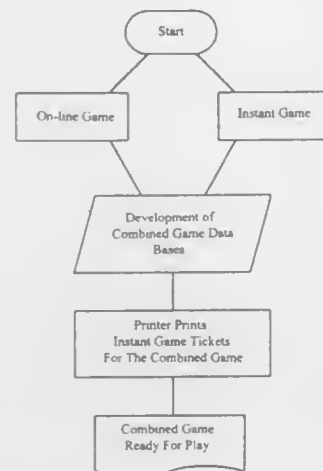
Filed May 8, 1996, Ser. No. 647,400

Int. Cl.<sup>6</sup> A63F 3/06

U.S. Cl. 463—17

16 Claims

1. A method for conducting lotteries which combines an instant game and an on-line game so that the purchase of a single game



ticket by a player will provide for active player participation in the instant game and active player participation in the number selection at the direction of the player in the on-line game.

5,772,512

## ELECTRONIC FOOTBALL GAME

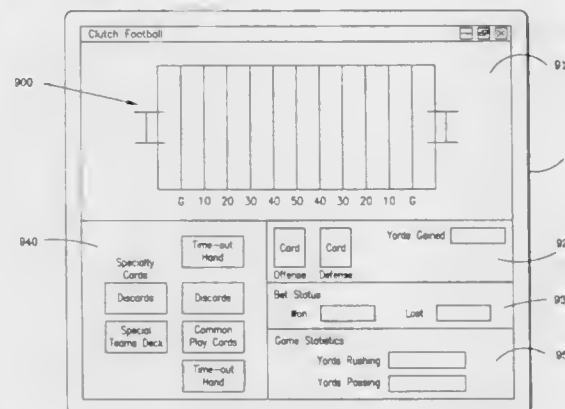
Ronald L. Chichester, Kingwood, Tex., assignor to Clutchability, L.L.C., Houston, Tex.

Filed Jul. 31, 1996, Ser. No. 688,861

Int. Cl.<sup>6</sup> A63F 9/22

U.S. Cl. 463—40

11 Claims



1. A game machine for a user to place bets, execute plays, manipulate cards, and store statistics that make up a game of football composed of a first team and a second team, the first team being controlled by a first user, the second team being controlled by a remote second user connected to the game machine by a network, said game machine comprising:

display means comprising: (i) a game status window, (ii) a game window, (iii) a play execution window, (iv) a bet status window, (v) a card status window, and (vi) a game statistics window;

memory means for storing information about said football game, said information includes the teams, the plays, bets, cards, and statistics, the memory means responsive to input from a button interface means and a graphical interface means;

a first portion of the memory means stores graphical, textual, and numerical information of the bet based upon input from a user;

a second portion of the memory means stores graphical, textual, and numerical information of the cards based upon input from a user;

a third portion of the memory means stores graphical, textual, and numerical information of the plays based upon input from a user;

a fourth portion of the memory stores graphical, textual, and numerical information of said game based upon input from a user;

a fifth portion of the memory means stores graphical, textual, and numerical information about the statistics of said football game;

button interface means including a standard computer keyboard whereby a user can enter or modify graphical, textual and numerical input information regarding the football teams, the plays, the bets, the cards, the statistics, and said football game, the button interface means is for changing the parameters in the memory means;

graphical interface means for a user to locate, identify, and manipulate the textual and the numerical input information, the graphical user interface means further enabling a user to visually locate, identify, and manipulate icons designating the teams, cards, bets, plays, statistics, and said football game, the graphical interface means is for changing parameters in the memory means;

storage means for storing information about said football game including information regarding the plays, bets and cards corresponding to the information in the memory means;

a first portion of the storage means stores graphical, textual, and numerical information of the bet corresponding to the first portion of the memory means;

a second portion of the storage means stores graphical, textual, and numerical information of the cards corresponding to the second portion of the memory means;

a third portion of the storage means stores graphical, textual, and numerical information of the plays corresponding to the third portion of the memory means;

a fourth portion of the storage means stores graphical, textual and numerical information of the game corresponding to the fourth portion of the memory means;

a fifth portion of the storage means stores graphical, textual and numerical information of the statistics corresponding to the fifth portion of the memory means;

microprocessor means in connection with the display means, the memory means, and the storage means, the microprocessor means is used for processing information about said football game, plays, bets, statistics, and cards, the microprocessor means is further used for updating the windows in the display based upon a change in parameters in the memory means;

a write agent, the write agent overwrites the parameters in said storage means with corresponding parameters in the memory means;

communication means for writing the parameters in the memory means to a remote second game machine, the communication means is further used for receiving write statements to the storage means from the second game machine;

a snarf agent, the snarf agent snoops write signals to address locations of the parameters in the storage means, the snarf agent snarfs the snooped write signals and overwrites the corresponding parameters in the memory means, the snarf agent then triggers the microprocessor means to update the windows on the display based upon the parameters in the memory means.

5,772,513

## APPARATUS FOR SIMULATIVELY ROTATING PLAYING BOX OF A SIMULATION GAME MACHINE

Toshimitsu Ohishi, Kobe, Japan, assignor to Konami Co., Ltd., Hyogo-ken, Japan

Filed Aug. 14, 1995, Ser. No. 514,637

Claims priority, application Japan, Aug. 17, 1994, 6-193223

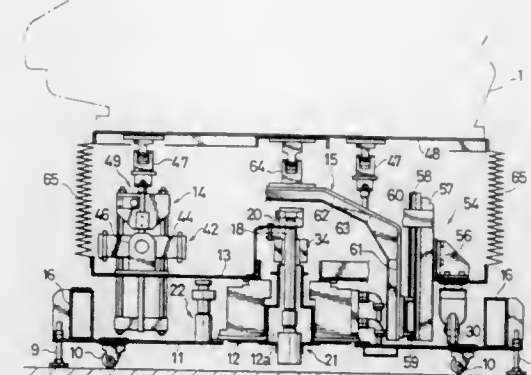
Int. Cl.<sup>6</sup> G09B 9/00; A63G 31/16

U.S. Cl. 463—46

8 Claims

1. A rotating apparatus for simulatively rotating a playing box of a simulation game machine, comprising:

a turn table on which the playing box is mounted, the playing box being provided with a controlling portion having a first signal transmission wire;



a driver which rotates the turn table, the driver being provided with a controller having a second signal transmission wire; and

a rotary connector provided in a center of the turn table, the rotary connector including:

a first conductive member rotatable with the turn table and electrically connected with the first signal transmission wire, the first conductive member comprising a hollow cylinder having an inside surface;

a second conductive member stationary relative to and electrically connected with the second signal transmission wire, the second conductive member comprising a hollow cylinder having an outside surface, said outside surface of the second conductive member being in contact with the inside surface of the first conductive member; and

connecting means providing a non-optical and direct electrical connection between said first and second conductive members.

5,772,514

## TORQUE CONTROL DEVICE FOR ROTARY MINE DRILLING MACHINE

Richard E. Moore, Humble, Tex., assignor to Duramax, Inc., Middlefield, Ohio

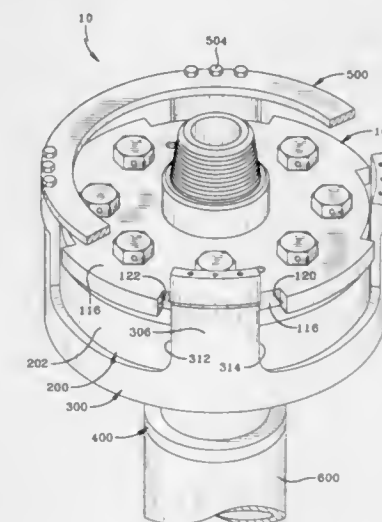
Continuation of Ser. No. 197,726, Feb. 17, 1994, Pat. No.

5,588,916. This application Sep. 13, 1996, Ser. No. 713,781

Int. Cl.<sup>6</sup> E21B 17/06

U.S. Cl. 464—20

14 Claims



1. A device for reducing the deleterious torque in a shock absorbing, rotary drive coupling unit for connecting a drive shaft and a driven shaft in a rotary mine drilling machine, said device comprising:

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drive plate means connectable to the drive shaft of the rotary drilling machine for rotating with the drive shaft and for transmitting the motion of the drive shaft;

driven plate means connectable to the driven shaft for being rotated by the drive shaft and for rotating the driven shaft;

a shock and torque-absorbing portion fastened to said drive plate means and fastened to said driven plate means, said shock and torque-absorbing portion comprising elastomeric material for transmitting torque between said drive plate means and said driven plate means;

torque-relief means operatively connected to said drive plate means and said driven plate means for limiting the torque placed on said shock and torque-absorbing portion, said torque-relief means including:

at least one first engagement means operatively connected to said drive plate means for driving said driven plate means in response to a predetermined amount of torque being applied to said driven plate means, and

at least one second engagement means connected to said driven plate means for cooperating with said first engagement means to drive said driven plate, wherein said first engagement means contacts said second engagement means and said drive plate means, and relieves the torque on said shock and torque-absorbing portion and directly drives said driven plate means in response to a predetermined amount of torque being applied to said driven plate means, said predetermined amount of torque being selected to avoid torque-related damage to said elastomeric material from heavy loads; and

tensile-force relief means connected to said driven plate means and having a portion mounted above said drive plate means and being operatively connected to said driven plate means, said drive plate means contacting said tensile-force relief means and being restrained from further upward movement in response to a predetermined lifting force applied to said drive plate means.

5,772,515

## TORQUE DAMPER

Tatsuo Yamakawa; Makoto Amano, both of Inasa-gun; Hideo Udo, Wako; Atsushi Mano, Wako, and Kazuhiro Nakajima, Wako, all of Japan, assignors to Kabushiki Kaisha F.C.C., Shizuoka, and Honda Giken Kogyo Kabushiki Kaisha, Tokyo, both of Japan

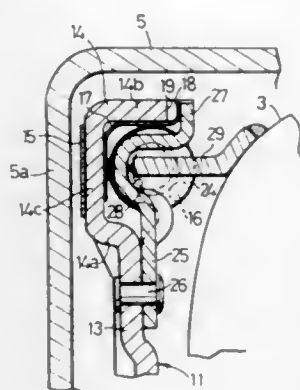
Filed Oct. 22, 1996, Ser. No. 734,823

Claims priority, application Japan, Oct. 27, 1995, 7-281017

Int. Cl.<sup>6</sup> F16D 3/14

U.S. Cl. 464—67

6 Claims



1. A torque damper comprising a plurality of guide sheets which are disposed in a circumferential arrangement in an annular channel defined around an outer periphery of a first transmitting member with an axially one side of said channel opened to cover an outer peripheral wall and a bottom wall of the channel, a plurality of damper spring means accommodated in a circumferential arrangement in the channel with the guide sheets interposed there-

between, a plurality of guide plates circumferentially disposed and secured to the first transmitting member to inhibit disengagement of said damper spring means from said channel, holder members secured to said first transmitting member and interposed between end washers mounted at opposed ends of adjacent damper spring means to limit a proximity distance between said opposed ends, and transmitting arms which are provided on a second transmitting member capable of being displaced in a relatively rotational manner with respect to said first transmitting member and which are interposed between the opposed end washers, wherein a variation in torque between said first and second transmitting members is damped by a compressive deformation of said damper spring means, and wherein said torque damper further includes radially outward directed positioning claws formed on said guide sheets, and retaining claws formed on said guide plates to urge said positioning claws axially, said positioning claws and said retaining claws being engaged in a plurality of notches which are formed in the outer peripheral wall of the channel.

5,772,516

## DAMPING DEVICE ADAPTED TO BE INTEGRATED INTO A MOTOR VEHICLE POWER UNIT

Ciriaco Bonfilio, 15 rue Castérès, 92110 Clichy (FR), France

PCT No. PCT/FR94/01483, § 371 Date Sep. 27, 1995, § 102(e)

Date Sep. 27, 1995, PCT Pub. No. WO95/17615, PCT Pub.

Date Jul. 6, 1995

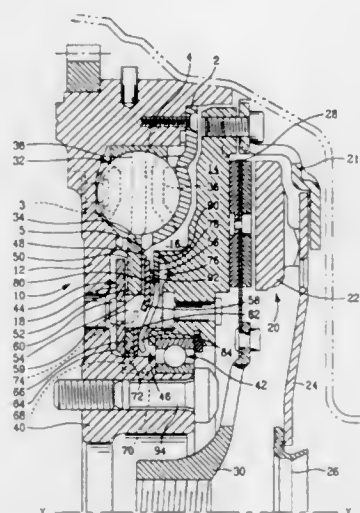
PCT Filed Dec. 19, 1994, Ser. No. 507,311

Claims priority, application France, Dec. 23, 1993, 93 15572

Int. Cl.<sup>6</sup> F16D 3/14

U.S. Cl. 464—68

8 Claims



1. A damping device (10) comprising damping means which are disposed between two coaxial rotating masses (12, 14), the first one (12) of the two masses is adapted to be coupled to the combustion engine of a motor vehicle power unit, and the second one (14) of the two masses is adapted to be connected to the input shaft of a gearbox of the power unit, in which the damping means comprise:

a resilient damping mechanism (32) interposed circumferentially between the two rotating masses (12, 14) so as to couple them together circumferentially, and comprising at least an output disc (32, 32A, 32B);

a first friction damping mechanism (44) which comprises, firstly, a first annular friction element (52) coupled, in rotation and axially, to the second one (14) of the two rotating masses, and secondly a second annular friction element (54) coupled in rotation to the second one (14) of the two rotating masses, with respect to which the second friction element is displaceable axially under the action of first resilient means (78), which urge the second friction element axially towards the

first annular friction element (52), so as to grip axially at least one output disc (34, 34A, 34B) of the resilient damping mechanism (32); and

a second friction damping mechanism (46) which includes at least one third annular friction element (66) coupled in rotation to one of the first and second rotating masses (12, 14) and displaceable axially with respect to said one of the two rotating masses under the action of second resilient means (80) which urge the third annular friction element axially towards an annular support surface (62), which is formed in facing relationship therewith and which is coupled in rotation to one of the first and second rotating masses (12, 14), wherein the first and second friction damping mechanisms (44, 46) are carried by the second mass (14), and in that the first and second resilient means are made as a single component (76) which comprises a resilient ring (78) forming the first resilient means and a set of resiliently deformable radial fingers (80) forming the second resilient means, and which is interposed between the second rotating mass (14) and the second annular friction element (54) and between the second rotating mass (14) and the third annular friction element (66), wherein the third annular friction element (66) is offset radially inwardly with respect to the first and second annular friction elements, and in that the radial fingers (80) are inclined and extend radially from one of the circular edges (82) of the ring (78), in such a way that free ends (84, 86) of the radial fingers (80) act on the third annular friction element (66).

5,772,517

## TRANSMISSION JOINT HAVING A TRIPOD ELEMENT, THE ARMS OF THE TRIPOD ELEMENT HAVING SPHERICAL SURFACES ON AXES OFFSET FROM RADII OF THE TRIPOD ELEMENT

Pierre Louis Guimbretiere, Neauphle-le-Chateau, France, assignor to GKN Automotive AG, Lohmar, Germany

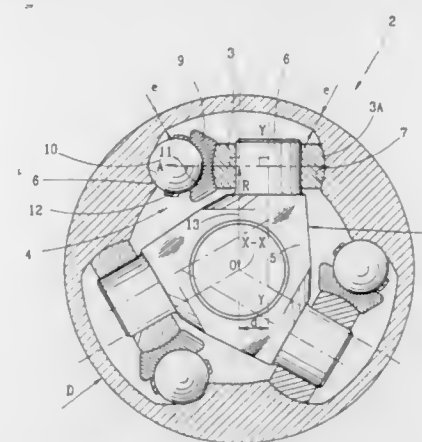
Filed Feb. 20, 1996, Ser. No. 604,012

Claims priority, application France, Feb. 17, 1995, 95 01879

Int. Cl.<sup>6</sup> F16D 3/20

U.S. Cl. 464—111

26 Claims



1. A transmission joint comprising:

a male tripod element to be fixed to a first shaft, said male tripod element including arms, each arm of said arms comprising a spherical surface, said spherical surface having a center and an axis, and said male tripod element having a radius;

a female element to be fixed to a second shaft, said female element defining a plurality of tracks such that each arm has two tracks of said plurality of tracks associated therewith, with one of said two tracks being disposed on each of two opposite sides of said arm; and

a first guide means for each arm for ensuring cooperation of each arm with one of said two tracks associated therewith, said first guide means having a center, and a second guide means for each arm for ensuring cooperation of each arm with

the other of said two tracks associated therewith, said first guide means being larger than said second guide means in a circumferential direction of said female element;

wherein the axis of said spherical surface of each arm is parallel to the radius of said male tripod element, is perpendicular to a line extending through the center of said spherical surface and the center of said first guide means, and is offset from the radius of said male tripod element in a direction away from said first guide means.

5,772,518

Patent Not Issued For This Number

5,772,519

## TORSION DAMPER, HAVING A FRICTION DEVICE ESPECIALLY FOR A MOTOR VEHICLE

Jacques Feigler, St. Brice S/Foret, France, assignor to Valeo, Paris, France

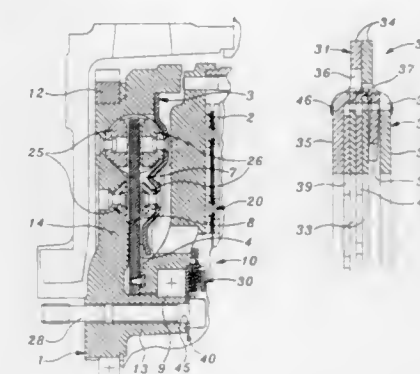
Filed May 6, 1996, Ser. No. 642,938

Claims priority, application France, May 4, 1995, 95 05332

Int. Cl.<sup>6</sup> F16D 3/66

U.S. Cl. 464—68

8 Claims



1. A torsion damper comprising: a primary rotatable part; a secondary rotatable part; centring means interposed operatively between the primary and secondary parts and mounting the secondary rotatable part coaxially on the primary rotatable part for relative rotation between the coaxial rotatable parts; circumferentially acting resilient means interposed between the rotatable parts; and friction means operatively interposed between the rotatable parts, the torsion damper defining a cavity containing the resilient means, the centring means closing the cavity, and the friction means being disposed outside the cavity in engagement with the centring means, wherein the friction means comprise a cassette fixed to the secondary rotatable part and a drive ring fixed to the primary rotatable part, the cassette comprising: two annular stirrup members which define an annular housing and means fastening the stirrup members together, and wherein the cassette further comprises axially acting resilient means, a first friction disc and a second friction disc received in said annular housing, said first friction disc being arranged to be driven in rotation by the drive ring, said second friction disc being fixed to the stirrup members for rotation with said stirrup members, said axially acting resilient means pressing the first friction disc in contact with the second friction disc.



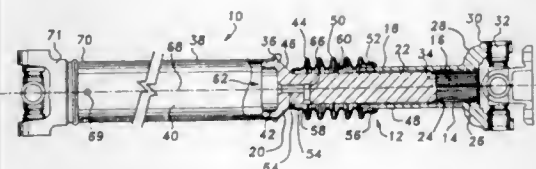
**5,772,520**  
**VENTED STUDYJOKE ON SLIP-BETWEEN-CENTER DRIVESHAFT**

Chris Peter Nicholas, Berkley, and Timothy Peter Raleigh, Macomb Township, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jul. 11, 1996, Ser. No. 678,128  
Int. Cl.<sup>6</sup> F16C 3/03

U.S. Cl. 464—162

13 Claims



6. A vented slip joint assembly comprising:  
a first shaft having a first end with an externally splined portion and a second end;  
a hollow driveshaft having a first cavity within the drive shaft, the driveshaft drivably connected to the second end of the first shaft;  
a second shaft having a internally splined portion drivably connected to the splined portion of the first shaft;  
a seal sealingly engaged with the first and second shafts to define a second cavity bounded by the seal and the first and second shafts; and  
a vent provided in the first shaft, the vent having a first end in fluid communication with the second cavity, the vent extending through the first shaft and having a second end in fluid communication with the first cavity of the driveshaft.

**5,772,521**  
**PROTECTIVE DEVICE FOR A DRIVESHAFT HAVING RADIAL SUPPORTING MEANS FOR THE PROTECTIVE CONE**

Paul Herchenbach, Ruppichterth, and Horst Kretschmer, Köln, both of Germany, assignors to GKN Walterscheid GmbH, Lohmar, Germany

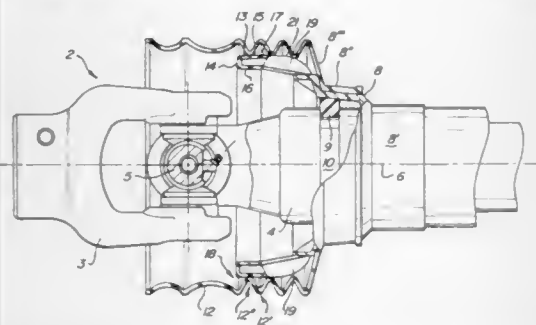
Filed Nov. 8, 1996, Ser. No. 745,389

Claims priority, application Germany, Nov. 8, 1995, 195 41 512-4

Int. Cl.<sup>6</sup> F16D 3/84

U.S. Cl. 464—170

7 Claims



1. A protective device for a driveshaft, with the driveshaft including two universal joints each having two joint yokes and a cross member articulately connecting the two joint yokes, as well as a connecting shaft connecting the two universal joints and extending along a longitudinal axis with each universal joint, said protective device comprising:  
a connecting cap adapted for connecting with one of the joint yokes;  
a protective cone connecting with said connecting cap;  
an intermediate sliding ring coupled with said connecting cap, said sliding ring adapted to be supported on the joint yoke, said protective cone being of a plastic material and, starting

from the connecting cap, adapted to cover the universal joint along at least part of the length of said universal joint;  
supporting means which counteract any contact between the protective cone and the enclosed components of the universal joint if the protective cone is subjected to any external loads, said supporting means including a supporting ring the outer circumferential face of said supporting ring supporting the protective cone on part of an inner face of said protective cone and said supporting means including further connecting means connecting the support ring to the connecting cap and holding the supporting ring at an axial distance from the connecting cap along the longitudinal axis.

**5,772,522**  
**METHOD OF AND SYSTEM FOR ANALYZING A GOLF CLUB SWING**

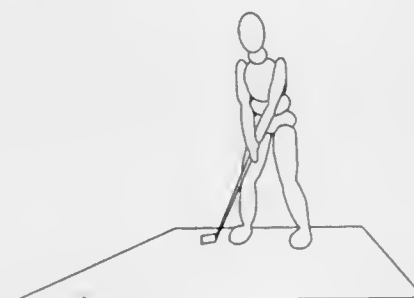
Steven M. Nesbit, Easton, Pa.; Terry A. Hartzell, Madison, Wis.; Keith A. Oglesby, Farmington Hills, Mich.; Jeff Cole, Whitehouse Station, and Anthony E. Radich, Somerville, both of N.J., assignors to United States of Golf Association, Far Hills, N.J.

Filed Nov. 23, 1994, Ser. No. 344,725

Int. Cl.<sup>6</sup> A63B 69/36

U.S. Cl. 473—222

12 Claims

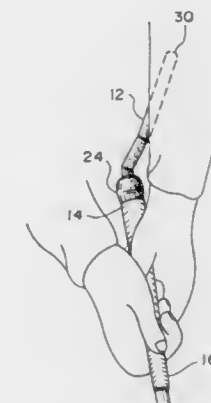


1. A method of analyzing a golfer and a golf swing comprising the steps of  
generating a three-dimensional android model having rigid segments with characteristics representative of a human person and spherical joints interconnecting said rigid segments;  
generating a parametric dynamic model of a golf club representative of a club;  
combining said android model with said golf club model and a ground surface model to create a complete model;  
placing a plurality of markers on a person;  
placing a triad of markers on a golf club shaft of a golf club;  
recording and processing the motion of said markers on said person and on said club shaft in three dimensions during swinging of said club by said person to obtain marker path data characteristics of the golf swing;  
processing said marker path data to calculate three dimensional angular motions for said android model segments and said dynamic golf club model corresponding to said marker path data; and  
kinematically driving said joints of said android model in dependence on said three-dimensional angular motions to effect superposition of said golf swing on said android model and said golf club model.

**5,772,523**  
**GOLF TRAINING DEVICE**  
Ted Sheftic, 406-A Mill Rd., New Oxford, Pa. 17350  
Filed Apr. 3, 1997, Ser. No. 833,039  
Int. Cl.<sup>6</sup> A63B 69/36

U.S. Cl. 473—227

11 Claims



1. A golf training device adapted for training a golfer to pivot the legs, hips and body, and maintain a solid leading arm during the execution of a golf swing, comprising:

- a cylindrical cap, having a longitudinal axis, for attachment to a golf club grip;  
a first section adjacent to and axially aligned with said cylindrical cap and extending from said cap at a first angle relative to said longitudinal axis; a second section angularly offset and extending from said first section at a second angle relative to said longitudinal axis, said second section being longer than said first section; and a third section angularly offset and extending from said second section at a third angle relative to said longitudinal axis, said third section being longer than said second section and having a free end thereon;  
whereby said device, when said cylindrical cap is properly attached to a golf club grip, moves adjacent, but does not contact, the front hip of the golfer when the golfer pivots and maintains a solid leading arm during the execution of a golf swing and said free end of the third section of said device contacts the golfer if the golfer fails to properly pivot or maintain a solid leading arm during the execution of a golf swing.

**5,772,524**  
**WATER RETARDING GOLF CLUB GRIP**  
Ben Huang, 19472 Woodlands La., Huntington Beach, Calif. 92648

Continuation-in-part of Ser. No. 637,931, Jan. 14, 1991, abandoned, Ser. No. 890,383, May 26, 1992, abandoned, Ser. No. 953,190, Sep. 29, 1992, abandoned, Ser. No. 58,313, May 3, 1993, abandoned, Ser. No. 278,186, Jul. 21, 1994, Pat. No. 5,397,123, Ser. No. 542,009, Nov. 13, 1995, Pat. No. 5,645,501, Ser. No. 567,339, Dec. 28, 1995, abandoned, and Ser. No. 595,445, Feb. 26, 1996, abandoned. This application Jun. 14, 1996, Ser. No. 656,942  
Int. Cl.<sup>6</sup> A63B 49/08

U.S. Cl. 473—300

11 Claims

1. A grip for a golf club shaft, said grip comprising:  
a strip which includes an open-pored felt layer, a thin layer of water resistant material, and a smooth closed-pore outer polyurethane layer;  
the thin layer of water resistant material being interposed between the outer polyurethane layer and the felt layer;  
the felt layer having its upper surface bonded to the lower surface of the layer of water resistant material;  
the upper surface of the water resistant material being bonded to the lower surface of the polyurethane layer,

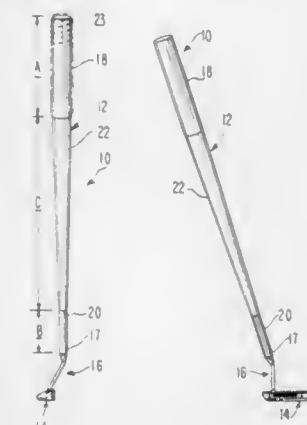


- with the felt layer providing strength for the polyurethane layer while the polyurethane layer absorbs shocks and provides tackiness so as to inhibit slippage of a user's hand relative to a shaft;  
a tape on the underside of the felt layer and bent over the sides of the felt layer to adhere the felt layer to a golf club shaft and to restrain the entry of water into the felt layer; and  
with the strip being spirally wrappable about a shaft with the side edges of said tape being in watertight abutment.

**5,772,525**  
**GOLF PUTTER**  
Lon Klein, Ryebrook, N.Y., assignor to New Vision Golf Corp., New City, N.Y.  
Continuation of Ser. No. 733,274, Oct. 17, 1996, abandoned, which is a division of Ser. No. 356,841, Dec. 15, 1994, Pat. No. 5,569,098. This application Apr. 2, 1997, Ser. No. 825,689  
Int. Cl.<sup>6</sup> A63B 53/14

U.S. Cl. 473—300

15 Claims



1. An improved golf putter for putting a golf ball along a path of desired golf ball travel and of the type having a hosel connecting a head to an elongated shaft,  
said elongated shaft comprising a first head end affixed to said putter head and a second grip end, a grip end length portion proximate to said grip end having a substantially constant enlarged transverse dimension between about 1.0 and 1.2 inches, a hosel end length portion proximate to said first head end having a substantially constant reduced transverse dimension between about 0.5 and 0.7 inches, and a tapered center length portion extending from said grip end length portion to

said hosel end length portion having transverse dimensions which diminish in size from said enlarged transverse dimension at an end thereof proximate to said grip end length portion to said reduced transverse dimension at an opposite end thereof proximate to said hosel end length portion.

5,772,526  
GOLF CLUB HEADS

Naoto Hano, Chiba-ken, Japan, assignor to Maruman Golf Kabushikikaisha, Tokyo, Japan

Continuation of Ser. No. 552,628, Jul. 16, 1990, abandoned.

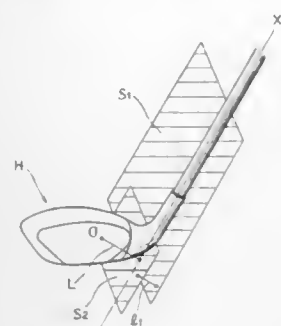
This application Dec. 30, 1992, Ser. No. 743,112

Claims priority, application Japan, Jul. 17, 1989, 1-182436

Int. Cl.<sup>6</sup> A63B 53/04

U.S. Cl. 473—314

14 Claims



1. A wood type golf club head comprising:  
a toe located at a front of said head;  
a sole located at a bottom of said head;  
a heel located at a rear of said head;  
a ball-striking face located in a central position of said head between said toe and said heel, said ball-striking face having front and rear sides; and  
a neck leading from said heel to a shaft of a golf club to which said head is to be connected, wherein a point, at which a center of gravity of said head is located, is positioned on said rear side of said ball-striking face, and a length of an imaginary perpendicular line which is drawn from said point at which said center of gravity of said head is located to a longitudinal axis of said shaft of said golf club to which said head is connected, is at least 35 mm.

5,772,527  
GOLF CLUB HEAD FABRICATION METHOD

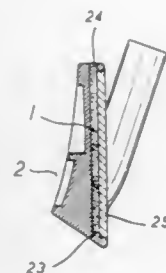
Jung Ming Liu, Kaohsiung, Taiwan, assignor to Linphone Golf Co., Ltd., Kaohsiung, Taiwan

Filed Apr. 24, 1997, Ser. No. 846,487

Int. Cl.<sup>6</sup> A63B 53/04; B29C 45/03

U.S. Cl. 473—324

7 Claims



1. A golf club head fabrication method including the steps of:  
i) preparing a rubber mixture by mixing a rubber with fillers, then pre-warming the rubber mixture thus obtained in a mate-

rial tank of an injection molding machine at a temperature of about 60° C., and then delivering the pre-warmed rubber mixture to an injection molding tube of the injection molding machine which is heated to a temperature of about 70° C.;

- ii) preparing a club head casing having a front open chamber at its front side, a filling hole at one side in communication with said front open chamber, and an inside flange raised from a bottom side of said front open chamber around the border, then welding a face panel to the inside flange of said club head casing to close said front open chamber, and then filling a bonding agent through said filling hole into said front open chamber, and then pre-heating said club head casing at a temperature of about 100° C. for about 480 second; and  
iii) injecting said pre-warmed rubber mixture into said filling hole by said injection molding machine at an injection velocity of about 3.0 cm/sec, an injection pressure of about 100 kg/cm<sup>2</sup>, a mold closing pressure of about 150 kg/cm<sup>2</sup>, and an injection time of about within 10 seconds to 30 seconds, to mold a shock absorbing rubber in said front open chamber through a vulcanization process.

5,772,528

Patent Not Issued For This Number

5,772,529  
GOLF CLUB HAVING ENLARGED HEAD DESIGN  
FORMED FROM RIGID MESH MATERIAL

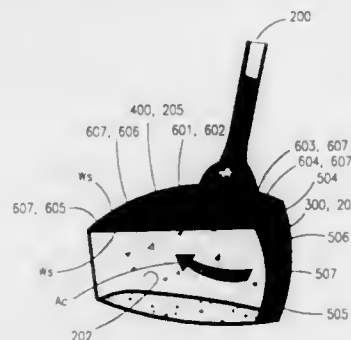
Thomas L. Ruth, Jr., 65731 E. Rolling Hills Dr., Tucson, Ariz. 85739

Filed Apr. 28, 1997, Ser. No. 845,880

Int. Cl.<sup>6</sup> A63B 53/04

U.S. Cl. 473—327

18 Claims



10. A golf club apparatus, said apparatus comprising:  
a hollow clubhead frame, said frame having a first window structure and a second window structure, said first window structure delineating a first flange structure for receiving a clubface structure, said second window structure delineating a second flange structure for receiving an exhaust clubhead structure;  
a clubface structure comprising a first mesh structure having openings sized for facilitating entry of air, and being sized and shaped to conform and attach to said first flange structure, said first mesh structure comprising a first mesh material arrangement formed such that a depth dimension associated with a mesh opening is less than or equal to a regulatory depth dimension for grooves on a clubface; and  
an exhaust clubhead structure comprising a second mesh structure having openings sized for exhausting air, and being sized and shaped to conform and attach to said second flange structure,  
said clubhead frame, said clubface structure, said exhaust clubhead structure being constructed from metallic material selected from a group consisting of aluminum, stainless steel, and titanium.

5,772,530  
THREAD WOUND GOLF BALL

Akira Kato, Shirakawa, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo-Ken, Japan

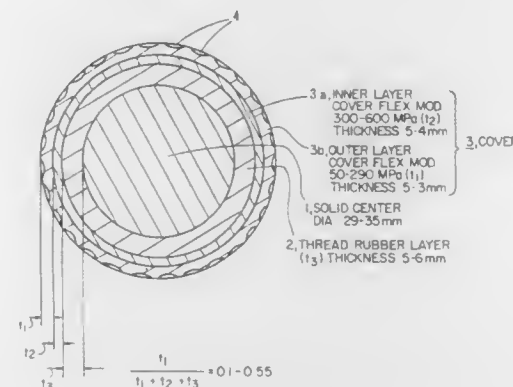
Filed Dec. 20, 1996, Ser. No. 771,414

Claims priority, application Japan, Dec. 22, 1995, 7-350157

Int. Cl.<sup>6</sup> A63B 37/06; 37/12

U.S. Cl. 473—363

2 Claims





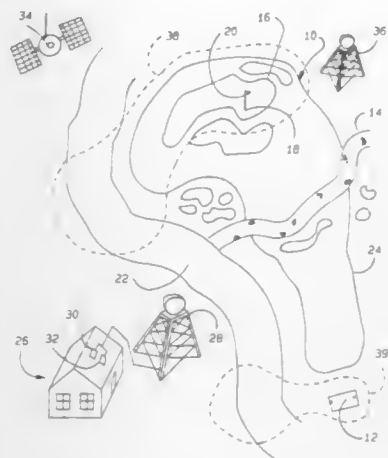
5,772,534

**SATELLITE ENHANCED GOLF INFORMATION SYSTEM**  
Douglas P. Dudley, 2916 Blakely Dr., Orlando, Fla. 32835-6141  
Continuation of Ser. No. 240,983, May 11, 1994, abandoned,  
which is a continuation-in-part of Ser. No. 942,343, Sep. 9,  
1992, Pat. No. 5,326,095. This application May 19, 1997, Ser.  
No. 858,816

Int. Cl.<sup>6</sup> A63B 57/00

U.S. Cl. 473—407

20 Claims



1. A golf information system for providing a golfer with information regarding the distance to designated points on a golf course having a plurality of golf holes comprising:

a receiver moveable with said golfer having locating means for determining the position of said receiver on said golf course and microprocessing means for calculating distances from said position of said receiver to said designated points stored in a memory, said microprocessing means relaying said information to display means for displaying said information to said golfer regarding the distance to said designated points on said golf course relative to said receiver; and

golf hole determination means for causing said display means to output said information related to one of said golf holes being played by said golfer wherein the golf course includes a plurality of golf hole identifying regions with at least one said hole identifying region associated with each said golf hole and at least two said hole identifying regions associated with one said golf hole, such that said position of said receiver is compared with said hole identifying regions by said microprocessing means to detect the presence of said receiver within a hole identifying region on said golf course in order to automatically establish a present golf hole being played by said golfer, wherein once said present golf hole is established said information is related to said designated points of said golf course associated with said present golf hole until a new golf hole is automatically established by detecting the presence of said receiver within another of said hole identifying regions.

5,772,535

**INFLATABLE PORTABLE GAME**

John Kenneth Murphy, 27 Gowan Lane, Aurora, Ontario, Canada, L4G 4X6

Filed Dec. 18, 1996, Ser. No. 768,936

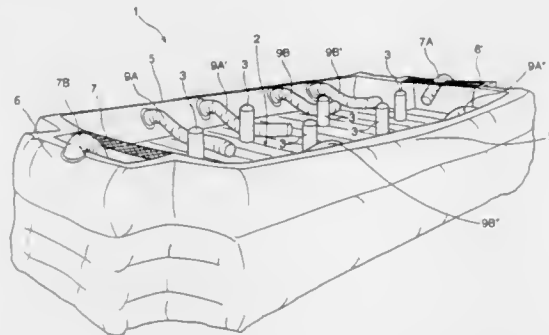
Claims priority, application Canada, Nov. 19, 1996, 2190695  
Int. Cl.<sup>6</sup> A63B 71/02

U.S. Cl. 473—415

20 Claims

1. An inflatable portable substantially collapsible structure comprising:

an inflatable substantially collapsible playing field having at least two walls, a top and a bottom, said field being of a form selected from the group consisting of a hockey rink, a soccer field and a baseball field.



at least one object director to direct an object with a fluid along or above the playing surface and  
at least one score area.

5,772,536

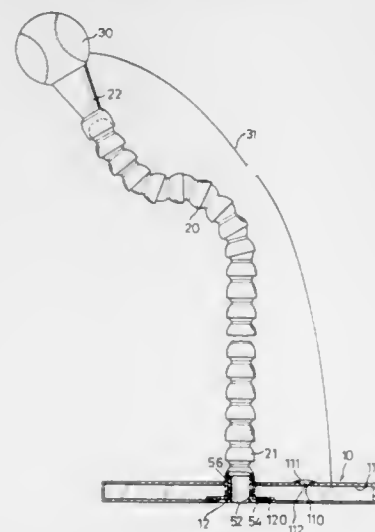
**BATTING PRACTICE DEVICE**

Lian-Cheng Wang, Changhua Hsien, Taiwan, assignor to  
Cheng Lien Plastic Co., Ltd., Taipei, Taiwan  
Filed Feb. 19, 1997, Ser. No. 802,172

Int. Cl.<sup>6</sup> A63B 69/40

U.S. Cl. 473—417

5 Claims



1. A batting practice device comprising:

a base frame having upper and lower sides and a vertical passage extending therethrough a chamber defined in said base frame, a hole defined in an upper side of said base frame and communicating with said chamber whereby a fluid weighting material may be placed in said chamber, a plug detachably fitted on the upper side of said base frame and including a lower portion received in said hole; a depression defined in said underside of said base frame and communicating with said passage;

an engaging member fixedly mounted on said base frame and said engaging member being defined by a stub, said stub extending through said passage and protruding outward of said base frame upper side, an outer thread formed on one end of said stub, and a flange formed on the other end of said stub, said flange being received in said depression;

a bellows shaped flexible tube having upper and lower ends; said tube being defined by a plurality of pivot elements, each element having a concave inner surface at one end and a convex outer surface at its other end; said convex outer surface at said one end of each element being in complementary engagement with said concave inner surface at said other end of an adjoining element to define a substantially ball and

socked joint; a ball support element pivotally attached at said tube upper end; a ball releasably supported on said ball support element  
a connecting wire having a first end attached to said base frame and a second end attached to said ball.

5,772,537

**DEVICE FOR RETURNING A BALL AT A USER DETERMINABLE SPEED**

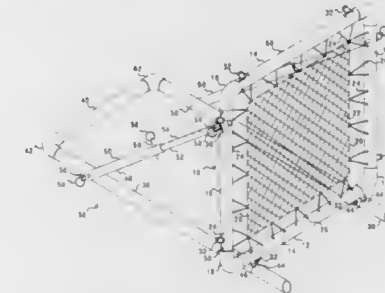
Ronald A. Anderson, Seattle, and Matthew P. Veeder, Stanwood, both of Wash., assignors to Happy Day Sports Company, Seattle, Wash.

Continuation-in-part of Ser. No. 795,346, Feb. 4, 1997, abandoned, and Ser. No. 794,863, Feb. 5, 1997, abandoned. This application Jun. 12, 1997, Ser. No. 873,842

Int. Cl.<sup>6</sup> A63B 69/00

U.S. Cl. 473—435

25 Claims



1. Apparatus for deflecting a sports projectile that is traveling along an incident path, back along a return path, comprising:

(a) a frame having a base portion and an elevatable portion;  
(b) an elastomeric panel suspended within the elevatable portion by an elastomeric cord that extends between a periphery of the elastomeric panel and the elevatable portion of the frame, said elastomeric cord coupling the elastomeric panel to the elevatable portion of the frame so that the elastomeric panel defines an impact area for the sports projectile as the projectile travels along the incident path; and  
(c) means for adjusting a tension of the elastomeric panel to enable a user to selectively change a force with which the sports projectile is deflected back along the return path relative to that at which the sports projectile traveling along the incident path strikes the elastomeric panel.

5,772,538

**FREE STANDING GOAL BARRIER APPARATUS**

John Szykiel, 6040 Stoney Pointe Dr., Lansing, Mich. 48917, and Michael Huhn, 9365 Grove Rd., DeWitt, Mich. 48820

Filed Jun. 30, 1997, Ser. No. 886,108

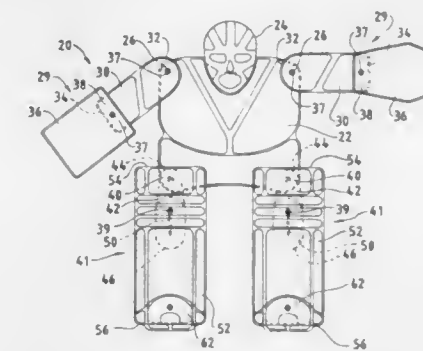
Int. Cl.<sup>6</sup> A63B 69/00

U.S. Cl. 473—446

27 Claims

1. A free standing goalie apparatus comprising:

a torso;  
two upper limbs, each upper limb further having an upper arm section and a lower arm section, the upper arm section having



a shoulder end and a wrist end, the shoulder end being pivotally affixed to the torso and the wrist end being pivotally affixed to the lower arm section;

two lower limbs, each lower limb having an upper leg section, a lower leg section, and a foot section, the upper leg section further having an upper pivot point and a lower pivot slot, the upper leg section being pivotally affixed at its upper pivot point to the torso, and to the lower leg section at its lower pivot slot, and the foot section being pivotally affixed to the lower leg section;

a frame, the frame being affixed to the back of the torso; and  
a base attached to the frame.

5,772,539

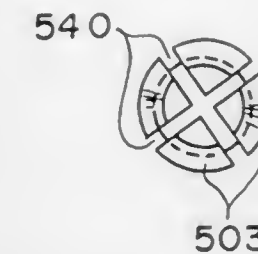
**SAFETY BASE WITH ANCHOR, METHODS OF USING AND MAKING, AND ASSOCIATED**

Roger E. Hall, P.O. Box 346, Elizabethtown, Pa. 17022-0346  
Continuation-in-part of Ser. No. 441,634, May 15, 1995, Pat. No. 5,556,089, which is a division of Ser. No. 940,542, Sep. 4, 1992, Pat. No. 5,255,692, which is a continuation of Ser. No. 669,088, Mar. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 595,577, Oct. 1, 1990, abandoned, which is a division of Ser. No. 442,465, Nov. 30, 1989, Pat. No. 4,979,740, which is a continuation of Ser. No. 194,276, May 16, 1988, abandoned, which is a continuation of Ser. No. 647,534, Sep. 19, 1984, Pat. No. 4,744,561, which is a continuation-in-part of Ser. No. 472,241, Mar. 4, 1983, Pat. No. 4,531,733, which is a continuation-in-part of Ser. No. 395,279, Jul. 6, 1982, Pat. No. 4,398,715, which is a continuation of Ser. No. 234,618, Feb. 17, 1981, abandoned, which is a division of Ser. No. 18,844, Mar. 19, 1979, Pat. No. 4,266,768, which is a continuation-in-part of Ser. No. 758,638, Jan. 12, 1977, abandoned. This application Jun. 7, 1995, Ser. No. 484,897

Int. Cl.<sup>6</sup> A63B 71/00

U.S. Cl. 473—499

19 Claims



1. An athletic base system comprising:

a ground support structure for releasably securing an athletic base thereto, and an athletic base, said ground support structure further comprising:

an upper mounting surface for receiving an athletic base thereon;

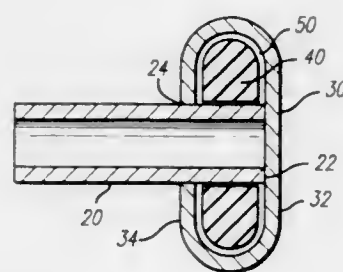
a member extending below said mounting surface for securing the position of the ground support structure relative to the ground;

said mounting surface having at least one fastening element disposed thereon for releasably fastening said athletic device thereto;

wherein said at least one fastening element comprises a nipple having an outer peripheral surface and having a stem portion and a tip portion, said tip portion having a greater cross-sectional dimension than said stem section, and having a lower locking surface extending substantially perpendicularly outwardly from the surface of said stem at an upper extent of said stem to engage a fastening element on an athletic base which is to be secured to the ground support structure, and wherein said peripheral surface defines a nipple volume occupied by said nipple,

wherein said at least one nipple includes a relief zone within said nipple volume, in which no nipple material is present, said relief zone being so constructed and arranged to permit the upper portions of the nipple to deflect radially inwardly upon the application of inwardly directed force;

said athletic base having an upper contact surface and a lower surface, said base having a fastening element recess extending upwardly from said lower surface adapted to releasably engage said at least one nipple, said recess having a radially inwardly extending lip at said lower surface, said lip being sized to engage said locking surface of said nipple when said nipple is inserted into said recess.



chamber by contact with walls of said chamber in at least one direction transverse to said longitudinal axis.

5,772,542

## TETHER FOR A BALL

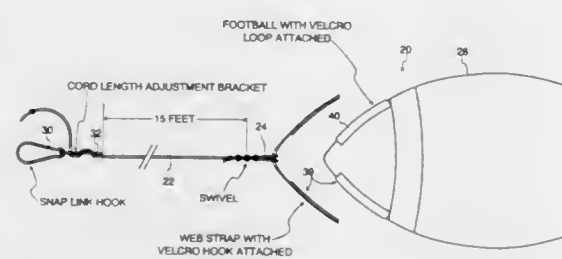
Larry A. Gildea, Gobles, and Gregg R. Beaudette, St. Joseph, both of Mich., assignors to All Sports Training Resources, Inc., St. Joseph, Mich.

Filed Feb. 7, 1997, Ser. No. 795,136

Int. Cl.<sup>6</sup> A63B 69/00

U.S. Cl. 473—576

19 Claims



1. A tether for a ball the tether comprising:  
a primary shock cord having two free ends and a first spring constant;

one of said two free ends adapted to be secured to stationary object; and

a differential shock device selected to have a relatively higher spring constant than said first spring constant, said differential shock device adapted to be secured to the other of said two free ends of said primary shock cord and attached to a ball by attaching means;

wherein said spring constant of said differential shock device is selected to permit said differential shock device to begin stretching once said primary shock cord has stretched beyond its original length to a slightly below failure of said shock cord point.

5,772,543

## GAME BALL

Robert Paino, 469 Highland Ave., Malden, Mass. 02148

Continuation-in-part of Ser. No. 518,663, Aug. 24, 1995, Pat. No. 5,611,541. This application Jan. 8, 1997, Ser. No. 780,316

Int. Cl.<sup>6</sup> A63B 43/04; 37/08

U.S. Cl. 473—594

2 Claims

1. A game ball of the type adapted to be brought to a game site and filled with granular or particulate material obtained at the game site comprising:

a first pliable panel having two ends, a first side, a second side, an inner and outer surface, and a flap having a length approximately one third the length of said first side protruding radially outward from a central position on said first side;

a second pliable panel substantially identical to said first pliable panel but further having the flap thereof folded over upon the inner surface thereof, and permanently affixed thereto thereby

5,772,540

## RACKET FOR TENNIS OR THE LIKE GAMES

Siegfried Kuebler, Mozartstr. 17, D-88662 Überlingen, Germany

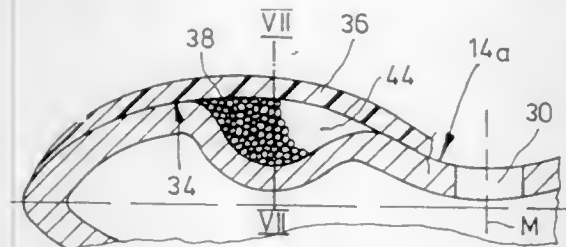
Filed Sep. 20, 1995, Ser. No. 530,570

Claims priority, application Germany, Sep. 22, 1994, 44 33 794.9

Int. Cl.<sup>6</sup> A63B 49/02

U.S. Cl. 473—519

9 Claims



1. A racket comprising a frame for accommodating stringing, said frame having a hollow tube and a handle end, said hollow tube having an outside surface, said outside surface having formed thereon means for receiving a granular mass for altering weight distribution of the racket, a granular mass located in said receiving means and a covering means extending over said receiving means for retaining the granular mass within said receiving means.

5,772,541

## VIBRATION DAMPENED HAND-HELD IMPLEMENTS

John Buiatti, Castaic, Calif., assignor to Jas D. Easton, Inc., Van Nuys, Calif.

Filed May 1, 1997, Ser. No. 847,180

Int. Cl.<sup>6</sup> A63B 59/00

U.S. Cl. 473—520

13 Claims

1. An implement having a handle which, during use is subject to vibration in at least one direction transverse to a longitudinal axis of said handle, and a vibration dampening system mounted on said implement, characterized in that said vibration dampening system comprises a chamber on said implement proximate a location of maximum transverse displacement of a point on said implement during vibration and an elastomeric member disposed in said chamber, said elastomeric member being freely moveable in said

5,772,545

## SPORTSBALL AND MANUFACTURING METHOD THEREOF

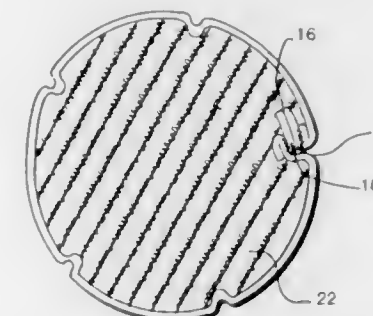
Tsung Ming Ou, No. 32, Lane 56, Chung Cheng 2nd Road, Kaohsiung, Taiwan

Filed Dec. 20, 1996, Ser. No. 771,264

Int. Cl.<sup>6</sup> A63B 41/10; B65H 54/64

U.S. Cl. 473—605

9 Claims



forming a flap retaining element in substantial mating alignment with said flap of said first panel;

at least one third pliable panel having two ends, two sides, and an inner and outer surface;

wherein the second side of said first and second pliable panels are each permanently adjoined to one side of said third pliable panel; and

a sealing means forming a temporary, user resealable joining means between said flap and said flap retaining means, comprising a hook and loop type fastener;

wherein said game ball is first filled with said granular or particulate material and once the game ball is filled to a desired volume, engaging the hook and loop type fastener seals the material within the game ball making said game ball suitable for play desired volume of said material is sealing said disposed upon said outer surface

5,772,544

## BASEBALL AND SOFTBALL

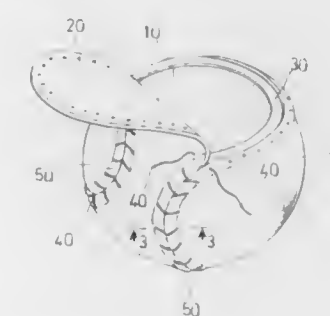
Wen Hsiang Yang, No. 201, Chong Don Street, Kaohsiung, Taiwan

Filed Apr. 21, 1997, Ser. No. 837,572

Int. Cl.<sup>6</sup> A63B 47/12

U.S. Cl. 473—598

1 Claim



1. A ball comprising

a core,

at least two cover members engaged on said core and including an abutting peripheral portion,

a pad engaged between said abutting peripheral portion of said at least two cover members and said core, said pad being made of resilient material, and

at least one thread stitched along said abutting peripheral portion of said at least two cover members for forming a plurality of stitches and for securing said pad and said abutting peripheral portion of said at least two cover members together,

said at least one thread being tightened and engaged into said resilient pad for forming a plurality of bulges between said stitches and for allowing said at least one thread to be engaged between and protected by said bulges.

5,772,546

## CONTINUOUSLY VARIABLE AUTOMATIC DRIVE

Jaroslav Piotr Warszawski, Skalltzer Str. 2, 10999 Berlin, Germany

Continuation-in-part of Ser. No. 387,816, Apr. 24, 1995, abandoned. This application Sep. 13, 1996, Ser. No. 713,418

Claims priority, application Germany, Jun. 29, 1993, 43 22 382.6

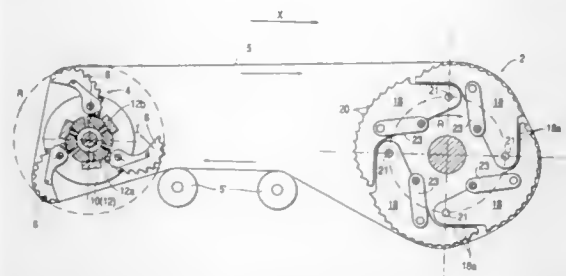
Int. Cl.<sup>6</sup> F16H 61/00

U.S. Cl. 474—50

21 Claims

1. A continuously variable drive adapted for use with an endless drive, comprising:





a driving sprocket and a driven sprocket, wherein the endless drive is adapted to connect the driving and driven sprockets to transmit rotary motion from the driving sprocket to the driven sprocket, wherein the driven sprocket comprises:  
a driving sprocket housing adapted for mounting to a rotary output;  
a plurality of involute-shaped driving toothed segments each having a leading end and a trailing free end, wherein the toothed segments are symmetrically spaced around the housing and are each pivotally attached to the housing about the leading end, each toothed segment being movable between a high gear ratio position where the trailing free end is moved inwardly closest to the housing and the effective diameter of the driven sprocket is smallest and a low gear ratio position where the trailing free end is moved outwardly farthest from the housing and the effective diameter of the driven sprocket is largest; and  
a biasing means for biasing each toothed segment mounted to the housing toward the high gear ratio position, wherein the effective diameter of the driven sprocket automatically varies anywhere between the low gear ratio position and the high gear ratio position based upon force applied to the driving sprocket and selected strength of the biasing means.

5,772,547

## BICYCLE CRANKSET

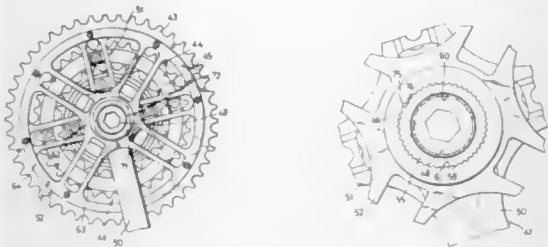
Masao Terada, Osaka, Japan, assignor to Shimano, Inc., Osaka, Japan

Filed Aug. 28, 1996, Ser. No. 705,866

Claims priority, application Japan, Sep. 20, 1995, 7-242004  
Int. Cl.<sup>6</sup> F16H 9/06

U.S. Cl. 474-77

21 Claims



1. A bicycle crankset for mounting a chainring (43,44,45), the crankset comprising:  
a crank arm (50) having a first end for mounting a pedal (40) and a second end having a boss (55) for mounting to a crank axle (46);  
a chainring retainer (51) for supporting the chainring (43,44,45), wherein the chainring retainer includes:  
a first engagement member (68) for engaging the boss (55); and  
an elongated retainer intermediate member (66) extending radially outwardly from the first engagement member (68) to a retainer intermediate member outer peripheral section;  
a reinforcement member (52) including:  
a second engagement member (61) laterally spaced apart from the first engagement member (68) for engaging the boss (55); and

an elongated reinforcement intermediate member (63) extending radially outwardly from the second engagement member (61) to a reinforcement intermediate member outer peripheral section;

wherein the retainer intermediate member outer peripheral section is attached to the reinforcement intermediate member outer peripheral section so that both the retainer intermediate member outer peripheral section and the reinforcement intermediate member outer peripheral section are laterally aligned between the first engagement member (68) and the second engagement member (61).

5,772,548

## POWER TRAIN OF AUTOMATIC TRANSMISSION FOR VEHICLE

Donghoon Park, Kyungki-do, Rep. of Korea, assignor to Hyundai Motor Co., Ltd., Seoul, Rep. of Korea

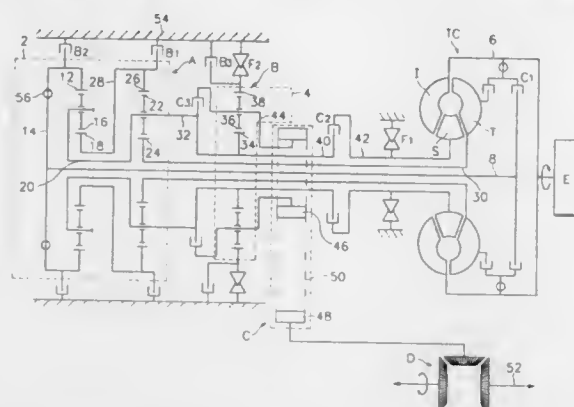
Filed Jun. 6, 1995, Ser. No. 467,804

Claims priority, application Rep. of Korea, Jun. 23, 1994, 94-14446

Int. Cl.<sup>6</sup> F16H 47/08

U.S. Cl. 475-44

32 Claims



1. A power train of an automatic transmission for a vehicle, comprising:

a torque converter for receiving power from an engine and having an impeller, a stator and a turbine;

transmission means, connected to said turbine, for selectively converting a speed of said turbine, said transmission means including:

first transmission means, connected to said turbine, for selectively converting a speed of said turbine;

second transmission means, connected to said first transmission means, for selectively converting an output speed of said first transmission mechanism;

third transmission means, connected to said second transmission means, for reducing an output speed of said second transmission means to produce an output speed of said automatic transmission; and

means for selectively connecting said second transmission means to said stator such that said output speed of said automatic transmission continuously varies between a first and second transmission gear ratio; and wherein

said first transmission means includes a compound planetary gear unit including first and second simple planetary gear units, said first simple planetary gear unit including a first ring gear, a first planetary carrier of first pinion gears and a first sun gear, said second simple planetary gear unit including a second ring gear, a second planetary carrier of second pinion gears and a second sun gear, said second ring gear being connected to said first sun gear and functioning as one of a reaction force element and an input element, said first transmission means further includes a first power delivering member connecting said first and second planetary carriers, and a first friction element for selectively connecting said first ring gear to a fixed housing of said automatic transmission;

said second transmission means includes a third simple planetary gear unit having a third ring gear, third planetary carrier of pinion gears, and a third sun gear, said third simple planetary gear unit being connected to said first power delivering member and selectively changing a transmission gear ratio of said first transmission means.

5,772,549

## BELT TENSIONING DEVICE

Thomas Berndt, Hof; Joachim Jud, Daaden; Asmus Koch, Hachenburg, and Ulrich Roth, Neunkhausen, all of Germany, assignors to Muhr und Bender, Attendorf, Germany

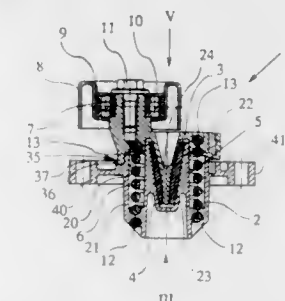
Filed Dec. 12, 1996, Ser. No. 766,165

Claims priority, application Germany, Dec. 12, 1995, 195 46 207.6; Feb. 1, 1996, 196 03 558.9

Int. Cl.<sup>6</sup> F16H 7/12

U.S. Cl. 474-135

14 Claims



1. A belt tensioning device for a motor vehicle comprising:

a receiver housing;

a roller carrier connected to the receiver housing;

a bearing means located between the receiver housing and the roller carrier; and

a spring element which acts between receiver housing and the roller carrier;

wherein the spring element is arranged in a manner applying both a belt tensioning force on the roller carrier and the spring loading of the bearing means;

wherein the bearing means comprises a bearing cone which is joined to one of the receiver housing and the pulley carrier; and wherein a conical opening which corresponds in shape to the bearing cone is provided in the other of the pulley carrier and the receiver housing.

5,772,550

## AUTOMATIC TRANSMISSION CONTROL SYSTEM

Shinya Kamada; Koichi Yamamoto; Tomoo Sawazaki; Hiroshi Shinozuka; Kazushi Kurokawa; Takamichi Teraoka; Masakazu Hombo; Naotaka Hirami; Yasunori Kanda; Akinobu Aoki; Tatsuhiko Iwasaki, and Takeyoshi Kawa, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

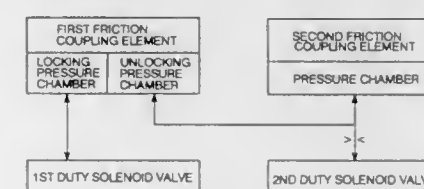
Filed Apr. 1, 1996, Ser. No. 626,067

Claims priority, application Japan, Mar. 31, 1995, 7-100005; Feb. 27, 1996, 8-069080

Int. Cl.<sup>6</sup> F16H 61/00

U.S. Cl. 475-120

18 Claims



1. A control system for an automatic transmission of the type having a transmission gear mechanism and a plurality of friction

5,772,551

## DUAL FLEXIBLE BITE CONNECTOR

Norman H. Mabie, Claremont, N.H., assignor to L.M. & L. Corporation, Claremont, N.H.

Filed Apr. 29, 1996, Ser. No. 639,770

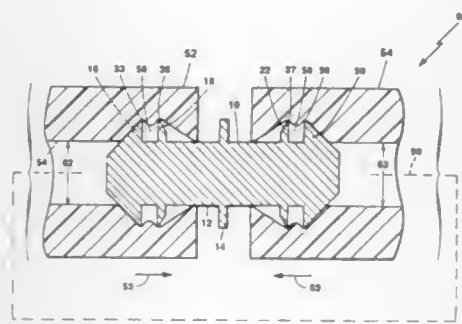
Int. Cl.<sup>6</sup> F16G 5/00

U.S. Cl. 474-256

16 Claims

1. An integral connector for joining end portions of a flexible belt of resilient material thereby to form an endless belt assembly, said connector comprising:

an elongated, axially extending central body portion having a given transverse dimension and at least two axially spaced



biting head portions, an outer biting head portion and an inner biting head portion, at each end of said central body portion; each of said biting head portions being rigid and formed by a tapered surface and by a base planar surface with a transverse dimension that exceeds the transverse dimension of the recesses at the end portions of the belt and of said central body portion;

each of said outer biting head portions having said tapered and base planar surfaces extending toward a first intersection about the periphery of said outer biting head portions, and having a continuous outlying edge section integrally formed at said first intersection;

each of said inner biting head portions having said base planar surface extending to a height approximately equal to the height of said outer biting head portions with a first side tapering to said height in the direction of the nearest one of said outer biting head portions and

extending to an intersection with a second side to form about the periphery of each inner biting head portions a continuous outlying edge integrally formed at said second intersection; said tapered and base planar surfaces of each of said outer biting head portions defining predetermined angles of such first intersections;

said tapered and base planar surfaces of each of said inner biting head portions defining predetermined angles of said second intersection; and

said outlying edge sections being flexible about said intersections to provide multiple, spaced, locked-in engagements, between said connector and the flexible belt at each recessed end.

5,772,552  
GEAR TRANSMISSION UNIT FOR AUTOMATIC TRANSMISSION

Ryuji Ibaraki, Kunio Morisawa, and Jiro Yoshizumi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 537,360, Oct. 2, 1995, abandoned.

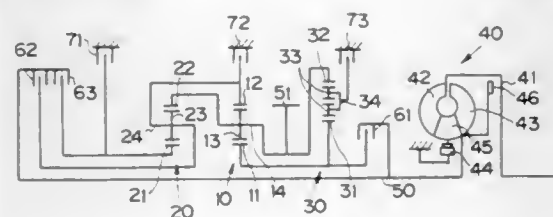
This application Mar. 21, 1997, Ser. No. 822,708

Claims priority, application Japan, Oct. 3, 1994, 6-263201; Dec. 22, 1994, 6-336221

Int. Cl.<sup>6</sup> F16H 3/46

U.S. Cl. 475—281

28 Claims



1. A gear transmission unit for an automatic transmission, which has:

a single pinion type first planetary gear unit in which a pinion meshing with both a first sun gear and a first ring gear arranged concentrically with said first sun gear is rotatably retained by a first carrier;

a single pinion type second planetary gear unit in which a pinion meshing with both a second sun gear and a second ring gear arranged concentrically with said second sun gear is rotatably retained by a second carrier, said second ring gear being connected to said first carrier, and in which said second carrier is connected to said first ring gear; and

a double pinion type third planetary gear unit in which a first and a second pinions meshing with each other are rotatably retained by a third carrier and are arranged between a third sun gear and a third ring gear arranged concentrically with the third sun gear, and the first pinion meshes with the third sun gear and the second pinion meshes with the third ring gear, comprising:

an output element connected to at least one of said first carrier and said third ring gear; and

brake means for fixing said third carrier, and

wherein said first carrier is connected to said third ring gear.

5,772,553

CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION

Kazumasa Tsukamoto, Toyota; Masahiro Hayabuchi, Anjo; Yoshihisa Yamamoto, Nishio; Hiroshi Tsutsui, Nishio, and Yuuki Kousaka, Nishio, all of Japan, assignors to Aisin AW Co., Ltd., Japan

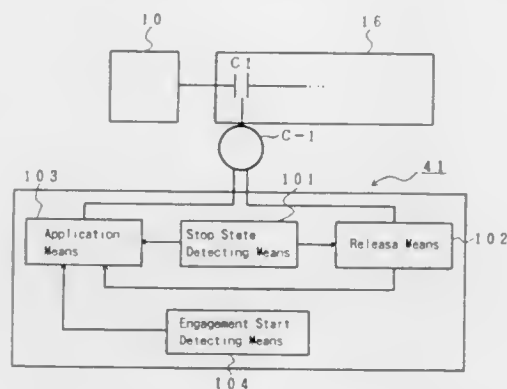
Filed Aug. 30, 1996, Ser. No. 708,077

Claims priority, application Japan, Aug. 31, 1995, 7-224311

Int. Cl.<sup>6</sup> F16H 61/20

U.S. Cl. 477—95

4 Claims



1. A control system for an automatic transmission mounted in a vehicle, comprising:

a clutch applied when a forward running range is selected, for transmitting the rotation of an engine to a speed change unit;

a hydraulic servo for applying the clutch responsive to feed of an oil pressure; and

a control unit for controlling the oil pressure fed to the hydraulic servo, said control unit including:

stop state detecting means for detecting satisfaction of a set of conditions defining a stop state for the vehicle, said conditions including a vehicle speed of substantially zero, a released accelerator pedal and a depressed brake pedal;

release means for bringing the clutch into a substantially released state by lowering the oil pressure feed to the hydraulic servo responsive to detection of the vehicular stop state;

application means for applying the clutch, responsive to detection that the vehicular stop state conditions are not satisfied, while in said substantially released state; and

engagement start detecting means for detecting whether or not the engagement of the clutch has started, and

5,772,555

DRIVING FORCE CONTROL SYSTEM FOR A VEHICLE  
Toshimichi Minowa, Ibaraki-ken; Hiroshi Kimura; Junich Ishii, both of Katsuta; Takashi Shiraishi, Ibaraki-ken, and Naoyuki Ozaki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

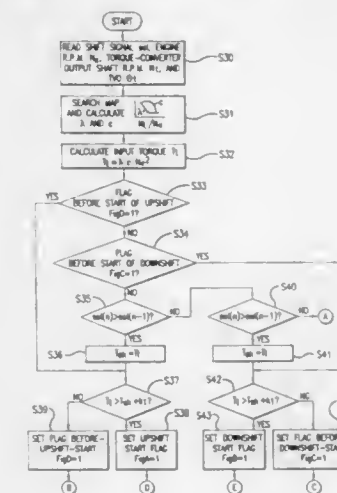
Continuation of Ser. No. 661,558, Jun. 11, 1996, which is a continuation of Ser. No. 120,552, Sep. 14, 1993, abandoned, and Ser. No. 470,450, Jun. 6, 1995, Pat. No. 5,573,476. This application Dec. 3, 1996, Ser. No. 760,146

Claims priority, application Japan, Sep. 16, 1992, 4-246720; Nov. 17, 1992, 4-307169

Int. Cl.<sup>6</sup> B60K 41/04; F16H 61/26

U.S. Cl. 477—109

6 Claims



wherein said application means raises the oil pressure fed to the hydraulic servo, according to a first mode, responsive to detection that the vehicular stop state conditions are not satisfied, with both the brake pedal and the accelerator pedal released, and according to a second mode, in which the rate of increase in the oil pressure is higher than that of the first mode, responsive to detection that the vehicular stop state conditions are not satisfied, with the accelerator pedal depressed, and according to the second mode in preference to the first mode, responsive to detection, while the vehicular stop state conditions are not satisfied with both the brake pedal and the accelerator pedal released, that the accelerator pedal has been depressed while the engagement of the clutch has not started.

5,772,554

APPARATUS FOR CONTROLLING VEHICLE ENGINE-BRAKING FORCE UPON SHIFT-DOWN ACTION OF AUTOMATIC TRANSMISSION

Atsushi Tabata, Okazaki, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

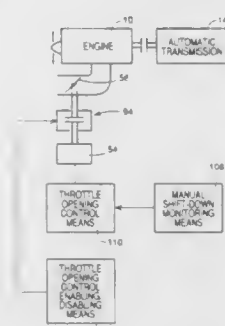
Filed Sep. 26, 1996, Ser. No. 721,378

Claims priority, application Japan, Sep. 29, 1995, 7-253057

Int. Cl.<sup>6</sup> B60K 41/06

U.S. Cl. 477—109

22 Claims



1. An apparatus for controlling an engine-braking force to be applied to a motor vehicle having an engine with a throttle valve, and a automatic transmission, said apparatus comprising:

a throttle valve drive device for operating said throttle valve to change an amount of opening of the throttle valve according to a drive signal;

throttle opening control means, operable upon a manual shift-down action of said automatic transmission as a result of operation of an operator's controlled member, for increasing the amount of opening of said throttle valve to temporarily increase a speed of said engine to a level which is expected to be established after said manual shift-down action, so as to assure smooth application of engine braking to the motor vehicle; and

throttle opening control enabling/disabling means for inhibiting an operation of said throttle opening control means when a degree of opening of said throttle valve exceeds a predetermined value at a predetermined time after a selected moment of said manual shift-down action of said automatic transmission, the manual shift-down action being a result of operation of the operator's controlled member.

1. A transmission shock reduction system for reducing transmission shock at a time of transmission shifting for a vehicle having an engine with an output shaft, a torque converter connected to said output shaft of the engine and having a torque converter output shaft, a stepped automatic transmission mechanism connected to said torque converter output shaft, said stepped automatic transmission mechanism having an automatic transmission output shaft and a clutch for engaging and disengaging a plurality of gear shafts and input/output shafts to change a shift change ratio, a hydraulic circuit having line pressure control means, for changing a line pressure to operate said clutch and a driving axle connected to said automatic transmission output shaft, said transmission shock reduction system comprising:

shift signal output means for delivering a shift signal which indicates a shift change ratio of said stepped automatic transmission mechanism; and

line pressure calculation means for calculating a target line pressure under shifting of said stepped automatic transmission mechanism such that a difference in magnitude of torque of said driving axle as between before shifting and under shifting is reduced, to control said line pressure control means so that said line pressure of said hydraulic circuit is set to said target line pressure.

5,772,556

PROCESS FOR THE CYCLIC ADAPTATION OF A CHARACTERISTIC FOR GEAR-CHANGING IN AN AUTOMATIC GEARBOX OF A MOTOR VEHICLE

Friedo Tinschert, Ludwigsburg, and Rainer Wuest, Stuttgart, both of Germany, assignors to Mercedes-Benz AG, Germany

Filed Apr. 1, 1996, Ser. No. 625,139

Claims priority, application Germany, Mar. 31, 1995, 195 11 866.9

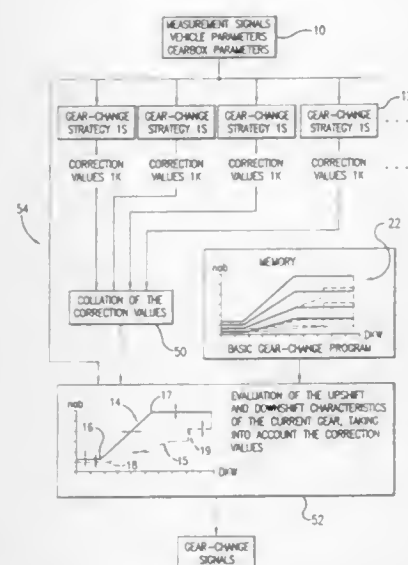
Int. Cl.<sup>6</sup> F16H 61/02

U.S. Cl. 477—110

13 Claims

1. A process for controlling gear shifting in a motor vehicle by cyclic adaptation of a gear change characteristic in an automatic gearbox thereof, the process comprising the steps of:





providing a characteristic map in which a parameter dependent on a travel speed of the vehicle is plotted against a parameter associated with an engine torque, and which contains a characteristic that has gear change points designated by coordinate values in said map;

adapting said characteristic to a change in influencing variables as a function of correction values, by means of a gear-change strategy which determines the correction values by evaluating measured actual values of the influencing variables, using an algorithm which correlates vehicle-specific and driving-state-specific ones of said influencing variables, in successive computational cycles; and

controlling gear changing in said vehicle as a function of the adapted characteristic;

wherein said correction values are established for each of two coordinate values of selected gear-change points of said characteristic; and

wherein a common correction value is determined for selected adjacent gear-change points, said common correction value serving to adapt the coordinate values of said selected adjacent gear change points, for the parameter associated with the engine torque.

5,772,557

**CONTROL SYSTEM FOR AUTOMATIC TRANSMISSION**  
Masayuki Tasaka, Osaka; Kenji Suzuki, Okazaki; Yoshihiro Yamada, Anjo; Shinichi Matsui, Nagoya, and Tatsuyuki Yoneda, Toyota, all of Japan, assignors to Aisin AW Co., Ltd., Anjo, Japan

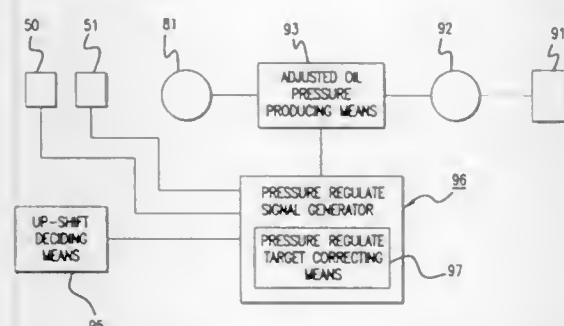
Filed Dec. 24, 1996, Ser. No. 780,156

Claims priority, application Japan, Dec. 28, 1995, 7-342987

Int. Cl.<sup>6</sup> F16H 61/06

U.S. Cl. 477-162

8 Claims



1. A control system for an automatic transmission, comprising:  
a frictional engagement element;

adjusted oil pressure producing means for adjusting an oil pressure supplied from an oil pressure source to produce an adjusted oil pressure;

a hydraulic servo for applying/releasing the frictional engagement element on the basis of the adjusted oil pressure;

engine load detecting means for detecting an engine load;

vehicle speed detecting means for detecting a vehicle speed;

up-shift determining means for determining whether an up-shift has been executed; and

pressure regulate signal generating means for calculating the regulated target pressure of the adjusted oil pressure, when the up-shift is executed, to generate and output a pressure regulate signal matching the regulated target pressure to the adjusted oil pressure producing means.

wherein the adjusted pressure signal producing means includes regulated target pressure correcting means for correcting the regulated target pressure on the basis of the difference between a present vehicle speed and a vehicle speed at a shift point when the shift is executed under the engine load.

5,772,558

**STATIONARY EXERCISE APPARATUS**

Robert E. Rodgers, Jr., Houston, Tex., assignor to CCS, LLC, Broomfield, Colo.

Continuation of Ser. No. 426,467, Apr. 19, 1995, Pat. No. 5,549,526, which is a continuation-in-part of Ser. No. 377,846,

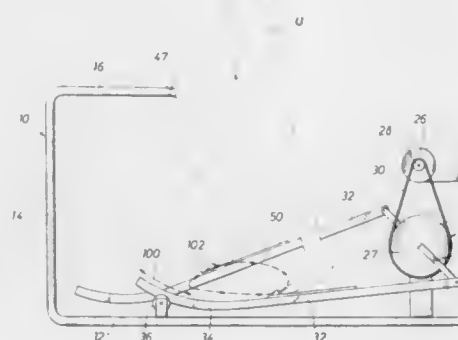
Jan. 25, 1995, Pat. No. 5,518,473. This application Jun. 18,

1996, Ser. No. 665,399

Int. Cl.<sup>6</sup> A63B 69/16; 22/04

U.S. Cl. 482-51

8 Claims



1. An apparatus for exercising comprising:

a frame having a base portion adapted to be supported by a floor; first and second reciprocating members, each reciprocating member having a first end and a second end, said first ends of said first and second reciprocating members having a camming portion including a curved profile portion and adapted to engage said base portion at said curved profile portion;

a coupling member having (i) a pulley supported by said frame defining a pivot axis, and (ii) means for attaching said second ends of said first and second reciprocating members to said pulley so that rotation of said pulley results in the rotation of said second ends of said first and second reciprocating members in a substantially circular path about said pivot axis; and means operatively associated with said reciprocating members for supporting the bottom of the foot of the user of the apparatus so that during operation of the apparatus each foot of the user follows a predetermined closed path having a preferred anatomical pattern.

5,772,559

**MODULAR AEROBIC-EXERCISE STEPPER**

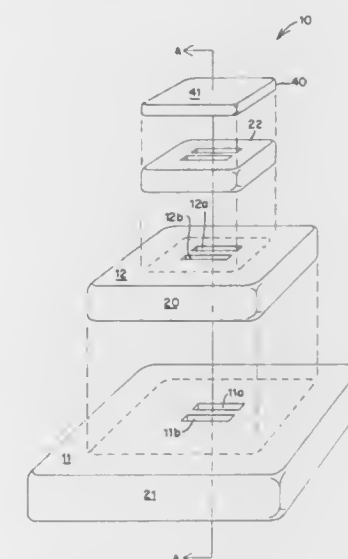
Deborah Sithole, 241-20 Northern Blvd., Apt. C, Douglaston, N.Y. 11362

Filed May 21, 1996, Ser. No. 651,917

Int. Cl.<sup>6</sup> A63B 5/00

U.S. Cl. 482-52

5 Claims



1. A modular stepper, comprising:

a) an upper platform having length and width dimensions; and  
b) a base having length and width dimensions greater than said length and width dimensions of said upper platform, such that when said upper platform is centrally located upon a top surface of said base, a portion of said top surface of said base surrounding said upper platform is exposed sufficient to permit a user to step on said portion from all directions surrounding said stepper, said base including two base slots located on said top surface of said base, and said upper platform including two upper ridges located on a platform bottom surface of said upper platform and two upper slots located on a platform top surface of said upper platform, where said base slots and said upper ridges are arranged to interlock and substantially secure said upper platform to said base, wherein a platform top surface of said upper platform, said top surface of said base, an upper underside surface of said upper platform and a lower underside surface of said base, are all covered with a non-slip rubber material.

5,772,560

**REORIENTING TREADMILL WITH LIFT ASSISTANCE**

Scott R. Watterson; William T. Dalebout, both of Logan, and Timothy O. Armstrong, Providence, all of Utah, assignors to ICON Health & Fitness, Inc., Logan, Utah

Filed Jan. 30, 1996, Ser. No. 593,802

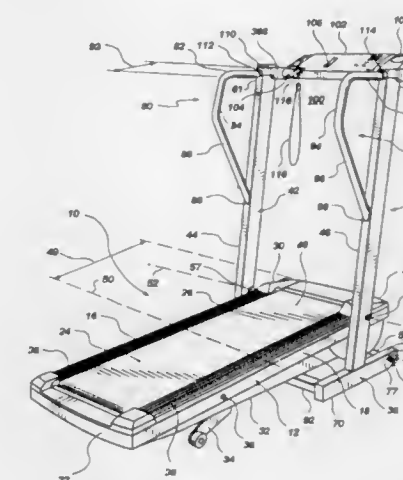
Int. Cl.<sup>6</sup> A63B 22/02

U.S. Cl. 482-54

13 Claims

1. A treadmill comprising:

support structure having feet means for positioning on a support surface and having upright structure extending upwardly from said feet means;  
a tread base having a frame that includes a front, a rear, a left side, a right side and an endless belt positioned between said left side and said right side, said frame being connected to said support structure spaced from said front toward said rear to be movable between a first position in which said endless belt is positioned for operation by a user positioned thereon and a second position in which said rear of said frame is positioned toward said support structure; and



lift means interconnected between said support structure and said tread base to urge said tread base from said first position to said second position.

5,772,561

**DUMBBELL SUPPORT ATTACHMENT FOR WEIGHT LIFTING BENCH**

Richard C. Hayden, 1576 Heatherwood Dr., Decatur, Ga. 30033

Continuation-in-part of Ser. No. 385,773, Feb. 9, 1995, Pat.

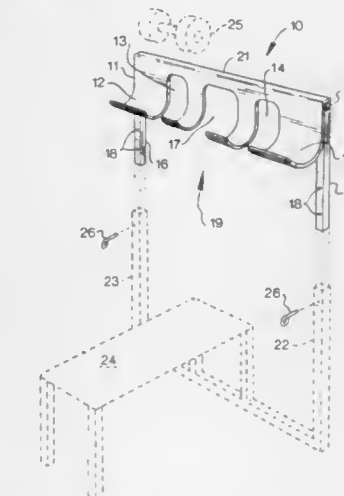
No. 5,616,108. This application Mar. 31, 1997, Ser. No.

829,331

Int. Cl.<sup>6</sup> A63B 13/00

U.S. Cl. 482-104

7 Claims



1. A support for a dumbbell having a pair of weights spaced apart from each other and mounted on a cross bar, the support being adapted for use with a weight lifting bench having two vertically-disposed tubular members between which the bench is disposed, comprising:

(a) a horizontal support bar;  
(b) means, rigidly attachable to the two tubular members, for mounting the horizontal support bar thereon; and  
(c) an elongated structure which has first and second portions, the first portion being rigidly attached to the horizontal support bar; the second portion, in transverse cross-section, being disposed along a generally semicircular curve, the structure defining at least three branches which are spaced apart longitudinally from each other, the branches in each contiguous pair of branches being separated from each other by a distance which is shorter than the cross bar of the dumbbell in length, each branch forming an upwardly concave surface when the

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first portion extends downwardly from the horizontal support bar, so that the weights of the dumbbell can rest on each contiguous pair of branches.

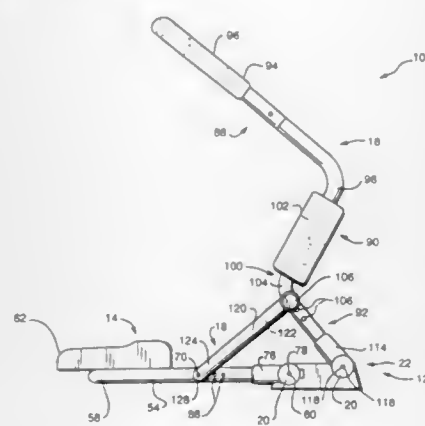
### 5,772,562 ABDOMINAL EXERCISE APPARATUS

Clive Graham Stevens, 372 Hills Borough Road, Auckland, New Zealand

Filed May 28, 1996, Ser. No. 653,796  
Int. Cl.<sup>6</sup> A63B 23/02

U.S. Cl. 482-140

19 Claims



8. An exercise apparatus, said apparatus comprising:
- (a) a base means, said base means configured to be directly supported on a support surface, said base means having a first end and a second end;
- (b) a U-shaped member, said U-shaped member having a first end and a second end, said first end of said U-shaped member being pivotally connected to said first end of said base means at a first location, said second end of said U-shaped member being pivotally connected to said second end of said base means at a second location;
- (c) a U-shaped handle means, said U-shaped handle means having a first end and a second end, said first end of said U-shaped handle means being pivotally connected to said first end of said base means at a third location which is spaced from said first location, said second end of said U-shaped handle means being pivotally connected to said second end of said base means at a fourth location which is spaced from said second location; and
- (d) a linking member means, said linking member means having a first end and a second end, said first end being operatively connected to said U-shaped member for pivoting movement relative thereto, said second end being operatively connected to said U-shaped handle means for pivoting movement relative thereto, said linking means holding said U-shaped handle means at an angular position relative to said U-shaped member, said interconnected U-shaped handle means and said U-shaped member means move relative to said base means during use of the exercise apparatus.

5,772,563

### MULTIPURPOSE EXERCISER

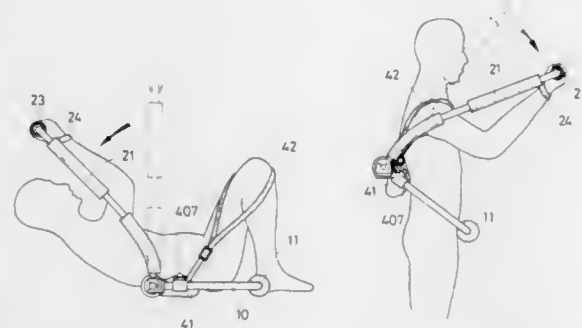
I-Shun Lin, No. 4, Lane 39, Sec. 2, Chang An Rd., Lu Chu Hsiang, Tao Yuan Hsien, Taiwan

Filed Apr. 18, 1997, Ser. No. 844,334  
Int. Cl.<sup>6</sup> A63B 23/02

U.S. Cl. 482-140

3 Claims

1. A multipurpose exerciser, comprising:
- a n-shaped secondary frame having a pair of opposing ends, said secondary frame having a multiplicity of adjustment holes formed adjacent each of said pair of opposing ends;



- a n-shaped primary frame having a pair of opposing ends pivotally connected to respective opposing ends of said secondary frame, said primary frame having a pair of side sections wrapped with a layer of foam rubber and a handle portion extending between said pair of side sections with a layer of foam rubber wrapped thereon, each of said side sections having an upper section and a lower section interconnected by a spring disposed therebetween;
- a pair of hand loops disposed on said handle portion of said primary frame adjacent opposing ends thereof;
- a crossbar slidably coupled to said secondary frame adjacent said pair of opposing ends thereof, said crossbar including a pair of hollow connecting members respectively coupled to opposing ends thereof, each of said pair of hollow connecting members having (a) a first bore formed therethrough for receiving said secondary frame therein, (b) a receiving cylinder extending from an outer surface thereof and having a second bore formed therethrough and in open communication with said first bore, (c) a bolt disposed in said second bore and having a distal end releasably engageable with a selected one of said multiplicity of adjustment holes, (d) a spring disposed on said bolt for applying a bias force thereto, (e) a fixing nut threadedly coupled to said receiving cylinder and having an aperture formed therethrough for passage of a proximal end of said bolt therethrough, and (f) an adjustment knob threadedly engaged with said proximal end of said bolt; and
- a pair loop-shaped straps coupled to said crossbar adjacent opposing ends thereof.

5,772,564

### MAGNETIC BEARING SPINDLE DEVICE FOR MACHINE TOOLS

Manabu Taniguchi, Kashihara, and Hirochika Ueyama, Hirakata, both of Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed Jul. 15, 1997, Ser. No. 893,159

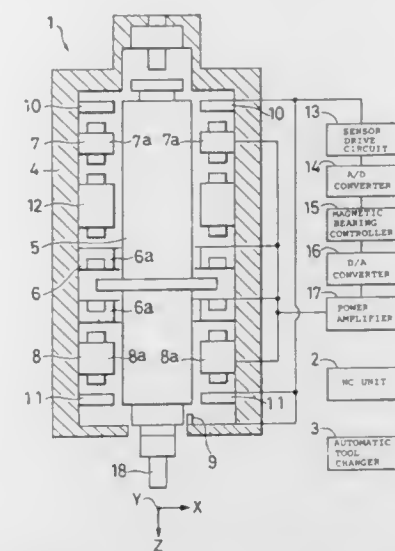
Claims priority, application Japan, Jul. 16, 1996, 8-185876

Int. Cl.<sup>6</sup> B23Q 3/157; B23C 9/00; F16C 23/00

U.S. Cl. 483-7

3 Claims

1. A magnetic spindle device for machine tools wherein a spindle for mounting a tool element thereon is contactlessly supported by a plurality of controllable magnetic bearings, the tool element mounted on the spindle being automatically changeable for a tool element of different kind, the spindle device being characterized in that the device comprises means for measuring the weight of the tool element by measuring the exciting currents of



5,772,565

### HEAT SEALER

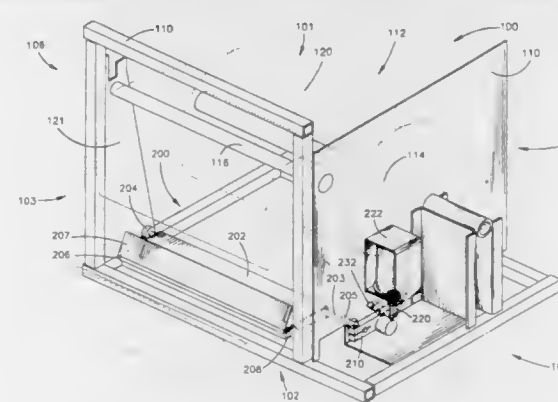
Ronald R. Weyandt, Chesterland, Ohio, assignor to Automated Packaging Systems, Inc., Streetsboro, Ohio

Filed Aug. 30, 1995, Ser. No. 521,211

Int. Cl.<sup>6</sup> B31B 49/00; 23/60

U.S. Cl. 493-8

22 Claims



1. A method for forming a seal between at least two layers of material, the method comprising the steps of:
- (a) actuating a seal assembly to move with a relatively low force from a spaced position toward a seal position to seal the at least two layers of material, wherein the actuating step (a) includes the step of applying a first electrical signal to a solenoid operatively coupled to the seal assembly;
- (b) sensing when the seal assembly has reached a seal-ready position;
- (c) actuating, in response to the sensing step (b), the seal assembly to move to the seal position with a seal force greater than the low force, wherein the actuating step (c) includes the step of applying to the solenoid a second electrical signal different from the first electrical signal; and
- (d) sealing the at least two layers of material when the seal assembly is in the seal position.
7. An apparatus for moving a seal assembly from a spaced position to a seal position, the seal assembly including relatively moveable components, the apparatus comprising:
- (a) a solenoid operatively interposed between the components for relatively moving the components from the spaced position to the seal position;

- (b) a sensor for generating a sensor signal when the components have reached a seal-ready position; and
- (c) circuitry coupled to the solenoid and to the sensor, the circuitry responsive to a switch for applying a first electrical signal to the solenoid to move the components with a relatively low force toward the seal position, the circuitry being responsive to the sensor signal for applying to the solenoid a second electrical signal different from the first electrical signal to move the components, when in the seal-ready position, with a seal force greater than the low force to the seal position.

5,772,566

### MACHINE TOOL

Anton Richard Schweizer, Wurmelingen, and Rudolf Haninger, Seitingen-Oberflacht, both of Germany, assignors to Chiron-Werke GmbH & Co. KG, Tuttlingen, Germany

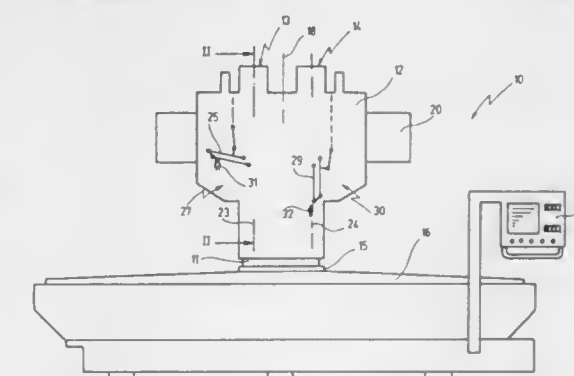
Filed Aug. 26, 1996, Ser. No. 702,921

Claims priority, application Germany, Sep. 2, 1995, 195 32 399.8; Oct. 5, 1995, 195 37 071.6

Int. Cl.<sup>6</sup> B23Q 3/157

U.S. Cl. 483-47

9 Claims



1. Machine tool, comprising:
- at least one spindle having a spindle axis,
- a facing head fitted to said spindle, said facing head comprising means for displacing a tool inserted into said facing head in a direction perpendicular to said spindle axis,
- means for numerically controlling said displacing means, and
- a tool changer arranged for inserting tools into said facing head and for exchanging said tools at said facing head, said tool being connected to a tool holder,
- said tool changer comprises a gripper arm having a gripper arranged at its free end, said gripper positively enclosing a tool holder,
- wherein first snap means for snap-locking said tool holder in the axial direction and second snap means for snap-locking said tool holder in the circumferential direction are associated with the gripper, the first and second snap means being separately actuatable.

5,772,567

### COMPOSITE FURNACE ROLLS

Jorge A. Morando, Grosse Ile, Mich., assignor to Alphatech, Inc., Cadiz, Ky.

Continuation-in-part of Ser. No. 287,647, Aug. 9, 1994, abandoned, Ser. No. 383,578, Feb. 3, 1995, Pat. No. 5,615,482, and Ser. No. 540,880, Oct. 11, 1995. This application May 28, 1996, Ser. No. 653,867

Int. Cl.<sup>6</sup> B23P 15/00

U.S. Cl. 492-54

8 Claims

1. A roll for transferring a flat heated strip of a first steel alloy from an annealing furnace, comprising:
- an elongated tubular body (118) having a longitudinal axis, said tubular body being formed of a second steel alloy having a





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5,772,572

## LABORATORY CENTRIFUGE HAVING A CASING COVER AND ROTOR CHAMBER ADAPTED TO EXHAUST CIRCULATED AIR

Michael Koch, Osterode; Detlev Demmig, Seesen; Rüdiger Uhlendorf, Löwenhagen, and Sebastian Reich, Hattorf, all of Germany, assignors to Heraeus Instruments GmbH & Co. KG, Hanau, Germany

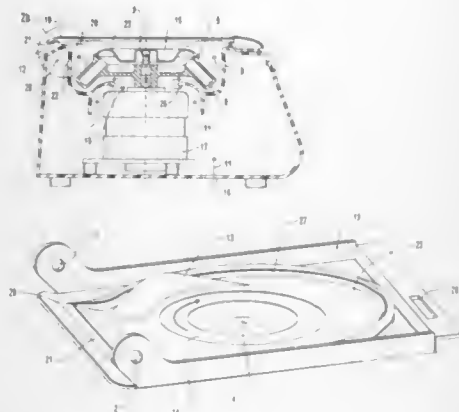
Filed Apr. 21, 1997, Ser. No. 843,749

Claims priority, application Germany, Apr. 22, 1996, 196 15 702.1

Int. Cl.<sup>6</sup> B04B 15/02; 5/02; 7/02

U.S. Cl. 494—14

6 Claims



1. A laboratory centrifuge comprising a housing which contains a motor for driving a vertical-axis rotor adapted to accept test tubes therein, said vertical-axis rotor positioned in a rotor chamber within said housing above said motor, and a casing cover attached to said housing for closing over said rotor chamber which laboratory centrifuge, during operation, has cooling air flowing from the lower side of the housing up to the rotor in the rotor chamber and out of the rotor chamber through an air exit in a direction of flow tangential to the perimeter of the rotor, said air exit communicating with air outside of said housing and comprising at least one slit-like air exit opening formed between the casing cover and the housing, wherein a displacement body forming a part of a molded article secured to the inside surface of the casing cover projects into an annular gap between the rotor and the rotor chamber such that air flowing past said displacement body is displaced away from said inside surface of said casing cover, said displacement body having an aerodynamic shape to minimize turbulence within said air flowing past said displacement body and wherein said slit-like air exit opening has a cross section narrowing in the direction of air flow out of said rotor chamber at a position between said molded article and a top edge of the rotor chamber.

5,772,573

## DECANTER CENTRIFUGE AND GEAR BOX WITH HARMONIC DRIVE AND ASSOCIATED OPERATING METHOD

Chi-Chung Hao, Orange, Conn., assignor to Baker Hughes Incorporated, Houston, Tex.

Filed Feb. 26, 1996, Ser. No. 607,319

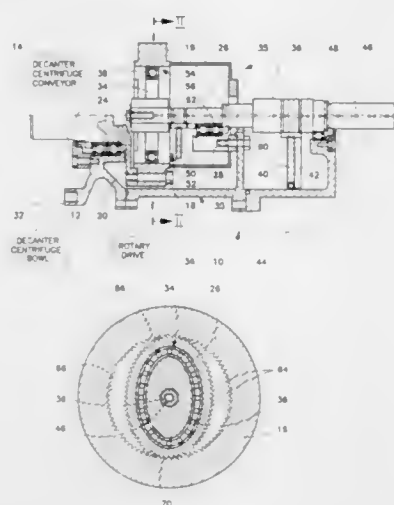
Int. Cl.<sup>6</sup> B04B 1/20; 9/08; 15/00

U.S. Cl. 494—15

20 Claims

14. A method for operating a decanter centrifuge assembly having a bowl and a screw conveyor disposed inside said bowl for rotation at a speed different from an angular velocity of said bowl, comprising:

rotating the bowl of the centrifuge assembly at a first predetermined angular velocity;  
transmitting rotary power from the bowl to a flexible spline of a harmonic drive unit via a transmission coupling extending to a first side of said harmonic drive unit, so that said flexible spline rotates about a rotation axis at said first predetermined angular velocity;



rotating a circular spline of said harmonic drive unit about said rotation axis at a second predetermined angular velocity differing incrementally from said first predetermined angular velocity;

distorting said flexible spline via a wave generator disposed in contact with said flexible spline, to place said flexible spline in contact with said circular spline and thereby enable a transmission of rotary power between said flexible spline and said circular spline; and

transmitting rotary force from said circular spline to the conveyor of the centrifuge assembly via a transmission coupling extending to a second side of said harmonic drive unit opposite said first side, to rotate said conveyor at said second predetermined angular velocity.

5,772,574

## DEVICE FOR MEDICAL RADIATION THERAPY

Norbert Nanko, Freiburg, Germany, assignor to B.V. Optische Industrie "De Oude Delft", Delft, Netherlands

PCT No. PCT/EP94/04106, § 371 Date Aug. 29, 1996, § 102(e)

Date Aug. 29, 1996, PCT Pub. No. WO95/16489, PCT Pub.

Date Jun. 22, 1995

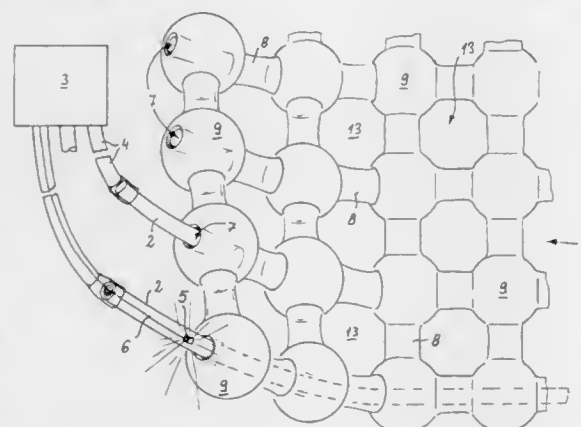
PCT Filed Dec. 9, 1994, Ser. No. 663,214

Claims priority, application Germany, Dec. 14, 1993, 43 42 589.5

Int. Cl.<sup>6</sup> A61N 5/00

U.S. Cl. 600—1

28 Claims



1. A device for medical radiation therapy, comprising a deformable carrier mat (1, 1a) for application in a treatment area of a patient, in which mat an essentially point-shaped radiation source (5) is displaceable and positionable, the carrier mat (1, 1a) having prefabricated mounting channels (7, 7a, 7b, 7c) running within a plane of the mat to accommodate guide sleeves (2) for the radiation source, the carrier mat comprising a one-piece autoclavable

5,772,575

## IMPLANTABLE HEARING AID

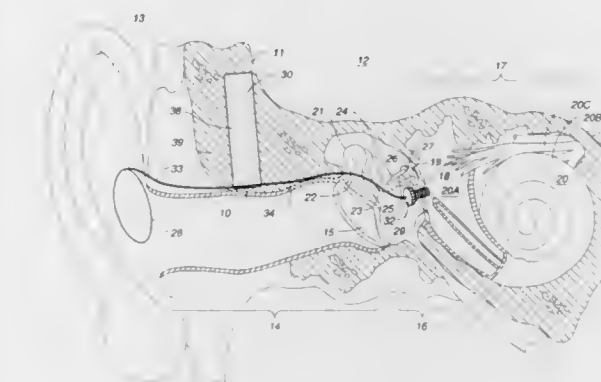
S. George Lesinski, 629 Oak St., Suite 201, Cincinnati, Ohio 45206, and Armand P. Neukermans, 3510 Arbutus Ave., Palo Alto, Calif. 94303, assignors to S. George Lesinski, Cincinnati, Ohio, and Armand P. Neukermans, Palo Alto, Calif.

Filed Sep. 22, 1995, Ser. No. 532,398

Int. Cl.<sup>6</sup> H04R 25/00

U.S. Cl. 600—25

57 Claims



1. A hearing aid adapted for implantation into a subject having both a fluid-filled inner ear, and a middle ear that has an ear drum located distal from the inner ear, said hearing aid comprising:

a microphone adapted for subcutaneous implantation in the subject and for generating an electric signal in response to impingement of sound waves upon the subject;

signal processing means adapted for receiving the electric signal from the microphone, and for processing and re-transmitting a processed electric signal, said signal processing means also being adapted for implantation in the subject;

a battery for supplying electrical power to said signal processing means, said battery also being adapted for implantation in the subject; and

a microactuator adapted for implantation in the subject in a location which disposes a transducer included in said microactuator intermediate the fluid filled inner ear and the ear drum, the transducer creating mechanical vibrations in the fluid within the inner ear of the subject in response to receiving the processed electric signal from said signal processing means, the vibrations in the fluid present in the inner ear being proportional to displacing, in response to a sinusoidal processed electric signal at a frequency of 1000 Hz, at least  $1.0 \times 10^{-4}$  microliters of the fluid for an electrical power input to the microactuator of less than 50 microwatts, whereby upon implantation of the microactuator the hearing aid stimulates auditory nerve fibers which stimulation the subject perceives as sound.

5,772,576

## APPARATUS AND METHOD FOR VEIN REMOVAL

David R. Knighton, Minneapolis, and Vance D. Fiegel, New Brighton, both of Minn., assignors to Embro Vascular L.L.C., St. Louis Park, Minn.

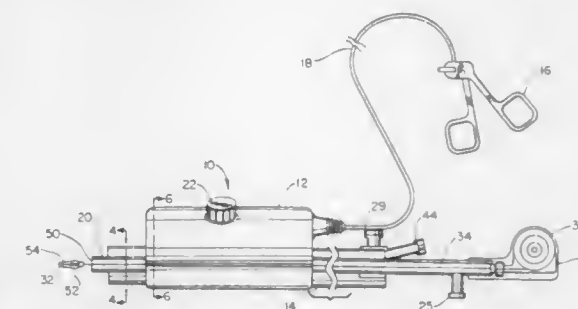
Filed Dec. 11, 1995, Ser. No. 570,229

Int. Cl.<sup>6</sup> A61F 2/04

U.S. Cl. 600—36

96 Claims

1. A device for removing a generally cylindrical tissue structure from a human or animal body, comprising:



an elongated body portion having a distal end and a proximal end, the body portion having at least one lumen extending longitudinally therethrough, the at least one lumen being sized to accommodate the tissue structure and at least one tool used in removing the tissue structure; and

a generally cylindrical tissue structure dissection element sized to fit within the at least one lumen, the dissection element having a lumen sized to accommodate the tissue structure and to isolate the tissue structure from the at least one tool along a substantial portion of the at least one lumen of the body portion.

5,772,577

Patent Not Issued For This Number

5,772,578

## ENDOSCOPIC INSTRUMENT

Rudolf Heimberger, Oberderdingen; Helmut Hecke, Knittlingen; Uwe Schaumann, Villingen-Schwenningen, and Ralf Burkhardt, Sulzfeld, all of Germany, assignors to Richard Wolf GmbH, Knittlingen, Germany

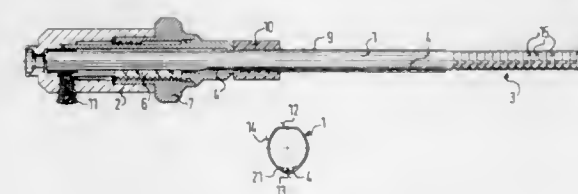
Filed Sep. 16, 1996, Ser. No. 714,739

Claims priority, application Germany, Sep. 14, 1995, 195 34 112.0

Int. Cl.<sup>6</sup> A61B 1/00

U.S. Cl. 600—139

14 Claims



1. A bendable endoscopic instrument comprising:

a shank (1) having a bendable region (3) with transverse recesses (15) dividing said bendable region into segments (16), said transverse recesses extending over a circumferential angle of more than 270° and less than 360°, and comprising a tension means (4) longitudinally running across the recesses (15) for controlling bending from a proximal end;

the shank (1), at least at said bendable region (3), comprising a cross-section which is flattened at one side, and the shank (1) providing a link function at the flattened region (12);



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tension means (4) being arranged in guides (21) on a side region (13) of the shank lying opposite the flattened region (12), said guides being adapted to the inner contour of the shank (1) in the side region (13), each guide spanning a neighboring transverse recess (15) and being firmly attached to a segment (16) at one side of the spanned recess (15).

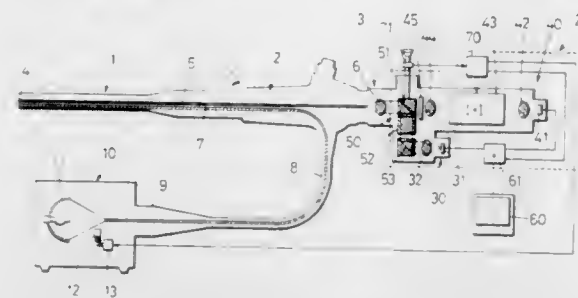
5,772,579

Patent Not Issued For This Number

5,772,580  
**BIOLOGICAL FLUORESCENCE DIAGNOSTIC APPARATUS WITH DISTINCT PICKUP CAMERAS**  
Tetsuya Utsui, Hiroshi Sano, and Rensuke Adachi, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1996, Ser. No. 607,361  
Claims priority, application Japan, Mar. 3, 1995, 7-043782;  
Oct. 6, 1995, 7-259948; Oct. 31, 1995, 7-282905

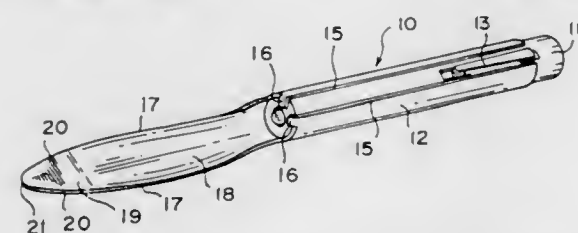
Int. Cl.<sup>6</sup> A61B 1/04  
U.S. Cl. 600—160 17 Claims



1. A biological fluorescence diagnostic apparatus having a system that irradiates biological tissue with illuminating light from a light source having a wavelength range within which the biological tissue generates fluorescent light upon light irradiation and that transmits an image through an ocular optical system provided in an eyepiece of an endoscope, said apparatus comprising:

- a television camera unit including an ordinary image pickup television camera for taking an ordinary endoscopic observation image passing through the ocular optical system of the endoscope, and a fluorescence image pickup television camera with an image intensifier for taking a fluorescence observation image passing through the ocular optical system of the endoscope after amplifying a light intensity of said fluorescence observation image, said ordinary image pickup television camera and said fluorescence image pickup television camera being distinct and being integrally mountable to the eyepiece of the endoscope;
- a path switching optical system including a reflecting surface, said path switching optical system mounted to be selectively inserted into and withdrawn from an optical path of light passing through the ocular optical system;
- a filter selectively insertable into and movable out of an illuminating light path of the endoscope, said filter transmitting light having a wavelength range within which the biological tissue generates fluorescent light;
- a control unit;
- a detector that detects a position of said path switching optical system, said control unit controlling said image intensifier and said filter in response to an output of said detector; and
- a system that operatively connects said television camera unit to the eyepiece of the endoscope.

5,772,581  
**PENLIGHT LARYNGOSCOPE**  
James F. Gaines, 25339 Rainbow La., Chantilly, Va. 20152  
Filed Apr. 22, 1997, Ser. No. 837,210  
Int. Cl.<sup>6</sup> A61B 1/06  
U.S. Cl. 600—190 8 Claims



1. An in-line unitary illuminated laryngoscope and examining instrument comprising:

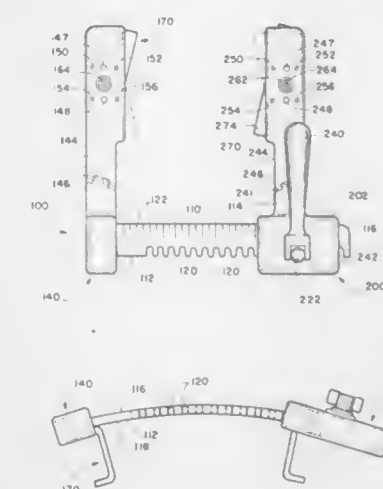
an in-line unitary examining instrument and removable lighting means;

said in-line unitary examining instrument including a first generally cylindrical barrel portion having a first open end and a second oppositely disposed end with stop means thereon and a centrally located slot extending the full length of said first generally cylindrical barrel portion for receiving and retaining said removable lighting means;

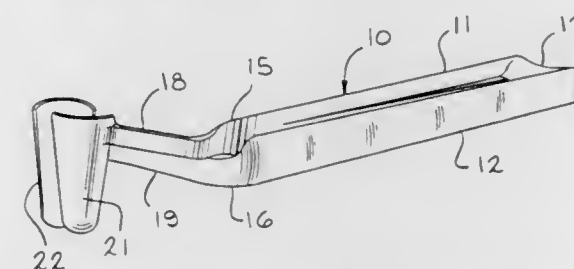
a second arcuate blade portion extending forward from said second end of said first generally cylindrical barrel portion and having a slight concave curvature facing upwardly along its upper surface; and

a third flat portion integral with and extending forward from said second arcuate blade portion a short distance forming the terminal end thereof with each of said first, second and third portions in axial alignment and having a common longitudinal axis;

whereby said illuminated laryngoscope can be manipulated by one hand of the user to depress a tongue, expand cheeks, and displace an epiglottis while illuminating the oral cavity and directing light to the larynx while performing an examination or manipulation.



5,772,582  
**NASAL SPECULUM**  
James J. Huttner, and David I. Kinsel, both of Sylvania, Ohio, assignors to Bionix Development Corp., Toledo, Ohio  
Filed Apr. 8, 1997, Ser. No. 835,258  
Int. Cl.<sup>6</sup> A61B 1/32  
U.S. Cl. 600—219 13 Claims



1. A one-piece nasal speculum having a pair of arms, said arms having first and second ends, said arms connected at said first ends and crossing prior to said second ends, blades having smooth and matching conical work surfaces mounted on said second ends of said arms, said work surfaces having a generally conical appearance with a rounded bottom for insertion in a nasal passageway, wherein said arms are squeezed to move the blades to a desired open examining position and the spring tension of the one-piece nasal speculum urges said blades toward a closed position and a lock for releasably securing said blades in the open examining position.

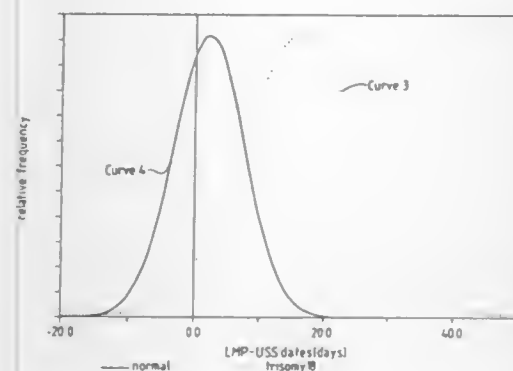
5,772,583  
**STERNAL RETRACTOR WITH ATTACHMENTS FOR MITRAL & TRICUSPID VALVE REPAIR**  
John T. M. Wright, 555 S. Downing St., Denver, Colo. 80209; Donald P. Elliott, 5401 E. Dakota Ave., #12, Denver, Colo. 80222, and Francis C. Wells, 40 West Street, Great Gransden, Sandy, Bedfordshire SG 193 AU, United Kingdom  
Continuation-in-part of Ser. No. 184,511, Jan. 21, 1994, abandoned. This application Dec. 29, 1995, Ser. No. 581,035  
Int. Cl.<sup>6</sup> A61B 1/30; B25G 3/36  
U.S. Cl. 600—232 15 Claims

1. A sternal retractor (100) comprising a curved rack (110) constructed to define along, at least a portion of the length thereof a plurality of teeth and having a first end and a second end, a first arm (140) attached adjacent the first end, a second arm (200) mounted for movement along the length of the rack between the

first and second ends, the first arm (140) comprising a mount (141) which has a rectangular passage (142) formed there through to accept the rack (110), a first articulated arm (144) pivotally secured to the mount (141), the second arm (200) comprising a mounting body (202) through which is formed a passage (204) having a generally rectangular cross-section to receive the rack, the passage being sufficiently larger than the rack to permit the body to slide along the rack, a cog mechanism (220) constructed and configured to force the second arm (200) to move along the rack upon operation of the cog mechanism, and only one, single first retractor blade (170) pivotally secured to the first arm for engagement with the sternum of the patient and only one single second retractor blade (270) pivotally secured to the second arm for engagement with the sternum of the patient, the blades and arms being so configured and constructed that, in use, the respective blade is the sole engagement with respective edges of the patient's sternum to be separated to pivotally align with said respective edges of the patient's sternum for applying opening force evenly along the respective blade only to that portion of the respective edges of the sternum engaged by the single blade, and wherein the rack has a length (L), a width (W) and a thickness (Th) and is curved in the thickness dimension of the rack to define a convex side (Cx) and a concave side (Cv) and is so constructed and configured that, in use, the concave side (Cv) lies on the patient's chest and the tangent (T) of the convex side (Cx) is perpendicular to the radius of curvature (R) of the rack, which radius approximates the curvature of the patient's chest, for thereby separating the opposed edges of the sternum along a curved path that lies in the plane defined by the radius (R) and perpendicular to the tangent (T).

5,772,584  
**METHOD AND APPARATUS FOR ANTENATAL SCREENING FOR CHROMOSOMAL ABNORMALITIES**  
Christopher John Davies, Caerphilly, United Kingdom, assignor to Johnson & Johnson Clinical Diagnostics, Inc., Rochester, N.Y.  
Division of Ser. No. 217,461, Mar. 24, 1994, abandoned. This application Aug. 7, 1995, Ser. No. 511,949  
Claims priority, application United Kingdom, Mar. 26, 1993, 9306354  
Int. Cl.<sup>6</sup> A61B 5/00 2 Claims

1. An apparatus comprising a means adapted for receiving measurements relating to a fetus carried by a pregnant woman connected by a communication channel to a computer means for comparing the measurements to reference data to determine fetal abnormalities wherein the measurements relate to the difference



between the gestational age of the woman as determined (a) by reference to the last menstrual period dates and (b) by a biometric measurement of the fetus.

5,772,585

**SYSTEM AND METHOD FOR MANAGING PATIENT MEDICAL RECORDS**

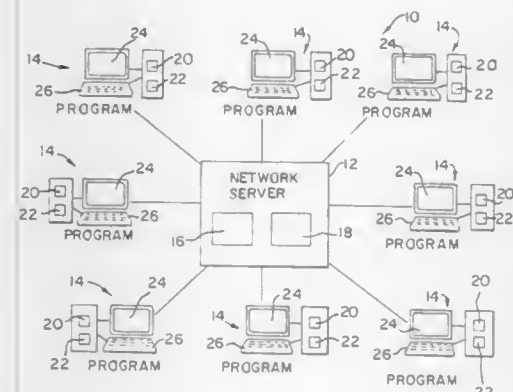
Marianne Lavin, Chicago, and Michael Nathan, Highland Park, both of Ill., assignors to EMC, Inc, Des Plaines, Ill.

Filed Aug. 30, 1996, Ser. No. 706,316

Int. Cl.<sup>6</sup> A61B 5/02; G06F 17/20; 17/28

U.S. Cl. 600—300

49 Claims



1. A computer aided method for creating, managing, updating, and analyzing patient information in a medical database to assist in the efficient operation of a medical clinic, the method comprising the steps of:

- scheduling patient appointments and storing the appointments in a relational database;
- compiling patient data, the data including at least one of medical history and demographic information, in the relational database;
- displaying patient data compiled in the database to a user;
- displaying an allergy warning to the user during a patient office visit;
- updating patient data with progress notes concurrently with an examination of the patient during the patient office visit wherein the user records the progress notes into the relational database; and
- recording a diagnosis based on the progress notes.

**5,772,586  
METHOD FOR MONITORING THE HEALTH OF A PATIENT**

Pekka Heinonen, and Harri Okkonen, both of Espoo, Finland, assignors to Nokia Mobile Phones, Ltd., Finland

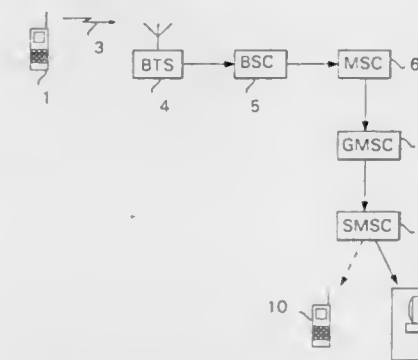
Filed Feb. 4, 1997, Ser. No. 795,389

Claims priority, application Finland, Feb. 12, 1996, 960636

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 600—300

7 Claims



1. A system for use in monitoring the health of a patient, the system comprising:

- a portable measuring device for carrying out a measurement to provide measurement results suitable for evaluating the patient's health;
- data processing system that maintains data corresponding to the measurement results;
- said measuring device comprising a measuring unit and a mobile phone having a battery space and using a wireless data transmission link, the mobile phone being connected to said measuring unit, wherein the measuring unit is located in the battery space of the mobile phone and is connected to a communication bus of the mobile phone, the measuring unit comprising means for supplying the measurement results to the mobile phone via the communication bus and further via a mobile communication network to the data processing system.

5,772,587

**PHOTOSENSOR WITH MULTIPLE LIGHT SOURCES**

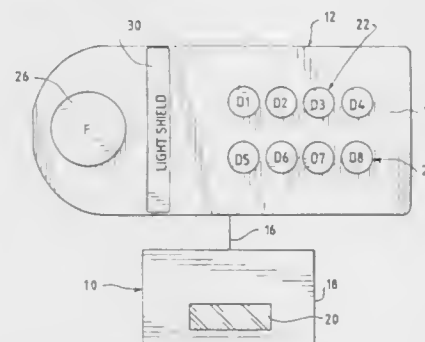
Enrico Gratton; Sergio Fantini; Maria Angela Franceschini, all of Urbana; William Mantulin, and Beniamino Barbieri, both of Champaign, all of Ill., assignors to The Board of Trustees of The University of Illinois, and I.S.S. (USA) Inc., both of Champaign, Ill.

Continuation-in-part of Ser. No. 168,813, Dec. 16, 1993, Pat. No. 5,497,769, and Ser. No. 253,935, Jun. 3, 1994, Pat. No. 5,492,118. This application Nov. 29, 1995, Ser. No. 564,439

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 600—310

21 Claims



1. The method of determining parameters of a highly scattering medium, which comprises:

5,772,589

**MEASUREMENT PROCESS FOR BLOOD GAS ANALYSIS SENSORS**

Peter Bernreuter, Unterleinsiedl 4, D-92289 Ursensollen, Germany

PCT No. PCT/EP95/03903, § 371 Date Nov. 19, 1996, § 102(e)

Date Nov. 19, 1996, PCT Pub. No. WO96/11623, PCT Pub.

Date Apr. 25, 1996

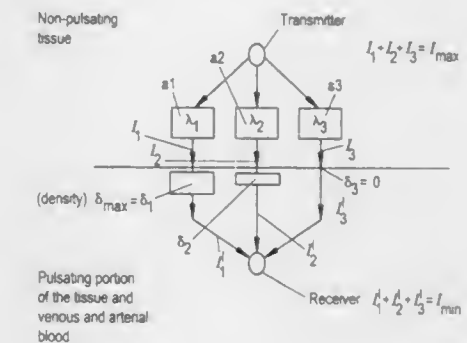
PCT Filed Oct. 3, 1995, Ser. No. 716,321

Claims priority, application Germany, Feb. 13, 1995, 195 158.1; Apr. 4, 1995, 195 12 478.2

Int. Cl.<sup>6</sup> A61N 5/00

U.S. Cl. 600—323

3 Claims



5,772,588

**APPARATUS AND METHOD FOR MEASURING A SCATTERING MEDIUM**

Mitsuharu Miwa, and Yutaka Tsuchiya, both of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Shizuoka-ken, Japan

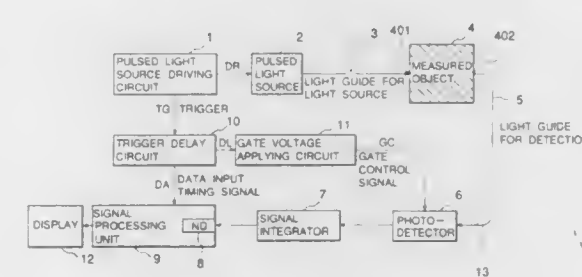
Filed Aug. 28, 1996, Ser. No. 704,124

Claims priority, application Japan, Aug. 29, 1995, 7-220493

Int. Cl.<sup>6</sup> A61B 3/00

U.S. Cl. 600—310

24 Claims



1. An apparatus for measuring a scattering medium containing a light absorbing substance, comprising:

- a light source for emitting light of a predetermined wavelength at a predetermined incident timing;
- a light guide for causing said light to be incident on said scattering medium;
- a photodetector, including a photomultiplier tube having a dynode, for detecting intensity of said light which has diffusely propagated through said scattering medium from an incident position to a detection position;
- a gate voltage applying circuit for applying gate voltage pulses to said dynode at a plurality of detection timings, periods between said incident timing and said detection timings being different from each other, in order to make said photodetector output light detection signals corresponding to intensity of said light during periods of application of said gate voltage pulses; and
- a signal processing unit for collecting said light detection signals to obtain signal intensities during the periods of application of said gate voltage pulses, and calculating internal information of said scattering medium based on said signal intensities thus obtained.

5,772,590

**CARDIOVASCULAR CATHETER WITH Laterally STABLE BASKET-SHAPED ELECTRODE ARRAY WITH PULLER WIRE**

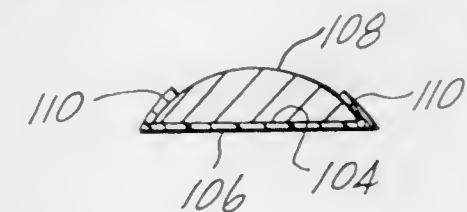
Wilton W. Webster, Jr., Altadena, Calif., assignor to Cordis Webster, Inc., Baldwin Park, Calif.

Continuation-in-part of Ser. No. 432,011, May 1, 1995, Pat. No. 5,628,313, which is a continuation-in-part of Ser. No. 906,546, Jun. 30, 1992, Pat. No. 5,411,025. This application Jun. 7, 1995, Ser. No. 486,395

Int. Cl.<sup>6</sup> A61B 5/0402

U.S. Cl. 600—374

33 Claims



1. A catheter for cardiac mapping comprising:



1. An osteoporosis apparatus for measuring ultrasonic characteristics of a patient's bone, the apparatus comprising:  
two ultrasonic transducers spacedly positioned in respective heads in the apparatus for ultrasonic transmission from one to the other;  
circuitry for controlling transmission from the one transducer, measuring the reception at the other and providing an output indicative of the ultrasonic characteristics(s); the apparatus including:  
two diaphragms positioned in the respective heads;  
structural spacing means that permits the diaphragms to be brought in contact with the patient's bone so that there is a fluid path from each transducer to its diaphragm and a gap between the diaphragms which is occupied in use by the patient's bone,  
wherein the diaphragms are connected by a fluid system which is adapted to be pressurised for adjustment of the diaphragms by inflation against the patient's bone.

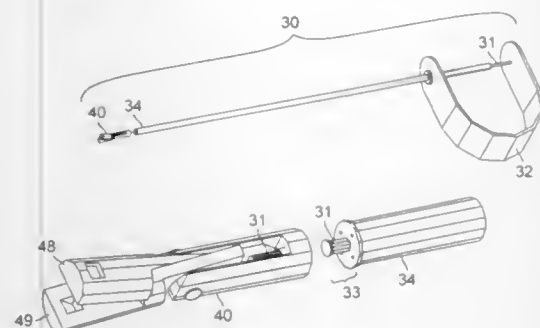
5,772,597

## SURGICAL TOOL END EFFECTOR

Daniel S. Goldberger, Boulder, Colo.; Robert S. Smith, Berkeley, and David A. Benaron, Redwood City, both of Calif., assignors to Sextant Medical Corporation, Boulder, Colo. Continuation-in-part of Ser. No. 944,516, Sep. 14, 1992, Pat. No. 5,460,182. This application May 9, 1995, Ser. No. 437,327 Int. Cl.<sup>6</sup> A61B 6/00

U.S. Cl. 600—473

16 Claims



1. A surgical tool end effector tip for characterizing tissue in vivo comprising:

- a body having a tissue presenting surface for monitoring a tissue to be characterized and a connecting surface for detachably interconnecting to a surgical-tool fitting in supporting engagement therewith;
- a first window at the body tissue presenting surface to launch an emission of electromagnetic radiation into the tissue to be characterized; and
- a second window at the body tissue presenting surface to couple to electromagnetic radiation transmitted through said tissue; wherein the tissue presenting surface further comprises an end effector structure.

5,772,598

## DEVICE FOR TRANSILLUMINATION

Horst Halling, Pier, Germany, assignor to Forschungszentrum Jülich GmbH, Jülich, Germany PCT No. PCT/DE94/01492, § 371 Date May 29, 1996, § 102(e) Date May 29, 1996, PCT Pub. No. WO95/16908, PCT Pub. Date Jun. 22, 1995

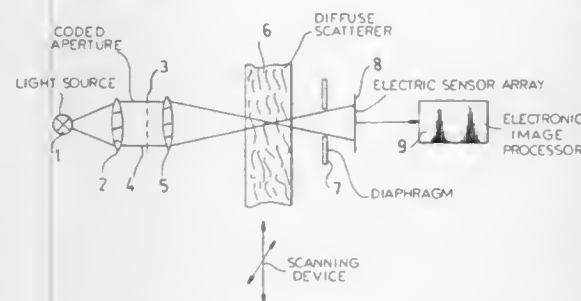
PCT Filed Dec. 15, 1994, Ser. No. 652,569

Claims priority, application Germany, Dec. 15, 1993, 43 42 526.7

Int. Cl.<sup>6</sup> A61B 6/00

U.S. Cl. 600—476

3 Claims



1. A device for transilluminating an object containing tissue and capable of diffuse scattering of transilluminating light, said device comprising:

- a source of light capable of transilluminating said object;
- a coded aperture through which a parallel beam of light from said source is passed said beam traveling along a path;
- means in the path of the beam passing through said coded aperture for focussing coded light therefrom;

means for positioning said object at a focal plane of the focussed light;

means for collimating light transversing said object; and a light-sensitive detector and image processor for collecting collimating light, said light beam being coded with a pattern enabling evaluation of signals from said detector for cross correlation.

5,772,599

## APPARATUS AND METHOD FOR MONITORING A SYSTEM

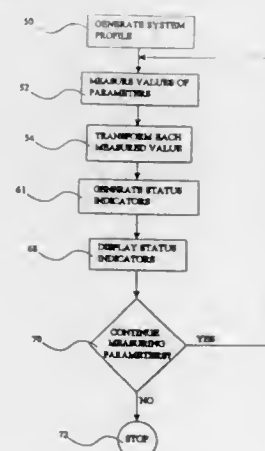
Igal Nevo, Bala Cynwyd; Maher Salah, and Srinivas S. Dagalar, both of Philadelphia, all of Pa., assignors to Albert Einstein Healthcare Network, Phila, Pa.

Filed May 9, 1996, Ser. No. 647,396

Int. Cl.<sup>6</sup> A61B 5/02

U.S. Cl. 600—483

15 Claims



5. An apparatus for monitoring a system comprising:

- a. means for sensing a plurality of parameters associated with the system;
- b. transformation means for transforming each value of said plurality of parameters associated with the system using a function dependent on at least baseline and critical values of the parameter, wherein the transformation means employs a sigmoid function;
- c. mapping means for mapping the function to a sequence of reference values and generating a deviation indicator for each parameter; and
- d. analysis means for analyzing the deviation indicators and generating a system criticality indicator.

5,772,600

## COHERENT PATTERN IDENTIFICATION IN NON-STATIONARY PERIODIC DATA AND BLOOD PRESSURE MEASUREMENT USING SAME

Alan R. Kahn, Minneapolis, Minn.; Dennis E. Bahr, Middleton, Wis., and Kurt W. Allen, Minneapolis, Minn., assignors to B.P. Sure, L.L.C., Madison, Wis.

Filed Jun. 17, 1996, Ser. No. 665,362

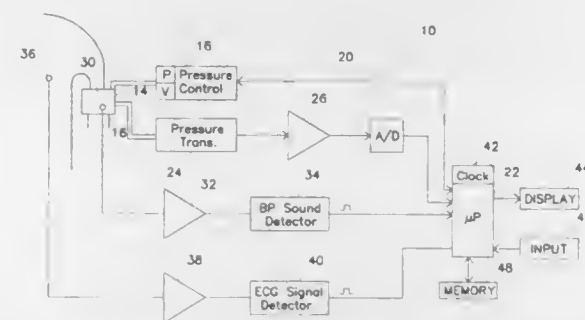
Int. Cl.<sup>6</sup> A61B 5/02

U.S. Cl. 600—494

22 Claims

1. A method for identifying blood pressure sounds of a patient, comprising the steps of:

- (a) applying a plurality of pressure levels to an artery of the patient;
- (b) detecting the pressure applied at each of the plurality of pressure levels;
- (c) detecting a patient ECG signal at each of the plurality of pressure levels;
- (d) detecting a potential blood pressure sound at each of the plurality of pressure levels;



(e) determining a time delay between the detections of the ECG signal and the potential blood pressure sound;

(f) generating a two dimensional data point at each of the plurality of pressure levels, a time dimension value of the data point corresponding to the time delay between the detected patient ECG signal at the pressure level and the detected potential blood pressure sound at the pressure level and a magnitude dimension value of the data point corresponding to the detected pressure at the pressure level, the two dimensional data points generated at each of the pressure levels forming a data set;

(g) grouping the data points in the data set into families by grouping together data points from the data set such that each data point in a family has similar time and magnitude dimension values to at least one other data point included in the family; and

(h) selecting the data points in the family of data points that includes the largest number of data points as the set of data points of interest identifying blood pressure sounds.

5,772,601

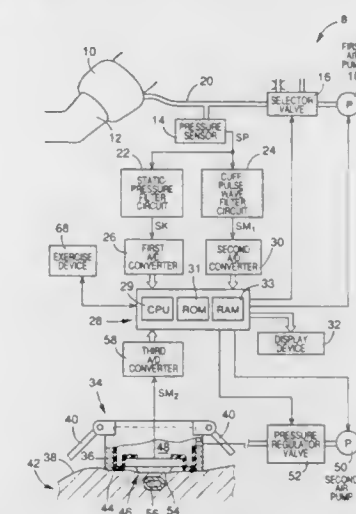
## APPARATUS FOR EVALUATING CARDIAC FUNCTION OF LIVING SUBJECT

Tohru Oka, Ichinomiya, and Hideichi Tsuda, Komaki, both of Japan, assignors to Colin Corporation, Komaki, Japan Filed Aug. 26, 1996, Ser. No. 703,360

Int. Cl.<sup>6</sup> A61B 5/29

U.S. Cl. 600—495

27 Claims





gas within said cuff to a second pressure, and for performing said predetermined s pressure reducing operation, selected by said judging means, to said pressure of said gas within said cuff; and  
blood pressure value determining means for detecting a pulse wave in said pressure while said predetermined step pressure reducing operation is performed to said pressure of said gas within said cuff by said second cuff pressure control means for determining a blood pressure value based on said pulse wave.

5,772,603

## DEVICE FOR FILTERING ECG SIGNALS

Thomas Ohlsson, Håsselby, and Peter Karlsson, Stockholm, both of Sweden, assignors to Siemens-Elma AB, Solna, Sweden

Continuation of Ser. No. 276,257, Jul. 18, 1994, abandoned.

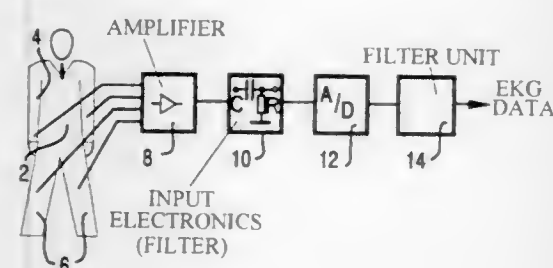
This application Jun. 3, 1997, Ser. No. 867,959

Claims priority, application Sweden, Jul. 16, 1993, 9302432

Int. Cl.<sup>6</sup> A61B 5/0428

U.S. Cl. 600—509

11 Claims



1. A device for filtering analog ECG signals for use with a source of said ECG signals comprising:

filter means, having inputs supplied with analog ECG signals, for filtering out components of said ECG signals, said filter means having an amplitude characteristic and a phase response, and producing filtered ECG signals;

an analog-to-digital converter, having inputs and to which said filtered ECG signals are supplied, and which converts said filtered ECG signals into an output signal consisting of a series of successive digital values corresponding to said filtered ECG signals at said inputs at successive times, said output signal exhibiting differing frequency contents at different times; and

high-pass filter means, to which said output signal from said analog-to-digital converter is supplied for forward filtration only, having an amplitude characteristic and a non-linear phase response with a frequency passband, a suppressed frequency band and a transition band between said passband and said suppressed frequency band, for delaying an output signal from said analog-to-digital converter with a frequency in said passband more than an output signal from said analog-to-digital converter with a frequency in said transition band, said amplitude characteristic of said high-pass filter means being the same as the amplitude characteristic of said filter means, and said phase response of said high-pass filter means being opposite to the phase response of said filter means.

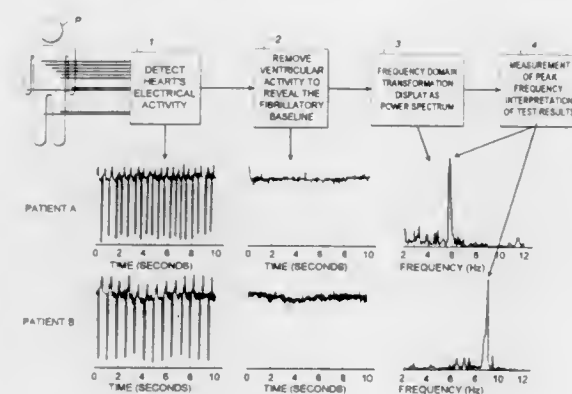
5,772,604  
METHOD, SYSTEM AND APPARATUS FOR DETERMINING PROGNOSIS IN ATRIAL FIBRILLATION  
Jonathan J. Langberg, Atlanta, Ga., and Andreas Bollmann, Magdeburg, Germany, assignors to Emory University, Atlanta, Ga.

Filed Mar. 14, 1997, Ser. No. 818,739

Int. Cl.<sup>6</sup> A61B 5/046

U.S. Cl. 600—518

79 Claims



1. A system for classifying atrial fibrillation, comprising:  
means for receiving electrical signals indicative of a heart's activity;  
means for processing the electrical signals to remove ventricular activity from the electrical signals and to output a fibrillatory baseline signal;  
means for transforming the fibrillatory baseline signal into a set of frequency domain signals;  
means for detecting a peak frequency within the set of frequency domain signals; and  
means for classifying atrial fibrillation based on the peak frequency.

5,772,605

## SYSTEM AND METHOD FOR DETECTING FACIAL SYMMETRY

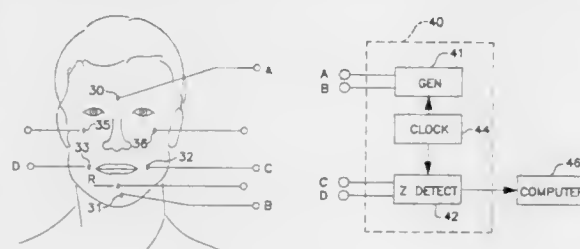
Koen Weijand, Hoensbroek, Netherlands, assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Dec. 18, 1996, Ser. No. 768,686

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 600—547

26 Claims



1. A facial impedance measurement system, for obtaining impedance measurements reflective of the condition of a patient's face, comprising:

electric field means for generating an electric field oriented along a facial mid-line on said patient's face; and  
impedance means operative concurrently with said electric field means for determining an impedance value related to at least one location on said patient's face, said at least one location being displaced from said facial mid-line to obtain a measure of the patient's facial condition.

5,772,606

## METHOD OF AND APPARATUS FOR MEASURING URIC COMPONENTS

Emi Ashibe; Takeshi Sakura; Harumi Uenoyama; Xu Kexin, and Hiroko Kuho, all of Kyoto, Japan, assignors to Kyoto Dai-Ichi Kagaku Co., Ltd., Kyoto, Japan

Filed Mar. 3, 1995, Ser. No. 397,953

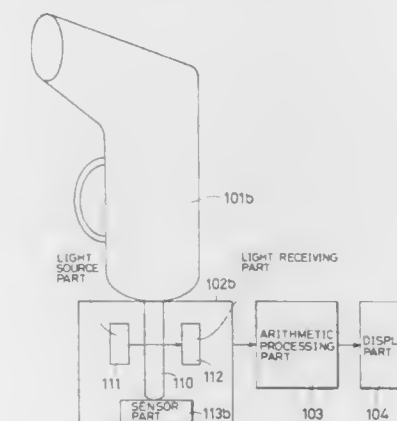
Claims priority, application Japan, Mar. 4, 1994, 6-060014;

Mar. 4, 1994, 6-060015; Mar. 7, 1994, 6-064505

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 600—573

23 Claims



1. A method of measuring uric components for quantitatively analyzing a plurality of uric components at the same time, comprising the steps of:

irradiating a urine sample with light of wavenumber not higher than about 25,000 cm<sup>-1</sup> and not lower than about 4,000 cm<sup>-1</sup>; measuring absorbances of said uric components to be measured at measuring wavelengths selected from wavelengths having correlation coefficients which have absolute values of at least 0.5 and not greater than 1.0, said correlation coefficients being defined as coefficients between concentrations and absorbances of aqueous solutions containing respective single components in the visible or near infrared wavelength region according to the formula:

$$R_j = \frac{(m-1) \sum_{i=1}^m (A_{ij} - \bar{A}_j)(C_i - \bar{C})}{\sum_{i=1}^m (A_{ij} - \bar{A}_j) \sum_{i=1}^m (C_i - \bar{C})}$$

where:

$$\bar{A}_j = \frac{1}{m} \sum_{i=1}^m A_{ij}$$

$$\bar{C} = \frac{1}{m} \sum_{i=1}^m C_i$$

where:

m: the number of samples

A<sub>ij</sub>: absorbance of the component in i th sample at wavelength λ<sub>j</sub>

C<sub>i</sub>: concentration of the component in i th sample, said measuring wavelengths being specific to respective said uric components; and

determining concentrations of each of said plurality of uric components at the same time from said absorbances being measured at said measuring wavelengths by multivariate regression analysis.

5,772,607

## BODY FLUID COLLECTION APPARATUS

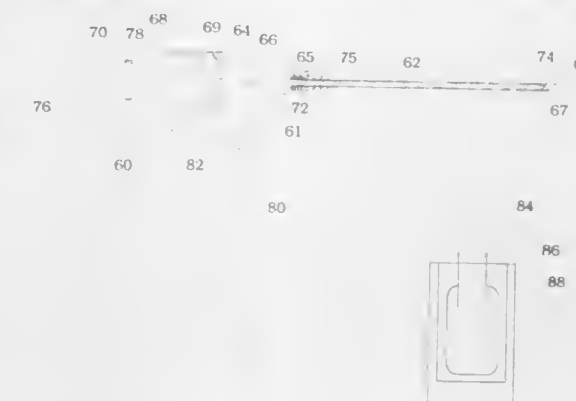
Gary Magram, Greenville, Del., assignor to The Nemours Foundation, Jacksonville, Fla.

Filed Jun. 6, 1995, Ser. No. 471,274

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 600—573

16 Claims



1. In drawing from within a cavity of a patient's body of a sample of a cerebrospinal fluid for analysis, a sealed, non-subatmospheric pressure, fluid collection apparatus, comprising:

(a) a sample container, comprising:

a rigid, transparent sheath defining an enclosure vented to atmospheric pressure outside the rigid, transparent sheath; and  
an inflatable pouch to receive body fluid, the inflatable pouch including:

a balloon within the enclosure defining an inner space and having an outer surface exposed to pressure within the enclosure and outside the inflatable pouch; the balloon being capable of free inflation within the enclosure as unpressurized body fluid drains by gravity in absence of other fluid motivation force into the inner space; and  
an inlet port joined to the balloon and in fluid communication with the inner space and adapted to provide a detachable, fluid tight connection to a source of supply of unpressurized body fluid, the inlet port being affixed to the rigid, transparent sheath;

(b) a needle assembly adapted to communicate with the cavity and conduct body fluid outside the patient's body, the needle assembly including:

a hollow barrel with an open end and a wall structure defining an interior volume to accept the body fluid;  
an elastomeric septum within the hollow barrel defining a puncturable, self-sealing, wall separating the interior volume from the open end;  
an outlet port on the wall structure and adapted to export body fluid from the interior volume;

(c) a transfer tube having first and second ends, the transfer tube being close coupled at the first end in fluid communication with the outlet port, and the tube including at the second end an adapter means for detachably, fluid tightly connecting the second end to the sample container; and

(d) a block valve between the cavity and the sample container for reversibly interrupting flow through the transfer tube.

5,772,608

## SYSTEM FOR SAMPLING ARTERIAL BLOOD FROM A PATIENT

V. Varaprabhu Dhas, Dewitt, N.Y., assignor to The Research Foundation of State University of New York, Albany, N.Y.

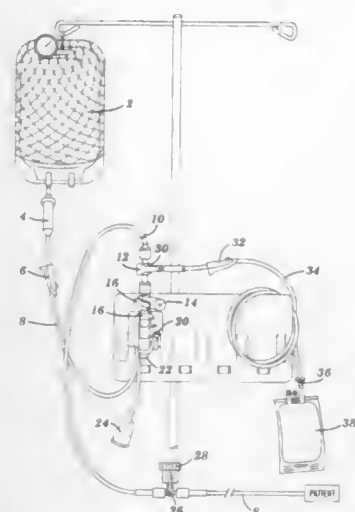
Filed Dec. 28, 1994, Ser. No. 365,307

Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 600—578

14 Claims

1. A system for sampling arterial blood from a patient comprising:



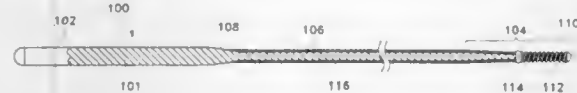
- a reservoir suitable for containing fluid;  
a first conduit having a first end and a second end with the first end connected to said reservoir;  
connection means suitable for connection to an artery of a patient and attached to the second end of said first conduit;  
a fluid displacement system comprising:  
a second conduit having a first end and a second end;  
a controller in said second conduit to permit fluid flow through the second conduit; and  
a junction where said second conduit connects to said first conduit, wherein the junction is at the first end of the second conduit;  
a flow regulator operative in a first mode to convey fluid to a patient through said first conduit from said reservoir and operative in a second mode to remove blood from a patient and convey it in said first conduit to a limit location, positioned between the second end of said first conduit and said junction, wherein removal of blood from the patient in the second mode causes fluid previously in said first conduit to move into said fluid displacement system;  
a sampling station in said first conduit positioned between the limit location and the second end of said first conduit; and  
a first valve positioned in said first conduit at said sampling station and movable to a first position to permit removal of blood from said first conduit at said sampling station, movable to a second position to permit fluid flow between said reservoir and the patient through said first conduit, and movable to a third position to permit fluid from said reservoir to be removed from said first conduit at said sampling station.

**5,772,609**  
**GUIDEWIRE WITH VARIABLE FLEXIBILITY DUE TO POLYMERIC COATINGS**  
Kim Nguyen, San Jose; Chi J. Chung, Sunnyvale, and Thomas J. Palermo, San Jose, all of Calif., assignors to Target Therapeutics, Inc., Fremont, Calif.

Continuation-in-part of Ser. No. 346,143, Nov. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 62,456, May 11, 1993, Pat. No. 5,409,015. This application Jun. 28, 1996, Ser. No. 672,637  
Int. Cl.<sup>6</sup> A61B 5/00

U.S. Cl. 600—585

23 Claims



1. A guidewire section for use with a catheter comprising an elongated, flexible wire core having a polymeric tie layer coaxially located about a length of the wire core surface, said tie layer having at least two axially spaced tie layer sections, each of said tie layer sections being of a different flexibility than an axially adjacent

tie layer section, and at least a portion of said polymeric tie layer having an exterior coating of lubricious material.

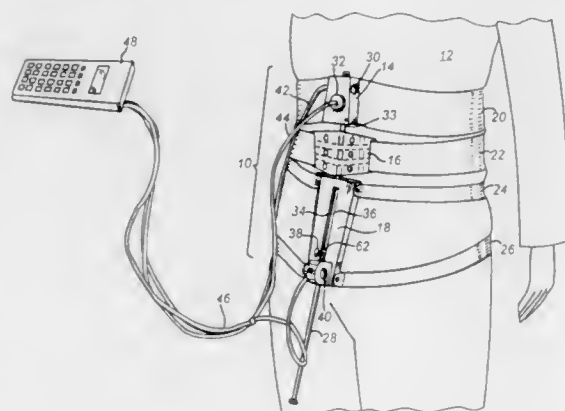
**5,772,610**  
**METHOD AND APPARATUS FOR DYNAMIC AND DIRECT MEASUREMENT OF LUMBAR LORDOSIS**  
Raymond W. McGorry, Charlton; Simon M. Hsiang, Holliston, and Richard Holihan, Natick, all of Mass., assignors to Liberty Mutual Group, Boston, Mass.

Filed Aug. 14, 1996, Ser. No. 696,489

Int. Cl.<sup>6</sup> A61B 5/11

U.S. Cl. 600—594

16 Claims



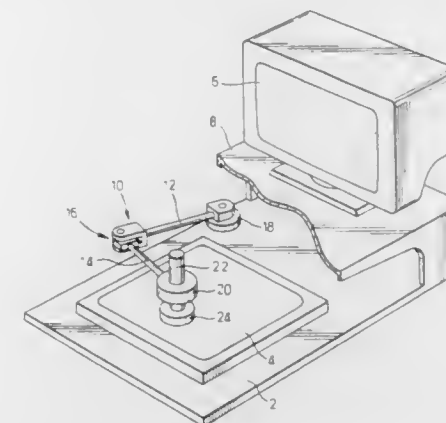
1. A device for measuring a change in arc length of curvature of the lumbar spine of a subject comprising:  
an elongate member, disposed approximately parallel to the lumbar back of the subject;  
a first plate that is adapted to connect a first point of the elongate member to the lumbar back, the first point being fixed relative to the back;  
a second plate that is adapted to connect a second point of the elongate member, spaced from the first point, to the lumbar back, the second plate including at least one guide member through which the elongate member extends;  
a third plate that is adapted to connect a third point of the elongate member, spaced from the second point, to the lumbar back, wherein the third point displaces relative to the third plate when the subject bends forwardly or rearwardly; and  
a displacement sensor, connected to the third plate and coupled to the elongate member, that determines displacement of the third point of the elongate member when the subject bends forwardly or rearwardly, which displacement represents change in arc length.

**5,772,611**  
**SYSTEM AND METHOD FOR DETECTION AND QUANTIFICATION OF PARKINSON'S DISEASE**  
Shraga Hocherman, 9 Ruth St., Haifa, Israel  
Continuation-in-part of Ser. No. 366,300, Dec. 29, 1994, abandoned. This application Jan. 30, 1996, Ser. No. 594,303  
Int. Cl.<sup>6</sup> A61B 5/103

U.S. Cl. 600—595

10 Claims

1. A system for detection and quantification of Parkinson's disease, comprising:  
a substantially planar digitizer tablet fixedly mounted on a base plate and capable of translating graphic information into digital information displayable, via computer means, as graphic information on a monitor screen viewable by the subject to be tested;  
a handle to be gripped and steered by said subject, said handle being fixedly attached to, and supported by, guide means providing said handle with two degrees of freedom in trans-

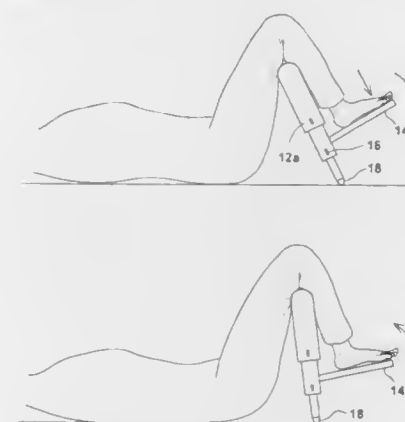


- lation in a plane above, and substantially parallel to, the plane of said digitizer tablet;  
means for concealing said handle and the subject's hand gripping it from the subject's eyes, said concealing means being a top plate located above said base plate, projecting beyond said base plate in a direction towards said subject to a sufficient degree to conceal said handle in its positions above said digitizer tablet;  
a stylus moving together with said handle and adapted to produce signals sensible by said digitizer tablet; and  
means for producing on said monitor screen a model path of a predetermined shape and size, as well as a target to be tracked by said subject, said target moving at a predetermined speed along said model path;  
whereby the quantification of Parkinson's disease for said subject is effected by assessing the direction and speed of the subject's response to said target.

**5,772,612**  
**STRETCHING METHOD FOR PREVENTING OR RELIEVING LOWER BACK PAIN**  
Daniel Ilan, 24 Hamatmid, Even Yehuda, Israel  
Filed Jun. 17, 1996, Ser. No. 671,120  
Int. Cl.<sup>6</sup> A61H 1/00

U.S. Cl. 601—23

5 Claims



1. A method for relieving and preventing lower back pains, comprising the steps of:  
(a) providing a device for simultaneously stretching and lifting a user's lower back, the device including:  
(i) a frame including an upper cross frame member extending substantially horizontally, said frame having a lower end for contacting the ground and serving as a fulcrum; and  
(ii) a foot rest member mounted to said frame at a point intermediate said upper cross frame member and said lower end;  
(b) lying with the user's back on the ground;

- (c) holding said device so that said lower end is on the ground while said upper cross frame member is elevated relative to the ground;  
(d) placing the user's legs over said device so that the user's feet rest on said foot rest member while the back of the user's knees rests substantially on said upper cross frame member; and  
(e) rocking said device back and forth about said lower end of said frame by periodically pushing on said foot rest member so as to simultaneously lift and stretch the user's lower back.

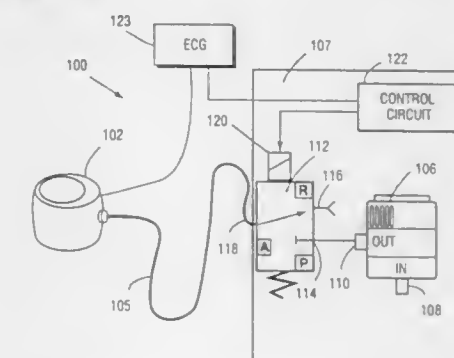
**5,772,613**  
**CARDIOPULMONARY RESUSCITATION SYSTEM WITH CENTRIFUGAL COMPRESSION PUMP**  
Mark Gelfand, and Neil S. Rothman, both of Baltimore, Md., assignors to Cardiologic Systems, Inc., Baltimore, Md.

Filed Oct. 9, 1996, Ser. No. 731,049

Int. Cl.<sup>6</sup> A61H 31/02

U.S. Cl. 601—41

6 Claims



1. A method for externally facilitating blood flow using a vest with a bladder for cyclically compressing a patient's chest to increase blood flow, a blower to inflate the bladder having a maximum pressure output for a given speed substantially equal to a desired peak bladder pressure, and a valve switchably coupling the blower to the bladder, said method comprising the following steps:  
a. continuously operating the blower while cyclically compressing the chest with the vest;  
b. switching the valve to place an outlet of the blower in fluid communication with the bladder;  
c. inflating the bladder with air output by the blower until the blower reaches the maximum output pressure;  
d. continuing to apply to the bladder the maximum output pressure from the blower until the valve is switched to vent air pressure from the vest; and  
e. repeating steps (b) to (d) to cyclically inflate and deflate the bladder.

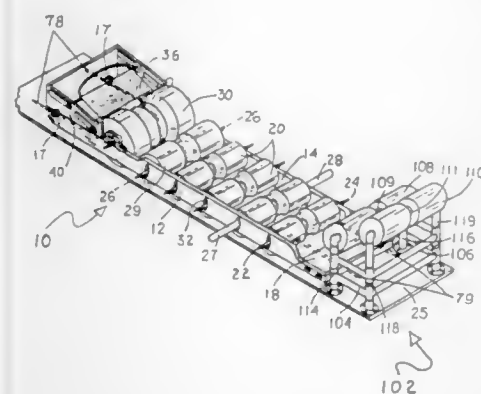
**5,772,614**  
**BACK MASSAGE DEVICE USABLE WITH LEG ELEVATION**  
Edward E. Lindquist, 2731 Citron Dr., Longwood, Fla. 32779  
Continuation-in-part of Ser. No. 213,036, Mar. 15, 1994, abandoned. This application Jul. 2, 1996, Ser. No. 674,396  
Int. Cl.<sup>6</sup> A61H 15/00

U.S. Cl. 601—116

58 Claims

1. A back massage and exercise device comprising a substantially flat, elongate frame of generally rectangular configuration able to be utilized on a supporting surface, said frame having a pair of long sides joined together by a pair of short sides and being several times as long as it is wide, a roller array in the form of a parallel series of elongate rollers loosely mounted in a spaced apart, operational relationship between the long sides of said frame, with each of said rollers having a longitudinal axis about





which it is freely rotatable, said frame having an operative position in which a lower portion of substantially all of said rollers is in contact with the supporting surface, with an upper portion of said rollers being available for directly supporting a human body, the user of said device being able to readily bring about back and forth rolling movement of said frame along the supporting surface at such time as he is lying on the rollers, with the motion of the upper portions of said rollers during such back and forth movement of the frame on the supporting surface bringing about a massaging action to the portion of the user's body in contact with the rollers, at least one of said rollers being of significantly larger diameter than the other rollers of the array, said frame having a head end, adjacent which said larger diameter roller is operatively mounted so as to be contacted by the user's head, said larger diameter roller being employable by the user for head, neck and shoulder massage, separate mounting means being provided for said larger diameter roller, so that latter roller can be selectively moved by the user in a manner independent of the motion of all the other rollers of the array, said larger diameter roller being in rolling contact with the supporting surface.

5,772,615

**MOTORIZED FOOT MASSAGING DEVICE**

Bill M. Elder, 130 Woodside Dr., San Anselmo, Calif. 94960, and Kenneth Tarlow, 94 Birch Ave., Corte Madera, Calif. 94925

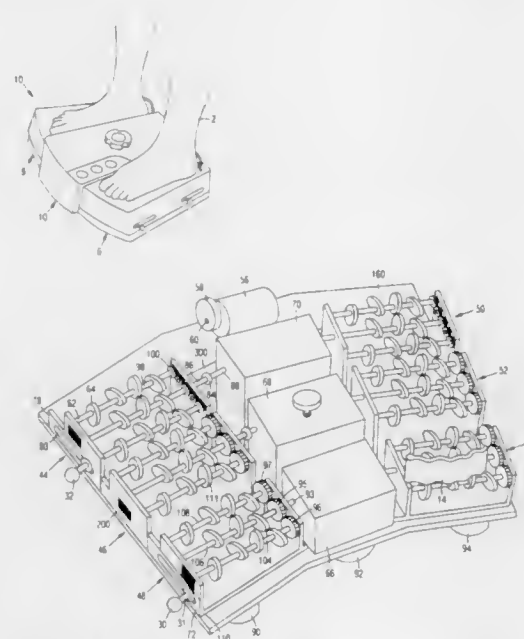
Filed Sep. 23, 1996, Ser. No. 717,721

Int. Cl.<sup>6</sup> A61H 15/00

U.S. Cl. 601—126

6 Claims

1. An improved motorized foot massaging device, comprising:  
a front pair, a center pair, and a rear pair of massaging modules mounted to a rigid base plate;  
a plurality of resilient rubber pads attached to an underside of said base plate;  
each of said pairs of massaging modules being comprised of a rigid sub-plate to which a centrally located motor is attached, said motor having a pair of drive shafts protruding from opposite sides thereof, and a gear reduction system coupled to each of said drive shafts which are connected via flexible joints to said massaging modules;  
each of said massaging modules being comprised of a U-shaped frame supporting a plurality of horizontally disposed shafts, each of said shafts having a spur gear so that the spur gear of one shaft meshes with and drives the spur gear of an adjoining shaft thereby causing all shafts to rotate, said shafts having a plurality of permanently fixed cams radiating at ninety degrees therefrom, each of said cams being offset by ninety degrees from an adjacent one of said cams, said front pair and said rear pair of said massaging modules being slidable and lockable onto said base plate, all of said massaging modules



being covered by removably affixed cloth covers, all of said motors and said gear reduction systems being covered by a rigid housing.

5,772,616

**PORTABLE WATER APPARATUS FOR CLEANING THE TEETH AND GUMS**

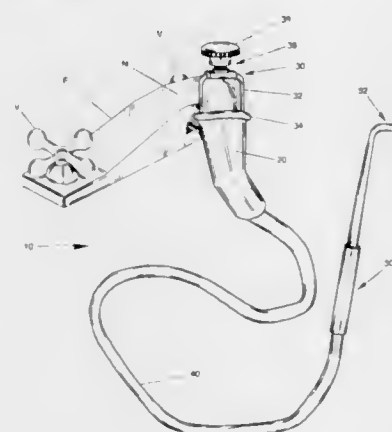
Joseph W. Competiello, and Sandra L. Competiello, both of 10 Mark La., Milton, Mass. 02186

Filed May 20, 1997, Ser. No. 858,930

Int. Cl.<sup>6</sup> A61G 17/02

U.S. Cl. 601—165

9 Claims



1. A device for cleansing and massaging the teeth and gums which is connected to the nozzle of a faucet, said device comprising:  
a funnel having a plate for fluid communication with the faucet nozzle;  
tubing in fluid communication with said funnel;  
a handle in fluid communication with said tubing;  
a tip in fluid communication with said handle; and  
a latch for holding the funnel in fluid communication with the nozzle, wherein said latch comprises a flat rubber plate with a raised connection orifice for communication with the nozzle of the faucet.

5,772,617

**STABILIZING ARM SLING**

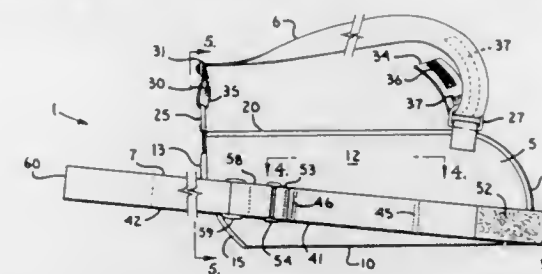
Bonita S. Lay, Gardner, Kans., assignor to A&B Stabilizer, Inc., Olathe, Kans.

Filed Oct. 9, 1996, Ser. No. 731,092

Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602—4

17 Claims



1. An arm sling comprising:  
a) a sling pouch having a front panel and a back panel and an elbow end and a wrist end;  
b) a shoulder strap having a first end secured to said sling pouch proximate said elbow end and a second end secured to said sling pouch proximate said wrist end;  
c) a restraining strap adapted to be secured around the torso of a wearer, said restraining strap having a first end and a second end; said restraining strap secured intermediate said first and second ends thereof to said back panel of said sling pouch inward from said elbow and wrist ends thereof and generally laterally relative to said back panel of said sling pouch such that a portion of said restraining strap overlaps a portion of said back panel; and  
d) a fastener for releasably securing said first and second ends of said restraining strap together.

5,772,618

**HINGE FOR AN ORTHOPEDIC BRACE**

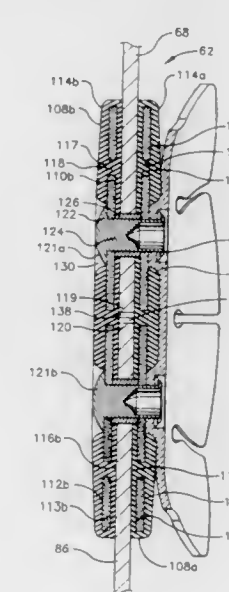
Bradley R. Mason, Olivenhain, and Jeffrey T. Mason, Escondido, both of Calif., assignors to Breg, Inc., Vista, Calif.

Filed May 31, 1996, Ser. No. 656,088

Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602—16

18 Claims



1. A hinge for an orthopedic brace comprising:  
a hinge plate including a substantially planar rigid support member having a first side and a second side, a first covering on said first side, and a second covering on said second side, wherein said first and second coverings are integrally formed

with one another from a solid insert molded plastic having a substantially smooth outer surface to provide a substantially continuous unitary covering substantially enclosing said support member.

5,772,619

**PIVOTAL BRACE FOR PROSTHESIS**

Blake Corbett, 856 Lynnhaven La., La Canada, Calif. 91011

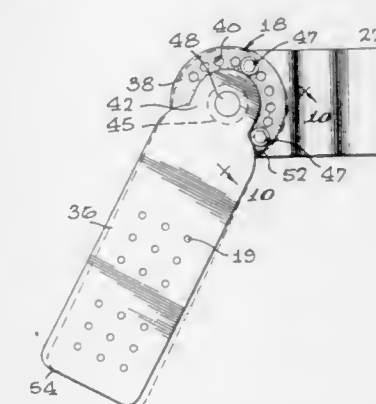
Continuation of Ser. No. 418,949, Apr. 7, 1995, abandoned.

This application Jan. 31, 1997, Ser. No. 791,546

Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602—16

7 Claims



1. A rotatable brace forming part of a prosthesis for supporting a human joint including a first wrapping support supporting a first limb member, a second wrapping support for supporting a second limb member, said rotatable brace being secured to said wrapping supports for permitting limited rotation of said joint:  
said rotatable brace comprising a first strap secured to one of said wrapping supports having a main portion and a portion of reduced width at one end terminating in a generally semicircular portion, a hole centered in said semicircular portion, and a pair of shoulder portions joining said main portion with said portion of reduced width;  
a second strap secured to the other of said wrapping supports having a hole generally centered at one end thereof, and a plurality of threaded ports positioned radially outwardly of said hole;  
a washer of low friction plastic material interposed between said first and second straps and having a centrally located hole and a plurality of ports aligned with said threaded ports;  
a pivot pin extending through said holes in said first and second straps and through said washer; and  
a pair of screws having upstanding heads extending through a pair of said ports in said washer and threadedly engaged with corresponding said threaded ports, said heads limiting rotation of said brace when contacted by said shoulder portions, said screws being deflectable and said washer being deformable to absorb forces at said rotation limit to avoid damage to said brace.

5,772,620

## HAND AND WRIST JOINT ORTHOSIS

Ingeborg Szlema, Kempen, and Dieter Brandt, Düsseldorf, both of Germany, assignors to Beiersdorf AG, Hamburg, Germany

PCT No. PCT/EP94/02655, § 371 Date Nov. 22, 1995, § 102(e) Date Nov. 22, 1995, PCT Pub. No. WO95/04507, PCT Pub. Date Feb. 16, 1995

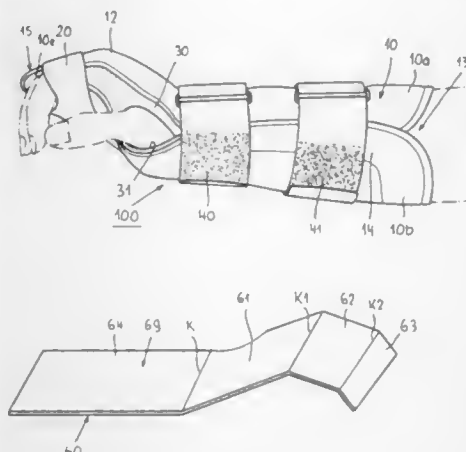
PCT Filed Aug. 10, 1994, Ser. No. 553,268

Claims priority, application Germany, Aug. 11, 1993, 43 26 751.3

Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602—21

14 Claims



1. A hand and wrist joint orthosis comprising a supporting body adapted to be held at the hand and wrist of the user, the supporting body comprising a volar rigid splint adapted to support the hollow hand and for holding the hand and the digits in a functional position, the rigid splint being positionable so as to face the digits with a section and to terminate so as to overlap the joints within the region of the phalanges and to extend over a greater portion of the digits, the rigid splint having a longitudinal direction and comprising, so as to be positionable in the region of the phalanges and the metacarpal bones, a first splint section, a second splint section and a third splint section, wherein a first bending line positionable within the region of the wrist joint between the rigid splint and the first splint section extends transversely of the longitudinal direction of the splint, a second bending line positionable in the region of the metacarpal joints between the first and second splint sections extending corresponding to a joint line through the metacarpal joints obliquely relative to the longitudinal direction of the rigid splint, and a third bending line positionable within the region of the phalangeal joints between the second and third splint sections extending corresponding to a joint line through the phalangeal joints obliquely relative to the longitudinal direction of the rigid splint, whereby the splint sections are positioned to coincide with the joint lines, and wherein an angle between the longitudinal direction of the rigid splint and the first splint section is  $40^\circ \pm 5^\circ$ , an angle between the first and second rail sections is  $60^\circ \pm 5^\circ$  and an angle between the second and third rail sections is  $60^\circ \pm 5^\circ$ ; and wherein the supporting body is a profile-sewn supporting body adapted to enclose wrist joint and hand in a sleeve-like fashion, the rigid splint being spoon-shaped and positionable on the volar side on an inner wall area of the supporting body so as to facilitate an intrinsic-plus position, the supporting body being of open construction and extending on one side in the longitudinal direction so as to form a putting-on aperture extending over the entire length of the orthosis, the supporting body comprising two body portions and adjustable closing tapes for holding together the two supporting body portions, further comprising a sleeve held by the adjustable closing tapes and extending over a length corresponding to the length of the forearm.

5,772,621

## TURF TOE BRACE

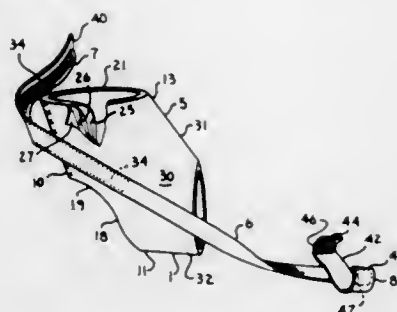
Gregory J. Unruh, Olathe, Kans., assignor to Cramer Products, Inc., Gardner, Kans.

Filed Nov. 7, 1996, Ser. No. 745,018

Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602—30

13 Claims



1. A turf toe brace to reduce the likelihood of hyper-extension of the great toe comprising:

- a) an anchor mechanism adapted to be secured to the foot rearwardly of the great toe; said anchor mechanism comprising a flexible boot adapted to encircle a portion of a foot of a user;
- b) said boot being elastic and including first and second sleeves that are adapted to be received snugly over a foot of the user;
- c) said first sleeve being sized and shaped to fit over and extend behind a rear of the foot; and
- d) said second sleeve being sized and shaped to be received over and encircle the middle of the foot substantially along the arch of the foot
- e) an elongate relatively non-stretchable strap;
- f) a releasable fastening mechanism for selectively attaching said strap to said ankle mechanism; and
- g) a loop located near a frontward end of said strap and adapted to be positioned around the great toe, such that a first end of said strap is positioned beneath the foot during use in the vicinity of the great toe.

5,772,622

## GRAVITY INVERSION BELT

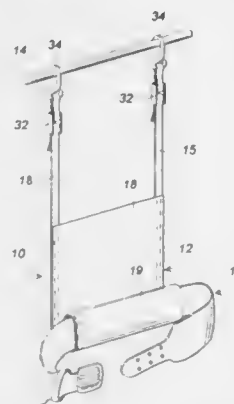
John A. Friske, 3318 Spring Creek La., Dunwoody, Ga. 30350

Filed Sep. 17, 1996, Ser. No. 715,003

Int. Cl.<sup>6</sup> A61H 1/02

U.S. Cl. 602—36

8 Claims



1. A body support harness for suspending the human body from a horizontal support in an inverted attitude comprising:
  - a) a belt for encircling and strapping about the waist of the human body;
  - b) a pair of elongated support straps each connected at one of its ends to said belt and spaced from each other about said belt for supporting the belt at opposite sides of the torso of the human body;

5,772,624

## REUSABLE BLOOD LINES

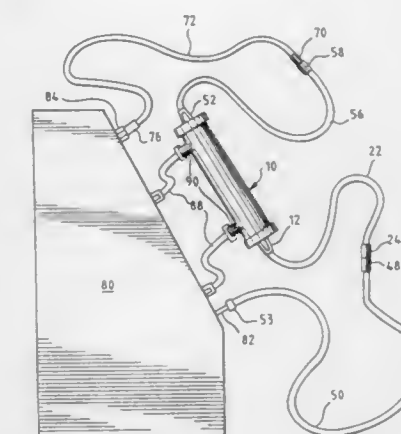
David S. Utterberg, Seattle, Wash., and Neil J. Sheehan, Palo Alto, Calif., assignors to Medisystems Technology Corporation, Las Vegas, Nev.

Filed Jul. 20, 1995, Ser. No. 504,457

Int. Cl.<sup>6</sup> A61M 37/00

U.S. Cl. 604—4

21 Claims



1. The blood treatment method which comprises:
  - a) flowing blood sequentially through connected members comprising: a first conduit, a first blood handling member comprising at least one of a first debubbling chamber, a branching conduit connector, and a pump device fitment; a second conduit; a blood treatment device; a third conduit; a second blood handling member comprising at least one of a second debubbling chamber, a branching conduit connector, and a pump device fitment; and a fourth conduit;
  - b) terminating and substantially removing said flowing blood; disconnecting and removing said first and second blood handling members;
  - c) connecting ends of said first and second conduits and said third and fourth conduits;
  - d) connecting at least one of said first and fourth conduits to a source of cleaning/storage solution; and
  - e) flowing said cleaning/storage solution through said first through fourth conduits and said blood treatment device.

5,772,623

## BANDAGE HAVING A TAB PORTION FOR FACILITATING EASY REMOVAL FROM THE SKIN

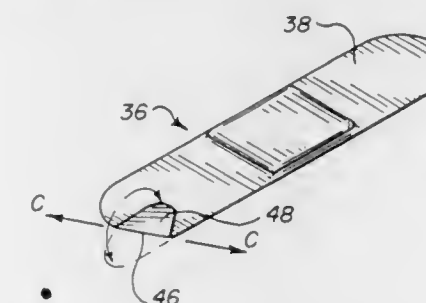
Stephen Conte, R.D. 2 Box 92-2, Oxford, N.Y. 13830

Filed Aug. 10, 1995, Ser. No. 513,455

Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 602—57

19 Claims



1. An adhesive flat bandage having at least one edge defining a predetermined periphery, each of said at least one edge having a respective axis extending therealong, said bandage used to cover a wound to the skin, said bandage comprising:

- a) a lower surface having a coating of first adhesive thereon, said first adhesive being of a first adhesive strength;
- b) an upper surface having a partial coating of a second adhesive thereon, said second adhesive being of a second adhesive strength; and
- c) at least one tab integrally extending outwardly from said at least one edge, said tab being foldable backwardly upon itself about said respective axis extending along said at least one edge and positioned in releasably adhered relation to said upper surface in covering relation to said second adhesive, whereby said tab may be detached from said upper surface and manipulated to pull said bandage away from said skin.

5,772,625

## EXTERNAL DRAINAGE SHUNT

John A. Krueger, Brookfield, Wis.; Kevin M. Jaeger, Lake Bluff, and Helmut W. C. Rosenberg, McHenry, both of Ill., assignors to Heyer-Schulte NeuroCare, Inc., Pleasant Prairie, Wis.

Filed Nov. 19, 1996, Ser. No. 752,731

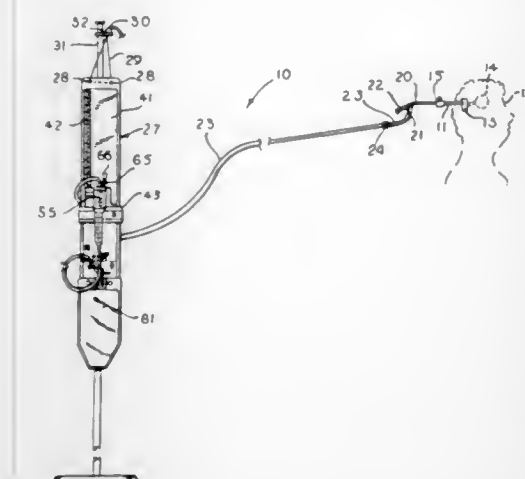
Int. Cl.<sup>6</sup> A61M 5/00

U.S. Cl. 604—9

18 Claims

1. An external ventricular drainage system adapted for connection to a ventricular drainage catheter for placement in the ventricles of a patient's brain for receiving cerebrospinal fluid, said catheter being secured to the patient to prevent relative movement therebetween, said drainage system comprising tubing attached to the catheter and having valve means therein for controlling fluid flow therethrough, a needle-less sampling site positioned downstream of the valve means, a one-way valve following the sampling site, a length of flexible tubing connected to the one-way valve, and extending to a collection burette, a support panel



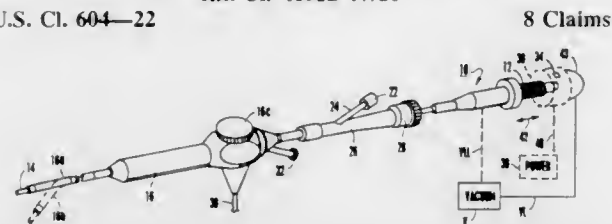


mounted on an IV pole, a sliding panel having means for supporting said burette and mounted on said support panel, a high flow stopcock below the burette, and a drainage bag supported on said support panel and connected to said burette by said stopcock.

5,772,626

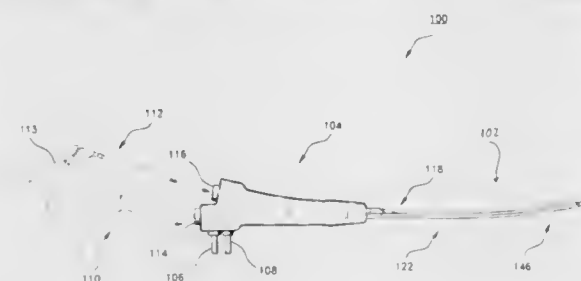
Patent Not Issued For This Number

**5,772,627**  
**ULTRASONIC TISSUE RESECTOR FOR NEUROSURGERY**  
George M. Acosta, Long Beach, and Derek J. Daw, Costa Mesa, both of Calif., assignors to Neuro Navigational Corp., Costa Mesa, Calif.  
Filed Jul. 19, 1996, Ser. No. 684,425  
Int. Cl.<sup>6</sup> A61B 17/20  
U.S. Cl. 604—22



1. A device for resecting neurological tissue, the device being configured for engaging a lumen of a neurosurgery instrument, the device being coupleable to an ultrasonic transducer that generates ultrasonic vibrations having a wavelength, the device comprising: a proximal ultrasonic horn having a distal end and a proximal end coupleable to the transducer; an elongated probe defining a distal tip segment for transmitting ultrasonic vibrations to a tissue to break down a tissue, the probe also defining plural non-tip segments proximal to the distal tip segment, each non-tip segment having the same inside diameter as the other non-tip segments, each non-tip segment having an outside diameter greater than its immediately distal non-tip segment; a hub threadably engaged with the horn and surrounding engaged with the probe to couple the probe to the horn; and an aspiration channel juxtaposed with the tip for evacuating portions of tissue broken down by the tip.

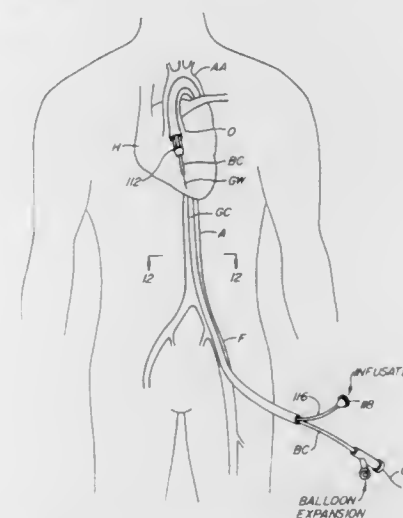
**5,772,628**  
**SURGICAL ACCESS DEVICE AND METHOD OF CONSTRUCTING SAME**  
Steven R. Bacich, Laguna Niguel; John P. Greelis, Aliso Viejo; Hien Nguyen, Santa Ana, and Tuoc Nguyen, Westminster, all of Calif., assignors to Imagyn Medical, Inc., Laguna Niguel, Calif.  
Filed Feb. 13, 1996, Ser. No. 600,603  
Int. Cl.<sup>6</sup> A61M 25/00  
U.S. Cl. 604—43



1. A surgical access device for providing at least one auxiliary lumen for the insertion into a patient's body of an instrument, endoscope, or other visualization device, said surgical access device having an outer surface defining at any particular location along its longitudinal axis, a cross-sectional profile, said device comprising: a first channel providing a first lumen for the insertion of an instrument, endoscope or other visualization device; and at least one secondary channel providing an auxiliary lumen for the insertion of an instrument, endoscope, or other visualization device, said secondary channel being mounted on said surgical access device so as to be positioned along said outer surface thereof, said secondary channel being constructed from a substantially noncompliant membrane having a pre-dilated position and a dilated position, which, in the pre-

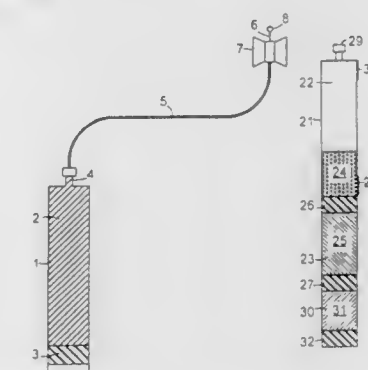
dilated position, is set in a self-retaining position which closely conforms to said outer surface.

**5,772,629**  
**LOCALIZED INTRAVASCULAR DELIVERY OF TFPI FOR INHIBITION OF RESTENOSIS IN RECANALIZED BLOOD VESSELS**  
Aaron V. Kaplan, Los Altos, Calif., assignor to Localmed, Inc., Palo Alto, Calif.  
Filed Oct. 23, 1995, Ser. No. 546,873  
Int. Cl.<sup>6</sup> A61M 31/00  
U.S. Cl. 604—52



1. A method for inhibiting abrupt closure and restenosis in a recanalized blood vessel, said method comprising intramurally delivering a TFPI polypeptide to a target site within the blood vessel in an amount sufficient to reduce platelet deposition.

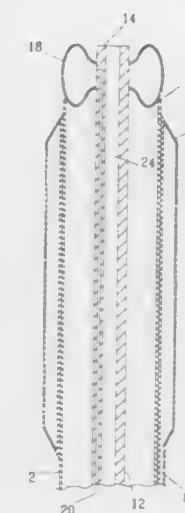
**5,772,630**  
**INJECTION CARTRIDGES**  
Olle Ljungquist, Täby, Sweden, assignor to Pharmacia AB, Stockholm, Sweden  
PCT No. PCT/SE94/00864, § 371 Date Mar. 27, 1996, § 102(e) Date Mar. 27, 1996, PCT Pub. No. WO95/09020, PCT Pub. Date Apr. 6, 1995  
PCT Filed Sep. 16, 1994, Ser. No. 619,634  
Claims priority, application Sweden, Sep. 29, 1993, 9303178  
Int. Cl.<sup>6</sup> A61M 37/00  
U.S. Cl. 604—90



1. Injection cartridge, adapted to expel a liquid medicament preparation from a main chamber through an outlet conduit, tube and injection needle or cannula arranged at the front end of said cartridge by the displacement of a front piston arranged rearward of said main chamber in said cartridge, characterized in that behind

said front piston, for the expulsion of said medicament preparation is arranged a supplementary chamber in said cartridge, said supplementary chamber being adapted to contain a rinsing liquid, which is different from said medicament preparation, said supplementary chamber being sealed at its rear end by means of a longitudinally moveable rear piston, and that at the front end of said cartridge is arranged a liquid by-pass conduit in a wall of said cartridge and of a length greater than a thickness of said front piston such that when said front piston is in its foremost position, said rinsing liquid is adapted to flow through said liquid by-pass conduit in said wall around said front piston and out through the outlet conduit tube and injection needle or cannula, for rinsing said outlet conduit, tube and injection needle or cannula.

**5,772,631**  
**PROCEDURE FOR ALLEVIATING ARTERIAL OBSTRUCTION**  
Norman E. Lepor, 9770 Apricot La., Beverly Hills, Calif. 90210  
Filed Apr. 28, 1995, Ser. No. 430,219  
Int. Cl.<sup>6</sup> A61M 29/00  
U.S. Cl. 604—96



2 Claims

1. A procedure for performing percutaneous transluminal coronary angioplasty (PTCA) and intra-aortic balloon (IAB) counter-propulsion with a medical device, the medical device being composed of: a guide catheter insertable into a coronary artery, said guide catheter having an outer surface and a lumen; an IAB mounted on said outer surface of said catheter; and a PTCA catheter insertable into a coronary artery through said guide catheter lumen, said PTCA catheter including an angioplasty balloon, said procedure comprising: inserting the guide catheter into the coronary artery to position the IAB into a descending aorta of the patient; inserting the PTCA catheter through the guide catheter lumen to bring the angioplasty balloon to the site of an obstruction in the coronary artery; inflating the angioplasty balloon to effect radial outward displacement of the obstruction; and responding to hemodynamic instability experienced by the patient by inflating and deflating the IAB in synchronism with the rhythm of the patient's heart.





5,772,638

## PROTECTOR FOR NEEDLE

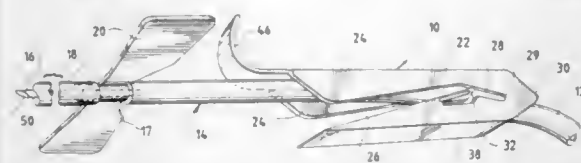
David S. Utterberg, Seattle, Wash., and William J. Schnell, Livertyville, Ill., assignors to Medisystems Technology Corporation, LaVegas, Nev.

Filed Sep. 17, 1996, Ser. No. 714,959

Int. Cl.<sup>6</sup> A61M 5/00

U.S. Cl. 604—263

28 Claims



1. A medical needle protector sheath which comprises a body having a top wall, sidewalls, a slot formed in each sidewall to receive a needle wing extending through each of said slots, said slots each defining first slot portions, each having one closed end adjacent one end of said body, said sidewalls defining at least one catch projection spaced from said closed ends of said slots to prevent needle wings that occupy said first slot portions from easily sliding away from said first slot portions, said catch projection defining an elongated member having a length greater than its width and having a first, free end that defines a wing catching tip extending into one of said slots, said elongated member being attached to the sidewall only at an elongated member end that is opposed to said first end, to permit said elongated member to flex in the sidewall plane, and further in which said elongated member extends in a direction that defines an acute angle to at least the majority of said top wall, with the first end of the elongated member facing said first slot portion.

5,772,639

## TOTAL ALIMENTARY NUTRITION CATHETER APPARATUS WITH MEANS FOR SUBCUTANEOUS DELIVERY OF ANESTHETIC AGENT OR OTHER FLUID MEDICAMENT

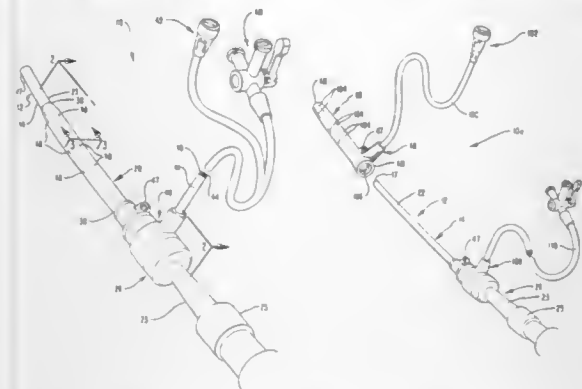
Fred P. Lampropoulos, Sandy; Jim Mottola, and Ron Stoker, both of South Jordan, all of Utah, assignors to Merit Medical Systems, Inc., South Jordan, Utah

Continuation-in-part of Ser. No. 621,017, Mar. 22, 1996, Pat. No. 5,665,076, which is a continuation of Ser. No. 417,824, Apr. 6, 1995, Pat. No. 5,533,986, which is a continuation-in-part of Ser. No. 198,625, Feb. 18, 1994, Pat. No. 5,405,334. This application Apr. 2, 1997, Ser. No. 832,396

Int. Cl.<sup>6</sup> A61M 25/00

U.S. Cl. 604—264

22 Claims



1. An indwelling catheter apparatus for providing nutrients into a patient's stomach, comprising:  
an indwelling cannula having (i) an indwelling distal end disposed within the stomach, the distal end having an exit port; (ii) a proximal hub end adapted for positioning outside of the body; and (iii) a primary lumen extending between the exit port and the proximal hub end for delivering nutrients to the stomach;

distal securing means for securing the distal end of the cannula within the stomach;  
proximal securing means for securing the proximal hub end of the cannula outside of the body; and  
delivery means for delivering fluid medicament to essentially only the area of subcutaneous tissue surrounding the cannula.

5,772,640

## TRICLOSAN-CONTAINING MEDICAL DEVICES

Shanta Modak, River Edge, N.J., and Lester Sampath, Nyack, N.Y., assignors to Trustees of Columbia University of the City of New York, New York, N.Y.

Filed Jan. 5, 1996, Ser. No. 583,239

Int. Cl.<sup>6</sup> A61M 5/32

U.S. Cl. 604—265

30 Claims

1. A hydrophilic polymeric medical article which has been impregnated, coated, or impregnated and coated with a treatment solution comprising (i) between about 1 and 10 percent of a hydrophilic polymer; (ii) between 1 and 5 percent of an anti-infective agent selected from the group consisting of chlorhexidine free base, a chlorhexidine salt, and a chlorhexidine derivative; and (iii) between 0.5 and 5 percent of triclosan.

5,772,641

## OVERLAPPING WELDS FOR CATHETER CONSTRUCTIONS

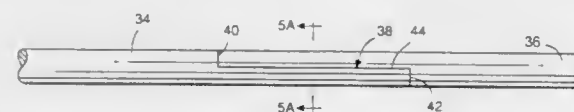
James C. Wilson, Queensbury, N.Y., assignor to Medi-Dyne Inc., Glens Falls, N.Y.

Filed Dec. 12, 1995, Ser. No. 570,941

Int. Cl.<sup>6</sup> A61M 25/00

U.S. Cl. 604—280

15 Claims



1. A catheter having at least two adjacent lengths of tubular material axially overlapped and joined together by a welded joint, said lengths having substantially identical and uniform outer diameters at and adjacent the welded joint; the catheter having a continuous external peripheral surface and a lumen extending along a longitudinal axis, and the welded joint including a seam on said external peripheral surface, at least a portion of said seam extending parallel to said longitudinal axis in between the two lengths of material such that each of said at least two adjacent lengths form substantially half of the peripheral surface of the catheter along the welded joint.

5,772,642

## CLOSED END CATHETER

Sam Ciamacco, Jr., San Diego; Mark A. Hoekwater, Carlsbad; Glen L. Lieber, Poway, and Michael A. Baker, Rancho Santa Fe, all of Calif., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Feb. 19, 1997, Ser. No. 801,987

Int. Cl.<sup>6</sup> A61M 25/00

U.S. Cl. 604—280

21 Claims

1. A closed end catheter system comprising:  
a catheter body having a proximal end and a distal end, the body defining a tool lumen sized to receive an elongated tool, the distal end of the tool lumen having a plug therein;  
a guidewire lumen extending within the catheter body and sized to receive a guidewire, the guidewire lumen extending along at least a portion of the length of the tool lumen such that the tool lumen and guidewire lumen are in a biaxial relationship;

5,772,644

## FILTER POUCH FOR STONE AND TISSUE SAMPLE COLLECTION

Jeffrey E. Bark, Green Bay, and Andrea Potokar, De Pera, both of Wis., assignors to Microtek Medical, Inc., Columbus, Miss.

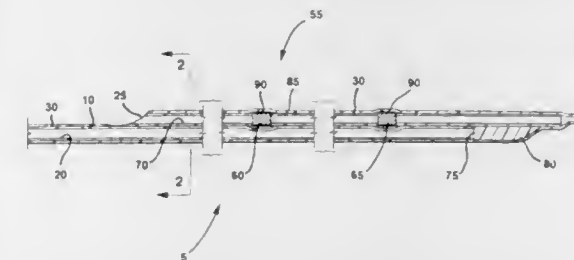
Continuation of Ser. No. 174,668, Dec. 28, 1993, abandoned.

This application Nov. 13, 1995, Ser. No. 558,926

Int. Cl.<sup>6</sup> A61M 1/00

U.S. Cl. 604—317

6 Claims



an elongated tool having a proximal end and a distal end, the elongated tool having a distal tip and a working portion near the distal tip;  
a first marker band affixed to the catheter body;  
a second marker band affixed to the catheter body and distal to the first marker band, the first and second marker bands being separated from each other by a distance not less than the length of the working portion of the tool; and  
the elongated tool extending longitudinally through the tool lumen such that when the distal end of the tool rests against the plug, the working portion of the tool is located between the first and second marker bands.



1. A disposable sample collection pouch suitable for the recovery of solid materials, such as body tissue or kidney stones, from blood, urine or other body fluids comprising:  
a. a flexible fluid-impermeable back sheet having a back sheet edge;  
b. a flexible fluid-impermeable front sheet having substantially the same size and shape as said back sheet, and having a front sheet edge sealed to said back sheet edge;  
c. a filter sheet having substantially the same size and shape as said back sheet, and having a filter sheet edge sealed between said back sheet edge and said front sheet edge, defining a sample retention chamber between said back sheet and said filter sheet and a discharge collection chamber between said filter sheet and said front sheet, said retention chamber operable to retain the solid materials;  
d. an inlet port having a first diameter and communicating with said sample retention chamber;  
e. a discharge tube having a second diameter and communicating with said discharge collection chamber, said first diameter being larger than said second diameter, said first diameter being sufficiently wide to allow entry of the solid materials into the sample retention chamber and recovery of the solid materials from the sample retention chamber after sampling; and  
f. said collection pouch is arranged so that during use said inlet port and said discharge tube are at different elevations to promote gravitational flow of fluid through said collection pouch from said inlet port to said discharge tube such that the solid materials are retained in said retention chamber.

5,772,643

## BARBED LUER ADAPTER

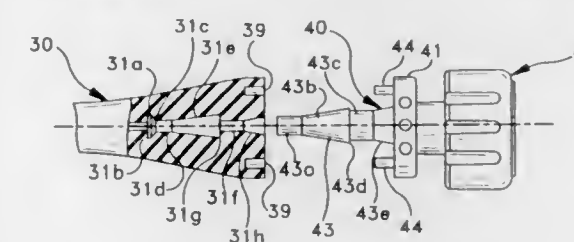
Glade H. Howell; Timothy J. Erskine, both of Sandy, and Christopher N. Cindrich, Provo, all of Utah, assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed Feb. 29, 1996, Ser. No. 608,785

Int. Cl.<sup>6</sup> A61M 5/00

U.S. Cl. 604—283

11 Claims



1. A luer adapter, comprising:  
a proximal generally tubular portion having a proximal end and a distal end;  
a flange having a proximal face and a distal face with the proximal face affixed to the distal end of the proximal generally tubular portion; and  
a barbed portion affixed to the distal face of the flange, wherein the barb has a generally cylindrical distal portion with a proximal end, a generally conical portion having a proximal end and a distal end affixed to the proximal end of the generally cylindrical distal portion, a generally cylindrical intermediate portion having a proximal end and a distal end affixed to the proximal end of the generally conical portion, and an outwardly tapered proximal portion having a proximal end affixed to the distal face of the flange and a distal end with a diameter substantially equal to a diameter of the proximal end of the generally cylindrical intermediate portion affixed to the proximal end of the generally cylindrical intermediate portion.

5,772,645

## INTRAVAGINAL EXPANDABLE MEMBER FOR PREVENTION OF VAGINAL BLEEDING

Filiberto P. Zadini, and Giorgio C. Zadini, both of 2237 Hilltop La., Camarillo, Calif. 93012

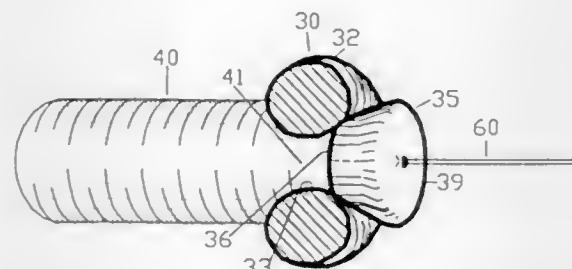
Continuation-in-part of Ser. No. 425,951, Apr. 18, 1995, Pat. No. 5,609,586. This application Oct. 16, 1995, Ser. No. 543,586

Int. Cl.<sup>6</sup> A61F 13/20

U.S. Cl. 604—358

9 Claims

8. A catamenial device for insertion into a vaginal canal having a vaginal wall, comprising:  
an absorbent member, and  
a substantially fluid-impermeable member overlaying a segment of said absorbent member to leave a substantial portion of



said absorbent member exposed for blood absorption, said substantially fluid-impermeable member being resiliently expandable to a diameter greater than a diameter of the absorbent member to sealingly engage said vaginal wall, means for preventing exit of blood from said vaginal canal through said absorbent member, said means being sealingly connected to said expandable member.

5,772,646

**ABSORBENT STRUCTURE COMPRISING A MICROBIAL POLYSACCHARIDE AND A PROCESS OF MAKING THE SAME**

Carol Ann Blaney, Roswell; Joel Brostin, Alpharetta, both of Ga.; Theresa Marie McIntire, Irvine, Calif., and Bernard Joseph Minerath, III, Oshkosh, Wis., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Division of Ser. No. 241,117, May 10, 1994, Pat. No. 5,580,241. This application Oct. 11, 1995, Ser. No. 541,049  
Int. Cl.<sup>6</sup> A61F 13/15

U.S. Cl. 604—367

35 Claims

1. An absorbent structure adapted for use in an absorbent product, said absorbent structure comprising a microbial polysaccharide, said microbial polysaccharide being produced in an aqueous medium and being produced by a process comprising the step of supercritical drying of said microbial polysaccharide.

5,772,647

Patent Not Issued For This Number

5,772,648

**ABSORBENT ARTICLE HAVING TUCKED FLAPS**

Thomas W. Osborn, III, Cincinnati, and Bruce William Lavash, West Chester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

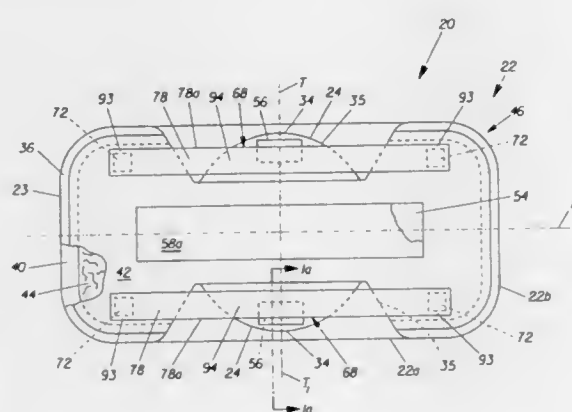
Continuation of Ser. No. 632,733, Apr. 15, 1996, abandoned, which is a continuation of Ser. No. 134,325, Oct. 7, 1993, abandoned, which is a continuation of Ser. No. 906,629, Jun. 30, 1992, Pat. No. 5,281,209. This application Nov. 4, 1996, Ser. No. 743,571

Int. Cl.<sup>6</sup> A61F 13/15; 13/20

U.S. Cl. 604—385.1

8 Claims

1. An absorbent article having a body-facing side, a garment side, two spaced apart longitudinal sides between said body-facing side and said garment side, a principal longitudinal centerline, and a principal transverse centerline, said absorbent article comprising: a main body portion having two spaced apart longitudinal edges, two spaced apart transverse edges, a first end region, a second end region, and a central region disposed between said end regions, said main body portion comprising: an absorbent assembly comprising a liquid pervious topsheet, a liquid impervious backsheet joined to said topsheet, and an absorbent core positioned between said topsheet and said backsheet; and a first retaining member and a second retaining member joined to said absorbent assembly, each of said first retain-



ing member and said second retaining member comprising two end regions, a center region positioned between and joined to said end regions, and a longitudinal edge, at least a portion of each of said end regions being joined to said absorbent assembly at a point of connection, at least a portion of said center region being decoupled from said absorbent assembly to form a first recessed area between said center region of said first retaining member and said absorbent assembly and to form a second recessed area between said center region of said second retaining member and said absorbent assembly;

a first flap and a second flap, each of said first flap and said second flap being joined along a line of juncture to said main body portion and having a proximal edge adjacent the line of juncture, a distal edge disposed away from the line of juncture, and a flap transverse centerline that passes through said central region of said main body portion, a portion of said first flap being capable of being tucked into said first recessed area and a portion of said second flap being capable of being tucked into said second recessed area; and

a zone of differential extensibility comprising a portion of at least one of said flaps that is capable of greater extensibility outward in a generally transverse direction than points on said flaps which are located along said flap transverse centerline adjacent said proximal edge of said flap.

5,772,649

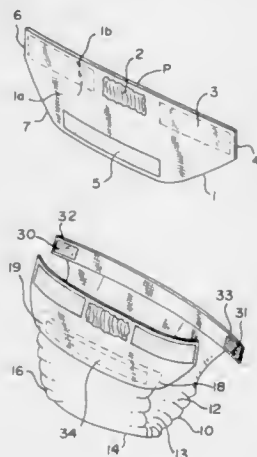
**PANEL ATTACHMENT FOR ABSORBENT UNDERGARMENTS**

Betty S. Siudzinski, 10 408 Broadfield Ct., Potomac, Md. 20854  
Continuation-in-part of Ser. No. 395,109, Feb. 27, 1995, abandoned. This application Aug. 30, 1996, Ser. No. 705,730

Int. Cl.<sup>6</sup> A61F 13/15

U.S. Cl. 604—386

11 Claims



1. A modified diaper having a panel attachment to increase the size of the diaper comprising:

5,772,651

**CONTAINER FOR DIAGNOSTIC CONTRAST COMPOSITIONS**

Christoph De Haen, Milan, and Valter Canepa, Savona, both of Italy, assignors to Dibra S.P.A., Milan, Italy

PCT No. PCT/EP95/00006, § 371 Date May 25, 1995, § 102(e) Date May 25, 1995, PCT Pub. No. WO95/19199, PCT Pub. Date Jul. 20, 1995

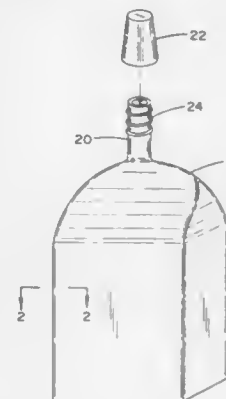
PCT Filed Jan. 3, 1995, Ser. No. 448,474

Claims priority, application Italy, Jan. 18, 1994, M194A0055

Int. Cl.<sup>6</sup> A61B 19/00

U.S. Cl. 604—403

10 Claims



1. A packaging containing a diagnostic degassed contrast aqueous composition, said composition being in the form of an air-free aqueous solution or suspension for use for oral administration of said air-free diagnostic contrast solution or suspension, said packaging comprising an air-tight collapsible container, equipped with a distributing beak having a sealing detachable cap, said diagnostic contrast composition containing an iodinated X-ray opacifying compound, said diagnostic contrast composition containing, as a contrast agent, an echographic reflecting agent or pure water.

5,772,650

**ABSORBENT SANITARY ARTICLE INCLUDING WINGS**

Satoshi Mizutani, Kawanoe, Japan, assignor to Uni-Charm Corporation, Ehime-ken, Japan

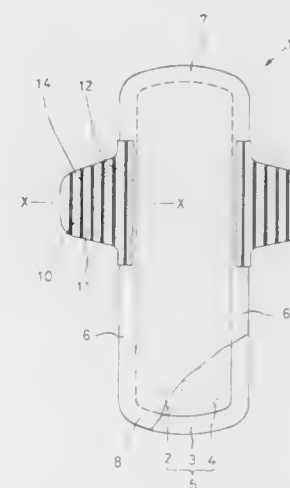
Filed May 11, 1995, Ser. No. 439,559

Claims priority, application Japan, May 13, 1994, 6-100163

Int. Cl.<sup>6</sup> A61F 13/15

U.S. Cl. 604—387

5 Claims



1. An absorbent sanitary article comprising a basic body including a liquid-permeable topsheet, a liquid-impermeable backsheet, said topsheet having a periphery secured to the backsheet, and a liquid-absorbent core disposed between, said topsheet and said backsheet, and further including a pair of wings extending laterally outwardly from transversely opposite sides of said basic body, wherein each of said wings is at least partially made of a composite sheet comprising a nonwoven fabric striped with a plurality of at least three strips of plastic film spaced apart from each other and extending substantially parallel to one another longitudinally of said article and bonded to an upper surface of said nonwoven fabric.

5,772,652

**STAB CAP FOR A VIAL HAVING A PUNCTURABLE SEAL**

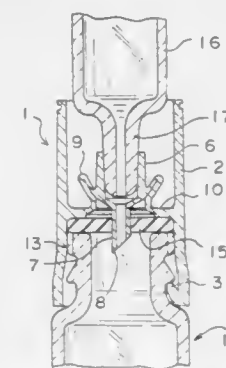
Peter M. Zielinski, Milleville, N.J., assignor to Comar, Inc., Buena, N.J.

Filed May 14, 1997, Ser. No. 827,989

Int. Cl.<sup>6</sup> A61B 19/00; D65D 39/00

U.S. Cl. 604—411

7 Claims



1. The combination of a stab cap and a vial having a puncturable seal, said stab cap comprising an open-ended sleeve, a transverse annular wall integral with the interior surface of the sleeve dividing the sleeve into an upper portion and a lower portion, a tubular body member positioned in the upper portion of the sleeve and coaxial therewith, an integral depending tubular portion extending downwardly from the tubular body member, said depending tubular portion terminating in a sharp end portion, a plurality of flexible fingers having opposite end portions integral with tubular body member and the annular wall, a plurality of upwardly inclined



flexible tabs integral with the open-ended sleeve at the lower end thereof; a vial having an open neck portion, at least one shoulder having an under surface provided on said neck portion, the inclined flexible tabs engaging the under surface of said shoulder, a puncturable seal having an upper surface and a lower surface, the lower surface of the seal being mounted on the open end of said vial, the annular wall in said sleeve engaging the upper surface of said seal, whereby when a hub of a syringe barrel is inserted into the tubular body member and pushed downwardly, the flexible fingers fold back on themselves to thereby allow the tubular body member to move downwardly relative to the open-ended sleeve, thereby causing the sharp end portion to puncture the seal.

5,772,653

Patent Not Issued For This Number

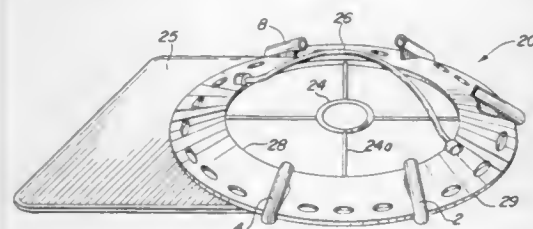
5,772,654

APPARATUS FOR BREAST REDUCTION SURGERY  
Horacio A. Leyva, 16000 Kingsmoore Way, Miami Lakes, Fla. 33014

Filed Nov. 8, 1995, Ser. No. 555,636  
Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—1

21 Claims



12. A breast reduction apparatus to be used during a surgery to reduce the size of a breast, the breast having a nipple, an areola and superior and inferior portions; said apparatus comprising:

a substantially circular, generally flat yet dome shaped shield body;

said shield body having an inner edge and an outer edge, and having a circular opening extending therethrough bounded by said inner edge;

said shield body being sized, dimensioned and configured to substantially correspond an areola of a breast and said opening being sized, dimensioned and configured to reveal a large portion of an areola therethrough;

means for positioning and centering said shield body on a nipple of a breast about an areola;

means for removably fastening said shield body to a breast; means for lifting said shield body after being fastened to a breast;

said shield body including a plurality of angled guides formed on an upper surface thereof and generally along and near said outer edge of said shield body;

a plurality of elongated tubular structures, each elongated tubular structure having a top open end, a bottom open end, and being hollow between said ends, each of said elongated tubular segments being secured to a corresponding one of said angled guides;

said angled guide disposing said elongated tubular structures at a predetermined angle to said shield body, and

a marker having a bovie, an open tip and a stopper, said open tip being structured and disposed to penetrate beneath an epidermal layer of breast tissue, said marker being sized, dimensioned and structured for insertion first into and passage through said elongated tubular structures and then into a breast thereby opening a marking track into a breast secured underneath said shield body, said stopper of said marker being

positioned on said marker so that said open tip extends a maximum pre-selected distance below said bottom open end of said tubular structure when said marker is fully inserted into said tubular structure such that said marker is prevented from opening a marking track, into a breast, of greater length than is desired.

5,772,655

MEDICAL INSTRUMENT WITH A TILTING DISTAL END  
Otmar Bauer, Kludenbach, and Manfred Boebel, Oetisheim, both of Germany, assignors to Richard Wolf GmbH, Knittlingen, Germany

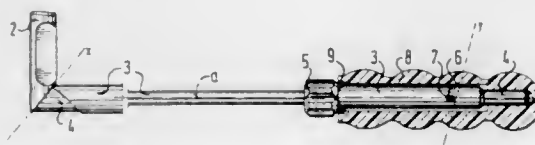
Filed May 13, 1996, Ser. No. 648,528

Claims priority, application Germany, May 19, 1995, 195 183 88.6

Int. Cl.<sup>6</sup> A61B 17/02

U.S. Cl. 606—1

8 Claims



1. A medical instrument comprising a distal end piece (2) which is connected to a holder (4) that extends through a shank (3), the shank (3) and the holder (4) having a longitudinal axis (a), a handle (5) is connected to the shank (3) for adjustment of the distal end piece (2) from a rest position to an operating position by tilting relative to the longitudinal axis (a) of the instrument, the end piece (2) and the holder (4) include ends which lie slidably against one another in a plane (x) running inclined to the longitudinal axis (a) as well as to a perpendicular (b) to the longitudinal axis (a), the end piece (2) and the holder (4) are pivotally connected with a fastening element (12) which forms an axis perpendicular to the plane (x), about which the end piece (2) is pivotable relative to the holder (4) upon movement of the handle (5) relative to the holder (4).

5,772,656

CALIBRATION APPARATUS FOR LASER ABLATIVE SYSTEMS

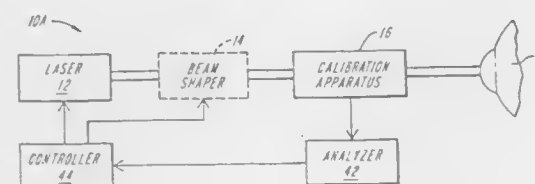
Peter J. Klopotek, Framingham, Mass., assignor to Summit Technology, Inc., Waltham, Mass.

Continuation of Ser. No. 72,505, Jun. 4, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 483,569

Int. Cl.<sup>6</sup> A61N 5/06

U.S. Cl. 606—12

45 Claims



1. An apparatus for measuring the properties of a surgical laser beam comprising a photoreactive element having a composition including at least one layer of dye-impregnated material having a non-uniform distribution of dye through the layer which reacts with laser radiation in a manner dependent upon an intensity profile of the laser beam and an optical sensing element for determining changes in the beam.

5,772,657

SIDE FIRING FIBER OPTIC LASER PROBE

Michael Hmelar, Palo Alto, and Nubar Manoukian, Cupertino, both of Calif., assignors to Coherent, Inc., Santa Clara, Calif.

Continuation of Ser. No. 427,173, Apr. 24, 1995, abandoned.

This application Jan. 8, 1997, Ser. No. 781,933

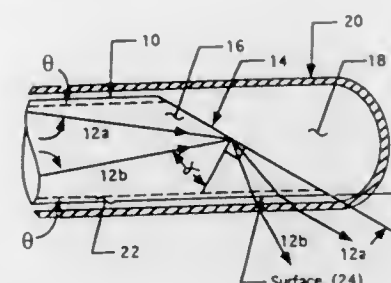
Int. Cl.<sup>6</sup> A61B 17/36

U.S. Cl. 606—15

32 Claims

U.S. Cl. 606—34

9 Claims



1. A fiber optic probe for delivering laser light comprising: an optical fiber having an input end and a delivery end, with the delivery end including a means for redirecting light travelling down the fiber in a direction transverse to a longitudinal axis of the fiber in a manner to exit the fiber through a side surface thereof; and

said fiber includes a central core and an outer clad having a first radius of curvature, wherein a portion of the outer clad forming the side surface of the fiber is provided with a beam controlling surface to control at least one of divergence, convergence and collimation of the laser light passing through said side surface, said beam controlling surface having a second radius of curvature that is different than said first radius of curvature.

5,772,658

SIDE-EMITTING OPTICAL FIBERS FOR LASERS

Ellie Konwitz, Ramat Gan, Israel, assignor to Laser Industries, Ltd., Tel Aviv, Israel

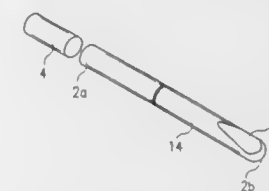
Filed Dec. 19, 1995, Ser. No. 574,552

Claims priority, application Israel, Dec. 20, 1994, 112087

Int. Cl.<sup>6</sup> A61N 5/06

U.S. Cl. 606—15

22 Claims



1. A side-emitting optical fiber that has a longitudinal axis in a direction of elongation comprising a proximal end for receiving radiation and a distal end for emitting the radiation via a radiation exit region at said distal end; the distal end having an outer surface formed with a visually discernible surface formation that defines a configuration that is elongated in the direction of elongation of the fiber and that increasingly narrows in dimension toward one of the ends to thereby enable visually discerning the orientation of the optical fiber with respect to the radiation exit region thereof the configuration having a maximum width transverse to the direction of elongation that is substantially smaller than a diameter of the fiber.

5,772,659

ELECTROSURGICAL GENERATOR POWER CONTROL CIRCUIT AND METHOD

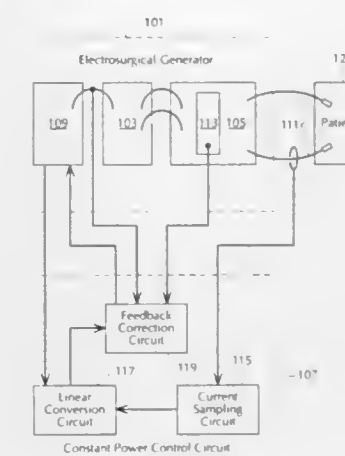
Daniel J. Becker, Broomfield, Colo., and Michael Steve Klicek, Troy, Mich., assignors to Valleylab Inc., Boulder, Colo.

Filed Sep. 26, 1995, Ser. No. 533,891

Int. Cl.<sup>6</sup> A61B 17/38

U.S. Cl. 606—34

9 Claims



1. A constant power control circuit for use in an electrosurgical generator having a power selection system that produces a control voltage signal to control a high voltage direct current supply which supplies a high voltage signal to an output switching radio frequency stage thereby creating an electrosurgical energy between two output electrodes, the constant power control circuit comprising:

a current sampling circuit inductively coupled to one output electrode, the current sampling circuit producing a sampled current signal proportional to an average current flowing through the output electrode;

a linear conversion circuit electrically connected to the current sampling circuit for generating a linear converted signal, wherein the linear conversion circuit includes:

a linear multiplier generating means for generating a multiplier reference signal;

a linear offset generating means for generating an offset reference signal;

a multiplier, electrically connected to the linear multiplier generating means, for multiplying the sampled current signal and the multiplier reference signal to produce a multiplied signal; and

a summer, electrically connected to the linear offset generating means, for summing the offset reference signal and the multiplied signal to produce the linear converted signal; and

a feedback correction circuit electrically connected to receive the linear converted signal from the linear conversion circuit and the control voltage signal from the power selection system for producing a feedback control signal which is supplied to the power selection system to control the amount of electrosurgical energy created, wherein the feedback correction circuit includes:

a subtractor, electrically connected to receive the linear converted signal and the control voltage signal, for determining a difference in amplitude between the control voltage signal and the linear converted signal and producing a delta signal proportional to the difference; and an adder, electrically connected to receive the delta signal and the control voltage signal, for adding the delta signal to the control voltage signal and producing the feedback control signal.

5,772,660

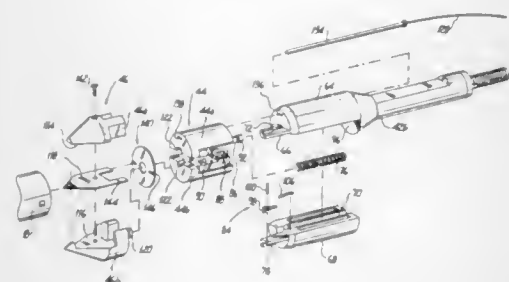
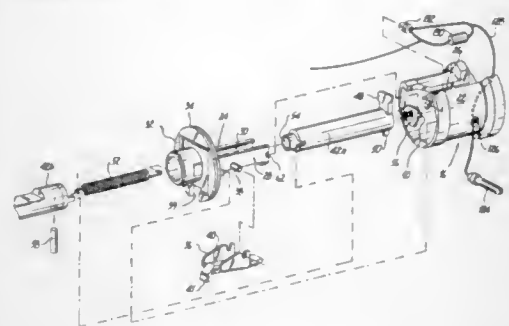
**TROCAR ASSEMBLY WITH ELECTROCAUTERY PENETRATING TIP**

Wayne P. Young, Brewster, N.Y.; Dominick L. Mastri, Bridgeport, and Darryl S. Pereira, Monroe, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn. Continuation of Ser. No. 407,342, Mar. 20, 1995, abandoned. This application Apr. 14, 1997, Ser. No. 834,085

Int. Cl.<sup>6</sup> A61B 17/36

U.S. Cl. 606—42

27 Claims



1. A trocar for penetrating a body wall, which comprises: a housing portion; obturator shaft at least partially extending from the housing portion and defining a longitudinal axis, the obturator shaft having proximal and distal ends; a conductor element connected to the obturator shaft and extending at least partially along the obturator shaft for conducting energy from an energy source; and a conductive tip member disposed adjacent the distal end of the obturator shaft for penetrating tissue, the conductive tip member mounted for axial movement relative to the obturator shaft between a first position to cause the conductive tip member to be in electrical communication with the conductor element and a second position to cause the conductive tip member to be electrically disassociated from the conductor element.

5,772,661

**METHODS AND INSTRUMENTATION FOR THE SURGICAL CORRECTION OF HUMAN THORACIC AND LUMBAR SPINAL DISEASE FROM THE ANTERO-LATERAL ASPECT OF THE SPINE**

Gary Karlin Michelson, 438 Sherman Canal, Venice, Calif. 90291

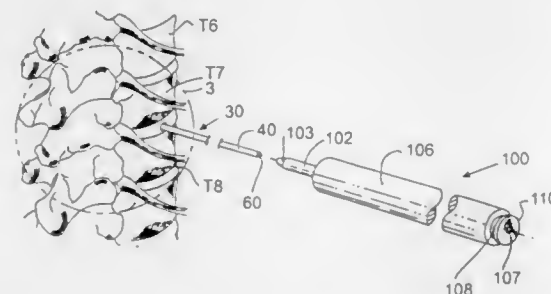
Continuation-in-part of Ser. No. 74,781, Jun. 10, 1993, which is a continuation-in-part of Ser. No. 698,674, May 10, 1991, which is a division of Ser. No. 205,935, Jun. 13, 1988, Pat. No. 5,015,247, and a continuation-in-part of Ser. No. 219,626, Mar. 28, 1994. This application Feb. 27, 1995, Ser. No. 394,836

Int. Cl.<sup>6</sup> A61B 17/56

U.S. Cl. 606—61

87 Claims

1. A method for inserting an interbody intraspinal implant into a disc space between adjacent vertebrae located within a human thoracic and lumbar spine having an anterior aspect and a posterior aspect being divided by a plane through transverse processes of the adjacent vertebrae, and having a lateral aspect, the method comprising the steps of:



- penetrating from a position anterior to the transverse processes the lateral aspect of a spinal disc intermediate the adjacent vertebrae; removing from between the adjacent vertebrae at least a portion of the spinal disc to form a laterally facing opening; and inserting from a position anterior to the transverse processes of the adjacent vertebrae said implant into the laterally facing opening.

5,772,662

**FEMORAL FIXATION SYSTEM**

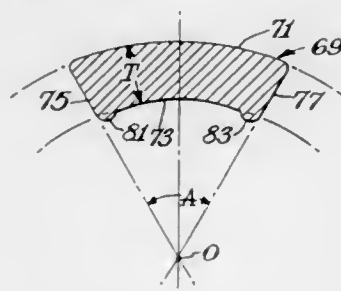
Michael W. Chapman, Sacramento, Calif.; Charles C. Edwards, Baltimore, Md., and Dana C. Mears, Oakmont, Pa., assignors to Howmedica Inc., New York, N.Y.

Continuation of Ser. No. 301,210, Sep. 19, 1994, abandoned, which is a division of Ser. No. 948,193, Sep. 21, 1992, Pat. No. 5,364,398, which is a division of Ser. No. 670,839, Mar. 18, 1991, Pat. No. 5,190,544, which is a division of Ser. No. 232,188, Aug. 15, 1988, Pat. No. 5,041,114, which is a division of Ser. No. 877,626, Jun. 23, 1986, Pat. No. 4,776,330. This application Dec. 6, 1996, Ser. No. 761,476

Int. Cl.<sup>6</sup> A61B 17/80

U.S. Cl. 606—69

5 Claims



1. An elongated plate adapted to be secured to a patient's bone, said plate having an upper surface, a lower surface intended to be adjacent the patient's bone in use and two side surfaces connecting the upper and lower surfaces, wherein said upper and lower surfaces are defined in transverse bone plate cross-sections by arcs of two concentric circles and said two side surfaces are defined therein by two straight lines which, when extended, form an angle bisected by a diametrical line of said concentric circles, said plate comprising two parallel integral rails extending downwardly along substantially the entire length of the plate, with said rails being located at opposite sides of said lower surface, whereby only said rails contact the patient's bone when the bone plate is secured thereto, with the thickness of the plate being substantially constant between the two side surfaces at positions where no apertures and no rails are present, the width of the upper surface being greater than the width of the lower surface, said side surfaces being tapered inwardly toward one another from said upper surface to said lower surface, said side surfaces forming acute angles with said upper surface and said side surfaces forming obtuse angles with said bottom surface, with said bone plate being adapted to be secured to the patient's bone by means of bone fasteners received in apertures in the bone plate.

5,772,663

**SURGICAL DEVICE FOR BANDING BONE WITH CABLE**

Leo A. Whiteside, 14825 Sugarwood Trail, Chesterfield, Mo. 63017, and Stephen E. White, 1147 Richland Meadows Dr., Ballwin, Mo. 63021

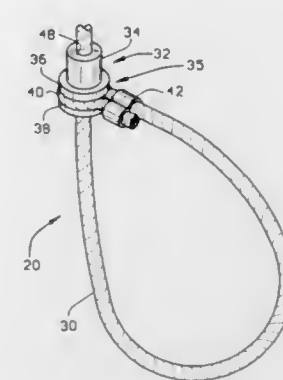
Continuation of Ser. No. 197,738, Feb. 17, 1994, abandoned.

This application Mar. 17, 1997, Ser. No. 818,277

Int. Cl.<sup>6</sup> A61B 17/56

U.S. Cl. 606—74

20 Claims



1. A cable strap for banding a bone, said cable strap comprising: a flexible cable for encircling the bone, said cable having at least two ends spaced by a length; and a fastener including a cable channel on an exterior surface pre-affixed to one of the cable ends, said cable end being threaded within said cable channel, said fastener being configured to be secured to said cable at a non-differentiated point along the cable length to thereby form a band about the bone, said fastener including a ferrule through which said cable is passed to form said band.

5,772,664

**INSTRUMENT FOR HARVESTING BONE GRAFTS HAVING SUBSTANTIALLY CYLINDRICAL BONE PLUGS**

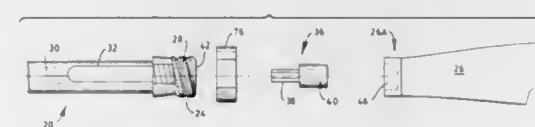
Allen H. DeSatnick; Ella Zaslavsky, both of Marblehead, and Herbert Marcus, Chelmsford, all of Mass., assignors to Wright Medical Technology, Inc., Arlington, Tenn.

Filed Feb. 12, 1997, Ser. No. 798,108

Int. Cl.<sup>6</sup> A61B 17/56

U.S. Cl. 606—80

12 Claims



1. An instrument for harvesting a bone-patella tendon-bone graft having bone plugs which are substantially cylindrical for substantially their entire length, said instrument comprising a substantially cylindrical tube extending along a central axis between a cutting end and a drive end, said tube including first and second elongated interlocking detachable elements, each of said elements including an elongated cylindrical shell portion extending from said cutting end toward said drive end, wherein said first and second elements, when interlocked, are biased towards each other and establish a cutting edge extending fully about said axis, wherein said first element includes a coupler at said drive end adapted for releasable engagement with a rotatable driver, and wherein said second element includes an axially extending slot near said drive end.

5,772,665

**DEVICE FOR MIXING A PHARMACEUTICAL COMPOSITION WITH AN OTHER AGENT**

Håkan Lars Christer Glad, Åsa; Tore Anders Kers, Södertälje, and Mats Anders Rudén, Askim, all of Sweden, assignors to Astra Aktiebolag, Södertälje, Sweden

PCT No. PCT/SE94/00996, § 371 Date Jan. 6, 1995, § 102(e) Date Jan. 6, 1995, PCT Pub. No. WO95/12424, PCT Pub. Date May 11, 1995

Continuation of Ser. No. 360,797, Jan. 6, 1995, abandoned.

This PCT application Oct. 24, 1994, Ser. No. 970,235

Claims priority, application Sweden, Nov. 3, 1993, 9303630.9; Mar. 25, 1994, 9401010

Int. Cl.<sup>6</sup> A61M 37/00

U.S. Cl. 604—82

14 Claims



1. A syringe for storing a pharmaceutical composition in a dry state and for mixing the composition with fluid prior to delivery, the syringe comprising: a hollow body having an outlet sealed by a removable closure; a plunger displaceably accommodated in the hollow body and in sealing contact with an inner wall of the hollow body; a chamber defined by the plunger, the inner wall of the hollow body, and the removable closure, the chamber for storing the pharmaceutical composition; a filling conduit communicating with the chamber through an inlet port located on an interior surface of the chamber; actuating means for displacing said plunger, said actuating means comprising a tubular rod integral with the plunger, said tubular rod having an inner room forming a filling compartment for storing the fluid and having gradation lines for measuring the fluid in said filling compartment, said filling compartment communicating with said filling conduit; and a check valve for permitting fluid flow into the chamber but preventing fluid flow out of the chamber, the check valve comprising a diaphragm disposed in the chamber and covering the inlet port on the interior surface of the chamber, the diaphragm having one or more slits cut therein. the diaphragm covering and sealing the inlet port and having a portion lying against the interior surface of the chamber adjacent to the inlet port when the flap is at rest, and the diaphragm constructed of a resilient material that will deflect when subjected to a force and return to an original state after termination of the force, wherein the diaphragm deflects inwardly into the chamber when subjected to an inwardly directed force causing an opening in diaphragm at the slits, and wherein the interior surface of the chamber adjacent to the inlet inhibits the diaphragm from deflecting outwardly.



5,772,666

**DEFORMABLE INTRAOCULAR LENS INJECTING APPARATUS WITH DEFORMABLE TIP PLUNGER**

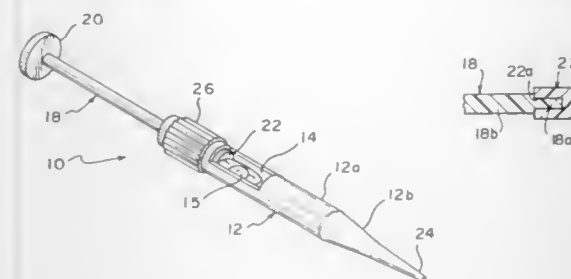
Vladimir Feingold, Laguna Niguel, and Daniel C. Eagles, Capistrano Beach, both of Calif., assignors to Staar Surgical Company, Inc., Monrovia, Calif.

Continuation-in-part of Ser. No. 547,908, Oct. 25, 1995, Pat. No. 5,616,148, and a continuation-in-part of Ser. No. 449,103, May 24, 1995, and a continuation-in-part of Ser. No. 403,530, Mar. 14, 1995, and a continuation-in-part of Ser. No. 401,523, Mar. 10, 1995, and a continuation-in-part of Ser. No. 368,792, Jan. 4, 1995, and a continuation-in-part of Ser. No. 345,360, Nov. 18, 1994, abandoned, and a continuation-in-part of Ser. No. 197,604, Feb. 17, 1994, Pat. No. 5,499,987, and a continuation-in-part of Ser. No. 196,855, Feb. 15, 1994, and a continuation-in-part of Ser. No. 953,251, Sep. 30, 1992. This application Dec. 11, 1995, Ser. No. 570,564

Int. Cl.<sup>6</sup> A61F 9/00

U.S. Cl. 606—107

11 Claims



1. A deformable intraocular lens injecting apparatus for implanting a deformable intraocular lens in an eye, comprising:

- a body portion having a lens delivery passageway;
- a movable plunger disposed within said body portion, said movable plunger including a deformable tip configured for advancing through the lens delivery passageway and forcing a deformable intraocular lens loaded in the lens injecting apparatus through the lens delivery passageway into the eye, said deformable tip being made of an expandable material that can absorb liquid and swell.

5,772,667

**METHOD OF USING AN INTRAOCULAR LENS INJECTOR**

Larry W. Blake, Cota de Caza, Calif., assignor to Pharmacia Iovision, Inc., Irvine, Calif.

Continuation of Ser. No. 466,037, Jun. 6, 1995, Pat. No. 5,643,275, which is a division of Ser. No. 86,930, Jul. 2, 1993, Pat. No. 5,468,246. This application Nov. 14, 1996, Ser. No. 749,947

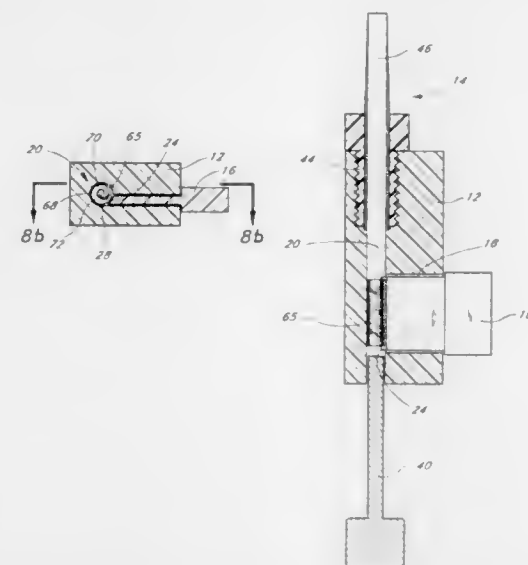
Int. Cl.<sup>6</sup> A61B 17/00; A61F 2/16

U.S. Cl. 606—107

2 Claims

1. A method of rolling an intraocular lens upon itself, comprising the steps of:

- pushing one edge of said lens to slide a portion of said lens in the direction of said pushing; and



guiding an opposite edge of said lens into contact with the center of said lens to roll said lens upon itself while said lens is sliding.

5,772,668

**APPARATUS FOR PLACING AN ENDOPROSTHESIS**

David Paul Summers, Montgomery, and Gary R. Ball, Spring, both of Tex., assignors to American BioMed, Inc., The Woodlands, Tex.

Continuation-in-part of Ser. No. 367,239, Dec. 16, 1994, Pat. No. 5,607,445, which is a continuation-in-part of Ser. No. 900,896, Jun. 18, 1992, Pat. No. 5,342,387. This application Jun. 7, 1995, Ser. No. 472,521

Int. Cl.<sup>6</sup> A61F 2/06

U.S. Cl. 606—108

11 Claims



- 8. A system for deploying a stent, comprising:
  - a cylindrical support device supporting first and second retainers axially spaced apart thereon;
  - a stent comprising an endless loop of material, said stent wrapped around said support device and extending between said retainers, said endless loop comprising a pair of separate legs connected by a pair of cusps, each of said cusps engaging one of said retainers, the engagement of said cusps with said retainers maintaining said stent in wrapped relationship to said device such that when said retainers are disengaged from said stent, said cusps are released and said stent is thereby released from said device.

5,772,669

**STENT DEPLOYMENT CATHETER WITH RETRACTABLE SHEATH**

Anthony C. Vrba, Maple Grove, Minn., assignor to Scimed Life Systems, Inc., Maple Grove, Minn.

Filed Sep. 27, 1996, Ser. No. 722,834

Int. Cl.<sup>6</sup> A61F 11/00

U.S. Cl. 606—108

9 Claims

- 4. A stent delivery system comprising:
  - an elongate flexible catheter comprised of an outer tube of predetermined length having proximal and distal ends and an



inner tube of greater length, the inner tube being carried within the outer tube and a portion of the inner tube extending beyond the distal end of the outer tube, the inner tube being relatively non-compressible;

- a distal tube having proximal and distal ends and being received over the portion of the inner tube extending beyond the distal end of the outer tube, the proximal end of the distal tube being slidably received into the distal end of the outer tube, the distal end of the distal tube terminating proximally of the distal end of the inner tube to leave a mounting area for a stent on the inner tube;

- a manifold and slide mechanism arranged at the proximal ends of the outer and inner tubes;
- a stent having a proximal end and a distal end concentrically carried by the inner tube in the mounting area thereof;
- a bumper carried by the inner tube and affixed to the inner tube at a position adjacent the proximal end of the stent;
- a sheath having proximal and distal ends concentrically arranged about the stent, the proximal end of the sheath being affixed to the distal end of the distal tube;

- pull collar carried by the inner tube for movement thereon in a proximal direction, the collar being positioned proximal of the bumper and interiorly affixed to the sheath near its proximal end for retracting the sheath;

- pull wire means having a proximal end and a distal end extending from the proximal end portion of the outer tube and therethrough and into and through the distal tube, the distal end of the wire means being connected to the pull collar, the proximal end of the wire means being connected to the slide mechanism whereby, upon movement of the slide mechanism in a proximal direction, the pull wire means moves the pull collar in a proximal direction to retract at least the proximal end of the distal tube into the distal end of the outer tube thereby initiating release of the stent from the catheter.

5,772,670

**FORCEPS FOR THE SURGICAL INTRODUCTION OF CATHETERS AND THE LIKE**

Ramón Bofill Brosa, Passatge Jardiner, 8, 08190 Valldoreix, Spain

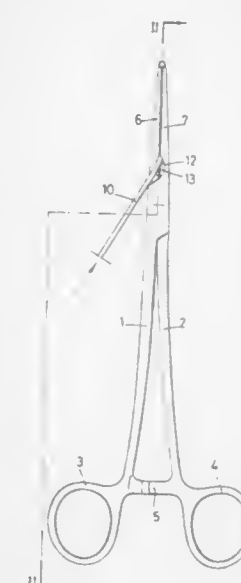
Filed Jun. 18, 1997, Ser. No. 878,205

Int. Cl.<sup>6</sup> A61B 17/28

U.S. Cl. 606—108

2 Claims

- 1. Forceps for the surgical introduction of a flexible tubular element, comprising: first and second elongate elements, each of said elongate elements having at one end an opening for insertion of a finger and at an opposite end a curved jaw member having a semi-cylindrically shaped groove along a length of said jaw member, said elongate elements being pivotally connected at a pivot point and being configured such that, in a closed position, said grooves in said jaw members are opposed and define a tubular channel for gripping and guiding said flexible tubular element, said forceps further comprising, in said closed position, substantially elliptically-shaped orifices on opposing sides of said forceps and



5,772,671

**DEVICE FOR IMPLANTING ARTICLES UNDER SKIN**

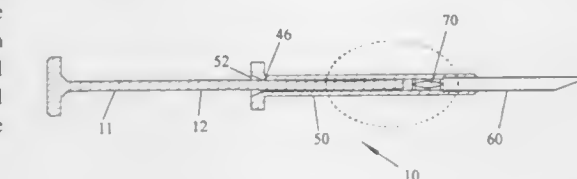
John C. Harmon, Eau Claire, Wis., assignor to Mark L. Anderson, Spring Valley, Wis.

Filed Jan. 13, 1997, Ser. No. 782,125

Int. Cl.<sup>6</sup> A61B 17/00; A61M 31/00

U.S. Cl. 606—117

5 Claims



1. An implanter for implanting microchips, medicans, or other articles under the skin of animals or humans comprising:

- (a) a body having a tubular structure with a distal end, a proximal end, and an interior wall defining a central bore for receiving a push rod and an article to be implanted;
- (b) a hollow needle attached to said distal end of said body and extending distally from said body; and
- (c) a push rod having:
  - (i) a rod element having a central axis, a proximal end and a distal end, said distal end of said rod element having a length bent away from said central axis; and
  - (ii) a knob element disposed on said proximal end of said rod element; said push rod being received by said central bore of said body at said proximal end of said body, said push rod being operationally disposed in said central bore of said body whereby said interior wall of said body induces bending of said bent length of said distal end of said push rod to cause said push rod to be frictionally retained against said interior wall of said body.

5,772,672

## ENDOSCOPIC SUTURE PASSER

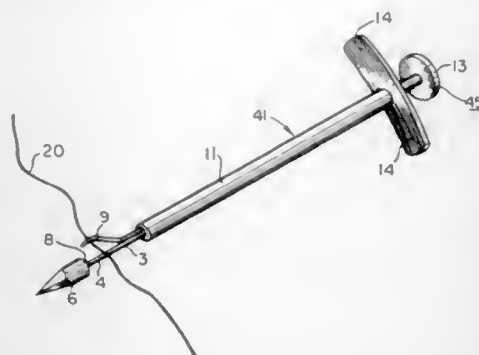
Frederick K. Toy; Roy T. Smoot, and Robert H. LaPrad, all of Seaford, Del., assignors to W.L. Gore & Associates, Inc., Newark, Del.

Division of Ser. No. 377,762, Jan. 24, 1995, Pat. No. 5,618,290, which is a continuation-in-part of Ser. No. 14,349, Oct. 19, 1993, Pat. No. Des. 368,776. This application Apr. 3, 1997, Ser. No. 834,757

Int. Cl.<sup>6</sup> A61B 17/04

U.S. Cl. 606—139

12 Claims



1. A suturing device having a proximal end with a handle and a pointed distal end, comprising:  
a needle having a shaft;  
a suture-receiving receptacle on said shaft proximal to said pointed distal end; and  
a latch on said shaft displaceable between open and closed positions for opening and closing said receptacle, said latch being spring-biased to the open position;  
said handle comprising means for operating said latch.

5,772,673

## APPARATUS FOR APPLYING SURGICAL CLIPS

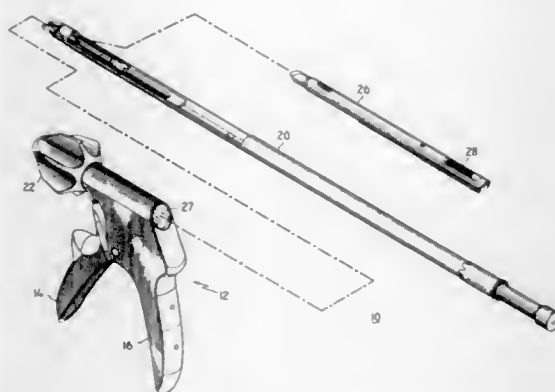
Douglas J. Cuny, Bethel; Ernie Aranyi, Easton; Scott W. Reed, Shelton, and Vinod C. Nagori, Trumbull, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Mar. 7, 1996, Ser. No. 611,962

Int. Cl.<sup>6</sup> A61B 17/10

U.S. Cl. 606—142

23 Claims



1. An apparatus for application of surgical clips to body tissue, which comprises:  
a) a handle assembly;  
b) an elongated body portion extending distally from the handle assembly;  
c) a jaw assembly mounted at a distal end portion of the elongated body portion, the jaw assembly including first and second jaws movable between an open position and a closed position;

- d) an actuator slidable within the elongated body portion in response to actuation of the handle assembly, the actuator having camming structure at a distal portion thereof for moving the first and second jaws between the open position and the closed position; and  
e) a loading unit releasably mounted to the elongated body portion and storing a plurality of surgical clips therein; the loading unit including:  
i) a clip advancer having a portion engageable with the actuator and movable therewith for advancing a distalmost surgical clip; and  
ii) a ratchet assembly positioned adjacent to the clip advancer, the ratchet assembly being in operative engagement with the clip advancer to index progressive movement thereof.

5,772,674

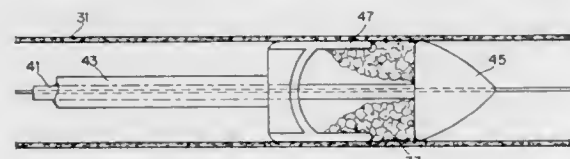
## CATHETER FOR REMOVAL OF CLOTS IN BLOOD VESSELS

Fred K. Nakhjavan, 914 Morgan Rd., Rydal, Pa. 19046  
Filed Mar. 31, 1997, Ser. No. 829,381

Int. Cl.<sup>6</sup> A61B 17/22

U.S. Cl. 606—159

17 Claims



6. A device for removal of a thrombus in a vessel, the device comprising a delivery catheter and a receiving catheter, the delivery catheter and receiving catheters being provided as a unit but being separable from each other, both the delivery catheter and the receiving catheter having distal ends, the distal end of the delivery catheter having a balloon, the device including means for deflating the balloons, the balloon of the receiving catheter being permanently positioned at the distal end of the receiving catheter so that the balloon of the receiving catheter does not move longitudinally relative to the receiving catheter, wherein the balloon of the receiving catheter includes means for forming a cup-shaped receptacle when the balloon of the receiving catheter is inflated, and wherein the receiving catheter and the deflating means comprise means for withdrawing the balloon of the receiving catheter, from the vessel, without insertion of said balloon into any other catheter.

5,772,675

## POSITIONING ASSEMBLY FOR RETAINING AND POSITIONING A CORNEA

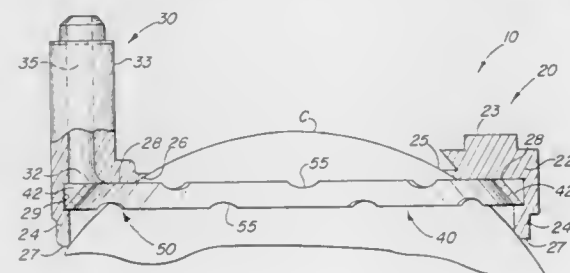
Johann F. Hellenkamp, Miami, Fla., assignor to Chiron Vision Corporation, Claremont, Calif.

Filed Oct. 31, 1996, Ser. No. 741,955

Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—166

26 Claims



1. A positioning assembly for retaining and positioning a cornea of a patient's eye for cutting during a surgical operation, said assembly comprising:

- a) a positioning ring having an aperture sized to receive and expose the cornea therethrough, said positioning ring including a vacuum port connected to and in fluid communication with a vacuum means for providing a suction force sufficient to temporarily attach said positioning ring to the eyeball about the cornea;  
b) a suction enhancement member including a segment structured and disposed to engage the positioning ring, so as to be disposed at least partially between said vacuum port of said positioning ring and the eyeball to be cut during surgery;  
c) said segment including at least one suction port and being structured to engage said positioning ring so as to define a suction channel between said positioning ring and said segment;  
d) said suction channel being disposed in fluid flow communication with said vacuum port of said positioning ring such that upon actuation of the vacuum means, the suction force is applied through said vacuum port and to said suction channel; and  
e) said segment being structured to maintain a flow-through integrity of said suction channel upon actuation of the vacuum means and temporary attachment of the positioning ring to the eyeball.

5,772,676

## ENDOSCOPIC CUTTING DEVICE

Alfred Cuschieri, and Tim Frank, both of Dundee, Great Britain, assignors to Karl Storz GmbH & Co., Tuttlingen, Germany

PCT No. PCT/DE95/00166, § 371 Date Feb. 16, 1996, § 102(e) Date Feb. 16, 1996, PCT Pub. No. WO95/20918, PCT Pub. Date Aug. 10, 1995

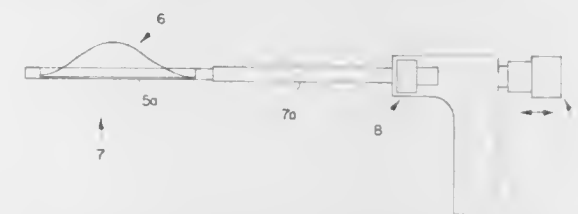
PCT Filed Feb. 7, 1995, Ser. No. 532,685

Claims priority, application Germany, Feb. 7, 1994, 44 03 602.7

Int. Cl.<sup>6</sup> A61B 17/32

U.S. Cl. 606—167

8 Claims



1. An endoscopic cutting device for severing tissue, said instrument having a longitudinal axis, a proximal end and a distal end, said cutting device comprising:  
a support extending axially from said distal end to said proximal end;  
a cutting blade mounted to said support, said blade having a cutting edge which extends axially from a location adjacent to said distal end;  
an actuator slidably mounted to said support for axial movement parallel to said cutting blade;  
a band having a distal end and a proximal end, its distal end being attached to said support adjacent to the distal end of said support, and its proximal end being attached to said actuator, said band being elastic, and in its relaxed shape being formed as an arch, overhanging said cutting blade to form an opening to receive tissue which is to be severed, said band having shape-restoring properties tending to return the band to its arch shape when distortive forces are removed; whereby, with said band in its relaxed shape, said actuator may be moved toward the proximal end of the instrument, thereby drawing the band and tissue inside said opening toward the support, severing the tissue as it engages the cutting blade, the attachment of the band to the support and to the actuator

being closer to the support than the cutting edge of the cutting blade so all of the tissue to be severed is forced past the cutting edge.

5,772,677

## INCISION DEVICE CAPABLE OF AUTOMATIC ASSEMBLY AND A METHOD OF ASSEMBLY

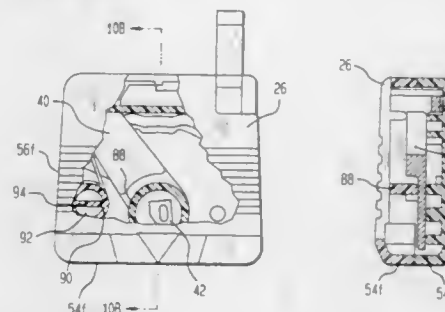
James A. Mawhirt, Brooklyn, N.Y.; Anthony F. Kuklo, Jr., Bridgewater, N.J.; Christopher R. Vander Wal, Oakland, N.J., and Peter J. Sklenar, Somerville, N.J., assignors to International Technidyne Corporation, Edison, N.J.

Filed Sep. 24, 1996, Ser. No. 718,774

Int. Cl.<sup>6</sup> A61B 17/14

U.S. Cl. 606—181

8 Claims



1. A method of assembling a skin incision apparatus, comprising the following steps:  
providing a housing having at least first and second housing sections, each housing section having a base, the first housing section having a cam and a pivot point carried by the base;  
installing a moveable arm having a pin and an opening on the first housing section with the pin of the moveable arm received by the cam on the base and the opening receiving the pivot point of the housing;  
installing a spring bias means on a spring carrying means;  
installing the spring carrying means on the first housing section;  
installing the second housing section over the first housing section such that the moveable arm, the spring bias means, and the spring carrying means are interposed between the bases of the housing sections, wherein a portion of the spring carrying means contained within the housing is externally accessible; and  
rotating the portion of the spring carrying means which is externally accessible to move the spring bias means from an installation position to a loaded position after the second housing section has been installed over the first housing section.

5,772,678

## RETRACTABLE DISPOSABLE TIP REUSABLE TROCAR OBTURATOR

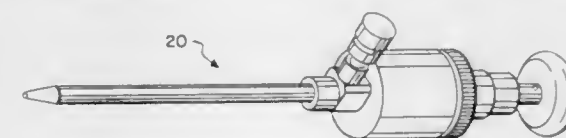
Rodger Thomason, Los Angeles; James E. Carter, Dana Point; Neil H. Naves, Mission Viejo; Mark J. Legome, Mission Viejo, and Jose M. Velez, Mission Viejo, all of Calif., assignors to Inlet Medical, Inc., Eden Prairie, Minn.

Filed Oct. 20, 1995, Ser. No. 546,015

Int. Cl.<sup>6</sup> A61B 17/34

U.S. Cl. 606—185

15 Claims



1. A retractable and reusable trocar obturator having a removable tip, comprising:



a trocar sheath having a proximal end and a distal end;  
a dilating obturator, said dilating obturator fitting in close relationship within said trocar sheath, said dilating obturator defining a narrow, central, longitudinal bore with proximal and distal apertures, said dilating obturator having a smooth conical tip centered about said distal aperture, said conical tip extending from said distal end of said trocar sheath, said conical tip smoothly mediating a transition between said distal aperture and said distal end of said trocar sheath;  
a manually operable narrow stylet, said narrow stylet fitting in close relationship with said dilating obturator, said stylet having an exceedingly sharp, cutting tip; and  
biasing means for urging said narrow stylet away from said distal end of said dilating obturator to retract said narrow stylet within said dilating obturator, said biasing means coupled to said narrow stylet; whereby  
said narrow stylet fits into said dilating obturator and said dilating obturator fits into said trocar sheath to provide the trocar obturator, said cutting tip of said narrow stylet exposed for puncturing a patient's body cavity when said urging of said biasing means is overcome by manual pressure from a surgeon's hand, said cutting tip then made available for puncturing a body cavity of said patient so that a resulting wound may be dilated by said dilating obturator to ultimately allow said distal end of said trocar sheath to enter said body cavity with minimal patient injury, said cutting tip immediately retracting into said dilating obturator when said manual pressure of said surgeon's hand is removed.

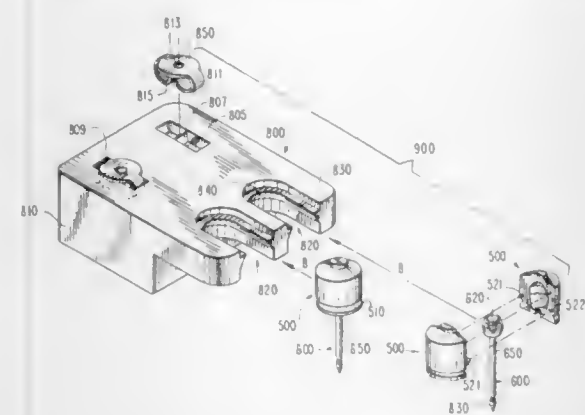
5,772,679

**EARRING PIERCER ASSEMBLY FOR STUD GUNS**  
Samuel J. Mann, Englewood, N.J., assignor to Inverness Corporation, Fair Lawn, N.J.

Filed Jun. 19, 1996, Ser. No. 600,695  
Int. Cl.<sup>6</sup> A61B 17/34

U.S. Cl. 606—188

31 Claims



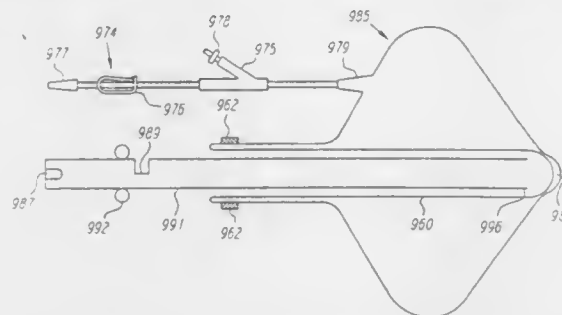
1. An earring retainer for adapting an earring having an ornamental portion and shaft portion for use in a stud gun having a plunger, comprising:  
a housing formed of two releasably securable portions, said housing having an inner surface defining an interior two-stage cavity, the first stage of the cavity sized to conform generally to the outer dimensions of the ornamental portion of an earring and a second stage dimensioned to conform generally to the shaft portion of an earring, the second stage sized so that a portion of the shaft of an earring extends outside the housing, the housing having an outer wall sized and shaped to fit in the plunger of a stud gun and to prevent relative movement thereto when said housing is disposed within the plunger of a stud gun and the releasably securable portions of the housing constructed and assembled to separate from the earring after the stud gun is used to pierce an ear with the earring.

5,772,680  
**APPARATUS AND METHOD FOR DEVELOPING AN ANATOMIC SPACE FOR LAPAROSCOPIC PROCEDURES WITH LAPAROSCOPIC VISUALIZATION**  
Maciej J. Kieturakis, San Carlos; Kenneth H. Mollenauer, Los Gatos; Jan M. Echeverry, San Jose; Thomas A. Howell, Palo Alto; James E. Jervis, Atherton; Helmut Kayan, Redwood City; and Janine C. Robinson, Half Moon Bay, all of Calif., assignors to General Surgical Innovations, Inc., Cupertino, Calif.

Continuation-in-part of Ser. No. 403,012, Mar. 10, 1995, Pat. No. 5,540,711, which is a continuation-in-part of Ser. No. 388,233, Feb. 13, 1995, which is a continuation-in-part of Ser. No. 267,488, Jun. 29, 1994, Pat. No. 5,607,443, which is a continuation-in-part of Ser. No. 124,283, Sep. 20, 1993, which is a continuation-in-part of Ser. No. 73,737, Jun. 8, 1993, abandoned, which is a division of Ser. No. 893,988, Jun. 2, 1992. This application Dec. 12, 1995, Ser. No. 570,766  
Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—190

48 Claims



1. An apparatus for creating an anatomic working space comprising:  
a tubular member having a bore extending therethrough and a blunt distal end;  
a balloon secured to said tubular member, said balloon having an interior space and an elongate neck, said tubular member extending through said elongate neck into said interior space of said balloon;  
said blunt distal end of said tubular member being within the interior space of the balloon;  
an inverted fold coaxially formed in said elongate neck of said balloon, said folded neck being disposed on the exterior of said tubular member; and  
access means for inflating said balloon after said balloon has been positioned in a desired location within a body.

5,772,681

**DILATION CATHETER**

Gianni Leoni, Greve, Denmark, assignor to Metra ApS, Greve, Denmark

PCT No. PCT/DK94/00086, § 371 Date Oct. 30, 1995, § 102(e) Date Oct. 30, 1995, PCT Pub. No. WO94/20166, PCT Pub. Date Sep. 15, 1994

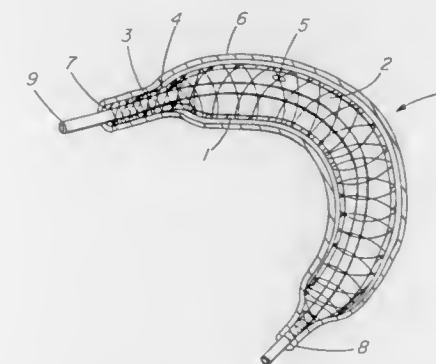
PCT Filed Mar. 2, 1994, Ser. No. 513,908

Claims priority, application Denmark, Mar. 2, 1993, 0232/93  
Int. Cl.<sup>6</sup> A61M 29/00

U.S. Cl. 606—192

10 Claims

1. A dilation catheter comprising a sealed distal end section (8), an open proximal end section (3) and an elongated middle section, one part of said middle section being an elongated flexible balloon section (11) expanding when supplied with pressure fluid through the proximal end section (3), said balloon section assuming a form of predominantly constant cross-section, said middle section comprising an inner elastic tube (1), a reinforcement net (2) made of metallic monofilaments surrounding the inner tube (1) and an outer elastic tube (6) surrounding the reinforcement net (2), wherein said reinforcement net (2) is made of metallic monofilaments crossing each other and being helically wound around the longitudinal axis



5,772,682

**NOSE RAISING ORTHOPEDIC DEVICE**

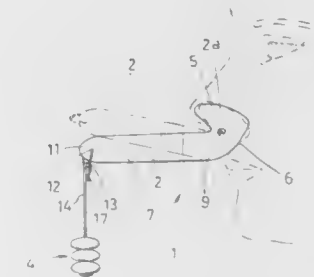
Masanobu Yokomizo, 4-13, Chikko, Wakayama-shi, Japan, 640, and Toshiharu Yokomizo, Koto-ku, Japan, assignors to Masanobu Yokomizo, Wakayama, Japan

Filed Oct. 10, 1996, Ser. No. 729,025

Claims priority, application Japan, Jun. 19, 1996, 8-158341  
Int. Cl.<sup>6</sup> A61B 17/00

U.S. Cl. 606—204.45

8 Claims



1. A nose raising orthopedic device comprising:  
a pair of raiser arms, each said raiser arm having at a first end thereof a pressing tab portion fittable into a naris of a human, and each said raiser arm having at a second end thereof a grip;  
a resilient device acting on said raiser arms to move said raiser arms relative to each other in a first direction to continuously urge said pressing tab portions toward each other; and  
said pressing tab portions being separable from each other by movement of said grips to move said raiser arms against the force of said resilient device in a second direction opposite to said first direction.

5,772,683

Patent Not Issued For This Number

5,772,684

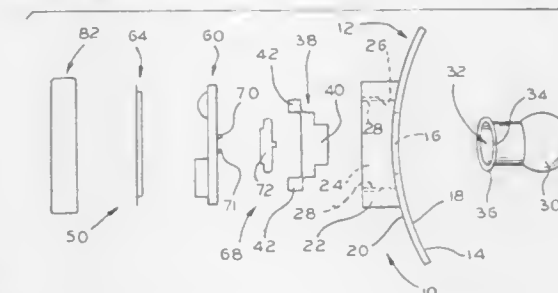
**MUSICAL PACIFIER**

Richard A. Shrock, c/o JASB, Inc., 850 Church Rd., Elgin, Ill. 60123-9344

Filed Jun. 1, 1995, Ser. No. 457,615  
Int. Cl.<sup>6</sup> A61J 17/00

U.S. Cl. 606—236

22 Claims



9. A watertight, immersion proof pacifier comprising:  
a mouthpiece including a faceguard having an opening defining an air passage to an integral sealed housing;  
a nipple having an interior space;  
means for sealingly mounting the nipple to the mouthpiece with the interior space in communication with the housing through said air passage;  
a switch actuated sound generating circuit disposed in said housing for controllably reproducing audio signals;  
a pressure sensitive switch normally generally closing said air passage, said switch electrically actuating said sound generating circuit in response to pressure generated in the nipple causing the switch to open the air passage and subsequently normally generally closing the air passage when the pressure is relieved; and  
means defining an air leakage path between said nipple interior space and said housing to maintain static pressure equilibrium between the nipple interior space and the housing.

5,772,685

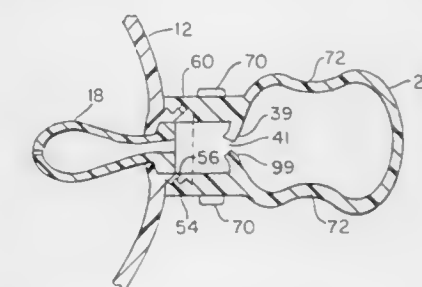
**INFANT PACIFIER-FLUID ADMINISTERING UNIT**

D. E. Crowe, and Sarah E. Barron, both of 808 E. Eighth Ave., Johnson City, Tenn. 37601

Continuation-in-part of Ser. No. 521,121, Aug. 29, 1995, Pat. No. 5,601,605. This application Dec. 11, 1996, Ser. No. 764,600  
Int. Cl.<sup>6</sup> A61J 17/00; 7/00

U.S. Cl. 606—236

30 Claims



1. A fluid dosage administering unit comprising a generally shield shaped body means having first and second sides and having aperture means therethrough around a generally transverse axis, said aperture means being defined by first wall means, flexible nipple means in the form of an infant's pacifier nipple having an inlet and a sucking orifice means spaced from said inlet, fluid dispenser means having fluid reservoir means and a fluid outlet therefor, said nipple means and dispenser means being mounted on opposite sides of said body means with said inlet and said outlet being adapted for fluid communication with each other wherein passage means is provided for placing said reservoir means in fluid communication with said sucking orifice means whereby fluid in

said reservoir means can be injected under pressure into said nipple means and out through said sucking orifice means, and wherein pressure responsive valve means is provided within said passage means whereby fluid in said reservoir means is caused to flow thru said valve means and out of said sucking orifice means upon pressurizing the fluid in said reservoir means.

5,772,686

## PELVIC RETROVERTER

Patrick Caruana, 5, rue de l'Hôtel de Ville, 26400 Crest, France

PCT No. PCT/FR96/00649, § 371 Date May 14, 1997, § 102(e)

Date May 14, 1997, PCT Pub. No. WO96/33779, PCT Pub.

Date Oct. 31, 1996

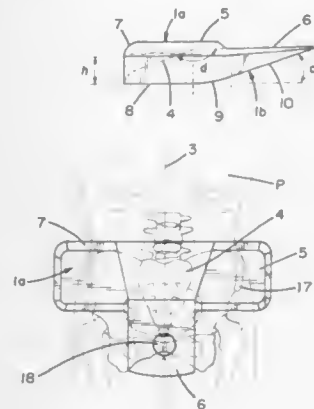
PCT Filed Apr. 29, 1996, Ser. No. 765,620

Claims priority, application France, Apr. 27, 1995, 95 05297

Int. Cl.<sup>6</sup> A61F 5/00

U.S. Cl. 606—240

13 Claims



1. A pelvis retroverter for straightening lumbar lordosis by retroverting the pelvis simultaneously with synergetic exercising of abdominal, pelvis-trochanter, gluteal, ischio-tibialis, and lumbar muscles of a front reclining user; the retroverter having a generally T-shape configuration comprising in succession, in a direction from the top of the T and along its axis of symmetry (3):

an ergonomic top face (1a) for supporting the front pelvic area of the user comprising:

a middle abdominal support zone (4) that is inclined, recessed forwards, and centered on the axis (3);

two ilium support zones (5) disposed symmetrically about the axis (3) on either side of the abdominal support zone (4);

a pubic support zone (6) aligned with the ilium support zones, and abutting the abdominal zone (3) and centered on the axis; and

an intermediate zone (7) on either side of the abdominal support zone (4) and extending partially around a periphery of ilium support zones (5);

and

a middle functional base (1b) opposed to and facing away from the top face and centered on the axis (3) and comprising:

a plane zone (8) parallel to the top face (2) and vertically displaced therefrom to prevent hyperlordosis, and connected to the intermediate zone (7) at one end;

a plane zone (10) connected to the end of the pubic support (6) at one end; and

an arcuate portion (9) interconnecting one end each of the plane zones (8 and 10).

5,772,687

## HUB FOR SYRINGE, CONNECTING STRUCTURE OF HUB, SYRINGE, SYRINGE ASSEMBLY AND METHOD OF ASSEMBLING SYRINGE ASSEMBLY

Yoshikuni Saito, Ooaza Kitanogami 1930, Kurobanemachi, Nasu-gun, Tochigi-Ken, Japan

Continuation of Ser. No. 213,434, Mar. 14, 1994, abandoned.

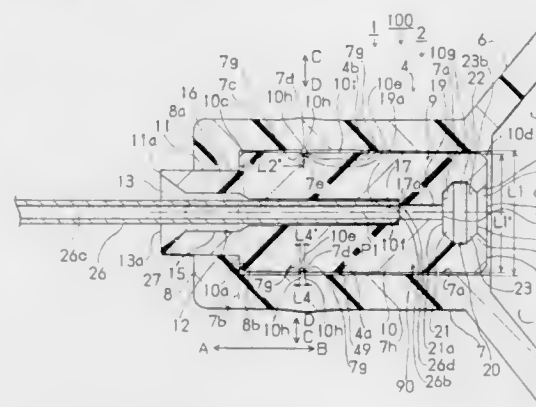
This application Sep. 21, 1995, Ser. No. 531,670

Claims priority, application Japan, Mar. 12, 1993, 5-79184; Apr. 6, 1993, 5-103527

Int. Cl.<sup>6</sup> A61M 5/00; 5/31

U.S. Cl. 604—243

15 Claims



1. A syringe assembly comprising:

a syringe body having first and second ends and a central longitudinal axis, the syringe body forming an axial space to contain an injection medium;

a piston slidably received in the syringe body;

a holding member installation hole cylindrically formed at the first end of said syringe body;

a needle holding member adapted to connect with a needle, the needle holding member attachably and detachably received in said holding member installation hole, said needle holding member having a main body in the shape of a cylinder which can be linearly inserted into said holding member installation hole by selective application of linear force in one of a first direction substantially parallel to the longitudinal axis of said syringe body and a second direction opposite said first direction, and which can be linearly pulled out of said holding member installation hole into said syringe body by application of linear force in said second direction;

a seal portion in the shape of a projection having a first width in the longitudinal direction of said main body, the projection annularly formed at an outer peripheral portion of said main body;

member side engagement means provided with said main body so as to engage with said piston; and

a member seal portion in the shape of a groove having a second width narrower than said first width in the longitudinal direction of said syringe body, the groove annularly formed at an inner peripheral face of said holding member installation hole of said syringe body, wherein said projection of said seal portion of said main body contacts and engages with said groove of said member seal portion with a predetermined contact pressure.

5,772,688

## SKIN-CONTACT TYPE MEDICAL TREATMENT APPARATUS

Masahisa Muroki, Kanazawa, Japan, assignor to Polytronics, Ltd., Kanazawa, Japan

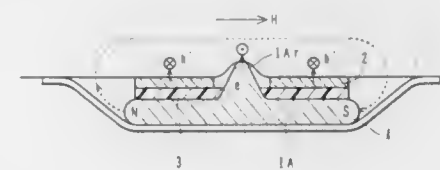
Filed Jun. 20, 1996, Ser. No. 667,812

Int. Cl.<sup>6</sup> A61N 1/30

U.S. Cl. 607—1

13 Claims

1. A skin-contact type medical treatment apparatus comprising:



a first conductive member having a first skin-contact surface adapted to be in contact with a first surface of skin when in use, the first skin-contact surface being made of metal or its alloy;

a second conductive member having a second skin-contact surface adapted to be in contact with a second surface of skin different from the first surface when in use together with the first conductive member, the second skin-contact surface being made of n-type semiconductor material having a standard single electrode potential lower than that of the first skin-contact surface; and

a protective resistor having a resistance value in the range of from 0.1 to 50MΩ for electrically connecting the first and second conductive members at an area different from the first and second skin-contact surfaces.

5,772,689

## IMPLANTABLE CARDIOVERTER-DEFIBRILLATOR WITH APICAL SHOCK DELIVERY

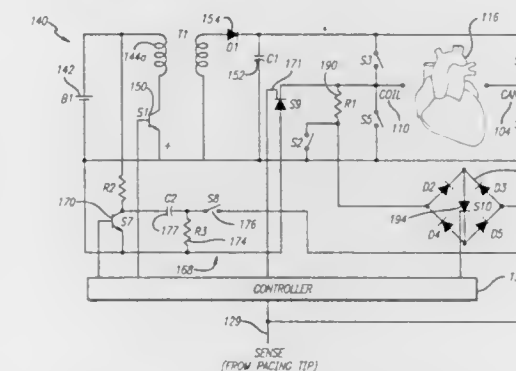
Mark W. Kroll, Simi Valley, Calif., assignor to Pacesetter, Inc., Sylmar, Calif.

Filed Dec. 3, 1996, Ser. No. 758,797

Int. Cl.<sup>6</sup> A61N 1/39

U.S. Cl. 607—4

38 Claims



1. An implantable electrical device for applying a therapeutic stimulation pulse to a heart of a patient comprising:

first electrode adapted to be positioned within a ventricle of the heart in a first position and configured to provide a first therapeutic stimulation pulse to the heart wherein the first therapeutic stimulation pulse is configured to be provided for defibrillation or cardioversion purposes;

a second electrode adapted to be positioned within the ventricle of the heart in a second position wherein the second electrode is further configured to provide pacing pulses to a second region of the heart adjacent the second position;

a current limiting circuit being configured so that, when the first electrode is providing the first therapeutic stimulation pulse to the heart, the second electrode provides an additional therapeutic stimulation pulse to the second region of the heart for cardioversion or defibrillation purposes wherein the circuit includes a means for limiting the current provided by the second electrode to the second region during delivery of the additional stimulation pulse; and

a controller that provides therapeutic stimulation pulses to the heart via the first and second electrodes and wherein the controller enables the current limiting means when providing the first therapeutic stimulation pulse to the heart and wherein

the current limiting means is disabled during delivery of pacing pulses to the second region of the heart via the second electrode.

5,772,690

## SYSTEM HAVING A SURROGATE DEFIBRILLATION ELECTRODE FOR TESTING IMPLANTABLE CARDIOVERTER-DEFIBRILLATORS DURING IMPLANT

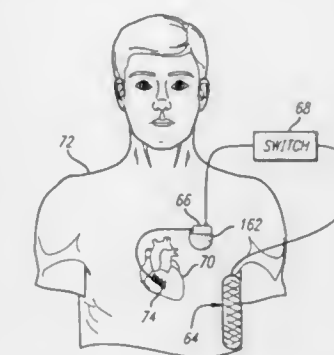
Mark W. Kroll, Simi Valley, Calif., assignor to Pacesetter, Inc., Sylmar, Calif.

Filed Oct. 24, 1996, Ser. No. 738,953

Int. Cl.<sup>6</sup> A61N 1/372

U.S. Cl. 607—7

17 Claims



1. A system for testing implantable cardioverter-defibrillators during implant, the system having an implantable cardioverter-defibrillator means for applying rescue cardioversion-defibrillation shocks to the heart of a patient in conjunction with implantation of the implantable cardioverter-defibrillator means, the system comprising:

first electrode means for implant in the heart;

second electrode means for positioning adjacent said heart;

the cardioverter-defibrillator means including:

circuitry means connected to the first electrode means and the second electrode means, the circuitry means for applying cardioversion-defibrillation shocks to the heart between the first electrode means and the second electrode means for determining the defibrillation threshold of the heart during implantation of the implantable cardioverter-defibrillator means;

removable external surrogate electrode means for temporary attachment to the skin of the patient and for detachable connection to the implantable cardioverter-defibrillator means in parallel with the second electrode means during implantation of the implantable cardioverter-defibrillator means; and

switch means for electrically connecting the external surrogate electrode means to the implantable cardioverter-defibrillator means for applying a rescue shock from the implantable cardioverter-defibrillator means between the external surrogate electrode means attached to the skin of the patient and the first electrode means during implantation of the implantable cardioverter-defibrillator means wherein the external surrogate electrode means and the switch means include means for detaching the external surrogate electrode means and the switch means from the implantable cardioverter-defibrillator means.



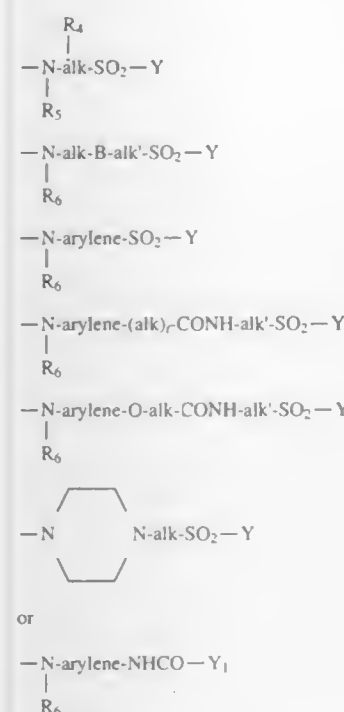
## 11 Claims



- eliminating viable cells from mammalian heart valve tissue;
- repopulating the heart valve tissue with allogenic or autogenic fibroblast cells in the presence of fibroblast growth factor; and
- implanting the reduced immunogenic heart valve repopulated with fibroblast cells.







R<sub>4</sub> is hydrogen, hydroxyl, sulfo, sulfato, carboxyl, cyano, halogen, C<sub>1</sub>-C<sub>4</sub>alkoxy, carbonyl, carbamoyl or a group —SO<sub>2</sub>—Y; R<sub>5</sub> is hydrogen, unsubstituted or hydroxyl-, sulfo-, sulfato-, carboxyl- or cyano-substituted C<sub>1</sub>-C<sub>4</sub>alkyl; R<sub>6</sub> is hydrogen or C<sub>1</sub>-C<sub>4</sub>alkyl.

alk and alk' are each, independently of one another, C<sub>1</sub>-C<sub>6</sub>alkylene.

arylene is an unsubstituted or sulfo-, carboxyl-, hydroxyl-, C<sub>1</sub>-C<sub>4</sub>alkyl-, C<sub>1</sub>-C<sub>4</sub>alkoxy- or halogen-substituted phenylene or naphthylene radical.

Y is vinyl or a radical —CH<sub>2</sub>—CH<sub>2</sub>—U and U is a leaving group.

Y<sub>1</sub> is a group —CHX—CH<sub>2</sub>X or —CX=CH<sub>2</sub>.

X is chlorine or bromine.

B is a radical —O— or —NR<sub>6</sub>— in which R<sub>6</sub> is as defined above, and

n and t are each, independently of one another, 0 or 1.

5,772,699

#### STABLE AQUEOUS REACTIVE DYE COMPOSITION AND METHOD FOR STABILIZING AN AQUEOUS REACTIVE DYE COMPOSITION

Andrew D. Boyer, Denver, Pa., assignor to Crompton & Knowles Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 402,852, Mar. 13, 1995, abandoned. This application Feb. 10, 1997, Ser. No. 799,023  
Int. Cl.<sup>6</sup> D06P 1/382; C09B 62/503

U.S. Cl. 8—549

19 Claims

1. An aqueous reactive dye composition stable to decomposition comprising:

an aqueous solution containing from about 5.0 weight percent to about 50.0 weight percent of a water soluble reactive dye having at least one —SO<sub>2</sub>CH<sub>2</sub>CH<sub>2</sub>OSO<sub>3</sub>H group; and at least one chelating agent selected from the group consisting of:

- (a) a polycarboxylic acid selected from the group consisting of tartaric acid, succinic acid, glutaric acid, adipic acid, and mixtures thereof;
- (b) an aminocarboxylate; and
- (c) mixtures of (a) and (b);

said chelating agent being in a sufficient concentration to maintain the pH of said aqueous reactive dye composition from about 3.0 to about 7.0 for at least three months.

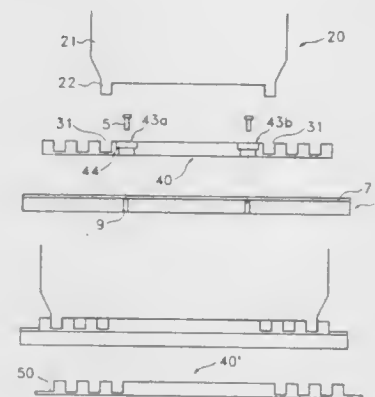
5,772,700

#### LOCATION GUIDE BAR WHICH ACCOMMODATES MULTIPLE SIZE CASSETTES FOR USE IN A LOADER AND UNLOADER INDEXER

Myoung-Taek Choi, Kyonggi-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea  
Filed Jun. 30, 1997, Ser. No. 885,797

Claims priority, application Rep. of Korea, Oct. 14, 1996, 96-45712  
Int. Cl.<sup>6</sup> B65G 49/07; B65D 85/48; B05C 13/00; A47G 19/08

U.S. Cl. 29—25.01 16 Claims



1. A location guide bar for a loader and unloader indexer having a support and a platform spaced from the support and moving up and down with guidance of a slide bar, comprising:

a body which is inserted into a slot in the platform; and guide holes formed in the body, said guide holes positioned in the body at distances corresponding to distances between legs of different sized wafer cassettes.

5,772,701

#### METHOD OF MAKING TANTALUM CAPACITORS

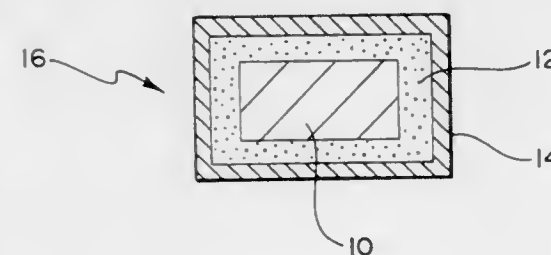
April D. McMillan, Knoxville; Robert E. Clausen, Oak Ridge, both of Tenn., and William F. Vierow, Saco, Me., assignors to Lockheed Martin Energy Research Corporation, Oak Ridge, Tenn.

Filed Sep. 5, 1996, Ser. No. 708,424

Int. Cl.<sup>6</sup> B22F 1/00; H01G 9/05

U.S. Cl. 29—25.03

14 Claims



1. A method of manufacturing a tantalum anode for a tantalum capacitor, comprising the steps of:

- preparing a tantalum powder compact;
- placing the tantalum compact, along with loose refractory metal powder, inside an electromagnetic radiation-transparent cassette to form an assembly; and
- heating the assembly in an electromagnetic radiation heating apparatus for a time sufficient to effect at least partial sintering of the tantalum compact.

5,772,702

#### METHOD OF PREPARING ELECTROCHEMICAL CELLS

Jeremy Barker; J. Lee Morris; Frederik Flemming, and Wade W. Guindy, all of Henderson, Nev., assignors to Valence Technology, Inc., Henderson, Nev.

Filed Apr. 10, 1996, Ser. No. 630,315

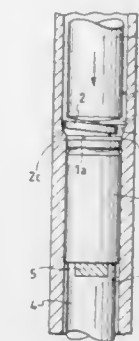
Int. Cl.<sup>6</sup> H01M 10/38

U.S. Cl. 29—623.1

18 Claims

1. A method of preparing an electrochemical cell comprising the steps of:

- (a) preparing an anode precursor by forming an anode film comprising a carbon, a first polymeric binder, and a first plasticizer and thereafter extracting said first plasticizer;
- (b) preparing a cathode precursor by forming a cathode film comprising a cathodic material, a second polymeric binder, and a second plasticizer and thereafter extracting said second plasticizer;
- (c) preparing a polymeric electrolyte precursor by forming a polymeric matrix comprising a third plasticizer and thereafter extracting said third plasticizer;
- (d) following steps a-c, storing said anode precursor, said cathode precursor, and said polymeric electrolyte precursor for a period of time from 24 hours to about 4 weeks prior to activation; and
- (e) activating said anode precursor, said cathode precursor, and said polymeric electrolyte precursor, wherein said polymeric precursor is interposed between said anode precursor and said cathode precursor.



diameter portion, said smaller-diameter portion has an inner diameter substantially identical with or slightly larger than an outer diameter of a cylindrical battery casing;

a lower spindle supporting a bottom surface of said cylindrical battery casing;

an upper spindle pushing a seal plate downward along an inner surface of said cylindrical guide sleeve, said seal plate being inclined in a floating condition with respect to an axial direction of said cylindrical guide sleeve and connected via a lead to an electrode assembly accommodated in said cylindrical battery casing;

guide actuating means for shifting said cylindrical guide sleeve in an up-and-down direction, said guide actuating means lifting said cylindrical guide sleeve upward along an outer surface of said lower spindle until said seal plate is surrounded by said larger-diameter portion and a lower end of said tapered portion reaches a position above an upper opening of said cylindrical battery casing; and

upper spindle actuating means for shifting said upper spindle in the up-and-down direction, said upper spindle actuating means lowering said upper spindle along said larger-diameter portion to cause a bottom surface of said upper spindle to push and guide said seal plate toward said upper opening of said cylindrical battery casing via said tapered portion.

5,772,703

#### THERMAL EDGE ON DOUBLE-SIDED ELECTRODES

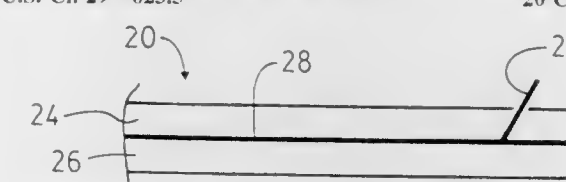
Wade Guindy, Henderson, Nev., assignor to Valence Technology, Inc., Henderson, Nev.

Filed Nov. 4, 1996, Ser. No. 742,397

Int. Cl.<sup>6</sup> H01M 4/82

U.S. Cl. 29—623.5

20 Claims



1. A method of reducing shorts in a battery, the method comprising:

- providing a current collector covered with an active battery material;
- cutting the current collector covered with the active material to form an electrode section, burrs being formed on at least one edge of the current collector due to the cutting step; and
- thereafter, applying heat and pressure to at least one edge of the electrode section to coat burrs of the current collector with the active material.

5,772,704

#### CYLINDRICAL BATTERY ASSEMBLING APPARATUS

Kouichi Nishihara, Moriguchi; Takeharu Nakanose, Katano; Katsuhisa Wadasaki, and Seiichi Katou, both of Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Dec. 9, 1996, Ser. No. 762,151

Claims priority, application Japan, Dec. 15, 1995, 7-326725

Int. Cl.<sup>6</sup> B23P 19/00

U.S. Cl. 29—730

6 Claims

1. A cylindrical battery assembling apparatus comprising:
- a cylindrical guide sleeve having a larger-diameter portion formed at an upper portion thereof, a smaller-diameter portion formed at a lower portion thereof, and a tapered portion formed between said larger-diameter portion and smaller-

5,772,705

#### FUEL OIL COMPOSITIONS

Rinaldo Caprotti, Oxfordshire, United Kingdom, assignor to Exxon Chemical Patents Inc., Linden, N.J.

PCT No. PCT/EP95/02251, § 371 Date Dec. 5, 1996, § 102(e)  
Date Dec. 5, 1996, PCT Pub. No. WO95/33805, PCT Pub. Date Dec. 14, 1995

PCT Filed Jun. 8, 1995, Ser. No. 750,306

Claims priority, application United Kingdom, Jun. 9, 1994, 9411614

Int. Cl.<sup>6</sup> C10L 1/14; 1/22

U.S. Cl. 44—389

10 Claims

1. A process for the manufacture of a low sulfur content, middle distillate petroleum based fuel oil composition of enhanced lubricity without the need for addition of a conventional lubricity enhancing additive, which process comprises refining a crude oil to produce a refined middle distillate fuel oil product having a sulfur content of at most 0.2% by weight, and blending at least one cold flow improver with the refined middle distillate fuel oil product to provide a middle distillate fuel oil composition having a lubricity such as to give a wear scar diameter, as measured by the HFFR test at 60° C., of at most 500 μm.

5,772,706

**METHODS AND COMPOSITIONS FOR IMPROVEMENT OF LOW TEMPERATURE FLUIDITY OF FUEL OILS**  
John A. Schield, Chesterfield, Mo., and Jerry J. Weers, Richmond, Tex., assignors to Baker Hughes Incorporated, Houston, Tex.

Filed Sep. 12, 1997, Ser. No. 928,289  
Int. Cl.<sup>6</sup> C10L 1/18

U.S. Cl. 44—395

21 Claims

1. A composition useful for improvement of low temperature fluidity of fuel oils, comprising from about 1 to about 40 parts by weight ethylene/vinyl acetate copolymer having a vinyl acetate content of from about 10% by weight to about 50% by weight and a weight average molecular weight of from about 2,000 to about 10,000, per 1 part by weight esterified copolymer of at least one generally linear  $\alpha$ -olefin of from about 18 to about 50 carbon atoms and maleic anhydride in an  $\alpha$ -olefin to maleic anhydride molar ratio of from about 4:1 to about 1:2, the copolymer having a weight average molecular weight of from about 2,000 to about 20,000, the esterified copolymer having been esterified with a plurality of aliphatic alcohols having from about four to about forty carbon atoms, including at least one eight carbon alcohol, the at least one eight carbon alcohol making up from about 50 to about 85 molar percent of the alcohols.

5,772,707

**PROCESS AND APPARATUS FOR METHANOL REFORMING**

Norbert Wiesheu, Guenzburg; Detlef zur Megede, Bubesheim, and Rainer Autenrieth, Erbach, all of Germany, assignors to Daimler-Benz AG, Germany

Filed Jul. 1, 1996, Ser. No. 673,085

Claims priority, application Germany, Jul. 22, 1995, 195 26 886.5

Int. Cl.<sup>6</sup> C01B 3/02

U.S. Cl. 48—197 R

6 Claims

1. A process for methanol reforming, comprising the steps of passing the gas mixture to be reformed through a catalyst-containing reaction compartment, and setting at least one of active length and active inlet cross-section of a temperature-controlled intake-side reaction compartment section capable of a high methanol conversion rate as a function of the respective throughput of gas mixture to be reformed such that a residence period of the gas mixture remains essentially constant in the intake-side reaction compartment section.

5,772,708

**COAXIAL COAL WATER PASTE FEED SYSTEM FOR GASIFICATION REACTOR**

Robert Edward Froehlich, New Providence, N.J., assignor to Foster Wheeler Development Corp., Clinton, N.J.

Filed Mar. 17, 1995, Ser. No. 405,653

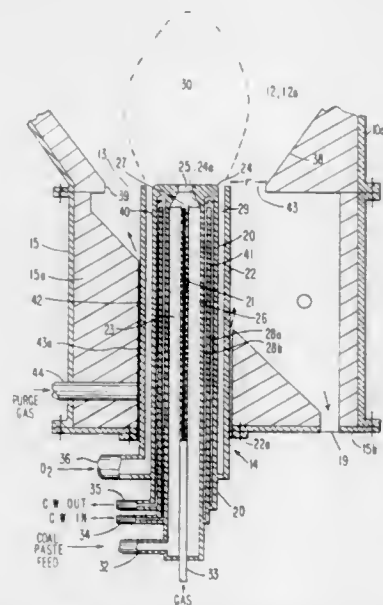
Int. Cl.<sup>6</sup> C10J 3/68

U.S. Cl. 48—76

12 Claims

1. A feed system for feeding a coal-water paste material into a pressurizable fluidized bed reactor of combustion/gasification reactions therein, the system comprising:

- a cylindrical-shaped vertically-oriented reactor vessel (10) having a lower portion (10a) adapted for containing a fluidized bed (12) of particulate coal, said reactor vessel having a coaxial opening (13) provided at the lower end of the reactor lower portion (10a), an outlet connection (16) provided at the reactor upper end for gas removal; and a nozzle support unit (15) attached onto the reactor lower portion (10a) lower end, the nozzle support unit (15) having a withdrawal opening (19) provided at the support unit lower end for ash agglomerate removal; and
- a feed nozzle assembly (14) mounted in said nozzle support unit (15) and inserted into the coaxial opening (13) provided in said reactor vessel lower portion (10a) so that the nozzle



assembly (14) has its upper end positioned substantially adjacent and coaxial with the reactor lower end opening (13), said nozzle assembly (14) including multiple concentric tubular means adapted for introducing a coal-water paste feed material upwardly into said reactor vessel and including an elongated inner tube (21) having a terminus end (27) located upstream of a central orifice (25), for atomizing the feed material and a concentric outer tubular shroud (22), having its upper end located substantially even with the nozzle assembly (14) upper end.

5,772,709

**APPARATUS FOR REMOVING AMMONIA AND CARBON DIOXIDE GASES FROM A STEAM**

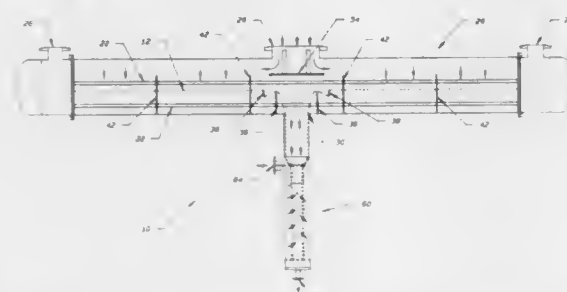
Donald Neal Ruck, Holley; James Richard Lines, Lancaster; Roderick Elwyn Athey, Pittsford, and David William Tice, Holley, all of N.Y., assignors to Graham Corporation, Batavia, N.Y.

Filed Apr. 18, 1996, Ser. No. 634,241

Int. Cl.<sup>6</sup> B01D 47/14

U.S. Cl. 55—222

11 Claims



8. A two stage condenser assembly for absorbing gases into a condensate of a steam containing water vapor and the gases, comprising:

- a first stage condenser housing having a vapor inlet, an outlet and a condensing surface to form a condensate and a residual gas containing the gases;
- a second stage connected to the first stage condenser housing, the second stage including a vapor outlet and a condensate outlet; and
- a flow control surface for regulating a flow of the condensate from the first stage condenser housing to the second stage to form a continuous condensate barrier in the second stage, the barrier intermediate the vapor inlet and the vapor outlet, the flow control surface, the vapor inlet and the vapor outlet selected to pass the residual gas through the continuous con-

densate barrier as the residual gas travels from the first stage condenser housing to the vapor outlet.

5,772,710

**AIR TREATING SYSTEM**

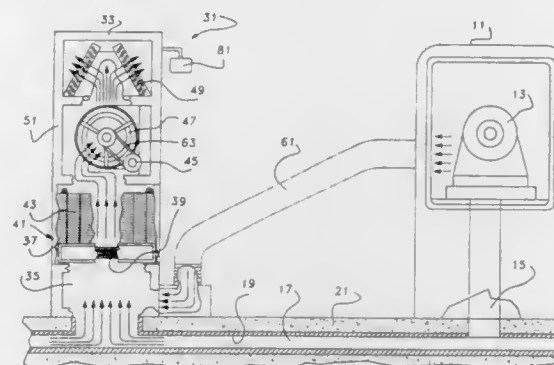
Larry A. Bauer, Osage Beach; Bruce B. Atkinson, Lebanon; Bruce A. Mazor, Lebanon, all of Mo.; Anthony J. Coronati, Sidney, Ohio, and Steven C. Hokky, Lebanon, Mo., assignors to Copeland Corporation, Sidney, Ohio

Filed Dec. 19, 1995, Ser. No. 574,992

Int. Cl.<sup>6</sup> B01D 50/00

U.S. Cl. 55—269

13 Claims



1. An air treating system for use in an industrial plant, said air treating system comprising:

- a first prefilter;
  - a first impinger;
  - a first filter;
  - a first evaporator;
  - a first blower causing air to flow through said first prefilter, said first impinger, said first filter and said first evaporator;
  - a single air conditioning compressor and condenser unit in fluid communication with said first evaporator such that said first evaporator acts as a dehumidifier;
  - a first self-contained unit containing said first prefilter, said first impinger, said first filter, said first blower and said first evaporator;
  - a second self-contained unit containing a second prefilter, a second filter, a second blower and a second evaporator;
  - a third self-contained unit containing a third prefilter, a third filter, a third blower and a third evaporator;
  - at least one conduit for transporting said air which carries said contaminated particles, said blower drawing said air from said at least one conduit and through said prefilter;
  - and a machining center communicating with said at least one conduit for transmission of said air carrying said contaminated particles;
- wherein said air conditioning compressor and condenser unit is remotely located on a roof of said plant;
- wherein said first evaporator, said first blower, said first filter and said first prefilter are located in said plant; and
- wherein said first, second and third self-contained units all communicate with said single air conditioning compressor and condenser unit, said self-contained units all are spatially separated from each other;
- whereby contaminated particles are removed from said air, said air is dehumidified, and said air is cooled.

5,772,711

**FILTER BLOCKAGE WARNING INDICATOR**

Joseph W. Kieffer, Rogers, Minn., assignor to Wagner Spray Tech Corporation, Minneapolis, Minn.

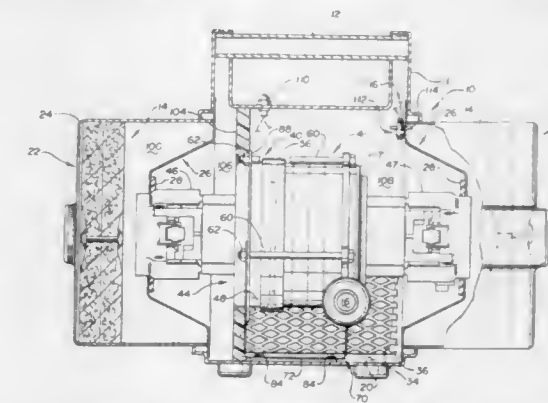
Division of Ser. No. 498,739, Jul. 6, 1995, Pat. No. 5,639,222.

This application Dec. 2, 1996, Ser. No. 753,830

Int. Cl.<sup>6</sup> B01D 35/143

U.S. Cl. 55—274

11 Claims



1. In a portable turbine apparatus having an inlet air filter for providing air for use with paint spray guns, a filter blockage warning indicator assembly in combination therewith comprising:

- an indicator having first and second states;
- a vacuum sensor having
  - a vacuum sensor port for sensing vacuum, the port in fluid communication with an air space downstream of the inlet filter;
  - a pair of electrical contacts having one of a closed and an open condition therebetween when vacuum sensed by the port is below a predetermined vacuum level and having the other of the closed and open condition when the vacuum sensed by the port is above the predetermined vacuum level; such that the indicator is placed in one of the first and second states via the contacts when the vacuum sensed is above the predetermined vacuum level to indicate that filter blockage is above a predetermined blockage level and the indicator is in the other of the first and second states when the vacuum sensed is below the predetermined vacuum level to indicate that filter blockage is below the predetermined blockage level.

5,772,712

**MANUALLY CLOSABLE VACUUM CLEANER BAG COLLAR AND METHOD OF MAKING**

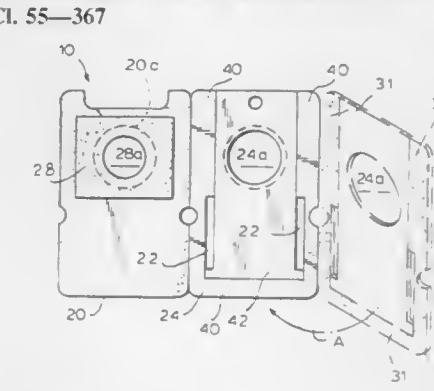
Humberto Perea, Paterson; Mark D. Bosses, Montvale, both of N.J., and Uri Milstein, Flushing, N.Y., assignors to Home Care Industries, Inc., Clifton, N.J.

Continuation of Ser. No. 661,225, Jun. 10, 1996, Pat. No. 5,725,620. This application Oct. 28, 1997, Ser. No. 958,971

Int. Cl.<sup>6</sup> B01D 46/02; B29C 53/04

U.S. Cl. 55—367

11 Claims



1. A manually closable collar for a vacuum cleaner bag, comprising:



a collar adapted to be secured to an air bag and formed of relatively rigid material defining three overlying and generally planar panels, each of said panels defining an aperture therethrough, said apertures being initially aligned in said collar to enable the passage of air therethrough and into the air bag, the middle panel of said collar defining:

- (i) a fixed raceway element adhesively secured to at least one of the outer panels of said collar, and
- (ii) a detachable slider element secured to said raceway element only by various nicks, said slider element having a first portion defining said aperture of said middle panel and a second portion which is unapertured; when detached from said raceway element by a user breaking the various nicks, said slider element being manually slidably movable from a first or open position, wherein said aperture of said middle panel is aligned with the apertures of said outer panels, to a second or closed position, wherein said second portion blocks air flow between said apertures of said outer panels.

9. A method of making a manually closable collar for a vacuum cleaner bag from a single collar blank, comprising the steps of:

- (A) folding a single collar blank of relatively rigid material to define three overlying and generally planar panels, each of the panels defining an aperture therethrough, the apertures being initially aligned in the folded blank to enable the passage of air therethrough, the middle panel of the collar defining a fixed raceway element and a detachable slider element secured to the raceway element only by various nicks, and the slider element having a first portion defining the aperture of the middle panel and a second portion which is unapertured;
  - (B) adhesively securing the raceway element to at least one of the outer panels;
- when detached from the raceway element by the user of the vacuum bag breaking the various nicks, the slider element being manually slidably movable from a first or open position, wherein the aperture of the middle panel is aligned with and enables air flow between the apertures of the outer panels, to a second or closed position, wherein the second portion is aligned with and blocks air flow between the apertures of the outer panels.

5,772,713

## ADJUSTABLE FILTER ASSEMBLY

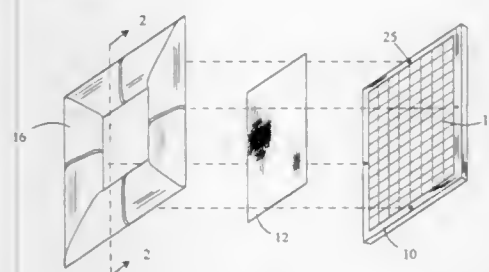
Irma C. Salinas, and Kenyon D. Potter, both of 1180 Eddy St., San Francisco, Calif. 94109

Filed May 30, 1996, Ser. No. 655,601

Int. Cl.<sup>6</sup> B01D 46/10; 29/01

U.S. Cl. 55—496

20 Claims



1. An adjustable filter assembly comprising:
  - a filter medium having a peripheral edge wherein said filter medium has a pre-defined size;
  - a frame encircling said peripheral edge, said frame having an inner edge and an outer edge;
  - an adjustable molding capable of being extended in at least one dimension wherein said adjustable molding is a continuous structure comprising:
    - a plurality of straight pieces; and
    - a plurality of corner pieces having two diverging legs wherein said straight and said corner pieces are alternately connected to form a continuous structure, each of said legs comprises a flat face; an inner wall; and an outer wall;

a flange connected to said outer wall and disposed in substantially perpendicular relation to said outer wall; and a connecting means for attaching said adjustable molding to said frame;

wherein at least one of said legs of said corner pieces has a tracking means for telescopingly engaging and retaining said straight pieces;

wherein said outer wall is coincident with or extends outwardly beyond said outer edge of said frame when said molding is in an unextended position and said inner wall is inward of said inner edge of said frame, whereby at least a portion of said molding overlaps said frame, and said outer wall extends outward beyond said outer edge of said frame when said molding is in an extended position.

5,772,714

## PROCESS FOR PRODUCING OPAQUE SILICA GLASS

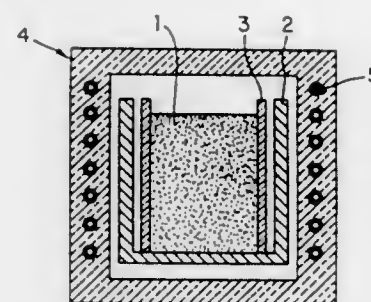
Tatsuhiko Sato, Takefu; Akira Fujinoki, Koriyama; Kyoichi Inaki, Koriyama; Nobumasa Yoshida, Koriyama, and Tohru Yokota, Koriyama, all of Japan, assignors to Shin-Etsu Quartz Products Co., Ltd., Takefu, Japan

Continuation-in-part of Ser. No. 377,734, Jan. 25, 1995, abandoned. This application Jul. 18, 1996, Ser. No. 682,962

Int. Cl.<sup>6</sup> C03B 20/00

U.S. Cl. 65—175

28 Claims



1. A process for producing opaque silica glass comprising the steps of:

- filling a quartz raw material grain having a particle size of 10 to 350  $\mu\text{m}$  into a heat resistant mold;
- heating said grain from room temperature up to a temperature lower by 50° to 150° C. than a melting point of said quartz material grain at a temperature-increase speed of 10° to 40° C./min;
- slowly heating said quartz material grain up to a temperature higher by 10° to 80° C. than the melting point of said quartz material grain at a speed of 10° C./min or less;
- maintaining said quartz material grain at the temperature higher by 10° to 80° C. than the melting point of said quartz raw material grain to melt the grain and form a silica glass material; and thereafter cooling said silica glass material.

5,772,715

## SYSTEM AND METHOD FOR PROCESSING SHEET GLASS

Harold A. McMaster, Perrysburg; James B. Foote, Toledo, both of Ohio, and Alan J. McMaster, Dexter, Mich., assignors to Solar Cells, Inc., Toledo, Ohio

Filed Jan. 17, 1997, Ser. No. 783,935

Int. Cl.<sup>6</sup> C03B 18/16

U.S. Cl. 65—32.1

28 Claims

1. A processing system for processing sheet glass of a predetermined thickness, comprising:
  - a housing having an enclosed processing chamber in which the sheet glass is processed; and
  - a slit seal through which the sheet glass is movable between the chamber and the environment, the slit seal defining a slit

5,772,717

## TEMPERING METHOD USING A TWO PHASE FLOW OF CRYOGEN

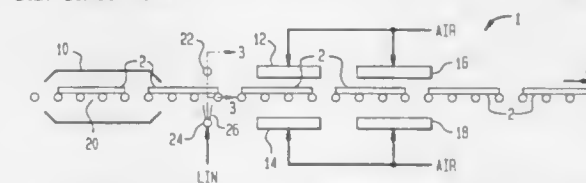
Mark J. Kirschner, Morristown; Hamdi Kozlu, Bedminster, and Michael K. Sahm, Annendale, all of N.J., assignors to The BOC Group, Inc., New Providence, N.J.

Filed Sep. 20, 1996, Ser. No. 716,976

Int. Cl.<sup>6</sup> C03B 27/00; 25/00; 21/00; 23/00

U.S. Cl. 65—104

5 Claims



1. A method of tempering an article formed from a material having a thickness including surface and midplane layers, said method comprising:

- heating the article so that it is in an essentially stress free state;
- quenching said article so that a stress pattern is initiated having said midplane layer in tension and said surface layers are in compression;
- cooling said article so that said stress pattern is further developed and said article attains a tempered state;
- the article being at least quenched in part by spraying said surface layers thereof with a two phase flow of coolant consisting essentially of a liquid and a vapor made up of a cryogen, the coolant being sprayed so that surface tensile stresses of said surface layers existing at initiation of quenching are not exceeded and said liquid does not accumulate on said surface layers as a film.

5,772,718

## GLASS GOB SHEARING APPARATUS WITH INTERNALLY COOLED BLADES AND METHOD OF SHEARING EMPLOYING SAME

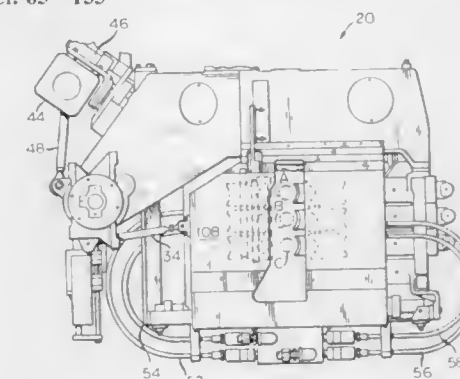
Robin L. Flynn, Toledo, Ohio, assignor to Owens Brockway Glass Container Inc., Toledo, Ohio

Filed Feb. 6, 1996, Ser. No. 602,874

Int. Cl.<sup>6</sup> C03B 7/10

U.S. Cl. 65—133

32 Claims



5,772,716

## METHOD FOR PYROLYTICALLY COATING GLASS, GLASS CERAMIC AND ENAMEL PRODUCTS

Hans-Günter Krohm, Raesfeld, and Sven-Uwe Vallerien, Essen, both of Germany, assignors to Th. Goldschmidt AG, Essen, Germany

Filed Sep. 18, 1995, Ser. No. 529,941

Claims priority, application Germany, Sep. 17, 1994, 44 33 206.8

Int. Cl.<sup>6</sup> C03C 17/00

U.S. Cl. 65—60.2

5 Claims

1. A method for producing electrically conductive and infrared-reflective tin oxide layers with reduced optical iridescence intensity on a substrate chosen from the group consisting of glass, glass ceramic and enamel substrates, comprising the steps of:

- initially applying a solution of boron, silicon, tin and optionally phosphorus compounds in water, organic solvents or both on a surface of the substrate and converting pyrolytically the applied solution into a first layer of oxides of these elements, the refractive index of which lies between that of the substrate to be coated and a tin oxide layer formed in the subsequent step, and
- subsequently on this first layer, applying pyrolytically a second tin oxide layer.

one another between first positions of said first carriage and said second carriage where said first blade and said second blade are spaced apart from one another and second positions of said first carriage and said second carriage where said first blade and said second blade partly overlap one another to shear a stream of molten glass flowing therebetween; and first biasing means acting generally perpendicularly to the travel paths for biasing one of said first blade and said second blade toward the other of said first blade and said second blade to ensure contact without excessive contact loads between said first blade and said second blade when said first blade and said second blade partly overlap one another during the shearing of the stream of molten glass.

5,772,719

**SYSTEM FOR DETECTING AND ADJUSTING THE POSITION OF A BURNER DURING THE ANNEALING PROCESS OF A GLASS SHEET**

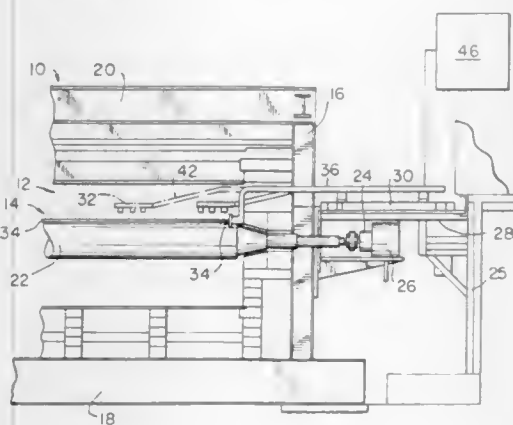
Manuel Alarcón-López, México City; Lenin Román-Gómez, Ecatepec de Morelos; Rafael Jorge Rojas-Cortés, Tlanepantla; Víctor Enciso-Aguilar, Ecatepec de Morelos; Severino Islas-Sánchez, Ojo de Agua Tecamac, and José Carlos Montes-Juárez, México City, all of Mexico, assignors to Vidrio Plano de Mexico, S.A. de C.V., San Juan Ixhuatpec, Mexico

Filed Oct. 6, 1995, Ser. No. 540,337

Claims priority, application Mexico, Jun. 9, 1995, 952558  
Int. Cl.<sup>6</sup> C03B 25/00

U.S. Cl. 65—158

11 Claims

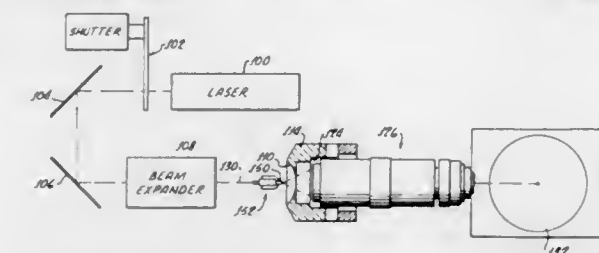


1. A system for detecting and automatically adjusting the position of a plurality of burners in respect to the edge of a glass sheet, said glass sheet being transported by means of rolls through a thermal treatment lehr, the system comprising: a support structure; a reciprocating structure coupled onto the support structure; at least one burner attached to the reciprocating structure; sensor elements to sense the position of the edge of the glass sheet, attached conjointly with said at least one burner, in order to adjust the position of said at least one burner based on the position of said sensor elements over the edge of said glass sheet; and control means coupled to the sensor elements in order to adjust the position of the at least one burner, in accordance with the position of the sensor elements at the edge of said glass sheet.

5,772,720  
**HEAT FORMED OPTICAL FIBER END FACE**  
Laurie K. Taira-Griffin, Huntington Beach; John S. Szalay, Corona del Mar; Michael R. Vince, Thousand Oaks; Joseph A. Wysocki, Malibu, all of Calif., and Stephen W. McCahon, Coralville, Iowa, assignors to Raytheon Company, Lexington, Mass.  
Continuation of Ser. No. 476,807, Jun. 7, 1995, abandoned.  
This application Mar. 17, 1997, Ser. No. 819,453  
Int. Cl.<sup>6</sup> C03B 37/15

U.S. Cl. 65—387

19 Claims



1. A method for finishing the free end of an optical fiber that is to be used in an optical information system wherein an optical signal is transmitted through said optical fiber to another optical device, said method comprising forming a rounded end on said optical fiber by applying heat to soften and shape the end face of said optical fiber, said step of applying heat comprising directing a laser beam directly to the end face of said optical fiber, said step of directing a laser beam at the end face of said optical fiber comprising the steps of providing a parabolic reflector having a focal point, positioning said free end of said optical fiber at said focal point and reflecting an expanded laser beam from said parabolic reflector to said free end of the optical fiber.

5,772,721

**PROCESS FOR PRODUCING ODORLESS ORGANIC AND SEMI-ORGANIC FERTILIZER**

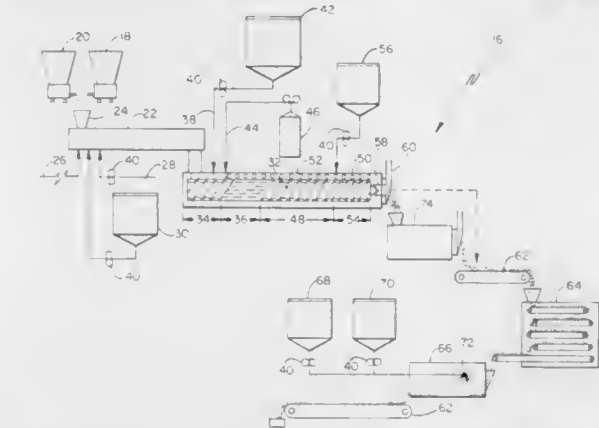
Massoud Kazemzadeh, 10025 Beard Ave. So., Bloomington, Minn. 55431

Filed Nov. 21, 1995, Ser. No. 561,376

Int. Cl.<sup>6</sup> C05F 11/08

U.S. Cl. 71—11

10 Claims



1. A process for forming a substantially odorless fertilizer from organic waste material, comprising: combining an organic waste material and a binder material consisting essentially of a carbohydrate or a protein, with moisture to provide a mixture material including 18–65% moisture, by weight; mechanically working the mixture material to dispersively mix the mixture material while heating the mixture material to at least a glass transition temperature of the binder material, to form an amorphous, substantially uniform matrix; while maintaining the matrix at a temperature above the glass transition temperature, further mechanically working and mixing the matrix within an anaerobic environment while

heating the matrix to increase its temperature to at least 100° C. and increasing its pressure to at least about 100 psi; and expelling the matrix from the anaerobic environment to an ambient environment, thus to abruptly reduce the pressure of the matrix to an ambient level, thereby lysing spores and organisms carried by the matrix whereby the expelled material is substantially sterilized.

5,772,722

**METHOD FOR REDUCING ODOR OF MANURE AND REDUCED ODOR MANURE COMPOSITION**

Joe V. Gednalske, Riverfalls, Wis.; Robert W. Herzfeld, Stillwater, Minn., and William G. Johnson, Columbia, Mo., assignors to Cencel/Land O'Lakes Agronomy Company, Arden Hills, Minn.

Filed May 30, 1996, Ser. No. 657,020

Int. Cl.<sup>6</sup> C05F 3/00

U.S. Cl. 71—21

16 Claims

1. A method for reducing odor of manure, the method comprising: providing an odor reducing effective amount of an odor reducing blend having an effective amount of acidulated soybean soapstock and an effective amount of an emulsifier; and mixing the odor reducing blend with manure.  
9. A reduced odor manure composition comprising manure and an odor reducing effective amount of an odor reducing blend, the odor reducing blend comprising an effective quantity of acidulated soybean soapstock and an effective quantity of an emulsifier.

5,772,723

**METHOD OF MANUFACTURING CITRIC ACID CHELATES**

Alan M. Robinett, and Carl Schauble, both of Ozark, Ala., assignors to Frit, Inc., Ozark, Ala.

Filed Nov. 22, 1996, Ser. No. 755,236

Int. Cl.<sup>6</sup> C05F 11/00

U.S. Cl. 71—27

20 Claims

1. A method of manufacturing a water soluble composition adapted for subsequent solubilizing and application to agricultural crops, comprising the steps of: mixing a divalent metal salt, citric acid and sodium citrate to obtain a first mixture having a moisture content of from approximately 10% to 1.25% by weight; and processing the first mixture in a drying environment to obtain a product consisting essentially of a partially chelated mixture of a divalent metal salt, citric acid and sodium citrate having a moisture content less than that of the first mixture prior to the processing step.  
14. A water soluble composition adapted for subsequent solubilizing and application to agricultural crops, consisting essential of a partially chelated mixture of a divalent metal salt, citric acid and sodium citrate, wherein the partially chelated mixture has a moisture content of at most 1.25% by weight of the mixture.

5,772,724

**HIGH PURITY TITANIUM PRODUCTION PROCESS**  
Hideaki Inoue, Nishinomiya, and Masahiro Odagiri, Ibaraki, both of Japan, assignors to Sumitomo Sitix Corporation, Hyogo, Japan

Filed Oct. 3, 1996, Ser. No. 724,894

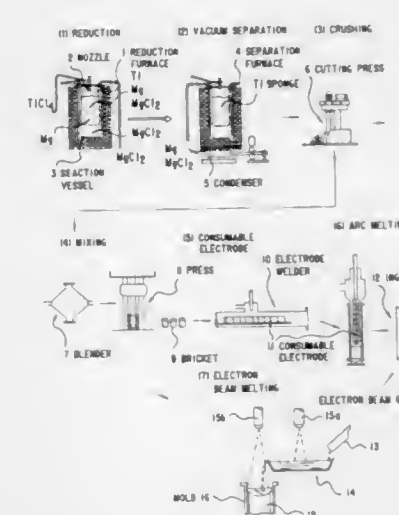
Claims priority, application Japan, Oct. 6, 1995, 7-259143; Oct. 12, 1995, 7-26039

Int. Cl.<sup>6</sup> C22B 34/12

U.S. Cl. 75—10.13

18 Claims

1. A method for producing high-purity titanium from a cylindrical lump of titanium sponge obtained by the Kroll process comprising separating a core of the cylindrical lump of said sponge





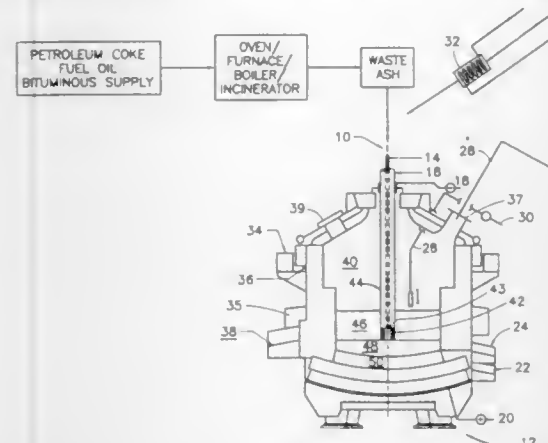
5,772,726

**METHOD OF SEPARATING VANADIUM FROM ASH**  
Herbert P. Woods, Exton, and Lionel M. Gillston, Norristown, both of Pa., assignors to Roy F. Weston, Inc., West Chester, Pa.

Filed Oct. 8, 1996, Ser. No. 727,124  
Int. Cl.<sup>6</sup> C22B 34/22; C22C 33/00

U.S. Cl. 75—10.22

20 Claims



1. A method of separating vanadium from waste ash containing vanadium and vanadium compounds, iron and iron compounds or nickel comprising:

generating a high temperature thermal plasma in the presence of oxygen;

contacting said waste ash with said high temperature thermal plasma, thereby forming a layer containing vanadium and vanadium compounds, iron and iron oxides from said waste ash and a slag layer on top of said layer;

causing vanadium and vanadium compounds in said layer to separate and collect at an upper surface of said layer and then react with said oxygen to form vanadium oxides and combine with said slag layer;

removing most of, but not all of, said layer;

stirring said slag layer without addition of more of said oxygen and adding aluminum and carbon to said slag layer;

reducing energy production of said high temperature thermal plasma;

generating vanadium metal by causing said aluminum to replace vanadium in said vanadium oxides;

generating iron metal by causing said carbon to remove oxygen from said iron oxides in said remaining portion of said layer; and

combining said vanadium and iron metal to form a ferro-vanadium alloy.

5,772,727

**PROCESS FOR THE PRODUCTION OF METAL FROM METAL ORES**

Hans De Haas, Lilienthal; Joachim Janz, Oyen; Horstmar Mohnkern, Ritterhude, and Manfred Voss, Bremen, all of Germany, assignors to Stahlwerke Bremen GmbH, Bremen, Germany

PCT No. PCT/EP94/01203, § 371 Date Aug. 18, 1995, § 102(e) Date Aug. 18, 1995, PCT Pub. No. WO95/17527, PCT Pub. Date Jun. 29, 1995

PCT Filed Dec. 17, 1994, Ser. No. 507,247

Claims priority, application Germany, Dec. 21, 1993, 43 43 768.0; Apr. 25, 1994, 941 06 439.6

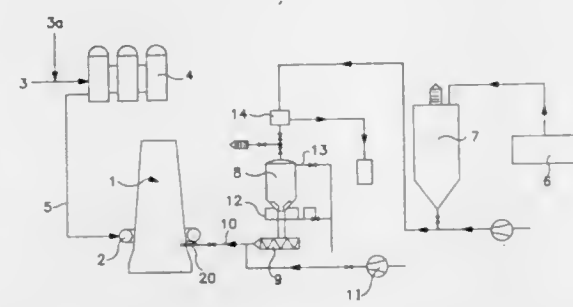
Int. Cl.<sup>6</sup> C21B 5/02

U.S. Cl. 75—378

18 Claims

1. A process of producing metal from a metal ore containing metal oxides, the process comprising the steps of:

obtaining a reducing gas containing at least one of carbon and hydrogen from solid substances containing at least one of carbon and hydrocarbons;



bringing the ore into reaction contact with the reducing gas in a metallurgical blast furnace; and

injecting a comminuted, fluidized plastics material into a blast current in a hearth region of the blast furnace, the plastics material comprising an agglomerate including plastics particles having a particle size substantially between 1 mm and 10 mm.

5,772,728

**METHOD FOR UPGRADING OF SILICON-CONTAINING RESIDUES OBTAINED AFTER LEACHING OF COPPER-CONTAINING RESIDUES FROM CHLOROSILANE SYNTHESIS**

Inger Johanne Eikeland, Oslo; Roald Gundersen, Vennesla, and Ragnhild Jensen, Kristiansand, all of Norway, assignors to Elkem ASA, Norway

Continuation of Ser. No. 537,934, Oct. 26, 1995, abandoned.

This application May 19, 1997, Ser. No. 859,819

Claims priority, application Norway, Mar. 30, 1994, 941174

Int. Cl.<sup>6</sup> C01B 33/00

U.S. Cl. 75—430

8 Claims

1. Method for upgrading a silicon and copper containing solid residue to obtain a silicon product comprising the steps of:

obtaining a solid residue from a direct synthesis of organochlorosilanes, said solid residue being a silicon and copper containing waste product from said synthesis;

leaching said residue to extract copper therefrom;

supplying the solid leached residue optionally together with an oxidation agent to a smelting furnace;

melting the residue and optional oxidizing agent to form a melt comprising a molten metallic phase substantially containing silicon and a slag phase comprising a calcium silicate slag; and

tapping the molten metallic phase and said slag phase from the smelting furnace, said slag phase being inert and said molten metallic phase being said silicon product.

5,772,729

Patent Not Issued For This Number

5,772,730

**PROCESS FOR SEPARATING CONTAMINANTS FROM ORGANIC PHASES DURING HYDROMETALLURGICAL EXTRACTION OF METALS**

Gustavo Holger Bannach Sichtermann, Santiago; Aliro Teodoro Nelson Pincheira Alvarez, Chuquicama; Andres Antonio Reghezza Inzunza, Chuquicama; Alberto Segundo Cruz Rivera, Chuquicama; Gino Salvador Slanzi Guerra, Chuquicama; Ernesto Otmardo Riedel Hohmann, Chuquicama, and Elias Ahmed Yuri Spataris, Calama, all of Chile, assignors to Corporacion Nacional Del Cobre De Chile, Santiago, Chile

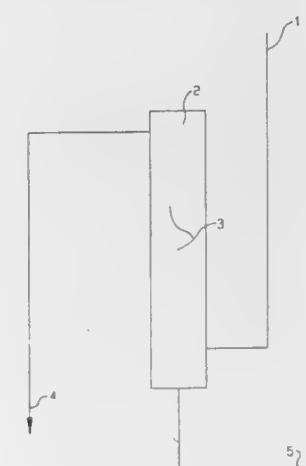
Filed Apr. 19, 1993, Ser. No. 49,736

Claims priority, application Chile, Apr. 20, 1992, 378-92

Int. Cl.<sup>6</sup> C21B 9/00

U.S. Cl. 75—710

22 Claims



1. A process for removing dispersed contaminating residues from an organic phase solution in a solvent extraction metallurgical process, comprising:

continuously introducing an organic phase solution which includes an acidic cycle and contains dispersed contaminating residues including particulate and aqueous residues through an inlet opening in a lower portion of a gravity-open, substantially vertical vessel means provided with a filtration bed comprising a plurality of elements formed of a material compatible with the acidic cycle of the organic phase solution, said elements defining a plurality of coalescing and filtration sites for inducing coalescence and mechanical retention of said dispersed particulate and aqueous contaminating residues thereon;

continuously advancing said organic phase solution upwardly through said coalescing and filtration sites of said filtration bed at a flow rate of between about 8 to 30 m<sup>3</sup>/hr/m<sup>2</sup> to separate at least about 74 percent of said contaminating residues from said organic phase solution by coalescence and filtration upon said bed elements and settling of said coalesced aqueous residue downwardly through said filtration bed, said organic phase being at least partially purified thereby; and

continuously withdrawing said purified organic phase solution from an outlet opening in an upper portion of said vessel and removing said separated aqueous residues from an outlet opening positioned below said inlet opening in the lower portion of said vessel.

5,772,731

**TREATMENT OF LIQUORS**

Stephen B. Harrison, London, England, assignor to The BOC Group plc, Windlesham, England

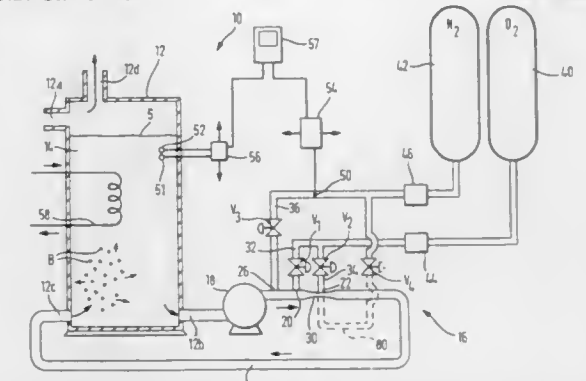
Filed Feb. 19, 1997, Ser. No. 801,371

Claims priority, application United Kingdom, Feb. 22, 1996, 9603747

Int. Cl.<sup>6</sup> B01D 19/00

U.S. Cl. 95—8

16 Claims



1. A process for the removal of carbon dioxide from liquor in a vessel comprising continuously withdrawing a portion of the liquor into a sidestream, introducing a nitrogen-rich gas into the sidestream in a manner which forms separate and discrete bubbles of between 0.005 mm and 1.0 mm diameter and returning said portion of liquor to the vessel wherein the nitrogen acts to adsorb carbon dioxide from the liquor and is then expelled from the liquor as an off-gas.

5,772,732

**AIR HANDLER FILTER MONITORING APPARATUS AND METHOD**

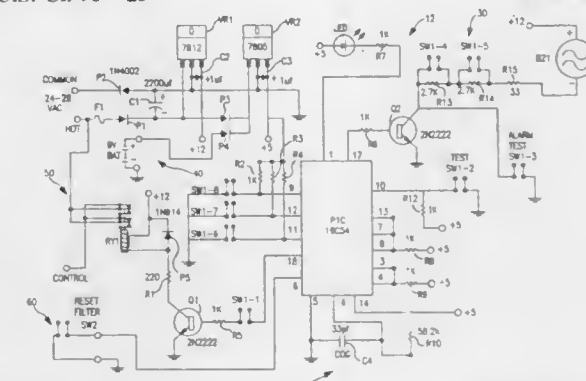
Terry Lynn James, 300 Hwy. 66, Conway, S.C. 29526, and Tommy M. Buckley, 3735 Limerick Rd., Myrtle Beach, S.C. 29577

Filed Nov. 25, 1996, Ser. No. 757,962

Int. Cl.<sup>6</sup> B01D 46/00

U.S. Cl. 95—25

14 Claims



1. A monitoring apparatus for alerting an operator to the need to change a filter in a temperature control system, comprising: means for selecting and setting a primary period of filter use to assure replacement before the filter becomes clogged; means for counting out the selected primary period; means for activating signalling means to signal the operator to replace the filter, absent replacement of the filter; means for sensing replacement of the filter; means for resetting the means for counting to begin the counting out the selected primary period again upon replacement of the filter; means for counting out a secondary period measured from the end of the primary period; and means for shutting down the system at the end of the secondary period absent replacement of the filter.

10. A method of monitoring a filter of an air temperature control system operated by a thermostat with an apparatus having means for selecting and setting a primary period of filter use to assure replacement before the filter becomes clogged; means for counting out the selected primary period; means for activating signalling means to signal the operator to replace the filter, absent replacement of the filter; means for sensing replacement of the filter; means for resetting the means for counting to begin the counting out the selected primary period again upon replacement of the filter, comprising the steps of:

- an operator selecting and setting a primary period of filter use appropriate to assure filter replacement before the filter becomes clogged;
- the apparatus counting out the selected primary period;
- the apparatus activating signalling means at the end of the primary period to signal the operator to replace the filter;
- the apparatus counting out a secondary time period measured from the end of the primary time period;
- at the end of the secondary time period, apparatus supplying power to a relay on the circuit board to disrupt voltage to the thermostat and thereby to shut down the system.

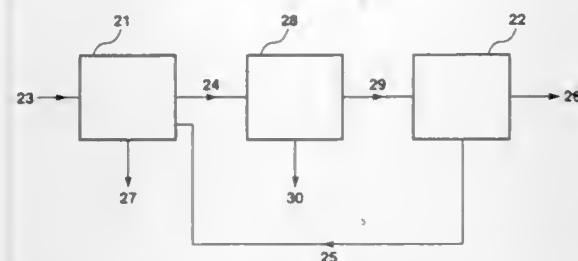
5,772,733  
NATURAL GAS LIQUIDS (NGL) STABILIZATION  
PROCESS

Kaeid A. Lokhandwala, Menlo Park, and Richard W. Baker, Palo Alto, both of Calif., assignors to Membrane Technology and Research, Inc., Menlo Park, Calif.

Filed Jan. 24, 1997, Ser. No. 789,374  
Int. Cl.<sup>6</sup> B01D 53/22

U.S. Cl. 95—39

54 Claims



1. A process for stabilizing natural gas liquid (NGL) containing  $C_{3+}$  hydrocarbons, comprising the following steps:
- (a) subjecting a raw NGL stream to phase separation by pressure reduction, thereby producing a stabilized NGL stream and a gas stream;
  - (b) cooling said gas stream, thereby removing a portion of said  $C_{3+}$  hydrocarbons as a liquid condensate from said gas stream, and leaving a non-condensed stream;
  - (c) subjecting said non-condensed stream to membrane separation, thereby producing a product gas stream enriched in methane compared with said non-condensed stream, and a heavy stream enriched in  $C_{3+}$  hydrocarbons compared with said non-condensed stream;
  - (d) returning said heavy stream to bring said heavy stream into equilibrating contact with said raw NGL stream in step (a).

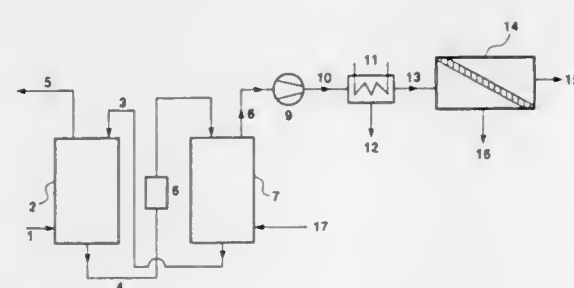
5,772,734  
MEMBRANE HYBRID PROCESS FOR TREATING LOW-ORGANIC-CONCENTRATION GAS STREAMS  
Richard W. Baker, Palo Alto, and Ramin Daniels, San Jose, both of Calif., assignors to Membrane Technology and Research, Inc., Menlo Park, Calif.

Filed Jan. 24, 1997, Ser. No. 788,765  
Int. Cl.<sup>6</sup> B01D 53/22; 19/00; 53/14

U.S. Cl. 95—42

55 Claims

1. A process for removing an organic compound from a raw gas stream, comprising:



- (a) performing a scrubbing step, comprising:
  - contacting said raw gas stream with a scrubbing liquid, thereby dissolving at least a portion of said organic compound in said scrubbing liquid;
  - resulting in a scrubbing liquid stream enriched in said organic compound, and a treated gas stream depleted in said organic compound;
- (b) performing a stripping step, comprising:
  - contacting said scrubbing liquid stream enriched in said organic compound with a strip gas, thereby causing stripping of said organic compound from said scrubbing liquid stream by said strip gas;
  - resulting in an enriched strip gas stream enriched in said organic compound and a depleted scrubbing liquid stream depleted in said organic compound;
- (c) performing a condensation step, comprising:
  - condensing at least a portion of said enriched strip gas stream;
  - resulting in a condensed stream enriched in said organic compound, and a non-condensed stream depleted in said organic compound;
- (d) performing a membrane separation step, comprising:
  - providing a membrane having a feed side and a permeate side;
  - providing a driving force for transmembrane permeation;
  - contacting said feed side with said non-condensed stream;
  - withdrawing from said membrane an enriched stream, enriched in said organic compound compared with said non-condensed stream;
  - withdrawing from said membrane a depleted stream, depleted in said organic compound compared with said non-condensed stream.

5,772,735  
SUPPORTED INORGANIC MEMBRANES  
Rakesh Sehgal, and Charles Jeffrey Brinker, both of Albuquerque, N. Mex., assignors to University of New Mexico, and Sandia Natl Laboratories, both of Albuquerque, N. Mex.  
Continuation of Ser. No. 551,956, Nov. 2, 1995, abandoned.  
This application Jul. 18, 1997, Ser. No. 896,716  
Int. Cl.<sup>6</sup> B01D 53/22

U.S. Cl. 95—45

40 Claims

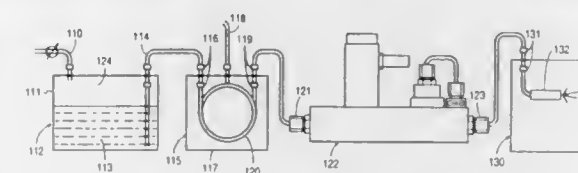
39. A method for separating the molecular components of a gaseous stream comprising a mixture of small molecules, said method comprising:
- sequentially contacting said gaseous stream with a plurality of supported inorganic membranes capable of molecular sieving, wherein the temperature of each membrane is greater than the temperature of the previously contacted membrane, whereby the molecular components of said gaseous stream are separated.

5,772,736  
DEVICE FOR REMOVING DISSOLVED GAS FROM A LIQUID

Bart J. van Schravendijk, Sunnyvale; Christopher W. Burkhart, San Jose; Tito H. Santiago, San Mateo; Charles E. Pomeroy, Santa Clara, and Jeffrey W. Lind, Santa Cruz, all of Calif., assignors to Novellus Systems, Inc., San Jose, Calif.  
Continuation of Ser. No. 394,128, Feb. 23, 1995, Pat. No. 5,645,625, which is a continuation of Ser. No. 270,515, Jul. 5, 1994, Pat. No. 5,425,803, which is a continuation of Ser. No. 978,216, Nov. 16, 1992, abandoned. This application Feb. 28, 1997, Ser. No. 808,525  
Int. Cl.<sup>6</sup> B01D 19/00

U.S. Cl. 95—46

34 Claims

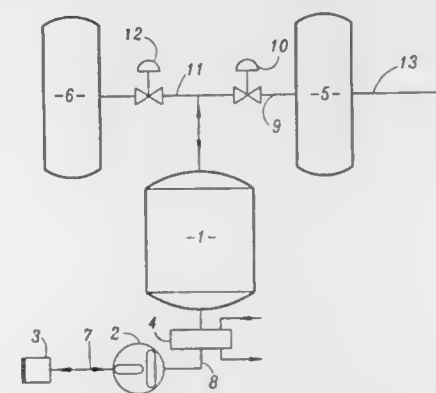


1. A method for removing a gas from a liquid comprising: passing said liquid through a structure permeable to said gas, said structure being subjected to a pressure differential across the walls of said structure; and passing said liquid through a liquid mass flow controller, said passage through said structure inhibiting formation of bubbles of said gas and thereby improving the accuracy of said liquid mass flow controller.

5,772,737  
PROCESS FOR TREATING A GAS MIXTURE BY PRESSURE SWING ADSORPTION  
Philippe Andreani, Le Kremlin Bicetre; Christian Monereau, Paris, and Pierre Petit, Buc, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation Des Procédes Georges, Paris, France  
Filed Mar. 26, 1997, Ser. No. 827,055  
Claims priority, application France, Mar. 27, 1996, 96 03809  
Int. Cl.<sup>6</sup> B01D 53/053

U.S. Cl. 95—98

9 Claims



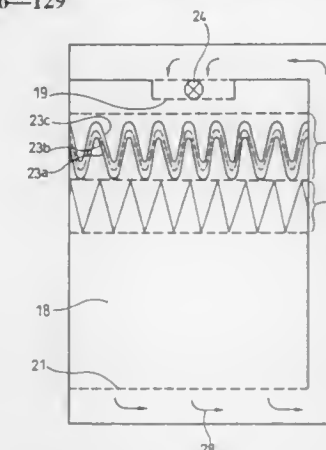
1. Process for treating a gas mixture by pressure swing adsorption in a plant comprising at least one adsorber (1), wherein, in the or in each adsorber (1), a cycle is carried out which comprises a production phase and a regeneration phase, the latter including an initial phase, which includes a cocurrent decompression step, and a final phase, which includes a countercurrent recompression step, wherein, at least during the recompression step (5) of the final regeneration phase, gas output from the cocurrent decompression step (3) is introduced in countercurrent, and in that the duration ( $T_R$ ) of the countercurrent recompression step (5) is less than that ( $T_D$ ) of the cocurrent decompression step (3).

5,772,738  
MULTIFUNCTIONAL AIR FILTER AND AIR-CIRCULATING CLEAN UNIT WITH THE SAME INCORPORATED THEREIN

Hisashi Muraoka, Yokohama, Japan, assignor to Purex Co., Ltd., and Kabushiki Kaisha Toshiba, both of Kanagawa-ken, Japan  
Continuation-in-part of Ser. No. 351,089, Nov. 30, 1994, abandoned. This application May 30, 1996, Ser. No. 657,935  
Claims priority, application Japan, Nov. 30, 1993, 5-326062  
Int. Cl.<sup>6</sup> B01D 53/02

U.S. Cl. 96—129

11 Claims



1. A multifunctional air filter module with at least one replaceable and reusable fabric filter element for reducing both organic and inorganic contaminants, said module comprising:
- a filter case having an air introduction side opening and an air discharge side opening;
  - a pleated fabric filter element selected from the group consisting of an activated carbon fiber having no further chemical contaminant absorptive substance attached thereto, a combination of said activated carbon fiber and a reinforcing fiber, and a combination of a fabric and activated carbon particles contained therein, positioned in said filter case in such a way that said pleated fabric filter element extends across an air flow directed from said air introduction side opening to said air discharge side opening, said pleated fabric filter element having a periphery that is fixed to said case without a clearance therebetween; and
  - at least one replaceable fabric filter element formed of a fabric selected from the group consisting of a fabric containing an activated carbon having a strong base attached thereto, a fabric containing an activated carbon having  $KMnO_4$  attached thereto, a fabric containing an activated carbon having  $ZnCl_2$  attached thereto, a cation exchange fiber fabric, and an anion exchange fiber fabric, said replaceable fabric filter element being simply placed in air introduction side grooves formed by said pleated fabric filter element and having a periphery not attached to said case.

5,772,739  
METHOD AND DEVICE FOR TREATING AN ENDLESS WEB OF MATERIAL WITH A WASHING LIQUID  
Walter Keller, Willich, and Christian Meyer, Viersen-Dülken, both of Germany, assignors to Wet-Tex Maschinenbau GmbH, Tonisvorst, Germany  
Filed Oct. 12, 1995, Ser. No. 542,389  
Claims priority, application Germany, Oct. 14, 1994, 44 36 746.5  
Int. Cl.<sup>6</sup> D06B 3/06

U.S. Cl. 95—241

25 Claims

1. A method for a treatment of an endless web of fabric in a treatment zone, in particular for washing a continuous textile web, with a heated treatment medium, wherein a gas-liquid mixture is withdrawn from the endless web of fabric in a withdrawing treatment zone with a vacuum generator, wherein a phase gas contained



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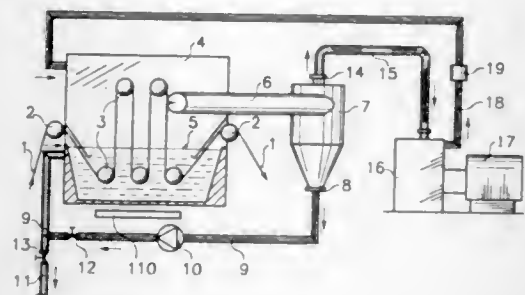
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in the gas-liquid mixture is separated, and wherein the remaining treatment liquid is returned into the treatment zone, wherein the gas-liquid mixture, generated during withdrawing the treatment medium from the endless web of fabric, is separated into a gas phase and a liquid phase outside of the treatment zone, wherein the separated liquid phase is pumped back into the treatment zone, and wherein the remaining gas phase is led through the vacuum generator and is then returned into the treatment zone.

5,772,740

**PASSIVATION METHOD AND COMPOSITION FOR GALVANIZED METAL SURFACES**

Jiangbo Ouyang, Media, and William L. Harpel, Langhorne, both of Pa., assignors to BetzDearborn Inc., Trevese, Pa. Division of Ser. No. 594,883, Feb. 7, 1996, Pat. No. 5,700,525, which is a continuation-in-part of Ser. No. 412,827, Mar. 29, 1995, abandoned. This application Jun. 10, 1997, Ser. No. 872,303

Int. Cl.<sup>6</sup> C23C 22/06

U.S. Cl. 106—14.12

4 Claims

1. An aqueous, substantially chromium free, composition for passivating a galvanized metal surface comprising from about 0.5 to about 50% phosphoric acid, from about 0.1 to 5% boric acid, and from about 0.1% to about 20% of a paraffin wax having a melting point of from about 90° F. to 200° F.

5,772,741

**AQUEOUS INK JET INK COMPOSITIONS**

Harry Joseph Spinelli, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 30, 1996, Ser. No. 739,986

Int. Cl.<sup>6</sup> C09D 11/02

U.S. Cl. 106—31.25

10 Claims

1. An ink jet ink composition comprising:  
(a) an aqueous continuous phase;  
(b) a discontinuous, non-aqueous phase comprising a pigment, a dispersant and a non-aqueous carrier; and  
(c) at least one polymeric emulsifier.

5,772,742

**DYE SET FOR IMPROVED COLOR QUALITY FOR INK-JET PRINTERS**

Patricia A. Wang, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 6, 1997, Ser. No. 851,981

Int. Cl.<sup>6</sup> C09D 11/02

U.S. Cl. 106—31.27

19 Claims

1. An ink set for ink-jet printing, comprising:  
a yellow ink comprising at least one yellow dye, said yellow ink having, on plain paper, a hue angle in the range from about 90 to about 100, a chroma greater than about 79, and a one-year simulated lightfade less than about 25;  
a magenta ink comprising at least one magenta dye, said magenta ink having, on plain paper, a hue angle in the range

from about 343 to about 352, a chroma greater than about 60, and a one-year simulated lightfade less than about 30; and  
a cyan ink comprising at least one cyan dye, said cyan ink having, on plain paper, a hue angle in the range from about 230 to about 238, a chroma greater than about 42, and a one-year simulated lightfade less than about 15;  
said yellow, magenta, and cyan dyes being soluble in an aqueous vehicle having a pH in the range from about 2 to about 6.

5,772,743

**INK COMPOSITIONS FOR THERMAL INK JET PRINTING**

Kurt B. Gundlach; Luis A. Sanchez; Cheryl A. Hanzlik, all of Fairport; Kathy-Jo Brodsky, Palmyra; Richard L. Colt, Rochester; Aileen M. Montes, Rochester, and Edward J. Radigan, Jr., Caledonia, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 30, 1997, Ser. No. 961,435

Int. Cl.<sup>6</sup> C09D 11/02

U.S. Cl. 106—31.27

16 Claims

1. An ink composition which comprises (a) water, (b) a colorant, (c) a fluorinated material selected from: (1) those of the formula  $((F_{2n+1}C_nCH_2S)_2(CH_3)C-CH_2CH_2COO^-)[B^+]$ , wherein n is an integer of from about 8 to about 20 and B is a cation, (2) those of the formula  $[(F_2C(F_2C)_nCH=CHCH_2OCH(OH)CH_2)_2NCH_2COO^-][X^+]$ , wherein X is a cation and n is an integer of from about 3 to about 20, and (3) mixtures thereof, and (d) a monomeric compound having at least two carboxylic acid functional groups.

5,772,744

**INK COMPOSITIONS FOR THERMAL INK PRINTING**

Kurt B. Gundlach, Fairport; Richard L. Colt, Rochester, and Edward J. Radigan, Jr., Caledonia, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 30, 1997, Ser. No. 961,335

Int. Cl.<sup>6</sup> C09D 11/02

U.S. Cl. 106—31.43

16 Claims

1. An ink composition which comprises water, a colorant, betaine, a tertiary amine, and a material of the formula  $((F_{2n+1}C_nCH_2S)_2(CH_3)C-CH_2CH_2COO^-)[B^+]$ , wherein n is an integer of from about 8 to about 20 and B is a cation.

5,772,745

**MONOAZO COMPOUNDS**

Peter Gregory, Bolton; Ronald Wynford Kenyon, Shipton Gorge, and Paul Wight, Prestwich, all of United Kingdom, assignors to Zeneca Limited, London, England

Continuation of Ser. No. 768,591, Dec. 18, 1996, abandoned. This application Jun. 12, 1997, Ser. No. 873,469

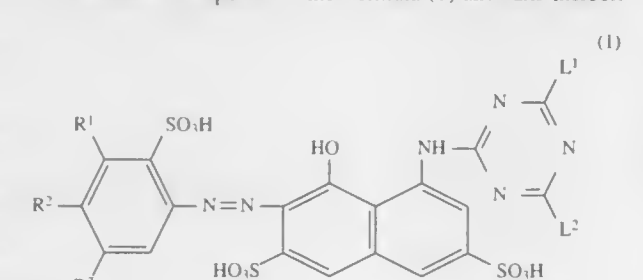
Claims priority, application United Kingdom, Dec. 19, 1995, 9525885

Int. Cl.<sup>6</sup> C09D 11/02

U.S. Cl. 106—31.48

16 Claims

1. A monoazo compound of the Formula (1) and salts thereof:



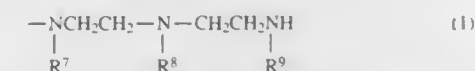
wherein:

each of R<sup>1</sup> and R<sup>3</sup>, independently, represents H, halogen, alkyl, alkoxy or C<sub>1-6</sub>-acylamino

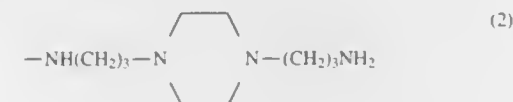
R<sup>2</sup> is halogen, alkyl, alkoxy or C<sub>1-6</sub>-acylamino, or R<sup>1</sup> and R<sup>2</sup> together form a benzo ring;

L<sup>1</sup> represents —OR<sup>4</sup>, —SR<sup>4</sup> or —NR<sup>4</sup>R<sup>6</sup> wherein each of R<sup>4</sup>, R<sup>5</sup> and R<sup>6</sup>, independently, represents H or optionally substituted hydrocarbyl or R<sup>5</sup> and R<sup>6</sup> together with the attached nitrogen atom form a 5- or 6-membered ring; and

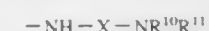
L<sup>2</sup> represents a substituted amino group selected from:



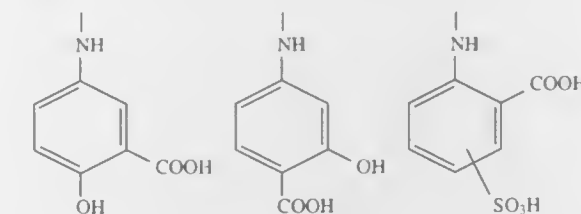
in which either R<sup>7</sup> is H and R<sup>8</sup> and R<sup>9</sup> together represent —CH<sub>2</sub>CH<sub>2</sub>— or R<sup>9</sup> is H and R<sup>7</sup> and R<sup>8</sup> together represent —CH<sub>2</sub>CH<sub>2</sub>—



and



in which X represents an optionally substituted alkylene group containing 2 or more carbon atoms and each of R<sup>10</sup> and R<sup>11</sup>, independently, represents H or optionally substituted hydrocarbyl, the compounds of Formula (1) being free from fibre-reactive groups and any carboxyl substituents present in the compounds being attached in the form of one or more residue of the following formulae:



5,772,746

**INK JET RECORDING LIQUID**

Seiji Sawada; Sunao Satake; Yasuharu Iida; Seiji Aida, and Yoshimitsu Ueno, all of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1997, Ser. No. 825,569

Claims priority, application Japan, Apr. 1, 1996, 8-078502

Int. Cl.<sup>6</sup> C09D 11/02

U.S. Cl. 106—31.86

10 Claims

1. An ink jet recording liquid containing a pigment dispersed in an aqueous medium, said aqueous medium comprising glycerol and 1,3-propanediol; and

an aqueous or water-dispersible vehicle resin in a ratio by weight from 0.1 to 15% as a resin solid to the total amount of the ink jet recording liquid.

5,772,747

**TIRE SEALANT COMPOSITION**

Ronald L. Turner, Golden, and John A. Elverum, Westminster, both of Colo., assignors to Peter Chun, Littleton, Colo.

Continuation of Ser. No. 283,839, Aug. 1, 1994, abandoned.

This application Nov. 12, 1996, Ser. No. 747,996

Int. Cl.<sup>6</sup> C09K 3/12

U.S. Cl. 106—33

11 Claims

1. A tire sealant composition comprising:

at least two separate components each having a viscosity low enough to allow passage through a tire valve stem wherein said at least two separate components comprise any of the following (a)–(f):

- a suspension of fibers and platelets in a viscous carrier medium, or
- triethanolamine and an aluminum oxide in water, or
- a water-free gum and water, or
- a water-free polymer and water, or
- an acrylic acid polymer and a base for neutralizing said polymer, or
- a salt and an aqueous aluminum oxide dispersion.

5,772,748

**PREFORM COMPACTION POWDERED METAL PROCESS**

Theodore Russell Hubbard, Smethport, Pa., assignor to Sinter Metals, Inc., Emporium, Pa.

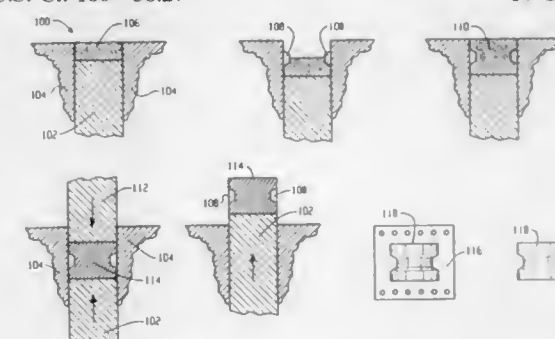
Division of Ser. No. 428,560, Apr. 25, 1995, Pat. No. 5,503,795.

This application Dec. 20, 1995, Ser. No. 575,215

Int. Cl.<sup>6</sup> B22F 3/12; 5/00; 5/06

U.S. Cl. 106—38.27

10 Claims



1. A preform, used to make a sintered metal product, said preform comprising:

- a preform volume formed of a predetermined material;
- a preform profile defining the surface of the preform volume, and having a predetermined shape with at least one transverse feature, wherein said preform is inserted into a pressed metal mold which is then filled with a powdered metal, so that, upon compaction with the powdered metal, the preform profile defines a reverse transverse profile on the surface of the compacted metal part, wherein the preform substantially changes the shape of the mold surface imparted to the compacted powdered metal, said preform is substantially removed by any one of infiltration or vaporization such that said preform volume becomes a substantially void region along the surface of the sintered metal product.

5,772,749

**ANIONIC BITUMINOUS EMULSIONS WITH IMPROVED ADHESION**

Peter Schilling, and Everett Crews, both of Charleston, S.C., assignors to Westvaco Corporation, New York, N.Y.

Filed Sep. 15, 1997, Ser. No. 929,837

Int. Cl.<sup>6</sup> C08L 95/00

U.S. Cl. 106—277

13 Claims

1. An improved method for enhancing adhesion between asphalt and aggregate in anionic bituminous emulsions wherein the improvement comprises the addition to the emulsion of a composition comprising a mixture of:

- 30–70 wt. % of the composition of a polyamidoamine condensation reaction product of:
  - 20–80 wt. % of a member selected from the group consisting of tall oil fatty acids, C<sub>21</sub> dicarboxylic acids, C<sub>22</sub> tricarboxylic acids, C<sub>22</sub> tricarboxylic acid anhydrides, and combinations thereof;

- 2) 80-20 wt. % of a polyethylene amine having a number average molecular weight in the range of about 60 to about 1,000; and  
3) up to 5% of paraformaldehyde; with  
B) 70-30 wt. % of the composition of bis-hexamethylenetriamine.

5,772,750

**PROCESS FOR PRODUCING  $\beta$ -FORM COPPER PHTHALOCYANINE PIGMENT**

Nobuyuki Tomiya, and Mikio Hayashi, both of Tokyo, Japan, assignors to Toyo Ink Manufacturing Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1997, Ser. No. 840,928

Claims priority, application Japan, Apr. 26, 1996, 8-107456

Int. Cl.<sup>6</sup> C09B 47/04

U.S. Cl. 106—413

8 Claims

1. A method for producing a  $\beta$ -form copper phthalocyanine pigment comprising the steps of: dry milling crude copper phthalocyanine at a temperature between 110 and 200° C. to form a mixture of  $\alpha$ -form crystal and  $\beta$ -form crystal copper phthalocyanine particles, and transforming the  $\alpha$ -form crystal to the  $\beta$ -form crystal by treating said mixture in an organic solvent or in a liquid mixture of water and an organic solvent, the organic solvent being capable of transforming  $\alpha$ -form crystal to  $\beta$ -form, to form copper phthalocyanine pigment.

wherein primary particles of said copper phthalocyanine pigment have an aspect ratio in the range of 1 to 3, and wherein the  $\alpha$ -form is present in said primary particles in an amount of less than 1 wt. %.

5,772,751

**CEMENT-BOUND LIGHT-WEIGHT INSULATING STRUCTURAL MONOLITHIC AGGREGATE CONCRETE**

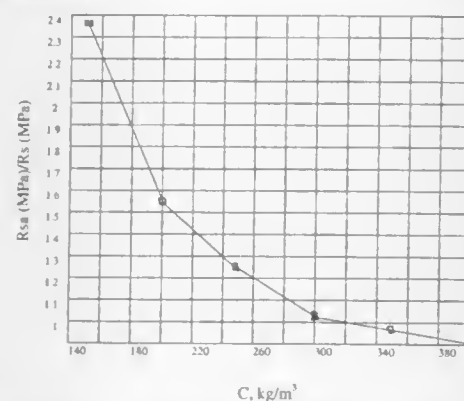
Mark L. Nisnevich, Saba, and Boris I. Kompaneetz, Efraim, both of Israel, assignors to College of Judea and Samaria, Ariel, Israel

Continuation-in-part of Ser. No. 548,792, Oct. 26, 1995, abandoned. This application May 5, 1997, Ser. No. 851,065

Int. Cl.<sup>6</sup> C04B 20/00; 28/04; 28/08

U.S. Cl. 106—679

25 Claims



1. An improved cement-bound insulating structural monolithic aggregate light-weight concrete possessing optimal correlation of desirable building properties of a concrete structure, the light-weight concrete comprising:

- (a) a hardened paste, said hardened paste including a hardened mixture of cement having a high density and an additive, said additive being close in grading to cement, having a grain size smaller than about 100 micrometers, and having a medium density in the range of about 1.5-2.5 g/cm<sup>3</sup>; and  
(b) a light-weight porous aggregate having a low density in the range of about 1.0-1.8 g/cm<sup>3</sup>, such that the light-weight concrete has a density lower than 1,800 kg/m<sup>3</sup>.

said additive being for replacing air-voids in said hardened paste and for, at least partially, filling-in open pores in said light-weight porous aggregate, such that the light-weight concrete becomes denser and therefore stronger and more durable, said additive being further for reducing segregation of said light-weight porous aggregate while forming the concrete, while at the same time for reducing said cement content in said light-weight concrete.

5,772,752

**SULFATE AND ACID RESISTANT CONCRETE AND MORTAR**

John W. Liskowitz, Belle Mead; Methi Wecharatana, Parsippany, both of N.J.; Chai Jaturapitakkul, Bangkok THX, and Anthony E. Cerkanowicz, deceased, late of Livingston, N.J., by Elizabeth M. Cerkanowicz, executrix, assignors to New Jersey Institute of Technology, Newark, N.J.

PCT No. PCT/US95/06336, § 371 Date Nov. 20, 1996, § 102(c) Date Nov. 20, 1996, PCT Pub. No. WO95/32162, PCT Pub. Date Nov. 30, 1995

Continuation-in-part of Ser. No. 246,861, May 20, 1994, abandoned. This PCT application May 19, 1995, Ser. No. 737,665

Int. Cl.<sup>6</sup> C04B 7/13; 14/04

U.S. Cl. 106—705

18 Claims

1. A hardenable mixture comprising cementitious materials, fly ash, and a fine aggregate, wherein the cementitious materials comprise fly ash as well as cement; and wherein the total amount of fly ash ranges from about 60% to about 120% of the total amount of cement in the hardenable mixture, by weight, wherein the fly ash is characterized by at least 99% of the particles having a particle size less than 20 microns and having a fineness modulus of less than about 600, wherein the fineness modulus is calculated as the sum of the percent of fly ash particles having a size greater than 0, 1, 1.5, 2, 3, 5, 10, 20, 45, 75, 150, and 300 microns.

5,772,753

**CEMENT ACCELERATORS**

Salvatore Valentini, Binningen, Switzerland, assignor to MBT Holding AG, Zurich, Switzerland

Filed Nov. 21, 1996, Ser. No. 754,954

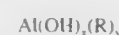
Claims priority, application United Kingdom, Nov. 23, 1995, 9524002; Dec. 1, 1995, 9524577

Int. Cl.<sup>6</sup> C04B 24/00

U.S. Cl. 106—810

20 Claims

1. A cement setting and hardening accelerator having the formula



wherein R is a basic anion which is not sulphate, and x+y=3, wherein x and y are not 0, and wherein R is derived from an organic acid.

5,772,754

**ULTRAFINE PARTICLES AND PRODUCTION METHOD THEREOF**

Shun-ichiro Tanaka, 1-35-12, Hongo, Seta-ku, Yokohama-shi, Kanagawa-ken, and Bing She Xu, Yokohama, both of Japan, assignors to Research Development Corporation of Japan, Kawaguchi, and Shun-ichiro Tanaka, Yokohama, both of Japan

Filed Feb. 7, 1996, Ser. No. 598,053

Claims priority, application Japan, Feb. 9, 1995, 7-021715

Int. Cl.<sup>6</sup> C30B 1/06

U.S. Cl. 117—5

10 Claims

1. An ultrafine powder comprising at least one selected from the group consisting of stable ultrafine particles of a metal oxide and nanoparticles of a metal which is a component of the metal oxide,

5,772,757

**APPARATUS AND METHOD FOR GROWING SEMICONDUCTOR CRYSTAL**

Junji Saito, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

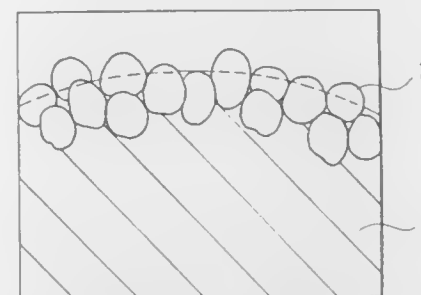
Division of Ser. No. 384,389, Feb. 3, 1995, Pat. No. 5,458,689, which is a continuation of Ser. No. 713, Jan. 5, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 475,170

Claims priority, application Japan, Jan. 7, 1992, 4-000544

Int. Cl.<sup>6</sup> C30B 25/14

U.S. Cl. 117—84

6 Claims



wherein the ultrafine particles and the nanoparticles are produced from metastable particles of the metal oxide by irradiating an electron beam in a vacuum to form the ultrafine powder.

5,772,755

**ORIENTED CRYSTALLINE MATERIALS**

Jack Hegenbarth, Wilmington, Del., and Diane R. Carpenter, West Chester, Pa., assignors to W. L. Gore & Associates, Inc., Newark, Del.

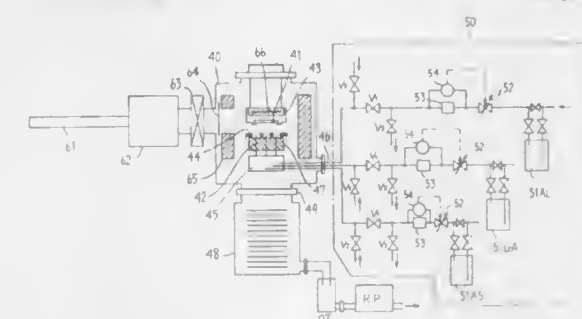
Filed Aug. 1, 1996, Ser. No. 690,151

Int. Cl.<sup>6</sup> C30B 7/00

U.S. Cl. 117—68

5 Claims

1. A multi-layer composite having as a first layer an oriented PTFE layer on a substrate; a second layer of a hydrophilic polymer adjacent and abutting the oriented PTFE of the first layer and providing a covering over the oriented PTFE; a third layer adjacent and abutting the second layer, said third layer being formed from a crystallizable and orientable material, said hydrophilic polymer being a copolymer of tetrafluoroethylene and a hydrophilic comonomer.



1. A method for growing a semiconductor on a substrate by evaporating a source gas from a tubular gas-cell to said substrate in a vacuum chamber, said source gas containing a gaseous compound of an element constituting the semiconductor, said gas-cell being arranged in said vacuum chamber, directing toward said substrate and receiving said source gas from the outside of said vacuum chamber, comprising a step of:  
setting the distance between said substrate and said gas-cell to be less than the mean free path of gases in said vacuum chamber or less than 10 cm; and  
supplying said source gas from said gas-cell to said substrate.

5,772,758

**NEAR REAL-TIME EXTRACTION OF DEPOSITION AND PRE-DEPOSITION CHARACTERISTICS FROM ROTATING SUBSTRATES AND CONTROL OF A DEPOSITION APPARATUS IN NEAR REAL-TIME**

Douglas A. Collins; Thomas C. McGill, and George O. Papa, all of Pasadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

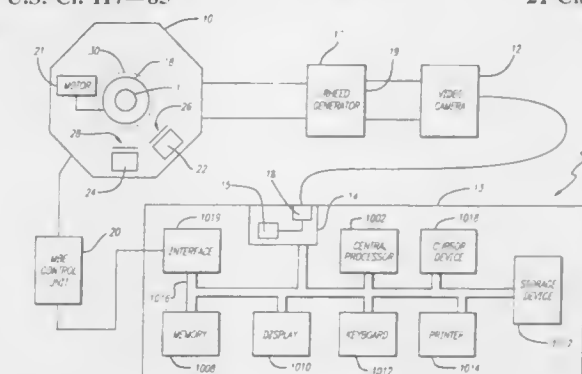
Continuation of Ser. No. 365,830, Dec. 29, 1994, abandoned.

This application Feb. 15, 1996, Ser. No. 602,144

Int. Cl.<sup>6</sup> C30B 25/16

U.S. Cl. 117—85

21 Claims



1. A method comprising the steps of:  
extracting characteristics of a surface on a substrate, the extracting step is performed in near real-time and includes the steps of:

- obtaining a video image of an energy pattern coming from said substrate, said video image having pixels,  
monitoring a selected set of said pixels,  
repeating the steps of obtaining and monitoring to generate a plurality of time-domain data, and  
filtering said plurality of time-domain data; and

1. A method of producing diamond crystal growth on a seed crystal includes the steps of providing a seed crystal containing at least one twin plane and re-entrant growth surfaces associated therewith and applying high temperature/high pressure synthesis conditions to the seed crystal to cause diamond growth to occur preferentially on the re-entrant surfaces.



controlling a deposition apparatus in near real-time to control a thickness of a layer of a material applied to said substrate in response to the characteristics extracted in near real-time.

5,772,759

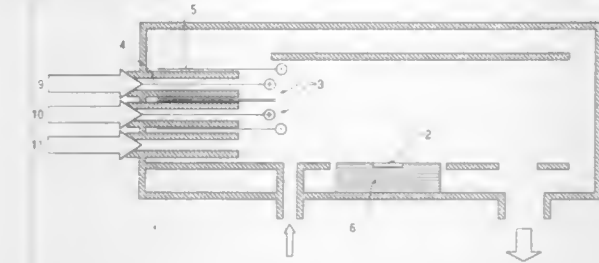
**PROCESS FOR PRODUCING P-TYPE DOPED LAYERS, IN PARTICULAR, IN II-VI SEMICONDUCTORS**  
Klaus Heime, and Michael Heuken, both of Aachen, Germany, assignors to Aixtron GmbH, Aachen, Germany  
Continuation of Ser. No. 403,776, Apr. 11, 1995, abandoned.  
This application Oct. 8, 1996, Ser. No. 727,763

Claims priority, application Germany, Sep. 28, 1992, 42 32 504.8

Int. Cl.<sup>6</sup> C30B 25/14

U.S. Cl. 117—103

5 Claims



1. A process for the production of p-type doped II-VI semiconductor layers for use in blue emitting semiconductor devices by means of a CVD precipitation process, comprising forming a plasma in a gas comprising a carrier gas and metalorganic starting material compounds containing group II and group VI elements at a total pressure of 9.5 to 150 hPa, said carrier gas consisting of nitrogen, and depositing a II-VI semiconductor layer on a substrate, wherein the step of forming the plasma results in the formation of nitrogen radicals which settle in said II-VI semiconductor layer.

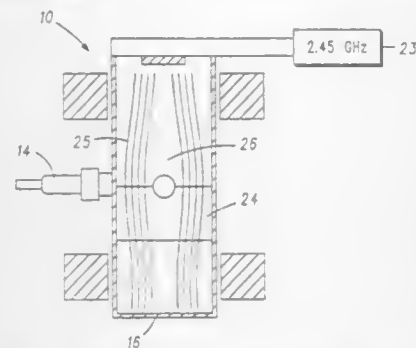
5,772,760

**METHOD FOR THE PREPARATION OF NANOCRYSTALLINE DIAMOND THIN FILMS**  
Dieter M. Gruen, Downers Grove, and Alan R. Krauss, Naperville, both of Ill., assignors to The University Of Chicago, Chicago, Ill.  
Continuation-in-part of Ser. No. 143,866, Oct. 27, 1993, Pat. No. 5,620,512, which is a continuation-in-part of Ser. No. 35,419, Mar. 23, 1993, Pat. No. 5,370,855, which is a continuation-in-part of Ser. No. 797,590, Nov. 25, 1991, Pat. No. 5,209,516. This application Oct. 11, 1995, Ser. No. 540,916

Int. Cl.<sup>6</sup> C30B 31/06

U.S. Cl. 117—104

30 Claims



1. A method for manufacturing a nanocrystalline diamond film on a substrate, comprising the steps of:  
(a) forming a carbonaceous vapor selected from the group consisting of a fullerene; fragments thereof; a hydrocarbon selected from the group consisting of CH<sub>4</sub>, C<sub>2</sub>H<sub>2</sub> and anthracene; and mixtures thereof;

- (b) providing a gas stream consisting essentially of an inert gas and hydrogen and combining said carbonaceous vapor with said gas stream;  
(c) passing said combined carbonaceous vapor and inert gas stream into a chamber;  
(d) forming a plasma in said chamber, said carbonaceous vapor undergoing interactions in said plasma to form carbon dimer species; and  
(e) depositing said carbon species onto said substrate to form a continuous, nanocrystalline diamond film consisting essentially of carbon in a diamond crystallographic structure.

5,772,761

**CRYSTALLIZATION FURNACE FOR MATERIAL WITH LOW THERMAL CONDUCTIVITY AND/OR LOW HARDNESS**

Gérard Petroz, Monthonnat, France, assignor to Commissariat a l'Energie Atomique, Paris, France

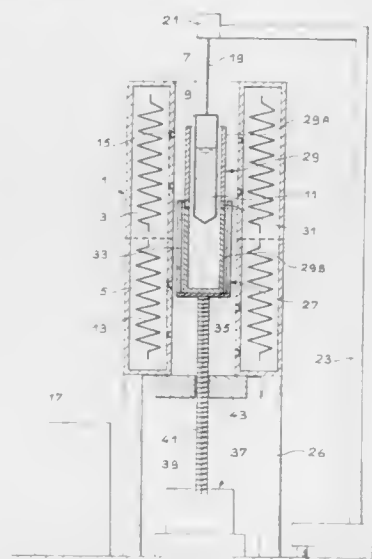
Filed Nov. 8, 1996, Ser. No. 747,155

Claims priority, application France, Nov. 23, 1995, 95 13934

Int. Cl.<sup>6</sup> C30B 35/00

U.S. Cl. 117—206

12 Claims



1. A crystallization furnace for a material with one of low thermal conductivity and low hardness, comprising a heating chamber (1), heating means (13) to set up a temperature profile along the center line of said chamber, and thus to define at least one hot zone (3) and at least one cold zone (5) and a crucible (9) filled with a solution of solute to be crystallized in a solvent, said crucible (9) being fixed and placed in the hot zone (3) in the heating chamber (1), characterized in that the furnace also includes: a crystallization device (27) comprising a temperature homogenizer (29A) and a heat sink (29B) separated by a thermally insulating spacer (31), said temperature homogenizer, heat sink and insulating spacer being rigidly attached, and means (37) for moving said crystallization device (27) along the center line of the chamber and around said crucible (9).

5,772,762

**APPARATUS FOR APPLICATION OF COATING COLOR ON A PROFILED EDGE OR ON A STRAIGHT EDGE AREA OF A WORKPIECE**

Udo Hanitzsch, Bielefeld, Germany, assignor to Firma Theodor Hymmen, Bielefeld, Germany

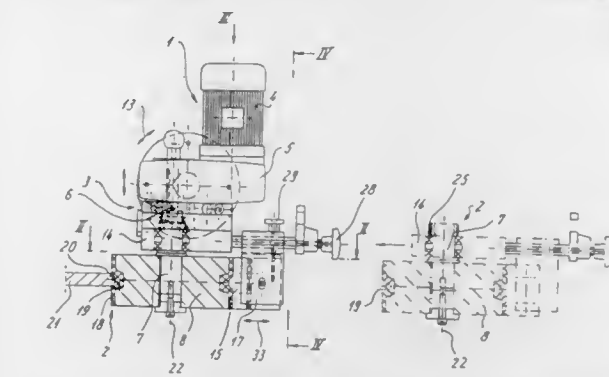
Filed May 8, 1996, Ser. No. 646,975

Claims priority, application Germany, May 22, 1995, 295 08 267.4; Aug. 5, 1995, 295 12 660.4

Int. Cl.<sup>6</sup> B05C 1/00

U.S. Cl. 118—203

14 Claims



1. Apparatus for application of coating color on a profiled edge or straight edge area of a workpiece, comprising:  
a motor-driven applicator roll supported on a shaft for rotation about a rotational axis for coating a workpiece;  
first and second structural assemblies; and  
a quick-release coupling for connecting the first and second structural assemblies to each other, said first structural assembly including a motor-and-gear unit and a mounting, and said second structural assembly including the applicator roll, a plate supporting the shaft of the applicator roll, a doctor being positionally adjustable relative to the applicator roll, and a pump for supplying coating color onto the applicator roll.

5,772,763

**ADJUSTABLE ROTARY COATER DEVICE FOR APPLYING HOT MELT MATERIAL TO A MOVING WEB**  
James Gordon Himes, Jr., Woodstock, and Charles H. Scholl, Duluth, both of Ga., assignors to Nordson Corporation, Westlake, Ohio

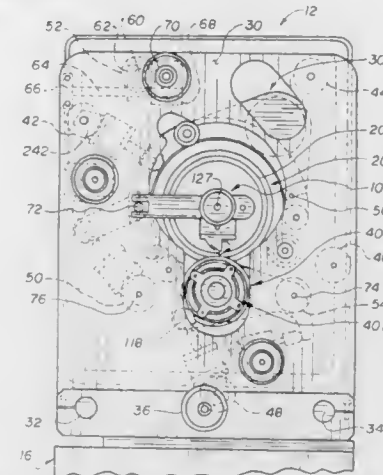
Division of Ser. No. 421,413, Apr. 12, 1995, Pat. No. 5,650,009.

This application Mar. 5, 1997, Ser. No. 811,676

Int. Cl.<sup>6</sup> B05C 1/00

U.S. Cl. 118—213

11 Claims



1. A rotary coater device (12), comprising:  
a frame including front and rear frame plates (30);  
a substantially cylindrical screen (202) mounted between said front and rear frame plates.

a die bracket assembly (100) mounted between said frame plates, said die bracket assembly including a die (500) pivotally mounted within said screen and having an opening (550) from which hot melt material is issued, said die being pivotable from an operating position wherein said die opening is proximate to an inner surface of said screen to an idle position wherein said die is drawn away from said inner surface; and  
a screen assembly (200) for supporting said cylindrical screen in an operating axial position about a first axis (127), said screen assembly including (i) at least one guide wheel (206) engageable with said screen and (ii) a retractable support arm (238) pivotable about an axis (72) from a first position wherein said at least one guide wheel is engaged with said screen in said operating axial position, to a second position wherein said at least one guide wheel is disengaged from said screen.

5,772,764

**COATING APPARATUS**

Masami Akimoto, Kumamoto, Japan, assignor to Tokyo Electron Limited, Tokyo, Japan

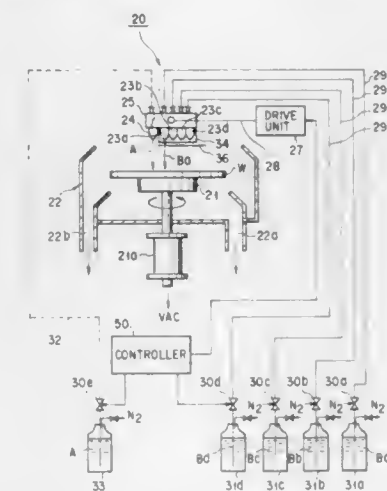
Filed Oct. 9, 1996, Ser. No. 729,028

Claims priority, application Japan, Oct. 13, 1995, 7-292131

Int. Cl.<sup>6</sup> B05B 13/02; 7/16; 15/02; 13/04

U.S. Cl. 118—319

14 Claims



1. A coating apparatus comprising:  
a spin chuck for holding and rotating a substrate;  
a header unit movably along a linear line connecting a position just above a center-of-rotation of the substrate, to a home position of the unit along the linear line;  
a plurality of first nozzles included in the header unit for discharging coating liquids to the substrate held on the spin chuck, the first nozzles having their respective nozzles ports arranged in line along the linear line;  
a plurality of coating liquid supply means for supplying the coating liquids to the first nozzles, respectively;  
at least one nozzle included in the header unit together with the first nozzles, for discharging, to the substrate, a solvent for solving the coating liquids in order to wet the substrate with the solvent before coating the coating liquids; and  
solvent supply means for supplying the solvent to the second nozzle.

5,772,765

**DEVICE FOR PROCESSING FLAT WORKPIECES, IN PARTICULAR PRINTED CIRCUIT BOARDS**

Daniel Hosten, Handzame, Belgium, assignor to Siemens S.A., Brussels, Belgium

PCT No. PCT/EP95/01754, § 371 Date Nov. 12, 1996, § 102(e) Date Nov. 12, 1996, PCT Pub. No. WO95/31589, PCT Pub. Date Nov. 23, 1995

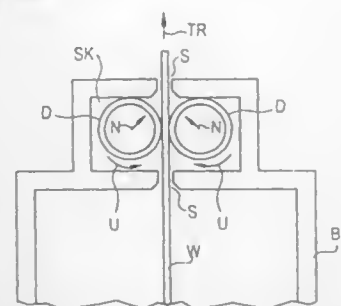
PCT Filed May 9, 1995, Ser. No. 737,257

Claims priority, application Germany, May 11, 1994, 44 16 708.3

Int. Cl.<sup>6</sup> B05C 3/02

U.S. Cl. 118—405

7 Claims



1. A device for immersion processing of flat workpieces which are conveyed in the vertical position on a horizontal transport path, the device comprising:

- an immersion processing cell for containing a processing bath fluid, the processing cell having a pair of opposed vertical end walls, each of the end walls having a vertical slot disposed therein to accommodate a passage of the workpieces; and a plurality of seals, a pair of the seals being assigned to the each of the vertical slots, each of the seals being cylindrical in shape, the seals being free and movable relative to the processing cell and disposed generally vertically, such that the seals are pressed by pressure of the bath (a) against one another and against the respective end wall when a workpiece is not disposed therebetween, and (b) against opposing outer surfaces of a workpiece and against the respective end wall when a workpiece is disposed therebetween, preventing a significant flow of said bath fluid from the respective slot and permitting a passage of the workpieces through the respective slot and between each of the pairs of seals.

5,772,766

**APPLICATION UNIT FOR THE DIRECT OR INDIRECT APPLICATION OF A LIQUID OR PASTY MEDIUM ONTO A MOVING MATERIAL WEB**

Stefan Reich, Heidenheim; Richard Bernert, Giengen; Martin Kustermann, Heidenheim; Manfred Ueberschaer, Nattheim, and Eckard Wozny, Heidenheim, all of Germany, assignors to Voith Papiermaschinen GmbH, Germany

PCT No. PCT/EP95/03444, § 371 Date May 9, 1996, § 102(e) Date May 9, 1996, PCT Pub. No. WO96/07790, PCT Pub. Date Mar. 14, 1996

PCT Filed Sep. 6, 1995, Ser. No. 640,905

Claims priority, application Germany, Sep. 9, 1994, 44 32 178.3; Sep. 9, 1994, 44 32 178.1; Sep. 9, 1994, 44 32 180.5

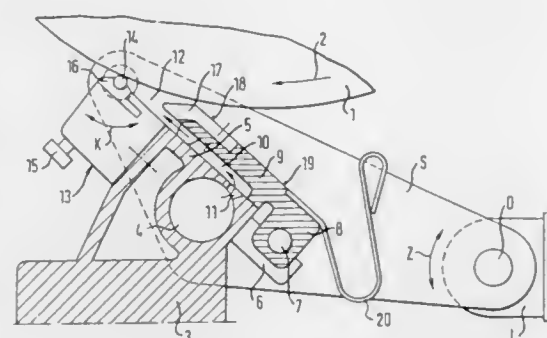
Int. Cl.<sup>6</sup> G05C 5/00

U.S. Cl. 118—413

30 Claims

1. An application unit for applying a liquid or a pasty medium onto a moving surface, wherein the surface has a direction of movement and has a width direction across the direction of movement, the application unit comprising:

- a support beam spaced away from and extending across the width of the surface;
- a front wall supported on the beam, generally more toward the surface, a rear wall also supported on the beam and spaced from the front wall and generally further from the surface for defining a supply gap for the medium located between the front and the rear walls, the front and rear walls being placed



and oriented so that the supply gap extends across the width of the surface and is generally oriented for flow of the medium generally in a direction toward the surface; distribution means coupled to the supply gap for delivering the medium into the supply gap so that the supply gap directs the medium flow generally toward the surface;

both the front and rear walls having regions thereof which extend generally toward the surface; releasable attachment means on each of the front and rear walls for enabling attachment thereto of one set of application means for applying the medium to the surface; the one set of application means being selected from a group consisting of:

- a first set of the application means comprising first members that when attached to the front and rear walls, are shaped for communicating with and receiving liquid or pasty medium from the supply gap and are shaped for forming an application chamber for the liquid or pasty medium at the surface, whereby the surface moving past the application chamber is contacted by the medium in the application chamber; and
- a second set of the application means comprising second members that when attached to the front and rear walls, are shaped for communicating with and receiving liquid or pasty medium from the supply gap, the second members being shaped and positioned for defining a dosing gap which receives the medium, the dosing gap defining a free jet nozzle for the liquid or pasty medium, and the nozzle being oriented generally facing toward the surface to spray the medium on the surface;

the application unit thereby being selectively convertible to apply the liquid or pasty medium onto the moving surface by way of the selected one of the first and second set of application means.

5,772,767

**SPRING AND SHAFT ASSEMBLY FOR HANDLING AND DIPPING FLEXIBLE BELTS**

John S. Chambers, Rochester; Ronald E. Godlove, Bergen; Huoy-Jen Yuh, Pittsford; Timothy J. Leenhouts, Fairport; Rachael A. Forgit, and Robert T. Cosgrove, both of Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 556,246, Nov. 9, 1995, Pat. No. 5,626,918. This application Dec. 17, 1996, Ser. No. 767,896

Int. Cl.<sup>6</sup> B05C 3/00; 13/00

U.S. Cl. 118—428

9 Claims

1. A spring and shaft assembly for transporting and handling a flexible belt comprising:

- a) a shaft having a first end and a second end;
- b) a spring assembly having an inner diameter and an outer diameter, said spring assembly mounted to said first shaft end such that said inner diameter may be brought in contact with an outside surface of said shaft;
- c) an activator connected to said spring assembly to vary said spring assembly outer diameter to engage and disengage an inside surface of the flexible belt;

5,772,769

**APPARATUS FOR COATING A WORKPIECE WITH FLUID CONTAMINATION DETECTION**

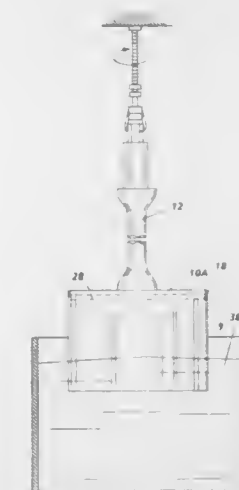
Anthony Sayka, San Antonio, Tex., assignor to VLSI Technology, Inc., San Jose, Calif.

Continuation of Ser. No. 471,649, Jun. 5, 1995, Pat. No. 5,558,902, which is a division of Ser. No. 250,659, May 27, 1994, Pat. No. 5,509,375, which is a continuation of Ser. No. 902,119, Jun. 22, 1992, abandoned. This application Aug. 16, 1996, Ser. No. 698,950

Int. Cl.<sup>6</sup> B05C 11/00; 5/00; B05B 13/02

U.S. Cl. 118—712

13 Claims



- d) a sealing arrangement which coats said spring assembly while said flexible belt inside surface is engaged thereby inhibiting a flow of surrounding fluid into an inside surface of the flexible belt; and
- e) a protrusion mounted to said shaft second end for attaching said shaft and said spring assembly to a mechanical handling device.

5,772,768

**PRINTING APPARATUS AND METHOD**

Noriyuki Inagaki, Osaka; Toru Hattori, Neyagawa, and Toshi-nori Mimura, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 1, 1995, Ser. No. 523,118

Claims priority, application Japan, Sep. 5, 1994, 6-210803

Int. Cl.<sup>6</sup> B05C 11/00

U.S. Cl. 118—688

5 Claims



- 1. A printing apparatus comprising: a rotatable transfer device including holding means for holding boards, said transfer device being rotatable so as to transfer said holding means from a first position through an angle of 180 degrees to a second position; a loading section for guiding the boards onto said holding means at said first position; a printing section having a mask for printing a conductive material onto each of the boards held by said holding means at said second position; a position detector for detecting a position of the board held by said holding means and outputting a signal indicative of the detected position; and an alignment section for correcting a position of said mask or the board held by said holding means on the basis of an output signal from said position detector, wherein said transfer device is operable to stop said holding means at said loading, printing, and alignment sections such that loading, printing, and alignment operations can be simultaneously performed.

5,772,770

**SUBSTRATE PROCESSING APPARATUS**

Atsuhiko Suda, and Satoshiro Okayama, both of Tokyo, Japan, assignors to Kokusai Electric Co., Ltd., Tokyo, Japan

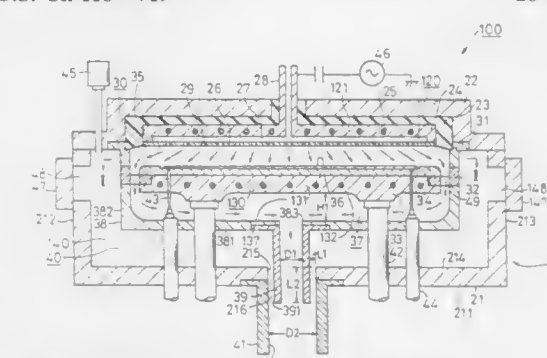
Filed Jan. 25, 1996, Ser. No. 591,773

Claims priority, application Japan, Jan. 27, 1995, 7-031508

Int. Cl.<sup>6</sup> C23C 16/00

U.S. Cl. 118—719

28 Claims



- 20. A substrate processing apparatus comprising: an outer chamber having an exhaust hole; an inner chamber disposed in said outer chamber; a reactive gas inlet pipe communicating with said inner chamber; a first exhaust pipe disposed to be capable of communicating with said inner chamber, said first exhaust pipe extending at least to an inner wall surface of said outer chamber; a second exhaust pipe communicating with the exhaust hole;



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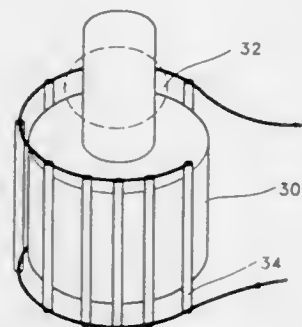
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one or more third exhaust pipes disposed to be capable of communicating with said inner chamber, said one or more third exhaust pipes extending at least to the inner wall surface of said outer chamber;

a substrate placing portion disposed in said inner chamber, said inner chamber having a plurality of second exhaust holes surrounding said substrate placing portion; and  
an exhaust chamber disposed in said outer chamber, said exhaust chamber being disposed under said inner chamber, said inner chamber communicating with said exhaust chamber through the second exhaust holes, and said first exhaust pipe and said one or more third exhaust pipes communicating with said exhaust chamber.



parallel to the wall of the plasma diffusion chamber and parallel to an axial direction of the plasma diffusion chamber.

5,772,771

**DEPOSITION CHAMBER FOR IMPROVED DEPOSITION THICKNESS UNIFORMITY**

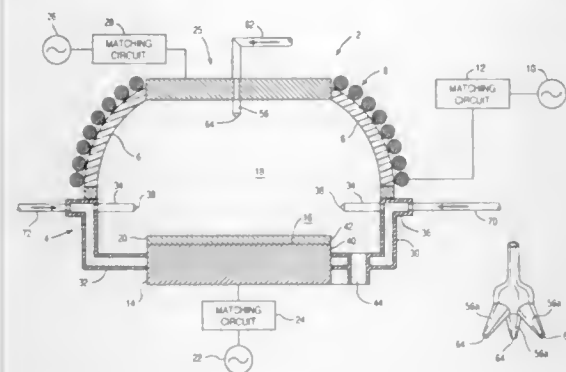
Shijian Li, San Jose; Fred C. Redeker, Fremont, and Tetsuya Ishikawa, Santa Clara, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Filed Dec. 13, 1995, Ser. No. 571,618

Int. Cl.<sup>6</sup> C23C 16/00

U.S. Cl. 118—723 1

14 Claims



1. A deposition chamber comprising:  
a housing defining a single vacuum chamber;  
a substrate support having a substrate support surface within the vacuum chamber, the substrate support surface having a central region and a periphery;  
a plurality of first gas distributors having first exits opening into the vacuum chamber, the first exits directed generally towards the central region;  
a second gas distributor having a second exit spaced apart from and generally overlying said substrate support surface, said second exit opening directly into the vacuum chamber; and  
said first gas distributors being located closer to the support surface than are the second gas distributors.

5,772,772

**PLASMA DIFFUSION CONTROL APPARATUS**

Kyeong-koo Chi, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Aug. 15, 1996, Ser. No. 698,362

Claims priority, application Rep. of Korea, Aug. 16, 1995, 95-25125

Int. Cl.<sup>6</sup> C23C 16/00

U.S. Cl. 118—723 MA

5 Claims

1. A plasma diffusion control system, comprising:  
(a) a plasma diffusion chamber having a wall; and  
(b) means for generating a composite magnetic field parallel to the wall of said plasma diffusion chamber, said means for generating comprising at least one current path in proximity to the wall of the plasma diffusion chamber, and said current path comprising a plurality of current-carrying wires arranged

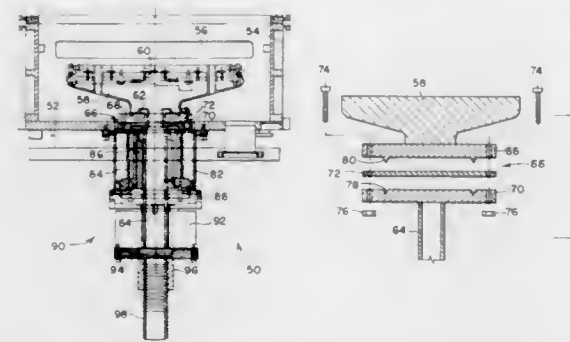
5,772,773  
**CO-AXIAL MOTORIZED WAFER LIFT**  
Joe Wytman, Los Gatos, Calif., assignor to Applied Materials, Inc., Santa Clara, Calif.

Filed May 20, 1996, Ser. No. 650,198

Int. Cl.<sup>6</sup> C23C 16/00

U.S. Cl. 118—729

20 Claims



1. An apparatus for vertically moving and positioning a wafer within a chamber comprising:  
a pedestal for supporting the wafer within the chamber;  
a shaft extending downwardly from a lower region of the pedestal;  
a hollow shaft motor surrounding said shaft proximal to a distal portion thereof; and  
a drive means connected to said shaft motor for drivingly engaging the distal portion of said shaft.

5,772,774

**EVAPORATOR FOR PRODUCING MAPLE SYRUP**

Jean-Marie Chabot, St-Damien-de-Bellechasse, Canada, assignor to Les Équipements d'Érablière CDL Inc., St-Lazare, Canada

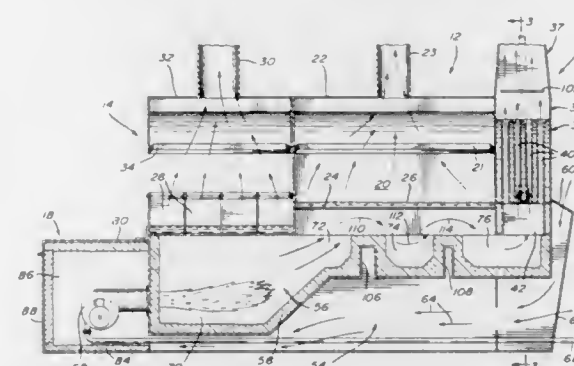
Filed Jan. 17, 1997, Ser. No. 785,504

Int. Cl.<sup>6</sup> B01J 3/00; C13D 3/00; B01D 1/04; 1/06

U.S. Cl. 127—2

10 Claims

1. In an evaporator having a maple sap evaporating pan in fluid communication with a maple syrup forming pan, a fire box in fluid communication with a set of horizontally disposed gas circulating adjuncts, a flue stack and chimney successively, the improvement comprising an auxiliary reservoir for preheating sap prior to entering said maple sap evaporating pan; said auxiliary reservoir consisting of a housing disposed in said flue stack and including an inlet for receiving cold sap in said housing; a series of spaced open end vertical tubes extending through said housing, each tube including a lower inlet receiving flue gases from a gas circulating adjunct disposed underneath the auxiliary reservoir for circulation through and heating said tubes and an upper outlet for exiting said bases to said chimney whereby cold sap received in said auxiliary



reservoir is heated by contact with said heated tubes; said housing further including an outlet allowing heated sap to be directed to said maple sap evaporating pan.

5,772,775

**METHOD OF EXTRACTION OF JUICE FROM SUGAR CANE**

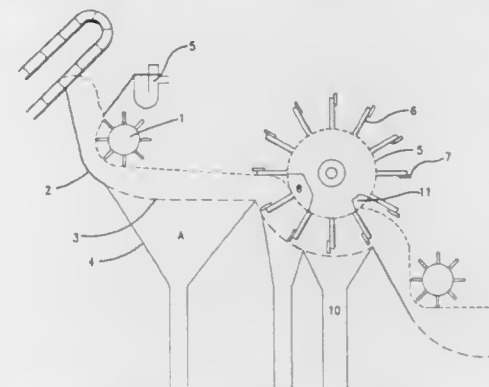
Michele Marcelle Amelie Riviere, Appartement 42, Residence "Compagnie des Indes" 20 Rue de la Compagnie, 97400 Saint Denis, Reunion Island, France

Filed Oct. 24, 1995, Ser. No. 547,630

Int. Cl.<sup>6</sup> B01J 3/00; C13D 1/12; 1/00

U.S. Cl. 127—45

5 Claims



1. A process for extracting juice from fibrous material, comprising the steps of:  
a) admixing said fibrous material with water, to form an aqueous slurry;  
b) introducing additional water into said aqueous slurry from below said aqueous slurry, to displace and remove air trapped in said aqueous slurry;  
c) displacing juice from said aqueous slurry by a flow of water in which the water advances as a plug-flow;  
d) draining displaced juice from said aqueous slurry, and  
e) repeating steps b)-d) at least once, wherein said aqueous slurry has a liquid content approximately 20 times its content of said fibrous material.

5,772,776

**PROCESS FOR THE RECOVERY OF HEAVY METALS SUCH AS LEAD FROM METAL CONTAMINATED SOIL**  
Bruce Edward Holbein, 44 Shadybrook Crescent, Guelph Ontario, Canada, N1G 3G5

Filed Jul. 7, 1995, Ser. No. 499,448

Int. Cl.<sup>6</sup> B08B 7/00; C22B 3/00

U.S. Cl. 134—2

43 Claims

1. A process for decontaminating a metal contaminated soil aggregate so as to obtain a product comprising a treated soil component having a metal content lower than that of the metal contaminated soil aggregate, said metal contaminated soil aggregate comprising at least one metal selected from the group comprising Pb, Hg, Cu, Cd, Zn, Ag, Ni, Co, Ga and Cr, said contaminated soil aggregate comprising a classified soil fraction representing soil particles having a size of from 0.15 mm and smaller, said process comprising

providing an initial aqueous soil slurry comprising said metal contaminated soil aggregate;  
admixing at least one water soluble dialkylthiocarbamate with said initial aqueous soil slurry so as to obtain a product aqueous soil slurry comprising one or more water insoluble metal-dialkylthiocarbamate complexes, each of said water insoluble metal-dialkylthiocarbamate complexes comprising a metal moiety; and

separating one or more of said insoluble metal-dialkylthiocarbamate complexes from said product aqueous soil slurry so as to obtain a treated aqueous slurry comprising a treated soil component having a metal content lower than that of said metal contaminated soil aggregate, and  
wherein the metal moiety of each of said one or more water insoluble metal-dialkylthiocarbamate complexes is a member of the group comprising Pb, Hg, Cu, Cd, Zn, Ag, Ni, Co, Ga and Cr.

5,772,777

**METHOD FOR PROCESSING COMPOSITE MATERIALS TO ENABLE RECYCLING THEREOF**

André Vallet, Saint Aubin du Medoc; Michel Delmas, Auzerville-Tolosane; Thierry Fargere, Beauvais, and Gilles Sacher, Toulouse, all of France, assignors to Societe Europeenne de Propulsion, Suresnes, France

PCT No. PCT/FR95/01671, § 371 Date Jun. 12, 1997, § 102(e) Date Jun. 12, 1997, PCT Pub. No. WO96/18484, PCT Pub. Date Jun. 20, 1996

PCT Filed Dec. 14, 1995, Ser. No. 849,683

Claims priority, application France, Dec. 16, 1994, 94 15174 Int. Cl.<sup>6</sup> B08B 7/04

U.S. Cl. 134—2

14 Claims

1. A process for the treatment of composite materials comprising a matrix and reinforcing fibers, the purpose of said process being to separate said fibers from said matrix in order particularly to recover said fibers, which can be recycled as reinforcing fibers, characterized in that said materials are exposed to ozone, to the exclusion of the treatment of materials whose matrix contains an alkali metal nitride and at least one oxidizing agent liable to react with said nitride.

5,772,778

**METHOD AND MEANS FOR WASHING AND DISPENSING OF BALLS**

Beogt Adolf Emanuel Bäck, Stenbarskatan 7, S-745 42, Enköpings, Sweden

PCT No. PCT/SE93/00806, § 371 Date Apr. 5, 1996, § 102(e) Date Apr. 5, 1996, PCT Pub. No. WO95/09678, PCT Pub. Date Apr. 13, 1995

PCT Filed Oct. 5, 1993, Ser. No. 624,509

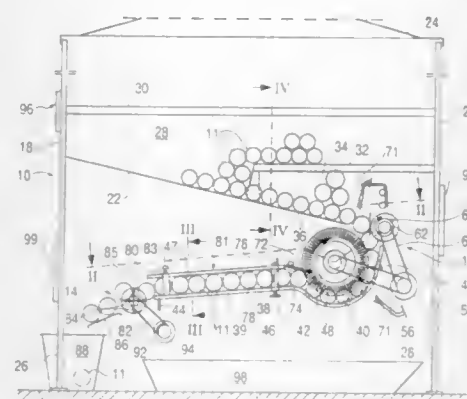
Int. Cl.<sup>6</sup> A63B 47/04

U.S. Cl. 134—6

16 Claims

1. A method for cleaning and dispensing spherical objects from a magazine, wherein the objects are brushed clean by a brush roll and are passed over a plurality of mutually parallel devices which define at least one track leading to a dispensing arrangement, said method comprising the steps of:

causing the objects to pass around a curved track by means of a brush roll which rotates in the direction of movement of the objects toward the dispensing arrangement, said curved track defined by curved upper ends of the mutually parallel devices which surround a portion of the brush roll and follow an outer curvature of the brush roll through a distance which is shorter than one complete revolution around the brush roll, and in a plane which extends generally perpendicular to the rotational axis of the brush roll;



causing the objects to move along the at least one track at a speed which is slower than the peripheral speed of the brush roll; and forcing the objects to move along the remainder of said at least one track and to the dispensing arrangement through which the objects are dispensed.

5,772,779

**PHOTOCONDUCTOR CLEANING BRUSH FOR ELIMINATION OF PHOTOCONDUCTOR SCUM**

Donald Saul Rimai, Webster; Theodore Herbert Morse, Rochester; John Robert Locke, Spencerport; Raymond Charles Bowen, Rochester, and James Clinton Maher, North Rose, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sep. 3, 1996, Ser. No. 697,942

Int. Cl.<sup>6</sup> B08B 7/00; 3/00; A47L 13/40; C08F 18/20

U.S. Cl. 134—6

13 Claims

1. A cleaning brush for cleaning a photoconductor element, the brush comprised of synthetic fibers which are substantially free from low yield strength, low surface energy materials, said fibers being in operative relationship with the photoconductor element so as to allow them to brush the surface of the element.

5,772,780

**POLISHING AGENT AND POLISHING METHOD**

Yoshio Homma, Hinode-machi; Kikuo Kusukawa, Fujino-machi; Shigeo Moriyama, Tama, and Masayuki Nagasawa, Kawagoe, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 21, 1995, Ser. No. 531,910

Claims priority, application Japan, Sep. 30, 1994, 6-236445

Int. Cl.<sup>6</sup> B08B 7/00

U.S. Cl. 134—7

22 Claims

1. A polishing method for polishing an insulating film of a silicon compound containing at least 1% by weight organic components on a substrate, the method comprising a step of chemically-mechanically polishing a surface of the insulating film with a slurry including cerium oxide particles, said particles having a crystallite size of not more than 30 nm.

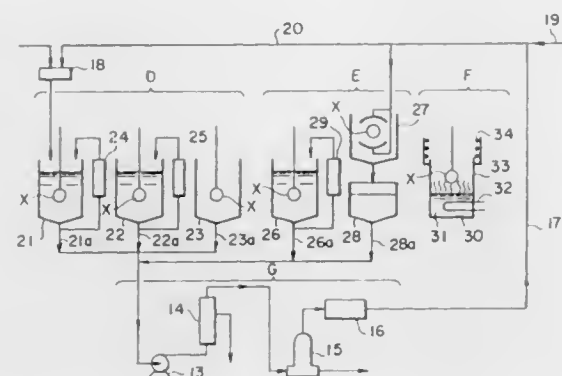
**5,772,781  
METHOD FOR CLEANING AN OBJECT USING AN AGENT THAT INCLUDES A POLYORGANOSILOXANE OR ISOPARAFFIN**

Minoru Inada, Yokohama; Kimiaki Kabuki, Tokyo; Yasutaka Imajo, Hachioji; Noriaki Yagi, Yokohama, and Nobuhiro Saitoh, Ohta, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

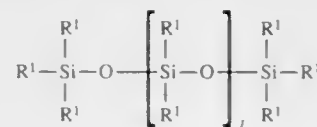
Division of Ser. No. 177,697, Jan. 4, 1994, Pat. No. 5,503,681, which is a continuation of Ser. No. 768,554, Sep. 27, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 480,864 Claims priority, application Japan, Mar. 16, 1990, 2-065837 Int. Cl.<sup>6</sup> B08B 3/08; 3/10; 5/00

U.S. Cl. 134—10

18 Claims

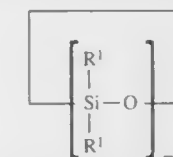


1. A method for cleaning an object comprising the steps of:
- (a) a first step of cleaning the object with a mixture containing a non-water system base cleaning agent and a cleaning power promoting agent in one cleaning vessel or a plurality of cleaning vessels in sequence, wherein if a plurality of cleaning vessels are used, the cleaning vessels are connected with each other such that said mixture is transmitted in sequence in a direction opposite to that in which the object is transmitted,
- (b) a second step of cleaning the object with a base cleaning agent alone in another cleaning vessel or a plurality of other cleaning vessels in sequence, wherein if a plurality of cleaning vessels are used, the cleaning vessels are connected with each other such that said base cleaning agent is transmitted in sequence in the direction opposite to that in which the object is transmitted,
- (c) a third step of drying the object by use of a vapor drying agent
- (d) a fourth step of recovering a cleaning waste liquid from at least one cleaning vessel selected from said cleaning vessels from step (a) or (b), wherein said recovered waste cleaning liquid is distilled to recover said base cleaning agent alone, and
- (e) a fifth step of re-supplying said recovered base cleaning agent to at least one cleaning vessel selected from said cleaning vessels from steps (a) or (b), wherein said base cleaning agents in (a) and (b) are independently at least one compound selected from the group consisting of a silicon-containing cleaning agent and an aliphatic hydrocarbon-containing cleaning agent, wherein said silicon-containing cleaning agent comprises at least a polyorganosiloxane selected from the group consisting of a straight chain polyorganosiloxane represented by a formula:



and

a cyclic polyorganosiloxane represented by a formula:



wherein R<sup>1</sup> in each formula is independently a substituted or unsubstituted hydrocarbon group, 1 is an integer from 0 to 5, and m is an integer of from 3 to 7, wherein said aliphatic hydrocarbon-containing cleaning agent comprises a volatile isoparaffin having from 6 to 15 carbon atoms.

5,772,782

**METHOD FOR REMEDIATING CONTAMINATED MATERIAL**

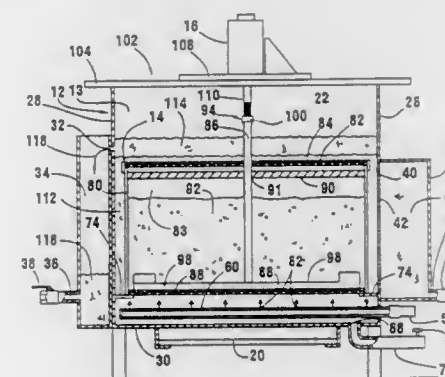
Brent J. Lashmett, Embarrass; Doug C. Lashmett; H. W. Lashmett, both of Babbitt; Larry R. Herzog, Mt. Iron; Thomas P. Tri, Duluth, and Merideth L. Karpik, Eveleth, all of Minn., assignors to B&S Research, Inc., Embarrass, Minn.

Division of Ser. No. 450,140, May 26, 1995, Pat. No. 5,589,004, which is a division of Ser. No. 283,611, Aug. 1, 1994, Pat. No. 5,492,139. This application Aug. 1, 1996, Ser. No. 691,178

Int. Cl.<sup>6</sup> B08B 7/04; C02F 3/02

U.S. Cl. 134—10

4 Claims



1. A method for removing contaminating material from a combination material containing said contaminating material and a reusable material comprising:

placing said combination material within an enclosed container having a plurality of openings therein sized to permit fluid to pass therethrough while at the same time preventing said reusable material from passing therethrough;

placing said container in a cleaning fluid within a tank, said cleaning fluid having microorganisms therein capable of consuming at least a portion of said contaminating material, said microorganisms coming into contact with said contaminating material within said container, whereby said microorganisms will cause a separation of a portion of said contaminating material from said reusable material and said cleaning fluid and will cause a portion of said contaminating material to rise to the top surface of said cleaning fluid within said tank; and skimming off said contaminating material which has risen to said top surface of said cleaning fluid;

leaving said enclosed container within said cleaning fluid in said tank until said contaminating material is substantially separated from said reusable material;

removing said enclosed container from said tank with substantially only said reusable material therein, said contaminating material being substantially removed therefrom.

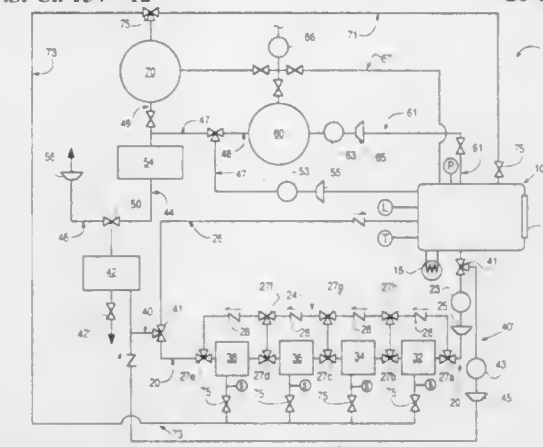
5,772,783

**METHOD FOR REJUVENATING PRESSURIZED FLUID SOLVENT USED IN CLEANING A FABRIC ARTICLE**

John F. Stucker, Scottsdale, Ariz., assignor to R.R. Street & Co. Inc., Naperville, Ill. Continuation of Ser. No. 506,508, Jul. 25, 1995, abandoned, and a continuation-in-part of Ser. No. 336,588, Nov. 9, 1994, abandoned. This application Jul. 12, 1996, Ser. No. 680,909 Int. Cl.<sup>6</sup> B08B 7/04

U.S. Cl. 134—12

26 Claims



1. A method of rejuvenating a pressurized fluid solvent used for cleaning a fabric article, the pressurized fluid solvent being contaminated with contaminants after cleaning the fabric article within a pressurized vessel, the method comprising the steps of:
- cycling a primary flow of the pressurized fluid solvent from the pressurized vessel through at least one filter to remove contaminants from the pressurized fluid solvent in the primary flow, the primary flow being cycled back to the pressurized vessel after passing through the filter;
- directing a secondary flow of the pressurized fluid solvent from the pressurized vessel to an evaporator to evaporate the pressurized fluid solvent of the secondary flow into a vapor and to separate contaminants therefrom;
- liquifying the vapor of the secondary flow from the evaporator to create rejuvenated pressurized fluid solvent substantially free of contaminants; and
- redirecting the rejuvenated pressurized fluid solvent of the secondary flow to the pressurized vessel for further use.

5,772,784

**ULTRA-LOW PARTICLE SEMICONDUCTOR CLEANER**

Raj Mohindra, Los Altos; Abhay Bhushan, Palo Alto; Rajiv Bhushan, Mountain View; Suraj Puri, Los Altos; John H. Anderson, Sr., Milpitas, and Jeffrey Nowell, San Francisco, all of Calif., assignors to YieldUP International, Mountain View, Calif. Continuation-in-part of Ser. No. 437,541, May 9, 1995, Pat. No. 5,571,337, which is a continuation-in-part of Ser. No. 339,326, Nov. 14, 1994, Pat. No. 5,634,978. This application Nov. 8, 1995, Ser. No. 555,634 Int. Cl.<sup>6</sup> B08B 3/04; 5/00

U.S. Cl. 134—21

50 Claims

1. A method for cleaning a semiconductor wafer comprising the steps of:
- immersing a wafer in a liquid comprising water, said wafer including a front face, a back face, and an edge, said water being substantially free from particles greater than about 0.5 micron in diameter;
- providing a substantially particle free environment adjacent to said front face and said back face as said liquid is being removed, said substantially particle free environment comprising a gas that is substantially free from particles greater than about 0.5 micron in diameter; and
- introducing a cleaning enhancement substance during said providing step, said cleaning enhancement substance doping said



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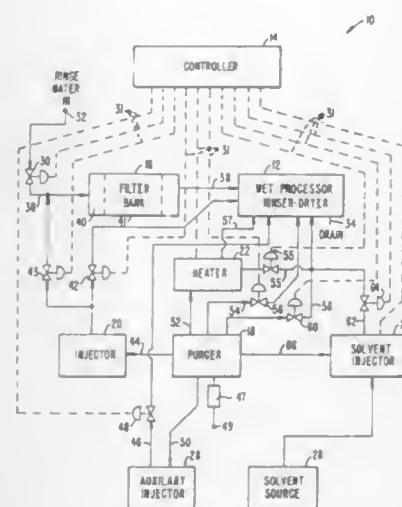
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liquid which is attached to said front face and said back face to cause a concentration gradient of said cleaning enhancement substance in said attached liquid to accelerate fluid flow of said attached liquid off of said wafer, said cleaning enhancement substance comprising a non-saturated compound;

wherein said wafer is substantially free from mechanical movement during said providing and introducing to decrease a possibility of any substantial damage to said wafer.

5,772,785

## MACHINE DISH-WASHING PROCESS

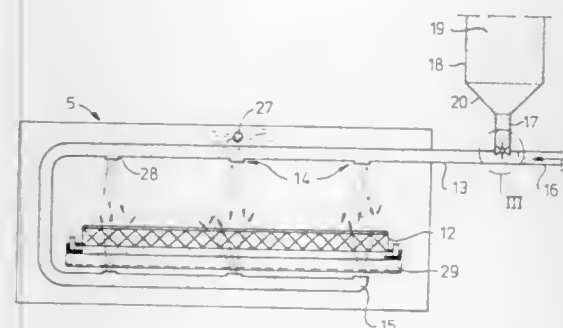
Cornelis Schouten, Rotterdam, Netherlands, assignor to Epenhuyzen Chemie N.V., Zwijndrecht, Netherlands  
Filed Nov. 17, 1995, Ser. No. 560,536

Claims priority, application Netherlands, Nov. 18, 1994, 9401932; Feb. 10, 1995, 9500254

Int. Cl.<sup>6</sup> B08B 3/02; 5/00

U.S. Cl. 134—25.2

25 Claims



1. A dish-washing process in a dish-washing machine comprising the following steps:

blowing a gas through a hollow pipe;  
metering a cleaning composition in powder form into the pipe while the gas is blowing to disburse a cloud of the composition throughout a crockery containing portion of the dish-washing machine and over the crockery in such a manner that a surface of the crockery is at least partially covered with the cleaning composition;

subsequently exposing the crockery to a solvent to give said powder-form cleaning composition an operational form while said powder-form composition is still on the crockery; and  
when the process is to be stopped, stopping the metering of the composition before stopping the blowing of the gas through the pipe.

5,772,786

## DETERGENT COMPOSITION COMPRISING LINE SOAP DISPERSANT AND LIPASE ENZYMES

Beatrjjs Lutgarde A. De Smet, Meise, Belgium; Johan Gerwin L. Puyter, Strombeek-Bever, Netherlands, and Lynda Anne Jones, Newcastle upon Tyne, Great Britain, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US93/08875, § 371 Date Mar. 1, 1995, § 102(e) Date Mar. 1, 1995, PCT Pub. No. WO94/07984, PCT Pub. Date Apr. 14, 1994

Continuation of Ser. No. 392,843, Mar. 1, 1995, abandoned.

This PCT application Sep. 20, 1993, Ser. No. 706,393

Claims priority, application European Pat. Off., Aug. 13, 1993, 93870170

Int. Cl.<sup>6</sup> C11D 3/38; 3/37; B08B 101/08

U.S. Cl. 134—25.2

9 Claims

1. A method of cleaning soiled dishes comprising the step of treating said dishes in an automatic dishwashing machine with a composition comprising:

(a) from 0.1% to 40% by weight of a lime soap dispersant which has a lime soap dispersing power of no more than 8 and which is selected from the group consisting of:

i) water-soluble salts of copolymers of acrylic acid, methacrylic acid, acrylamide and mixtures thereof, wherein said copolymers have a molecular weight of from 5,000 to 20,000 and do not demonstrate surfactant capability; and  
ii) surfactant lime soap dispersants selected from the group consisting of C<sub>16</sub> to C<sub>18</sub> dimethyl amine oxides, betaines and sulfobetaines;

(b) from 0.001% to 2% by weight of active lipolytic enzyme obtained from a lipase-producing strain of *Pseudomonas pseudocataligenes*;

(c) from 20% to 60% of a water-soluble detergent builder compound selected from the group consisting of silicates, carbonates and mixtures thereof; and

(d) from 0.01% to 15% of a suds suppressing system comprising a silicone, 2-alkyl alcohol, or mixture.

5,772,787

## METHOD OF CLEANING AND MAINTAINING VISCOSITY AND PH DEVICES FOR WATER BASED FLEXO INKS

Joseph John Weishe, Orelan, Pa., assignor to The Langston Corporation, Cherry Hill, N.J.

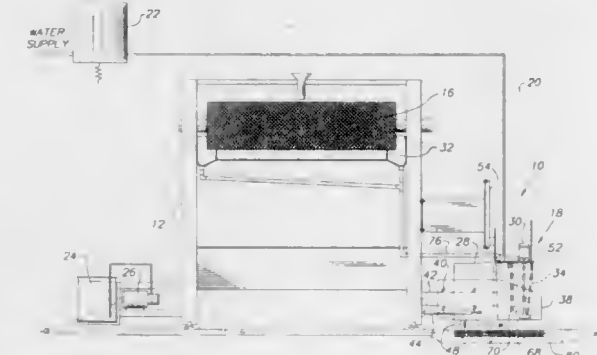
Filed Jun. 6, 1995, Ser. No. 479,479

Claims priority, application United Kingdom, Jan. 18, 1995, 9500937

Int. Cl.<sup>6</sup> B08B 3/00; 7/00

U.S. Cl. 134—26

14 Claims



1. A method of maintaining and cleaning a device for measuring a parameter of an ink for use in a print station comprising the following steps:

providing a measuring device for measuring a parameter of the ink;  
raising the measuring device out of a container adapted for holding ink;

5,772,791

## FLOATING SOLAR POWER PLANT WITH ASYMMETRICAL CONCENTRATORS

Johannes Nikolaus Laing, 1253 La Jolla Rancho Rd., La Jolla, Calif. 92037

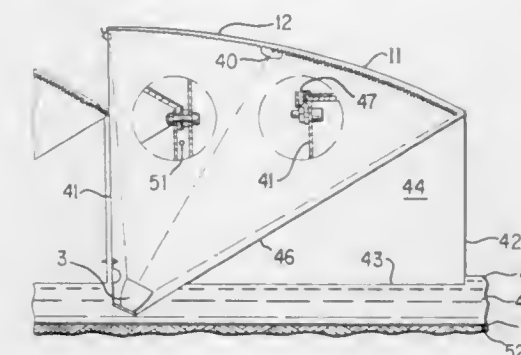
Filed Jun. 17, 1996, Ser. No. 665,241

Claims priority, application Germany, Jun. 20, 1995, 195 22 215.6

Int. Cl.<sup>6</sup> H01L 31/052

U.S. Cl. 136—246

8 Claims



1. A solar power plant consisting of a circular platform rotatable about a vertical axis, floating on a layer of water (48), the platform comprising a plurality of elongated concentrator channels (4), each concentrator channel (4) being covered with linear lenses (40), a turning device being provided which turns the platform during sunshine hours so that the concentrator channels (4) point to the azimuth of the sun, whereby each concentrator channel (4) comprises a trough-like structure having a wall portion (41) oriented almost vertically, photovoltaic cells (3, 60) targeted by the concentrated solar rays (31, 34) are arranged in close proximity to the lower end of said vertical wall portion (41), and a passage of triangular cross-section (44) remains through which ambient air airflow.

5,772,789

## FLUX-REMOVING AQUEOUS CLEANING COMPOSITION AND METHOD OF USE

Eric E. Eichhorn, Princeton, and Francis R. Cala, Highland Park, both of N.J., assignors to Church & Dwight Co., Inc., Princeton, N.J.

Filed Nov. 19, 1996, Ser. No. 752,141

Int. Cl.<sup>6</sup> B08B 7/00

U.S. Cl. 134—40

17 Claims

1. An aqueous cleaning concentrate capable of removing soldering flux residues from a surface of an electronic assembly without leaving significant amounts of white residue on surfaces of cleaning equipment used in removing said flux residues with said composition, said concentrate comprising:

(A) a flux-removing portion containing an alkaline salt component, wherein the alkaline salt component consists of one or more potassium carbonate salts; and

(B) an aqueous portion in which said flux-removing portion is disposed;

wherein said cleaning concentrate has a non-potassium alkali metal content of 0% by weight;

further wherein said cleaning concentrate is capable of forming wet residues on the surfaces of the cleaning equipment, wherein all or substantially all of said wet residues are transparent.

5,772,790

## METHODS AND COMPOSITIONS FOR REMOVING HMPUR RESIDUES

Lee M. Huber, Cary, N.C., assignor to Reichold Chemicals, Inc., Research Triangle Park, N.C.

Filed Jun. 26, 1996, Ser. No. 670,596

Int. Cl.<sup>6</sup> B08B 3/14

U.S. Cl. 134—42

18 Claims

1. A composition for removing hot melt polyurethane reactive (HMPUR) adhesives having isocyanate groups available for reaction, said composition comprising:

a monofunctional amine additive capable of reaction with the isocyanate groups of the HMPUR adhesives to be removed; and

a noncurable polyurethane prepolymer which does not react with the isocyanate groups of the HMPUR adhesives.

5,772,792

## SOLAR GENERATOR

Johann Zimmermann, Santisweg 10, D-88281 Schlier, Germany

PCT No. PCT/EP95/04570, § 371 Date Jul. 30, 1996, § 102(e) Date Jul. 30, 1996, PCT Pub. No. WO96/18235, PCT Pub. Date Jun. 13, 1996

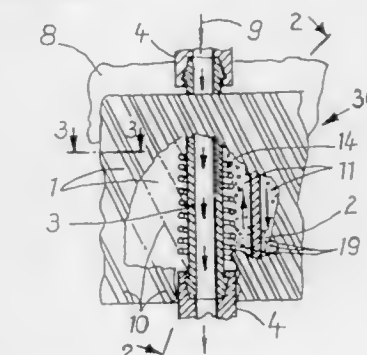
PCT Filed Nov. 21, 1995, Ser. No. 682,713

Claims priority, application Germany, Dec. 5, 1994, 9419371 U

Int. Cl.<sup>6</sup> H01L 31/058

U.S. Cl. 136—248

6 Claims



1. A sun generator comprising:

an inner tube filled with a first fluid;  
an outer tube surrounding said inner tube and filled with a second fluid in which magnetic particles are suspended, said first and second fluids being in a heat exchange relationship;  
an electrical heating element adjacent said inner tube and inside of said outer tube;

a system of lenses located on said outer tube, said system of lenses receiving radiation and reflecting a part of the received radiation to said outer tube and said inner tube for heating of said first and second fluid mediums;

a photovoltaic material integral with said system of lenses which produces a direct current when radiation impinges thereon, which direct current produces an active electromagnetic field in said material;

a first circulating means for circulating said second fluid and the magnetic particles therein in said outer tube whereby said magnetic particles circulating in said second fluid generate an alternating current in conjunction with the electromagnetic field which is applied to said heating element to heat said second fluid directly and hence said first fluid; and

a second circulating means for circulating said first fluid to obtain heat energy from said first fluid and to cool said second fluid.

5,772,793

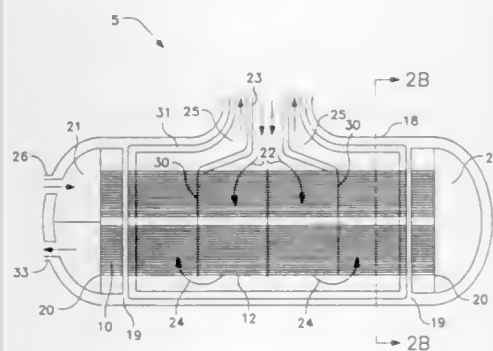
**TUBE-IN-TUBE THERMOPHOTOVOLTAIC GENERATOR**  
John Ashcroft; Brian Campbell, both of Scotia, and David DePoy, Clifton Park, all of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 28, 1996, Ser. No. 697,836

Int. Cl.<sup>6</sup> H01L 31/058

U.S. Cl. 136—253

17 Claims



1. A thermophotovoltaic device comprising:

at least one thermal radiator tube;

a cooling tube concentrically disposed within said at least one thermal radiator tube, the cooling tube having an exterior surface and an interior surface;

an array of thermophotovoltaic cells disposed on the exterior surface of the cooling tube,

wherein the cooling tube has an hexagonal exterior cross-sectional shape;

a shell surrounding the at least one thermal radiator tube, the shell having a first end and a second end; and

an inner and an outer tubesheet located at the first and at the second end of the shell, each tubesheet having an aperture corresponding to each cooling tube,

the at least one thermal radiator tube extending within the shell between the inner tubesheets, and the cooling tube extending within the shell through the corresponding apertures of the inner tubesheets to the corresponding apertures of the outer tubesheets.

5,772,794  
**MANUFACTURING METHOD OF MAGNETIC HEAD  
APPARATUS WITH SPIN VALVE EFFECT  
MAGNETORESISTIVE HEAD**

Yasufumi Uno, Nagano; Daisuke Miyauchi, Tokyo, and Mikio Matsuzaki, Saitama, all of Japan, assignors to TDK Corporation, Tokyo, Japan

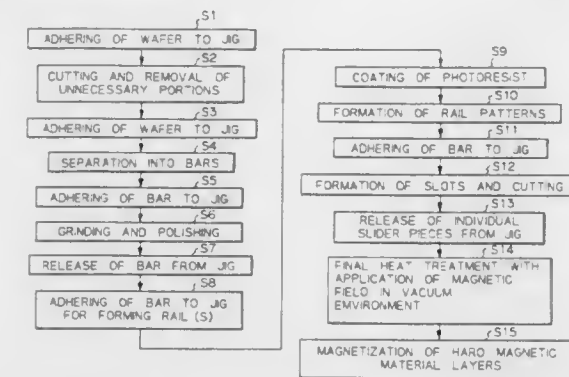
Filed Oct. 7, 1996, Ser. No. 729,762

Claims priority, application Japan, Oct. 9, 1995, 7-286391

Int. Cl.<sup>6</sup> C21D 1/04

U.S. Cl. 148—108

9 Claims



1. A method of manufacturing a magnetic head apparatus with a magnetoresistive head utilizing a spin valve effect, said method comprising the steps of:

a first step of forming a multi-layered spin valve structure on a substrate, said structure including at least first and second thin film layers of soft ferromagnetic material separated by a thin film layer of non-magnetic material, one of said first and second thin film layers of ferromagnetic material being pinned by a thin film layer of antiferromagnetic material;

a second step of forming a spin valve magnetoresistive head using the multi-layered spin valve structure; and

a third step of assembling a magnetic head apparatus using said spin valve magnetoresistive head.

at least one of said first to third steps including a heat treatment stage executed at a temperature which will vary a uniaxial anisotropy of said pinned thin film layer of soft ferromagnetic material.

said method further including a final heat treatment step of heating said multi-layered spin valve structure with application of a magnetic field in a direction perpendicular to a track width direction of said spin valve magnetoresistive head so that said pinned thin film layer of soft ferromagnetic material has a uniaxial anisotropy, said final heat treatment step being executed after said heat treatment stage is completed and at least after one of said second to third steps.

5,772,795

**HIGH STRENGTH DEEP DRAWING STEEL DEVELOPED  
BY REACTION WITH AMMONIA**

J. Scott Lally, Murrysville, and Harish A. Holla, Monroeville, Pa., assignors to USX Corporation, Pittsburgh, Pa.

Filed Dec. 23, 1996, Ser. No. 773,205

Int. Cl.<sup>6</sup> C23C 8/26; C21D 8/04; 1/06

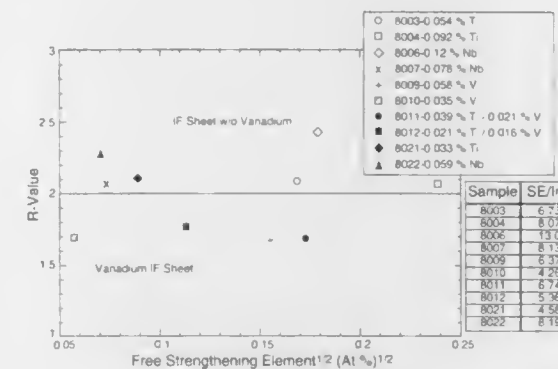
U.S. Cl. 148—221

51 Claims

1. A method of providing a sheet of deep drawing quality special killed, fully stabilized type steel of uniform enhanced strength and good formability and weldability, comprising:

a) providing an essentially unalloyed interstitial free carbon steel melt having a carbon content from about 0.001 to about 0.01 weight percent;

b) adding to the steel melt a strengthening element selected from the group consisting of titanium, niobium and vanadium and mixtures thereof in total amount from about 0.01 to about 0.3 free atomic percent available strengthening element uncombined with other elements;



c) casting and rolling the steel into a sheet according to a practice selected from the group consisting of (A) hot rolling and (B) hot rolling followed by cold rolling, wherein, when practice (A) is selected, the steel slab is hot rolled to a bar at a starting temperature between 2350° F. and 1750° F., followed by finish rolling, with a ferrite structure, starting toward the high end of a temperature range of about 1200°–1675° F. and finishing toward the low end of this temperature range, and coiling below about 1250° F., and wherein, when practice (B) is selected, hot rolling is carried out by a practice selected from the group consisting of (1) rolling the steel slab, with an austenite structure, in the temperature range of about 2350° F. to 1500° F., followed by coiling (2) rolling the steel slab, with a ferrite structure, in the temperature range from a starting temperature of about 1675° F. and finishing and coiling at a temperature above 1375° F., with coiling temperature not less than about 1350° F., and the hot rolling is followed by cold rolling of the thus hot-rolled sheet to a reduction in thickness of at least about 60%;

d) coiling the rolled sheet;

e) annealing the rolled sheet at a temperature in the range from about 1275° F. to about 1350° F. to optimize formation of a (111) grain structure of the steel;

f) treating the annealed sheet in an open coil annealing furnace in an isothermal step at a nitriding temperature from about 800° F. to about 1250° F. with a nitriding gas delivered to the annealing furnace and consisting of ammonia and an inert buffer gas in such a ratio that exhaust gas composition at an exit edge of the open coil is about 1 vol. % to about 11 vol. % ammonia to all other gases present in the exhaust mixture, and for a time from about ½ hour to about 12 hours depending on the sheet thickness and the desired depth of strengthening, to nitride the steel through at least a portion of the sheet thickness;

g) recirculating the nitriding gas through the furnace at a rate and in a manner to provide fully developed laminar gas flow across the width of the sheet, and substantially equal gas flow rates in coil interwrap spaces from inner to outer wraps;

h) controlling the strengthening of the steel sheet as a function of steel composition, the nitriding gas composition, nitriding time, nitriding temperature, thickness of the steel sheet and depth of strengthening desired to provide a steel sheet having an 0.2% off-set yield strength after temper rolling of at least about 45 ksi and an r value in excess of about 1.8 for the cold rolled sheet.

5,772,796

**TEMPERATURE STABLE PERMANENT MAGNET**  
Andrew S. Kim, Pittsburgh, Pa., assignor to YBM Magnex International, Inc., Newtown, Pa.

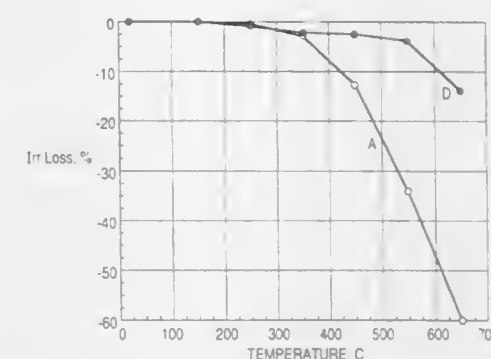
Filed Nov. 20, 1995, Ser. No. 560,888

Int. Cl.<sup>6</sup> H01F 1/055

U.S. Cl. 148—303

6 Claims

1. A rare earth element containing permanent magnet having a Curie temperature of  $\geq 750^\circ\text{C}$ ., a temperature coefficient of intrinsic coercivity of  $\leq -0.2\%/^\circ\text{C}$ ., intrinsic coercivity at room temperature of  $\geq 10\text{ kOe}$ ., a temperature coefficient of remanence of



$\leq -0.1\%/^\circ\text{C}$ ., remanence at room temperature of  $\geq 8\text{ kG}$ ., and an energy product at room temperature of  $\geq 15\text{ MGOe}$ ., with a maximum operating temperature of  $\geq 300^\circ\text{C}$ .

5,772,797

**SOFT MAGNETIC THIN FILM, METHOD FOR  
PREPARING SAME AND MAGNETIC HEAD**

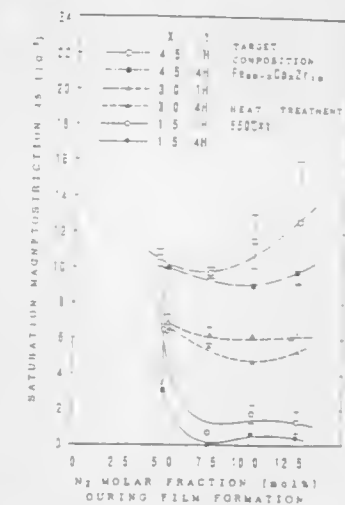
Kanji Nakanishi, Hadano; Osamu Shimizu, Minami-Ashigara; Satoshi Yoshida, Hachioji; Masaaki Katayama, Odawara, and Tatsuya Isomura, Minami-Ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
Continuation of Ser. No. 224,661, Apr. 7, 1994, abandoned, which is a division of Ser. No. 878,624, May 5, 1992, Pat. No. 5,421,915, which is a continuation-in-part of Ser. No. 707,359, May 29, 1991, abandoned, which is a division of Ser. No. 470,662, Jan. 26, 1990, Pat. No. 5,117,321. This application Jan. 2, 1997, Ser. No. 775,518

Claims priority, application Japan, Jan. 26, 1989, 1-15112; Feb. 8, 1989, 1-27518; Feb. 15, 1989, 1-33726; Aug. 9, 1989, 1-204586; Nov. 27, 1989, 1-304811; Dec. 1, 1989, 1-310607; Dec. 6, 1989, 1-315361; Jan. 17, 1990, 2-6242; May 15, 1991, 3-138561; Jul. 19, 1991, 3-203696

Int. Cl.<sup>6</sup> H01F 1/147

U.S. Cl. 148—306

7 Claims



1. A soft magnetic thin film comprised of a single-layer structure of a substantially uniform composition represented by the compositional formula  $\text{Fe}_{a-m}\text{M}_m\text{T}_b\text{N}_c$ , wherein a, b, c and m are atomic percent, M stands for at least one selected from the group consisting of Co, Ru and Ni, and T stands for at least one selected from the group consisting of Zr, Hf, Ti, Mo and W, and wherein  $0 < m/a < 0.3$ ,  $0 < b < 20$  and  $0 < c < 22$  with the exclusion of the range wherein both  $b < 7.5$  and  $c < 5$ , said soft magnetic thin film exhibiting a coercivity  $H_c$  of  $400\text{ Am}^{-1}$  (5 Oe) or less, having a crystallographic orientation of substantially a Fe(110) and having a saturation magnetostriction constant  $\gamma_s$  in the range  $1.6 \times 10^{-6}$  to 0 in an absolute value.



5,772,798

**HIGH STRENGTH ZIRCONIUM ALLOYS CONTAINING BISMUTH**

Leonard F. P. Van Swam, Richland, Wash., assignor to Siemens Power Corporation, Richland, Wash.

Filed Mar. 25, 1997, Ser. No. 823,941

Int. Cl.<sup>6</sup> C22C 14/00

U.S. Cl. 148—421

15 Claims

1. A high strength zirconium alloy consisting essentially of molybdenum and 3 to 6 weight percent bismuth and the balance zirconium.

5,772,799

**METHOD FOR MAKING CAN END AND TAB STOCK**  
Tyzh-Chiang Sun, Danville, and William Betts, Pleasanton, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Pleasanton, Calif.

Filed Sep. 18, 1995, Ser. No. 531,554

Int. Cl.<sup>6</sup> C22C 21/06

U.S. Cl. 148—439

13 Claims



1. A can lid or tab stock for aluminum alloy containers formed of aluminum alloy containing less than about 2% by weight magnesium and having an ultimate tensile strength of at least 50,000 psi produced by strip casting and aluminum alloy to form a hot strip or belt cast feedstock, rapidly quenching the hot feedstock to prevent substantial precipitation of alloying elements and cold rolling the quenched feedstock to reduce its thickness.

5,772,800

**ALUMINIUM ALLOY PLATE AND METHOD FOR ITS MANUFACTURE**

Alfred L. Heinz, Niederahr; Werner A. Schelb, Ransbach-Baumbach; Alfred J. P. Haszler, Vallendar, and Otmar M. Muller, Koblenz, all of Germany, assignors to Hoogovens Aluminium Walzprodukte GmbH, Koblenz, Germany

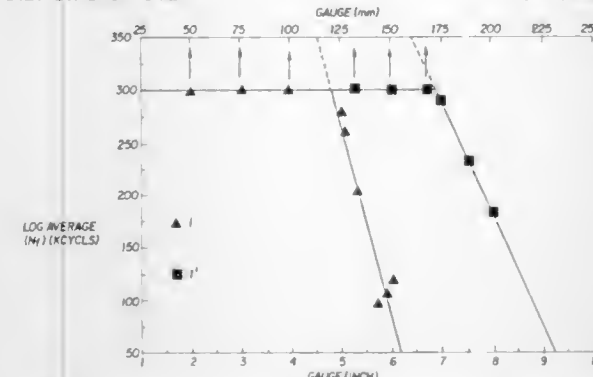
Filed Jun. 6, 1995, Ser. No. 466,114

Claims priority, application Netherlands, Jun. 9, 1994, 9400939; European Pat. Off., Jan. 19, 1995, 95200134; May 12, 1995, 9521243

Int. Cl.<sup>6</sup> C22F 1/04

U.S. Cl. 148—502

39 Claims



30. A method of manufacture of an aluminium alloy plate with a thickness of more than 5 cm (2 inches) having an average logarithmic fatigue life of more than 100,000 cycles determined in accordance with ASTM test method E 466, comprising the steps of:

- preparing a melt of the alloy;
- casting the melt into an ingot, and
- hot rolling the ingot into the plate by rolling the ingot in a plurality of passes, the method further including degassing said melt before said casting to such an extent that in the

solidified ingot before said hot rolling the density of micropores with a size larger than 80  $\mu\text{m}$  as measured by Optical Microscopy of samples taken from the midplane (T/2) position of the ingot is less than 0.1 micropores per  $\text{cm}^2$ , and in at least one pass of said hot rolling, rolling the ingot using work rolls of radius R in a hot rolling roll stand with a reduction ratio

$$\gamma = \frac{h_0 - h_1}{h_0}$$

in which expression  $h_0$  is the entry thickness of the ingot in that pass and  $h_1$  is the exit thickness of the ingot in that pass, the reduction ratio  $\gamma$  satisfying the condition

$$\frac{\sqrt{4(R/h_0)\gamma - \gamma^2}}{2 - \gamma} \geq 0.66$$

and the volume porosity of the plate is less than 0.005%.

5,772,801

**PROCESS FOR THE FORMING OF METAL ALLOY WHEEL RIMS**

Valter Baldi, Bologna, Italy, and David J. Edwards, deceased, late of Marquette, Mich., by David E. Edwards, legal representative, assignors to Reynolds Wheels S.p.A., Bologna, Italy

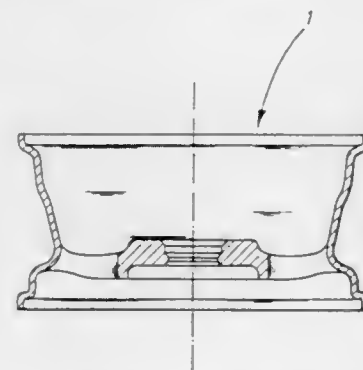
Filed Sep. 23, 1996, Ser. No. 717,717

Claims priority, application Italy, Sep. 29, 1995, B095A0460

Int. Cl.<sup>6</sup> C22F 1/00; B60B 21/00

U.S. Cl. 148—552

12 Claims



1. A process for the forming of wheel rims in metal alloy of the kind comprising a disc from which an alternating sequence of spokes and gaps is made and of a lateral surface defined by a middle portion delimited by an inner edge and an outer edge, the process characterized in that it comprises the following steps:

- obtaining a blank by a casting process, the blank being approximately in the shape of a double Y, in a diametrical cross section;
- mechanically cold processing the blank by cutting material away from its central area, from the inner surface of the disc and from its lateral surface;
- heating the semi-finished work in a furnace;
- fixing the heated semi-finished work across a spindle and a tailstock;
- turning the spindle and the semi-finished work about an axis corresponding to the axis of rotation of the rim;
- after mechanically cold processing the blank, flow forming by passing a roller over the areas constituted by the lateral surface of the semi-finished work to create a channel with an inner edge, an outer edge and a middle portion, leaving a defined machining allowance depending on the subsequent heat treatments; and
- mechanically cold processing the rim by cutting material away from the lateral surface, including the inner edge, the outer edge and the middle portion, to remove the machining allow-

5,772,804

**METHOD OF PRODUCING ALUMINUM ALLOYS HAVING SUPERPLASTIC PROPERTIES**

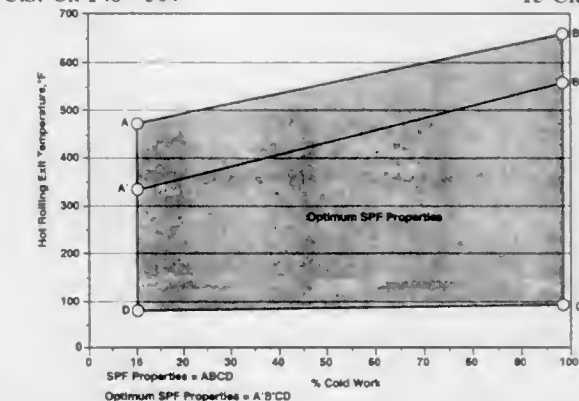
Kevin R. Brown, Pleasanton, Calif., assignor to Kaiser Aluminum &amp; Chemical Corporation, Pleasanton, Calif.

Filed Aug. 31, 1995, Ser. No. 521,364

Int. Cl.<sup>6</sup> C22C 21/00

U.S. Cl. 148—564

15 Claims



5,772,802

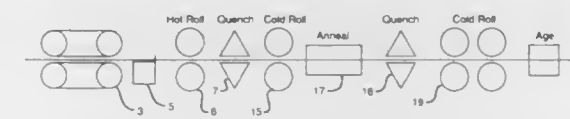
**METHOD FOR MAKING CAN END AND TAB STOCK**  
T. C. Sun, Danville, and William Betts, Pleasanton, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Pleasanton, Calif.

Filed Oct. 2, 1995, Ser. No. 538,415

Int. Cl.<sup>6</sup> C22F 1/04

U.S. Cl. 148—551

27 Claims



1. A method for making can end and tab stock for aluminum alloy containers comprising the steps of:

- strip casting an aluminum alloy by depositing molted aluminum between a pair of continuously moving metal belts to form a hot strip cast feedstock to be used to make can ends or tabs;
- rapidly quenching the hot feedstock to prevent substantial precipitation of alloying elements as intermetallic compounds;
- rapidly heating the feedstock to anneal the feedstock and effect recrystallization without causing substantial precipitation of alloying elements;
- quenching the annealed feedstock to avoid substantial precipitation of alloying elements; and
- cold rolling the quenched feedstock to reduce the thickness of the feedstock.

5,772,803

**TORSIONALLY REACTING SPRING MADE OF A BULK-SOLIDIFYING AMORPHOUS METALLIC ALLOY**

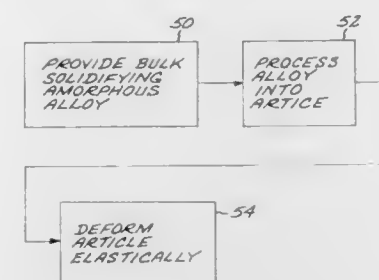
Atakan Peker, Aliso Viejo; William L. Johnson, Pasadena, and David M. Scruggs, Oceanside, all of Calif., assignors to Amorphous Technologies International, Laguna Niguel, Calif.

Filed Aug. 26, 1996, Ser. No. 702,918

Int. Cl.<sup>6</sup> C22C 45/10

U.S. Cl. 148—561

17 Claims



11. A method for providing springy performance in an article, comprising the steps of:

- providing a bulk-solidifying amorphous metallic alloy, the bulk-solidifying amorphous metallic alloy being a metallic alloy which is capable of being cooled from the melt at a cooling rate of less than about 500° C. per second, yet retain an amorphous structure; and
- processing the bulk-solidifying amorphous metallic alloy into the shape of a torsionally reacting spring having an amorphous metallic structure.

5,772,805

**WHEEL SAFETY RIM**

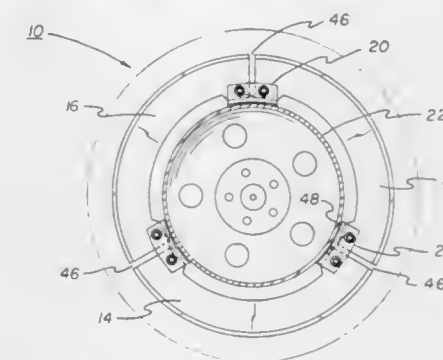
Glen L. Bobst, 2910 North St. Helena Hwy., St. Helena, Calif. 94574

Continuation-in-part of Ser. No. 543,617, Oct. 16, 1995, abandoned. This application Sep. 25, 1996, Ser. No. 719,761

Int. Cl.<sup>6</sup> B60C 17/04

U.S. Cl. 152—158

1 Claim



1. A wheel safety assembly for use with an inflatable vehicle wheel, said assembly comprising three arcuate segments secured to an interior peripheral surface of an existing vehicle wheel rim, each of said arcuate segments extending radially outwardly from said interior peripheral surface of said vehicle wheel rim and being

aligned in a balanced and symmetrical relationship, each of said arcuate segments further including arcuately shaped supporting surfaces engageable with an interior peripheral surface of a deflated vehicle tire, thereby to prevent a complete collapsing of said deflated vehicle tire so as to permit a vehicle to continue traveling on said deflated vehicle tire until a repair thereof can be completed the assembly further including a plurality of support plates each with a bottom arcuate surface welded to the vehicle wheel rim with elastomeric connectors and a pair of apertures formed in each of the support plates;

said elastomeric connectors situated within the apertures of the support plates and including a cylindrically shaped rubber grommet frictionally retained therein for permitting both circumferential and radial movement of said arcuate segments, thereby to achieve a precise balancing effect, wherein the grommets further include an interior metallic sleeve;

said arcuate segments each including an integral support rim extending downwardly from the support surfaces and having downwardly extending engagement tabs on opposed ends thereof each of which has a pair of elongated slots formed therein for allowing the coupling thereof with the elastomeric connectors of the corresponding support plates via a threaded fastener, lock nut and washer combination;

said arcuate segments each identically shaped and designed with a T-shaped cross-section, and further wherein each of said arcuate segments are equidistantly and spacedly positioned around said vehicle wheel to define a circular configuration; said arcuate segments being relatively moveable with respect to said support plates during a rotational movement of said vehicle tire, thereby to facilitate said precise balancing effect; and

at least two unitary installation tools each having an S-shaped configuration with a first generally U-shaped portion including a plurality of protrusions formed along a first end thereof; a second U-shaped portion having a pair of side members, one of which is integrally coupled to the first end of the first portion with at least one protrusion formed thereon adjacent the protrusions of the first portion; and a third lip portion integrally coupled to an end of one of the side members of the second portion which resides distant the first U-shaped portion, wherein the first portion, the second portion, and the third portion reside in a plane.

5,772,806

## PNEUMATIC TIRES

Masashiro Moriya, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

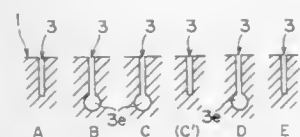
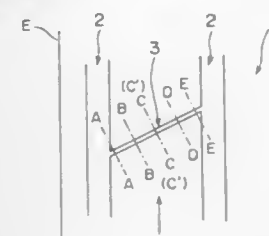
Filed Oct. 6, 1995, Ser. No. 540,184

Claims priority, application Japan, Oct. 6, 1994, 6-242939

Int. Cl.<sup>6</sup> B60C 11/12

U.S. Cl. 152—209 R

12 Claims



1. A pneumatic tire having a tread, said tread comprising: plurality of main grooves and sipes extending between adjacent main grooves, each of said sides having a substantially uniform width at a tread surface and having a first end portion opening to one of the adjacent grooves, a second end portion opening to the other of the adjacent grooves and a remaining portion between the

first end portion and the second end portion, wherein each of said sipes has a substantially uniform width along its entire depth at the first end portion and the second end portion and said substantially uniform width extending to a first depth in said first and second end portions, each of said sipes has an expanded width portion at the bottom of the sipe compared to said substantially uniform width at least at a greater part of a remaining portion which extends to a second depth and does not have an expanded width at the bottom of the sipe at the first end portion and the second end portion, wherein said second depth is greater than said first depth.

5,772,807

## TRUCK TIRE WITH THREAD OF RIB/GROOVE CONFIGURATION

Fernand Antoine Joseph Fourgon, Bastogne, Belgium, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 16, 1996, Ser. No. 715,264

Int. Cl.<sup>6</sup> B60C 1/00; 11/00

U.S. Cl. 152—209 R

1 Claim

1. A pneumatic tire having a tread of a cap/base construction including a tread cap and a tread base where said tread cap has from three to and including seven continuous, circumferential, spaced apart ribs with from two to six corresponding associated, adjoining, grooves between the ribs, wherein at least one of said ribs has a multiplicity of sipes on the surface of the rib, wherein said tire has a TRA rated maximum load limit in a range of about 2043 kg to about 5000 kg, at an inflation pressure in a range of about 723 to about 792 kpa and a bead diameter in a range of about 48 to about 64 cm (about 19 to about 25 inches) characterized in that, for its tread of cap/base construction:

(A) the tread cap is comprised of, based on 100 parts by weight (phr) elastomers (1) elastomers comprised of (a) about 25 to about 35 phr of organic solution polymerization prepared styrene/butadiene copolymer rubber having a styrene content of about 15 to about 25 percent and a Tg in a range of about -70° C. to about -80° C., (b) about 65 to about 75 phr of isoprene/butadiene copolymer rubber having an isoprene content in a range of about 40 to about 60 percent and a Tg in a range of about -60° C. to about -90° C., (2) about 50 to about 70 phr carbon black reinforcing filler as (a) about 60 to about 70 weight percent carbon black having an Iodine adsorption value in a range of about 115 to about 130 g/kg and a DBP number in a range of about 105 to about 118 cm<sup>3</sup>/100 g and, correspondingly, (b) about 40 to about 30 weight percent carbon black having an Iodine adsorption value in a range of about 105 to about 113 g/kg and a DBP number in a range of about 120 to about 130 cm<sup>3</sup>/100 g; and

(B) the tread base comprises cis 1,4-polyisoprene natural rubber reinforced with about 20 to about 60 phr of carbon black.

5,772,808

## RADIAL TIRE WITH THREE LAYER MULTI-SHEATH STEEL CARCASS CORDS

Yoshinori Kuriya, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

Division of Ser. No. 576,338, Dec. 21, 1995, Pat. No.

5,697,204. This application Aug. 12, 1997, Ser. No. 909,852

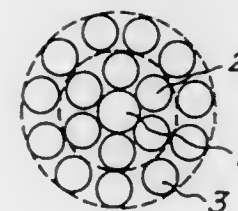
Claims priority, application Japan, Dec. 26, 1994, 6-322928; Dec. 13, 1995, 7-324911

Int. Cl.<sup>6</sup> B60C 9/00; 9/02; 9/04; 9/08

U.S. Cl. 152—454

4 Claims

1. A heavy duty pneumatic radial tire having an aspect ratio of not more than 80% and a carcass ply of steel cords having a three-layer twisting construction devoid of any wrap filament, each steel cord comprising:



a core layer of a single steel filament,

a first sheath layer of six steel filaments arranged around the core layer, and

a second sheath layer of steel filaments numbering 1 or 2 filaments less than a maximum number of the same steel filaments that are arranged on a circumscribed circle of the first sheath layer, said steel filaments in said second sheath layer having the same diameter as that of said steel filaments in said first sheath layer,

wherein said steel filaments in said first and second sheath layers are twisted in the same twisting direction at a different twisting pitch, and wherein filament diameters of said core layer and said first and second sheath layers satisfy the relationships

$$D_s < D_c \leq 0.20$$

$$D_s \times 1.06 \leq ((D_c + D_s) \times \pi) / 6 \leq D_s \times 1.1$$

where  $D_s$  is the filament diameter of the sheath layers in millimeters and  $D_c$  is the filament diameter of the core layer in millimeters.

5,772,809

## PNEUMATIC TIRES WITH SPECIFIED STEEL BELT CORDS

Manabu Yanagisawa, Kodaira, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

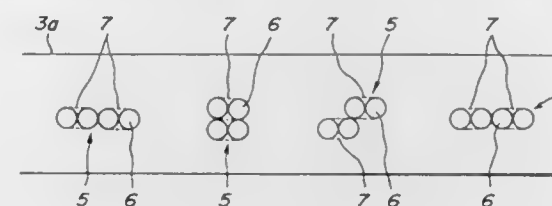
Filed Dec. 4, 1996, Ser. No. 760,597

Claims priority, application Japan, Feb. 23, 1996, 8-036496; Jun. 5, 1996, 8-142475

Int. Cl.<sup>6</sup> B60C 9/20; 9/18; 9/00; D07B 1/06

U.S. Cl. 152—527

5 Claims



1. A pneumatic tire comprising a carcass toroidally extending between a pair of bead portions and a belt arranged outside the carcass in a radial direction of the tire and composed of at least one belt layer, in which said at least one belt layer is constituted by arranging a plurality of steel cords, each cord being formed by twisting 2 to 4 filament bundles each consisting of two steel filaments parallel with each other so as to have a structure that major axes of the filament bundles in the cord are set toward substantially the same direction, in such a manner that the major axes of the filament bundles in the cords of the at least one belt layer arranged substantially in a row in a widthwise direction of the belt.

5,772,810

## RADIAL TIRE WITH TRIANGULATED CROWN REINFORCEMENT

Guy Cluzel, Beaumont, France, assignor to Compagnie Generale des Etablissements Michelin - Michelin & Cie, Clermont-Ferrand Cedex, France

PCT No. PCT/EP96/00347, § 371 Date Sep. 25, 1996, § 102(e) Date Sep. 25, 1996, PCT Pub. No. WO96/25297, PCT Pub. Date Aug. 22, 1996

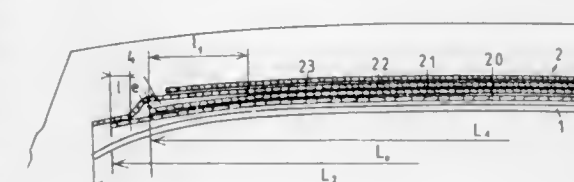
PCT Filed Jan. 30, 1996, Ser. No. 718,324

Claims priority, application France, Feb. 13, 1995, 95 01705

Int. Cl.<sup>6</sup> B60C 9/18; 9/20; 9/22

U.S. Cl. 152—531

2 Claims



1. A tire comprising a radial carcass reinforcement (1) surmounted by a crown reinforcement (2) formed, in direction radially from the inside to the outside, of at least one triangulation ply (20) of non-stretchable metal wires or cables which form an angle  $\alpha$  of between 60° and 90° with the circumferential direction and of two working plies (21 and 22) formed of non-stretchable metal wires or cables crossed from one ply to the next and forming an angle  $\beta, \gamma$  of between 10° and 45° with the circumferential direction, characterized by the fact that the first working ply (21) which is radially adjacent on the outside of the radially outermost triangulation ply (20) has a width  $L_1$  less than the width  $L_0$  of said triangulation ply (20), the second working ply (22), which is radially above the first (21), having an axial width  $L_2$  greater than the width  $L_0$  of the triangulation ply (20), and the edges of said second working ply (22) covering the edges of said triangulation ply (20) so that the radial distances between the respective wires or cables of the two plies at the level of said edges are at most equal to 1.5 mm over an axial distance  $l$  at least equal to 2% of the axial width  $L_0$  of the triangulation ply (20).

5,772,811

## HEAVY DUTY RADIAL TIRE WITH SPECIFIED BEAD CORE INSIDE DIAMETER

Kiyoshi Ueyoko, Kobe; Shuichi Sakamoto, Akashi; Tsuneyuki Nakagawa, and Kazuki Numata, both of Sibirakawa, all of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo-ken, Japan

Filed Jun. 13, 1996, Ser. No. 662,497

Claims priority, application Japan, Jun. 19, 1995, 7-151684; Jun. 29, 1995, 7-163809; Mar. 22, 1996, 8-066277

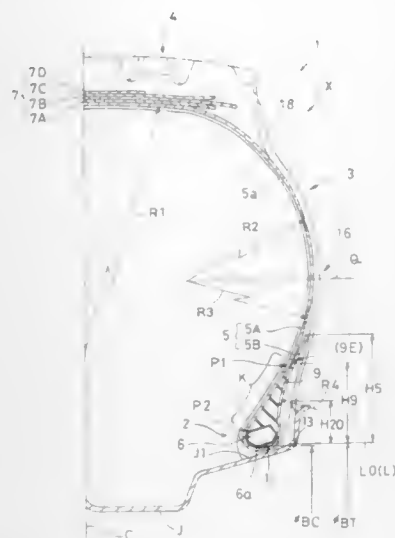
Int. Cl.<sup>6</sup> B60C 9/08; 15/00; 15/024; 15/04

U.S. Cl. 152—540

5 Claims

1. A heavy duty radial tire to be mounted on a 15 degree drop center rim, the tire comprising a tread portion, a pair of sidewall portions, a pair of bead portions with a bead core therein, a carcass comprising a main portion extending between the bead portions and a pair of turnup portions turned up around the bead cores from the axial inside to the outside of the tire, and a belt disposed radially outside the carcass and inside the tread portion, wherein, in a mounted state where the tire is mounted on the standard 15 degree drop center rim and inflated to a pressure of 0.5 ksc but not loaded,





the inside diameter BC of the bead cores at the radially innermost point thereof is not more than the diameter BT at the heel point of the bead portions.

5,772,812

Patent Not Issued For This Number

5,772,813

#### METHOD FOR MAKING AN ABSTRACT ARTICLE COMPRISING AN ABSORBENT CORE HAVING TWO TYPES OF FIBERS AND FIBERBOARD FOR USE IN SUCH A METHOD

Bruce Kevin Bitowft, Glashuettten, and Karsten Puchert, Griesheim, both of Germany, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 331,546, Sep. 12, 1995, abandoned.

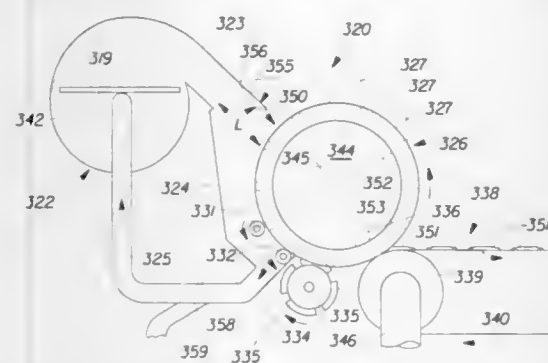
This application Jul. 11, 1996, Ser. No. 678,142

Claims priority, application European Pat. Off., May 6, 1992, 92870068

Int. Cl.<sup>6</sup> A61F 13/00

U.S. Cl. 156—62.4

7 Claims



1. A method of making an absorbent batt, the method comprising the steps of:

providing a fiber board comprising a first type of fibers that are hydrophilic and a second type of fibers that are synthetic, multi-dimensional and crimped, said multi-dimensional, crimped synthetic fibers having an average extended length of between 2 and 25 mm, a denier of between 6 and 40, and between 3 and 8 crimps or coils per inch, said two types of fibers being mixed and compressed wherein said multi-dimensional, crimped synthetic fibers are able to be defiberized without being destroyed, the percentage of said multi-

dimensional, crimped synthetic fibers in said fiber board being at least 10% by weight;  
supplying said fiber board to a defiberizing means for forming individualized fibers or groups of fibers;  
defiberizing said fiber board substantially without substantial plastic deformation of said multi-dimensional, crimped synthetic fibers; and  
transporting said defiberized fibers to a core forming means for forming an absorbent batt.

5,772,814

#### WELDING SYSTEM AND METHOD OF SETTING WELDING MACHINE PARAMETERS

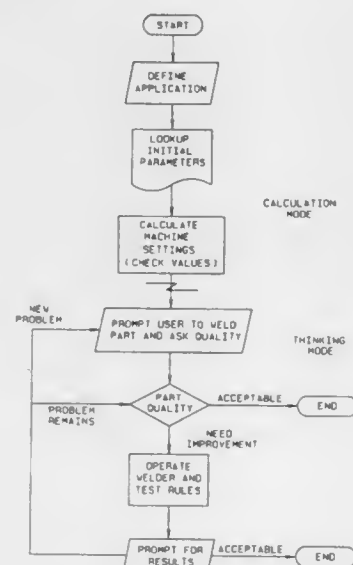
David A. Grewell, Waterbury, Conn., assignor to Branson Ultrasonic Corporation, Danbury, Conn.

Filed Jan. 26, 1996, Ser. No. 592,768

Int. Cl.<sup>6</sup> B32B 31/00

U.S. Cl. 156—64

55 Claims



37. A method of setting parameters for a welding operation on a welding machine comprising, the steps of:

- providing identifying information concerning the welding operation to an electronic controller for the welding machine;
- said controller setting initial parameter values;
- performing a trial welding operation using the initial parameter values;
- providing weld quality information from the trial welding operation to the controller;
- said controller being responsive to the weld quality information to change said initial parameter values for a subsequent trial welding operation;
- providing weld quality information from the trial welding operation using the changed parameter values to the controller;
- said controller being responsive to said latter weld quality information to further change the parameter values based in part on the weld quality information from all previous trial welding operations and to trial welding operations which do not follow predefined rules-of-thumb to increase a frustration level and to modify the weighting of possible solutions in response to the frustration level.

5,772,815

#### METHOD FOR MAKING LAMINATED INTEGRATED CIRCUIT DEVICES

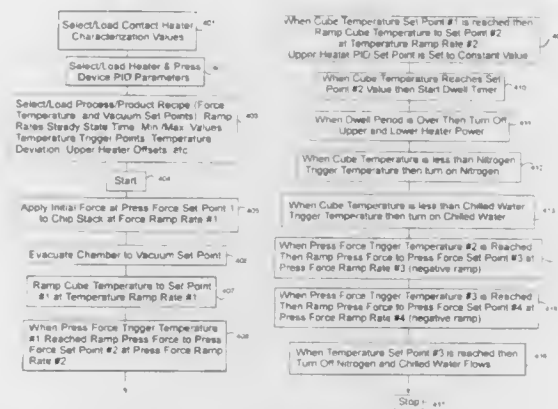
Stanley Robert Jordan, Boca Raton; Gary Leon Stewart, Lake Worth, and Ralph Trollinger, Pompano Beach, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 29, 1996, Ser. No. 672,398

Int. Cl.<sup>6</sup> B32B 31/00

U.S. Cl. 156—64

15 Claims



1. A method of making laminated integrated circuit cubes, comprising the steps of:  
placing a multiple-layer integrated circuit cube into a hermetic chamber;  
developing a vacuum in said chamber;  
using at least one heating element to apply conductive heat to said cube;  
sensing the temperature of the cube;  
applying a mechanical force to said cubes;  
sensing the mechanical force applied to the cube; and  
controlling the temperature of the cube and the force applied to the cube using feedback control.

5,772,816

#### REINFORCED TAPE STRIP FOR PERIMETER SECUREMENT OF A MEMBRANE ROOF AND METHOD FOR ATTACHING

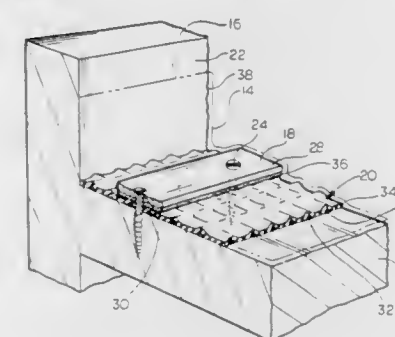
Michael J. Hubbard, Holland, Ohio, assignor to GenCorp Inc., Fairlawn, Ohio

Continuation of Ser. No. 353,735, Dec. 12, 1994, Pat. No. 5,593,748, which is a continuation of Ser. No. 193,320, Feb. 9, 1994, abandoned. This application May 24, 1995, Ser. No. 449,459

Int. Cl.<sup>6</sup> B32B 7/08; 31/00

U.S. Cl. 156—71

4 Claims



1. A method of attaching a roofing membrane to a parapet wall and abutting roof deck surface comprising the steps of:

- A. providing a tubular support body having a first axial end spaced from a second axial end,
- B. providing rim means at said first axial end, and providing an annular attachment means recessed inwardly on said body below said rim, and intermediate said axial ends,
- C. disposing a filter means on said rim means such that said particle-collecting portion of said filter is planar, and

deck surface at a foot of the parapet wall with a portion of the reinforced tape strip resting on the roof deck;  
applying a primer to an undersurface of the roofing membrane; removing the protective layer from the reinforced tape strip; and adhering the roofing membrane to the adhesive layer thereby providing perimeter securement of the membrane without penetrating the membrane.

5,772,817

#### OPTICAL PELLICLE MOUNTING SYSTEM

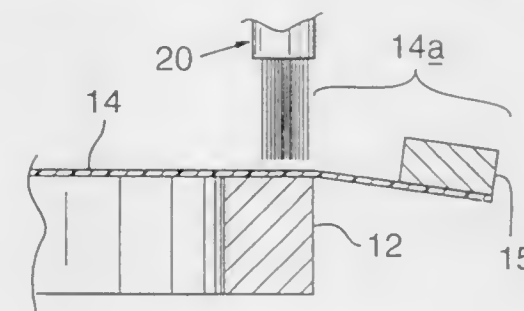
Yung-Tsai Yen, Atherton, and Quang Rung Bih, San Jose, both of Calif., assignors to Micro Lithography, Inc., Sunnyvale, Calif.

Filed Feb. 10, 1997, Ser. No. 797,875

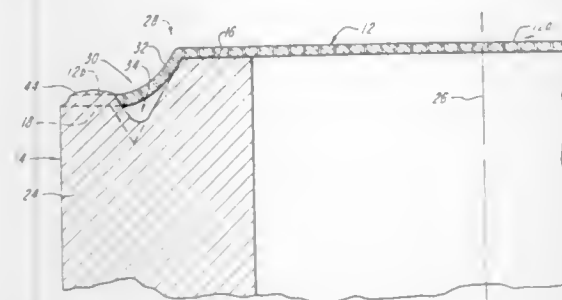
Int. Cl.<sup>6</sup> G03F 1/14; H01L 21/027

U.S. Cl. 156—73.1

18 Claims



1. A process for mounting an optical pellicle membrane to an optical pellicle frame, comprising:  
selecting a pellicle frame corresponding to the shape of the desired pellicle, wherein the pellicle frame has an inner edge and an outer edge;  
applying adhesive containing a solvent to the pellicle frame;  
heating the pellicle frame to evaporate the solvent;  
fabricating a pellicle membrane;  
mounting the pellicle membrane to the adhesive on the pellicle frame; and  
generating heat in the pellicle membrane and the adhesive after the membrane has been mounted to the adhesive on the pellicle frame, to bond the membrane to the frame, wherein the step of generating heat consists of heating the membrane and the adhesive in a region closer to the outer edge than the inner edge of the pellicle frame.



D. securing a peripheral securing portion of said filter means to said attachment means for attachment of said filter means to said body.

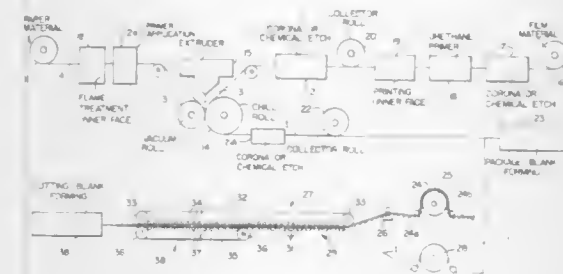
5,772,819

**METHOD OF MAKING A COMPOSITE OF PAPER AND PLASTIC FILM**

Michael Wayne Olvey, 240 Browns Hill Ct., Tyrone, Ga. 30290  
Continuation of Ser. No. 252,665, Jun. 1, 1994, abandoned,  
which is a continuation of Ser. No. 919,042, Jun. 17, 1991,  
abandoned, which is a continuation of Ser. No. 281,055, Dec.  
9, 1988, abandoned. This application Jun. 7, 1995, Ser. No.  
487,631

Int. Cl.<sup>6</sup> B32B 31/12; 31/18; 31/20; 31/30  
U.S. Cl. 156—82

23 Claims



14. A method of making a composite of paper and film comprising passing into and through the nip of a pair of nip rolls a web of kraft paper and a web of plastic film of bioriented polyester; extruding a layer of molten polymer impregnating and bonding agent into the nip between the webs on the entry side of the nip; controlling one or more of the speed of the webs, the temperature of the molten polymer, the pressure or spacing of the rolls at the nip, and the rate of extrusion, relative to the porosity and surface characteristics of the paper web, and controlling the moisture content near an inner surface of said paper web, such that a substantial portion of the molten polymer impregnates partially into and becomes part of the paper web and a substantial portion lies outwardly of the surface of the paper web and solidifies to form a new surface to which the film is bonded and on which the film is supported clear of the inner paper surface; and collecting from the nip rolls said composite comprising paper partially impregnated with solidified polymer agent, a contiguous layer of solidified polymer agent having said new surface outwardly of the paper inner surface, and the plastic film bonded to said new surface, and the polymer agent being generally uniform over the area of the composite in an amount of at least about nine pounds per thousand square feet.

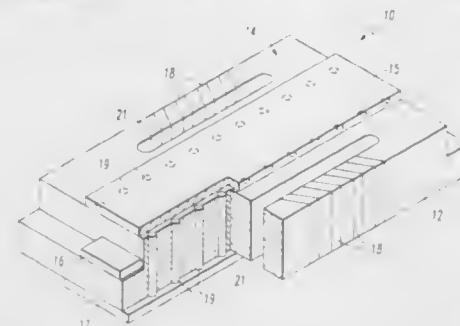
**5,772,820  
PROCESS FOR FABRICATING A MICROWAVE POWER DEVICE**

Karl F. Schoch, Jr., Pittsburgh; Theodore R. Vasilow, Irwin, both of Pa.; Andrew J. Piloto, Columbia, Md.; Deborah P. Partlow, Export, and Kenneth C. Radford, N. Huntingdon, both of Pa., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 511,927, Aug. 7, 1995. This application Jul. 25, 1996, Ser. No. 685,885  
Int. Cl.<sup>6</sup> B32B 31/26; H01P 1/387

U.S. Cl. 156—89

16 Claims



1. A process for fabricating a microwave power device comprising the steps of:

- (a) precipitating a ferrite powder through sol-gel chemical precipitation in a water-based system containing fully dissolved reactants;
- (b) filtering the solid precipitate from the liquids;
- (c) calcining the powder;
- (d) mixing the calcined ferrite powder together with a binder, a plasticizer and a solvent and mixing these materials to form a homogenized slip;
- (e) providing a thin layer of slip upon a section of backing material to form a tape;
- (f) drying the slip;
- (g) cutting the tape into a plurality of tape sections;
- (h) removing the backing material from the tape sections;
- (i) applying selected amounts of conductive metal in a selected pattern upon predetermined ones of the tape sections, the conductive metal having a predetermined melting point;
- (j) stacking a number of layers of the tape sections, including tape sections having the conductive metal, in a desired order and laminating the stack of layers; and
- (k) firing the stack of layers to a temperature less than the melting point of the conductive metal and being approximately 800° C. to 1000° C., to thereby sinter the laminated layers into one integrated structure.

5,772,821

**METHOD AND APPARATUS FOR PRODUCTION OF A THREE-DIMENSIONAL FABRIC**

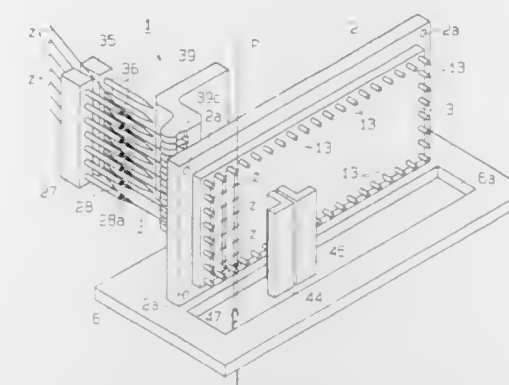
Yoshiharu Yasui, Fujio Hori, Masaaki Amano, and Junji Takeuchi, all of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Feb. 5, 1996, Ser. No. 596,593  
Claims priority, application Japan, Feb. 8, 1995, 7-020678  
Int. Cl.<sup>6</sup> D03D 13/00

U.S. Cl. 156—93

3 Claims

1. A method for producing a three-dimensional fabric having laminated fiber layers in which the layers lie in parallel planes and at least two of said layers consist of fibers arranged respectively along first and second axial directions, and at least one connection yarn is inserted through said fiber layers in a direction perpendicular to said planes of said layers to unite the layers with each other, each of said fiber layers being formed by arranging the fiber by folding the fiber back and forth along said respective axial direction, said method comprising the steps of:  
performing said folding of the fiber by engaging the respective fiber with a plurality of boundary establishing members



located with a predetermined pitch on a frame surrounding an area where said connection yarn is inserted through said fiber layers, said yarn being folded about said boundary establishing members to thereby determine the boundary of said respective fiber layers;

thrusting simultaneously a plurality of yarn inserting needles arranged in a series together with a corresponding plurality of connection yarns into said fiber layers until a holding section of each yarn inserting needle projects outside of the fiber layers to make a loop of each of said connection yarns at each holding section;

inserting a lock yarn through each of said loops along said series of needles to prevent each loop from falling out;

thereafter tightening said lock yarn by urging pressing members from a spaced apart standby position into an operational position in engagement with opposite sides of the fiber layers adjacent the yarn inserting needles pressing the fiber layers together and then pulling back said yarn inserting needles; repeating the steps of thrusting said needles, inserting a lock yarn and thereafter tightening said lock yarn until insertion of said connection yarns is completed; and

thereafter removing said fiber layers from said frame.

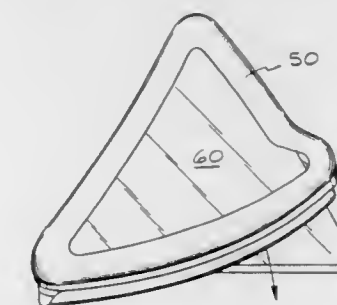
5,772,822

**METHOD OF MANUFACTURING GLASS PANEL AND GASKET ASSEMBLIES**

Ronald E. Dupuy, Wabash, Ind., assignor to GenCorp Inc., Fairlawn, Ohio

Filed Mar. 14, 1996, Ser. No. 615,376  
Int. Cl.<sup>6</sup> B29C 35/02; 65/00; B60J 10/02  
U.S. Cl. 156—108

17 Claims



1. A process for manufacturing a glass panel and gasket assembly comprising the steps of:

- (a) providing a mold cavity defining a cross sectional shape of a desired gasket;
- (b) injecting a curable elastomer into said mold cavity to form a gasket having a channel with first and second sidewalls, allowing such elastomer of such gasket to partially cure, removing such partially-cured gasket from such mold cavity, providing a glass panel having a periphery adjacent a first surface and a second surface,

inserting such glass panel within the channel of such partially-cured gasket with a portion of each of said surfaces in contact with one of said sidewalls, and  
completing curing of such elastomer of such gasket, whereby such partially-cured gasket is sealingly disposed on the portions of such surfaces of such glass panel when such partially-cured gasket becomes completely cured.

5,772,823

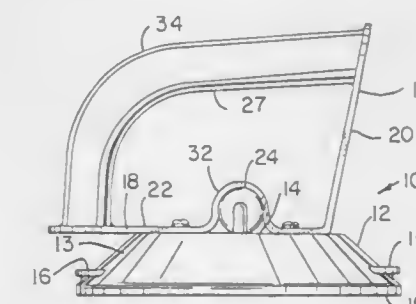
**METHOD FOR INSTALLING AUTOMOTIVE WINDSHIELDS**

Bradd R. Rusch, Janesville, and Jeffrey L. Ritchie, Fond du Lac, both of Wis., assignors to Auto Glass Specialists, Inc., Madison, Wis.

Division of Ser. No. 586,383, Jan. 16, 1996, Pat. No. 5,639,134.  
This application Jun. 12, 1997, Ser. No. 874,019  
Int. Cl.<sup>6</sup> B25J 15/06; B60J 1/00

U.S. Cl. 156—108

3 Claims



1. A method for installing an automobile windshield, comprising the steps of:

- (a) engaging a first and a second suction grip with a windshield to be installed, each grip having a single resilient suction cup having an edge for forming an air tight seal with an automobile windshield, a means for extracting the air from between the suction cup and an engaged automobile windshield to thereby form a differential pressure seal between the cup and the windshield, a rigid handle member to which the suction cup is fixed, wherein the handle member has a support plate which extends generally parallel to the cup, and a flange plate which extends upwardly from the cup, wherein the angle defined between the support plate and the flange plate is greater than 90°, and a curved tubular handle which extends from the support plate to the flange plate, wherein a volume is defined between the handle and the handle member for the reception therein of the fingers of an installer, and the curvature of the handle thereby permits the repositioning of the fingers of an installer along the handle as the orientation of the device changes with the position of the automobile windshield with respect to the body of the installer in the course of the installation of the windshield;
- (b) lifting the engaged windshield, and inverting the windshield so that the grips are beneath the windshield in such a manner that the one lifting may engage his hands against the support plates of the grips;
- (c) applying a bead of sealant around the perimeter of the inverted windshield;
- (d) lifting the windshield with the sealant applied thereto by the connected grips, and altering the orientation of the grips with respect to an installer to bring the windshield into a generally vertical orientation in such a manner that one lifting may engage his hands against the flange plates of the grips;
- (e) bringing the generally vertical windshield into engagement with the windshield frame of an automobile to thereby connect the windshield to the automobile; and
- (f) releasing the grips from engagement with the windshield.



# UMI

1. A method of constructing an inkjet pen to withstand thermal strain occurring at a region of contact between an arm of a pen

8- CHLOROPICOTINIC ACID 277

1. A method for bonding wood plies together, comprising the steps of
  - (i) providing plural wood plies for assembly together to form plywood or a veneer laminate,
  - (ii) selecting the width, depth and pitch of passages to be formed in at least one face of at least one of said plural wood plies to be bonded together,
  - (iii) forming said passages in said at least one face of at least one of said plural wood plies to be bonded together, said one face forming an interface with another one of said plural wood plies when said plural wood plies are bonded together, each of said passages extending continuously from a first edge of said

at least one of said plural wood plies to a second edge thereof, and said passages being substantially evenly distributed across said one face,

(iv) placing said plural wood plies in face to face abutment with a thermosetting adhesive material therebetween,

(v) selecting a heating fluid from the group of fluids consisting of hot vapor and hot air,

(vi) blowing said selected heating fluid through said passages, from said first edge of said at least one of said plural wood plies to said second edge thereof, to heat and set the adhesive material, said heating fluid heating only portions of the plies surrounding the passages,

(vii) concurrently with said blowing step, pressing said plural wood plies together in a direction perpendicular to said interfaces between said wood plies for forming said plywood or veneer laminate,

wherein the plies contain an amount of moisture which if vaporized would soften said plies so as to allow a reduction of thickness of the whole of said wood plies during said pressing step, and

wherein the width, depth and pitch of said passages is selected such that the whole of said plural wood plies is virtually not reduced in thickness during pressing.

5,772,831

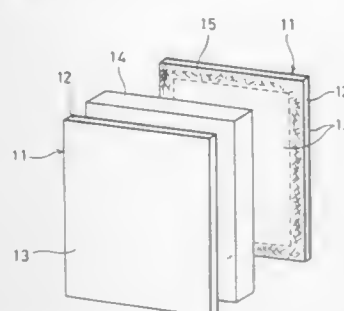
**FILTER MEMBRANE ELEMENT AND METHOD OF MANUFACTURING SAME**

Masashi Moro, and Kiyoshi Izumi, both of Osaka, Japan, assignors to Kuhota Corporation, Osaka, Japan

Continuation-in-part of Ser. No. 351,353, Apr. 3, 1995, abandoned. This application Jul. 9, 1996, Ser. No. 676,534

Int. Cl.<sup>6</sup> C09J 5/02; B01D 29/00

U.S. Cl. 156—309.3



1. A method of manufacturing a filter membrane element comprising an organic filter membrane having a plate support member made of nonwoven fabric and a film coating formed on both sides of the support member, a filter plate made of resin, and a felt spacer disposed between said filter plate and said organic filter membrane, wherein

a solvent which is capable of melting the film coating is applied to an overall periphery of the organic filter membrane;

a portion only of said film coating on a support member surface confronting said spacer is dissolved by the application of said solvent to cause the support member to be exposed at the dissolved portion thereof;

the exposed portion of the support member and the corresponding portion of the spacer, and a portion of the other side of the spacer and the corresponding portion of the filter plate are respectively bonded by melt welding; and

a part of a melted resin of the filter plate surface which has permeated into the spacer is consolidated to seal the periphery of the spacer.

**5,772,832  
PROCESS FOR ETCHING OXIDES IN AN ELECTROMAGNETICALLY COUPLED PLANAR PLASMA APPARATUS**

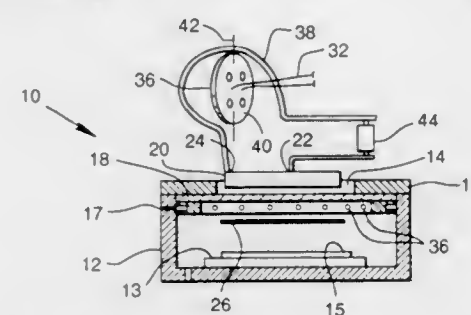
Kenneth S. Collins, San Jose, and Jeffrey Marks, Sunnyvale, both of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

Division of Ser. No. 762,464, Dec. 9, 1996, which is a continuation of Ser. No. 289,336, Aug. 11, 1994, abandoned, which is a continuation of Ser. No. 984,045, Dec. 1, 1992, abandoned, which is a continuation-in-part of Ser. No. 722,340, Jun. 27, 1991, abandoned. This application Apr. 4, 1997, Ser. No. 835,091

Int. Cl.<sup>6</sup> H01L 21/00

U.S. Cl. 156—345

19 Claims



1. In an apparatus for plasma etching a substrate comprising a chamber including an inlet for a plasma precursor etch gas and a substrate support for the substrate, the improvement comprising a ring of silicon or carbon-containing material mounted about the substrate.

5,772,833

**PLASMA ETCHING APPARATUS**

Koichiro Inazawa, Yoshio Ishikawa, Takashi Asakawa, Masato Hiratsuka, and Nobuyuki Okayama, all of Tokyo, Japan, assignors to Tokyo Electron Limited, Japan

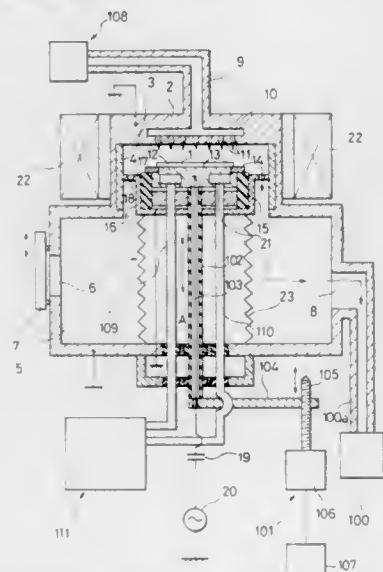
Filed Nov. 17, 1994, Ser. No. 341,524

Claims priority, application Japan, Nov. 20, 1993, 5-314096

Int. Cl.<sup>6</sup> H01L 21/02

U.S. Cl. 156—345 P

14 Claims

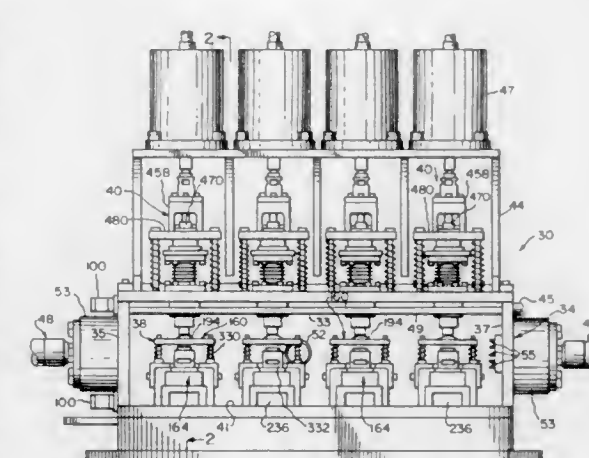


1. A plasma etching apparatus comprising: a vacuum container having a processing chamber having a peripheral surface section therein in which a plasma is generated to etch a to-be-processed article; a cathode electrode provided in said process chamber and supporting the to-be-processed article, the cathode electrode having an effective area exposed to the process chamber;

an anode electrode including an end surface section directly facing the cathode electrode and contiguously defining the process chamber with the peripheral surface section thereof, the anode electrode having an effective area exposed to said process chamber and made of a material of at least one of a metal, metal oxide, and metal nitride;

gas introducing means for introducing an etching gas into said process chamber; and

power applying means for applying radio frequency electric power to said cathode electrode and producing plasma of said etching gas between said cathode electrode and said anode electrode in said process chamber, wherein an area ratio of said effective area of said anode electrode to said effective area of said cathode electrode is not more than 3.5 and where said material of the effective area of said anode electrode is sputtered by the plasma and is deposited on the article in an amount of  $10^{14}$  or more atom/cm<sup>2</sup> during an etching of the article.



5,772,834

**PLASTIC SUBSTRATE PRODUCTION PRODUCTION DEVICE**

Serge Chilloff, Olivet; Jean-Marc Bernard, Chapelle Saint Mesmin, and Gérard Nioche, Clery Saint Andre, all of France, assignors to Gilles Leroux, S.A., Loury, and ATN S.A., Olivet, both of France

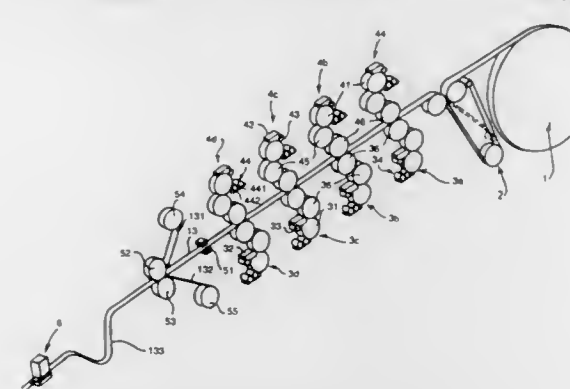
Continuation of Ser. No. 334,379, Nov. 3, 1994, abandoned.

This application May 3, 1997, Ser. No. 851,081

Int. Cl.<sup>6</sup> B32B 31/00

U.S. Cl. 156—351

14 Claims



1. Plastic substrate production device, comprising: a substrate coil of a strip of plastic; a straightening device; at least one printing station for printing a pattern on said strip; a drying station located at an exit of said printing station; driving means for driving the strip through said straightening device, at least one printing station and drying station; cutting means located downstream of said driving means; detecting means for detecting a printed marking on said strip to position a pattern opposite said cutting means; and means for detecting the difference in speed between the printing station and said cutting means.

5,772,835

**VACUUM OVEN CHAMBER FOR MAKING LAMINATED INTEGRATED CIRCUIT DEVICES**

Stanley Robert Jordan, Boca Raton; Gary Leon Stewart, Lake Worth, and Ralph Trollinger, Pompano Beach, all of Fla., assignors to IBM Corporation, Armonk, N.Y.

Filed May 29, 1996, Ser. No. 654,956

Int. Cl.<sup>6</sup> B30B 15/34

U.S. Cl. 156—358

20 Claims

1. An oven for heat-curing a workpiece, comprising: a chamber with at least one access opening;

**5,772,836  
TURNING APPARATUS FOR TIRE COMPONENTS**

Yuichiro Ogawa, Tokyo, Japan, assignor to Bridgestone Corporation, Tokyo, Japan

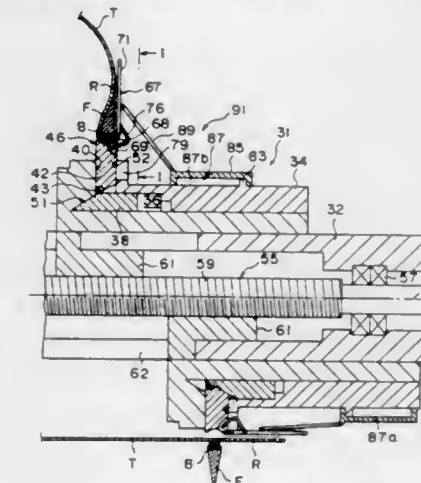
Filed Feb. 26, 1997, Ser. No. 806,778

Claims priority, application Japan, Feb. 27, 1996, 8-065390

Int. Cl.<sup>6</sup> B29D 30/32

U.S. Cl. 156—400

10 Claims



1. An apparatus for turning a tire component which is arranged outside a tire building drum and presents a cylinder and having a portion thereof caught by a bead, which is a set at a determined position of the outside of the tire component, and a bead-locking part of the tire building drum, said apparatus comprising bendable turning fingers for turning the tire component, said turning fingers connected rotatably to the bead-locking part wherein the turning fingers comprise short finger parts and long finger parts, bases of the short finger parts connected to the bead-locking part, and bases



of the long finger parts connected rotatable to heads of the short finger parts, and the long finger parts are longer than the short finger parts, connecting links for said turning fingers, the bases or said connecting links rotatable connected to the bead-locking parts at a radially inner side relative to the bases of the short finger parts, and heads of said connecting links being rotatable connected to the long finger parts and radially extending.

5,772,837  
APPARATUS FOR FORMING CAVITIES WITHOUT  
USING AN INSERT

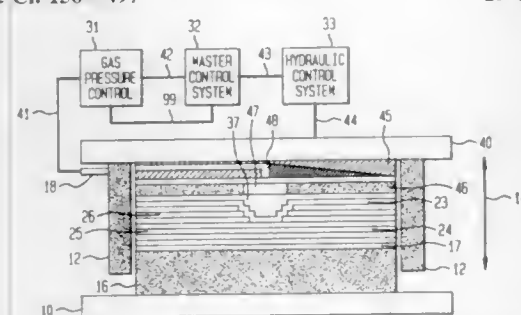
Govindarajan Natarajan, Pleasant Valley; Raschid Jose Bezama, Mahopac, and John Ulrich Knickerbocker, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 476,468, Jun. 7, 1995, Pat. No. 5,665,195, which is a division of Ser. No. 305,620, Sep. 14, 1994, Pat. No. 5,538,582. This application Mar. 24, 1997, Ser. No. 822,798

Int. Cl.<sup>6</sup> B32B 35/00

U.S. Cl. 156—497

29 Claims



1. An apparatus for forming cavities in at least one ceramic layer having at least one cavity comprising, a first plate to accommodate said at least one ceramic layer having at least one cavity, at least one cavity forming membrane over at least a portion of said at least one cavity in said at least one ceramic layer, a second plate having at least one opening over at least a portion of said at least one membrane, at least one external pressure application means over said second plate, and at least one internal pressure means over said at least one cavity forming membrane for providing an internal pressure, wherein said at least one external pressure application means applies external pressure over said second plate and wherein said at least one internal pressure means provides said internal pressure to said at least one membrane to counter said external pressure and to prevent said at least one cavity from deforming and thereby forms said at least one ceramic layer having at least one cavity.

5,772,838  
APPARATUS AND METHOD FOR MAKING LAMINATED  
ELECTRICAL OR ELECTRONIC DEVICES FROM A  
CONTINUOUS TAPE COATED ON ONE SIDE WITH  
CERAMIC MATERIAL

Gordon O. Zablony, Escondido, and James W. Horner, Ocean-side, both of Calif., assignors to Pacific Trinetics Corporation, San Marcos, Calif.

Filed Sep. 28, 1995, Ser. No. 535,622  
Int. Cl.<sup>6</sup> B32B 31/00

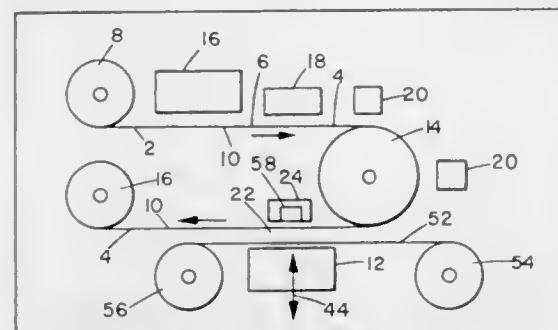
U.S. Cl. 156—512

14 Claims

1. Apparatus for forming a laminated electrical or electronic device from a continuous tape coated on one side with a ceramic material, comprising:

a vertically movable, horizontally oriented platen for accumulating a stack of substrates;

a tape positioning block located at a fixed vertical position above the platen for releasably positioning sequential indexed segments of a continuous tape in a predetermined position



aligned with and spaced above said platen with a ceramic coated side of said tape facing said platen;

cutting means cooperative with said platen for excising a patterned or unpatterned substrate from said ceramic coating of said tape;

drive means for moving said horizontal platen in a vertical direction towards and away from said tape positioning block between a first, lowered position spaced below said tape and a second, raised position in registration and contact with said tape, maintaining registration and contact of said platen with said tape while said cutting means excises said substrate, moving said platen away from said registration with said substrate transferred to said platen, and returning said platen into registration and contact with a next sequential segment of said tape;

control means for operating said positioning means, drive means, and cutting means repetitively whereby a plurality of said substrates is accumulated in a stack on said platen; and lamination means for bonding said plurality of substrates into a unitary laminated pad.

5,772,839  
FILM APPLYING APPARATUS

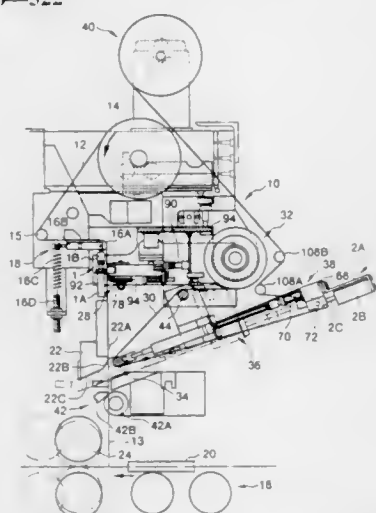
Iihiroshi Nagate, Fujinomiya, and Yoji Washizaki, Tokyo, both of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, and Somar Corporation, Tokyo, both of Japan  
Filed Jan. 25, 1996, Ser. No. 591,400

Claims priority, application Japan, Feb. 3, 1995, 7-017080; Jun. 30, 1995, 7-165198

Int. Cl.<sup>6</sup> B32B 31/00; G03C 1/805

U.S. Cl. 156—522

10 Claims



1. A film applying apparatus of the type wherein a continuous laminated film wound on a film supply roll and composed at least of a base film, a photosensitive layer and a cover film laminated one above another is guided via guide rolls to a leading end of a base plate while being conveyed by a conveying means, then tacked by a tacking member to the leading end of the base plate with the cover film peeled from the photosensitive layer, and thereafter applied to the base plate under pressure by lamination

rolls while conveyance of the base plate is further continued, characterized by comprising:

said tacking member having, at its base plate side, a leading end portion including a vertical surface extending along a path of the laminated film, a first beveled surface extending obliquely from a leading end of said vertical surface in a direction away from said path, a second beveled surface extending obliquely from a leading end of said first beveled surface in a direction away from said path, and suction holes formed in said vertical surface, said first beveled surface and said second beveled surface being for holding the laminated film by suction on these surfaces;

a half-cut device disposed upstream of said tacking member and movable in the widthwise direction of the laminated film for cutting the cover film and the photosensitive layer, with the base film left uncut;

an adhesive tape supplying device disposed adjacent to said tacking member for supplying an adhesive tape in a direction having a component in the direction of movement of the laminated film while keeping the adhesive tape in substantially confronted relation to the laminated film;

a presser roll extending in the widthwise direction of the laminated film and rollingly engageable with said first and second beveled surfaces of said leading end portion of said tacking member, said presser roll guiding therearound the adhesive tape with its adhesive side facing outward;

a presser roll actuating device rotatably supporting thereon said presser roll and operable to force said presser roll against said leading end portion of said tacking member to cause said presser roll to roll on from said first beveled surface to a leading end of said second beveled surface to thereby force the adhesive tape into adhesion with the cover film, said presser roll actuating device being also operable to move said presser roll in a direction away from a position of said leading end of said second beveled surface;

adhesive-tape pullback means for pulling the adhesive tape in a direction away from said first and second beveled surfaces in synchronism with the movement of said presser roll when said presser roll is moved in a direction away from said second beveled surface;

a film-and-tape take-up device for taking up the adhesive tape and a portion of the cover film bonded to the adhesive tape and separated from the photosensitive layer on the base film as the adhesive tape is pulled in the direction away from said first and second beveled surfaces;

wherein each of said guide rolls is composed of a tension roll urged by a spring via a pivot arm in such a direction as to pull the laminated film backward, said tension roll said spring and said pivot arm constituting a laminated film tensioning mechanism, and wherein a film tensioning device is disposed to secure engagement with said laminated film tensioning mechanism and engageable with said laminated film tensioning mechanism to force said tension roll in a direction to tension the laminated film by a predetermined distance for at least a part of a time period between initiation of movement of the tacking member in a direction away from the base plate and initiation of pressure-bonding of the laminated film by the lamination rolls after the laminated film is tacked by said tacking member to the leading end of the base plate, with the cover film separated from the laminated film; and

wherein a slackening device is disposed for slackening the adhesive tape and the cover film bonded thereto at a portion of the adhesive tape extending between said presser roll and said film-and-tape take-up device at a time subsequent to the initiation of movement of said tacking member in the direction away from the base plate, and before or simultaneously with the start of tensioning of the laminated film by said film tensioning device.

5,772,840  
TAPE APPLICATOR FOR APPLYING A TRANSFERRING  
MATERIAL TO A SHEET

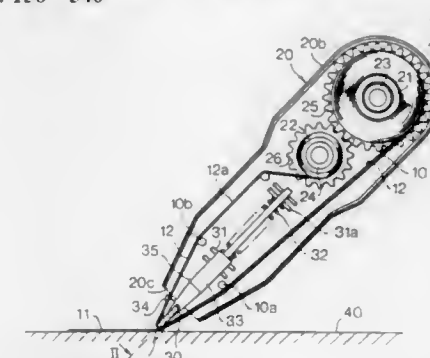
Hideyoshi Morinaga, Hirakata, Japan, assignor to Union Chemical Co., Ltd., Hirakata, Japan

Filed Dec. 26, 1995, Ser. No. 578,021

Claims priority, application Japan, Dec. 26, 1994, 6-337774  
Int. Cl.<sup>6</sup> B32B 31/00

U.S. Cl. 156—540

6 Claims



1. A tape applicator comprising:  
a casing having an opening at an end thereof;  
a supply spool rotatably mounted in the casing;  
a take-up spool rotatably mounted in the casing;  
a pressure blade member provided in the casing and arranged in a longitudinal direction of the casing;

the pressure blade member having a pressure blade portion projected from the opening, and a shaft portion rotatably supported in the casing so as to be rotated about an axis thereof so that when the casing is laterally tilted with respect to the moving direction, the pressure blade member is rotated by reaction to an applied force, causing the tip edge thereof to coincide with a surface of paper to be applied with the transfer agent layer;

resilient means for resiliently holding the pressure blade member so that a tip edge of the pressure blade portion is yieldably held in a direction perpendicular to moving direction of the tape applicator when force against a paper is applied; and  
a base tape, on the outside surface of which a transfer agent layer is provided, wound on the supply spool and on the take-up spool, and slidably attached on the tip edge of the pressure blade portion.

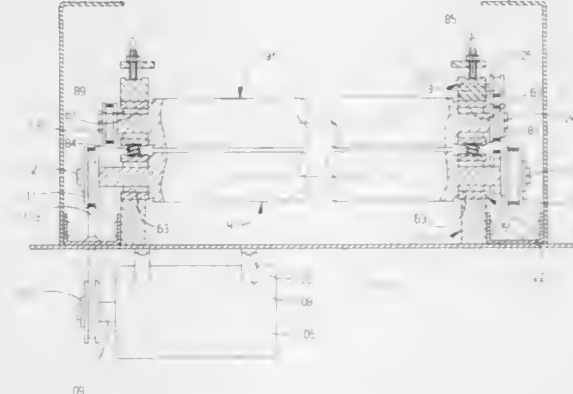
5,772,841  
IN-LINE PRESSURE SEALER

Timothy D. Lindsay, Dover, N.H., assignor to Bescorp Inc., Dover, N.H.

Filed Dec. 26, 1995, Ser. No. 578,246

Int. Cl.<sup>6</sup> B32B 31/20; B43M 5/04  
U.S. Cl. 156—555

17 Claims



1. An in-line pressure sealer comprising:  
a. a pair of infeed rollers;

- b. a pair of outfeed rollers;  
c. infeed adjustment means for adjustably setting a predetermined clearance between the infeed rollers;  
d. outfeed adjustment means for adjustably setting a predetermined clearance between the outfeed rollers;  
e. infeed biasing means for biasing the infeed rollers away from each other to the predetermined clearance thereof set by the infeed adjustment means;  
f. outfeed biasing means for biasing the outfeed rollers away from each other to the predetermined clearance thereof set by the outfeed adjustment means; and  
g. drive means for rotating the infeed and outfeed rollers.

5,772,842

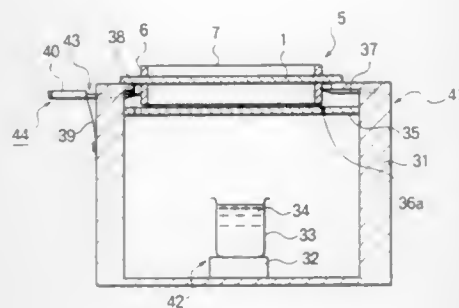
## APPARATUS FOR STRIPPING PELLICLE

Shinichiro Tanaka, Itami; Sigeru Wada, and Haruhiko Kusunose, both of Tokyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, and Ryoden Semiconductor System Engineering Corporation, Hyogo, both of Japan  
Filed Nov. 22, 1995, Ser. No. 561,065

Claims priority, application Japan, Nov. 28, 1994, 6-293017  
Int. Cl.<sup>6</sup> B32B 35/00

U.S. Cl. 156—584

5 Claims



## I. A pellicle stripping apparatus comprising:

- a supporting section for supporting a photomask, said supporting section having gripping portions for gripping at least two edges of a pellicle frame of a pellicle adhered to the photomask; and  
a steam generating section for generating high temperature steam and contacting the pellicle adhered to the photomask with the steam, said steam generating section including a container having a steam vent directly opposite a portion of the pellicle adhered to the photomask and a heater for boiling water in said container.

5,772,843

## EVAPORATOR

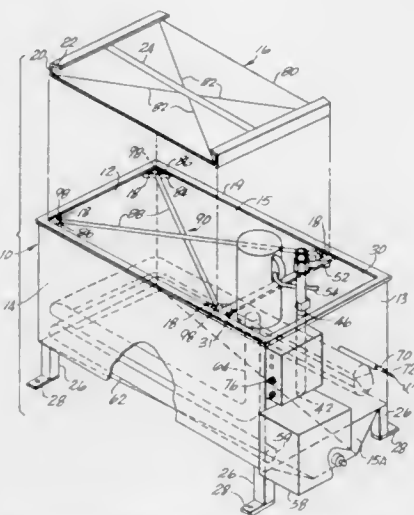
Laurence Mark Rhodes, 11825 Grande Vista Dr., Whittier, Calif. 90601

Filed Jun. 6, 1996, Ser. No. 659,639  
Int. Cl.<sup>6</sup> B01D 1/14; C10B 27/00; 29/00

U.S. Cl. 159—16.1

26 Claims

- I. Apparatus for evaporating a volatile liquid, the apparatus comprising:  
a tank having sides and a bottom for holding the liquid, the tank having an open top;  
a lid disposed on the tank to substantially cover the open top of the tank;  
upwardly extending and horizontally spaced webs on the lid;  
an elongated handle spaced above the lid and secured at each end to a respective web; and



means for heating the material in the tank to evaporate the volatile liquid.

5,772,844

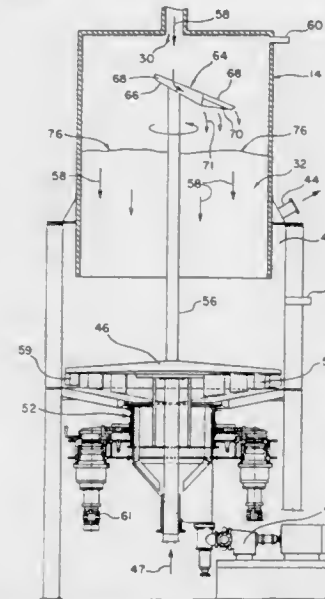
## PROCESS DISTRIBUTING FLUFFED PULP INTO A STATIC BED REACTOR FOR GASEOUS TREATMENT

Johannes Kappel, Graz, and Peter Scheucher, Kumberg, both of Austria, assignors to Andritz-Patentverwaltungs-Gesellschaft m.b.H., Graz, Austria  
Filed Oct. 27, 1995, Ser. No. 549,550

Claims priority, application Austria, Mar. 10, 1995, 420/95

U.S. Cl. 162—24

19 Claims



- I. A process for treating pulp with a gaseous reaction medium comprising the steps of:  
feeding a substantially uniform mixture of a gaseous reaction medium and a pulp to a fluffer upstream of a fluffing zone, and passing said gaseous reaction medium and pulp in admixture through said fluffing zone in said fluffer to produce a partially reacted, fluffed pulp, wherein said fluffer is positioned directly above a static bed reactor;  
discharging said partially reacted fluffed pulp downwardly from said fluffer to free fall through said gaseous reaction medium in a chute and into said static bed reactor through a pulp inlet at the top of said reactor onto a distribution means, and distributing said pulp substantially uniformly in said reactor to form a pulp bed having a substantially uniform and homogeneous upper surface and bed depth, said reactor having a rotating distribution means for distributing said fluffed pulp

substantially uniformly across the entire diameter of said reactor and upper surface of said pulp bed, wherein said distribution means is disposed in said reactor and vertically spaced below said pulp inlet of said reactor, and passing a gaseous reaction medium uniformly through said pulp bed.

5,772,845

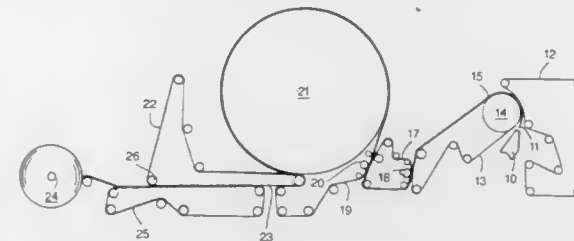
## SOFT TISSUE

Theodore Edwin Farrington, Jr.; Julia Smith Bahlman; Mark Alan Burazin; Fung-jou Chen; Kristin Ann Goerg, all of Appleton; Michael Alan Hermans; Robert John Makolin, both of Neenah, and Michael John Rekoske, Appleton, all of Wis., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Continuation of Ser. No. 82,684, Jun. 24, 1993, Pat. No. 5,607,551. This application Oct. 17, 1996, Ser. No. 733,123  
Int. Cl.<sup>6</sup> B32B 5/12

U.S. Cl. 162—109

10 Claims



- I. A soft tissue product comprising one or more throughdried tissue plies having a MD Max Slope of about 10 or less and a relatively uniform density.

5,772,846

## NONWOVEN GLASS FIBER MAT FOR FACING GYPSUM BOARD AND METHOD OF MAKING

Alan Michael Jaffee, Bowling Green, Ohio, assignor to Johns Manville International, Inc., Denver, Colo.  
Filed Jan. 9, 1997, Ser. No. 781,556  
Int. Cl.<sup>6</sup> D21H 11/00

U.S. Cl. 162—145

26 Claims

- I. A nonwoven fibrous mat comprising fibers bound together with a mixture containing a cross linked vinyl chloride acrylate copolymer having a glass transition temperature as high as about 113 degrees F.

5,772,847

## METHOD FOR FORMING PULP FROM PROCESSED RECYCLED FIBERS

Carl W. Simpson, Gig Harbor, and Raymond Lam, Tacoma, both of Wash., assignors to Stone-Consolidated (US) Corporation, Steilacoom, Wash.

Filed Oct. 24, 1995, Ser. No. 547,508  
Int. Cl.<sup>6</sup> D21F 1/66; C02F 1/52

U.S. Cl. 162—189

40 Claims

- I. A method for making a cellulosic pulp comprising cellulosic fibers from recycling mill sludge produced by another mill, the method comprising the steps of:  
providing recycling mill sludge comprising cellulosic fibers, ink, and a heavy metal;  
adding water and at least one chelating agent to the recycling mill sludge, wherein the chelating agent chelates the heavy metal in the recycling mill sludge, thereby producing an aqueous composition having a consistency that is suitable for processing in a pulper; and

processing the aqueous composition in the pulper for a period of time sufficient to form a pulp comprising the cellulosic fibers from the recycling mill sludge.

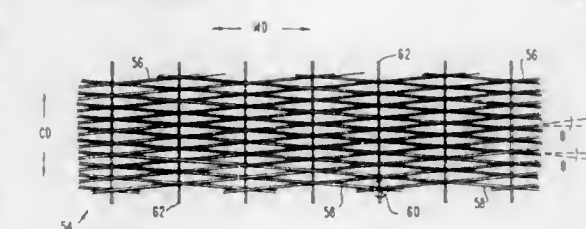
5,772,848

## BRAIDED BASE FABRICS FOR SHOE PRESS BELTS

William H. Dutt, Wynantskill, N.Y., assignor to Albany International Corp., Albany, N.Y.  
Filed Dec. 3, 1996, Ser. No. 759,040

U.S. Cl. 162—358.4

13 Claims



- I. A resin-impregnated endless impermeable press belt in a long nip shoe press or calender, or for other papermaking and paper-processing applications, said resin-impregnated endless belt comprising:  
a base fabric, said base fabric being a braided structure having a plurality of braided layers of yarns, wherein in each of said layers at least one yarn thereof extends into a contiguous layer to form an interlock therebetween, said base fabric being in the form of an endless loop with an inner surface, an outer surface, a longitudinal direction and a transverse direction; and  
a coating of a polymeric resin material on at least said inner surface of said base fabric, said coating impregnating and rendering said base fabric impermeable to liquids, said coating being smooth and providing said belt with a uniform thickness.

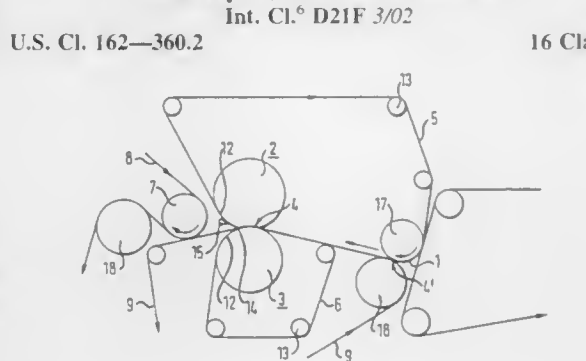
5,772,849

## PRESS

Andreas Meschenmoser, Horgenzell, Germany, assignor to Voith Sulzer Papiermaschinen GmbH, Heidenheim, Germany  
Filed May 17, 1996, Ser. No. 650,126

U.S. Cl. 162—360.2

16 Claims



- I. A press for dewatering a continuously conveyed fiber material web (1), comprising:  
two press elements (2, 3) on opposite sides of the continuously conveyed fiber material web (1) having pressing surfaces, the pressing surfaces pressed toward one another from opposite sides of the continuously conveyed fiber material web (1) to form a press gap (4) through which the continuously conveyed fiber material web is (1) passed to a press gap outlet; at least one dewatering band (5, 6), the continuously conveyed fiber material web (1) being guided together with the at least one dewatering band (5, 6) through the press gap (4) and



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thereafter being separated from the continuously conveyed fiber material web (1) in a region following the press gap outlet;

a first one (2) of the two press elements (2, 3) having a grooved or blind bored surface and a second one of the two press elements (3) having a smooth and closed surface, so that the dewatering of the continuously conveyed fiber material web (1) in the press gap (4) predominantly takes place towards the first one of the two press elements (2);

means for separating the continuously conveyed fiber material web (1) from the first one of the two press elements (2) at the press gap outlet;

means for guiding the continuously conveyed fiber material web and the at least one dewatering band (5, 6) in a section (12) following the press gap outlet over an angular range of the second press element of the two press elements (3) after separation from the first one of the two press elements;

means for providing a relaxation of the at least one dewatering band (6) leaving the press gap outlet so that at least one of the properties of thickness, elasticity, and absorbency of the at least one dewatering band (5, 6) provides a short suction zone (14) following the press gap outlet; and,

the continuously conveyed fiber material web (1) being separated from the one dewatering band (5, 6) immediately following the suction zone (14).

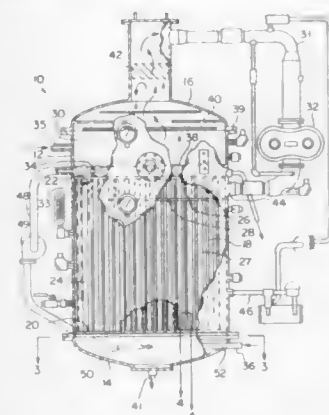
#### 5,772,850 APPARATUS FOR VAPOR COMPRESSION DISTILLATION

Bobby D. Morris, 103 Lake Forest Dr., Greer, S.C. 29651

Filed May 11, 1995, Ser. No. 439,303

Int. Cl.<sup>6</sup> B01D 1/12;3/04

U.S. Cl. 202—237



1. A vapor compression distillation apparatus comprising:

a container having a generally vertical longitudinal center axis, said container having a bottom end cap and a top end cap;

a plurality of generally vertical tubes spacedly disposed within said container;

said tubes being fixedly held in position by opposing top and bottom tube sheets defining a condensing chamber therebetween;

said condensing chamber being divided into two smaller chambers, an upper and a lower chamber, said upper and lower chambers being in communication;

an evaporation chamber within said container between said top tube sheet and said top end cap;

a vapor compressor communicating with an upper area of said evaporation chamber and with said upper chamber of said condensing chamber;

heating means communicating with said container; and

a plurality of passages for passing a liquid into or out of said container;

whereby a liquid can enter said container below said bottom tube sheet, pass upwardly into, through and above said tubes to a predetermined level where the liquid can be caused by said heating means to boil producing a vapor from some of the liquid, wherein the vapor can rise and pass through said top end cap to a vapor compressor for pressurizing the vapor,

and wherein the pressurized vapor can then pass into said upper chamber and said condensing chamber where the pressurized vapor condenses and forms a distillate which can pass through said bottom tube sheet and out of said container.

#### 5,772,851 ELIMINATION OF VOLATILE RESIDUES FROM POLYACRYLATE MELTS

Jürgen Barwich, Neustadt; Oral Aydin, Mannheim; Ulrich Erhardt, Ladenburg, and Walter Holtrup, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Germany

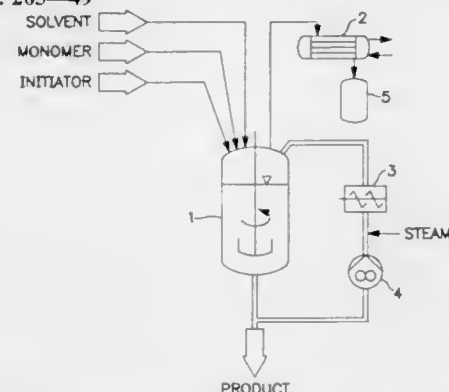
Continuation of Ser. No. 347,235, Nov. 23, 1994, abandoned.

This application Jun. 17, 1996, Ser. No. 664,802

Int. Cl.<sup>6</sup> B01D 3/10;3/34; C08F 6/26;6/28

U.S. Cl. 203—49

12 Claims



1. A process for the elimination of volatile components from polyacrylate melts prepared by polymerization, which comprises distilling the volatile components under reduced pressure;

adding an entraining agent directly into a bypass containing the melt, said entraining agent selected from the group consisting of steam, nitrogen, argon or CO<sub>2</sub> at above 100° C., said entraining agent being added while circulating the melt.

#### 5,772,852 SEPARATING HCl AND HALOCARBONS

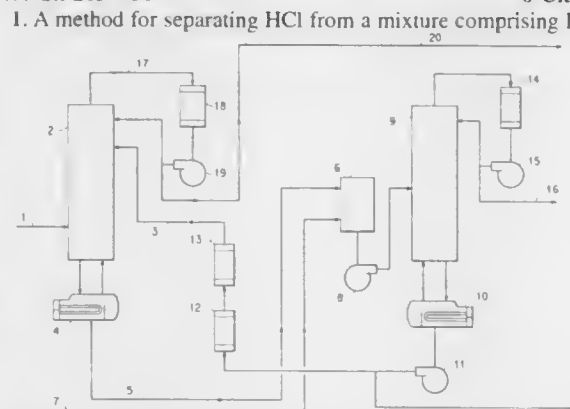
Barry Asher Mahler, Glen Mills; Vinci Martinez Felix, Kennett Square, both of Pa., and Ralph Newton Miller, Newark, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 425,265, Apr. 11, 1995, Pat. No. 5,665,266, which is a division of Ser. No. 208,256, Mar. 9, 1994, abandoned, which is a continuation-in-part of Ser. No. 55,486, Apr. 30, 1993, Pat. No. 5,421,964. This application Jul. 6, 1995, Ser. No. 499,101

Int. Cl.<sup>6</sup> B01D 3/36; C07C 17/38

U.S. Cl. 203—50

6 Claims



1. A method for separating HCl from a mixture comprising HCl and a fluorocarbon selected from the group consisting of chloropentafluoroethane, chlorotrifluoromethane, and trifluoromethane comprising:

distilling by heating said mixture to a temperature of about -50° to about +50° C. in a vessel maintained at a pressure of 75-987 psia, to form an azeotropic or near azeotropic composition consisting essentially of about 49.2-99.9 mole % HCl and about 0.1-50.8 mole % of said fluorocarbon, from said mixture, and; recovering HCl substantially free of said fluorocarbon.

#### 5,772,853 SEPARATION OF 1-PROPANOL FROM T-AMYL ALCOHOL BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. 3rd Ave., Bozeman, Mont. 59715

Filed Nov. 17, 1997, Ser. No. 971,290

Int. Cl.<sup>6</sup> B01D 3/40; C07C 29/84

U.S. Cl. 203—57

1 Claim

1. A method for recovering 1-propanol from a mixture consisting of 1-propanol and t-amyl alcohol which consists essentially of distilling a mixture consisting of 1-propanol and t-amyl alcohol in the presence of an extractive distillation agent, recovering the 1-propanol as overhead product and obtaining the t-amyl alcohol and the extractive distillation agent as bottoms product, wherein said extractive distillation agent consists essentially of one material selected from the group consisting of butyl acetate, amyl acetate, hexyl acetate, benzyl acetate, hexyl formate, isobutyl isobutyrate, isobutyl butyrate, butyl butyrate, ethyl acetoacetate, dimethyl adipate, ethyl salicylate, dibutyl phthalate, butyl propionate, pentyl propionate, isopropyl palmitate, 2-heptanone, cyclopentanone, 3-heptanone, acetophenone, 2,6-dimethyl-4-heptanone, propylene glycol propyl ether, 2-ethoxyethanol, diethylene glycol, tripropylene glycol, 5-methyl-2-hexanone, o-xylene, 2-pentanone, decalin, dipentene, p-xylene, 1,2,3,4-tetrahydronaphthalene, nonane, diethylbenzene, dodecane, beta-pinene, phenyl ether, butyl ether, 1-methoxy-2-propanol, myrcene, anisole, N,N-dimethyl aniline, morpholine, pyridine, 4-methyl morpholine, 2-nitrotoluene, 3-nitrotoluene, nitrobenzene, butyronitrile, salicylaldehyde, 1,4-dioxane, 3-ethyl phenol, tetraethyl orthosilicate, 2-nitropropane, nonyl phenol, ethylbenzene, m-xylene, p-xylene and toluene.

#### 5,772,854 USE OF PAIRED REBOILERS IN THE PURIFICATION OF PROPYLENE OXIDE BY EXTRACTIVE DISTILLATION

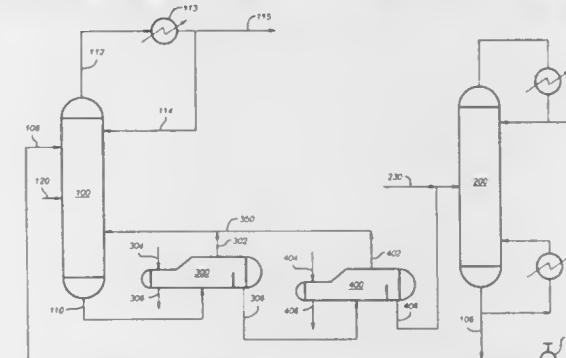
William Pleasant Nelson, Nederland, and Mark Elliott Taylor, Orange, both of Tex., assignors to Huntsman Specialty Chemicals Corporation, Austin, Tex.

Filed Aug. 17, 1995, Ser. No. 516,374

Int. Cl.<sup>6</sup> B01D 3/40; C07D 301/32

U.S. Cl. 203—64

16 Claims



1. A continuous operation of an extractive distillation column for the purification of a propylene oxide feedstock contaminated with water, methanol and acetone wherein said impure propylene oxide feedstock is continuously introduced into the lower half of said extractive distillation column under distillation conditions of predetermined temperature and pressure which comprises the steps of:

promoting the formation and maintenance of an acetone buffer

zone in the distillation column below the point of introduction of said impure propylene oxide feedstock, wherein an oxyalkylene glycol extractive distillation agent is continuously introduced into said extractive distillation column above said buffer zone, wherein a lighter distillation fraction consisting essentially anhydrous propylene oxide contaminated with trace quantities of said acetone and methanol is continuously withdrawn from said extractive distillation column above the point at which said alkylene glycol extractive distillation agent is introduced, and wherein a heavier distillation fraction containing substantially all of the oxyalkylene glycols, water, acetone and methanol introduced into said extractive distillation column is continuously withdrawn adjacent the bottom of the distillation column.

passing said heavier distillation fraction to a first reboiler and heating it therein at a temperature of about 90° to about 100° C. to partially vaporize said heavier distillation fraction to provide a first vaporized reboiler fraction rich in acetone and lean in oxyalkylene glycols,

passing the unvaporized liquid portion of said heavier distillation fraction to a second reboiler connected in series with the first reboiler and heating it therein at a temperature of about 180° to about 220° C. to further partially vaporize said unvaporized liquid portion to provide a second vaporized reboiler fraction lean in acetone and rich in oxyalkylene glycols, and

recycling said first and said second vaporized reboiler recycle fractions to said extractive distillation column at a point below said buffer zone.

15. A continuous extractive distillation process for the continuous distillation of an impure propylene oxide feedstock contaminated with water, methanol and acetone and in an extractive distillation column containing at least 25 theoretical plates, fitted with a pair of reboilers and a reflux condenser to remove oxygenated contaminants, including water, methanol and acetone from the impure propylene oxide which comprises the steps of:

continuously introducing said impure propylene oxide feedstock into the lower half of said extractive distillation column, said feedstock containing about 0.01 to about 2 wt. % of acetone, about 0.1 to about 2 wt. % of water and about 50 to 4000 ppm of methanol,

continuously introducing an extractive distillation agent comprising triethylene glycol into said extractive distillation column at a point at least 4 theoretical plates above the point of introduction of said impure propylene oxide feedstock, said triethylene glycol being introduced into said extractive distillation column in the ratio of feedstock to triethylene glycol of from about 1:1 to about 20:1,

continuously maintaining distillation conditions including a pressure of about 10 to 40 psia, a reflux ratio of from about 1:1 to about 5:1 and a reboiler temperature within the range of about 100° to about 250° C. and a top temperature of about 20° to about 80° C. correlated to provide and maintain an acetone buffer zone in said distillation column below the point of introduction of said feedstock,

continuously withdrawing a lighter distillation fraction from the reflux condenser of said extractive distillation column consisting essentially of anhydrous propylene oxide contaminated with trace quantities of said acetone and methanol,

continuously withdrawing a heavier distillation fraction from adjacent the bottom of said extractive distillation column containing substantially all of said extractive distillation agent, water, acetone and methanol introduced into said extractive distillation column,

passing said heavier distillation fraction to a first reboiler and heating it therein at a temperature of about 90° to about 100° C. to partially vaporize said heavier distillation fraction to provide a first vaporized reboiler fraction rich in acetone and lean in extractive distillation agent and a first unvaporized liquid fraction,

1. A system for evaluating reflectance, the system comprising:
  - (a) a process chamber having a deposition zone;
  - (b) at least one or more thin film deposition devices in the deposition zone;
  - (c) a plurality of carriers moveable through the process chamber, wherein the moveable carriers expose at least a portion of an object to the deposition zone, thereby coating at least a portion of the object with a coating material having one or more layers;
  - (d) a light source;
  - (e) a reflectometer that is located outside the deposition zone, and that directs an incident light beam from the light source at the surface of the object, and captures a reflected light beam, wherein the reflected light beam is the incident light beam after it is reflected off of the surface of the object;
  - (f) a light splitting apparatus for splitting the reflected beam into a plurality of constituent beams, each of the constituent beams being representative of a given wavelength;
  - (g) an array of light sensors positioned so that each of the constituent beams is aligned with one of the light sensors, wherein each of the light sensors generates current that varies with the intensity of light incident upon it;



- (h) an interface, wherein the interface converts the current from the light sensors into a code that represents the intensity of the light for each of the constituent beams; and  
(i) means for analyzing the code from the interface along with information about the composition of the coating material to determine an actual layer thickness value for each of the layers of the coating material.

5,772,862

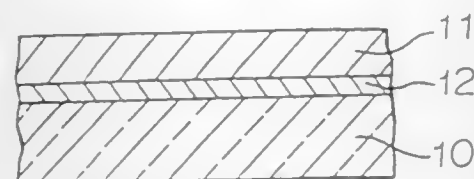
**FILM COMPRISING SILICON DIOXIDE AS THE MAIN COMPONENT AND METHOD FOR ITS PRODUCTION**  
Eiichi Ando; Akira Mitsui, both of Yokohama; Junichi Ebisawa, Tokyo; Koichi Suzuki, Yokohama; Kiyoshi Matsumoto, Tokyo, and Takuji Oyama, Yokohama, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan  
Division of Ser. No. 323,579, Oct. 17, 1994, Pat. No. 5,605,609, which is a continuation of Ser. No. 55,782, May 3, 1993, abandoned, which is a continuation of Ser. No. 671,801, Apr. 22, 1991, abandoned, which is a continuation-in-part of Ser. No. 318,330, Mar. 3, 1989, Pat. No. 5,110,637. This application Apr. 27, 1995, Ser. No. 429,845

Claims priority, application Japan, Mar. 3, 1988, 63-048765; Mar. 31, 1988, 63-076202; Jun. 14, 1988, 63-144827; Oct. 21, 1988, 63-264163; Aug. 1, 1989, 1-197993; Sep. 1, 1989, 1-224484; Jun. 21, 1990, 2-161413; WIPO, Aug. 1, 1990, PCT/JP90/00982

Int. Cl.<sup>6</sup> C23C 14/34

U.S. Cl. 204—298.13

1 Claim



1. A target for sputtering comprising Si, as the main component, and Zr, wherein the amount of zirconium is at least 4 atoms relative to 96 atoms of Si.

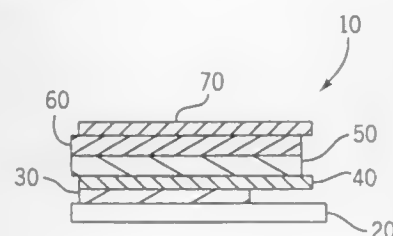
5,772,863

**ELECTROCATALYTIC CERMET SENSOR**  
Erika L. Shoemaker, and Michael C. Vogt, both of Westmont, Ill., assignors to University of Chicago, Chicago, Ill.  
Filed May 1, 1996, Ser. No. 641,979

Int. Cl.<sup>6</sup> G01N 27/407

U.S. Cl. 204—426

7 Claims



1. A gas sensor for sensing CO<sub>2</sub>, comprising:  
a substrate layer;  
a reference electrode source of oxygen anions and in electrical contact with said substrate layer, said reference electrode source of oxygen anions comprised of a nonstoichiometric compound enabling diffusion of oxygen anions therethrough;  
a lower electrical reference electrode coupled to said reference electrode source of anions;

- a solid electrolyte coupled to said lower reference electrode and consisting essentially of a tungsten-bismuth oxide to promote CO<sub>2</sub> reactions;  
a buffer layer for preventing flow of Pt ions into said solid electrolyte; and  
an upper catalytically active electrode coupled to said buffer layer.

5,772,864

**METHOD FOR MANUFACTURING IMPLANTABLE MEDICAL DEVICES**

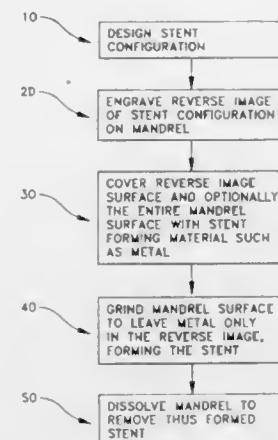
Per Møller, Lyngø, and Jørgen Kamstrup-Larsen, Allerød, both of Denmark, assignors to Meadox Medicals, Inc., Oakland, N.J.

Filed Feb. 23, 1996, Ser. No. 606,086

Int. Cl.<sup>6</sup> C25D 1/02; 1/08

U.S. Cl. 205—73

5 Claims



1. A method of forming an elongate expandable intraluminal prosthesis comprising the steps of:  
providing a dissolvable elongate mandrel having a metallic electro-deposition accommodating exterior surface portion;  
engraving a precise open-celled pattern of voids in said surface portion of said mandrel to define a reverse image of said expandable prosthesis;  
electrochemically depositing a prosthesis-forming metallic medium into said engraved open-celled voids of said dissolvable mandrel; and  
dissolving said mandrel to leave remaining said expandable prosthesis formed by said prosthesis-forming medium.

5,772,865

**ELECTROLYTIC CONVERSION SOLUTION FOR TREATING METAL SURFACE AND METHOD FOR ELECTROLYTIC CONVERSION**

Shigemi Tanaka; Akira Hashimoto; Masaru Kawai, and Yukihisa Toyoda, all of Tokyo, Japan, assignors to Dipsol Chemicals Co., Ltd., Tokyo, Japan

Filed Sep. 23, 1996, Ser. No. 717,726

Claims priority, application Japan, Oct. 4, 1995, 7-257498

Int. Cl.<sup>6</sup> C23C 22/07

U.S. Cl. 205—261

13 Claims

1. An electrolytic conversion solution for metal surface treatment comprising (A) a vanadate or a vanadium salt of an inorganic acid in an amount of 5 to 50 g/l. (B) an organic acid having a reducing ability in an amount of 0.1 to 50 g/l. and a balance of water, and having a pH of not less than 7, and being free of tellurium and selenium.

5,772,866

**COMPOSITIONS AND METHODS FOR BREAKING WATER-IN-OIL EMULSIONS**

Paul R. Hart, The Woodlands, Tex., assignor to BetzDearborn Inc., Trevose, Pa.

Division of Ser. No. 568,069, Dec. 6, 1995, Pat. No. 5,693,257.

This application Aug. 6, 1997, Ser. No. 907,326

Int. Cl.<sup>6</sup> C10G 33/04; B01D 17/04; C08L 91/00

U.S. Cl. 208—14

6 Claims

1. A composition comprising a non-alkoxylated alkylphenol-formaldehyde resin, a poly(alkylene glycol) having an alkylene group which is linear or branched and has about 2 to 4 carbon atoms, and crude oil.

5,772,867

**FLUID FILTERING MACHINE WITH FILTERING MEMBRANE CONTROLLED BY PLC**

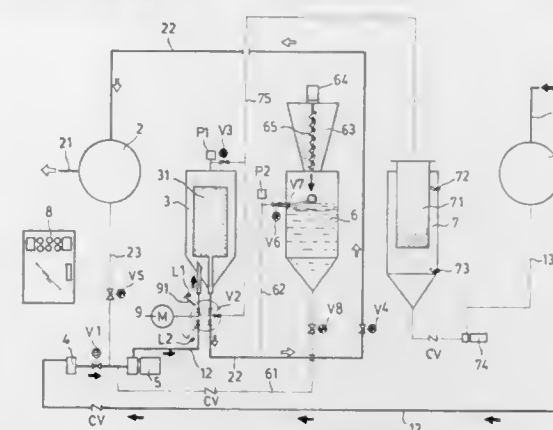
Hsu-Hsin Chiang, No. 141 San Min Road, Sec. 3, Taichung City, Taiwan, and Jusuf-Utomo Du, Kedoya Angsana Ruko Tomang, Tol Blok II No. 42, Taman Kedoya Baru Jakarta 11520, Indonesia

Filed Mar. 12, 1997, Ser. No. 815,610

Int. Cl.<sup>6</sup> B01D 17/12; 37/02

U.S. Cl. 210—90

1 Claim



1. A fluid filtering machine with a filtering membrane controlled by a programmable logic controller comprising:

- a raw water tank for containing un-filtered raw water, said raw water tank being connected with an inlet pipe for water supplying, an outlet pipe for supplying the raw water to a filtering tank and a returning inlet pipe;  
a purified water tank for containing filtered water, said purified water tank connected with a purified water outlet pipe, a purified water inlet pipe and a retro-cleaning auxiliary inlet pipe which is connected with said outlet pipe of said raw water tank;  
a filtering tank containing a filtering core having said membrane;  
a primary debris strainer disposed along said outlet pipe of said raw water tank, wherein debris with relatively larger size can be filtered by said primary strainer;  
a working pump coupled to said outlet pipe of said raw water tank and downstream of said strainer for delivering the raw water within said raw water tank to said filtering tank;  
a filtering substance supplying tank, said filtering substance supplying tank being connected with a first circulating circuit to said outlet pipe of said raw water tank and from a position adjacent to the top of said filtering substance supplying tank and a second circulating circuit connected to said purified water inlet pipe of said purified water tank;  
a concentrated debris tank provided with a recycling cylinder, upper and lower level controllers being also provided, the top of said concentrated debris tank being connected with a recycling circuit and the bottom of said concentrated debris tank being connected with a working pump for delivering fluid from said concentrated debris tank back to said returning inlet pipe of said raw water tank; and

- a programmable logic controller which is used to control and actuate flow through the machine;  
characterized in that

- said outlet pipe of said filtering tank, said outlet pipe of said purified water tank and said recycling circuit all being connected with a five-port-two-way valve, wherein the five-port-two-way-valve is connected with an actuating rod to be actuated by a motor, wherein a pair of microswitches are disposed adjacent to said actuating rod and wherein said filtering tank is connected to a pressure switch and a solenoid for air releasing;

- said filtering substance supplying tank being connected with a hopper, wherein by means of a screw conveyor actuated by a motor, filtering substance within the hopper can be supplied to the supplying tank, and wherein in a connection between said filtering substance supplying tank and a second circulating circuit, a solenoid and a float ball water flow controlling valve are provided, said second circulating circuit being also provided with a pressure switch, said first circulating circuit being provided with a solenoid;

- in a position downstream of said primary debris strainer and upstream of said retro-cleaning auxiliary inlet pipe, a solenoid is provided, said retro-cleaning auxiliary inlet pipe being also provided with a solenoid, said purified water inlet pipe being also provided with a solenoid;

- each of the solenoids being controlled by said programmable logic controller;  
wherein through input from the pressure switches, each of said solenoids and said actuating rod actuated by the corresponding motor can be accurately and precisely controlled by said programmable logic controller according to a predetermined procedure, consequently, operations of filtering, retro-cleaning, formation of the filtering membrane and supplying of said filtering substance can each be properly set at a preset time and for a preset duration, the filtering substance can be homogeneously deployed and an accurate physical filtering effect can be therefore attained.

5,772,868

**HYDRAULIC FILTER CIRCUIT WITH PRESSURE MAINTAINING VALVES, BYPASS AND VENT**

Hans Reinhardt, Bretten, Germany, assignor to ARGO GmbH für Fluidtechnik, Germany

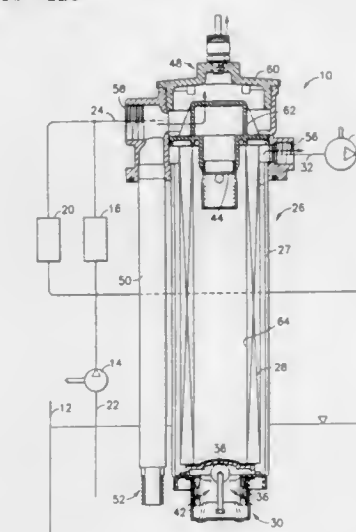
Filed Nov. 26, 1996, Ser. No. 755,831

Claims priority, application Germany, Mar. 29, 1995, 195 11 482.5

Int. Cl.<sup>6</sup> B01D 35/01; 35/143; 35/157

U.S. Cl. 210—120

18 Claims



1. A hydraulic circuit, comprising:  
a supply of hydraulic fluid made available to a hydraulic consuming device via a pumps





means for loading said surfaces with at least one solute that is reactive with said surfaces, by flowing a liquid mixture containing said solute through said body at a velocity sufficient to induce flow of said mixture within at least a substantial portion of said interstitial volume at a reduced velocity greater than about 5,000.

5,772,875

## CHROMATOGRAPHY COLUMN

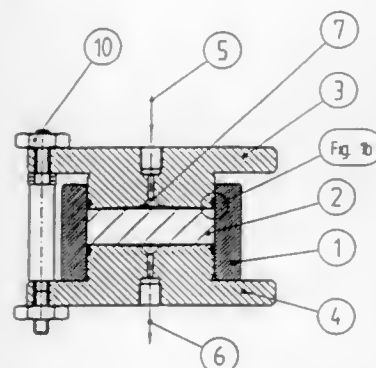
Conny Pettersson, Håsselby; Ingrid Porrvik, Upsala, and Eva Eriksson, Stockholm, all of Sweden, assignors to Amersham Pharmacia Biotech AB, Upsala, Sweden  
PCT No. PCT/SE95/00632, § 371 Date Mar. 4, 1997, § 102(e)  
Date Mar. 4, 1997, PCT Pub. No. WO95/34359, PCT Pub. Date Dec. 21, 1995

PCT Filed Jun. 2, 1995, Ser. No. 750,329

Claims priority, application Sweden, Jun. 14, 1994, 9402091

Int. Cl.<sup>6</sup> B01D 15/08

U.S. Cl. 210—198.2



1. A liquid chromatography column, comprising a column tube including a chromatographic matrix, the matrix being monolithic and porous, liquid flow inlet means and liquid flow outlet means, a distributor located adjacent the inlet for distributing incoming liquid, and, when eluant passes through the matrix, a liquid accommodating gap which is devoid of matrix material, wherein the liquid accommodating gap is between the matrix and the distributor and is directly adjacent the matrix, the gap being effective to improve a theoretical plate number, an elution volume or a symmetry factor of the liquid chromatography column.

5,772,876

## SEPARATING AGENT

Tatsushi Murakami, Hyogo, Japan, assignor to Daicel Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 583,062, Jan. 3, 1996, abandoned.

This application Sep. 22, 1997, Ser. No. 933,920

Claims priority, application Japan, Jul. 7, 1994, 6-155596

Int. Cl.<sup>6</sup> B01D 15/08

U.S. Cl. 210—198.2

9 Claims

1. A separating agent comprising an optically active polysaccharide derivative having a molecular weight distribution Mw/Mn of from 1 to 2.21, wherein Mw represents the weight-average molecular weight based on polystyrene and Mn represents the number-average molecular weight based on polystyrene.

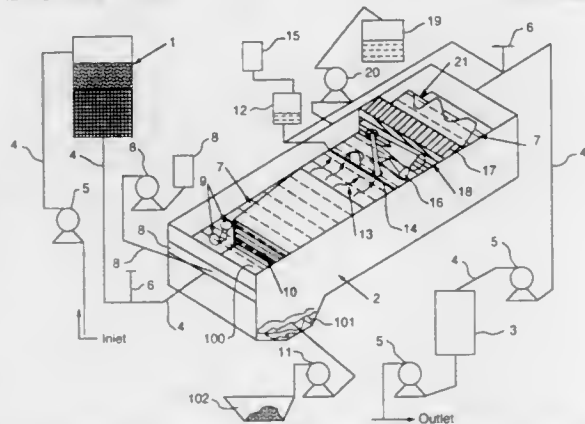
5,772,877  
APPARATUS FOR MAGNETO-FLUIDIC WATER/OIL SEPARATION

Simon Dvorchik, 2123 Shady Ave., #B6, Pittsburgh, Pa. 15217, and Igor Dvorchik, 215 Sunset Dr., Pittsburgh, Pa. 15146  
Filed Feb. 2, 1996, Ser. No. 596,416

Int. Cl.<sup>6</sup> B01D 35/06; C02F 1/28

U.S. Cl. 210—223

22 Claims



10 Claims

1. A skimmer system for separating oil and an aqueous solution from a mixture thereof, comprising a system for imparting magnetic properties to the oil, by delivering a magnetic component to the oil to be mixed therewith, and a first magnetic trap including at least a pair of spaced-apart magnetically permeable plates having a gap therebetween and capable of imparting a gradient magnetic field at said gap, said gap being positioned slightly above the surface of said oil and aqueous solution mixture, said gradient magnetic field having a directional component which draws said oil imparted with magnetic properties through said gap and into said trap, thereby extracting the oil imparted with magnetic properties from the surface of said aqueous solution, said trap including an oil collection sump located below said gap.

5,772,878

## LIQUID FILTRATION DEVICE

Alexander V. Eichelsheim, Oldenzaal, and Pieter Engeland, Veenendaal, both of Netherlands, assignors to Faïrey Arlon B.V., Arnhem, Netherlands

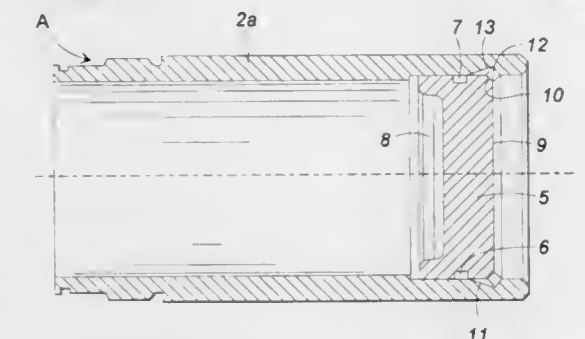
Filed Apr. 3, 1996, Ser. No. 627,882

Claims priority, application Netherlands, Apr. 3, 1995, 1000020

Int. Cl.<sup>6</sup> B01D 27/08; 35/30; 35/31

U.S. Cl. 210—232

7 Claims



1. A liquid filtration device, comprising a substantially cylindrical housing one end of which is closed and the other end of which is connected to a head provided with an inlet and an outlet, a filtration element capable of being provided within said housing, wherein the housing is formed by a tube section of the desired diameter and cut at a desired length, said tube section being closed, at its end opposite from the head of the filtration device, by a bottom piece inserted therein with a sliding fit, the outer circumferential face of said bottom piece being sealed from the corresponding part of the inner circumferential wall of the tube section by means of at least one o-ring engaged in a corresponding groove

in said bottom piece, wherein the circumferential edge at the end face of said bottom piece opposite from the head of the filtration device has an approximately 45° bevel, and wherein the bottom piece end opposite from the head of the filtration device bears on a snap ring provided within an inner circumferential groove of the tube section.

5,772,879

## SELF-CLEANING FLUID STRAINER

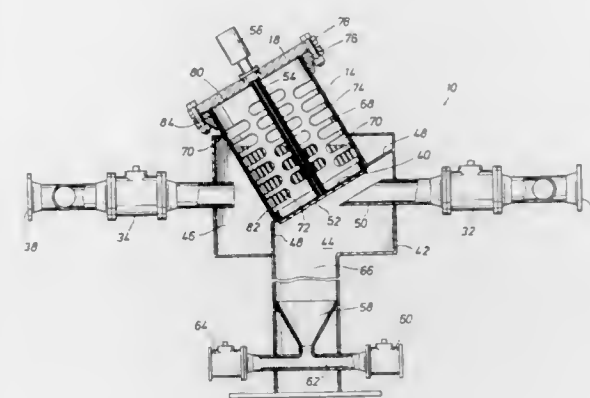
Allan Jaikaran, 68 Sea View Drive, Gulf View, San Fernando, Trinidad/Tobago

Filed Dec. 11, 1995, Ser. No. 570,290

Int. Cl.<sup>6</sup> B01D 63/00

U.S. Cl. 210—321.69

11 Claims



1. An influent liquid purifying strainer comprising:  
a. a filtration chamber comprising an inlet plenum and an outlet plenum, the inlet and outlet plenums separated by a divider plate;  
b. a porous membrane between the inlet and outlet plenums, the divider plate and the membrane together forming a boundary between the inlet and outlet plenums;  
c. a fluid outlet from the outlet plenum;  
d. a fluid inlet to the inlet plenum, the fluid inlet directing influent against the porous membrane at an angle other than perpendicular, the angle sufficient to provide a scrubbing action of the influent against the porous membrane; and  
e. a filtrate settlement sump in fluid communication with the inlet plenum, wherein the filtrate settlement sump is located below the inlet plenum.

5,772,880

## CONTAINER WITH A TANGENTIAL PORT

Daniel R. Lynn, Spring Grove, Ill.; Billy W. Minshall, Mill Creek, Wash.; Allen R. Wons, and David P. Fisher, both of Antioch, Ill., assignors to Baxter International, Inc., Deerfield, Ill.

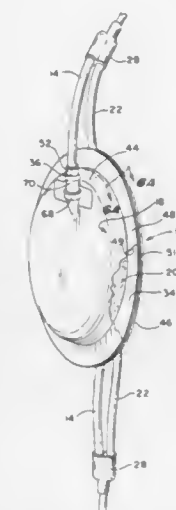
Division of Ser. No. 178,383, Dec. 22, 1993, Pat. No. 5,591,337, which is a continuation-in-part of Ser. No. 121,344, Sep. 14, 1993, abandoned. This application Aug. 20, 1996, Ser. No. 700,239

Int. Cl.<sup>6</sup> B01D 27/08

U.S. Cl. 210—435

4 Claims

1. A container comprising first and second walls each formed of a thermoplastic sheet having a peripheral edge a peripheral seal joining the peripheral edges together to form an interior chamber enclosed by the first and second walls, and a port communicating with the interior chamber spaced from and not extending through the peripheral seal, the port comprising a hollow thermoplastic tube extending through a slit in one of the first and second sheets



and being oriented tangentially to the one sheet, the slit being fused by heat about the tube forming a heat fused junction.

5,772,881

## NON-METALLIC SPIN-ON FILTER

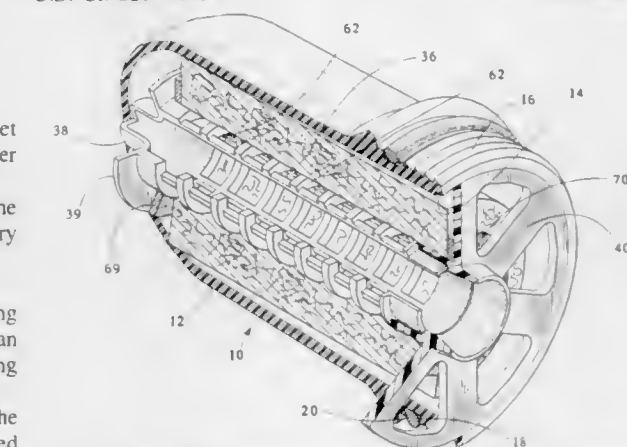
John W. Stockhove, Carmi, and Larry Dean Michels, Olney, both of Ill., assignors to Champion Laboratories, Inc., Albion, Ill.

Filed Nov. 8, 1996, Ser. No. 746,430

Int. Cl.<sup>6</sup> B01D 27/08

U.S. Cl. 210—440

14 Claims



1. A non-metallic replaceable filter for automotive use having a generally cup-shaped shell having an open end defining an interior opening and a closed end, a backplate adapted to close the open end of the shell, said backplate including a planar member having a perimeter corresponding to the configuration of the interior opening of said open end of the shell and having additional passages therethrough and a central cylindrical portion extending inwardly therefrom, said cylindrical portion defining a flow passage, and annular filter media in the shell, said filter media having a first end adjacent said back plate and a second end adjacent the closed end of said shell, said filter media having an opening therethrough defining an interior surface of said filter media, a core disposed in the opening through the filter media and cooperating with the backplate and the shell to position and hold the filter media in the shell, said core having a first end slidably received within the flow passage of the central cylindrical portion of said backplate, said core having a second end adjacent the closed end of said shell, said core having a plurality of longitudinally spaced, laterally extending annular rings on a perimeter of said core between the first and second ends of said core for supporting the interior surface of said filter media, and a plurality of holes longitudinally spaced in the core opening between the annular rings, and wherein the second end of said core includes spring means engaging the closed end of the shell for biasing the core and

the filter media toward the backplate to help seal undesirable flow between the first end of the filter media and the backplate and the second end of the filter media and the flange of said core, wherein said core including said annular rings and said spring means constitute a single unitary structure formed of a single plastic material, whereby fluid to be filtered will flow through the passages in the backplate, between the shell and the filter media, through the filter media and pass through the holes in the core into the core along the length thereof.

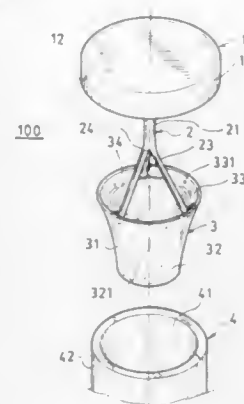
5,772,882

**ANTI-CLOGGING DEVICE FOR DRAIN PIPE IN BUILDING CONSTRUCTION**

Yi-Chun Chang, P. O. Box 55-846, Taipei, Taiwan  
Filed May 20, 1997, Ser. No. 859,121  
Int. Cl.<sup>6</sup> B01D 35/02

U.S. Cl. 210—460

5 Claims



1. An anti-clogging device for drain pipe in building construction comprising:

a cap member adapted for covering a top end portion of a drain pipe fixed in a building concrete floor, said cap member including: a cylindrical flange circumferentially disposed around the cap member having an inside diameter of said flange generally equal to an outside diameter of the drain pipe; and

said cylindrical flange of said cap member slightly tapered downwardly to be adjustably fixed on the drain pipe;

a hanging connector protruding downwardly from said cap member, said hanging connector including: a link having an upper link portion secured to the cap member, and a plurality of hanging members branched from a lower portion of the link for connecting a bucket, having a staple portion formed between the link and the hanging members; and said bucket insertable into an inside diameter of the drain pipe, whereby upon breaking and removal of the cap member from said hanging connector, said bucket will be gravitationally rested in the drain pipe to collect waste materials filled into the drain pipe and will be removed from the drain pipe to prevent clogging of the drain pipe during the building construction.

5,772,883

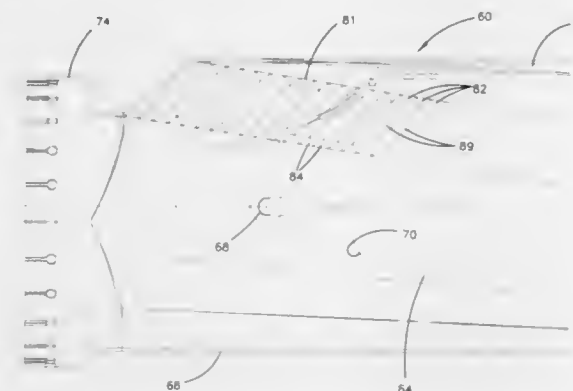
**SLANTED INLINE FILTER**

Jim C. Rothman, Burnsville; Gary R. Gillingham, Prior Lake; Wayne M. Wagner; Joseph C. Tokar, both of Apple Valley; Daniel T. Risch, Burnsville; Fred H. Wahlquist, Bloomington, and Bernard A. Matthys, Apple Valley, all of Minn., assignors to Donaldson Company, Inc., Minneapolis, Minn.  
Filed Apr. 26, 1996, Ser. No. 638,453  
Int. Cl.<sup>6</sup> B01D 25/02

U.S. Cl. 210—487

30 Claims

1. A filter device having a duct with flow passing along a direction from upstream to downstream, the filter device comprising a plurality of planar filter media layers arranged in a stack



within the duct, wherein each of the layers includes a plurality of substantially parallel flutes and flutes of adjacent layers have substantially parallel flutes; wherein the stack of filter media layers is inclined at an oblique angle relative to the direction of the flow.

5,772,884

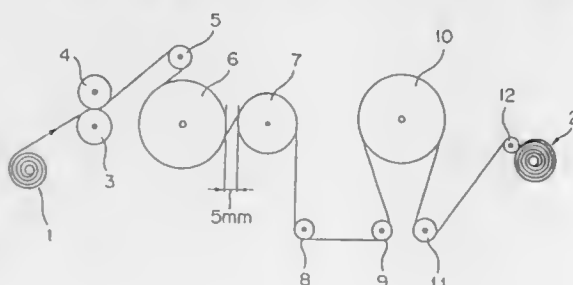
**POROUS POLYTETRAFLUOROETHYLENE FILM AND PROCESS FOR PREPARATION THEREOF**

Osamu Tanaka; Toshio Kusumi; Jun Asano; Katsutoshi Yamamoto; Osamu Inoue; Shinichi Chaen; Nobuki Uraoka, and Shinji Tamaru, all of Settsu, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan  
PCT No. PCT/JP94/00080, § 371 Date Nov. 22, 1994, § 102(e) Date Nov. 22, 1994, PCT Pub. No. WO94/16802, PCT Pub. Date Aug. 4, 1994

PCT Filed Jan. 21, 1994, Ser. No. 302,913  
Claims priority, application Japan, Jan. 25, 1993, 5-009797  
Int. Cl.<sup>6</sup> B01D 39/00

U.S. Cl. 210—500,36

9 Claims



1. A porous polytetrafluoroethylene film which is prepared by stretching biaxially an unsintered PTFE has an average pore size of from 0.2 to 0.4  $\mu\text{m}$  and exhibits a pressure drop of from 20 to 50  $\text{mmH}_2\text{O}$  when air is passed through the film at a flow rate of 5.3  $\text{cm}^3/\text{sec}$ .

5,772,885

**SLUDGE REMOVAL SUCTION HEADER**

Sami Sarrouh, 19323 Davinwood Dr., Cleveland, Ohio 44135  
Filed Mar. 31, 1997, Ser. No. 832,606  
Int. Cl.<sup>6</sup> B01D 21/04

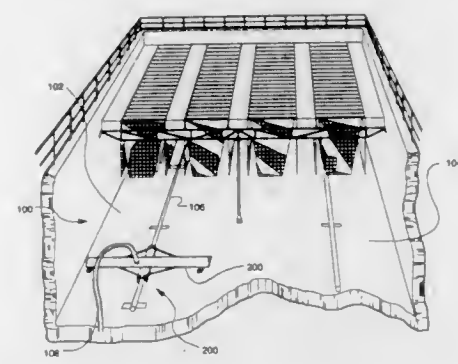
U.S. Cl. 210—523

9 Claims

1. A sludge removal suction header system for use with a water/wastewater treatment sludge removal system, said sludge removal suction header system comprising:

an obtuse angled shaped header, said header having an outer wall and forming a large cross section width dimension; internal annular passages for equalizing the pressure distribution inside said header;

a plurality of suction orifices penetrating said outer wall;



flow splitters located on and protruding slightly from a lower surface of said header; and  
an air removal system for exhausting air from said header.

5,772,886

**AQUACULTURE PROCESS**

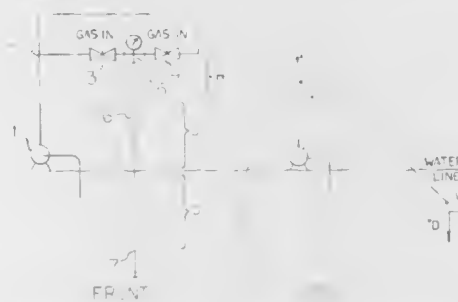
Griscom Bettle, 1660 Stone Ridge Ter., Sarasota, Fla. 34232

Filed Jul. 22, 1996, Ser. No. 681,155

Int. Cl.<sup>6</sup> C02F 3/02

U.S. Cl. 210—605

11 Claims



1. An aquaculture process for dissolving gas in liquid by impinging two or more streams of opposing flow substantially and directly one to the other wherein the two streams enter an impingement zone from conveying means of substantially equal shape with a velocity of about 4 ft/sec, wherein at least one of the streams is a gas/liquid mixture and at least one of the streams passes through a venturi prior to impingement, the impingement of the two streams taking place above a water line of an environment being discharged into so as to offset the pressure of the fluid discharging from the process, the impingement of the two streams further taking place in a contained environment such that the fluid dynamics of each stream just prior to and after the point of impingement is substantially turbulent, whereby after impingement, the streams are discharged at velocities that have substantially turbulent fluid dynamics with the discharge from the impingement zone not changing direction before discharge to the surrounding environment, the gas/liquid being partially recirculated back to the impingement zone with a recirculation ratio that is sufficiently large so as to maintain the gas concentration in the liquid substantially constant.

5,772,887

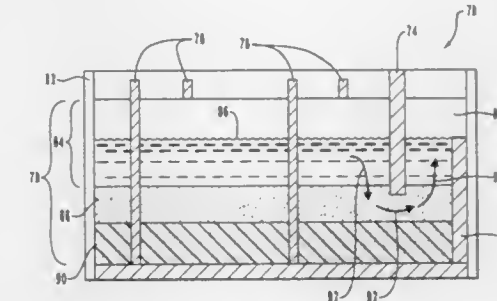
**MODULAR BIOREACTOR FOR THE REMEDIATION OF LIQUID STREAMS AND METHODS FOR USING THE SAME**

Karl S. Noah; Raymond L. Sayer, and David N. Thompson, all of Idaho Falls, Id., assignors to Lockheed Martin Idaho Technologies Company, Idaho Falls, Id.  
Filed Mar. 28, 1997, Ser. No. 827,244  
Int. Cl.<sup>6</sup> C02F 3/06

U.S. Cl. 210—617

20 Claims

1. A system for removing contaminants from a liquid stream, said system comprising:



a bioreactor module having an inner portion and an outer portion, the bioreactor module comprising:  
a reactor fill in the inner portion of the bioreactor module for removing contaminants from the liquid stream;  
means for directing the stream in a horizontal direction, the means being in the inner portion of the bioreactor module;  
means for directing the stream in a vertical direction, the vertical directing means being in the inner portion of the bioreactor module; and  
means for connecting the bioreactor module to another bioreactor module.

16. A method for removing contaminants from a liquid stream, said method comprising the steps of:

providing a modular bioreactor system for removing contaminants from a stream, the bioreactor system comprising at least one bioreactor module unit having an inner portion and an outer portion, the bioreactor module comprising:  
a reactor fill in the bioreactor module, the reactor fill having a bioreactor material for removing contaminants from the liquid stream;

means for directing a stream in a horizontal direction, the means being in the inner portion of said reactor module;  
means for directing a stream in a vertical direction, the means being in the inner portion of said reactor module; and  
means for connecting the reactor module to another reactor module; and

passing a contaminated liquid stream through the bioreactor module system so that the contaminated stream is contacted with the reactor fill to remove contaminants from the stream.

5,772,888

**SEPARATION AND/OR CONCENTRATION OF AN ANALYTE FROM A MIXTURE USING A TWO-PHASE AQUEOUS MICELLAR SYSTEM**

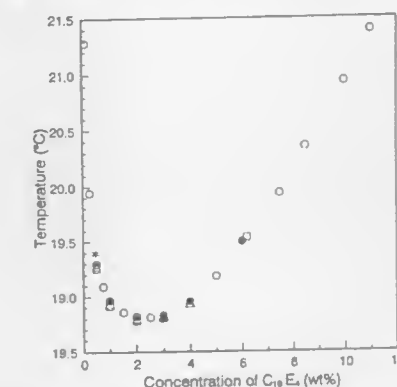
Chia-Li Liu, and Daniel Blankshtein, both of Brookline, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jul. 18, 1996, Ser. No. 683,233

Int. Cl.<sup>6</sup> B01D 11/04

U.S. Cl. 210—634

65 Claims



1. A method for size separating a mixture of reagents including an analyte and at least one contaminant of different size, comprising:



- (a) providing at least one surfactant, the surfactant being capable under selected conditions of forming a two-phase aqueous micellar system having a micelle-rich phase and a micelle-poor phase
- (b) forming the two-phase aqueous micellar system containing surfactant as specified in (a) in the presence of the mixture of reagents; and
- (c) forming conditions for driving the majority of the larger reagent in the mixture into the aqueous domain of the micelle-poor phase and the majority of the smaller reagents in the mixture into the aqueous domain of the micelle-rich phase.

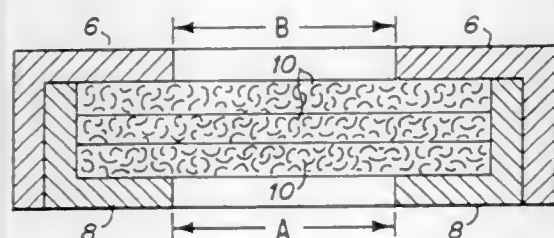
5,772,889  
SYSTEM AND METHOD FOR PERFORMING NUCLEIC ACID SEPARATIONS USING LIQUID CHROMATOGRAPHY

Douglas T. Gjerde, Saratoga; Robert M. Haelele, Palo Alto, and David W. Togami, San Jose, all of Calif., assignors to Transgenomic, Inc., San Jose, Calif.

Filed Nov. 13, 1996, Ser. No. 748,376  
Int. Cl.<sup>6</sup> B01D 15/08

U.S. Cl. 210—635

15 Claims



1. A method for improving separation of nucleic acid fragments into fractions based on their molecular weight during passage through a liquid chromatographic column containing a resin bed comprising IPRPC DNA separation particles, wherein the method comprises supplying and feeding solutions entering the column with components having process solution-contacting surfaces which contact process solutions held therein or flowing there-through, wherein said process solution-contacting surfaces are material which does not release multivalent cations into aqueous solutions held therein or flowing there-through, whereby the column is protected from multivalent cation contamination of the contents thereof, and wherein the nucleic acid fragments are separated by ion pairing reverse phase chromatography.

5,772,890  
CMA PRODUCTION UTILIZING ORGANIC ION EXCHANGE FROM FERMENTATION BROTH

Gale L. Hubred, Richmond, Calif., assignor to General Atomic International Services Corporation, San Diego, Calif.

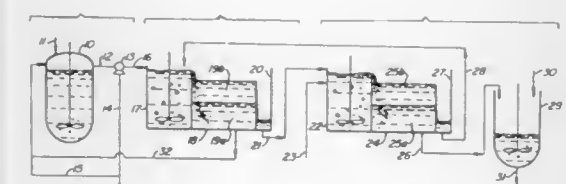
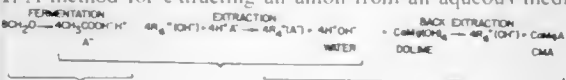
Continuation-in-part of Ser. No. 681,143, Apr. 5, 1991, Pat. No. 5,162,214. This application Aug. 17, 1992, Ser. No. 931,214

Int. Cl.<sup>6</sup> B01D 11/04

U.S. Cl. 210—638

11 Claims

1. A method for extracting an anion from an aqueous medium



- comprising the steps of
- (a) contacting an aqueous anion containing liquid with a water-immiscible extraction liquid comprising a quaternary ammonium compound which exchanges a hydroxide ion with said anion to thereby extract said anion from said aqueous liquid into said extraction liquid;
- (b) separating said extraction liquid containing said anion from said aqueous liquid;
- (c) contacting said extraction liquid containing said anion with a second aqueous phase comprising reactants which react with said anion to form a water-soluble product dissolved in said second aqueous phase;
- (d) separating said second aqueous phase containing said dissolved product from said extraction liquid.

5,772,891  
WATER TREATING METHOD FOR TREATING WASTE WATER BY USING ION EXCHANGE RESIN

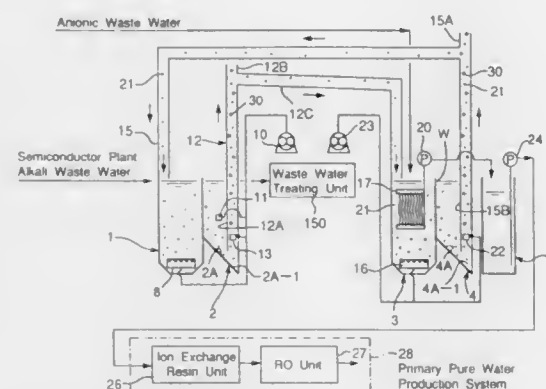
Kazuyuki Yamasaki, Hiroshima; Yoshihiro Hamaguchi, Kurashiki, and Shigeki Matsumoto, Fukuyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 659,285, Jun. 6, 1996, Pat. No. 5,707,514. This application Aug. 18, 1997, Ser. No. 912,719

Claims priority, application Japan, Aug. 16, 1995, 7-208737  
Int. Cl.<sup>6</sup> C02F 1/42; B01D 24/28

U.S. Cl. 210—669

2 Claims



1. A water treating method comprising the steps of:
- introducing alkali water or acid water into a first water tank;
- introducing anionic water or cationic water into an ion exchange tank for subjecting the anionic water or cationic water to an ion exchange treatment with anion exchange resin or cation exchange resin to thereby obtain treated water;
- introducing the anion exchange resin or cation exchange resin in the ion exchange tank into the first water tank to regenerate the anion exchange resin or cation exchange resin with the alkali water or acid water; and
- returning the anion exchange resin or cation exchange resin regenerated in the first water tank to the ion exchange tank; said anion exchange resin or cation exchange resin being circulated between the ion exchange tank and the first water tank.

5,772,892

Patent Not Issued For This Number

5,772,893  
ETHER DIPHOSPHONATE SCALE INHIBITORS

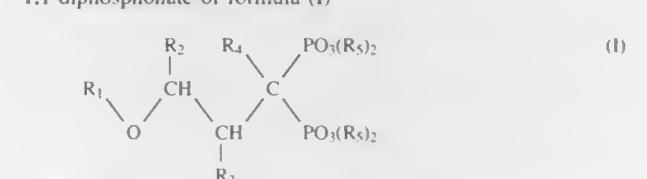
Peter E. Reed, Plainfield; Michael A. Kamrath, Aurora; Phillip W. Carter, Naperville, and Ronald V. Davis, Geneva, all of Ill., assignors to NALCO Chemical Company, Naperville, Ill.

Filed Aug. 13, 1996, Ser. No. 696,450

Int. Cl.<sup>6</sup> C02F 5/14

U.S. Cl. 210—699

28 Claims



wherein  $R_4$  is selected from the group consisting of hydrogen and  $C_1$ - $C_3$  alkyl groups;  $R_2$  and  $R_3$  are selected from the group consisting of hydrogen and methyl;  $R_5$  is selected from the group consisting of hydrogen, metal cations and ammonium cations; and  $R_1$  is selected from the group consisting of  $C_1$ - $C_{10}$  alkyl groups and  $C_1$ - $C_{10}$  ethers.

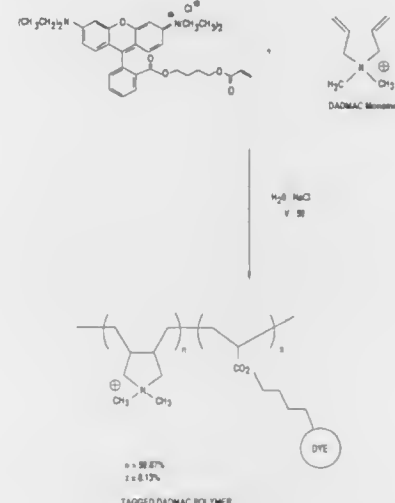
5,772,894  
DERIVATIZED RHODAMINE DYE AND ITS COPOLYMERS

William J. Ward, Glen Ellyn; Jeffrey R. Cramm, Winfield; Peter E. Reed, Plainfield, and Brian S. Johnson, Naperville, all of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Filed Jul. 17, 1996, Ser. No. 682,497

Int. Cl.<sup>6</sup> B01D 21/01; C02F 1/56; C08F 224/00; 226/02  
U.S. Cl. 210—734

5 Claims



1. A method of treating industrial waters with fluorescent copolymers to control and monitor the dosage and presence of said copolymers, which comprises the steps of:
- a) adding a fluorescent copolymer to said industrial water, wherein said fluorescent copolymer is formed from the free radical polymerization of diallyldimethyl ammonium chloride with the Rhodamine B ester of a hydroxy  $C_2$ - $C_6$  lower alkyl acrylate; and
- b) monitoring said fluorescent copolymer in said industrial water by fluorescence detection.

5,772,895  
SYSTEM FOR CONTROLLING THE COMPOSITION OF COLOR COUPLER ON A REAL-TIME BASIS

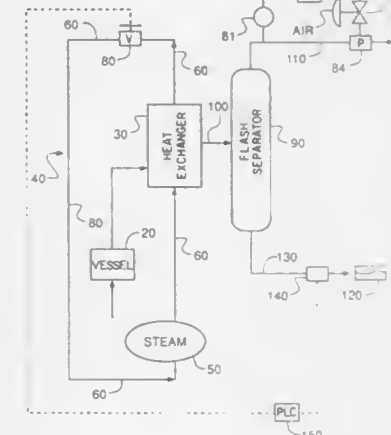
James Michael Sanchez, Fairport; Kevin F. Prinzing, Penfield, and Eric M. Gilbert, Walworth, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 15, 1996, Ser. No. 602,168

Int. Cl.<sup>6</sup> B01D 17/12; 1/00

U.S. Cl. 210—739

2 Claims



1. A system for controlling the composition of color coupler on a real time basis, the system comprising:
- (a) means for mixing color coupler with a non-permanent solvent for forming a preliminary solution;
- (b) a heat exchanger which receives the preliminary solution for altering the temperature of the preliminary solution;
- (c) a separator for separating the preliminary solution into a color coupler solution suitable for use in producing photographic film and into a residual vapor;
- (d) an in-line viscometer which receives the color coupler solution from said separator for determining the viscosity of the color coupler solution;
- (e) means for altering the temperature of said heat exchanger in response to a signal received from said viscometer for optimizing the composition of the color coupler solution, wherein said altering means further comprises a programmable logic controller for receiving the signal from said viscometer, and for comparing the received signal with a predetermined set-point for determining the temperature alteration of said heat exchanger; and
- (f) a water heat exchanger having a circulation loop with said heat exchanger for enabling temperature variations of said heat exchanger.

5,772,896  
SELF-REGULATING WATER PURIFICATION COMPOSITION

Raymond P. Denkwicz, Jr., Warwick; John D. Rafter, Providence, and Mark A. Bollinger, Warwick, all of R.I., assignors to Fountainhead Technologies, Smithfield, R.I.

Filed Apr. 5, 1996, Ser. No. 628,405

Int. Cl.<sup>6</sup> C02F 1/50

U.S. Cl. 210—754

25 Claims

1. A method of purifying water by removing metal ions and killing bacteria comprising exposing the water to a silver-containing material, said silver-containing material maintaining a silver ion concentration in said water of between 0.01 and 0.1 ppm, wherein said silver-containing material comprises silver metal and zinc metal in an effective amount to maintain said silver ion concentration in said water.

**5,772,897**  
**CONTINUOUS OXIDATION PROCESS USING A HYPOCHLORITE SOLUTION**

Frederick Ernest Hancock, Stockton, United Kingdom, assignor to Imperial Chemical Industries PLC, United Kingdom

PCT No. PCT/GB95/00522, § 371 Date Dec. 23, 1996, § 102(e) Date Dec. 23, 1996, PCT Pub. No. WO95/26318, PCT Pub. Date Oct. 5, 1995

PCT Filed Mar. 10, 1995, Ser. No. 716,271

Claims priority, application United Kingdom, Mar. 28, 1994, 9406117

Int. Cl.<sup>6</sup> C02F 1/76

U.S. Cl. 210—756 7 Claims

1. A continuous process for the oxidation of oxidizable materials in an aqueous medium comprising adding a hypochlorite solution to an aqueous medium containing at least 500 ppm by weight of oxidizable material and passing the mixture under alkaline conditions through a fixed bed of a particulate catalyst consisting essentially of i) 80–99% by weight of an inert porous support, and ii) a total of at least 1% by weight of an oxidic material selected from nickel oxide, copper oxide, a mixture of nickel and copper oxides, and a mixture of copper oxide and zinc oxide.

**5,772,898**  
**HYDROCARBON CONVERSION PROCESS USING NOVEL METALLO MANGANESE OXIDES**

Gregory J. Lewis, Mt. Prospect, Ill., assignor to UOP LLC, Des Plaines, Ill.

Continuation-in-part of Ser. No. 468,891, Jun. 6, 1995, Pat. No. 5,637,545, which is a continuation-in-part of Ser. No. 360,516, Dec. 21, 1994, abandoned. This application May 2, 1997, Ser. No. 850,405

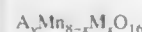
Int. Cl.<sup>6</sup> C02F 1/68; C07C 41/01; 45/00; 255/00  
U.S. Cl. 210—762 19 Claims

1. A hydrocarbon conversion process comprising contacting a hydrocarbon feed with a catalyst under hydrocarbon conversion conditions to give a converted product, the catalyst comprising a crystalline metallo manganese oxide composition having a three-dimensional framework structure, an intracrystalline pore system and an empirical chemical composition on an anhydrous basis expressed by the formula:



where A is a templating agent selected from alkali metals, alkaline earth metals and ammonium ion, "y" is the moles of A and varies from the group consisting of about 0.5 to about 2.0, M is a metal selected from the group consisting of chromium, zirconium, tin, platinum, rhodium, niobium, tantalum, vanadium, antimony, ruthenium, gallium and germanium, "x" is the moles of M and varies from about 0.01 to about 4.0 and characterized in that manganese has a valence of +3, or +4, M has a valence of +3, +4 or +5 and the composition has the hollandite structure.

13. A process for reducing the cyanide concentration in an aqueous stream comprising contacting the aqueous stream with a catalyst in the presence of an oxidizing agent under acidic oxidation conditions thereby oxidizing the cyanide, the catalyst comprising a crystalline metallo manganese oxide composition having a three-dimensional framework structure, an intracrystalline pore system and an empirical chemical composition on an anhydrous basis expressed by the formula



where A is a templating agent selected from the group consisting of alkali metals, alkaline earth metals and ammonium ion, "y" is the moles of A and varies from about 0.5 to about 2.0, M is a metal selected from the group consisting of chromium, zirconium, tin, platinum, rhodium, niobium, tantalum, vanadium, antimony, ruthenium, gallium and germanium, "x" is the moles of M and varies from about 0.01 to about 4.0 and characterized in that manganese has a valence of +3, or +4, M has a valence of +3, +4 or +5 and the composition has the hollandite structure.

**5,772,899**  
**FLUID DISPENSING SYSTEM HAVING INDEPENDENTLY OPERATED PUMPS**

Ocie T. Snodgrass, Garland; Michael K. Farney, Grapevine, and Gregory M. Gibson, Dallas, all of Tex., assignors to Millipore Investment Holdings Limited, Wilmington, Del.

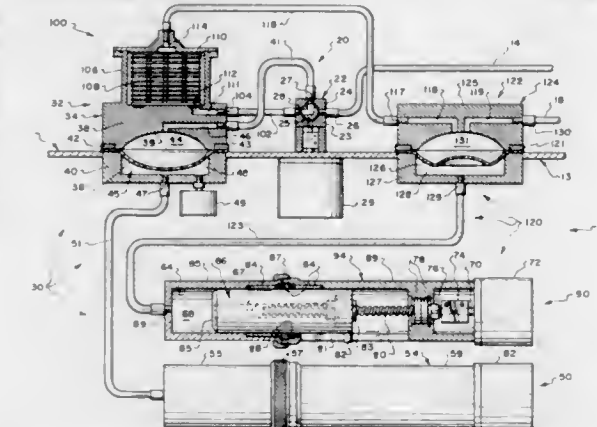
Continuation of Ser. No. 107,866, Aug. 18, 1993, Pat. No. 5,516,429, which is a continuation of Ser. No. 747,884, Aug. 20, 1991, abandoned, which is a continuation of Ser. No. 329,525, Mar. 28, 1989, Pat. No. 5,167,837. This application

Feb. 23, 1996, Ser. No. 605,878

Int. Cl.<sup>6</sup> B01D 24/38; F04B 23/06

U.S. Cl. 210—767

27 Claims



4. A method for filtering and dispensing an industrial fluid which is viscous and/or high purity and/or shear sensitive, comprising the steps of: pumping said fluid with first pumping means through valve means and filtering means; receiving said fluid in second pumping means; preventing backflow of filtered fluid; and dispensing said fluid by operating said second pumping means, in which each of said first and second pumping means include s surfaces that contact said fluid, said surfaces being of materials that are non-contaminating to said fluid.

**5,772,900**  
**METHOD AND APPARATUS FOR RECLAIMING USED WORKING FLUID**

Hiroshi Yoritaka, Toyoake, and Takashi Yoshikawa, Nagoya, both of Japan, assignors to Noritake Co., Limited, Nagoya, Japan

PCT No. PCT/JP95/01239, § 371 Date Mar. 15, 1996, § 102(e) Date Mar. 15, 1996, PCT Pub. No. WO95/35261, PCT Pub. Date Dec. 28, 1995

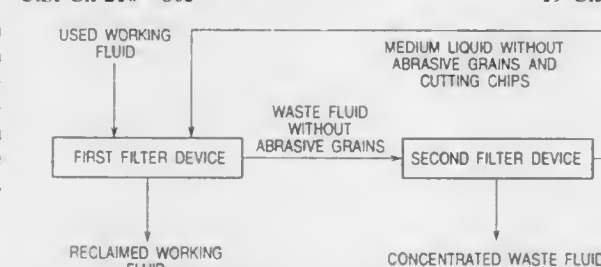
PCT Filed Jun. 20, 1995, Ser. No. 600,954

Claims priority, application Japan, Jun. 22, 1994, 6-140009; Jan. 27, 1995, 7-011762

Int. Cl.<sup>6</sup> B01D 17/12

U.S. Cl. 210—805

19 Claims



1. A method of reclaiming a used working fluid produced after a working fluid which contains abrasive grains dispersed therein is used for abrasive machining on a workpiece, wherein cutting chips produced during said abrasive machining are removed from said used working fluid, said method comprising the steps of: circulating said used working fluid in a circulating path including a cross flow filter having a first chamber and a second chamber which are defined by a cross flow filtration film, said cross flow filtration film having pores which are sufficiently

smaller than an average grain size of said abrasive grains and are sufficiently larger than an average grain size of said cutting chips;

cross flow filtering said used working fluid while said used working fluid is fed to flow over the surface of said cross flow filtration film, such that a portion of said used working fluid is discharged through said cross flow filtration film, as a waste fluid, into said second chamber of said cross flow filter together with said cutting chips, for reducing an amount of said cutting chips in said used working fluid flowing in said circulating path; and

recovering a reclaimed working fluid from said circulating path, said reclaimed working fluid containing said cutting chips in an amount which has been reduced in said step of cross flow filtering said used working fluid.

**5,772,901**  
**OIL/WATER/BIOCATALYST THREE PHASE SEPARATION PROCESS**

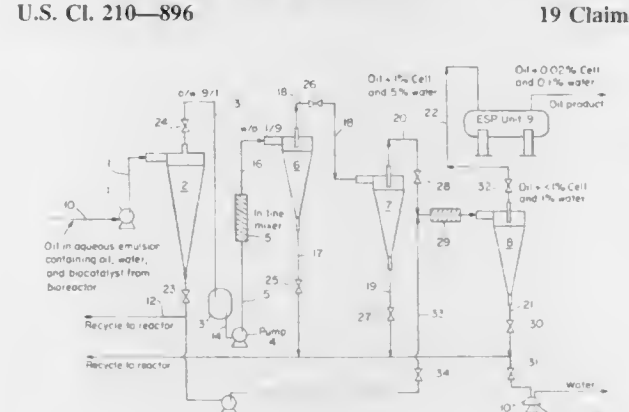
Li-Qun Yu, Houston; Todd A. Meyer, and Brian R. Folsom, both of The Woodlands, all of Tex., assignors to Energy BioSystems Corporation, The Woodlands, Tex.

Filed Apr. 30, 1996, Ser. No. 640,129

Int. Cl.<sup>6</sup> B01D 21/26; 17/038

U.S. Cl. 210—896

19 Claims



1. A method for separating a first emulsion comprising a first continuous phase, a first discontinuous phase and fine solid particles, comprising the steps of:

- directing the first emulsion through a first hydrocyclone, whereby the first emulsion is separated into an overflow emulsion and an underflow emulsion, said overflow emulsion comprising at least a portion of said first continuous phase, at least a portion of said first discontinuous phase and at least a portion of said fine solid particles;
- inverting the phases of said overflow emulsion thereby obtaining an inverted emulsion whereby said first continuous phase of said overflow emulsion is a second discontinuous phase in said inverted emulsion and said first discontinuous phase of said overflow emulsion is a second continuous phase in said inverted emulsion;
- directing said inverted emulsion through one or more subsequent hydrocyclones arranged in series; and
- collecting said second continuous phase and said second discontinuous phase of said inverted emulsion, wherein said fine solid particles are collected with said second discontinuous phase.

**5,772,902**  
**METHOD TO PREVENT ADHESION OF MICROMECHANICAL STRUCTURES**

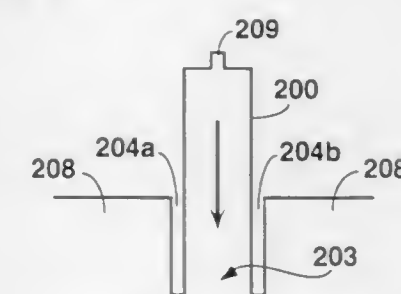
Michael L. Reed, Pittsburgh, Pa., and Takeshi Abe, Chiba, Japan, assignors to Carnegie Mellon University, Pittsburgh, Pa.

Division of Ser. No. 379,174, Jan. 27, 1995. This application Apr. 10, 1996, Ser. No. 630,263

Int. Cl.<sup>6</sup> H01L 21/302; B44C 1/22

U.S. Cl. 216—2

22 Claims

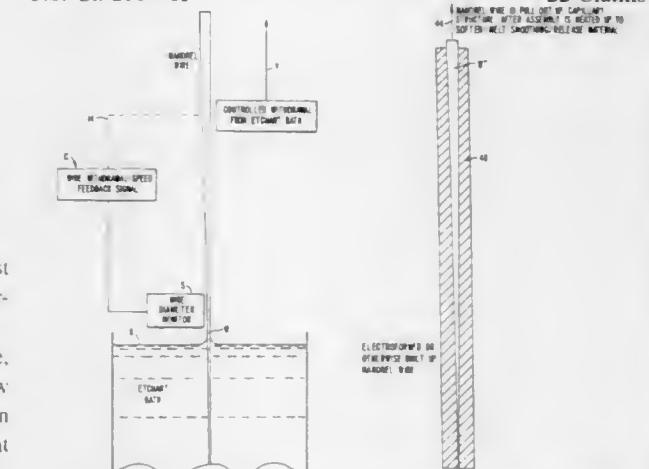


1. In a micromachining process for producing microstructures that include a base portion attached to a substrate, a released portion having top and bottom surfaces suspended above the substrate, and edge surfaces extending from the top surface to the bottom surface, a method for inhibiting adhesion between the released portion and the substrate during rinsing and drying, the method comprising the step of shaping the microstructure to include at least one convex corner along an edge surface of the microstructure at a region of the microstructure which can undergo substantial displacement toward the substrate.

**5,772,903**  
**TAPERED CAPILLARY OPTICS**  
Gregory Hirsch, 365 Talbot Ave., Pacifica, Calif. 94044  
Filed Sep. 27, 1996, Ser. No. 721,871  
Int. Cl.<sup>6</sup> C03C 25/06

U.S. Cl. 216—11

22 Claims



1. A process for producing a tapered capillary optic of desired taper for focusing radiation comprising the steps of: providing an etchant bath; providing a wire to be etched by the etchant bath; placing the wire in the etchant bath to a preselected depth for etching; withdrawing the wire from the preselected depth at a controlled rate to form a differential etch to form a tapered wire with a desired taper having the desired taper profile of the tapered capillary optic; coating the tapered wire with a coating reflective of the radiation to be focused by the capillary optic to produce a coated wire; and removing the tapered wire from the coated wire to leave only a coated bore having the desired taper for focussing radiation.



5,772,904

## FIELD EMISSION DISPLAY AND FABRICATING METHOD THEREFOR

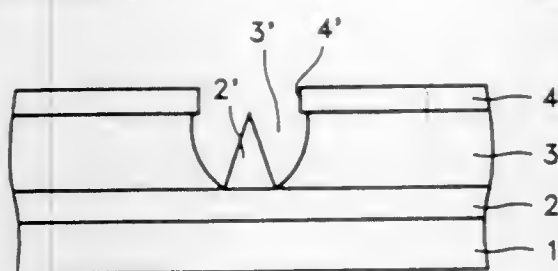
Jong-min Kim, Jongro-gu, Rep. of Korea, assignor to Samsung Display Devices Co., Ltd., Suwon, Rep. of Korea  
Division of Ser. No. 487,042, Jun. 7, 1995. This application  
Jul. 25, 1996, Ser. No. 685,826

Claims priority, application Rep. of Korea, Mar. 28, 1995, 95-6749

Int. Cl.<sup>6</sup> H01L 21/00; B44C 1/22

U.S. Cl. 216—24

14 Claims



1. A method for fabricating a field emission display comprising the steps of:

- forming a cathode pattern on a substrate;
- forming an amorphous silicon layer on said cathode pattern;
- forming a thin film of a material having a work function below a value on said amorphous silicon layer;
- forming a mask layer on said thin film and etching and patterning said mask layer to form a mask;
- isotropically etching said thin film using said mask to form a tip;
- etching said amorphous silicon layer to form a tip pedestal;
- depositing insulation material around said tip pedestal;
- depositing a metal on said insulating layer to form a gate layer; and
- etching the mask to remove portions of said insulation material and said gate layer deposited on said tip.

5,772,905

## NANOIMPRINT LITHOGRAPHY

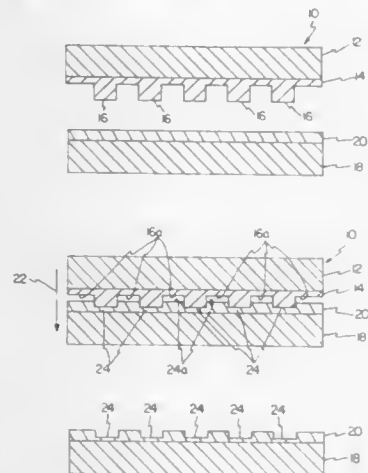
Stephen Y. Chou, Golden Valley, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Nov. 15, 1995, Ser. No. 558,809

Int. Cl.<sup>6</sup> H01L 21/304

U.S. Cl. 216—44

19 Claims



1. A lithographic method for forming a pattern in a film carried on a substrate, comprising the steps of:

- obtaining a substrate;
- depositing a film on the substrate;
- obtaining a mold of a stiff material which is hard relative to the film, the mold having a first protruding feature and a recess formed thereby and a second protruding feature spaced apart from the first protruding feature, the first and second features

and the recess having a shape forming a mold pattern and providing at least one mold pattern lateral dimension which is less than 200 nm;

urging the mold at a molding pressure into the film whereby the thickness of the film under the protruding feature is reduced and a thin region is formed in the film, wherein the molding pressure is sufficiently high to transfer the mold pattern to the film and the molding pressure causes a local deformation in the mold which is less than the mold pattern lateral dimension;

removing the mold from the film; processing the relief whereby the thin region is removed exposing portions of the surface of the substrate which underlie the thin region; and

whereby the exposed portions of the surface of the substrate substantially replicate the mold pattern and have at least one lateral dimension which is less than 200 nm.

5,772,906

## MECHANISM FOR UNIFORM ETCHING BY MINIMIZING EFFECTS OF ETCH RATE LOADING

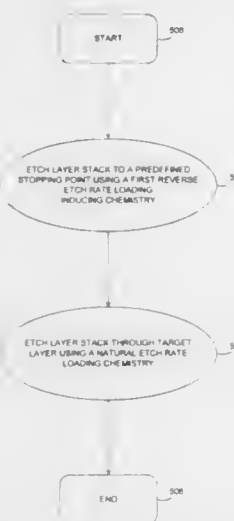
Susan C. Abraham, San Jose, Calif., assignor to LAM Research Corporation, Fremont, Calif.

Filed May 30, 1996, Ser. No. 652,718

Int. Cl.<sup>6</sup> H01L 21/306

U.S. Cl. 216—72

38 Claims



1. A method for etching a layer stack structure on a substrate, said method comprising:

- etching said layer stack to a stopping point using a reverse etch rate loading inducing chemistry, said reverse etch rate loading inducing chemistry being selected to cause etching to occur faster in a narrow region of said substrate relative to a wide region of said substrate; and
- etching said layer stack at least partially through a target layer in said layer stack structure using a natural etch rate loading chemistry, said natural etch rate loading inducing relative to said narrow region of said substrate.

5,772,907

## LACTIC ACID TREATMENT OF INP MATERIALS

Kiki Ikossi-Anastasiou, Baton Rouge, La.; Steve C. Binari, Annadale; J. Brad Boos, Springfield, both of Va., and Galina Kelner, Potomac, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 8, 1996, Ser. No. 646,537

Int. Cl.<sup>6</sup> G23F 1/00

U.S. Cl. 216—100

6 Claims

1. A method comprising the steps of

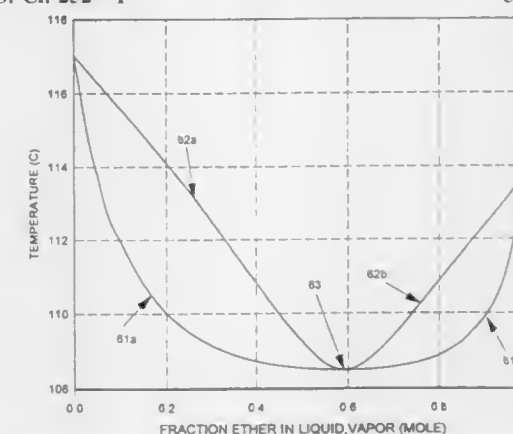
5,772,909

## PROCESS FOR SEPARATION OF VANILLIN FROM OTHER CHEMICALS BY MEANS OF AZEOTROPIC DISTILLATION WITH DIBENZYL ETHER AND MIXTURES OF VANILLIN AND DIBENZYL ETHER USED IN SUCH PROCESS

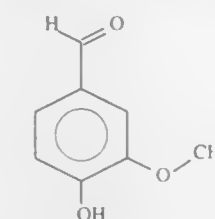
Thomas Jones, Rahway; Jeffrey L. Finnan, Maplewood, and Joseph Arvizzigno, Scotch Plains, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.  
Division of Ser. No. 450,303, May 25, 1995, Pat. No. 5,510,006. This application Nov. 2, 1995, Ser. No. 552,227  
Int. Cl.<sup>6</sup> C09K 3/00; A23L 1/00

U.S. Cl. 252—1

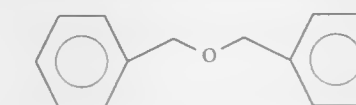
3 Claims



1. An azeotropic mixture consisting of vanillin having the structure:



and dibenzyl ether having the structure:

5,772,908  
DEVICE FOR CONTROLLING THE FLOW OF LIQUID STEEL BETWEEN A LADLE AND A CONTINUOUS CASTING DISTRIBUTOR

François Neol Richard, Nancy, France, assignor to Vesuvius France S.A., Feignies, France

PCT No. PCT/FR95/00235, § 371 Date Sep. 26, 1996, § 102(e)  
Date Sep. 26, 1996, PCT Pub. No. WO95/23663, PCT Pub. Date Sep. 8, 1995

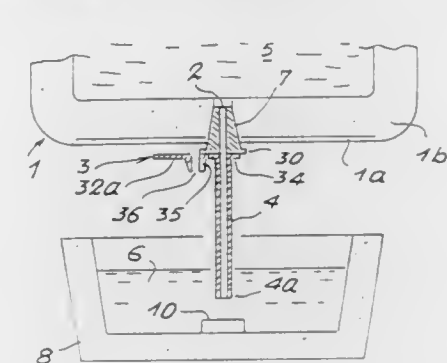
PCT Filed Feb. 27, 1995, Ser. No. 702,538

Claims priority, application France, Mar. 4, 1994, 94 02622

Int. Cl.<sup>6</sup> B22D 41/50

U.S. Cl. 222—594

22 Claims



1. Installation for controlling the flow of liquid steel, incorporating a ladle, a continuous casting distributor able to contain a liquid steel bath and located on a continuous casting platform, said ladle being able to contain and transport a liquid steel quantity between a remote site and the continuous casting platform, the ladle being provided with a casting hole permitting the transfer of said steel quantity into the distributor, said casting hole being surrounded by a fixed, upper plate, a frame fitted beneath the ladle and having guidance means, a plate able to move on the guidance means and seal the casting hole, means for pressurizing said plate, means for protecting the liquid steel jet during its passage from the ladle to the distributor, said means incorporating a jet protection tube to be placed in an extension of the casting hole and which has a lower end to be immersed on the liquid steel bath contained in the distributor and means for bringing about a constriction of a passage section offered to the liquid steel, wherein:

the plate able to seal the casting hole is a cover plate intended solely to seal the casting hole.

the jet protection tube is formed in a rigid plate/jet protection tube assembly with a plate, whereby said plate/jet protection tube assembly can be received and displaced on guidance means so as to face the casting hole on replacing the cover plate which is pushed out of this position, pressurizing means being provided for keeping the plate of the plate/jet protection tube assembly tightly applied against the fixed, upper plate, the means for bringing about a constriction of the passage section offered to the steel comprise the jet protection tube.

5,772,910

## METHOD OF PROVIDING LUBRICITY TO SYNTHETIC YARNS TO BE PROCESSED FOR FALSE TWISTING WITH SHORT HEATER

Hisao Yamamoto, and Koji Maejima, both of Aichi, Japan, assignors to Takemoto Yushi Kabushiki Kaisha, Aichi, Japan  
Filed Aug. 14, 1997, Ser. No. 911,422

Int. Cl.<sup>6</sup> D06M 13/513; 13/517

U.S. Cl. 252—8.84

5 Claims

1. A method of providing lubricity to synthetic yarns which are to be subjected to a false twisting process with a short heater, said method comprising the step of applying a lubricating agent to the synthetic yarns at a rate of 0.1–3 weight % of said synthetic yarns, said lubricating agent comprising a polyether compound and linear polyorganosiloxane of one or more kinds selected from Type A and

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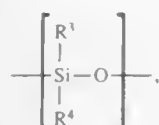
1998

UMI

Type B at a weight ratio of (polyether compound/linear polyorganosiloxane)=100/0.05-100/12, said Type A being linear polyorganosiloxane having within the molecule thereof 4-12 siloxane units shown by Formula (1) as constituent units thereof, said Type B being linear polyorganosiloxane having within the molecule thereof a total of 4-12 siloxane units shown by Formula (1) and siloxane units shown by Formula (2) as constituent repetition units such that the siloxane units shown by Formula (2) are less than 25 molar % of all siloxane units of said Type B, Formula (1) being:



and Formula (2) being:



where  $R^1$  and  $R^2$  are same or different alkyl groups with 1-4 carbon atoms,  $R^3$  is fluoroalkyl group with 1-4 carbon atoms, and  $R^4$  is fluoroalkyl group with 1-4 carbon atoms or alkyl group with 1-4 carbon atoms.

5,772,911

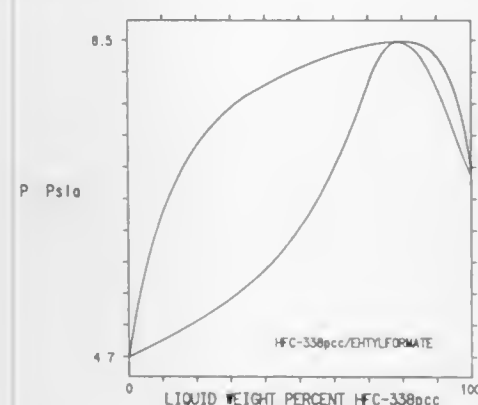
**1,1,2,2,3,3,4,4-OCTAFLUOROBUTANE COMPOSITIONS**  
Barbara Haviland Minor, and Allen Capron Sievert, both of Elkton, Md., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 486,427, Jun. 7, 1995, abandoned, which is a division of Ser. No. 314,836, Sep. 29, 1994, Pat. No. 5,562,853. This application May 7, 1997, Ser. No. 852,311

Int. Cl.<sup>6</sup> C09K 5/04

U.S. Cl. 252-67

2 Claims



1. An azeotropic or azeotrope-like binary composition consisting essentially of 53-99 weight percent 1,1,2,2,3,3,4,4-octafluorobutane and 1-47 weight percent ethyl formate, wherein when the temperature has been adjusted to about 25° C., the vapor pressure of the composition is higher than the vapor pressure of the individual components and the vapor pressure of the 1,1,2,2,3,3,4,4-octafluorobutane/ethyl formate is about 7.2-8.5 psia, and the change in vapor pressure of the composition is less than about 10 percent after 50 percent has been allowed to evaporate.

5,772,912

ENVIRONMENTALLY FRIENDLY ANTI-ICING

Robert T. Lockyer, Los Gatos; John Zuk, San Jose, and Leonard A. Haslim, Hayward, all of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 380,913, Jan. 25, 1995, abandoned. This application Jan. 24, 1996, Ser. No. 605,295

Int. Cl.<sup>6</sup> C09K 3/18

U.S. Cl. 252-70

42 Claims

1. An environmentally-friendly anti-icing or deicing composition, said composition comprises:

- water in between about 40 and 86 percent by weight of the combined weight of water and freezing point depressant;
- at least one non-toxic, water soluble, freezing point depressant selected from the group consisting of monohydric alcohols having from 2 to 6 carbon atoms, polyhydric alcohols having from 3 to 12 carbon atoms, monomethyl or monoethyl ethers of polyhydric alcohols having from 3 to 12 carbon atoms, and mixtures thereof wherein the amount of said freezing point depressant is between about 14 and 60 percent by weight of said combined water and freezing point depressant weights; and
- a non-toxic thickener which is present in an amount between about 0.01 and 10 percent by weight of the total composition, said thickener is a xanthan which when combined with (a) and (b) provides a continuous liquid composition, wherein said liquid composition is a homogeneous, continuous single phase, and said liquid composition when formed has a high near-static initial viscosity above about 20,000 cPs when measured using a viscosity measuring device, and the formed liquid after being subjected to at least one external dynamic strain at a rate of at least 20 sec<sup>-1</sup> for at least 1.0 min., has a second, lower viscosity below about 1,000 cPs as measured using said viscosity measuring device, and upon removal of said external dynamic strain rate, within 10 min., said liquid composition has a third viscosity of within about 99.5% of said initial viscosity when said third viscosity is measured on said viscosity measuring device, with the proviso that the composition does not include a water insoluble liquid and with the proviso that the composition is not an emulsion.

5,772,913

**AQUEOUS SYSTEM CONTAINING A SYNERGISTIC COMBINATION FOR SCALE CONTROL**

Jasbir S. Gill, McKees Rocks, and Jennifer R. Parsons, Pittsburgh, both of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

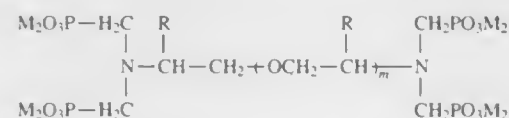
Filed Sep. 24, 1996, Ser. No. 719,184

Int. Cl.<sup>6</sup> C02F 5/14; 5/10

U.S. Cl. 252-180

19 Claims

1. An aqueous system containing scale forming salts and characterized by high pH and high calcite concentrations wherein the pH is at least 8.5 and the calcite saturation level is at least 100 times the solubility limit of calcium as calcite, which further contains a synergistic effective amount of a combination comprising: (A) a polyether polyamino methylene phosphonate of the formula:



where n is an integer or fractional integer which is, or on average is, from about 2 to about 12, inclusive; M is hydrogen or an alkali metal; and each R may be the same or different and is independently selected from hydrogen and methyl; (B) a terpolymer comprising the monomers of acrylic acid, sulfophenoxymethyl ether and maleic acid, wherein the weight average molecular weight for said terpolymer is in the range from about 4,000 to 10,000; and (C)

a hydroxyphosphonoacetic acid; and (D) a phosphonocarboxylic acid copolymer comprising the monomers of acrylic acid, telomer with (1-hydroxy-1-methylethyl) phosphinic acid monosodium salt and 2-acrylamido 2 methylpropane sulfonic acid.

5,772,914

CHIRAL DOPES

Detlef Pauluth, Ober-Ramstadt; Matthias Bremer; Herbert Plach, both of Darmstadt, and Georg Weber, Erzhhausen, all of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Darmstadt, Germany

Filed Nov. 18, 1996, Ser. No. 746,943

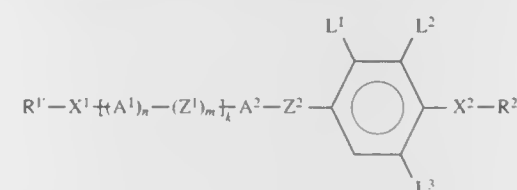
Claims priority, application Germany, Nov. 17, 1995, 195 42 849.8

Int. Cl.<sup>6</sup> C09K 19/06; 19/52; 19/12; C07C 19/08

U.S. Cl. 252-299.6

19 Claims

1. A chiral benzene compound of the formula I



in which

$L^1$ ,  $L^2$  and  $L^3$  are each, independently of one another, F or H,  $X^1$  and  $X^2$  are each, independently of one another, O or a single bond,  $R^1$  and  $R^2$  are each, independently of one another, a chiral radical containing at least one alkyl chain having 1 to 15 carbon atoms, in which one or more non-adjacent  $CH_2$  groups are optionally replaced by O or  $CH=CH$  or both, and which is optionally substituted by F, Cl,  $CF_3$ ,  $CF_2H$ ,  $CFH_2$  or CN,

$A^1$  and  $A^2$  are each, independently of one another, 1,4-phenylene which is unsubstituted or substituted by one or two fluorine atoms and in which, in addition, one or two CH groups are optionally replaced by N; or unsubstituted 1,4-cyclohexylene in which, in addition, one or two  $CH_2$  groups are optionally replaced by O or S; or thiazole-2,5-diyl; or 1,4-bicyclo[2.2.2]octylene;

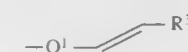
$Z^1$  and  $Z^2$  are each, independently of one another,  $-COO-$ ,  $-OCO-$ ,  $-OCH_2-$ ,  $-CH_2O-$ ,  $-CH_2CH_2-$ ,  $-CH=CH-$ ,  $-C\equiv C-$  or a single bond,

k is 0, 1 or 2, and

n and m are each, independently of one another, 0 or 1

provided that:

- at least two of  $L^1$ ,  $L^2$  and  $L^3$  is F, or
- at least one of the radicals  $R^1$  and  $R^2$  is a radical of the formula II



in which

$Q^1$  is a single bond or an alkylene group having 1 to 8 carbon atoms in which, in addition, one, two or more  $CH_2$  groups are optionally replaced by  $-O-$  in such a way that two heteroatoms are not adjacent, and

5,772,915

GLASS COMPOSITIONS

Animesh Jha, Middlesex, and Wayne G. Jordan, Langley, both of United Kingdom, assignors to British Telecommunications public limited company, London, England

PCT No. PCT/GB95/00630, § 371 Date Mar. 20, 1997, § 102(e)

Date Mar. 20, 1997, PCT Pub. No. WO95/26320, PCT Pub. Date Oct. 5, 1995

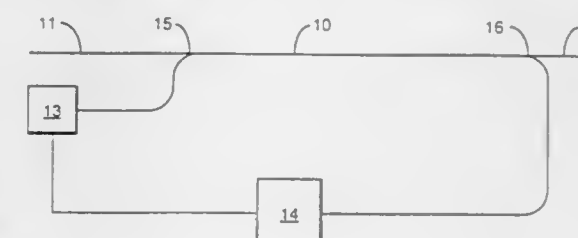
PCT Filed Mar. 22, 1995, Ser. No. 702,464

Claims priority, application European Pat. Off., Mar. 25, 1994, 94302167

Int. Cl.<sup>6</sup> C03C 3/32; 4/00; 13/04; H01S 3/17

U.S. Cl. 252-301.4 H

6 Claims



1. A halide glass composition having fluorescent or lasing properties wherein said composition consists of:

an active dopant capable of supporting fluorescent or lasing activity and a host glass,

wherein the concentration of the active dopant is 0.001 to 4 weight percent based on the host glass;

the host glass containing less than 0.2 mole % of aluminium and less than 0.2 mole % of lead based on the total metal content and the halide content consisting of:

W mole % of F—,  
X mole % of Br—,  
Y mole % of I—,  
Z mole % of Cl—,

wherein

$W+X+Y+Z=100$

and each of the following expressions lies within the range specified:

	MIN	EXPRESSION	MAX
0.05		$X+Y+Z$	15
0.05		$X+Y$	6
0		$Z$	10

and wherein

$Y=0$ ;

$X=0.5$  to 0.7;

$Z=2.0$  to 2.5.



5,772,916

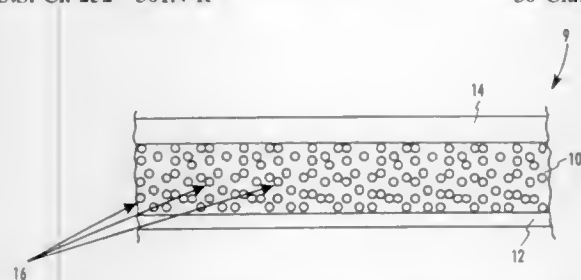
**PHOSPHOR SCREEN, METHOD OF PRODUCING THE SAME, AND METHOD FOR PREPARING A PHOSPHOR POWDER FOR PRODUCING A PHOSPHOR SCREEN**  
Fauzia Jamil, King of Prussia, and Peter K. Soltani, West Chester, both of Pa., assignors to Liberty Technologies, Inc., Conshohocken, Pa.

Filed Oct. 15, 1996, Ser. No. 720,980

Int. Cl.<sup>6</sup> C09K 11/08

U.S. Cl. 252—301.4 R

30 Claims



1. A method for preparing a phosphor powder for producing a high resolution phosphor screen that is scannable with infra red radiation to produce an image, and has a reduced lag time upon such scanning, comprising:

- preparing a composition comprising a strontium sulfide base, a first dopant comprising an amount of a source of samarium, sufficient to provide about 0.0025 to 0.1% by weight of samarium oxide, a second dopant comprising a source of cerium, sufficient to provide about 0.0025 to 0.2% by weight of cerium sulfide, and at least one fusible salt, wherein the ratio of elemental samarium to elemental cerium is about 1:5 to 1:10;
- heating said composition in an inert atmosphere to a temperature of from about 1050° C. to about 1200° that is sufficient to enable said dopants to dope said strontium sulfide in an amount sufficient to cause said doped strontium sulfide to become crystals of a phosphor;
- cooling said phosphor to an extent sufficient to sinter said phosphor into at least one ingot;
- subdividing said phosphor ingot, in a manner to insure minimum physical damage and reduce contamination to the crystals, to form an at least partially deactivated phosphor powder comprising a substantial amount of particles having a particle size, as measured in the longest dimension, which is greater than 0 and less than about 5 microns;
- heating said powder in an inert atmosphere to a temperature of up to about 550° C. and for a time sufficient to reactivate said phosphor and to at least partially agglomerate particles of said powder into larger size particles;
- disrupting said agglomerated particles to reconstitute them into a reactivated powder comprising particles having a particle size, as measured in the longest dimension, that is greater than 0 and less than about 5 microns; and
- collecting at least a substantial proportion of said 0 to less than 5 micron, reactivated particles.

5,772,917

**LUMINESCENT ZEOLITE**

Ulrich H. Kynast, Roetgen, and Volker U. Weiler, Aachen, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 7, 1997, Ser. No. 795,121

Claims priority, application European Pat. Off., Feb. 8, 1996, 96200282

Int. Cl.<sup>6</sup> C09K 11/06

U.S. Cl. 252—301.4 R

11 Claims

1. Luminescent zeolite of the Faujasite type containing Ce<sup>3+</sup> ions wherein the Si/Al atomic ratio of the zeolite is in the range 1.0–4.0, characterized in that the zeolite further contains cations S<sup>n+</sup> wherein n≥2, and in that the sum of the amount of Ce<sup>3+</sup> ions and the amount of cations S<sup>n+</sup> per unit cell of the zeolite is at least 16.

5,772,918

**RED FLUORESCENT COMPOSITION FOR COLOR CATHODE-RAY TUBE**

Dae Hwang Kim, Seoul, Rep. of Korea, assignor to LG Electronics Inc., Rep. of Korea

Continuation of Ser. No. 602,529, Feb. 20, 1996, abandoned.

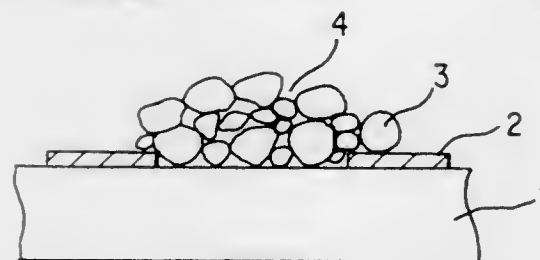
This application Jun. 24, 1997, Ser. No. 880,312

Claims priority, application Rep. of Korea, Feb. 20, 1995, 1995-3225

Int. Cl.<sup>6</sup> H01J 29/20

U.S. Cl. 252—301.45

1 Claim



1. A cathode ray tube comprising green, blue and red phosphors; said red phosphor is a europium activated yttrium oxysulfide red fluorescent composition Y<sub>2</sub>O<sub>3</sub>S:Eu having a mixture of a first red fluorescent particle with a particle size from 7–8 μm and a second red fluorescent particle with a smaller particle size of from 3–5 μm and said first red fluorescent and said second red fluorescent comprises respectively 0.07–0.08 g atomic weight of europium as an activator relative to 1 mole of yttrium oxysulfide as a mother body and a ratio of said first fluorescent to said second fluorescent is 0.25 to 4 wherein the tube has a range of color reproduction which is enlarged toward natural color.

5,772,919

**METHODS OF INHIBITING CORROSION USING HALO-BENZOTRIAZOLES**

David W. Reichgott, Seattle, Wash.; Sydia B. Anderson, Doylestown, Pa.; Michael A. Cady, Yardley, Pa.; Roger C. May, Glenside, Pa., and Anita G. Monino, Horsham, Pa., assignors to BetzDearborn Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 407,173, Mar. 21, 1995, abandoned. This application Jan. 3, 1997, Ser. No. 778,705

Int. Cl.<sup>6</sup> C09K 3/00; C23F 11/04; C04B 9/02

U.S. Cl. 252—390

8 Claims

1. A method of inhibiting corrosion of metal surfaces contacted by an aqueous system being treated with a halogen comprising adding to said aqueous system being treated with a halogen an amount effective for the purpose of inhibiting corrosion of a halo-benzotriazole prepared ex-situ said aqueous system.

5,772,920

**U.V. ABSORBER COMPOSITIONS**

Michael Best, Charlotte, N.C.; Jean-Luc Mura, Rixheim, and Francis Palacin, Riedisheim, both of France, assignors to Clariant Finance (BV) Limited, Tortola, Virgin Islands (Br.)

Continuation-in-part of Ser. No. 501,335, Jul. 12, 1995, abandoned. This application Jul. 15, 1996, Ser. No. 679,840

Int. Cl.<sup>6</sup> C09K 15/22; C08K 5/34

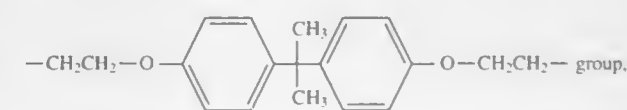
U.S. Cl. 252—403

8 Claims

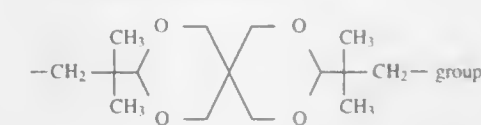
1. A composition comprising, based on the total weight of said composition:

- 20–45% of an insoluble or sparingly soluble U.V. absorber of the 2-(2'-hydroxyphenyl)-benzotriazole series having an average particle size of less than 5 μm;
- 7 to 25% of a dispersing agent which is a condensation product of a sulphonated tolylether and formaldehyde;
- 0.5 to 10% of a non-ionic surfactant which is:
  - an addition product of an ethylene and/or propylene oxide with tri or di styryl phenol;

- an addition product of an ethylene and/or propylene oxide with a fatty alcohol;
- a blend of 1) and an addition product of an ethylene and/or propylene oxide with a<sub>1,3</sub>poly alkylene glycol;
- a blend of 2) and an addition product of an ethylene and/or propylene oxide with a<sub>1,3</sub>poly alkylene glycol;
- and water;
- and optionally, one or more of the following:
  - up to 1.6% of a solubilizing agent
  - 0.1 to 0.2% of a buffer
  - 0.1 to 0.3% of an antifouling agent
  - 0.1 to 1.0% of an antifoaming agent.



C<sub>5</sub>–C<sub>7</sub>cycloalkylene; C<sub>1</sub>–C<sub>4</sub>alkyl-substituted  
C<sub>5</sub>–C<sub>7</sub>cycloalkylene, phenylene or a



or  
X<sub>n</sub>, where n=4, is [—G<sub>1</sub>—COO—]<sub>n</sub>—G<sub>2</sub>,  
wherein  
G<sub>1</sub> is a direct bond or C<sub>1</sub>–C<sub>4</sub>alkylene, and  
G<sub>2</sub> is C<sub>5</sub>–C<sub>10</sub>alkanetetrayl.

5,772,921

**SYNERGISTIC MIXTURE CONSISTING OF A 2,4-DIMETHYL-6-S-ALKYLPHENOL AND A STERICALLY HINDERED PHENOL**

Bernard Gilg, St. Louis-la-Chaussée, France, and Kurt Stinsky, Basel, Switzerland, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Filed Jan. 29, 1997, Ser. No. 789,898

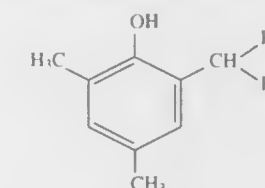
Claims priority, application Switzerland, Jan. 31, 1996, 249/96

Int. Cl.<sup>6</sup> C09K 15/08; 15/22; 15/32

U.S. Cl. 252—404

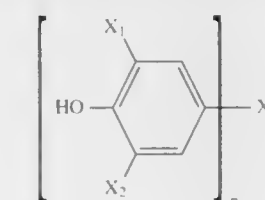
9 Claims

- A mixture, comprising
  - at least one compound of formula I



wherein

- R<sub>1</sub> is methyl or ethyl, and R<sub>2</sub> is C<sub>10</sub>–C<sub>30</sub>alkyl, and
- at least one compound of formula II



wherein

- n is 1, 2 or 4.
  - X<sub>1</sub> is tert-butyl,
  - X<sub>2</sub> is C<sub>1</sub>–C<sub>4</sub>alkyl,
  - X<sub>3</sub>, where n=1, is C<sub>1</sub>–C<sub>20</sub>alkyl,
  - a triazinylamino group which is substituted at the triazine ring by C<sub>1</sub>–C<sub>10</sub>alkylthio, or
  - a —A<sub>1</sub>—COO—A<sub>2</sub> or —A<sub>1</sub>—CONH—A<sub>2</sub> group,
- wherein  
A<sub>1</sub> is either a direct bond or C<sub>1</sub>–C<sub>4</sub>alkylene, and  
A<sub>2</sub> is C<sub>1</sub>–C<sub>20</sub>alkyl; C<sub>4</sub>–C<sub>20</sub>alkyl which is interrupted by —O—;  
C<sub>5</sub>–C<sub>12</sub>cycloalkyl; phenyl; phenyl which is substituted by —OH and/or C<sub>1</sub>–C<sub>4</sub>alkyl; C<sub>7</sub>–C<sub>9</sub>phenylalkyl; C<sub>7</sub>–C<sub>9</sub>phenylalkyl which is substituted at the phenyl moiety by —OH and/or C<sub>1</sub>–C<sub>4</sub>alkyl.
- X<sub>3</sub>, where n=2, is a —E<sub>1</sub>—COO—E<sub>2</sub>—OOC—E<sub>3</sub>— or —E<sub>1</sub>—CONH—E<sub>2</sub>—NHCO—E<sub>3</sub>— group,

wherein

- E<sub>1</sub> and E<sub>3</sub> are each independently of the other a direct bond or C<sub>1</sub>–C<sub>4</sub>alkylene,
- E<sub>2</sub> is C<sub>2</sub>–C<sub>20</sub>alkylene; C<sub>4</sub>–C<sub>20</sub>alkylene which is interrupted by —O— or —S—; a

5,772,922

**NEUTRON-ABSORBING COMPOSITE MATERIAL AND ITS PRODUCTION PROCESS**

Guy-Marc Decroix, Chevilly-Larue; Danièle Noaillac, Orsay; Jacques Chatillon, Verrières le Buisson, and Yann Frassin, Pornchet, all of France, assignors to Commissariat à l'Energie Atomique, Paris, France

Continuation of Ser. No. 349,265, Dec. 5, 1994, abandoned.

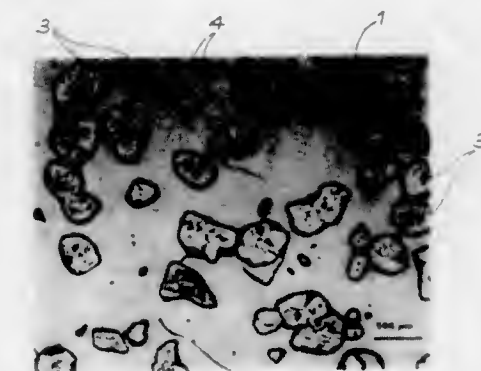
This application Dec. 5, 1996, Ser. No. 761,006

Claims priority, application France, Dec. 10, 1993, 93 14873

Int. Cl.<sup>6</sup> C04B 35/66; C09K 3/00

U.S. Cl. 252—478

5 Claims



1. Neutron-absorbing composite material consisting of a homogeneous matrix of a first component constituted by a ceramic selected from the group consisting of boron carbide and boron nitride in which are homogeneously dispersed clusters of at least one second component chosen from refractory metals, molybdenum borides and B<sub>4</sub>C, at least two of said components being different, said refractory metals being selected from the group consisting of Mo and Zr, said clusters ranging in size from 100 to 500 μm.

5,772,923

**SOLUTION COMPRISING POLYANILINE AND AMPHIPHILIC SOLUBILIZER**

Kalle M. J. Levon, 154 Bergen St., Apt. No. 1, Brooklyn, N.Y. 11217

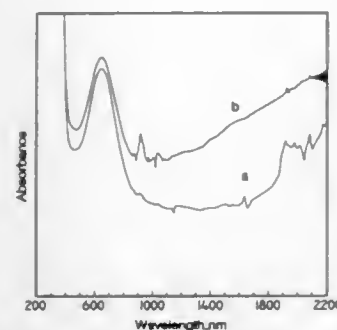
Filed Oct. 29, 1996, Ser. No. 739,370

Int. Cl.<sup>6</sup> H01B 1/00; 1/20; C08K 5/13

U.S. Cl. 252—800

10 Claims

1. A solution which comprises a non-polar organic solvent, polyaniline, and an effective amount of an amphiphilic non-polymeric phenol-containing reagent for the solubilization of the



polyaniline in the solvent, wherein said non-polar organic solvent is different from said amphiphilic non-polymeric phenol-containing reagent.

5,772,924

COMPOSITE CONDUCTIVE POWDER AND CONDUCTIVE FILM FORMED FROM THE POWDER  
Takao Hayashi, Yamaguchi, and Katsuhiko Yoshimaru, Saitama, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 449,240, May 24, 1995, abandoned.

This application Feb. 27, 1997, Ser. No. 806,501

Claims priority, application Japan, Jun. 14, 1994, 6-132117

Int. Cl.<sup>6</sup> H01B 1/08; C09C 1/36; B05D 5/12

U.S. Cl. 252—520.1

8 Claims

1. A composite conductive powder consisting essentially of a calcined product obtainable by calcination of a mixture of first conductive powder mainly comprising indium oxide which contains at least one member selected from the group consisting of tin oxide, titanium oxide and zirconium oxide as a dopant and a second conductive powder mainly comprising tin oxide which contains at least one member selected from the group consisting of antimony oxide, tantalum oxide and niobium oxide as a dopant.

5,772,925

ANTI-REFLECTIVE COATING COMPOSITION  
Satoshi Watanabe, Toshinobu Ishihara, Ichiro Kaneko, Katsuyuki Oikawa, and Yoshihumi Takeda, all of Nakakubiki-gun, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 441,739, May 16, 1995, abandoned.

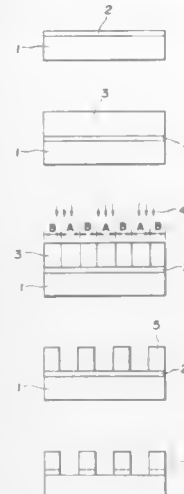
This application Jul. 10, 1997, Ser. No. 891,000

Claims priority, application Japan, Jun. 29, 1994, 6-169971

Int. Cl.<sup>6</sup> F21V 9/00; B05B 5/00; B05D 5/06

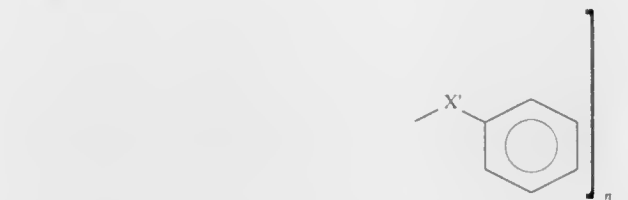
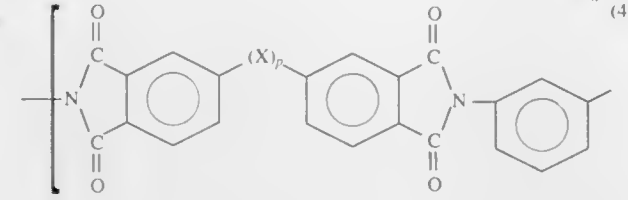
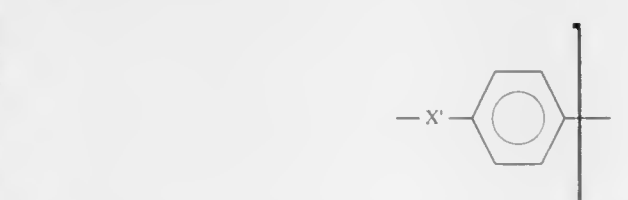
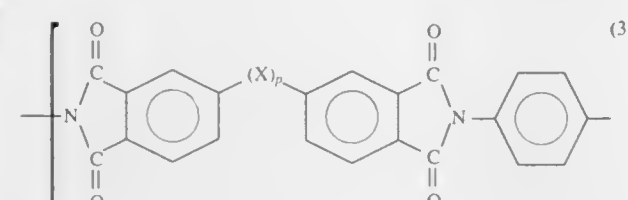
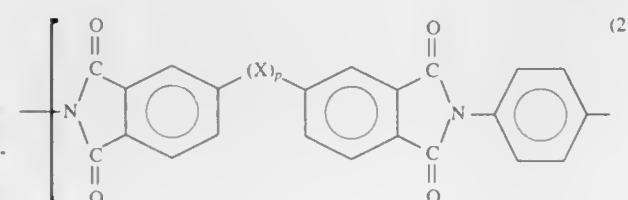
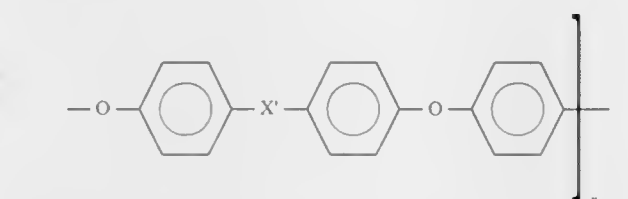
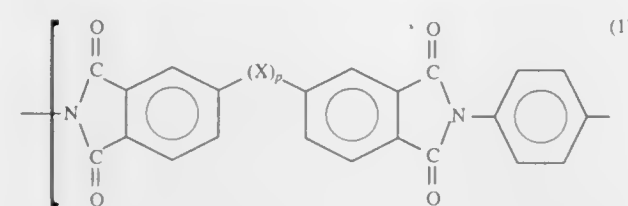
U.S. Cl. 252—582

16 Claims



1. An anti-reflective coating composition comprising an organic solvent-soluble polyimide having a structural element selected

from the group consisting of the following general formulae (1) to (4):



wherein X is —CH<sub>2</sub>—, —SO<sub>2</sub>— or —C(CH<sub>3</sub>)<sub>2</sub>— or X' is —CH<sub>2</sub>—, —SO<sub>2</sub>—, —C(CH<sub>3</sub>)<sub>2</sub>— or —C(CF<sub>3</sub>)<sub>2</sub>— —C(CF<sub>3</sub>)<sub>2</sub>—, letter p is equal to 0 or 1 and letter n is a number such that the polyimide has a logarithmic viscosity in the range of 0.01 to 5 dl/g, and

an organic solvent selected such that the composition is spin coatable.

5,772,926

CHEMILUMINESCENT REACTIONS USING DIHYDROXYAROMATIC COMPOUNDS AND HETEROCYCLIC ENOL PHOSPHATES

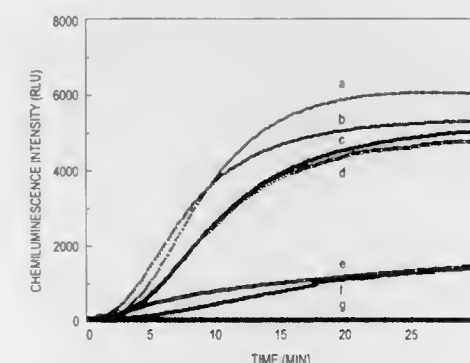
Hashem Akhavan-Tafti, Brighton, Mich., assignor to Lumigen, Inc., Southfield, Mich.

Filed May 13, 1997, Ser. No. 855,421

Int. Cl.<sup>6</sup> C09K 3/00; C12Q 1/00

U.S. Cl. 252—700

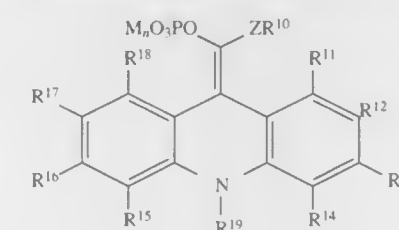
72 Claims



1. A method of generating chemiluminescence comprising reacting in the presence of oxygen

a) a dihydroxyaromatic compound which comprises from 1–5 carbocyclic aromatic rings and which is substituted with two hydroxy groups separated by an even number of ring carbon atoms; and

b) a heterocyclic enol phosphate compound having the formula



wherein R<sup>10</sup> is an organic group containing up to 50 non-hydrogen atoms selected from C, N, O, S, P and halogen atoms, each of R<sup>11</sup>–R<sup>18</sup> is independently selected from hydrogen, alkyl, substituted alkyl, aryl, substituted aryl, aralkyl, substituted aralkyl, alkenyl, alkynyl, alkoxy, aryloxy, halogen, amino, substituted amino, carboxyl, carboalkoxy, carboxamide, cyano, and sulfonate groups, and wherein pairs of adjacent groups can complete a benzo-fused ring, R<sup>19</sup> is an organic group containing up to 50 non-hydrogen atoms selected from C, N, O, S, P and halogen atoms, Z is selected from O and S atoms, each M is independently selected from H and a cationic center and n is a number which satisfies electroneutrality; and provided that any one of R<sup>11</sup>–R<sup>18</sup> or a substituent on any one of R<sup>10</sup>–R<sup>19</sup> can be a group —A—Q wherein A is a spacer group selected from C<sub>1</sub>–C<sub>10</sub> alkylene and C<sub>2</sub>–C<sub>10</sub> oxyalkylene groups and Q is a linking group capable of forming a covalent bond selected from halogen, diazo, —NCO, —NCS, —CHO, acid anhydride, oxiranyl, succinimidoxycarbonyl, maleimide, cyano, triazole, tetrazole, hydroxyl, —COOH, thiol, primary amino and secondary amino groups.

5,772,927

CARBURETOR FUEL ADJUSTING DEVICE

Kimio Koizumi, Yasuaki Kohira, and Satoru Araki, all of Kanagawa, Japan, assignors to U.S.A. Zama, Inc., Franklin, Tenn.

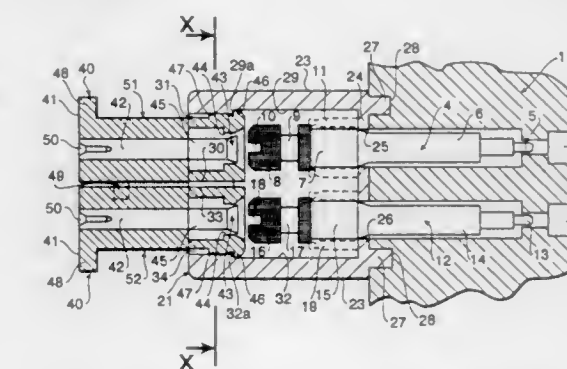
Continuation of Ser. No. 526,039, Sep. 8, 1995, abandoned, which is a continuation-in-part of Ser. No. 406,567, Mar. 20, 1995, abandoned. This application Mar. 27, 1996, Ser. No. 624,757

Claims priority, application Japan, Dec. 1, 1994, 6-323568

Int. Cl.<sup>6</sup> F02M 3/10

U.S. Cl. 261—67

22 Claims



1. A fuel adjustment device for a carburetor comprising a body,

manual adjustment valves that regulate separately the effective cross-sectional area of a main fuel jet and a low-speed fuel jet in said body of the carburetor, said adjustment valves are located parallel and adjacent to each other and have extensions extending beyond said body, said manual adjustment valves having base-end portions and small-diameter portions, an adjustment limiting device comprising

a cap engaging said extension of said adjustment valve for the main fuel jet in an engaged position, and

a retainer attached to said body of the carburetor and disposed over said extension of said adjustment valve for the main fuel jet, said retainer having a retention hole therein adapted to receive and retain said cap in a disengaged position adjacent said extension of said adjustment valve, said retainer having a retaining plate having retainer holes adapted to receive and retain said adjustment valves in prescribed adjustment positions,

wherein the retainer holes of said retainer plate each have a diameter larger than the external diameter of the small-diameter portion of each of said adjustment valves and smaller than the external diameter of the base-end portion of each of said adjustment valves.

5,772,928

NEEDLE AND SEAT VALVE ASSEMBLY

Barry L. Holtzman, 2801 Thatcher Ct., Bloomington, Ind. 47401

Filed Jun. 14, 1996, Ser. No. 664,187

Int. Cl.<sup>6</sup> F02M 5/12

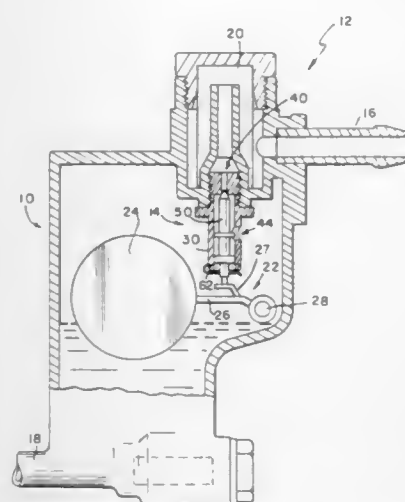
U.S. Cl. 261—67

25 Claims

1. A valve assembly for controlling the flow of fuel to the fuel chamber of a carburetor, the valve assembly comprising a housing including a side wall defining an inlet, an outlet in fluid communication with the inlet, an interior region therebetween, and

a needle received in the interior region of the housing for movement therein between a closed position blocking the flow of fuel between the inlet and the outlet and an open position allowing the flow of fuel between the inlet and the outlet, the needle including a post and a skirt fixed to the post and extending outwardly therefrom, the skirt cooperating with the side wall to restrict the flow of fuel therebetween dampening the movement of the needle relative to the housing so





5,772,929  
MANUFACTURING METHOD OF MICROCAPSULE  
USING PHOSPHOLIPID

Shinichi Enomura, Kashiara, and Mitsuru Nakano, Sakai,  
both of Japan, assignors to M Technique Co., Ltd., Osaka,  
Japan

Filed Nov. 20, 1995, Ser. No. 560,815  
Claims priority, application Japan, Jul. 10, 1995, 7-198191  
Int. Cl.<sup>6</sup> B01J 13/00; I3/04

U.S. Cl. 264—4.1 14 Claims  
1. A manufacturing method of microcapsules comprising the  
steps of:

filling a treating tank of a high speed rotary dispersing machine  
with only a treating liquid to avoid contact with a gas phase,  
said treating liquid comprising at least a phospholipid;  
dispersing the treating liquid by the high speed rotary dispersing  
machine; and

while dispersing said treating liquid, pressurizing the treating  
tank which is kept completely filled or at most has only a  
slight gas phase to decrease cavitation generation and to form  
microcapsules, wherein a mean particle size of said microcap-  
sules in said treating liquid is substantially reduced and stabi-  
lity of said microcapsules remains high for a long period as  
compared to the otherwise identical process but conducted in  
the presence of an air phase due to the elimination of bubbles  
in said filling and dispersing steps.

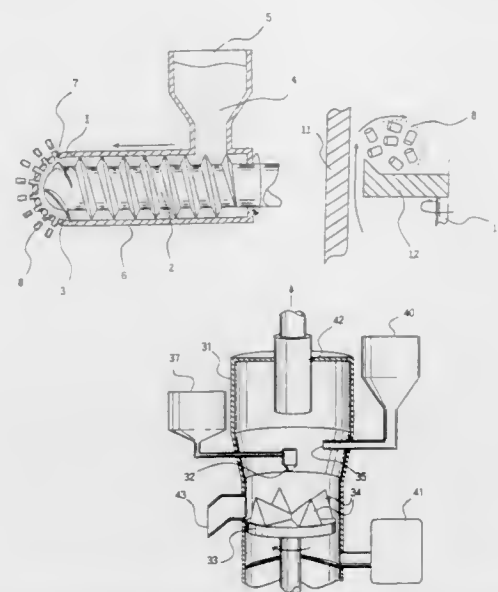
5,772,930  
METHOD OF PRODUCING CATHODE MIXTURE FOR  
BATTERIES

Tatsuya Hashimoto, Itami; Fumio Daio, Kitakatsuragi-gun;  
Kenichi Ohshima, Katano, and Akira Iguchi, Neyagawa, all  
of Japan, assignors to Matsushita Electric Industrial Co.,  
Ltd., Osaka-Fu, Japan

Filed Dec. 26, 1996, Ser. No. 774,166  
Claims priority, application Japan, Dec. 27, 1995, 7-340940;  
Oct. 15, 1996, 8-272597; Oct. 15, 1996, 8-272598; Oct. 15, 1996,  
8-272608

Int. Cl.<sup>6</sup> B29B 9/00 12 Claims  
1. A method of producing a cathode mixture for batteries com-  
prising the steps of:

supplying a wet mixture containing a cathode active material, a  
binding agent and a conductive material into a screw inline  
granulator comprising a cylinder, an extruding screw disposed  
in said cylinder and a hemispherical die having through holes



at the tip surface of said cylinder so as to produce granules by  
extruding said mixture from said through holes by the rotation  
of said extruding screw;  
preparing a granule shaping apparatus comprising a sealed cylin-  
drical container, a rotary disc placed horizontally and having a  
frame-like side wall projecting upward in said cylindrical  
container and a means for blowing air from the clearance  
between said container and said rotary disc; and  
supplying said granules onto said rotary disc, to shape said  
granules into spheres.

5,772,931  
SLAG COATING PROCESS  
Bruce Langley Farrand, Hamilton, Canada, assignor to  
Dofasco Inc., Hamilton, Canada

Filed Dec. 20, 1996, Ser. No. 771,406  
Int. Cl.<sup>6</sup> F27D 1/16

U.S. Cl. 264—30 12 Claims



1. A slag coating process for coating a steelmaking vessel with  
slag between heats to protect a refractory lining of the vessel, the  
process comprising the steps of:

assessing the volume and viscosity of slag remaining in the  
vessel after a tap of refined steel;  
adding a predetermined quantity of coolant comprising cold slag  
formed from a previous operation of a steelmaking vessel,  
said quantity being adapted to cool the volume of slag remain-  
ing in the vessel and to produce a slag having a viscosity  
sufficient to coat the refractory lining;

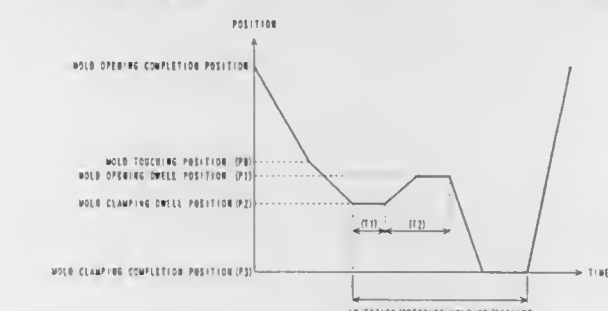
rocking the steelmaking vessel to mix and distribute the slag  
over the refractory lining; and  
dumping excess slag from the steelmaking vessel.

5,772,932  
MOLD CLAMPING CONTROL METHOD FOR  
INJECTION MOLDING MACHINE

Masao Kamiguchi; Yuichi Hosoya, both of Kawaguchiko-  
machi; Koji Senda, Yamanashi, and Noriaki Neko, Fujii-  
oshida, all of Japan, assignors to Fanuc Ltd., Yamanashi,  
Japan

Filed Jul. 29, 1996, Ser. No. 688,245  
Claims priority, application Japan, Jul. 29, 1995, 7-210175  
Int. Cl.<sup>6</sup> B29C 45/77

U.S. Cl. 264—40.5 12 Claims



1. A mold clamping control method for an injection molding  
machine in which a mold is clamped by moving a movable platen  
with respect to a stationary platen, said method comprising:

- advancing said movable platen to a mold clamping dwell  
position set between a mold touching position and a mold  
clamping completion position to hold said movable platen in  
said mold clamping dwell position, and starting injection;
- retracting said movable platen to a mold opening dwell  
position set between said mold touching position and said  
mold clamping dwell position to hold said movable platen in  
said mold opening dwell position; and
- advancing said movable platen to said mold clamping  
completion position.

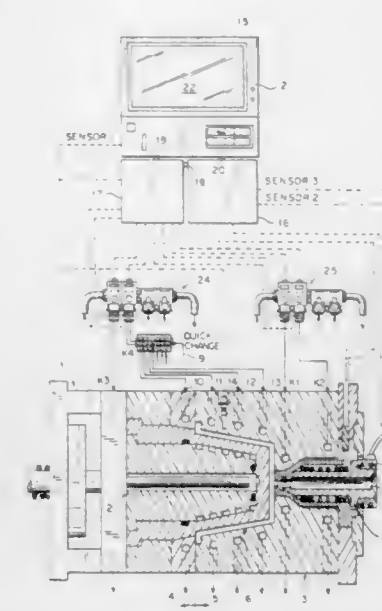
5,772,933  
METHOD FOR TEMPERING AN INJECTION MOLD  
HAVING AT LEAST ONE HEATED NOZZLE OR HOT  
RUNNER

Werner Kotzab, Heinestrasse 7, D-97422 Schweinfurt, Ger-  
many

Filed Oct. 12, 1995, Ser. No. 542,161  
Claims priority, application Germany, Oct. 12, 1994, 44 36  
376.1; Dec. 10, 1994, 44 44 092.8

Int. Cl.<sup>6</sup> B29C 45/75 7 Claims

1. A method for tempering an injection mold for die-casting a  
plastic or an aluminum part, said injection mold having at least one  
heated runner and means for cooling and heating, said method  
comprising the steps of introducing under pressure in a recurrent  
cycle, a molten material through said heated runner into a mold  
cavity of the injection mold, permitting the molten material to  
harden and thereafter removing the part formed from the injection  
mold, wherein a temperature is measured by at least one tempera-  
ture measuring sensor during each said recurrent cycle and com-  
pared with a predetermined command temperature; and said means  
for cooling and heating are actuated to supply cooling or heating as  
a function of a deviation between the measured temperature and  
the predetermined command temperature; wherein respective mea-  
suring sensors control the means for the cooling and heating,  
wherein a three-dimensional quantitative distribution profile of the  
cooling or the heating is ascertained, and at least at one specific  
time during a recurrent cycle a comparison is made between the



predetermined command temperature and the measured tempera-  
ture of the one temperature measuring sensor, a plurality of flow  
control valves are triggered as a function of the deviation and as a  
function of the three-dimensional quantitative distribution profile  
of the cooling and the heating, wherein a separate controller, each  
with a separate processor, is respectively provided for the cooling  
and the heating, and that the amount of heat to be supplied to  
various regions of the mold in every said recurrent cycle, resulting  
from the heating and from a thermal quantity of the melt, is  
transmitted before a next said recurrent cycle to the controller of  
the means for cooling, and the cooling quantities are controlled as  
a function of an amount of said heating and the thermal quantity of  
the melt for the next recurrent cycle;

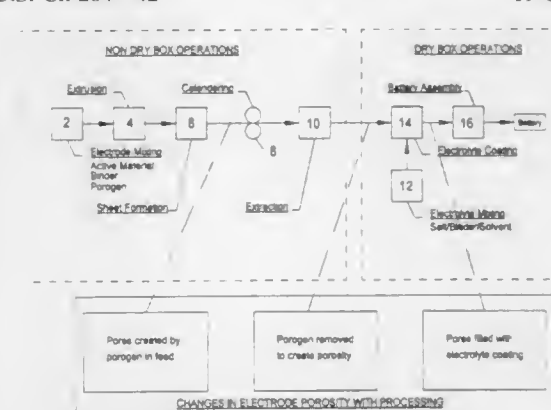
wherein the temperature, measured during each said recurrent  
cycle by the temperature measuring sensor located in the  
vicinity of the mold cavity, is compared with a lower tempera-  
ture threshold, and as soon as the temperature drops below  
this lower temperature threshold the heating is reduced via the  
controller for the means for heating.

5,772,934  
PROCESS TO PRODUCE LITHIUM-POLYMER  
BATTERIES

Kenneth Orville MacFadden, Highland, Md., assignor to W. R.  
Grace & Co.-Conn., New York, N.Y.

Filed May 24, 1996, Ser. No. 653,173  
Int. Cl.<sup>6</sup> H01M 6/18

U.S. Cl. 264—42 19 Claims



1. A process for forming a solid polymer electrolyte-electrode  
composite comprising the steps of:  
forming an electrode comprising active material, binder and  
poregen;

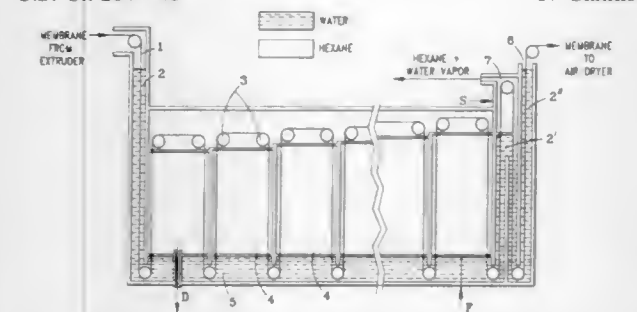
removing at least a portion of the porogen to provide a porous electrode;  
applying to the porous electrode a fluid, low viscosity mixture of components of a solid polymer electrolyte composition comprising electrolyte salt, polymer binder and electrolyte liquid, said application being conducted at an elevated temperature sufficient to cause said composition to be a fluid, low viscosity mixture, and said binder of the solid polymer electrolyte has a lower melt (deformation onset) thermal properties than the binder of the electrode;  
diffusing the applied electrolyte mixture into the pores of the electrode to form a composite product; and  
cooling the composite product, the solid polymer electrolyte being entrapped in the porous electrode.

5,772,935  
METHOD OF CONTINUOUS EXTRACTION OF  
PLASTICIZER FROM BATTERY SEPARATOR  
MEMBRANES AND THE LIKE DURING THEIR  
MANUFACTURE, AND EXTRACTOR APPARATUS  
THEREFOR

Igor Zhadanovsky, 27 Herrick Rd., #3, Newton, Mass. 02159  
Filed Aug. 14, 1996, Ser. No. 696,506  
Int. Cl.<sup>6</sup> B01D 67/00

U.S. Cl. 264—48

17 Claims



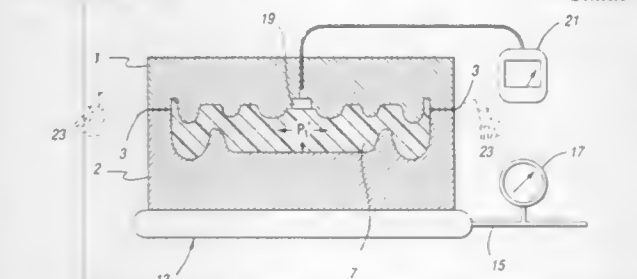
1. A method of continuous extraction of an oil plasticizer from a composite polymer membrane sheet, that comprises, conveying the membrane sheet between an extruder inlet and outlet and immediately through and along successive sections of an extruder solvent in counter flow to fresh solvent injection, the solvent being of a type suitable for extraction oil, but insoluble in water; and injecting water/steam at the inlet and outlet and into the sections to provide inlet and outlet water compartments locking against solvent evaporation into the atmosphere and to provide intermediate water interfaces to the membrane as it passes between the successive extruder solvent sections.

5,772,936  
METHOD OF REDUCING PINCH DEFORMATION AND  
CONTOUR LINES IN POLYURETHANE MOLDED FOAM  
EMPLOYING TIMED PARTIAL PRESSURE RELEASE

Keith Douglas Cavender, Charleston, W. Va., assignor to  
ARCO Chemical Technology, L.P., Greenville, Del.  
Filed Feb. 8, 1995, Ser. No. 385,409  
Int. Cl.<sup>6</sup> B29C 44/02

U.S. Cl. 264—51

19 Claims



1. A process for the in-mold cell opening of molded polyurethane foams, comprising:

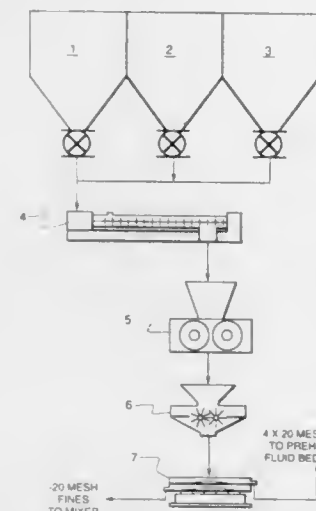
- introducing a liquid foamable polyurethane prereaction mixture into a mold having sealing surfaces and adapted to be sealed by application of a first clamping force sufficient to seal the mold along said sealing surfaces, at least a portion of said first clamping force provided by one or more clamping devices selected from the group consisting of mechanical clamps, pneumatic clamps, and hydraulic clamps, such that egress of polyurethane past the sealing surfaces is substantially prevented;
- sealing said mold by application of said first clamping force;
- permitting said prereaction mixture to react and expand into contact with the internal mold surfaces to form a curing polyurethane cellular product containing pressurized expansion gas(es) contained within the cells of said curing polyurethane cellular product, said curing polyurethane cellular product having a TPR window;
- partially reducing said first clamping force to a second, reduced clamping force during the TPR window of said curing polyurethane cellular product such that the internal pressure generated by said curing polyurethane cellular product exceeds the force required to maintain said sealing, breaking said seal, a substantial portion of cell walls of said cells rupture and a portion of said expansion gas(es) escape from said mold, substantial separation of said sealing surfaces of said mold prevented due to application of said second, reduced clamping force;
- allowing said curing polyurethane cellular product to cure in said mold until it has developed sufficient strength to be removed from said mold; and
- removing a cell-opened polyurethane cellular product from said mold.

5,772,937  
METHOD TO PRODUCE AGGREGATE PRODUCTS  
Sidney M. Cohen, Allentown, and Michael E. Prokesch, Zion Hill, both of Pa., assignors to Fuller Company, Bethlehem, Pa.

Filed Oct. 15, 1996, Ser. No. 732,805  
Int. Cl.<sup>6</sup> B29C 67/04

U.S. Cl. 264—117

23 Claims



1. A method to produce aggregate products from waste material streams, said method comprising:
- combining an encapsulation material with said waste materials to form a mix suitable for granulation;
  - feeding the mix to a granulation means to form particles having a size suitable to be thermally treated in a bed thermal processing means;
  - delivering the particles into a bed thermal processing apparatus in which the particles are converted into an aggregate product; and
  - cooling the aggregate product.

15. An apparatus utilized for the continuous production of an aggregate product from a waste material and an encapsulation material, said apparatus comprising
- mixing means to combine the encapsulation material with the waste materials to form a mix;
  - means to compact the mix;
  - granulation means to form particles from the compacted mix having a size suitable to be thermally processed in a bed thermal processing means;
  - a bed thermal processing means for receiving and thermally processing the particles to thereby form an aggregate therefrom; and
  - means for cooling the aggregate product.

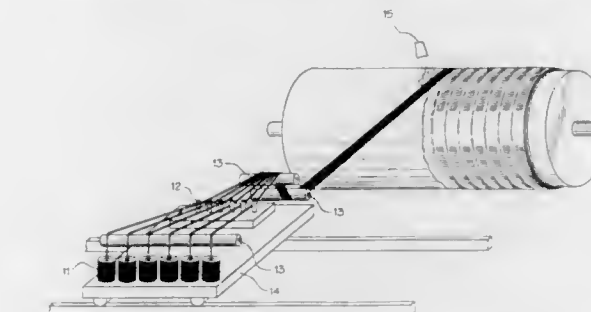
5,772,938  
COMPOSITE STORAGE TANK HAVING DOUBLE WALL  
CHARACTERISTICS

Bruce R. Sharp, 321 Ski Way Box 5867, Incline Village, Nev. 89450

Division of Ser. No. 644,258, May 10, 1996, Pat. No. 5,628,425. This application May 13, 1997, Ser. No. 854,915  
Int. Cl.<sup>6</sup> B05D 3/12; B29C 39/16; B65D 90/02

U.S. Cl. 264—137

30 Claims



1. A method of building a composite storage tank having double wall characteristics, comprising the steps of:
- applying a viscous resinous core material to a support surface;
  - winding onto, into or with the viscous resinous core material discrete filament bundles so as to encapsulate said filament bundles, yet not significantly penetrate into said filament bundles; and
  - at least partially curing the viscous resinous core material to form a cylindrical-shaped tank wall whereby an interior of each said filament bundle is substantially resin-free to provide continuous closed communication flow paths which allow detection of leakage in said tank wall.

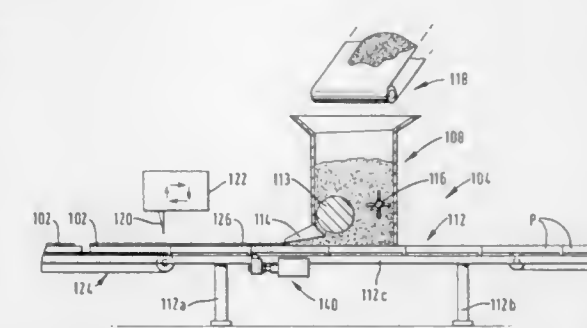
5,772,939  
MANUFACTURE OF BUILDING PRODUCTS  
Jeffery James Palm, Gilroy; Luis Garcia, Jr., Hollister; James Gilbert Buchanan, Lodi, all of Calif., and Bhushan Kumar Oberoi, Reigate, United Kingdom, assignors to Monier, Inc., Winters, Calif.

Filed Jul. 3, 1996, Ser. No. 675,088  
Claims priority, application United Kingdom, Jul. 5, 1995, 9513692

Int. Cl.<sup>6</sup> B28B 11/16; B29C 37/00  
U.S. Cl. 264—145

3 Claims

1. A process for the manufacture of roof tiles having randomly shaped leading edges, i.e. the edges of the tiles that are lowermost in use on a roof, said process including the steps of:
- forming a ribbon of "green state" mortar on a series of tile forming pallets; and
  - effecting the rupture of said ribbon of "green state" mortar at joints between successive pallets of said series to provide the randomly shaped leading edges.



characterised in that the rupture of the ribbon of "green state" mortar at the joints between the successive pallets of the series is effected by causing successive leading ones of the series of pallets to be accelerated away from the remaining pallets of the series to create a gap therebetween whereby the ribbon of "green state" mortar is broken coincident with said gap, or substantially so, to produce a randomly shaped leading edge to the tiles formed on successive pallets of the series.

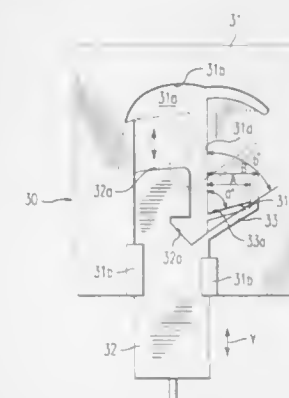
5,772,940  
METHOD OF MANUFACTURING MOLDINGS AND AN  
APPARATUS THEREOF

Yoshihiro Aoyama, Ohbu, Japan, assignor to Tokai Kogyo Kabushiki Kaisha, Ohbu, Japan

Filed Aug. 30, 1996, Ser. No. 707,207  
Claims priority, application Japan, Aug. 31, 1995, 7-248368  
Int. Cl.<sup>6</sup> B29C 47/16

U.S. Cl. 264—167

5 Claims



1. A method for producing a molding strip for a vehicle window opening, said molding strip having a side molding part, a corner molding part, and an upper molding part, each of said parts having inner and outer ornament portions, a glass engagement groove, and a leg portion, said leg portion connected to said inner and outer ornament portions, said side molding part having a ridge piece extending as a lip from said leg portion, said ridge piece of said side molding part being limited in extent such that said ridge piece does not extend to said upper molding part, said leg portion of said side molding part gradually being reduced in size such that the leg portion of said upper molding part is smaller than the leg portion of said side molding part, said method comprising the steps of:
- extruding molding material through an opening in a first die while blocking off part of said opening with a second die, the first and second dies situated in a first position so as to form said side molding part of said molding;
  - continuing to extrude said molding material while translating said second die relative to said first die in a first direction toward a second position of said second die, thereby gradually reducing in size said ridge piece of said side molding part and said leg portion to thereby form a corner part, said ridge piece being reduced in size from a leading end toward a root side; and



extruding an upper part of said molding strip wherein said second die is positioned relative to said first die so as to be in said second position thereby forming said upper molding part of said molding.

3. An apparatus for manufacturing a continuous extrusion molding, which comprises:

a first die having a port, the port having a shape of an elongate body with a ridge piece protruding from said elongate body as a lip, said port having one end in the shape of inner and outer ornament portions; and

a second die having an extrusion defining contour in communication with said port of said first die to form an end region of the molding opposite to the end the molding having the shape of inner and outer ornament portions, said extrusion defining contour includes a leg portion surface and a supporting piece surface, said second die having a lip removing member for removing said ridge piece, said second die located adjacent to and in a plane parallel to said first die, said second die movable relative to said first die in a direction perpendicular to an extrusion direction,

wherein, when the second die is moved relative to the first die to a first position thereby forming a side molding part, said side molding part includes a ridge piece extending as a lip from a leg portion, when the second die is moved relative to the first die toward a second position thereby gradually reducing in size said ridge piece of said side molding part and said leg portion to thereby form a corner molding part, when the second die is moved relative to the first die to the second position thereby forming an upper molding part including a leg portion, each of said side molding, corner molding and upper molding parts include a glass engagement groove and inner and outer ornament portions connected to said leg portion.

5,772,941

**POLYVINYL CHLORIDE RESIN SHEETS AND PRODUCTION THEREOF**

Reikichi Nakano, Kobe, Japan, assignor to Bando Chemical Industries, Ltd., Kobe, Japan

Filed Mar. 14, 1996, Ser. No. 616,067

Claims priority, application Japan, Mar. 16, 1995, 7-057723  
Int. Cl.<sup>6</sup> B29C 43/24

U.S. Cl. 264—175

5 Claims

1. A method for producing a polyvinyl chloride resin sheet having a thickness of 50–500  $\mu\text{m}$ ; an embossed and matted surface whose roughness is 15–25  $\mu\text{m}$ ; the sheet further comprising short glass fibers having a diameter of 6–12  $\mu\text{m}$  and an average length of 0.2–1.0 mm in an amount of 0.5–30 parts by weight per 100 parts by weight of polyvinyl chloride; and a transmittance of not less than 75%, the method comprising:

preparing a composition comprising

- (a) polyvinyl chloride;
- (b) a plasticizer in an amount of 5–35 parts by weight per 100 parts by weight of polyvinyl chloride; and
- (c) short glass fibers having a diameter of 6–12  $\mu\text{m}$  and an average length of 2–12 mm in an amount of 0.5–30 parts by weight per 100 parts by weight of polyvinyl chloride;

calendering the composition into a calendered resin sheet with calender rolls; and then embossing the surface of the calendered resin sheet with an embossing machine having an embossing roll whose surface roughness is in a range of from 3  $\mu\text{m}$  to 6  $\mu\text{m}$  and a backup roll, with a ratio of a peripheral velocity of the embossing roll to a peripheral velocity of a final roll of the calender rolls being in a range of 1.3–2.3 and with the peripheral velocity of the final roll being in a range of 10–25 m per minute, whereby the

polyvinyl chloride resin sheet having the surface roughness of 15–25  $\mu\text{m}$  is obtained, wherein the surface roughness is expressed in terms of ten point average roughness.

5,772,942

**PROCESSES FOR PRODUCING POLYBENZAZOLE FIBERS**

Yoshihiko Teramoto; Tooru Kitagawa, and Michio Ishitobi, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka-Fu, Japan

Filed Sep. 5, 1996, Ser. No. 707,546

Claims priority, application Japan, Sep. 5, 1995, 7-228009; Sep. 13, 1995, 7-235208

Int. Cl.<sup>6</sup> D01D 5/06; 10/02; 10/06; D01F 6/26

U.S. Cl. 264—184

9 Claims

1. A process for producing a polybenzazole fiber, comprising the steps of: extruding a spinning dope containing a polybenzazole polymer in an acid solvent through a spinning to form a dope filament; coagulating the dope filament as a fiber in a coagulating medium; washing the fiber with a fluid capable of dissolving the acid solvent; and drying the fiber, in a heating zone with at least 80% part of the total length of the heating zone being set at 240° C. or higher.

5,772,943

Patent Not Issued For This Number

5,772,944

**METHOD OF MANUFACTURING PLASTIC STRAP**

Sandro DiPede, North York, Canada, and Russell J. Gould, Mt. Prospect, Ill., assignors to Samuel Manu-Tech, Inc., Ontario, Canada

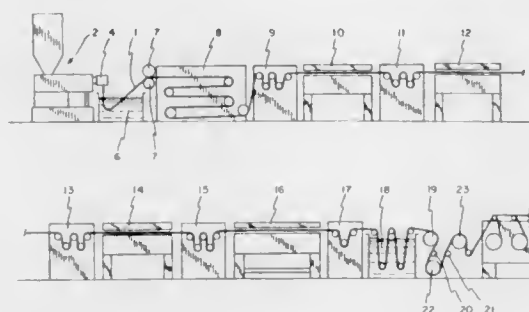
Division of Ser. No. 148,301, Nov. 8, 1993, Pat. No. 5,525,391.

This application Apr. 8, 1996, Ser. No. 629,162

Int. Cl.<sup>6</sup> B29C 47/88

U.S. Cl. 264—211.13

11 Claims



1. A method of manufacturing strapping comprising the steps of: passing a polyester or polyester copolymer material through a series of godet rolls at least three separate times such that the total stretch ratio to which said material is subjected is at least 5.0 to 1.0.

orienting the material to an extent sufficient to produce a strap having a break strength of at least 70,000 psi,

while said strap is below room temperature, exposing surface areas of said strap to a heated surface sufficient to cause the material of said strap at said surface areas to lose its orientation, thereby creating an amorphous layer on said strap.

5,772,945

**COMPOSITE MATERIAL ORTHOTIC INSERT CONSTRUCTED BY TWO STEP MOLDING**

Dennis N. Brown, Blaine, Wash., assignor to Northwest Podiatric Laboratory, Inc., Blaine, Wash.

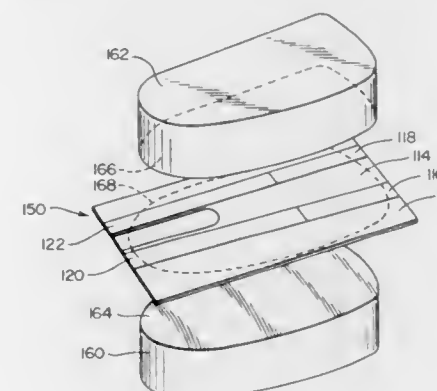
Division of Ser. No. 253,388, Jun. 3, 1994. This application

Jul. 28, 1995, Ser. No. 508,777

Int. Cl.<sup>6</sup> B29C 35/02; 43/20

U.S. Cl. 264—258

10 Claims



# UMI

1. A method of forming a composite charge prior to curing, comprising the steps of:

said storage means and storing said first and second carrier means with molded preforms in said storage means;

#### 14 Claims

1. A method of manufacturing a meltblown yarn comprising

- (a) forming a long meltblown web of a thermoplastic polymer having a width of from 2.5 to 16 cm, an average fiber size of from 0.3 to 10 microns, and a basis weight of from 1 to 20 g/m<sup>2</sup>; and
- (b) twisting the meltblown web into a spiral shape forming a yarn having a diameter of from 0.5 to 5 mm and a bulk density of 10 to 100 kg/m<sup>3</sup>.

#### 4 Claims

(h) heating the green article to remove organic content and to increase the density of the article.



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UMI

5,772,954  
COMBINED PREHEAT AND CUTTING OXYGEN VALVE  
FOR CUTTING TORCHES

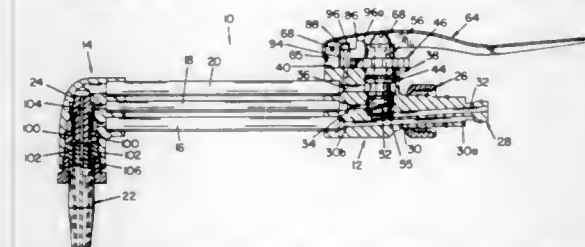
Randy C. Edenfield, Flowery Branch, Ga., assignor to The Lincoln Electric Company, Cleveland, Ohio

Filed Sep. 27, 1996, Ser. No. 722,892

Int. Cl.<sup>6</sup> B23K 7/00

U.S. Cl. 266—48

35 Claims



1. In a gas torch comprising a torch head and a torch tip at said head, a valve body having a fuel gas inlet and an oxygen inlet, a preheat oxygen outlet, a cutting oxygen outlet and a preheat fuel gas outlet, valve means for controlling the flow of preheat fuel gas to said preheat fuel gas outlet and oxygen to said preheat oxygen outlet and said cutting oxygen outlet, and means for connecting said preheat fuel gas outlet, said preheat oxygen outlet and said cutting oxygen outlet with said torch head for a combustible mixture of said preheat fuel gas and said preheat oxygen to flow through said tip for ignition and for said cutting oxygen to flow through said tip separate from said combustible mixture, the improvement comprising: said valve means including relatively displaceable coaxially interengaging preheat oxygen and cutting oxygen valve means in said valve body between said oxygen inlet and said preheat oxygen and cutting oxygen outlets, said preheat oxygen valve means having open and closed conditions for respectively connecting and disconnecting said oxygen inlet with said preheat oxygen outlet, said cutting oxygen valve means having open and closed conditions respectively connecting and disconnecting said oxygen inlet with said cutting oxygen outlet, and operating means for displacing said preheat oxygen and said cutting oxygen valve means between said open and closed conditions thereof.

5,772,955  
APPARATUS FOR SUSPENSION SMELTING

Pekka Hanniala; Risto Saarinen, both of Espoo; Erkki Krogerus, and Ilkka Kojo, both of Kirkkonummi, all of Finland, assignors to Outokumpu Engineering Contractors OY, Finland

Division of Ser. No. 373,983, Jan. 18, 1995, Pat. No. 5,565,016.

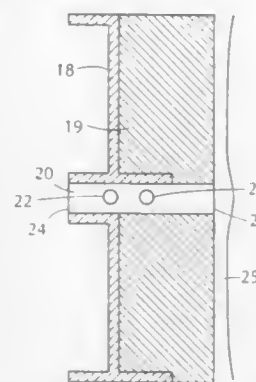
This application Jun. 28, 1996, Ser. No. 671,959

Claims priority, application Finland, Feb. 17, 1994, 940739

Int. Cl.<sup>6</sup> C22B 5/12

U.S. Cl. 266—182

3 Claims



1. A furnace for suspension smelting sulfidic finely divided materials, the furnace comprising walls defining a reaction space; means for feeding, respectively, finely divided solid raw material containing metal to be smelted, flux, and oxidizing gas; means for

removing molten phases created in the furnace and a gas phase; means for cooling at least the walls of the reaction space; and means for feeding additional fuel, wherein the walls comprise a frame with a reaction shaft side toward the interior of the reaction space and a frame side away from the interior of the reaction space and wherein there is attached to the frame at least one cooling element being essentially homogeneous and manufactured by draw casting.

5,772,956  
HIGH STRENGTH, FERRITIC HEAT-RESISTANT STEEL  
HAVING IMPROVED RESISTANCE TO  
INTERMETALLIC COMPOUND PRECIPITATION-  
INDUCED EMBRITTLEMENT

Yasushi Hasegawa; Masahiro Ohgami, and Hisashi Naoi, all of Futsu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

PCT No. PCT/JP96/00319, § 371 Date Oct. 11, 1996, § 102(e) Date Oct. 11, 1996, PCT Pub. No. WO96/25530, PCT Pub. Date Aug. 22, 1996

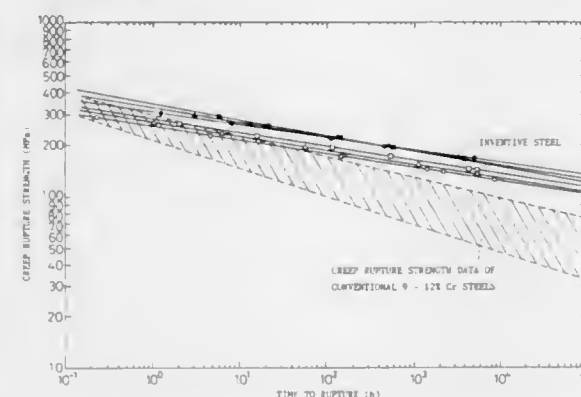
PCT Filed Feb. 14, 1996, Ser. No. 722,057

Claims priority, application Japan, Feb. 14, 1995, 7-025738

Int. Cl.<sup>6</sup> C22C 38/22; 38/30

U.S. Cl. 420—40

4 Claims



1. A high strength, ferritic heat resistant steel having improved resistance to intermetallic compound precipitation-induced embrittlement, characterized by comprising, by mass:

C: 0.01 to 0.30%,  
Si: 0.01 to 0.80%,  
Mn: 0.20 to 1.50%,  
Cr: 8.00 to 13.00%,  
Mo: 0.01 to 3.00%,  
W: 0.10 to 5.00%,  
Co: 0.05 to 6.00%,  
V: 0.002 to 0.800%,  
Nb: 0.002 to 0.500%, and  
N: 0.002 to 0.200% and

at least one additional element selected from

Ca: 0.0005 to 0.0050%,  
Ba: 0.0003 to 0.0020%,  
Mg: 0.0005 to 0.0050%,  
La: 0.001 to 0.020%,  
Ce: 0.001 to 0.020%, and  
Y: 0.001 to 0.020%,

said Ca, Ba, and Mg being contained as precipitate,

said La, Ce, and Y being contained as precipitate or in solid solution,

said steel further comprising one of or a combination of

Ti: 0.002 to 0.500% and  
Zr: 0.002 to 0.500%,

said steel having P, S, and O contents limited to

P: not more than 0.030%,  
S: not more than 0.010%, and  
O: not more than 0.020%,

with the balance consisting of Fe and unavoidable impurities.

5,772,957  
HIGH STRENGTH STEEL COMPOSITION HAVING  
ENHANCED LOW TEMPERATURE TOUGHNESS

Iain A. Thomson, Portland; Larry G. Ward, Milwaukee; James Peck, Clackamas, and Dwayne E. Lewis, Oregon City, all of Oreg., assignors to Blount, Inc., Montgomery, Ala.

Continuation-in-part of Ser. No. 431,438, May 1, 1995, Pat.

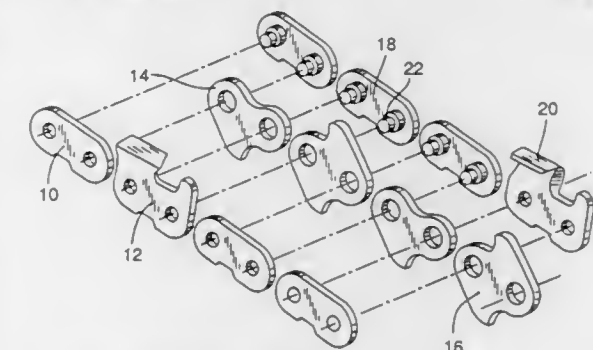
No. 5,651,938. This application Aug. 23, 1996, Ser. No.

702,357

Int. Cl.<sup>6</sup> C22C 38/44; C21D 9/00

U.S. Cl. 420—108

23 Claims



1. A steel composition, comprising:

from about 0.25 weight percent to about 0.35 weight percent nickel;

from about 0.2 to about 0.3 weight percent chromium;

from about 0.5 weight percent to less than about 1.0 weight percent carbon;

from about 0.3 to about 0.5 weight percent manganese;

from about 0.1 to about 0.35 weight percent silicon; and

from about 0.1 weight percent to about 0.13 weight percent molybdenum and the balance iron and normal small amounts of impurities.

5,772,958  
METHOD AND APPARATUS FOR THE  
PASTEURIZATION OF A CONTINUOUS LINE OF  
PRODUCTS

Jørgen Tage Nielsen, Copenhagen N, Denmark, assignor to Sander Hansen A/S, Glostrup, Denmark

PCT No. PCT/DK95/00062, § 371 Date Aug. 16, 1996, § 102(e)

Date Aug. 16, 1996, PCT Pub. No. WO95/22352, PCT Pub.

Date Aug. 24, 1995

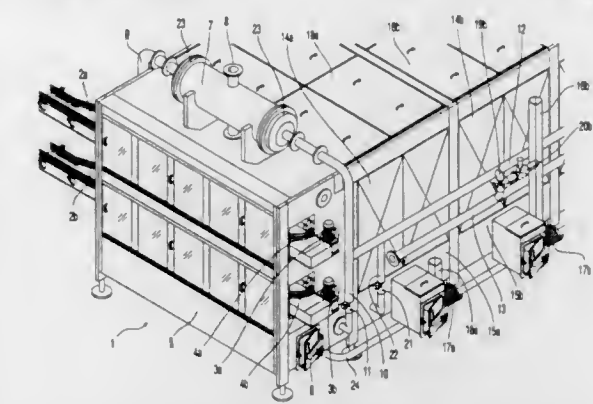
PCT Filed Feb. 9, 1995, Ser. No. 693,295

Claims priority, application Denmark, Feb. 18, 1994, 0204/94

Int. Cl.<sup>6</sup> A61L 2/18; 2/20; A23C 3/027; B08B 3/04

U.S. Cl. 422—1

8 Claims



1. In a method for the pasteurization of a continuous line of products in an apparatus having a heating area, a pasteurization area and a cooling area as well as conveyance means for carrying the products through the areas in the order indicated in a regular motion from an inlet of the apparatus to an outlet thereof, so that heating, pasteurization and cooling are effected by heat transfer

between the products and a fluid, preferably water, which is sprinkled over the products, the areas being divided into zones extending in the direction of motion of the products, and the temperature of the fluid in the individual zone being controlled to the desired sequence of the heat transfer for the zone, with one of said zones having sprinkling fluid at a highest temperature, the improvement comprising:

- a) heating fluid in a heat unit comprising a heat insulated storage tank and a single source of heat;
- b) constantly circulating the heated fluid through the heat unit;
- c) maintaining the heated fluid in the heat unit at a temperature substantially higher than the temperature of the sprinkling fluid in the zone having the highest temperature;
- d) taking the heated fluid out under low pressure from the heat unit; and
- e) supplying the heated fluid taken out under low pressure in a controlled amount directly from the heat unit to each zone in which the products are to be heated.

5,772,959  
REFRIGERATOR FRESHENER

Edward M. Bermas, Greenwich, Conn., assignor to Harrison-Clifton, Inc., Greenwich, Conn.

Continuation of Ser. No. 560,747, Nov. 20, 1995, abandoned, which is a continuation of Ser. No. 354,935, Dec. 13, 1994,

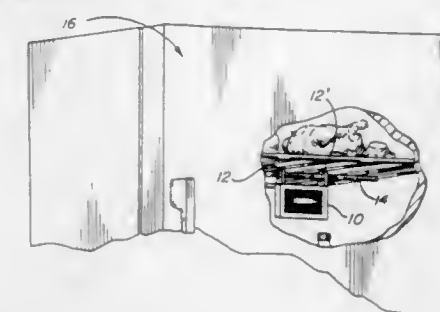
Pat. No. 5,468,447, which is a continuation of Ser. No. 159,732, Nov. 30, 1993, abandoned. This application Oct. 11,

1996, Ser. No. 728,939

Int. Cl.<sup>6</sup> A61L 9/00

U.S. Cl. 422—5

2 Claims



2. A process for maintaining a fresh environment within a refrigerator, by acting immediately to delay the buildup of odors when aromatic foods are placed therein and continuing to maintain low odor levels for extended times, comprising:

providing an air-permeable container having enclosed therein an absorbent, in particulate form, consisting essentially of from 75 to 95 percent of active carbon having pores wherein at least 30 percent of the pores have a diameter of from about 15 to less than about 50 Å and from 5 to 25 percent of an odor-absorbing zeolite having an organophilic character and a surface area of at least 400 square meters per gram; and positioning the container within a refrigerator to permit the normal movement of air within the refrigerator to pass by and be deodorized by the active carbon and the zeolite.

5,772,960  
CONTAINER FOR MEDICAL USE

Takushi Ito, Mitaki-Honmachi; Kouji Suzuki, Misasa-Kitamachi, and Norihiko Kobayashi, Hatsukaichi, all of Japan, assignors to JMS Co., Ltd., Hiroshima, Japan

Filed Dec. 3, 1996, Ser. No. 753,930

Claims priority, application Japan, Dec. 4, 1995, 7-339991

Int. Cl.<sup>6</sup> A61B 19/00; B01J 19/00; G01N 33/00

U.S. Cl. 422—41

16 Claims

1. A container for medical use comprising a storage portion formed of a sheet of soft polyvinyl chloride resin containing a vinyl chloride resin and DUP as a plasticizer wherein the amount

of DUP is between 70 and 100 parts by weight per 100 parts by weight of vinyl chloride resin and wherein the sheet exhibits an oxygen permeability of about  $9.0 \times 10^{-10}$  to  $22.0 \times 10^{-10}$  cc.cm/cm<sup>2</sup>.sec.cmHg/22° C. and a carbon dioxide permeability of about  $6.0 \times 10^{-9}$  to  $19.0 \times 10^{-9}$  cc.cm/cm<sup>2</sup>.sec.cmHg/22° C.

5,772,961

## DEVICE FOR USE IN DIAGNOSIS

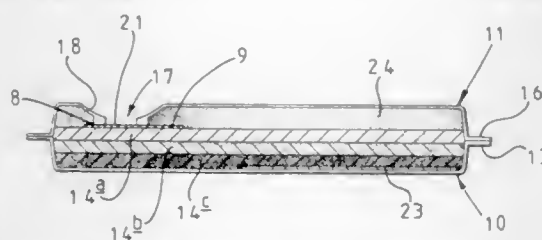
Philip Rees Mico, Malvern Wells, England, assignor to Bio-Diagnostics Limited, Upton-Upon-Severn, England  
PCT No. PCT/GB95/00086, § 371 Date Oct. 10, 1996, § 102(e)  
Date Oct. 10, 1996, PCT Pub. No. WO95/19845, PCT Pub.  
Date Jul. 27, 1995

PCT Filed Jan. 18, 1995, Ser. No. 676,332  
Claims priority, application United Kingdom, Jan. 22, 1994,  
9401219

Int. Cl.<sup>6</sup> G01N 33/48

U.S. Cl. 422—50

10 Claims



1. A device for use in testing samples comprising a container defining an internal cavity, at least one aperture in the container, a porous support located within the cavity so as to have at least a portion thereof accessible through said aperture to provide a visual indication of test results, and a body of fluid-absorbent material located within the cavity adjacent the porous support, said body of fluid-absorbent material being formed from fibres at least some of which are super absorbent fibres of a kind capable of absorbing fluid into the material of the fibre itself, so as to cause the fibre to swell and increase in volume, said container comprising a base element and a cover element which overlies substantially all of the base element and is bonded to the base element around its periphery so as to define said cavity, each element comprising a panel of rigid or semi-rigid material shaped to define said cavity or part of said cavity, the cavity or part cavity on one element being surrounded by a continuous border surface which is bonded to a corresponding surface on the other element to form a substantially air-tight seal, the aforesaid aperture being formed in the cover element of the container and being surrounded by a depression on the outer surface of the cover element to assist in guiding a fluid to the aperture, and a removable cover being provided for sealing engagement across both said aperture and depression, wherein the cavity in the container also includes a panel formed of rubber which is located adjacent the body of fluid-absorbent material to vary the rate of flow of fluid through said material.

5,772,962

## ANALYZING APPARATUS USING DISPOSABLE REACTION VESSELS

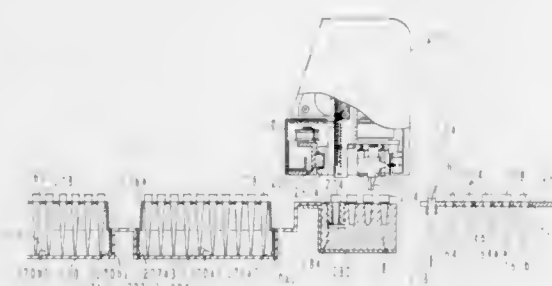
Hiroyasu Uchida, Takashi Sato, and Kenichi Itoh, all of Hitachinaka, Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed May 28, 1996, Ser. No. 654,714

Claims priority, application Japan, May 29, 1995, 7-130733  
Int. Cl.<sup>6</sup> G01N 35/10

U.S. Cl. 422—67

15 Claims

8. An analyzing apparatus in which a sample and a reagent react in a reaction vessel to form a reaction solution, the reaction solution is measured in a measuring device, and the reaction vessel is thereafter discarded, said apparatus comprising:  
a vessel magazine having a plurality of reaction vessels thereon;  
a delivery station for receiving a sample and a reagent into a reaction vessel thereon;



gripping means having finger members for seizing and transferring a reaction vessel;  
carrying means for moving said gripping means so as to carry one of said reaction vessels;  
control means for controlling movement of said carrying means; and  
detection means for detecting the existence of a reaction vessel by lowering said gripping means;  
wherein said control means controls said carrying means so as to lower said gripping means to permit said detection means to detect a reaction vessel, to be transferred by said gripping means from one of said vessel magazine and said delivery station, from a position above said one of said vessel magazine and said delivery station, before said gripping means transfers said reaction vessel.

5,772,963

## ANALYTICAL INSTRUMENT HAVING A CONTROL AREA NETWORK AND DISTRIBUTED LOGIC NODES

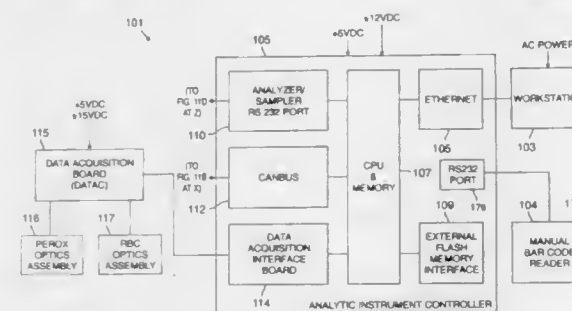
Luigi Cantatore, White Plains; Jeff Busch, Katonah; Maurice J. Epstein, Ardsley, and Edward J. Hetherington, Brewster, all of N.Y., assignors to Bayer Corporation, Tarrytown

Filed Jul. 30, 1996, Ser. No. 688,476

Int. Cl.<sup>6</sup> G01N 35/00

U.S. Cl. 422—67

24 Claims



1. A method for utilizing a control area network (CANBUS) in operating an analytical instrument, comprising:  
providing an operator input device to initiate analysis of a test sample;  
providing a system controller connected to the operator input device;  
providing at least a first node and a second node, each node containing a microprocessor and circuitry responsive to said system controller to perform a function related to said analytical instrument operation, wherein said first and second nodes are operable to perform different functions;  
connecting the system controller to a CANBUS Interface circuit;  
connecting the CANBUS Interface to a CANBUS scrambler circuit;  
connecting each of said first and second nodes to the CANBUS scrambler;  
utilizing a CANBUS protocol to enable communications between each of said nodes and the system controller;  
connecting a power supply to the CANBUS; and  
operating the at least first and second nodes under the control of said system controller using said CANBUS so that each node operates to perform its function independently of the operation of other node.

5,772,964

## NOZZLE ARRANGEMENT FOR COLLECTING COMPONENTS FROM A FLUID FOR ANALYSIS

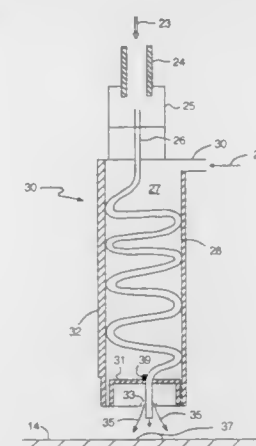
Thomas H. Prevost, Bergen, N.Y., and James L. Dwyer, Concord, Mass., assignors to Lab Connections, Inc., Marlborough, Mass.

Filed Feb. 8, 1996, Ser. No. 599,020

Int. Cl.<sup>6</sup> G01N 30/02

U.S. Cl. 422—70

17 Claims



1. A system for processing fluid carrying a component by depositing the component onto a medium and evaporating the fluid, comprising:  
a collection medium, and  
a nozzle arrangement including a capillary with a first, inlet end for receiving flow of said fluid carrying said component and a second, outlet end, a heater for heating a substantial region of the capillary, and a sheath gas directed toward said collection medium in a manner that said fluid is exposed to said sheath gas after emerging from said outlet end of said capillary, wherein said capillary has an inner diameter of about 15 to 300  $\mu$ m and a length of about 20 cm or more.

5,772,965

## METHOD AND SYSTEM FOR DETECTING DETERIORATION OF EXHAUST GAS CONTROL CATALYST

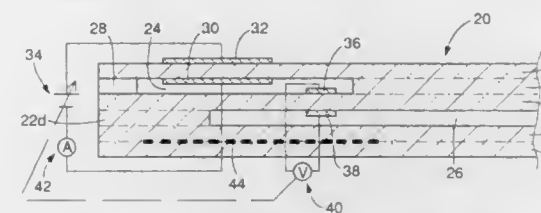
Nobuhide Kato, Aichi-ken, and Noriyuki Ina, Okazaki, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Apr. 15, 1996, Ser. No. 632,148

Claims priority, application Japan, Apr. 19, 1995, 7-093612  
Int. Cl.<sup>6</sup> G01N 27/41

U.S. Cl. 422—98

12 Claims



1. A system for detecting deterioration of an exhaust gas control catalyst provided in an exhaust gas passage through which a combustion exhaust gas containing a combustible gas component is discharged, comprising:  
a processing zone in fluid communication with a portion of said exhaust gas passage which is downstream of said catalyst as viewed in a direction of flow of said exhaust gas;  
diffusion control means for introducing, under a predetermined diffusion resistance, said combustion exhaust gas which has passed through said catalyst into said processing zone;  
an electrochemical oxygen pumping cell including an oxygen ion conductive solid electrolyte layer which partially defines said processing zone, and a pair of electrodes which are

disposed in contact with said oxygen ion conductive solid electrolyte layer and one of which is exposed to said processing zone;

means for energizing said electrochemical oxygen pumping cell to perform an oxygen pumping action for pumping oxygen out of said processing zone to thereby control an oxygen concentration in an atmosphere within said processing zone to a predetermined value at which said combustible gas component cannot be substantially burned;

detecting means for detecting a pumping current flowing through said electrochemical oxygen pumping cell, during energization of said electrochemical oxygen pumping cell;

oxygen partial pressure detecting means for detecting an oxygen partial pressure of said atmosphere within said processing zone;

a variable-voltage power source for applying a voltage between said pair of electrodes of said electrochemical oxygen pumping cell;

means for controlling said power source in response to a signal from said oxygen partial pressure detecting means such that said voltage is controlled on the basis of a monitor voltage, said monitor voltage being maintained in a range of 600–2000 mV, which corresponds to said oxygen partial pressure detected by said oxygen partial pressure detecting means, to thereby control said oxygen pressure of said atmosphere within said processing zone; and

means for determining a degree of deterioration of said catalyst according to an oxygen concentration in said combustion exhaust gas which is obtained on the basis of said pumping current obtained by said detecting means.

5,772,966

## ASSAY DISPENSING APPARATUS

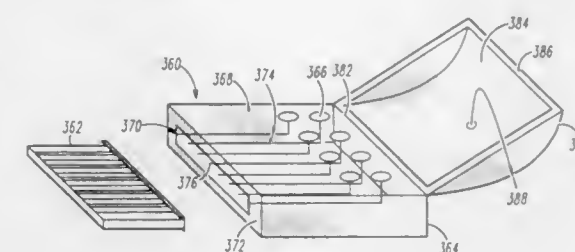
George N. Maracas, 2613 E. Bighorn Ave., Phoenix, Ariz. 85048-9512; William L. Reber, 1029 Bucanier Rd., #6, Schaumburg, Ill. 60916, and Cary D. Perttunen, 11764 Rain-tree Ct., Shelby Township, Macomb County, Mich. 48315

Filed Jan. 24, 1997, Ser. No. 789,220

Int. Cl.<sup>6</sup> G01N 1/14

U.S. Cl. 422—100

10 Claims



1. An assay dispensing apparatus comprising:  
a plurality of filling ports arranged in a two-dimensional pattern at a first face of a body;  
an assay-member-receiving slot defined by the body at a second face, the second face oriented transverse to the first face;  
a plurality of outlets arranged in a one-dimensional pattern, the plurality of outlets positioned and accessible within the assay-member-receiving slot; and  
a plurality of conduits which couple the plurality of filling ports to the plurality of outlets, each of the plurality of conduits having an interior volume less than a volume of one of the plurality of filling ports coupled thereto.



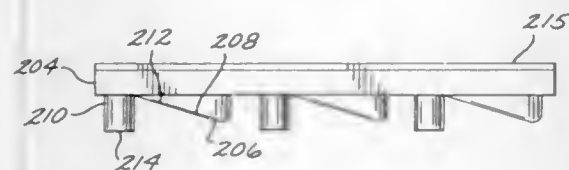
5,772,967

**LUMINESCENCE TEST AND EXPOSURE APPARATUS**  
Jon C. Wannlund, 5850 Despejo Pl., San Diego, Calif. 92124,  
and Jerry W. Smith, 2540 E. Delhi Rd., Ann Arbor, Mich.  
48103

Continuation of Ser. No. 942,321, Sep. 28, 1992, abandoned,  
which is a continuation of Ser. No. 567,385, Aug. 14, 1990,  
abandoned, which is a division of Ser. No. 308,718, Feb. 13,  
1989, Pat. No. 4,985,631, which is a continuation-in-part of  
Ser. No. 155,955, Feb. 16, 1988, Pat. No. 5,035,866. This  
application May 2, 1994, Ser. No. 237,239  
Int. Cl.<sup>6</sup> B01L 3/00

U.S. Cl. 422—102

20 Claims



1. An article of manufacture, comprising:  
at least two elongated test wells, each test well including  
a first reaction chamber having a first reaction chamber bot-  
tom and a first reaction chamber upwardly sloping interior  
wall,  
a solid, dry first chemical reactant in the first reaction chamber,  
a second reaction chamber having a second reaction chamber  
bottom at a lesser height than a top of the first reaction  
chamber upwardly sloping interior wall and a second reaction  
chamber upwardly sloping interior wall that slopes  
upwardly from the second reaction chamber bottom in an  
elongated direction away from the first reaction chamber,  
the second reaction chamber being disposed adjacent the  
top of the first reaction chamber upwardly sloping interior  
wall, whereby tilting of the article of manufacture causes a  
liquid in the first reaction chamber to flow along the first  
upwardly sloping interior wall and into the second reaction  
chamber,  
a final reaction chamber having a final reaction chamber  
bottom at a lesser height than a top of the second reaction  
chamber upwardly sloping interior wall, the final reaction  
chamber being disposed adjacent the top of the second  
reaction chamber upwardly sloping interior wall, whereby  
tilting of the article of manufacture causes a liquid in the  
second reaction chamber to flow along the second reaction  
chamber upwardly sloping interior wall and into the final  
reaction chamber, the final reaction chamber bottom being  
transparent so that light produced in the final reaction  
chamber may be monitored from beneath the final reaction  
chamber through the bottom of the final reaction chamber,  
and  
a solid, dry final chemical reactant in the final reaction cham-  
ber; and  
a planar support plate for the at least two test wells, the at least  
two test wells being arranged in and affixed to the support  
plate so that the bottoms of the final reaction chambers of  
each of the test wells extend downwardly below the support  
plate and are coplanar in a plane that lies parallel to the plane  
of the support plate, and so that the elongated directions of the  
at least two test wells are parallel to each other.

5,772,968

**APPARATUS AND METHOD FOR HYDROLYZING  
KERATINOUS MATERIAL**  
Marvin R. Wolfe, Walton, Ky., assignor to Sunrise, Inc., Wal-  
ton, Ky.

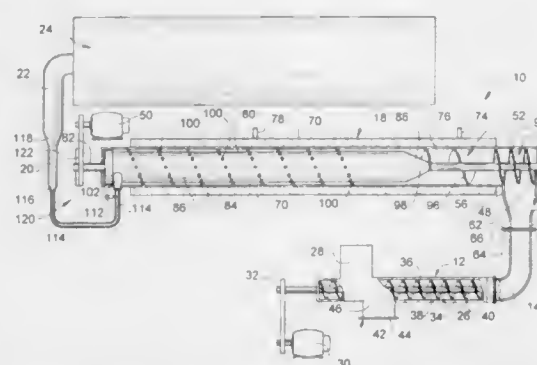
Filed Jul. 3, 1996, Ser. No. 674,814

Int. Cl.<sup>6</sup> A22C 21/00; A23J 1/10; A23K 1/10

U.S. Cl. 422—189

24 Claims

1. A hydrolyzer system, comprising:



- a feed screw conveyor having several flights for removing  
excess water from a keratinous feed substrate material, said  
feed screw compressing said feed substrate forming a plug;  
a hydrolyzer defining a cylindrical barrel having a central shaft  
rotatably supported therein, said central shaft including means  
for conveying and mixing said feed substrate, said hydrolyzer  
having an inlet and a discharge outlet;  
a transfer conduit in fluid communication with said feed screw  
conveyor;  
a feed expansion chamber in fluid communication with said  
transfer conduit and said hydrolyzer, said feed expansion  
chamber defining a cone having a larger diameter section in  
fluid communication with said inlet of said hydrolyzer;  
at least one product expansion chamber means for reducing the  
pressure in the hydrolyzer system and cooling the feed sub-  
strate product produced in said hydrolyzer; and  
a dryer for removing excess moisture from the hydrolyzed  
substrate.

5,772,969

**METHOD AND APPARATUS FOR RECOVERING HEAT  
IN A FLUIDIZED BED REACTOR**

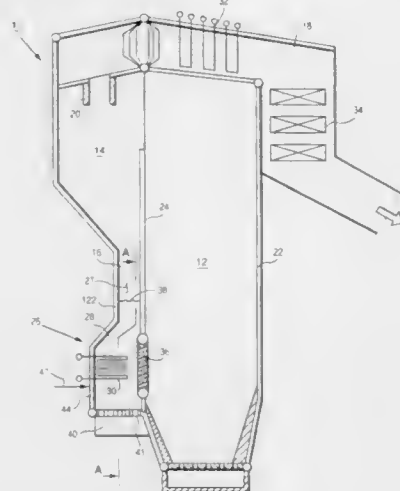
Timo Illypainen, Karhula, Finland, assignor to Foster Wheeler  
Energia OY, Helsinki, Finland

Continuation of Ser. No. 149,342, Nov. 9, 1993, abandoned,  
which is a continuation-in-part of Ser. No. 973,396, Nov. 10,  
1992, Pat. No. 5,341,766, Ser. No. 41,571, Apr. 5, 1993, Pat.  
No. 5,332,553, Ser. No. 41,580, Apr. 5, 1993, Pat. No.  
5,345,896, Ser. No. 66,277, May 26, 1993, Pat. No. 5,540,894,  
Ser. No. 89,810, Jul. 12, 1993, and Ser. No. 124,767, Sep. 22,  
1993, Pat. No. 5,425,412. This application Dec. 6, 1994, Ser.  
No. 340,875

Int. Cl.<sup>6</sup> F27B 15/14; 15/16

U.S. Cl. 422—146

20 Claims



1. Apparatus for recovering heat from solid particles in a circu-  
lating fluidized bed reactor comprising:  
a processing chamber with a first fluidized bed of solid particles  
therein;

- a separator connected to an upper outlet of the processing  
chamber;  
a return duct connected to a lower portion of the separator;  
a non-partitioned heat transfer chamber, connected to a bottom  
portion of said return duct and to said processing chamber  
having a second fluidized bed of solid particles continuous  
through the heat transfer chamber;  
a plurality of heat transfer surfaces disposed in said bed in the  
non-partitioned heat transfer chamber;  
inlet means for introducing a continuous flow of hot solid  
particles from said processing chamber into said heat transfer  
chamber, via the separator and return duct, and onto an upper  
surface of the second fluidized bed of solid particles;  
outlet means for continuously recycling solid particles from said  
heat transfer chamber into said processing chamber;  
nozzle means for introducing gas into said heat transfer cham-  
ber;  
said heat transfer chamber including at least one heat transfer  
zone and at least one solid particle transport zone disposed at  
substantially the same horizontal level, wherein more heat  
transfer surface area is disposed in said at least one heat  
transfer zone than is disposed in said at least one solid particle  
transport zone and wherein said outlet means is disposed in  
said at least one solid particle transport zone;  
the heat transfer and transport zones are arranged to permit free  
flow of the solid particles between the zones, and the heat  
transfer and the transport zones are adjacent each other;  
means for controlling the heat transfer in said heat transfer  
chamber, said means including separately controlled means  
for introducing different flows of gas into said at least one  
heat transfer zone and said at least one solid particle transport  
zone via said nozzle means, and  
means for introducing transporting gas flows in the heat transfer  
chamber to control the flow of solid particles through the solid  
particle transport zone and the outlet means.

5,772,970  
**REACTION COLUMN**

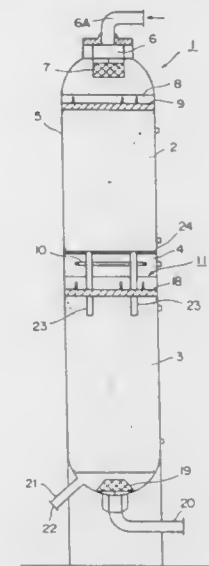
Yasuo Okamoto, Kanagawa-ken, Japan, assignor to Nippon Oil  
Co., Ltd., Tokyo, Japan

Filed Dec. 6, 1996, Ser. No. 761,316

Int. Cl.<sup>6</sup> B01J 8/04

U.S. Cl. 422—191

5 Claims



1. A reaction column comprising:  
a reactor;  
at least one catalyst bed comprising a solid catalyst with which a  
mixture of a gas with a liquid is brought into contact; and  
a cooling bed provided below the catalyst bed, the cooling bed  
comprising:  
(a) a cooling fluid feed section and

- (b) mixing means for mixing a cooling fluid with the mixture  
of a gas with a liquid falling down through the reactor, the  
mixing means being provided below the cooling fluid feed  
section of the cooling bed, the mixing means comprising:  
(1) a collector tray provided along a horizontal cross-  
sectional region of the reactor, the collector tray having a  
central axis, an upper surface having a center portion,  
and a through hole provided in the center portion;  
(2) a swirl baffle vertically provided substantially at the  
center portion of the upper surface of the collector tray,  
the swirl baffle having an interior with the through hole  
of the collector tray being located in the interior, and the  
swirl baffle being formed with a cylindrical member  
having a central axis substantially coincident with the  
central axis of the collector tray, the cylindrical member  
having a circumferential wall, inflow ports respectively  
for the cooling fluid and the mixture of a gas with a  
liquid being provided at a plurality of positions discrete  
from each other by a predetermined angle in the circum-  
ferential direction of the circumferential wall of the  
cylindrical member of the swirl baffle, the inflow ports  
having first and second side edges, and a guide plate  
being connected in a substantially tangential direction to  
the first side edge of each of the inflow ports, the guide  
plate serving to guide the cooling fluid and the mixture  
of a gas with a liquid so that the cooling fluid and the  
mixture of a gas with a liquid flowed from the inflow  
ports into the swirl baffle swirl in the same direction  
within the swirl baffle; and  
(3) a weir, extending upward from the collector tray, con-  
nected to the through hole in the interior of the swirl  
baffle, the weir being formed with a cylindrical member  
having a central axis substantially coincident with the  
central axis of the collector tray.

5,772,971

**IODINE-BASED MICROBIAL DECONTAMINATION  
SYSTEM**

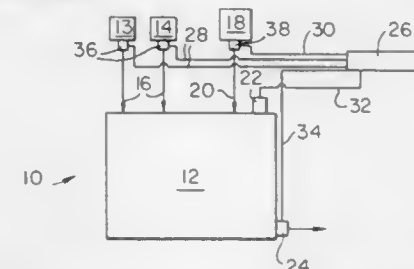
Joseph Murphy, Northbridge; John Hickey, Weymouth, and  
Yongjun Duan, Lexington, all of Mass., assignors to Symbol-  
ion Corporation, Framingham, Mass.

Filed Jul. 5, 1996, Ser. No. 677,366

Int. Cl.<sup>6</sup> A61L 2/00

U.S. Cl. 422—292

10 Claims



1. Biocidal iodine-based decontamination apparatus having a  
decontamination chamber for sterilizing or disinfecting medical  
devices and/or instrumentation by contact with free molecular  
iodine, said apparatus comprising:  
a source of iodine forming liquid reagents which generate free  
molecular iodine in situ upon admixture with water;  
supply means for feeding said iodine forming liquid reagents  
into said decontamination chamber in or with an aqueous  
medium such that free molecular iodine is generated in situ, in  
said apparatus, at a rate that is no less than 0.5 ppm per hour  
and no more than 25 ppm per hour; and  
control means for maintaining the concentration level of said  
generated free molecular iodine above a minimum level of  
about 15 ppm over a prolonged time period, said control  
means comprising:  
detection means for determining the concentration level of free  
molecular iodine within said decontamination chamber; and

controller means responsive to said detection means for comparing the detected level of free molecular iodine in said decontamination chamber to information representative of said minimum concentration level and said flow rate information for regulating said supply means in accordance therewith.

5,772,972

**CATALYST/HYDROCARBON TRAP HYBRID SYSTEM**  
Jeffrey Scott Hephurn, Dearborn; Hung-Wen Jen, Troy; Harendra Sakarlal Gandhi, Farmington Hills, and Klaus Otto, Livonia, all of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Continuation of Ser. No. 370,284, Jan. 9, 1995, abandoned.

This application Sep. 16, 1996, Ser. No. 715,254

Int. Cl.<sup>6</sup> F01N 3/10; B01D 53/34

U.S. Cl. 423—213.5 6 Claims

1. A method for reducing cold start hydrocarbon emissions from a gasoline internal combustion engine for treating exhaust gases during cold start of said engine by the steps consisting of:

providing a hybrid system of hydrocarbon trapping material and palladium based three-way catalyst material supported on alumina or ceria in an exhaust gas system of a gasoline internal combustion engine, said hydrocarbon trapping material capable of adsorbing hydrocarbons present in said internal combustion engine exhaust gases and substantially maintaining adsorbance of said adsorbed hydrocarbons present in said internal combustion engine exhaust gases until after said palladium based three-way catalyst material reaches a temperature at which it is capable of oxidizing said hydrocarbons as they desorb from said hydrocarbons trapping material, said supported palladium based three-way catalyst material being carried on a substrate in an amount of about 130–500 g palladium/ft<sup>3</sup> of said substrate, wherein said substrate is selected from (a) said hydrocarbon trapping material and such that said supported palladium based three-way catalyst material is provided as a layer on said hydrocarbon trapping material, (b) monolithic ceramic material and such that said supported palladium based three-way catalyst material and said hydrocarbon trapping material are provided as a mixture thereof or as layers, one upon the other, on said monolithic ceramic material, and (c) monolithic metallic material and such that said supported palladium based three-way catalyst material and said hydrocarbon trapping material are provided as a mixture thereof or as layers, one upon the other, on said monolithic metallic material; and

contacting said hybrid system with said exhaust gases.

5,772,973

**EXHAUST GAS CLEANER AND METHOD FOR REMOVING NITROGEN OXIDES**

Kiyohide Yoshida; Akira Abe, both of Kumagaya; Tatsuo Miyadera, Tsukuba, and Naoko Irite, Kumagaya, all of Japan, assignors to Kabushiki Kaisha Riken, and Hiroshi Kashiwagi of Director-General of Agency of Industrial Science and Technology, both of Japan

Continuation of Ser. No. 601,495, Feb. 14, 1996, Pat. No. 5,656,249, which is a continuation of Ser. No. 288,253, Aug. 11, 1994, abandoned, which is a continuation-in-part of Ser. No. 170,736, Dec. 21, 1993, abandoned. This application Feb. 24, 1997, Ser. No. 805,234

Claims priority, application Japan, Dec. 28, 1992, 4-360035; Dec. 28, 1992, 4-360039; Mar. 10, 1993, 5-76294; May 21, 1993, 5-142689

Int. Cl.<sup>6</sup> B01J 23/00

U.S. Cl. 423—239.1

3 Claims

1. A method for removing nitrogen oxides from an exhaust gas containing nitrogen oxides and oxygen in an amount larger than its stoichiometric amount relative to unburned components in said exhaust gas, which comprises:

(i) disposing an exhaust gas cleaner in a flow path of said exhaust gas, said exhaust gas cleaner consisting essentially of a catalyst component consisting essentially of silver or silver oxides, each of said silver and silver oxides having an average diameter of 10–1,000 nm and being supported on a porous inorganic oxide selected from the groups consisting of alumina, silica, titania, zirconia, alumina-titania, alumina-silica and alumina-zirconia, said silver and silver oxides being present in said gas cleaner in an amount of 0.2 to 15 weight % on a metal basis and said porous inorganic oxide having a specific surface area of 10 m<sup>2</sup>/g or more;

(ii) introducing a reductant selected from the group consisting of propane, propylene, acetylene, diesel oil, cetane, heptane, kerosene, alcohols having 2 or more carbon atoms and a mixture thereof into said exhaust gas on the upstream side of said exhaust gas cleaner in an amount 0.1–5 times the weight of said nitrogen oxides in said exhaust gas; and

(iii) bringing said exhaust gas into contact with said exhaust gas cleaner at a temperature of 200°–600° C., thereby causing a reaction of said nitrogen oxides with said reductant to remove said nitrogen oxides.

5,772,974

**CARBONACEOUS ELECTRODE MATERIAL FOR BATTERY AND PROCESS FOR PRODUCTION THEREOF**  
Hiroaki Ohashi, and Yoshiki Shigaki, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Japan

Filed Feb. 8, 1996, Ser. No. 598,685

Claims priority, application Japan, Feb. 9, 1995, 7-044741

Int. Cl.<sup>6</sup> D01F 9/12

U.S. Cl. 423—447.7 7 Claims

1. A carbonaceous material for secondary battery electrodes, comprising a carbonaceous material having a halogen content of 50–10000 ppm and a micro-texture suitable for doping with and dedoping of lithium including an average (002) plane-spacing of 0.365–0.400 nm as measured by X-ray diffraction method.

5,772,975

**CARBON BLACK**

Nobutake Mise; Yutaka Fukuyama; Mamoru Nakayama, and Shigeru Kawakami, all of Kitakyushu, Japan, assignors to Mitsubishi Chemical Corporation, Tokyo, Japan

Filed Feb. 26, 1997, Ser. No. 806,657

Claims priority, application Japan, Feb. 28, 1996, 8-041445

Int. Cl.<sup>6</sup> C09C 1/48

U.S. Cl. 423—449.1 4 Claims

1. A carbon black having a D<sub>1/2</sub>/D<sub>mod</sub> ratio of at most 0.53, wherein D<sub>mod</sub> is from 20 to 80 nm.

5,772,976

**CHEMICAL GAS GENERATOR**

Arthur Cortellucci, Buffalo, N.Y.; Itamar Bodek, Lynnfield, Mass.; Roy J. Grabski, Depew, N.Y., and James R. Valentine, Reading, Mass., assignors to Figgie International Inc., Willoughby, Ohio

Continuation of Ser. No. 457,523, Jun. 1, 1995, abandoned.

This application Oct. 6, 1997, Ser. No. 944,589

Int. Cl.<sup>6</sup> C01B 13/00

U.S. Cl. 423—579 14 Claims

1. A method of generating a gas comprising the steps of: disposing within a casing a material which produces the gas when supplied with heat for initiating decomposition thereof; burning a pyrotechnic material; supplying heat from burning of the pyrotechnic material to the gas producing material for initiating decomposition thereof; providing a gas impervious barrier for segregating from the produced gas all gases evolved from burning of the

5,772,979

**ALUMINOSILICATES**

Abraham Araya, Wirral, United Kingdom, assignor to Crossfield Limited, Warrington, England

PCT No. PCT/EP95/00103, § 371 Date Dec. 19, 1996, § 102(e) Date Dec. 19, 1996, PCT Pub. No. WO95/21125, PCT Pub. Date Aug. 10, 1995

PCT Filed Jan. 11, 1995, Ser. No. 693,104

Claims priority, application United Kingdom, Feb. 4, 1994, 9402160

Int. Cl.<sup>6</sup> C01B 39/02

U.S. Cl. 423—700

2 Claims

1. Process for manufacturing an alkali metal aluminosilicate of zeolite P type having the oxide formula

$M_{2/n}O, Al_2O_3, 1.9-2.6 SiO_2, y H_2O$

y being the water content, wherein sodium silicate, sodium aluminate and sodium hydroxide are mixed together to produce a first reacting gel having the general formula:

$2.5-7.5 Na_2O, 2.2-4.0 SiO_2, Al_2O_3, 60-250 H_2O$

said first reacting gel being then allowed to react sufficiently until zeolite P nuclei are formed,

sodium aluminate solution being then added to said first reacting gel, while its degree of crystallinity is below 25%, in a sufficient amount so as to produce a second reacting gel having the general formula:

$2.3-7.5 Na_2O, 1.9-2.6 SiO_2, Al_2O_3, 40-150 H_2O$

said second reacting gel being allowed to react to provide said alkali metal aluminosilicate of zeolite P type having the indicated oxide formula, the resulting product being filtered washed and dried.

5,772,980

**FIBROUS ZEOLITE ZSM-5 AND PREPARATION METHOD THEREOF**

Yong-gun Sul; Kyeong-taek Jung, both of Seoul; Jin-ho Hyun, Incheon; Du-sung Kim, and Young-chul Gil, both of Seoul, all of Rep. of Korea, assignors to Daelim Engineering Co., Ltd., Seoul, Rep. of Korea

Filed Oct. 16, 1996, Ser. No. 733,149

Claims priority, application Rep. of Korea, Mar. 11, 1996, 96-6324

Int. Cl.<sup>6</sup> C01B 39/06; 39/36

U.S. Cl. 423—705

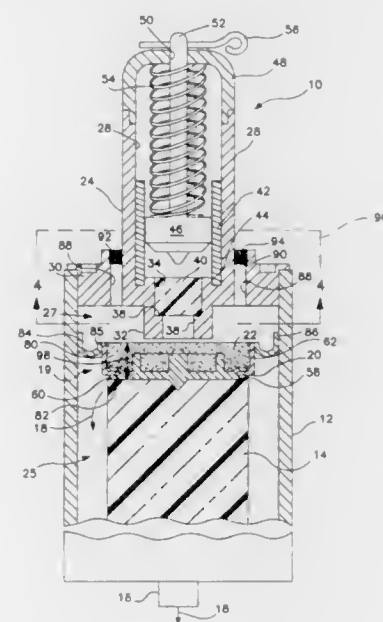
9 Claims



1. A fibrous zeolite ZSM-5 represented by the following formula:

$xSiO_2, (1-x)Al_2O_3,$

wherein x is 0.9429–0.9943.



pyrotechnic material; and removing the produced gas, free of gases evolved from burning of the pyrotechnic material, from the casing.

5,772,977

**ANTHRAQUINONE PROCESS**

Colie Lawrence Jenkins, Memphis, Tenn.; Fred Bronson Kirby, and Theodore Augur Koch, both of Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 355,783, Dec. 14, 1994, abandoned. This application Oct. 27, 1995, Ser. No. 549,586

Int. Cl.<sup>6</sup> C01B 15/023

U.S. Cl. 423—588

2 Claims

1. An improved anthraquinone slurry process for the production of hydrogen peroxide, the improvement comprising utilizing in the hydrogenation stage of said process a catalyst of palladium on a support consisting essentially of

(A) 0.2–10% by weight of metallic palladium and

(B) a calcined gamma alumina support having greater than 90% of the alumina in the gamma crystalline phase, said support having pore diameter of 50–1000 Å, volume average particle size of 1–200 microns, BET surface area of 20–200 m<sup>2</sup>/g and an attrition resistance of greater than 90%.

5,772,978

**PROCESS FOR PRODUCING TUNGSTEN OXIDE**

John A. Bailey, Bloomington; Kenton D. Budd, and Tai T. Tran, both of Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 24, 1996, Ser. No. 639,020

Int. Cl.<sup>6</sup> C01G 41/00; 41/02

U.S. Cl. 423—606

31 Claims

1. A process for producing a tungsten oxide precursor solution comprising the steps of (i) drying a peroxypolytungstate solution to form a powder; (ii) dissolving or dispersing said powder in a solvent comprising an alcohol to form an alcoholic solution; and (iii) heating said alcoholic solution to convert said alcoholic peroxypolytungstate solution to a stable oxide polytungstate solution.

31. A process for producing a tungsten oxide precursor solution comprising the steps of treating an acidified ammonium metatungstate solution with peroxide to form a peroxypolytungstate solution and converting said peroxypolytungstate solution to a stable oxide polytungstate solution.



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**THIOLATION OF PROTEINS FOR RADIONUCLIDE-BASED RADIOIMMUNODETECTION AND RADIOIMMUNOTHERAPY**

Seregulam V. Govindan, Summit; Ruth Grebenau, West Orange; Gary L. Griffiths, Morristown, and Hans J. Hansen, Mystic Island, all of N.J., assignors to Immunomedics, Inc., Morris Plains, N.J.

Continuation of Ser. No. 253,772, Jun. 3, 1994, abandoned.  
This application Jan. 8, 1997, Ser. No. 779,556  
Int. Cl.<sup>6</sup> A61K 51/00; A61M 36/14

U.S. Cl. 424—1.49 25 Claims

1. A diagnostic kit suitable for forming a labeled imaging or therapy agent to be administered to a human patient, which comprises a sterile package containing (i) a protein conjugate comprising a chelating agent covalently linked to a protein, wherein said chelating agent comprises an N-(3-methyl-3-mercaptopropyl) glycinate moiety, and wherein said protein is a whole antibody or an antigen-binding antibody fragment; and (ii) a reducing agent for pertechnetate or perhenate, said pertechnetate or perhenate to be added in a subsequent labeling step.

5,772,982

**METHOD OF USING HYALURONIC ACID FOR THE DETECTION, LOCATION AND DIAGNOSIS OF TUMORS**

Roderick T. Coward, 1365 Milton Avenue, Mississauga, Ontario, Canada, L5G 3C5

Continuation of Ser. No. 288,052, Aug. 10, 1994, abandoned.  
This application Oct. 16, 1996, Ser. No. 732,171  
Int. Cl.<sup>6</sup> A61K 51/00; A61M 36/14

U.S. Cl. 424—1.73 11 Claims

1. A method for detecting and locating a tumor in a mammal, comprising the steps of:  
labelling hyaluronic acid or its potassium, sodium or calcium salts with a diagnostic agent;  
administering said labelled hyaluronic acid to said mammal; and  
utilizing an appropriate imaging method to detect and locate said labelled hyaluronic acid in the body of said mammal.

5,772,983

**METHODS OF SCREENING FOR COMPOUNDS WHICH MODULATE INSECT BEHAVIOR**

Robert J. O'Connell, Worcester, and Alan J. Grant, Watertown, both of Mass., assignors to Worcester Foundation For Biomedical Research, Shrewsbury, Mass.

Filed Oct. 16, 1995, Ser. No. 543,271  
Int. Cl.<sup>6</sup> A61K 49/00; G01N 31/00; 33/48

U.S. Cl. 424—9.2 40 Claims

1. A method of selecting for a compound which modulates the behavior of an insect, comprising the steps of:  
(a) measuring an electrical characteristic of a chemoreceptor neuron in a sensillum of the insect in the presence of control stimulation to determine a measure of baseline activity (A) for the neuron;  
(b) contacting the neuron during a stimulation period with a known chemical modulator of the behavior of the insect;  
(c) measuring an electrical characteristic produced by the neuron in response to the contacting with the known modulator to determine a measure of known modulator-induced activity (C) for the neuron, wherein C is representative of a correlation between the neuron and the modulator-induced behavior of the insect;  
(d) contacting the neuron with a compound-to-be-tested;  
(e) measuring an electrical characteristic produced by the contacted neuron in response to the contacting with the compound to determine a measure of unknown modulator-induced activity (E) of the neuron;  
(f) comparing A, C, and E; and

(g) when C is greater than A, classifying, based on the comparison of step (f), the compound with respect to its ability to modulate the behavior of the insect.

5,772,984

**METHOD OF ULTRASOUND IMAGING USING MICROBUBBLE-FORMING, SOLID X-RAY CONTRAST AGENTS**

Arne Berg, Sandvika; Jo Klaveness; Per Strande, both of Oslo, all of Norway, and Lars Stubberud, Södertälje, Sweden, assignors to Nycomed Imaging AS, Oslo, Norway

Division of Ser. No. 170,197, Feb. 9, 1994, Pat. No. 5,607,661.  
This application Jun. 5, 1995, Ser. No. 462,398

Claims priority, application United Kingdom, Jul. 5, 1991, 9114565; Jan. 9, 1992, 9200386

Int. Cl.<sup>6</sup> A61K 49/04

U.S. Cl. 424—9.52 9 Claims

1. A method of diagnosis in a human or animal subject by ultrasonic imaging wherein contrast in the ultrasound image is enhanced by intravenous administration of an ultrasound contrast agent composition comprising aggregates of microparticles of a water-soluble solid X-ray contrast agent, said aggregates forming microbubbles of biocompatible gas when suspended in a liquid carrier medium.

5,772,985

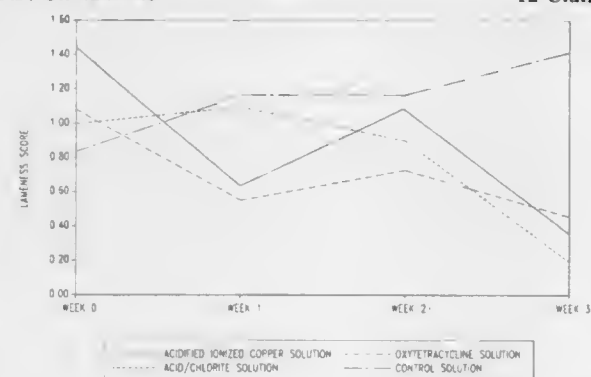
**METHOD FOR TREATING BOVINE HAIRY HEEL WARTS**

G. Kere Kemp, Mercer Island, Wash., and Robert D. Kross, Bellmore, N.Y., assignors to Alcide Corporation, Redmond, Wash.

Filed Sep. 8, 1995, Ser. No. 525,903

Int. Cl.<sup>6</sup> A61K 9/12; 33/14

U.S. Cl. 424—45 12 Claims



1. A method for treating bovine hairy heel warts, comprising applying to a bovine hairy heel wart an effective amount of an aqueous composition comprising a protic acid and a chlorite ion, wherein the protic acid is present in an amount ranging from about 0.005% to about 5% by weight of the composition, and wherein the chlorite ion is present in an amount ranging from about 0.01% to about 1.0% by weight of the composition.

5,772,986

**COMPOSITIONS AND METHODS FOR REDUCING ORAL MALODOR**

Robert D. Kross, 2506 Florin Ct., Bellmore, N.Y. 11710

Filed Apr. 8, 1996, Ser. No. 629,357

Int. Cl.<sup>6</sup> A61K 7/20

U.S. Cl. 424—53 16 Claims

1. A method for treating oral malodor in a subject comprising exposing oral surfaces and tissues of the mouth to an effective amount of a pre-conditioning liquid in a first step to produce an

acidic environment on said oral surfaces and tissues of the mouth for reaction with a subsequent chlorite solution and subsequently exposing said exposed surfaces and tissues to an aqueous solution containing a concentration of chlorite effective to substantially reduce the oral malodor.

5,772,987

**PHOTOPROTECTIVE/COSMETIC COMPOSITIONS COMPRISING TiO<sub>2</sub> NANOPIGMENTS AND ACYLAMINO ACIDS**

Isabelle Hansenne, Paris, and Alain Lety, Lagny sur Marne, both of France, assignors to Société L'Oréal S.A., Paris, France

Filed Oct. 4, 1996, Ser. No. 725,494

Claims priority, application France, Oct. 4, 1995, 95 11662

Int. Cl.<sup>6</sup> A61K 7/42; 9/10; 31/195; 9/15

U.S. Cl. 424—59 19 Claims

1. A photoprotective cosmetic photocoloration-resistant composition comprising an effective UV-screening amount of at least one titanium dioxide nanopigment and an effective photobleaching-reducing amount of at least one ionic amphiphilic lipid comprising an acylamino acid selected from the group consisting of an acylglutamate, monosodium acylglutamate, disodium acylglutamate, monosodium stearoylglutamate monosodium myristoylglutamate, monosodium lauroylglutamate, disodium stearoylglutamate, and acylglutamide, in a cosmetically acceptable vehicle therefor.

5,772,988

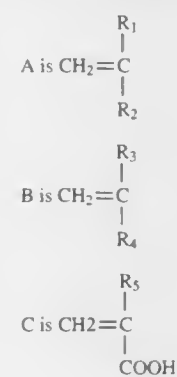
**NAIL ENAMEL COMPOSITIONS FROM ACETOACETOXY METHACRYLATE COPOLYMER**  
Frank Charles Pagano, Avenel; Anjali Abhimanyu Patil, Westfield; Robert Walter Sandewicz, Spotswood, all of N.J.; Waifong Liew Anton, and Harry Joseph Spinelli, both of Wilmington, Del., assignors to Revlon Consumer Products Corporation, New York, N.Y.

Filed May 10, 1996, Ser. No. 646,676

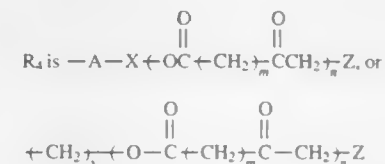
Int. Cl.<sup>6</sup> A61K 7/04; 7/03

U.S. Cl. 424—61 29 Claims

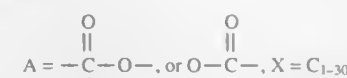
1. A nail enamel composition comprising, by weight of the total composition:  
10–95% solvent, and  
5–90% of a copolymer resulting from the addition polymerization of monomer units A, B, and C wherein:



wherein R<sub>1</sub>, R<sub>3</sub>, and R<sub>5</sub> are each independently H, a C<sub>1-30</sub> straight or branched chain alkyl, aryl, aralkyl; R<sub>2</sub> is a pyrrolidone, or a substituted or unsubstituted aromatic, alicyclic, or bicyclic ring where the substituents are C<sub>1-30</sub> straight or branched chain alkyl, or COOM wherein M is a C<sub>1-30</sub> straight or branched chain alkyl, pyrrolidone, or a substituted or unsubstituted aromatic, alicyclic, or bicyclic ring where the substituents are C<sub>1-30</sub> straight or branched chain alkyl



wherein



X=C<sub>1-30</sub> straight or branched chain alkyl. m is 1 to 5, n is 1 to 30, y is 0 to 50; and Z=H or a C<sub>1-30</sub> straight or branched chain alkyl.

5,772,989

Patent Not Issued For This Number

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**COMPOSITION FOR SLOWING DOWN THE LOSS OF HAIR BASED ON PYRIMIDINE N-OXIDES TRIAMINOSUBSTITUTED OR THEIR SULFOCONJUGATED**

Michel Hocquaux, Paris; Khalid Bakkar, Sevran; Jean Baptiste Galey, Paris, and Eric Terranova, Asnières, all of France, assignors to L'Oréal, Paris, France

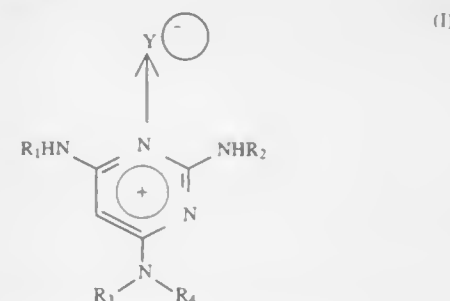
Continuation of Ser. No. 899,884, Jun. 17, 1992, abandoned.

This application Dec. 20, 1993, Ser. No. 169,754

Claims priority, application France, Jun. 20, 1991, 91 07591  
Int. Cl.<sup>6</sup> A61K 7/06; 7/00

U.S. Cl. 424—70.1 13 Claims

1. In a process for slowing down the loss of hair and for inducing and stimulating its growth, the improvement which consists in applying to the hair and scalp an effective amount of a composition which consists essentially of, in a physiologically acceptable medium selected from the group consisting of water, lower alcohols having from 1 to 4 carbon atoms, alkylene glycols, alkyl ethers of alkylene glycols, and mixtures thereof, at least one compound of formula:



in which:

R<sub>1</sub> and R<sub>2</sub>, independently of each other, denote a hydrogen atom or a C<sub>1-8</sub> alkyl radical, with the proviso that R<sub>1</sub> and R<sub>2</sub> do not simultaneously denote a hydrogen atom;

R<sub>3</sub> and R<sub>4</sub>, independently of each other, denote a hydrogen atom or a C<sub>1-8</sub> alkyl radical, with the proviso that R<sub>3</sub> and R<sub>4</sub> taken together with the nitrogen atom attached to position 6 of the pyrimidine ring form a heterocyclic moiety having from 3 to 6 carbon atoms;

X denotes a hydrogen atom or a halogen;

Y denotes O or OSO<sub>3</sub>;

and its addition salts of physiologically acceptable acids, and other hair or scalp treating active ingredients, in order to have no antihypertensive effect or a substantially reduced antihypertensive effect in comparison to minoxidil.

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Patent Not Issued For This Number

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COMPOSITIONS FOR CO-ADMINISTRATION OF  
INTERLEUKIN-3 MUTANTS AND OTHER CYTOKINES  
AND HEMATOPOIETIC FACTORS

S. Christopher Bauer, New Haven; Mark Allen Abrams; Sarah Ruth Bradford-Goldberg, both of St. Louis; Maire Helena Caparon, Chesterfield; Alan Michael Easton, Maryland Heights; Barbara Kure Klein, St. Louis; John Patrick McKearn; Peter O. Olins, both of Glencoe; Kumnan Paik, Ballwin, and John Warren Thomas, Town & Country, all of Mo., assignors to G.D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 411,796, Apr. 6, 1995, which is a continuation-in-part of Ser. No. 981,044, Nov. 24, 1992, abandoned. This application Feb. 4, 1994, Ser. No. 191,973

Int. Cl.<sup>6</sup> A61K 38/20; 38/19

U.S. Cl. 424—85.2 23 Claims

2. A composition comprising a mutant human interleukin-3 polypeptide comprising:

a modified interleukin-3 amino acid sequence selected from the group consisting of:

(a) an amino acid sequence of SEQ ID NO:1

(b) an N-terminal Met residue, Ala residue, or Met-Ala dipeptide joined to an amino acid sequence according to (a), wherein

Xaa at position 17 is Ser, Lys, Gly, Asp, Met, Gln, or Arg;

Xaa at position 18 is Asn, His, Leu, Ile, Phe, Arg, or Gln;

Xaa at position 19 is Met, Phe, Ile, Arg, Gly, Ala, or Cys;

Xaa at position 20 is Ile, Cys, Gln, Glu, Arg, Pro, or Ala;

Xaa at position 21 is Asp, Phe, Lys, Arg, Ala, Gly, Gl, Gln, Asn, Thr, Ser or Val;

Xaa at position 22 is Glu, Trp, Pro, Ser, Ala, His, Asp, Asn, Gln, Leu, Val or Gly;

Xaa at position 23 is Ile, Val, Ala, Leu, Gly, Trp, Lys, Phe, Ser, or Arg;

Xaa at position 24 is Ile, Gly, Val, Arg, Ser, Phe, or Leu;

Xaa at position 25 is Thr, His, Gly, Gln, Arg, Pro, or Ala;

Xaa at position 26 is His, Thr, Phe, Gly, Arg, Ala, or Trp;

Xaa at position 27 is Leu, Gly, Arg, Thr, Ser, or Ala;

Xaa at position 28 is Lys, Arg, Leu, Gln, Gly, Pro, Val or Trp;

Xaa at position 29 is Gln, Asn, Leu, Pro, Arg, or Val;

Xaa at position 30 is Pro, His, Thr, Gly, Asp, Gln, Ser, Leu, or Lys;

Xaa at position 31 is Pro, Asp, Gly, Ala, Arg, Leu, or Gln;

Xaa at position 32 is Leu, Val, Arg, Gln, Asn, Gly, Ala, or Glu;

Xaa at position 33 is Pro, Leu, Gln, Ala, Thr, or Glu;

Xaa at position 34 is Leu, Val, Gly, Ser, Lys, Glu, Gln, Thr, Arg, Ala, Phe, Ile or Met;

Xaa at position 35 is Leu, Ala, Asn, Pro, Gln, or Val;

Xaa at position 36 is Asp, Leu, or Val;

Xaa at position 37 is Phe, Ser, Pro, Trp, or Ile;

Xaa at position 38 is Asn, or Ala;

Xaa at position 40 is Leu, Trp, or Arg;

Xaa at position 41 is Asn, Cys, Arg, Leu, His, Met, or Pro;

Xaa at position 42 is Gly, Asp, Ser, Cys, Asn, Lys, Thr, Leu, Val, Gl, Phe, Tyr, Ile, Met or Ala;

Xaa at position 43 is Glu, Asn, Tyr, Leu, Phe, Asp, Ala, Cys, Gl, Arg, Thr, Gly or Ser;

Xaa at position 44 is Asp, Ser, Leu, Arg, Lys, Thr, Met, Trp, Glu, Asn, Gln, Ala or Pro;

Xaa at position 45 is Gln, Pro, Phe, Val, Met, Leu, Thr, Lys, Trp, Asp, Asn, Arg, Ser, Ala, Ile, Glu or His;

Xaa at position 46 is Asp, Phe, Ser, Thr, Cys, Glu, Asn, Gln, Lys, His, Ala, Tyr, Ile, Val or Gly;

Xaa at position 47 is Ile, Gly, Val, Ser, Arg, Pro, or His;

Xaa at position 48 is Leu, Ser, Cys, Arg, Ile, His, Phe, Glu, Lys, Thr, Ala, Met, Val or Asn;

Xaa at position 49 is Met, Arg, Ala, Gly, Pro, Asn, His, or Asp;

Xaa at position 50 is Glu, Leu, Thr, Asp, Tyr, Lys, Asn, Ser, Ala, Ile, Val, His, Phe, Met or Gln;

Xaa at position 51 is Asn, Arg, Met, Pro, Ser, Thr, or His;

Xaa at position 52 is Ash, His, Arg, Leu, Gly, Ser, or Thr;

Xaa at position 53 is Len, Thr, Ala, Gly, Glu, Pro, Lys, Ser, or Met;

Xaa at position 54 is Arg, Asp, Ile, Ser, Val, Thr, Gln, Asn, Lys, His, Ala or Leu;

Xaa at position 55 is Arg, Thr, Val, Ser, Leu, or Gly;

Xaa at position 56 is Pro, Gly, Cys, Ser, Gln, Glu, Arg, His, Thr, Ala, Tyr, Phe, Leu, Val or Lys;

Xaa at position 57 is Asn or Gly;

Xaa at position 58 is Leu, Ser, Asp, Arg, Gln, Val, or Cys;

Xaa at position 59 is Glu, Tyr, His, Leu, Pro, or Arg;

Xaa at position 60 is Ala, Ser, Pro, Tyr, Asn, or Thr;

Xaa at position 61 is Phe, Asn, Glu, Pro, Lys, Arg, or Ser;

Xaa at position 62 is Asn, His, Val, Arg, Pro, Thr, Asp, or Ile;

Xaa at position 63 is Arg, Tyr, Trp, Lys, Ser, His, Pro, or Val;

Xaa at position 64 is Ala, Asn, Pro, Ser, or Lys;

Xaa at position 65 is Val, Thr, Pro, His, Leu, Phe, or Ser;

Xaa at position 66 is Lys, Ile, Arg, Val, Asn, Glu, or Ser;

Xaa at position 67 is Ser, Ala, Phe, Val, Gly, Asn, Ile, Pro, or His;

Xaa at position 68 is Len, Val, Trp, Ser, Ile, Phe, Thr, or His;

Xaa at position 69 is Gln, Ala, Pro, Thr, Glu, Arg, Trp, Gly, or Len;

Xaa at position 70 is Asn, Leu, Val, Trp, Pro or Al;

Xaa at position 71 is Ala, Met, Leu, Pro, Arg, Glu, Thr, Gln, Trp, or Asn;

Xaa at position 72 is Ser, Glu, Met, Ala, His, Asn, Arg, or Asp;

Xaa at position 73 is Ala, Glu, Asp, Leu, Ser, Gly, Thr, or Arg;

Xaa at position 74 is Ile, Met, Thr, Pro, Arg, Gly, Ala;

Xaa at position 75 is Glu, Lys, Gly, Asp, Pro, Trp, Arg, Ser, Gln, or Leu;

Xaa at position 76 is Ser, Val, Ala, Asa, Trp, Glu, Pro, Gly, or Asp;

Xaa at position 77 is Ile, Ser, Arg, Thr, or Leu;

Xaa at position 78 is Leu, Ala, Ser, Glu, Phe, Gly, or Arg;

Xaa at position 79 is Lys, Thr, Asn, Met, Arg, Ile, Gly, or Asp;

Xaa at position 80 is Asn, Trp, Val, Gly, Thr, Leu, Glu, or Arg;

Xaa at position 81 is Leu, Gln, Gly, Ala, Trp, Arg, Val, or Lys;

Xaa at position 82 is Leu, Gln, Lys, Trp, Arg, Asp, Glu, Asn, His, Thr, Ser, Ala, Tyr, Phe, Ile, Met or Val;

Xaa at position 83 is Pro, Ala, Thr, Trp, Arg, or Met;

Xaa at position 84 is Cys, Glu, Gly, Arg, Met, or Val;

Xaa at position 85 is Leu, Asn, Val, or Gln;

Xaa at position 86 is Pro, Cys, Arg, Ala, or Lys;

Xaa at position 87 is Leu, Ser, Trp, or Gly;

Xaa at position 88 is Ala, Lys, Arg, Val, or Trp;

Xaa at position 89 is Thr, Asp, Cys, Leu, Val, Glu, His, Asn, or Ser;

Xaa at position 90 is Ala, Pro, Ser, Thr, Gly, Asp, Ile, or Met;

Xaa at position 91 is Ala, Pro, Ser, Thr, Phe, Leu, Asp, or His;

Xaa at position 92 is Pro, Phe, Arg, Ser, Lys, His, Ala, Gly, Ile or Leu;

Xaa at position 93 is Thr, Asp, Ser, Asn, Pro, Ala, Leu, or Arg;

Xaa at position 94 is Arg, Ile, Ser, Glu, Leu, Val, Gln, Lys, His, Ala, or Pro;

Xaa at position 95 is His, Gln, Pro, Arg, Val, Leu, Gly, Thr, Asn, Lys, Ser, Ala, Trp, Phe, Ile, or Tyr;

Xaa at position 96 is Pro, Lys, Tyr, Gly, Ile, or Thr;

Xaa at position 97 is Ile, Val, Lys, Ala, or Asn;

Xaa at position 98 is His, Ile, Asn, Leu, Asp, Ala, Thr, Glu, Gln, Ser, Phe, Met, Val, Lys, Arg, Tyr or Pro;

Xaa at position 99 is Ile, Leu, Arg, Asp, Val, Pro, Gln, Gly, Ser, Phe, or His;

Xaa at position 100 is Lys, Tyr, Leu, His, Arg, Ile, Ser, Gln, or Pro;

Xaa at position 101 is Asp;

Xaa at position 102 is Gly, Leu, Glu, Lys, Ser, Tyr, or Pro;

Xaa at position 103 is Asp, or Ser;

Xaa at position 104 is Trp, Val, Cys, Tyr, Thr, Met, Pro, Leu, Gln, Lys, Ala, Phe, or Gly;

Xaa at position 105 is Asn, Pro, Ala, Phe, Ser, Trp, Gln, Tyr, Leu, m, Lys, Ile, Asp, or His;

Xaa at position 106 is Glt, Ser, Ala, Lys, Thr, Ile, Gly, or Pro;

5,772,994

HEMATOPOIETIC FACILITATORY CELLS AND THEIR  
USES

Suzanne T. Ildstad; Richard L. Simmons, both of Pittsburgh, Pa.; Camillo Ricordi, Miami Beach, Fla.; Sherry M. Wren, Pittsburgh, and Christina Kaufman, Munhall, both of Pa., assignors to The University of Pittsburgh, Pittsburgh, Pa.

Continuation of Ser. No. 69,315, May 28, 1993, abandoned.

This application Jun. 5, 1995, Ser. No. 463,908

Int. Cl.<sup>6</sup> A01N 63/00; C12N 15/00

U.S. Cl. 424—93.7 72 Claims

1. A cellular composition comprising mammalian hematopoietic cells, which are depleted of graft-versus-host-disease-producing cells having a phenotype of  $\alpha\beta$  TCR<sup>+</sup> and  $\gamma\delta$  TCR<sup>+</sup>, with the retention of mammalian hematopoietic facilitatory cells having a phenotype of CD3<sup>+</sup>, CD8<sup>+</sup>,  $\alpha\beta$  TCR<sup>+</sup> and  $\gamma\delta$  TCR<sup>+</sup> as determined by antibody staining and flow cytometry, which hematopoietic facilitatory cells are capable of facilitating engraftment of bone marrow cells.

5,772,995

COMPOSITIONS AND METHODS FOR ENHANCED  
TUMOR CELL IMMUNITY IN VIVO

Habib Fakhrai, La Jolla; Oliver Dorigo, San Diego, and Robert E. Sobol, Rancho Santa Fe, all of Calif., assignors to Sidney Kimmel Cancer Center, San Diego, Calif.

Filed Jul. 18, 1994, Ser. No. 276,694

Int. Cl.<sup>6</sup> A61K 38/54

U.S. Cl. 424—93.21 2 Claims

1. A composition for prolonging survival of a subject having a glioma, said composition comprising a therapeutically effective amount of genetically modified glioma cells containing a genetic construct expressing a TGF $\beta$  antisense molecule effective to reduce or inhibit expression of TGF $\beta$ , wherein said genetically modified glioma cells are of the same tumor type obtained from the subject or are donor glioma cells, which are of the same histologic type as the subject's tumor cells.

5,772,996

PHARMACEUTICAL COMPOSITIONS CONTAINING  
SUPEROXIDE DISMUTASE FROM BACILLUS  
STEAROTHERMOPHILUS AND BACILLUS CALDOTENAX

Anthony Atkinson; Kevin John Bown; John Karl Brehm; Stephen Phillip Chambers, and Nigel Peter Minton, all of London, England, assignors to Public Health Laboratory Service Board, London, United Kingdom

Continuation of Ser. No. 978,697, Feb. 2, 1993, abandoned.

This application May 22, 1995, Ser. No. 445,909

Claims priority, application United Kingdom, Aug. 3, 1990, 9017037

Int. Cl.<sup>6</sup> A61K 38/44; C12N 9/08; 15/63

U.S. Cl. 424—94.4 12 Claims

1. A pharmaceutical composition for use in the prophylaxis or treatment of pathological conditions resulting from the presence of superoxide radicals, comprising a Manganese-superoxide dismutase (MnSOD) enzyme and a pharmaceutically acceptable excipient, the MnSOD enzyme (a) being in native form, (b) having essentially the amino acid sequence of SEQ ID NO: 17 or SEQ ID NO:29, (c) being free of pyrogens consisting of macromolecular substances native to *Bacillus stearothermophilus* (BS) or *Bacillus caldotenax* (BC) and (d) catalysing dismutation of O<sub>2</sub><sup>-</sup> to H<sub>2</sub>O<sub>2</sub>.

5,772,993

OSTEOCALCIN PROMOTER-BASED TOXIC GENE  
THERAPY FOR THE TREATMENT OF CALCIFIED  
TUMORS AND TISSUES

Leland W. K. Chung, Livingston; Chinghai Kao, Charlottesville; Robert A. Sikes, Charlottesville; Song-Chu Ko, Charlottesville, all of Va., and Jun Cheon, Sol, Rep. of Korea, assignors to The University of Virginia Patent Foundation, Charlottesville, Va.

Filed Jan. 21, 1997, Ser. No. 785,088

Int. Cl.<sup>6</sup> A61K 48/00; A01N 63/00; C12P 21/04; C12N 15/00

U.S. Cl. 424—93.6 6 Claims

4. A method for treating a tumor, comprising delivering directly to said tumor a therapeutic agent, said therapeutic agent comprising (a) a recombinant adenovirus (Ad) vector containing an osteocalcin (OC) promoter driven toxic thymidine kinase, Ad-OC-TK optionally acyclovir (ACV).

5. The method of claim 4; wherein said tumor is osteosarcoma, breast cancer, prostate cancer, melanoma or brain tumor.



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**5,772,997**  
**MONOCLONAL ANTIBODIES DIRECTED TO THE HER2 RECEPTOR**

Robert M. Hudziak, Corvallis, Oreg.; H. Michael Shepard, Rancho Santa Fe, Calif.; Axel Ullrich, Portola Valley, Calif., and Brian M. Fendly, Half Moon Bay, Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Division of Ser. No. 286,303, Aug. 4, 1994, Pat. No. 5,677,171, which is a continuation of Ser. No. 977,453, Nov. 18, 1992, abandoned, which is a continuation of Ser. No. 147,461, Jan. 25, 1988, abandoned, which is a continuation-in-part of Ser. No. 143,912, Jan. 12, 1988, abandoned. This application May 23, 1995, Ser. No. 447,478

Int. Cl.<sup>6</sup> A61K 39/395; C07K 16/30; 16/46; C12P 21/08  
U.S. Cl. 424—130.1 13 Claims

1. A monoclonal antibody which specifically binds to the extracellular domain of the HER2 receptor and inhibits growth of tumor cells which overexpress HER2 receptor in a patient treated with an effective amount of said antibody.

**5,772,998**  
**MONOCLONAL ANTIBODIES TO TRANSFORMING GROWTH FACTOR-BETA AND METHODS OF USE**

James R. Dasch, Palo Alto; Doran R. Pace, III, San Francisco, and Wendy O. Waegell, Mountain View, all of Calif., assignors to Celtrix Pharmaceuticals, Inc., Santa Clara, Calif.

Division of Ser. No. 759,109, Sep. 6, 1991, Pat. No. 5,571,714, which is a continuation of Ser. No. 288,432, Dec. 22, 1988, abandoned. This application May 4, 1995, Ser. No. 434,976

Int. Cl.<sup>6</sup> A61K 39/395; C07K 16/22  
U.S. Cl. 424—133.1 7 Claims

1. A method for neutralizing the inhibitory effects of transforming growth factor beta (TGF- $\beta$ ), which method comprises administering a therapeutically effective amount of a monoclonal antibody that neutralizes transforming growth factor- $\beta$ 1 and transforming growth factor- $\beta$ 2.

6. The method of claim 1 wherein said monoclonal antibody is a chimeric monoclonal antibody, said chimeric monoclonal antibody comprising an antigen binding portion and a remainder portion, said antigen binding portion obtained from a monoclonal antibody that neutralizes transforming growth factor- $\beta$ 1 and transforming growth factor- $\beta$ 2 and said remainder portion obtained from human antibodies.

7. The method of claim 6 wherein said chimeric monoclonal antibody comprises the antigen binding portion obtained from the monoclonal antibody obtained from hybridoma 1D11.16 having A.T.C.C. Accession No. HB9849.

**5,772,999**  
**METHOD OF PREVENTING, COUNTERING, OR REDUCING NSAID-INDUCED GASTROINTESTINAL DAMAGE BY ADMINISTERING MILK OR EGG PRODUCTS FROM HYPERIMMUNIZED ANIMALS**

Hellen Chaya Greenblatt, Wilmington, Del.; Orn Adalsteins-son, Kennett Square, Pa.; David Alan Brodie, East Windsor, N.J., and Sandra G. Fitzpatrick-McElligott, Rose Valley, Pa., assignors to DCV Biologics, L.P., Wilmington, Del.

Filed Jul. 30, 1996, Ser. No. 688,576  
Int. Cl.<sup>6</sup> A61K 39/395

U.S. Cl. 424—187.1 14 Claims

1. A method for preventing or reducing non-steroidal, anti-inflammatory drug-induced gastrointestinal damage in a subject who will receive or is receiving a non-steroidal, anti-inflammatory drug, comprising the steps of:

hyperimmunizing an egg-producing animal or a milk-producing animal;

collecting hyperimmunized egg product or hyperimmunized milk product from the hyperimmunized animal;

administering the egg or milk product to the subject, wherein the egg or milk product is capable of preventing or reducing said

gastrointestinal damage, in an amount sufficient to prevent or reduce said gastrointestinal damage; and administering a non-steroidal, anti-inflammatory drug.

**5,773,000**  
**THERAPEUTIC TREATMENT OF CLOSTRIDIUM DIFFICILE ASSOCIATED DISEASES**

Eileen F. Bostwick, Dayton, and Robert A. Hoerr, Long Lake, both of Minn., assignors to GalaGen Inc., Arden Hills, Minn.

Continuation of Ser. No. 300,918, Sep. 6, 1994, abandoned.

This application Oct. 15, 1996, Ser. No. 730,437  
Int. Cl.<sup>6</sup> A61K 39/395; 39/40; C07K 16/12  
U.S. Cl. 424—167.1 6 Claims

1. A method of treating pseudomembranous colitis in a human comprising: administering, in a tablet, capsule or suppository, to said human suffering therefrom an amount of anti-*Clostridium difficile* bovine immunoglobulin concentrate effective for treating said colitis.

**5,773,001**  
**CONJUGATES OF METHYLTRITHIO ANTITUMOR AGENTS AND INTERMEDIATES FOR THEIR SYNTHESIS**

Philip Ross Hamann, Garnerville; Lois Hinman, N. Tarrytown; Irwin Hollander, Monsey, all of N.Y.; Ryan Holcomb, Glen Rock, N.J.; William Hallett; Hwei-Ru Tsou, both of New City, N.Y., and Martin J. Weiss, Ft. Lee, N.J., assignors to American Cyanamid Company, Madison, N.J.

Filed Jun. 3, 1994, Ser. No. 253,877  
Int. Cl.<sup>6</sup> A61K 39/395; C07K 16/00; C07G 11/00  
U.S. Cl. 424—181.1 29 Claims

1. A cytotoxic drug conjugate of formula:



wherein

$Z^1$  is a protein selected from mono- and polyclonal antibodies, their antigen-recognizing fragments, and their chemically or genetically manipulated counterparts, and growth factors and their chemically or genetically manipulated counterparts, wherein a covalent bond to the protein is an amide formed from reaction with lysine side chains, or a steroid, wherein the covalent bond to the steroid is an amide or an ester;

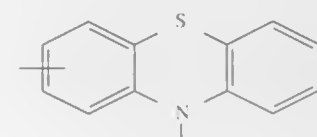
Alk and Alk<sup>2</sup> are independently a bond or branched or unbranched (C<sub>1</sub>–C<sub>10</sub>) alkylene chain;

Sp<sup>1</sup> is a bond, —S—, —O—, —CONH—, —NHCO—, —NR'—, —N(CH<sub>2</sub>CH<sub>2</sub>)<sub>2</sub>N—, or —X—Ar'—Y—(CH<sub>2</sub>)<sub>n</sub>—Z wherein X, Y, and Z are independently a bond, —NR'—, —S—, or —O—, with the proviso that when n = 0, then at least one of Y and Z must be a bond and Ar' is 1,2-, 1,3-, or 1,4-phenylene optionally substituted with one, two, or three groups of (C<sub>1</sub>–C<sub>5</sub>) alkyl, (C<sub>1</sub>–C<sub>4</sub>) alkoxy, (C<sub>1</sub>–C<sub>4</sub>) thioalkoxy, halogen, nitro, COOR', CONHR', O(CH<sub>2</sub>)<sub>n</sub>COOR', S(CH<sub>2</sub>)<sub>n</sub>COOR', O(CH<sub>2</sub>)<sub>n</sub>CONHR', or S(CH<sub>2</sub>)<sub>n</sub>CONHR', with the proviso that when Alk<sup>1</sup> is a bond, Sp<sup>1</sup> is a bond;

n is an integer from 0 to 5;

R' is a branched or unbranched (C<sub>1</sub>–C<sub>5</sub>) chain optionally substituted by one or two groups of —OH, (C<sub>1</sub>–C<sub>4</sub>) alkoxy, (C<sub>1</sub>–C<sub>4</sub>) thioalkoxy, halogen, nitro, (C<sub>1</sub>–C<sub>4</sub>) dialkylamino, or (C<sub>1</sub>–C<sub>4</sub>) trialkylammonium —A<sup>+</sup> where A<sup>+</sup> is a pharmaceutically acceptable anion completing a salt;

Ar is 1,2-, 1,3-, or 1,4-phenylene optionally substituted with one, two, or three groups of (C<sub>1</sub>–C<sub>6</sub>) alkyl, (C<sub>1</sub>–C<sub>5</sub>) alkoxy, (C<sub>1</sub>–C<sub>4</sub>) thioalkoxy, halogen, nitro, or COOR', CONHR', O(CH<sub>2</sub>)<sub>n</sub>COOR', S(CH<sub>2</sub>)<sub>n</sub>COOR', O(CH<sub>2</sub>)<sub>n</sub>CONHR', or S(CH<sub>2</sub>)<sub>n</sub>CONHR' wherein n and R' are as defined above or a 1,2-, 1,3-, 1,4-, 1,5-, 1,6-, 1,7-, 1,8-, 2,3-, 2,6-, or 2,7-naphthylidene or

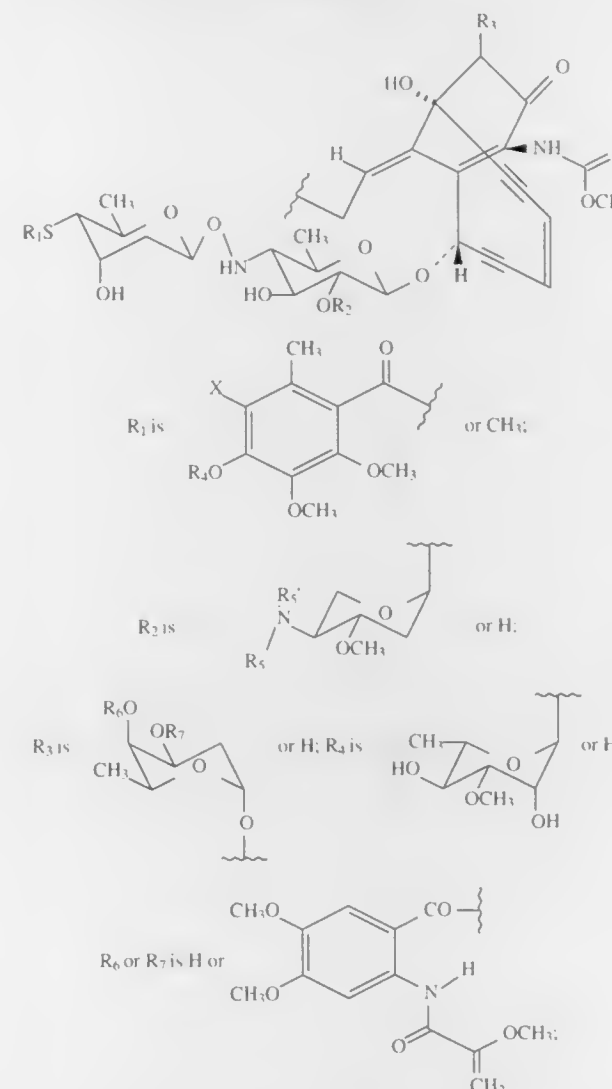


each naphthylidene or phenothiazine optionally substituted with one, two, three, or four groups of (C<sub>1</sub>–C<sub>6</sub>) alkyl, (C<sub>1</sub>–C<sub>4</sub>) alkoxy, (C<sub>1</sub>–C<sub>4</sub>) thioalkoxy, halogen, nitro, or COOR', CONHR', O(CH<sub>2</sub>)<sub>n</sub>COOR', S(CH<sub>2</sub>)<sub>n</sub>COOR', O(CH<sub>2</sub>)<sub>n</sub>CONHR', or S(CH<sub>2</sub>)<sub>n</sub>CONHR' wherein n and R' are as defined above, with the proviso that when Ar is naphthylidene, Z<sup>1</sup> is not hydrogen and with the proviso that when Ar is phenothiazine, Sp<sup>1</sup> is a bond only connected to nitrogen;

Sp<sup>2</sup> is a bond, —S—, or —O—, with the proviso that when Alk<sup>2</sup> is a bond, Sp<sup>2</sup> is a bond;

Z<sup>1</sup> is H, (C<sub>1</sub>–C<sub>4</sub>) alkyl, or phenyl optionally substituted with one, two, or three groups of (C<sub>1</sub>–C<sub>4</sub>) alkyl, (C<sub>1</sub>–C<sub>4</sub>) alkoxy, (C<sub>1</sub>–C<sub>4</sub>) thioalkoxy, halogen, nitro, COOR', CONHR', O(CH<sub>2</sub>)<sub>n</sub>COOR', S(CH<sub>2</sub>)<sub>n</sub>COOR', O(CH<sub>2</sub>)<sub>n</sub>CONHR', or S(CH<sub>2</sub>)<sub>n</sub>CONHR' wherein n and R' are as defined above;

Z<sup>2</sup> is Q—Sp—S—S—W, wherein W is



R<sub>5</sub> is —CH<sub>3</sub>, —C<sub>2</sub>H<sub>5</sub>, or —CH(CH<sub>3</sub>)<sub>2</sub>; X is an iodine or bromine atom; R<sub>5</sub> is a hydrogen or the group RCO, wherein R is hydrogen, branched or unbranched (C<sub>1</sub>–C<sub>10</sub>) alkyl or (C<sub>1</sub>–C<sub>10</sub>) alkylene group, a (C<sub>6</sub>–C<sub>11</sub>) aryl group, a (C<sub>6</sub>–C<sub>11</sub>) aryl-alkyl (C<sub>1</sub>–C<sub>5</sub>) group, or a heteroaryl or heteroaryl-alkyl (C<sub>1</sub>–C<sub>5</sub>) group wherein heteroaryl is 2- or 3-furyl, 2- or

3-thienyl, 2- or 3-(N-methylpyrrolyl), 2-, 3-, or 4-pyridyl, 2-, 4-, or 5-(N-methylimidazolyl), 2-, 4-, or 5-oxazolyl, 2-, 3-, 5-, or 6-pyrimidinyl, 2-, 3-, 4-, 5-, 6-, 7-, or 8-quinolyl, or 1-, 3-, 4-, 5-, 6-, 7-, or 8-heteroaryl optionally substituted by one or more hydroxy, amino, carboxy, halo, nitro, lower (C<sub>1</sub>–C<sub>4</sub>) alkoxy, or lower (C<sub>1</sub>–C<sub>4</sub>) thioalkoxy groups;

Sp is a straight or branched-chain divalent or trivalent (C<sub>1</sub>–C<sub>18</sub>) radical, divalent or trivalent aryl or heteroaryl radical, divalent or trivalent (C<sub>1</sub>–C<sub>18</sub>) cycloalkyl or heterocycloalkyl radical, divalent or trivalent aryl- or heteroaryl-alkyl (C<sub>1</sub>–C<sub>18</sub>) radical, divalent or trivalent cycloalkyl- or heterocycloalkyl-alkyl (C<sub>1</sub>–C<sub>18</sub>) radical or divalent or trivalent (C<sub>2</sub>–C<sub>18</sub>) unsaturated alkyl radical, wherein heteroaryl is furyl, thienyl, N-methylpyrrolyl, pyridinyl, N-methylimidazolyl, oxazolyl, pyrimidinyl, quinolyl, isoquinolyl, N-methylcarbazoyl, aminocoumarinyl, or phenazinyl and wherein when Sp is a trivalent radical, Sp can be additionally substituted by lower (C<sub>1</sub>–C<sub>4</sub>) dialkylamino, lower (C<sub>1</sub>–C<sub>4</sub>) alkoxy, hydroxy, or lower (C<sub>1</sub>–C<sub>4</sub>) alkylthio groups; and

Q is =NHNCO—, =NHNCS—, =NHNCONH—, =NHNCSNH—, or =NHO—

m is from about 0.1 to 15.

**5,773,002**  
**CLONING AND SEQUENCING OF ALLERGENS OF DERMATOPHAGOIDES (HOUSE DUST MITE)**

Wayne R. Thomas, Nedlands, and Kaw-Yan Chua, Nollamara, both of Australia, assignors to The Institute of Child Health Research, West Perth, Australia, and Immologic Pharmaceutical Corporation, Waltham, Mass.

Division of Ser. No. 945,288, Sep. 10, 1992, Pat. No. 5,433,948, which is a continuation-in-part of Ser. No. 580,655, Sep. 11, 1990, abandoned, which is a continuation-in-part of Ser. No. 458,642, Feb. 13, 1990, abandoned. This application Jun. 5, 1995, Ser. No. 461,441

Int. Cl.<sup>6</sup> A61K 39/35 5 Claims

U.S. Cl. 424—184.1

1. An isolated peptide comprising a portion of a *Der f*11 protein allergen having the following amino acid sequence (SEQ ID NO:13), wherein the peptide comprises at least one T cell epitope and at least one amino acid sequence polymorphism selected from the group consisting of Xaa<sub>1</sub>, Xaa<sub>2</sub>, Xaa<sub>3</sub>, Xaa<sub>4</sub>, Xaa<sub>5</sub>, and Xaa<sub>6</sub>:

Asp Gln Val Asp Val Lys Asp Cys Ala Asn Xaa<sub>1</sub> Glu Ile Lys Lys Val Met Val Asp Gly Cys His Gly Ser Asp Pro Cys Ile Ile His Arg Gly Lys Pro Phe Thr Leu Glu Ala Leu Phe Asp Ala Asn Gln Asn Thr Lys Thr Ala Lys Xaa<sub>2</sub> Glu Xaa<sub>3</sub> Lys Ala Ser Leu Asp Gly Leu Glu Ile Asp Val Pro Gly Ile Asp Thr Asn Ala Cys His Phe Xaa<sub>4</sub> Lys Cys Pro Leu Val Lys Gly Gln Gln Tyr Asp Xaa<sub>5</sub> Lys Tyr Thr Trp Asn Val Pro Lys Ile Ala Pro Lys Ser Glu Asn Val Val Val Thr Val Lys Leu Xaa<sub>6</sub> Gly Asp Asn Gly Val Leu Ala Cys Ala Ile Ala Thr His Ala Lys Ile Arg Asp (SEQ ID NO: 13) where Xaa<sub>1</sub> is selected from the group consisting of Asn and Ser;

where Xaa<sub>2</sub> is selected from the group consisting of Thr and Ile;

where Xaa<sub>3</sub> is selected from the group consisting of Ile and Thr;

where Xaa<sub>4</sub> is selected from the group consisting of Met and Val;

where Xaa<sub>5</sub> is selected from the group consisting of Ala and Ile;

and

where Xaa<sub>6</sub> is selected from the group consisting of Val and Ile;

with the proviso that,

when Xaa<sub>1</sub> is Asn, then Xaa<sub>3</sub> is Thr; and

when Xaa<sub>3</sub> is Ile, then Xaa<sub>1</sub> is Ser.

5,773,003

## HAPTEN-CARRIER CONJUGATES FOR USE IN DRUG-ABUSE THERAPY AND METHODS FOR PREPARATION OF SAME

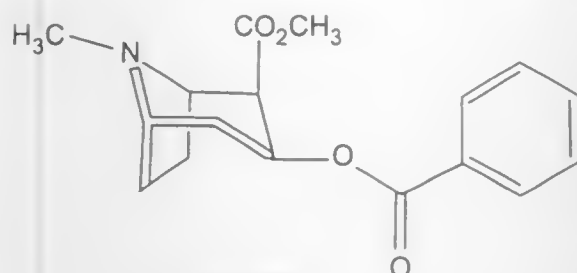
Philip A. Swain, Brighton; Victoria Carol Schad, Cambridge; Julia Lea Greenstein, West Newton; Mark Adrian Exley, Chestnut Hill; Barbara Saxton Fox, Wayland; Stephen P. Powers, Waltham, and Malcolm L. Geffer, Lincoln, all of Mass., assignors to ImmuLogic, Inc., Waltham, Mass.

Division of Ser. No. 414,971, Mar. 31, 1995, abandoned. This application Jun. 1, 1995, Ser. No. 456,444

Int. Cl.<sup>6</sup> A61K 39/385; 39/12

U.S. Cl. 424—193.1

12 Claims



(-)-COCAINE

1. A therapeutic composition comprising at least one conjugate comprising a hapten-carrier conjugate having the structure shown in FIG. 1B, wherein B is  $\text{OCOC}_6\text{H}_5$ , wherein A, C, D, E, and F are each independently selected from the group of chemical moieties identified by CJ reference number, consisting of:

CJ0	Q
CJ1	$(\text{CH}_2)_n\text{Q}$
CJ1.1	$\text{CO}_2\text{Q}$
CJ1.2	$\text{COQ}$
CJ1.3	$\text{OCH}_3$
CJ2	$\text{OCO}(\text{CH}_2)_n\text{Q}$
CJ2.1	$\text{OCOCH}=\text{Q}$
CJ2.2	$\text{OCOCH}(\text{O})$
CJ2.3	$\text{OCO}(\text{CH}_2)_n\text{CH}(\text{O})\text{CH}_2$
CJ3	$\text{CO}(\text{CH}_2)_n\text{COQ}$
CJ3.1	$\text{CO}(\text{CH}_2)_n\text{CNQ}$
CJ4	$\text{OCO}(\text{CH}_2)_n\text{COQ}$
CJ4.1	$\text{OCO}(\text{CH}_2)_n\text{CNQ}$
CJ5	$\text{CH}_2\text{OCO}(\text{CH}_2)_n\text{COQ}$
CJ5.1	$\text{CH}_2\text{OCO}(\text{CH}_2)_n\text{CNQ}$
CJ6	$\text{CONH}(\text{CH}_2)_n\text{Q}$
CJ7	$\text{Y}(\text{CH}_2)_n\text{Q}$
CJ7.1	$\text{CH}_2\text{Y}(\text{CH}_2)_n\text{Q}$
CJ8	$\text{OCOCH}(\text{OH})\text{CH}_2\text{Q}$
CJ8.1	$\text{OCO}(\text{CH}_2)_n\text{CH}(\text{OH})\text{CH}_2\text{Q}$
CJ9	$\text{OCOC}_6\text{H}_5$ and
CJ10	See FIG. 2b

wherein Y is sulfur (S), oxygen (O), or an amine (NH), wherein n is an integer from 3 to 20, and wherein Q is selected from the group consisting of: H, OH,  $\text{OCH}_3$ ,  $\text{CH}_3$ ,  $\text{COOH}$ , halogens, activated esters, mixed anhydrides, acyl halides, acyl azides, alkyl halides, N-maleimides, imino esters, isocyanate, isothiocyanate, and T cell epitope-containing carriers; with the proviso that at least one of A, C, D, E, and F comprises a carrier containing at least one T cell epitope said carrier selected from the group consisting of cholera toxin B (CTB), diphtheria toxin, tetanus toxoid, pertussis toxin, ricin B subunit, retrovirus nucleoprotein (retro NP), rabies ribonucleoprotein (rabies RNP), Tobacco Mosaic Virus, and vesicular stomatitis virus-nucleocapsid protein (VSV-N); and a pharmacologically acceptable excipient.

5,773,004

## COMPOSITIONS FOR CURING DIABETES MELLITUS, PROCESSES FOR THE PREPARATION OF SAME, AND USAGE OF SAME

Masakiyo Takahashi, 12-15, Minamikatae 5-chome, Johnnaku, Fukuoka 814-01, Japan

Filed Oct. 30, 1995, Ser. No. 550,078

Claims priority, application Japan, Oct. 31, 1994, 6-267860

Int. Cl.<sup>6</sup> A01N 65/00; A23F 3/34; A61K 45/00; 35/78

U.S. Cl. 424—195.1

8 Claims

1. A composition for reducing the blood sugar in treating diabetes mellitus comprising an extract from a plant selected from the genus *Ludwigia*, wherein said extract is obtained by immersing said plant in a pharmacologically acceptable solvent.

5,773,005

PURIFIED FLAVONOID AND DITERPENE  $5\alpha$ -REDUCTASE INHIBITORS FROM THUJA ORIENTALIS FOR ANDROGEN-RELATED DISEASES

Hidehiko Takahashi, 15-26, Seijou 5-Chome; Susumu Hara, and Rieko Matsui, both of c/o Kabushiki Kaisha Yakurigaku Chuo Kenkyusho, 15-4, Soshigaya 4-Chome, all of Setagaya-ku, Tokyo 157, Japan

Filed Jun. 7, 1996, Ser. No. 659,847

Claims priority, application Japan, Jun. 9, 1995, 7-143504; Feb. 29, 1996, 8-043029

Int. Cl.<sup>6</sup> A61K 35/78; 31/12; 31/19; 31/35

U.S. Cl. 424—195.1

12 Claims

1. A non-steroidal inhibitor of  $5\alpha$ -reductase extracted from *Thuja orientalis* wherein the inhibitor is selected from the group consisting of purified (iso)scutellarein and a purified diterpene that has a double bond in the 12- and 14- positions, with the double bond in the 12- position taking the configuration E.

5,773,006

## LIPISOME CONTAINING IL-2

Peter M. Anderson, St. Louis Park; Arnold S. Leonard; Augusto C. Ochoa, both of Minneapolis, and Cynthia Loeffler, Woodbury, all of Minn., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Continuation of Ser. No. 164,746, Dec. 10, 1993, Pat. No. 5,650,152, which is a continuation of Ser. No. 650,033, Feb. 4, 1991, abandoned, which is a division of Ser. No. 382,778, Jul. 19, 1989, abandoned, which is a continuation-in-part of Ser. No. 263,546, Oct. 27, 1988, abandoned. This application Apr. 7, 1995, Ser. No. 418,664

Int. Cl.<sup>6</sup> A61K 45/05; 39/395; 39/02; 39/12

U.S. Cl. 424—195.11

4 Claims

1. Liposomes comprising liposomal lipid, interleukin-2 and a protein carrier, wherein the carrier:liposomal lipid ratio (w/w) is from 1:2 to 1:12, wherein said liposomal lipid is dimyristoyl phosphatidyl choline, and wherein said carrier is human serum albumin.

5,773,007

## VACCINE COMPOSITIONS

Christopher L. Penney, Quebec; Francis Michon, Ottawa, and Harold J. Jennings, Gloucester, all of Canada, assignors to National Research Council of Canada, Ottawa, Canada

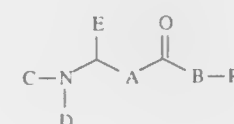
Continuation of Ser. No. 101,339, Aug. 2, 1993, abandoned, which is a continuation of Ser. No. 583,372, Sep. 17, 1990, abandoned. This application Aug. 26, 1994, Ser. No. 297,359

Int. Cl.<sup>6</sup> A61K 39/09; 39/085; 39/108; 47/42

U.S. Cl. 424—197.11

23 Claims

1. A vaccine composition comprising a bacterial polysaccharide protein conjugate and an effective amount of at least one adjuvant of the formula:



wherein

C is selected from the group consisting of hydrogen, an amino acid residue, and a peptide residue;

D is selected from the group consisting of hydrogen and any other pharmaceutically acceptable acid;

E is selected from the group consisting of 4-hydroxybenzyl, benzyl, 4-hydroxyphenyl, phenyl, 4-aminobutyl, isopropyl, methyl, hydrogen and a residue of a naturally occurring amino acid;

A is  $(\text{CH}_2)_n$ , oxygen or  $\text{CH}_2\text{O}$  and B is  $(\text{CH}_2)_n$  or oxygen, wherein n is 0 to 4, with the proviso that A and B are not the same for  $(\text{CH}_2)_n$  and oxygen; and

R is alkyl of 12 to 20 carbon atoms.

5,773,008

Patent Not Issued For This Number

5,773,009

## ROTAVIRUS STRAIN G9P11

Roger I. Glass; John R. Gentsch, both of Atlanta, Ga.; M. K. Bhan, and Bimal K. Das, both of New Delhi, India, assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 231,041, Apr. 15, 1994, abandoned.

This application Feb. 19, 1997, Ser. No. 802,141

Int. Cl.<sup>6</sup> A61K 39/15; C12N 7/00; 7/01; 15/63

U.S. Cl. 424—215.1

4 Claims

1. An isolated rotavirus of strain G9P11 comprising a bovine VP4 virus gene and a human VP7 virus gene.

5,773,010

## LOW MOLECULAR WEIGHT ALLERGEN OBTAINED FROM DERMATOPHAGOIDES FARINAE

Satoru Oka; Kazuhisa Ono, both of Hiroshima; Seiko Shigeta, and Takeshi Wada, both of Hiroshima-ken, all of Japan, assignors to Fumakilla Limited, Tokyo, and Hiroshima University, Hiroshima-ken, both of Japan

Division of Ser. No. 283,905, Aug. 4, 1994, Pat. No. 5,496,554, which is a continuation of Ser. No. 480,617, Feb. 15, 1990, abandoned. This application Nov. 29, 1995, Ser. No. 564,395

Claims priority, application Japan, Aug. 24, 1989, 1-220064

Int. Cl.<sup>6</sup> A61K 39/35; A61B 8/00; C12Q 1/00; G01N 33/53

U.S. Cl. 424—276.1

10 Claims

1. A partially purified extract of feces of *Dermatophagoides farinae* containing allergens having the following physicochemical, biochemical and immunological properties:

- ① being partially purified from fecal extracts of *Dermatophagoides farinae* maintained in culture;
- ② comprising a glycoprotein containing more than about 40% sugar;
- ③ having a molecular weight of 1,500 to 5,000 daltons as determined by SEPHADEX G25 gel filtration; and
- ④ possessing allergen activity.

5,773,011

## METHOD OF PREPARING A SYNERGISTIC IMMUNOLOGICAL ADJUVANT FORMULATION

Nikolaus Grubhofer, Gaiherg, Germany, assignor to Gerbu Biotechnik GmbH, Gaiherg, Germany

Continuation-in-part of Ser. No. 153,406, Nov. 16, 1993, abandoned. This application Jul. 21, 1995, Ser. No. 505,409

Claims priority, application Germany, Sep. 27, 1993, 43 32 825.3; Sep. 30, 1993, 43 33 376.1

Int. Cl.<sup>6</sup> A61K 45/00; 31/30; A01N 59/06; 55/02

U.S. Cl. 424—278.1

20 Claims

1. A method of forming an injectable medium comprising a synergistic immunological adjuvant formulation and an aqueous antigen solution, the method comprising the steps of: mixing together a glycopeptide, an amino acid complex and a lipid substance finely dispersible or soluble in said amino acid complex, to form a homogeneous mixture, drying the homogeneous mixture whereby to obtain a fine dispersion of said lipid substance with the dried residue of said amino acid complex and said glycopeptide, and adding said aqueous antigen solution to said fine dispersion whereby said amino acid complex readily dissolves in water present in said aqueous antigen solution and said finely dispersed lipid substance combines with protein molecules forming said antigen and thus remains finely dispersed in said injectable medium.

5,773,012

Patent Not Issued For This Number

5,773,013

Patent Not Issued For This Number

5,773,014

## COMPOSITIONS AND METHODS FOR INHIBITING THE FORMATION OF UNWANTED SKIN PIGMENTATION

Eric Perrier, Les Cotes D'Aarey, and Delphine Rival, Lyon, both of France, assignors to Bioetica, Inc., Portland, Me.

Filed Oct. 7, 1996, Ser. No. 710,165

Int. Cl.<sup>6</sup> A61K 7/00

U.S. Cl. 424—401

20 Claims

1. A composition for inhibiting formation of unwanted pigmentation, the composition comprising:

- a. a mulberry extract;
- b. a saxifrage extract;
- c. a scutellaria extract;
- d. a grape extract; and
- e. ethylenediaminetetraacetic acid.

5,773,015

## METHOD FOR CONTROLLING SKIN OILS AND GREASE

John Steven Bajor, Ramsey, N.J.; Angel Augusto Guerrero, Huntington, Conn., and Helen Elizabeth Knaggs, Weehawken, N.J., assignors to Elizabeth Arden Co., Division of Conopco, Inc., New York, N.Y.

Filed Nov. 27, 1996, Ser. No. 774,328

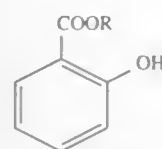
Int. Cl.<sup>6</sup> A61K 7/48

U.S. Cl. 424—401

3 Claims

1. A method for inhibiting skin production of oils and grease, the method comprising applying to the skin a safe and effective amount of salicylate ester in a pharmaceutically acceptable carrier, the salicylate ester having the formula (I):





wherein R is a C<sub>11</sub>-C<sub>30</sub> alkyl or alkenyl radical.

5,773,016

### INSECTICIDALLY-ACTIVE WATER-IN OIL-OUT EMULSIONS AND INSECTICIDALLY ACTIVE COMPOSITIONS DERIVED THEREFROM

Kurt D. Nelson, Mt. Pleasant, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Continuation of Ser. No. 379,247, Jan. 27, 1995, abandoned.

This application Apr. 29, 1997, Ser. No. 841,090

Int. Cl.<sup>6</sup> A01N 25/06

U.S. Cl. 424-405

12 Claims

1. An insecticidally-active water-in oil-out emulsion that has been formed by mixing its components together, comprising:

30%-70% by weight water;

a hydrocarbon solvent that is not a gas propellant, that is present in an oil phase of the emulsion, that is selected from the group consisting of aliphatic, aromatic, and naphthenic solvents, and mixtures thereof, and that is 0.05%-40% by weight of the emulsion;

between 0.2% and 2% by weight of insecticidal active selected from the group consisting of natural pyrethrins, synthetic pyrethroids, halogenated pyrethroids, and cyano-pyrethroids; and

an amount of surfactant effective to form a non-foaming water-in oil-out emulsion which upon visual inspection appears to completely separate into a composition with an oil phase and a water phase within fifteen seconds after said mixing of the emulsion has ceased, the surfactant being present in an amount of from 0.03% to 0.10% by weight, based on the total weight of the emulsion;

wherein the surfactant has an HLB of between about 3 and about 9 and is selected from the group consisting of glycol, glycerol, and sorbitol esters of oleic, stearic, palmitic, and lauric acids, polyethoxylated fatty alcohols having 2 to 9 ethylene oxide units, sorbitan, monooleate, sorbitan monostearate, and sorbitan monopalmitate and polyethoxylated nonyl phenols having 2 to 9 ethylene oxide units.

5,773,017

### DIATOMACEOUS EARTH INSECTICIDAL COMPOSITION

Zlatko Korunic, and Paul Fields, both of Winnipeg, Canada, assignors to Hedley Pacific Ventures Ltd., and Her Majesty the Queen in right of Canada, as represented by the Minister of Agriculture, Canada

Filed May 10, 1996, Ser. No. 644,490

Claims priority, application Canada, May 11, 1995, 2149164

Int. Cl.<sup>6</sup> A01N 25/12

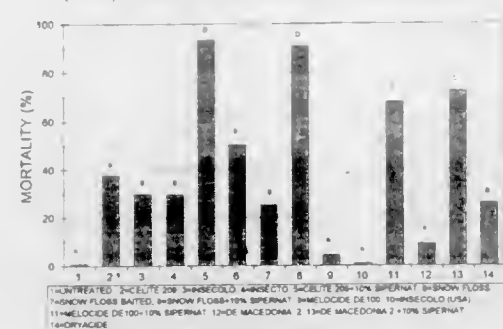
U.S. Cl. 424-409

10 Claims

1. An insecticidal dust composition consisting of a mixture of about 95% to 65% by weight diatomaceous earth (DE) and about

(1)

MORTALITY OF RUSTY GRAIN BEETLE EXPOSED (1 DAY) TO VARIOUS DIATOMACEOUS EARTH (300 PPM)



5% to 35% by weight silica selected from the group consisting of precipitated silica and aerogel silica, wherein the DE and silica are present in a combined synergistic insecticidally effective amount.

5,773,018

Patent Not Issued For This Number

5,773,019

### IMPLANTABLE CONTROLLED RELEASE DEVICE TO DELIVER DRUGS DIRECTLY TO AN INTERNAL PORTION OF THE BODY

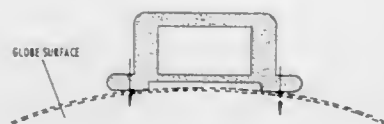
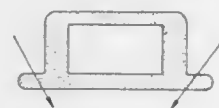
Paul Ashton, Boston, Mass., and Paul A. Pearson, Lexington, Ky., assignors to The University of Kentucky Research Foundation, Lexington, Ky.

Filed Sep. 27, 1995, Ser. No. 534,854

Int. Cl.<sup>6</sup> A61F 2/02; 2/14; A61K 47/30; 9/22

U.S. Cl. 424-423

22 Claims



1. A sustained release drug delivery device comprising: an inner core comprising an effective amount of a low solubility agent selected from the group consisting of immune response modifiers, corticosteroids, angiostatic steroids, anti-parasitic agents, anti-glaucoma agents, antibiotics, anti-sense compounds, differentiation modulators, anti-viral agents, anti-cancer agents, nonsteroidal anti-inflammatory agents, and low solubility codrugs; and a non-bioerodible polymer coating layer, the polymer layer being permeable to the low solubility agent, wherein the polymer coating layer covers the inner core and is essentially non-release rate limiting.

5,773,020

### TREATMENT OF ERECTILE DYSFUNCTION

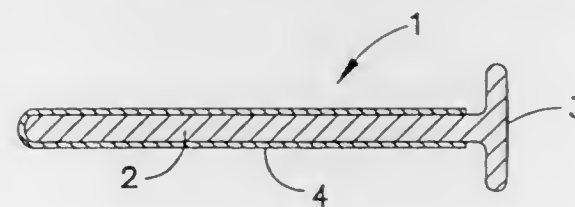
Virgil A. Place, Kawaihae, HI; Robert M. Gale, Los Altos, and Randall G. Berggren, Livermore, both of Calif., assignors to Vivus, Inc. East, Mountain View, Calif.

Continuation of Ser. No. 486,727, Jun. 7, 1995, abandoned, which is a division of Ser. No. 93,545, Jul. 19, 1993, Pat. No. 5,474,535, which is a division of Ser. No. 787,306, Oct. 30, 1991, Pat. No. 5,242,391, which is a continuation-in-part of Ser. No. 514,397, Apr. 25, 1990, abandoned. This application Oct. 28, 1997, Ser. No. 959,739

Int. Cl.<sup>6</sup> A61F 2/02; 2/04

U.S. Cl. 424-426

18 Claims



1. A dosage form for treating an erectile dysfunction comprising a shaft sized to be received within the male urethra and a composition retained within said shaft comprising an effective amount of a vasoactive prostaglandin and at least one dispersant.

5,773,021

### BIOADHESIVE OPHTHALMIC INSERT

Florian Gurtler, Chene Bougeries, and Robert Gurny, Geneva, both of Switzerland, assignors to Vetoquinol S.A., Lure, France

Continuation of Ser. No. 209,913, Mar. 14, 1994, abandoned. This application Nov. 18, 1996, Ser. No. 751,561

Int. Cl.<sup>6</sup> A61F 2/00

U.S. Cl. 424-427

11 Claims

1. An ophthalmic insert useful for the prolonged and controlled release of at least one medicinal substance, which comprises a homogeneous mixture of a composite polymeric material matrix and the medicinal substance, said composite polymeric material matrix comprising a mixture of:

a water-soluble biocompatible polymer selected from hydroxy-alkyl celluloses, maltodextrins, chitosans, modified starches or polyvinyl alcohols, a water-insoluble biocompatible polymer selected from alkylcelluloses, and a bioadhesive biocompatible polymer selected from polyvinyl carboxylic acids or sodium carboxymethyl celluloses, said insert being prepared by extrusion, thermoforming or heat compression of said homogeneous mixture.

5,773,022

### TOPICAL DRESSING

Adela Nyqvist-Mayer, Tullinge, Sweden, and Peter Walter, Ortenberg, Germany, assignors to Astra AB, Sweden

PCT No. PCT/SE95/00368, § 371 Date Aug. 22, 1996, § 102(e) Date Aug. 22, 1996, PCT Pub. No. WO95/26778, PCT Pub. Date Oct. 12, 1995

PCT Filed Apr. 5, 1995, Ser. No. 532,687

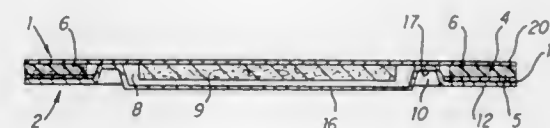
Claims priority, application Sweden, Apr. 5, 1994, 9401133; Sep. 19, 1994, 9403122

Int. Cl.<sup>6</sup> A61F 13/02; A61K 9/70; A61L 15/16

U.S. Cl. 424-443

13 Claims

1. A topical dressing comprising: a) a backing structure comprising: i) a pad containing active substance; ii) a resilient layer wherein: adhesive is provided on one side of said resilient layer; and



said resilient layer is provided with a cut-out region defining a cavity in which said pad is placed; and

iii) a disc wherein:

said disc is provided on the side of said resilient layer remote from the side with adhesive;

said disc is provided with one or more reinforcement strips extending outward from the peripheral edge of said disc toward the peripheral edge of said resilient layer; and

b) a covering structure, provided on the adhesive side of said resilient layer and sealed to said backing structure within said cavity and wherein said covering structure comprises

i) a release liner; and

ii) a disc formed to receive said pad during production and storage of said topical dressing.

5,773,023

### ENHANCED SKIN PENETRATION SYSTEM FOR IMPROVING TOPICAL DELIVERY OF DRUGS

George Endel Deckner, Trumbull, and Brian Scott Lombardo, Ansonia, both of Conn., assignors to Richardson-Vicks Inc., Shelton, Conn.

Division of Ser. No. 390,902, Feb. 16, 1995, abandoned, which is a continuation of Ser. No. 228,167, Apr. 15, 1994, abandoned, which is a continuation of Ser. No. 111,032, Aug. 24, 1993, abandoned, which is a continuation of Ser. No. 957,752, Oct. 2, 1992, abandoned, which is a continuation of Ser. No. 778,424, Oct. 16, 1991, abandoned. This application Jun. 5, 1995, Ser. No. 462,710

Int. Cl.<sup>6</sup> A61K 9/07; 31/78; 47/44

U.S. Cl. 424-449

29 Claims

1. A topical pharmaceutical composition having enhanced penetration through the skin, comprising:

(a) an aqueous carrier comprising from about 53% to about 91.5% water;

(b) a safe and effective amount of a pharmaceutical active selected from the group consisting of non-steroidal anti-inflammatory drugs, steroidal anti-inflammatory drugs, wound healing agents, skin bleaching or lightening agents, antitussive drugs, antipruritic drugs, anticholinergic drugs, anti-emetic and antinauseant drugs, anorexic drugs, central stimulant drugs, antiarrhythmic drugs, B-adrenergic blocker drugs, cardiotonic drugs, antihypertensive drugs, diuretic drugs, vasodilator drugs, vasoconstrictor drugs, anti-ulcer drugs, anesthetic drugs, antidepressant drugs, tranquilizer and sedative drugs, antipsychotic drugs, antineoplastic drugs, antimalarial drugs, muscle relaxant drugs, antispasmodic drugs, antidiarrheal drugs, bone-active drugs and mixtures thereof; and

(c) from about 0.05% to about 5% of a non-ionic polyacrylamide having a molecular weight of from about 1,000,000 to about 30,000,000, the polyacrylamide being predispersed in a water-immiscible oil containing a surfactant having an HLB of from about 7 to about 10,

wherein the composition is in gel emulsion form and has a pH below about 5.

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5,773,024

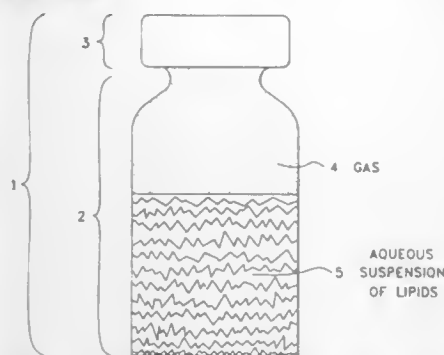
**CONTAINER WITH MULTI-PHASE COMPOSITION FOR USE IN DIAGNOSTIC AND THERAPEUTIC APPLICATIONS**

Evan C. Unger; Terry Matsunaga, and David Yellowhair, all of Tucson, Ariz., assignors to ImaRx Pharmaceutical Corp., Tucson, Ariz.

Continuation-in-part of Ser. No. 159,687, Nov. 30, 1993, Pat. No. 5,585,112, which is a continuation-in-part of Ser. No. 160,232, Nov. 30, 1993, Pat. No. 5,542,935, which is a continuation-in-part of Ser. No. 76,239, Jun. 11, 1993, Pat. No. 5,469,854, which is a continuation-in-part of Ser. No. 717,084, Jun. 18, 1991, Pat. No. 5,228,446, and a continuation-in-part of Ser. No. 716,899, Jun. 18, 1991, abandoned, which is a continuation-in-part of Ser. No. 569,828, Aug. 20, 1990, Pat. No. 5,088,499, which is a continuation-in-part of Ser. No. 455,707, Dec. 22, 1989, abandoned, said Ser. No. 307,305 is a continuation-in-part of Ser. No. 160,232, Nov. 30, 1993, Pat. No. 5,542,935, which is a continuation-in-part of Ser. No. 76,250, Jun. 11, 1993, Pat. No. 5,580,575, which is a continuation-in-part of Ser. No. 717,084, Jun. 18, 1991, Pat. No. 5,228,446, and a continuation-in-part of Ser. No. 716,899, Jun. 18, 1991, abandoned, said Ser. No. 717,084 and Ser. No. 716,899, is a continuation-in-part of Ser. No. 569,828, Aug. 20, 1990, Pat. No. 5,088,499, which is a continuation-in-part of Ser. No. 455,707, Dec. 22, 1989, abandoned, said Ser. No. 307,305 is a continuation-in-part of Ser. No. 212,553, Mar. 11, 1994, abandoned, which is a continuation-in-part of Ser. No. 76,239, Jun. 11, 1993, Pat. No. 5,469,854, and a continuation-in-part of Ser. No. 76,250, Jun. 11, 1993, Pat. No. 5,580,575.

This application Sep. 16, 1994, Ser. No. 307,305  
Int. Cl.<sup>6</sup> A61K 9/127

U.S. Cl. 424—450 51 Claims



1. A container which contains a composition comprising an aqueous phase and a gaseous phase substantially separate from said aqueous phase, wherein said aqueous phase comprises a lipid suspended therein and said gaseous phase comprises sulfur hexafluoride gas, and wherein said composition is capable of forming lipid spheres encapsulating the gas upon agitation of the container.

5,773,025

**SUSTAINED RELEASE HETERODISPERSE HYDROGEL SYSTEMS—AMORPHOUS DRUGS**

Anand Baichwal, Wappingers Falls, N.Y., assignor to Edward Mendell Co., Inc., Patterson, N.Y.

Continuation-in-part of Ser. No. 447,236, May 22, 1995, Pat. No. 5,554,387, which is a division of Ser. No. 118,924, Sep. 9, 1993, Pat. No. 5,455,046. This application Apr. 18, 1996, Ser. No. 634,295

Int. Cl.<sup>6</sup> A61K 9/22; 47/30

U.S. Cl. 424—458 35 Claims

1. A bioavailable sustained release oral solid dosage form comprising agglomerated particles of a therapeutically active medicament in amorphous form having an aqueous solubility of less than about 10 g/l, a gelling agent comprising xanthan gum and locust bean gum in a ratio from about 1:3 to about 3:1, an ionizable gel strength enhancing agent selected from the group consisting of

monovalent organic salts, monovalent inorganic salts, divalent organic salts, divalent inorganic salts, multivalent organic salts, multivalent inorganic salts and mixtures thereof and an inert diluent, wherein the ratio of said inert diluent to said gelling agent is from about 1:8 to about 8:1, and wherein said ionizable gel strength enhancing agent increases the gel strength of said gelling agent when said dosage form is exposed to gastrointestinal fluid, and wherein the amorphous form of said medicament affects the bioavailability of said oral dosage form.

5,773,026

**AQUEOUS FORMULATIONS OF WATER-INSOLUBLE THERAPEUTIC AGENT COMPRISING CAROTENOID AND/OR TOCOPHEROLS**

Lance Elliott Schlipalius, Ashwood, Australia, assignor to Betatene Limited, Australia

PCT No. PCT/AU94/00143, § 371 Date Sep. 22, 1995, § 102(e) Date Sep. 22, 1995, PCT Pub. No. WO94/21232, PCT Pub. Date Sep. 29, 1995

PCT Filed Mar. 22, 1994, Ser. No. 525,623

Claims priority, application Australia, Mar. 22, 1993, PL7935

Int. Cl.<sup>6</sup> A61K 9/107

U.S. Cl. 424—450 25 Claims

1. A therapeutic formulation for parenteral administration comprising:

- a water soluble or dispersible component comprising glycerol in the range of 30 to 90% by weight;
- an emulsifier in the range of 0.2% to 20% by weight; and
- a water insoluble therapeutic formulation in a suitable carrier medium wherein the water insoluble therapeutic formulation is selected from the group consisting of carotenoid compositions and tocopherols.

5,773,027

**LIPOSOMES ENCAPSULATING ANTIVIRAL DRUGS**

Michel G. Bergeron, Sillery, and André Desormeaux, Neufchâtel, both of Canada, assignors to Michael G. Bergeron, Sillery, Canada

Continuation-in-part of Ser. No. 316,735, Oct. 3, 1994, abandoned. This application Oct. 3, 1995, Ser. No. 538,457

Int. Cl.<sup>6</sup> A61K 9/127; C07H 31/70

U.S. Cl. 424—450 20 Claims

1. A liposome for the treatment of a viral disease which comprises: i) a lipid component comprising a mixture of diacylphosphatidylcholine and diacylphosphatidylglycerol in a molar ratio ranging between 10:1 and 1:1, wherein the acyl chains are either saturated or unsaturated and have between 16 and 18 carbon atoms in length and ii) a therapeutic amount of an entrapped drug effective against said viral disease.

5,773,028

**HYDROPHILIC ADHESIVE BASE MATERIAL**

Toshio Inagi, Mishima, and Makoto Kanabako, Fuji, both of Japan, assignors to Kowa Co., Ltd., Nagoya, Japan

Filed Jun. 27, 1996, Ser. No. 671,541

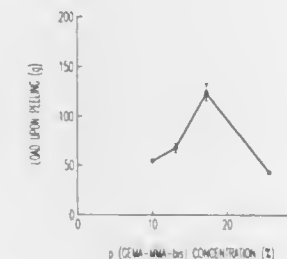
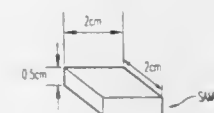
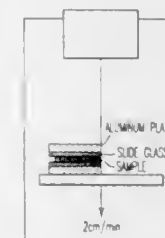
Claims priority, application Japan, Jul. 4, 1995, 7-168384

Int. Cl.<sup>6</sup> A61K 47/32; A61L 15/58

U.S. Cl. 424—487 10 Claims

1. A hydrophilic adhesive base material comprising the following components (A) and (B):

- a hydrophilic crosslinked polymer obtained by polymerizing:
  - a glucosyloxyalkyl (meth)acrylate,
  - an alkyl (meth)acrylate and/or a hydroxyalkyl (meth)acrylate, and



(c) a polyfunctional monomer; and  
(B) polyvinyl alcohol,  
obtained by freezing an aqueous solution containing said component (A) and from 3 to 10 wt. % of said component (B), and then thawing the frozen solution.

5,773,029

**HIGH SOLUBILITY MULTICOMPONENT INCLUSION COMPLEXES CONSISTING OF AN ACIDIC DRUG, A CYCLODEXTRIN AND A BASE**

Paolo Chiesi; Paolo Ventura; Maurizio Del Canale; Maurizio Redenti; Daniela Acerbi; Massimo Pasini, all of Parma, Italy; Jösef Szejtli, Budapest, Hungary; Maria Vikmon, Budapest, Hungary, and Eva Fenyvesi, Budapest, Hungary, assignors to Chiesi Farmaceutici S.p.A., Parma, Italy

PCT No. PCT/EP95/01407, § 371 Date Oct. 22, 1996, § 102(e) Date Oct. 22, 1996, PCT Pub. No. WO95/28965, PCT Pub. Date Nov. 2, 1995

PCT Filed Apr. 13, 1995, Ser. No. 722,220

Claims priority, application Italy, Apr. 22, 1994, M194A0790

Int. Cl.<sup>6</sup> A61K 9/10; 47/40

U.S. Cl. 424—488 9 Claims

1. A solid multicomponent inclusion complex comprising an acidic drug, a base and a cyclodextrin, said complex obtained by simultaneous salt formation and complexation.

5,773,030

**MULTIPLY-COATED PARTICLES**

Rudolf Nastke, Rehbrücke, Germany; Ernst Neuenschwander, Riehen, Switzerland, and Andreas Leonhardt, Freiburg, Germany, assignors to Novartis Corporation, Summit, N.J.

PCT No. PCT/EP94/00880, § 371 Date Sep. 29, 1995, § 102(e) Date Sep. 29, 1995, PCT Pub. No. WO94/22302, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 21, 1994, Ser. No. 532,551

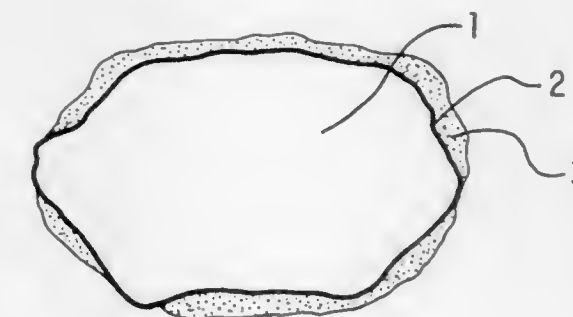
Claims priority, application United Kingdom, Apr. 1, 1993, 9306852

Int. Cl.<sup>6</sup> A61K 9/16; 9/50

U.S. Cl. 424—490 11 Claims

1. Encapsulated microparticles of a pesticide or mixture of pesticides, whereby the pesticide or pesticide mixture is solid at ambient temperature and substantially insoluble in water, each particle comprising

- a first discrete coating layer of a polymer which covers the surface of said particles partially or completely, and
- at least one further coating layer of the same polymer which covers the first layer and any exposed particle surface, wherein an inter-phase boundary is formed between the particle and the first coating layer and between the polymer layers, and the weight of each coating layer is from 1 to 30% of the average coated particle weight, and the sum of the weights of the coating layers is no greater than 40% of the



average coated particle weight wherein the median microparticle diameter is between 1 and 1000  $\mu$ m.

5,773,031

**ACETAMINOPHEN SUSTAINED-RELEASE FORMULATION**

Shirish A. Shah, and Chris Y. Ho, both of Kalamazoo, Mich., assignors to L. Perrigo Company, Allegan, Mich.

Filed Feb. 27, 1996, Ser. No. 608,839

Int. Cl.<sup>6</sup> A61K 9/14; 47/32

U.S. Cl. 424—497 7 Claims

1. An orally administrable sustained-release dosage form, comprising a mixture of a pharmaceutically effective amount of uncoated acetaminophen particles and a pharmaceutically effective amount of acetaminophen particles coated with a polymeric material which is water-insoluble, said polymeric material being water-permeable, and wherein said polymeric material comprises a methacrylate ester copolymer.

5,773,032

**LONG-ACTING INJECTION SUSPENSIONS AND A PROCESS FOR THEIR PREPARATION**

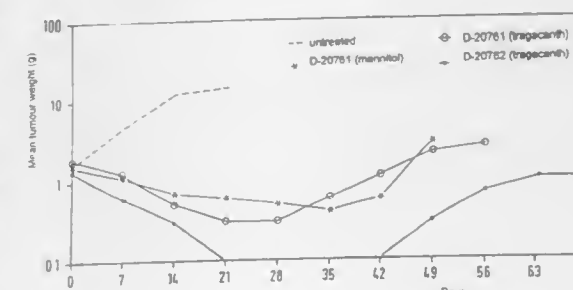
Jürgen Engel, Alzenau; Karin Klokke-Bethke, Lenggrig; Thomas Reissman, and Peter Hilgard, both of Frankfurt, all of Germany, assignors to Asta Medica Aktiengesellschaft, Dresden, Germany

Filed Jun. 10, 1996, Ser. No. 661,017

Int. Cl.<sup>6</sup> A61K 9/50

U.S. Cl. 424—501 8 Claims

DMBA-induced mammary carcinoma  
Treatment with a single dose (10 mg/kg) s.c.



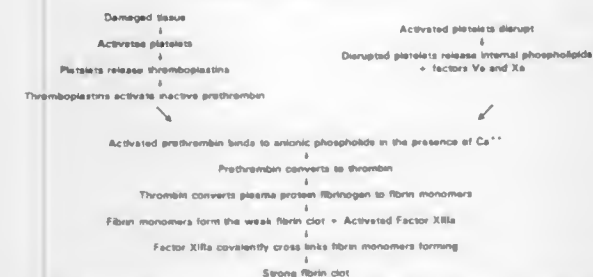
1. A poorly soluble salt of an LHRH analogue, wherein the particle size of the salt particles lies between 5 and 200  $\mu$ m, characterized in that the LHRH analogue is selected from the group consisting of cetorelix, antarelix, ganirelix, antide and A-75998 which is not in the form of particles or microcapsules of a homopolymer or copolymer with lactic acid and glycolic acid.



5,773,033

**FIBRINOGEN/CHITOSAN HEMOSTATIC AGENTS**  
Kent C. Cochrum, Harold R. Parker, and Maggie M. C. Chiu,  
all of Davis, Calif., assignors to The Regents of the University of California, Oakland, Calif.  
Continuation-in-part of Ser. No. 377,775, Jan. 23, 1995, Pat. No. 5,510,102. This application Apr. 23, 1996, Ser. No. 636,247

U.S. Cl. 424—530 Int. Cl.<sup>6</sup> A61L 25/00 15 Claims  
PHYSIOLOGICAL PROCESS OF COAGULATION



1. An improved hemostatic adhesive agent consisting essentially of a mixture of fibrinogen isolated from plasma and purified of other plasma proteins and a biocompatible chitosan polymer, wherein a ratio of the chitosan polymer to the isolated and purified fibrinogen is from about 0.1:10% to about 90:99.9%, w/w, and wherein said fibrinogen is separated from other plasma proteins by precipitation with ammonium sulfate solution having concentration of about 65–73 g per 100 ml, said precipitation comprising the addition of about 10 ml of said ammonium sulfate solution to about 40 ml of plasma continuously in increments from about 0.50 to about 0.62 ml per minute for about 15–20 minutes.

5,773,034

**CUTANEOUS REJUVENATING AND HEALING PRODUCT, METHOD FOR ITS MANUFACTURE AND USES THEREOF**

Georges Camprasse, Villeneuve la Petite, and Serge Camprasse, Chelles, both of France, assignors to Fortune Base Management, Ltd., Central Hong Kong, Hong Kong  
Continuation of Ser. No. 581,526, Jul. 3, 1996, abandoned.  
This application Jul. 3, 1997, Ser. No. 887,605  
Claims priority, application France, May 9, 1994, 94 05664  
Int. Cl.<sup>6</sup> A61K 35/56

U.S. Cl. 424—547 16 Claims

1. A cutaneous healing composition comprising an effective amount of a product obtained by the process comprising:  
a) subjecting cells from the mantle of the bivalved mollusc *Pinctada maxima* to a thermal treatment in a vacuum;  
b) freeze-drying said thermally-treated cells;  
c) mechanically grinding the pearl testa of the bivalved mollusc *Pinctada maxima*;  
d) subjecting the mechanically ground pearl testa to an ultrasound treatment and then to an enzymatic treatment; and  
e) mixing the material obtained in step b) with the material obtained in step d).

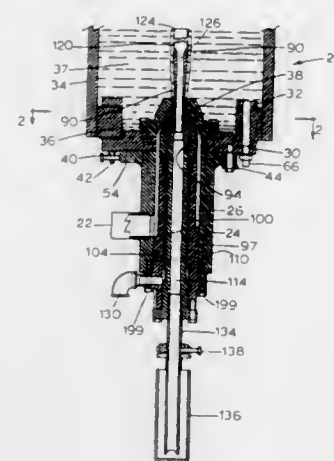
5,773,035

**TUBULAR CELLULOSIC CASING DIE**

Alan David Stall, Naperville, and Algis S. Lewkow, Tinley Park, both of Ill., assignors to Alfamel s.a., Madrid, Spain  
Filed Jul. 1, 1996, Ser. No. 674,150

U.S. Cl. 425—67 Int. Cl.<sup>6</sup> B29C 47/22 26 Claims

1. An adjustable tubular cellulosic casing die comprising:  
a carrier flange having mounting means for being fixed to an aquarium on a cellulosic tube casing machine;



an outer lip fixed to the carrier flange and defining a central orifice;  
a die body adjustably mounted on the carrier flange and defining a bore therethrough for feeding viscose to the outer lip;  
an inner lip joined to the die body for adjustment therewith, and having an outer surface adjacent the outer lip orifice to define an annular die opening with the outer lip; and  
means for adjusting the die body relative to the carrier flange to thereby adjust the inner lip relative to the outer lip.

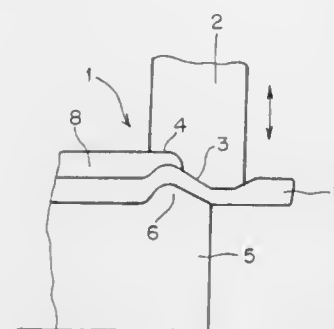
5,773,036

**DEVICE AND METHOD FOR EXTRUSION-COATING TUBES OR COMPOUND TUBULAR CONNECTION FITTINGS WITH RUBBER OR PLASTIC**

Detlef Zimmer, Verl; Michael Ahlers, and Dirk Stuhmann, both of Hamburg, all of Germany, assignors to Phoenix Aktiengesellschaft, Hamburg, Germany  
PCT No. PCT/DE95/00217, § 371 Date Feb. 1, 1996, § 102(e) Date Feb. 1, 1996, PCT Pub. No. WO95/23058, PCT Pub. Date Aug. 31, 1995

PCT Filed Feb. 21, 1995, Ser. No. 549,859  
Claims priority, application Germany, Feb. 23, 1994, 44 05 787.3

U.S. Cl. 425—125 Int. Cl.<sup>6</sup> B23B 3/00 6 Claims



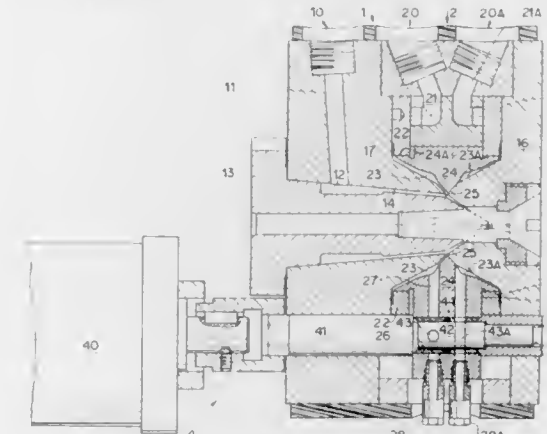
1. Device for extrusion-coating a tube body with rubber or plastic, said body being a hose connection comprising a connection pipe made of metal or plastic, onto which a hose section made of rubber or plastic is extruded, comprising  
a fixed contour molding tool, and  
at least one movable slide clamp per circumferential unit, whereby a sealing surface of the slide clamp substantially has a contour of a surface of the body directly opposing the slide clamp in a sealing zone.

5,773,037

**EXTRUSION HEAD WITH COLOR-CHANGING DEVICE**  
Ernst Geider, St-Sulpice, and Hans Jaun, La Conversion, both of Switzerland, assignors to Nokia-Maillefer Holding SA, Ecublens, Switzerland

Filed Oct. 29, 1996, Ser. No. 738,602  
Claims priority, application European Pat. Off., Nov. 10, 1995, 95 810 708

U.S. Cl. 425—132 Int. Cl.<sup>6</sup> B29C 47/20 11 Claims



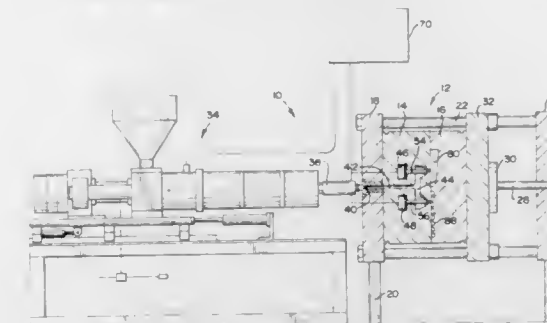
1. An extrusion head capable of extruding a surface layer over a first layer, wherein said extrusion head is connected directly to a first extruder delivering an extrudate intended to form said first layer, as well as two other extruders, each delivering an extrudate of a different color intended to form said surface layer, said extrusion head comprising a selection device capable of selectively directing one or the other of the colored extrudates over said first layer, said selection device comprising a movable needle-valve, axially displaceable, capable when acted upon by displacement control means of simultaneously establishing a first connection between a first chamber filled with an extrudate of a first color and a duct conveying said extrudate over the extrudate forming said first layer and blocking a second connection between a second chamber filled with an extrudate of a second color and said duct, or of simultaneously cutting off said first connection and establishing said second connection.

5,773,038

**APPARATUS FOR FAMILY MOLD SEQUENTIAL MOLDING**

Sieholt Hettinga, 2123 NW 111th St., Des Moines, Iowa 50325  
Filed Apr. 18, 1995, Ser. No. 423,797  
Int. Cl.<sup>6</sup> B29C 45/22

U.S. Cl. 425—145 15 Claims



1. A plastic injection molding apparatus for sequentially molding a plurality of plastic articles, said plastic injection molding apparatus comprising:

- a first mold section provided with a runner system connecting an inlet to a first outlet and a second outlet;
- a second mold section opposite to and in mating alignment with said first mold section, said second mold section being provided with a first recess in mating alignment with said first

outlet and forming a first discrete mold cavity when said second mold section is clamped into mating engagement with said first mold section, said second mold section being provided with a second recess in mating alignment with said second outlet and forming a second discrete mold cavity when said second mold section is clamped into mating engagement with said first mold section;

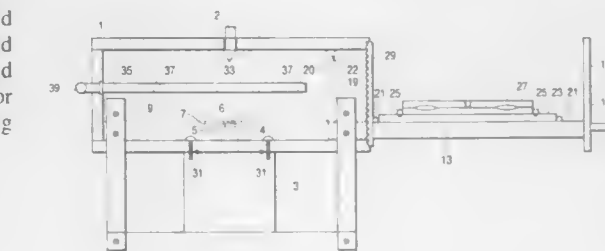
- a first gate operably coupled to said runner system in a manner which allows said first gate to regulate flow of a flowable plastic material through said first outlet;
- a second gate operably coupled to said runner system in a manner which allows said second gate to regulate flow of said flowable plastic material through said second outlet;
- means for clamping said second mold section into mating engagement with said first mold section to form said first discrete mold cavity with said first recess and said second discrete mold cavity with said second recess;
- first means for opening and closing said first gate;
- second means for opening and closing said second gate after opening and closing said first gate;
- means for injecting said flowable plastic material through said first outlet at a first pressure and rate; and
- means for injecting said flowable plastic material through said second outlet at a second pressure and rate, wherein said second pressure and rate is different from said first pressure and rate.

5,773,039

**APPARATUS FOR MULTIPLE WAX CASTINGS**  
Earl S. Jones, 4403 Elderon Ave., Baltimore, Md. 21215

Filed Apr. 1, 1996, Ser. No. 626,006  
Int. Cl.<sup>6</sup> B29C 45/24; 45/32; 45/64

U.S. Cl. 425—186 20 Claims



1. An apparatus for automated casting of a plurality of wax patterns, comprising:

- a nozzle;
- a housing having said nozzle centrally located therein and a seal on the front edge to seal when engaging a door;
- a drawer having a platform and said door, said drawer being removable from said housing;
- a removable base plate centrally disposed on said platform of said drawer, wherein a mold having a central opening on a top portion thereof and a plurality of mold cavities for forming said wax patterns is placed on top of said base plate, and wherein when said drawer is closed and said platform is disposed within said housing, said central opening of said mold is vertically aligned with said nozzle; and
- a cylinder which adjustably extends through an opening in said platform of said drawer for lifting said base plate within said housing after air is vacuumed from said housing, wherein said cylinder lifts said base plate to align said central opening of said mold placed atop of said base plate with said nozzle, so that said nozzle engages said mold to vertically inject melted wax therein, and wherein said cylinder applies evenly distributed clamping pressure to said base plate by pressing the top portion of said mold against a ceiling portion of said housing while the melted wax is being vertically injected into the mold.





wherein  $a$  is a constant related to the length of the passage gap and  $Y_a$  is the height of said inlet for said passage gap.

5,773,046

**APPARATUS FOR FORMING AN INTERNAL SOCKET IN A THERMOSETTING ELASTOMERIC HOSE**

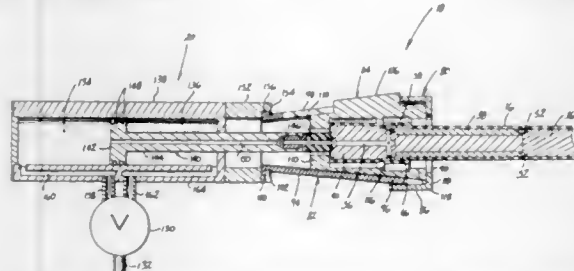
H. Steven Roby, McBain, Mich., assignor to Cadillac Rubber & Plastics, Inc., Cadillac, Mich.

Division of Ser. No. 418,259, Apr. 6, 1995, Pat. No. 5,624,624, which is a division of Ser. No. 134,047, Oct. 12, 1993, Pat. No. 5,445,360. This application Aug. 30, 1996, Ser. No. 706,005

Int. Cl.<sup>6</sup> B29C 57/00

U.S. Cl. 425—393

11 Claims



1. Apparatus for forming a contoured interior surface on a length of elastomeric hose comprising:

a mandrel having a distal end, a proximal end and at least one annular recess formed on an exterior surface of the mandrel a spaced distance from the proximal end thereof, the mandrel being adapted to telescopically receive a length of uncured elastomeric hose thereon; and

an end cap forming assembly adapted to be telescopically received on the mandrel, the end cap forming assembly comprising a plurality of sleeve members, the sleeve members having an interior surface defining a mold cavity therebetween when in a closed position and being adapted to move radially to an open position from the closed position to open the mold cavity, the interior surface of the sleeve members further forming an annular projection concentric with and complementary to the mandrel at least one annular recess when the sleeve members are in the closed position;

wherein the annular projection on the sleeve members, in the closed position, force a portion of the uncured hose into the at least one annular recess.

5,773,047

**MODEL FOR COMPOSITE TOOLING MOLD**

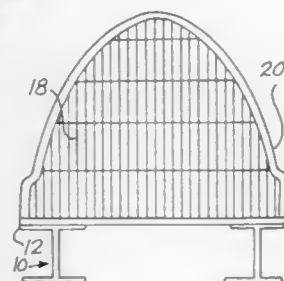
David J. Cloud, Bethel, Pa., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 518,097, Aug. 22, 1995, Pat. No. 5,707,477. This application Feb. 11, 1997, Ser. No. 799,669

Int. Cl.<sup>6</sup> B29C 33/38

U.S. Cl. 425—403

9 Claims



1. A model comprising:

a stack of aluminum honeycomb core layers;  
a layer of modeling material applied to at least a portion of the outer surface of said stack, cured and machined to form the outer surface of the model.

5,773,048

**RETAINER FOR INJECTION MOLDING MACHINE COMPONENTS**

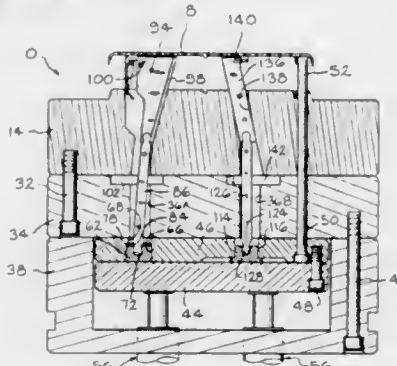
William C. Ramsey, R.R. #5, Bryan, Ohio 43506

Filed Aug. 7, 1995, Ser. No. 512,114

Int. Cl.<sup>6</sup> B29C 45/44

U.S. Cl. 425—556

18 Claims



1. A retainer assembly for receiving an actuator of a lifter mechanism for an injection molding machine comprising, in combination,

a cylindrical body having a top surface, a channel having an open throat adjacent said top surface defined by opposed, spaced-apart edges and a curved wall region merging with said edges, and

a spacer disposed on said top surface, said spacer defining an aperture adapted for receiving said actuator of said lifter mechanism,

wherein said spacer maintains said actuator in a centered position when said actuator of said lifter mechanism is received by said cylindrical body.

5,773,049

**TWO-LAYER FOAM INJECTION MOLDING MACHINE**

Masahiko Kashiwa, Tsutomu Nagaoka, and Naoki Takeuchi, all of Takasago, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

PCT No. PCT/JP94/02277, § 371 Date Jun. 27, 1996, § 102(e) Date Jun. 27, 1996, PCT Pub. No. WO95/18002, PCT Pub. Date Jul. 6, 1995

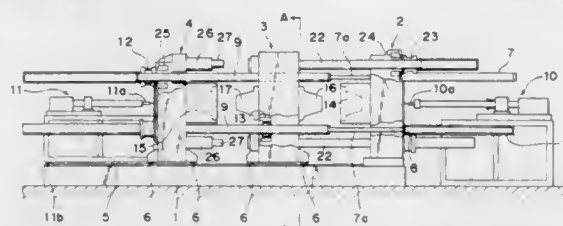
PCT Filed Dec. 28, 1994, Ser. No. 663,312

Claims priority, application Japan, Dec. 29, 1993, 5-352535; Dec. 29, 1993, 5-353866

Int. Cl.<sup>6</sup> B29C 45/16

U.S. Cl. 425—572

3 Claims



1. A two-layer foam injection molding machine for molding foam moldings in which a surface member composed of a foam layer and a skin layer on the surface of said foam layer is laminated in a body on a core member made from a hard resin, comprising:

a fixed plate attached to a primary mold for molding said core member, said fixed plate provided with a primary injection unit for supplying a material of said core member;

a rotary plate having a first mold facing said primary mold and a second mold facing a secondary mold having the same shape as said primary mold;

said rotary plate being capable of turning said first and second mold so that said first mold faces said secondary mold and said second mold faces said primary mold;

a movable plate attached to said secondary mold and provided with a secondary injection unit for supplying a material of said surface member;

first mold clamping means for clamping said primary mold of said fixed plate to one of said first mold and said second mold of said rotary plate;

second mold clamping means for clamping said secondary mold of said movable plate to one of said second mold and said first mold of said rotary plate; and

mold opening means provided so as to separate said movable plate and said rotary plate to provide a space between said second mold or said first mold and said secondary mold held to be openable,

wherein said rotary plate and said movable plate are guided by a plurality of tie bars projecting from said fixed plate and are openable and closable;

said first mold clamping means comprises first lock means which is provided for said rotary plate and can lock or unlock said tie bars and a mold clamping cylinder provided in said fixed plate to advance and retract said tie bars;

said second mold clamping means comprises second lock means which is provided for said movable plate and can lock or unlock said tie bars and said mold clamping cylinder; and said mold opening means can perform the mold opening operation while said second lock means is unlocked.

5,773,050

**MOULD CLOSING DEVICE FOR AN INJECTION MOULDING MACHINE**

Walter Wohlrab, Weissenburg, Germany, assignor to Krauss-Maffei AG, Munich, Germany

PCT No. PCT/EP94/04090, § 371 Date Apr. 23, 1996, § 102(e) Date Apr. 23, 1996, PCT Pub. No. WO95/17292, PCT Pub. Date Jun. 29, 1995

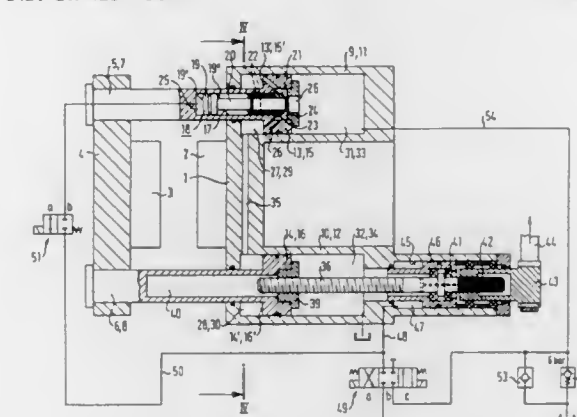
PCT Filed Dec. 9, 1994, Ser. No. 632,465

Claims priority, application Germany, Dec. 23, 1993, 43 44 340.0

Int. Cl.<sup>6</sup> B29C 45/68

U.S. Cl. 425—589

9 Claims



1. A mould closing device for an injection moulding machine having a fixed mould clamping plate supporting one tool half and a movable mould clamping plate carrying another tool half, said mould closing device comprising:

at least one piston-column unit of a first type having one end secured in the movable mould clamping plate and another end received in a first main cylinder secured to the fixed mould clamping plate;

at least one piston-column unit of a second type having one end secured in the movable mould clamping plate at a distance to the piston-column unit of the first type and another end received in a second main cylinder secured to the fixed mould clamping plate;

a screw drive mechanism for moving the moveable mould clamping plate with respect to the fixed mould clamping plate to thereby effect a rapid closing and opening of the tool

halves, said first type of piston-column unit being provided for support of the screw drive mechanism; and

force application means for buildup of a clamping force when the tool halves abut each other through operation of the screw drive mechanism, said force application means including a pressure amplifying unit acted upon by hydraulic fluid under pressure, without subjecting the screw drive mechanism to the application of the clamping force, said second type of piston-column unit being provided for support of the pressure amplifying unit.

5,773,051

**FISH FEED AND PROCESS FOR ITS MANUFACTURE**

Sung-Tae Kim, 253-6, Nonhyun-dong, Kangnam-gu, Seoul, Rep. of Korea

Filed Jul. 15, 1996, Ser. No. 680,121

Claims priority, application Rep. of Korea, Jul. 31, 1995, 95-23568

Int. Cl.<sup>6</sup> A23L 1/09; 1/05

U.S. Cl. 426—1

13 Claims

1. A process for manufacturing a fish-breeding feed which will refloat after initially sinking, which comprises

blending conventional fish-breeding feed containing fish meal, wheat meal, and soybean meal with substances which cause the feed to refloat when contacted with water, said substances including glucose, xanthan gum, sodium caseinate, sodium metaphosphate, sodium triphosphate, and soybean lecithin; supplying this blended mixture in powder form to a mixer for homogeneous mixing;

passing the homogeneous mixture through the compression screw of an extruder, while supplying 15% to 25% by weight of water, followed by high-speed mixing for 10 to 20 sec;

transferring the mixture to the compression screw of the extruder and compressing it through a die at a constant temperature of 80° to 100° C. to produce successive molded products; and

cutting the molded products in appropriate sizes suitable for fish feed.

5,773,052

**BETAINE AS A SUBSTITUTE FOR SUPPLEMENTARY METHIONINE IN ANIMAL DIETS**

Erkki Virtanen; Mika Koivisto, both of Helsinki, Finland; David D. Hall, Quincy, Ill., and James L. McNaughton, Easton, Md., assignors to Cultor-Ltd, Helsinki, Finland

Continuation of Ser. No. 53,138, Apr. 29, 1993, abandoned.

This application Apr. 20, 1995, Ser. No. 426,016

Int. Cl.<sup>6</sup> A01K 1/00

U.S. Cl. 426—2

27 Claims

1. A method of decreasing the percent carcass fat in a fowl, said method comprising feeding said fowl a diet containing at least 0.01% betaine and at least 0.31% methionine and a total concentration of betaine plus methionine of up to 0.71% of said feed, or wherein said diet contains at least 0.01% betaine and at least 0.37% methionine and a total concentration of betaine and methionine of up to 0.77% of said feed.

5,773,053

**CHEWING GUM BASE MANUFACTURING PROCESS USING PLURALITY OF SOFTENING AGENTS INLETS**  
Joo H. Song, Northbrook, and Donald J. Townsend, Chicago, both of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

PCT No. PCT/US95/03127, § 371 Date Mar. 12, 1997, § 102(e) Date Mar. 12, 1997, PCT Pub. No. WO96/08159, PCT Pub. Date Mar. 21, 1996

Continuation-in-part of Ser. No. 362,254, Dec. 22, 1994, Pat. No. 5,543,160, Continuation-in-part of Ser. No. 305,363, Sep. 13, 1994, abandoned, and a continuation-in-part of Ser. No. 141,281, Oct. 22, 1993, Pat. No. 5,419,919, and a continuation-in-part of Ser. No. 135,589, Oct. 14, 1993, Pat. No. 5,486,366, which is a continuation-in-part of Ser. No. 126,319, Sep. 24, 1993, Pat. No. 5,562,936. This PCT application Mar. 13, 1995, Ser. No. 809,376

Int. Cl.<sup>6</sup> A23G 3/30

U.S. Cl. 426—3

29 Claims

1. A process for continuously producing a chewing gum base comprising the steps of:

- continuously adding chewing gum base ingredients, including a hard elastomer, filler and one or more lubricating agents comprising a softening agent into a continuous mixer having a plurality of spatially separated feed inlets, a portion of said softening agent being introduced into said mixer through a first feed inlet and a second portion of said softening agent being introduced into said mixer through a second feed inlet located downstream of said first feed inlet;
- subjecting the chewing gum base ingredients to continuous mixing operations within the mixer, thereby producing a chewing gum base; and
- continuously discharging the chewing gum base from the mixer while chewing gum base ingredients continue to be introduced and mixed within the mixer.

5,773,054

**MANUFACTURE OF PARTICULATE NATURAL CHEESE WITHOUT BLOCK FORMATION**

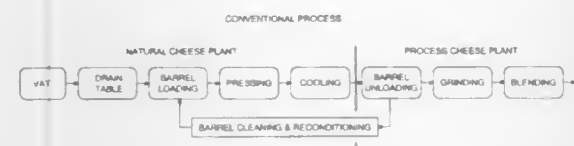
Ronald L. Meibach, Deerfield; Dale A. Kyser, Vernon Hills; Gary F. Smith, Highland Park; David Kaganoff; Ronald D. Gee, both of Chicago; Thomas A. Nosek, Wheeling, and Richard S. Silver, Wilmette, all of Ill., assignors to Kraft Foods, Inc., Northfield, Ill.

Continuation of Ser. No. 568,592, Dec. 5, 1995. This application Jun. 21, 1996, Ser. No. 668,547

Int. Cl.<sup>6</sup> A23C 19/06

U.S. Cl. 426—36

15 Claims



1. A method for making a particulate natural cheese suitable for preparation of process cheese comprising, providing a coagulum from milk by fermenting said milk with a lactic acid starter culture to provide a fermented milk and adding a milk coagulating enzyme to said fermented milk, cutting said coagulum to provide cheese curds and whey, heating said curds and whey, draining said whey from said cheese curds without agitating said curds to provide a curd mat, milling said curd mat to provide curd pieces and cooling said curd pieces from a temperature of from about 85° F. to about 95° F. to a temperature of from about 40° F. to about 50° F. in less than about 30 minutes so as to maintain said curd pieces as separate particles which do not knit during storage.

5,773,055

**PROCESS FOR PREPARING A BEAN FLAVOR**

Eldon Chen-hsiung Lee, New Milford, and John Stewart Tandy, Litchfield, both of Conn., assignors to Nestec S.A., Vevey, Switzerland

Filed May 1, 1996, Ser. No. 641,590

Int. Cl.<sup>6</sup> A23J 3/14; 3/16; A23L 1/20

U.S. Cl. 426—44

12 Claims

1. A process for preparing a fried bean flavor which comprises: preparing a bean paste by combining beans and water; adding a carbohydrase to the bean paste and partially hydrolysing the bean paste with the carbohydrase at an optimum activity and stability pH for the carbohydrase, with the pH being in the range of about 3 to 8;

adding a protease to the partially hydrolyzed bean paste and further hydrolysing the bean paste with the protease at an optimum activity and stability pH for the protease, with the pH being in the range of about 6 to 8 to form a hydrolysed bean paste;

adding an edible oil and lecithin to the hydrolysed bean paste to form a mixture;

reacting the mixture of the hydrolyzed bean paste, edible oil and lecithin at a temperature of from about 110 to 300° C. for from about 1 minute to 48 hours to form the fried bean flavor, wherein edible oil is present in an amount of from about 5 to 98% by weight and the lecithin is present in an amount of from about 0.05 to 25% by weight, said weights calculated based on the weight of the mixture.

5,773,056

**HIGH COCOA/CHOCOLATE LIQUOR SYRUPS WITH IMPROVED FLOW PROPERTIES**

Thalia A. Hohenthal, Santa Clara, and Michelle Weinberg, San Bruno, both of Calif., assignors to Guittard Chocolate Company, Burlingame, Calif.

Filed Sep. 12, 1996, Ser. No. 713,275

Int. Cl.<sup>6</sup> A23G 1/00

U.S. Cl. 426—45

14 Claims

1. A composition comprising an admixture of:

- from about 15 to about 20 weight percent chocolate flavoring;
- from about 35 to about 50 weight percent sweetener;
- an enzyme mixture comprising an  $\alpha$ -amylase, a pentosanase, and a pectinase; and
- water; said composition having a cocoa butterfat content of from about 2 to about 5% by weight.

5,773,057

**LOW-FAT GROUND MEAT PRODUCTS**

Prem S. Singh, Glenellyn, Ill., assignor to Swift-Eckrich, Inc., Downers Grove, Ill.

Filed Jun. 26, 1996, Ser. No. 672,057

Int. Cl.<sup>6</sup> A23J 3/08; A23L 1/0562; 1/314; 1/317

U.S. Cl. 426—61

26 Claims

1. A fermentable ground meat product comprising:

from about 95 wt. % to about 40 wt. % particles of ground meat, from about 5 wt. % to about 60 wt. % particles of a thermally irreversible hydrolyzed milk protein gel having an appearance and texture that mimics the appearance and texture of adipose tissue, the gel particles being from about 1/32" to about 1" in their longest dimension, and

an effective amount of an acid producing bacteria.

5,773,058

**DISK-SHAPED CONTAINER FOR NEW AND USED LOLLIPOP**

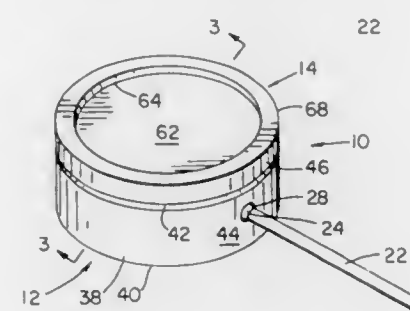
Wayne H. Jones, Idaho Falls, Id., assignor to Spangler Candy Company, Bryan, Ohio

Continuation of Ser. No. 778,583, Jan. 3, 1997, which is a continuation of Ser. No. 478,508, Jun. 7, 1995, abandoned, which is a continuation-in-part of Ser. No. 112,016, Aug. 25, 1993, abandoned. This application Feb. 28, 1997, Ser. No. 808,387

Int. Cl.<sup>6</sup> B65D 6/02; 85/60

U.S. Cl. 426—106

1 Claim



1. A disk-shaped container and lollipop combination comprising:

a. a lollipop confectionery formed in the shape of a disk;

b. a handle comprising:

- a non-edible stick with a longitudinal axis,
- a distal end for grasping by the user,
- a proximal end buried in the confectionery to support the confectionery on said stick, and
- a transverse flange having a predetermined diameter and fixably located on the handle at an intermediate point between the proximal and distal ends of the stick adjacent the confectionery and having the longitudinal axis of the stick passing through the center of the transverse flange; and

c. a hollow disk-shaped container for receiving the disk-shaped confectionery and dimensioned internally to conform substantially with and completely enclose the external dimensions of said disk-shaped confectionery, said container comprising: an upwardly extending removable mating first portion comprising a hollow body defined by a floor and a sidewall and functioning as a removable receptacle and dimensioned and shaped to receive and enclose the confectionery, and a downwardly extending mating second portion functioning as a snap-fit removable lid and dimensioned and shaped to cover the upper portion of said confectionery and together with the first portion fully enclose said confectionery, said first and second container portions being reclosably mating.

said first container portions further having an opening located in the sidewall thereof for receiving the distal end of the stick, and

said opening in said first container portion being dimensioned larger than a cross section of the stick such that said distal end of said confectionery supporting stick can be inserted into said first container portion and can be passed through said opening such that the distal end of the stick remains outside the disk-shaped container and the confectionery will be completely in said container when said second container portion is releasably mated to said first container portion over said confectionery;

said opening in said first container portion being smaller than the predetermined diameter of the transverse flange such that the transverse flange covers the opening completely when it is seated against the opening to prevent leakage therethrough.

5,773,059

**POLYAMIDE-BASED SAUSAGE CASING**

Ulrich Delius, Frankfurt, and Dieter Beissel, Wiesbaden, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jan. 18, 1996, Ser. No. 588,447

Claims priority, application Germany, Jan. 21, 1995, 195 01 834.6

Int. Cl.<sup>6</sup> A22C 13/00; B29C 55/28

U.S. Cl. 426—129

16 Claims

1. A polyamide-based sausage casing of a polymer blend comprising

- nylon 6,
  - 5–50% by weight, based on the total weight of all polymers in the layer, of a
  - b1) aliphatic copolyamide containing units of the formulae  $\text{—NH—[CH}_2\text{]}_m\text{—CO—}$  and  $\text{—NH—[CH}_2\text{]}_n\text{—CO—}$  where m is an integer from 7 to 11, or
  - b2) an aliphatic copolyamide containing units of the formulae  $\text{—NH—[CH}_2\text{]}_m\text{—CO—}$ ,  $\text{—NH—[CH}_2\text{]}_n\text{—NH—}$  and  $\text{—CO—[CH}_2\text{]}_o\text{—CO—}$ , where n is an integer from 6 to 12 and o is an integer from 7 to 10, or
  - both b(1) and b(2); and
  - c) 0–20% by weight of an amorphous copolyamide containing hexamethylenediamine, and at least one of terephthalic acid and isophthalic acid units; and
  - d) 0–20% by weight of a polyolefin modified by carboxyl groups,
- wherein a+b+c>50% by weight, based on the total weight of all polymers in the layer.

5,773,060

**METHOD OF CONTROLLING AND ADJUSTING THE AMOUNT OF FLUID INJECTED INTO A MEAT PRODUCT**

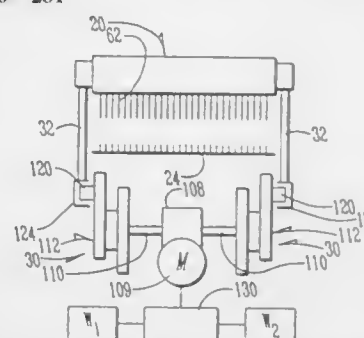
David W. Smith, West Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Continuation-in-part of Ser. No. 503,455, Jul. 17, 1995, abandoned. This application May 30, 1996, Ser. No. 656,147

Int. Cl.<sup>6</sup> A23L 1/31

U.S. Cl. 426—281

3 Claims



1. A method of injecting fluid into a meat product, comprising the steps of:

- providing a plurality of fluid injection needles;
- connecting a fluid reservoir containing pressurized fluid to said injection needles;
- weighing a meat product;
- reciprocally cycling said injection needles into and out of said meat product to penetrate said injection needles into said meat and to then inject said meat product with fluid from said injection needles, said cycling comprising controlling the vertical distribution of said fluid throughout said meat by adjusting the time said needles are injected into said meat product, to deliver a quantity of said fluid;
- weighing said meat product after it is injected with said fluid;
- comparing the ratio of the weight before and after injection with a target to determine any variance between said ratios; and
- increasing or decreasing the quantity of fluid to be delivered through the injection needles so that any variance in said



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ratios with respect to said target ratio will be minimized to permit a second meat product to be injected with fluid and to achieve said target ratio by increasing or decreasing the time that said needles are penetrating said meat product with respect to the time that said needles are withdrawn from said meat product.

5,773,061  
METHOD AND APPARATUS FOR MAKING  
AGGLOMERATED PRODUCT

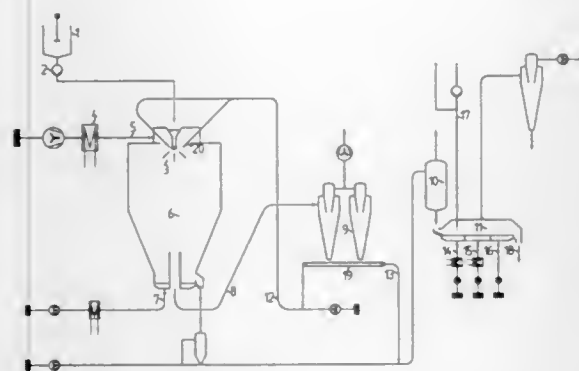
Jens Getler, Brønshøj; John I. Hansen, Holte, and Gert G. Andersen, Slangerup, all of Denmark, assignors to APV Anhydro A/S, Denmark

Filed May 15, 1996, Ser. No. 564,205

Claims priority, application Denmark, Jun. 24, 1993, 0752/93  
Int. Cl.<sup>6</sup> A23G 9/00

U.S. Cl. 426—285

17 Claims



1. A method for producing an agglomerated powder of a milk product or a mother's milk substitute product comprising: atomizing a concentrated liquid feed of the product by an atomizer in a drying chamber to produce fine particles; recirculating the fine particles to a wet zone around the atomizer to perform an agglomeration of the product; accommodating the resulting agglomerates in an internal fluid bed in the drying chamber; transferring the agglomerates from the internal fluid bed to a fluidized layer in an external fluid bed; and transferring the fine particles to a separating device which splits up the fine particles into first and second fractions, whereafter only the first fraction is recirculated to the wet zone around the atomizer in the drying chamber while the second fraction is led to the external fluid bed, where water, by a second atomizer, is atomized over the fluidized layer of agglomerates in the external fluid bed to perform a further agglomeration of the product.

5,773,062  
TEA BEVERAGE PRESERVATION AND METHOD OF  
MAKING

Michael Charles Cirigliano, Cresskill; Raymond Thomas McKenna, Scotch Plains, and Paul John Rothenberg, West Milford, all of N.J., assignors to Thomas J. Lipton Co., Division of Conopco, Inc., Englewood Cliffs, N.J.

Filed Dec. 11, 1996, Ser. No. 762,014

Int. Cl.<sup>6</sup> A23F 3/14; A23L 2/00

U.S. Cl. 426—330.3

12 Claims

1. An aqueous based beverage comprising at least about 0.01% to 0.5% tea solids by weight and a sufficient amount of Natamycin to prevent microbial spoilage, said beverage having a pH of about 2.5 to 6.5.

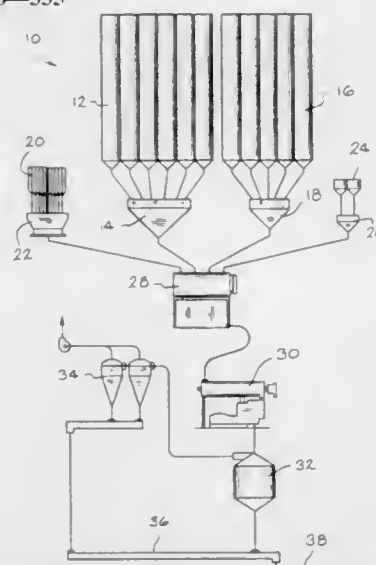
5,773,063  
METHOD FOR PRESERVING ANIMAL FEED WITH  
SODIUM BISULFATE AND COMPOSITION THEREOF  
Carl Joseph Knueven, Bowling Green, Ohio, assignor to Jones-Hamilton Co., Newark, Calif.

Filed Mar. 5, 1997, Ser. No. 811,701

Int. Cl.<sup>6</sup> A23K 3/02; A01F 25/00

U.S. Cl. 426—335

20 Claims



1. A method for preserving animal feed stored under aerobic conditions comprising treating the animal feed with an inorganic acid selected from the group consisting of sodium bisulfate, sulfamic acid, sulfurous acid and phosphoric acid having a pK<sub>a</sub> from about 1.0 to about 5.0 to reduce the pH of the animal feed to less than about 4.5, and storing the animal feed under aerobic conditions.

5,773,064  
HEAT TREATMENT OF RAW MOLLUSCAN SHELLFISH  
INCLUDING A BANDING PROCESS

John Tesvich, Rte. 1 Box 459-E, Buras, La. 70041; John Scheggan, 12110 E. Slauson, Ste. 15, Santa Fe Springs, Calif. 90670, and Patrick Fahey, 1200 Harmony St., New Orleans, La. 90015

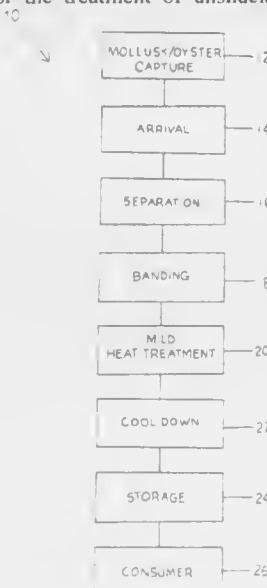
Filed Mar. 22, 1996, Ser. No. 620,155

Int. Cl.<sup>6</sup> A23B 4/005; A22C 29/04

U.S. Cl. 426—420

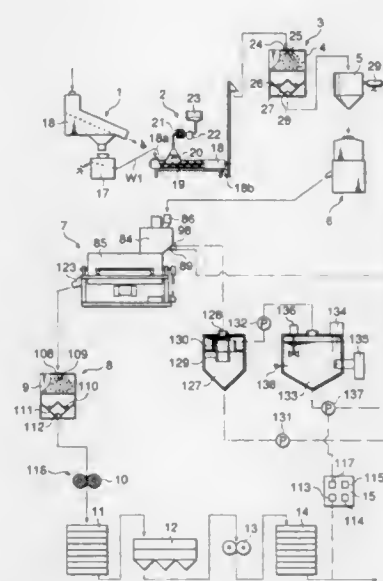
3 Claims

1. A process for the treatment of unshucked, raw molluscan



shellfish where the shellfish remain in their natural shell throughout the process, including the steps of:

- banding the unshucked raw molluscan shellfish by placing a band about the perimeter of their shell,
- heat treating the banded, raw molluscan shellfish by placing the banded shellfish in a fluid bath at a temperature of about 110 to 140 degrees Fahrenheit (43.33 to 60 degrees Centigrade) for 10 to 45 minutes, said heat treating being at a temperature and for a time sufficient to destroy harmful pathogenic bacteria including vibrio vulnificus, yet leave the shellfish in a raw state,
- cooling the heat treated, banded, unshucked, raw molluscan shellfish by placing the banded shellfish in a fluid bath at a temperature of about 28–45 degrees Fahrenheit for 15 to 20 minutes, said band maintaining said unshucked raw molluscan shellfish closed during said heat treating and cooling steps sufficient to prevent contamination of the unshucked raw molluscan shellfish and to retain its natural fluids,
- removing said band from about the shell of the cooled, unshucked, raw molluscan shellfish,
- shucking the cooled, raw molluscan shellfish, and
- serving the shucked, cooled, raw molluscan shellfish on the half shell.



tempering said raw wheat grains for 16–36 hours to cause the water to penetrate into the inside of said raw wheat grains.

5,773,065  
PROCESS FOR ROASTING COFFEE  
André Clauzure, Grisy-Suisnes, France, assignor to Pernod Ricard, Paris, France  
PCT No. PCT/FR94/01037, § 371 Date Mar. 7, 1996, § 102(e)  
Date Mar. 7, 1996, PCT Pub. No. WO95/07026, PCT Pub. Date Mar. 16, 1995

PCT Filed Sep. 5, 1994, Ser. No. 617,802

Claims priority, application France, Sep. 7, 1993, 93 10609  
Int. Cl.<sup>6</sup> A23F 5/00

U.S. Cl. 426—466

11 Claims

1. A process for obtaining a around roasted plant material comprising the steps of:

- subjecting the plant material to steam at a pressure greater than or equal to about 5 bar to roast the plant material and
- releasing the pressure to expel the plant material through a grid to grind said roasted plant material.

5,773,066  
METHOD AND APPARATUS FOR CARRYING OUT PRE-  
TREATMENT OF WHEAT GRAINS FOR FLOUR  
MILLING

Satoru Satake, Tokyo; Shigeharu Kanemoto, Hiroshima; Nobuhiro Matsumoto, Hiroshima; Akihiko Kato, Hiroshima; Yoshihiro Tokui, Hiroshima; Satoru Takashita, Hiroshima; Kaoru Shitadera, Hiroshima, and Hiroyuki Machara, Hiroshima, all of Japan, assignors to Satake Corporation, Tokyo, Japan

Filed Feb. 7, 1997, Ser. No. 795,654

Claims priority, application Japan, Feb. 9, 1996, 8-048069; May 10, 1996, 8-140635

Int. Cl.<sup>6</sup> A23P 1/00; B02B 3/00; 1/00

U.S. Cl. 426—483

16 Claims

1. A method of milling flour which includes polishing raw wheat grains after adding water to the raw wheat grains at a first stage and tempering the raw wheat grains, and grinding the polished wheat grains after adding water to the polished wheat grains at a second stage and tempering the polished wheat grains, said method comprising:

- adding water during said water addition at the first stage to cause said raw wheat grains to have a water content of 12–14%, and

5,773,067  
METHOD FOR PRODUCTION OF METERED AMOUNTS  
OF DRINKS, ESPECIALLY COFFEE

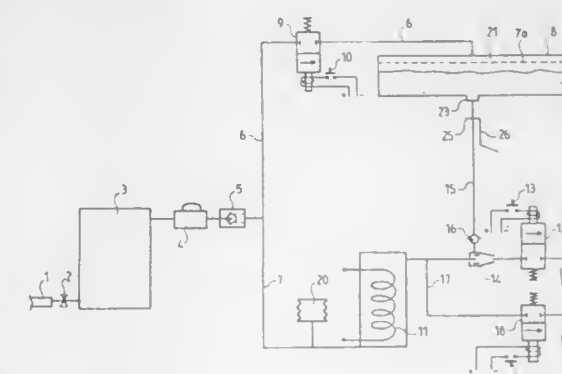
Alain Freychet, Chatou, and Jean-François Bassereau, Paris, both of France, assignors to Societe Agricole de Produits de Base, Franconville, France

Continuation of Ser. No. 362,967, Dec. 23, 1994, abandoned.  
This application Nov. 15, 1996, Ser. No. 749,827

Int. Cl.<sup>6</sup> A23F 5/00

U.S. Cl. 426—506

13 Claims



1. A method of automatically preparing at least one metered amount of a drink from a soluble powder in situ in a drink preparation device comprising the steps of:

- completely dissolving under atmospheric pressure a defined quantity of said powder forming a volume having an upper surface contained in an enclosed receptacle in said device by dispersing under atmospheric pressure a defined quantity of water, in a gentle and homogeneous manner, over said upper surface of said volume of soluble powder into said enclosed receptacle with a flow rate sufficient for a volume of water to accumulate at the surface of the powder to produce a concentrate of a drink contained in said enclosed receptacle while venting said enclosed receptacle;
- storing said concentrate of a drink in said enclosed receptacle; and, subsequently, taking off part or all of said concentrate from said enclosed receptacle and diluting the taken off concentrate in water to produce at least one metered amount of said drink.

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5,773,068

**LEAVENING SYSTEM AND PRODUCTS THEREFROM**  
Barbara B. Heidolph, Wentzville, and Louis A. Highfill, Washington, both of Mo., assignors to Solutia Inc., St. Louis, Mo.  
Filed Feb. 20, 1996, Ser. No. 603,301  
Int. Cl.<sup>6</sup> A21D 10/00

U.S. Cl. 426—551

29 Claims

1. A leavening composition comprising a carbonate factor and hemipotassium phosphate.

5,773,069

**PREPARATION OF INSTANT GLASS NOODLES**  
Hwee Peng Rebecca Lian, and Tian Seng Toh, both of Singapore, Singapore, assignors to Nestec S.A., Vevey, Switzerland

Filed Apr. 19, 1996, Ser. No. 635,377

Claims priority, application Singapore, Apr. 22, 1995, 9500310-9

Int. Cl.<sup>6</sup> A23L 1/16

U.S. Cl. 426—557

19 Claims

1. A process for preparing an instant glass noodle comprising: mixing water and a starch selected from the group consisting of raw mung bean starch, raw potato starch and mixtures thereof in amounts and at a temperature and for a time to form a dough and to gelatinize the starch partially, for binding the dough, and extruding the dough to obtain the dough in a form of noodles;

steaming the dough noodles with steam having a temperature of from 85° C. to 100° C. for from 30 seconds to 25 minutes to firm the noodles to obtain firmed noodles;

blanching the firmed noodles with water at a temperature and for time to gelatinize the starch further to obtain blanched noodles;

chilling the blanched noodles with water at a temperature and for a time to allow starch retrogradation to stiffen the blanched noodles to obtain stiffened noodles; and drying the stiffened noodles to obtain dried noodles having a moisture content of less than 15%.

5,773,070

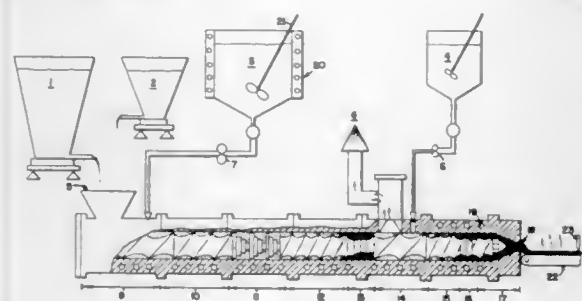
**METHOD OF FORMING A SEMI-MOIST JERKY OR LEATHERY PET FOODS OR TREATS**  
Massoud Kazemzadeh, Bloomington, Minn., assignor to MJM Technologies, Stacy, Minn.

Filed Apr. 9, 1996, Ser. No. 631,678

Int. Cl.<sup>6</sup> A23K 1/00

U.S. Cl. 426—573

5 Claims



1. A method for producing a semi-moist pet food or treat product having a flexible or jerky-like characteristic with a chewy or leathery texture consisting essentially of carrying out in a twin-screw, self-wiping, co-rotating and intermeshing extruder the steps of:

- kneading a mixture comprising a filler, a hydrocolloid and a liquid binder having a glass transition temperature of less than about +10° C. at a temperature of about 175° to 250° F.;
- venting off under reduced pressure water and volatiles;
- cooling the dough-like mixture to about 0° to 150° F. and

(d) conveying the product through a die onto a conveyor belt for cutting and packaging;

wherein the product has a moisture content of about 20 to 40%; a water activity (Aw) of about 0.35–0.65, and a glass transition temperature of less than about +18° C.

5,773,071

**NON-FAT BAKING INGREDIENT**  
Karen S. Gaither, Akron, and Rhonda W. Reitz, Medina, both of Ohio, assignors to The J. M. Smucker Company, Orrville, Ohio

Continuation of Ser. No. 698,198, Aug. 15, 1996, Pat. No. 5,688,548. This application Jul. 16, 1997, Ser. No. 895,152  
Int. Cl.<sup>6</sup> A23L 1/035

U.S. Cl. 426—577

18 Claims

1. An improved liquid shortening substitute comprising a mixture of at least 5% by weight a fruit, a sweetener, water, a pH adjuster and at least about 0.1% by weight a fat mimetic; said fruit including a flavor selected from the group consisting of apple, prune, apricot, plum, pear, peach, nectarine and mixtures thereof; said sweetener added in an effective amount to create a brix of about 10%–60%; said pH adjuster added in an effective amount to form an acidic shortening substitute, said pH adjuster including an adjuster selected from the group consisting of citric acid, ascorbic acid and mixtures thereof.

5,773,072

**METHOD OF MAKING A HEAT-STABILIZED OIL/WATER EMULSION CONTAINING EGG YOLK AND DATEM**

Lydia Campbell, Waldprechts-Weiler-Malsch, and Hans Uwe Trueck, Stuttgart, both of Germany, assignors to Nestec S.A., Vevey, Switzerland

Filed Nov. 28, 1995, Ser. No. 563,490

Claims priority, application European Pat. Off., Dec. 13, 1994, 94119664

Int. Cl.<sup>6</sup> A23L 1/39

U.S. Cl. 426—589

15 Claims

1. A process for preparing a heat-stable oil and water emulsion sauce which comprises homogenizing a mixture of unmodified egg yolk and of diacetyl tartaric acid ester of monoglyceride ("DATEM") emulsifying agents to obtain a homogenized mixture and combining the homogenized mixture with ingredients comprising an edible oil, water, a thickener component and an ingredient selected from the group consisting of salt and sugar to obtain a further mixture and so that the further mixture comprises, by weight, the oil in an amount of from 5% to 70%, the unmodified egg yolk in an amount of from 0.1% to 20% and the DATEM in an amount of between 0.5% and 1.5% (dry weight) and homogenizing the further mixture to obtain an emulsion which is heat-stable, and then heating the emulsion at a temperature and for a time to at least pasteurize the emulsion to obtain a heat-treated emulsion product.

5,773,073

**WATER-IN-OIL EMULSION CONTAINING A POLYGLYCEROL FATTY ACID ESTER HAVING ERUCIC ACID AS THE MAIN FATTY ACID COMPONENT**  
Koji Matsuda, Tokyo, and Miwako Kitao, Kanagawa, both of Japan, assignors to Mitsubishi Chemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 618,843, Nov. 28, 1990, abandoned.

This application Sep. 16, 1992, Ser. No. 945,586

Claims priority, application Japan, Nov. 28, 1989, 1-308394

Int. Cl.<sup>6</sup> A23D 7/00

U.S. Cl. 426—602

7 Claims

1. A water-in-oil emulsion comprising an aqueous phase and a fat phase in a weight ratio of the aqueous phase to the fat phase of

from 50/50 to 80/20 and containing a polyglycerol fatty acid ester which is added to the fat phase in an amount of from 0.1 to 5% by weight based on the total amount of the emulsion, which has erucic acid accounting for at least 70% by weight of its fatty acid component, and which has a mean esterification ratio of from 30 to 90%.

5,773,074

**METHOD FOR THE PRODUCTION OF FOODSTUFF USING SOLUBLE CASEIN COMPOUNDS OR CASEINATES AND THE PRODUCT THEREOF**

Jeroen Jacobus Cornelius Veldkamp, Den Dungen; John William Broekhuis, Hilversum, and Harm Jacob Wichers, Driebergen, all of Netherlands, assignors to Hak B.V., Giessen, Netherlands

PCT No. PCT/NL95/00078, § 371 Date Oct. 8, 1996, § 102(e)

Date Oct. 8, 1996, PCT Pub. No. WO95/23516, PCT Pub.

Date Sep. 8, 1995

PCT Filed Mar. 2, 1995, Ser. No. 702,576

Claims priority, application Netherlands, Mar. 2, 1994, 9400320

Int. Cl.<sup>6</sup> A23B 7/00

U.S. Cl. 426—615

8 Claims

1. Method for the production of an optionally preserved, water-and/or oil-containing foodstuff selected from the group consisting of vegetables, pulses and fruit, consisting of the steps of adding a casein compound which is soluble in water and/or oil or has been dissolved in water and/or oil to the foodstuff in which the casein compound is used in an amount of less than 20 g per 1000 g of foodstuff including water and/or oil containing brine or syrup, and also adding ascorbic acid and/or ascorbate or another reducing agent selected from the group consisting of sulphurous acid and the salts thereof and the following (organic) acids (which bind divalently or polyvalently charged metal ions): adipic acid, DL-malic acid, succinic acid, citric acid, acetic acid, fumaric acid, D-glucuronic acid, L-lactic acid, L-tartaric acid, phosphoric acid and galacturonic acid, mixtures thereof and low-molecular polymerised compounds which have the above-mentioned acids as based components and in which free carboxyl groups remain on the chain after polymerisation, to the foodstuff including water, oil or a mixture thereof.

5,773,075

**HIGH TEMPERATURE COUNTERCURRENT SOLVENT EXTRACTION OF CAPSICUM SOLIDS**

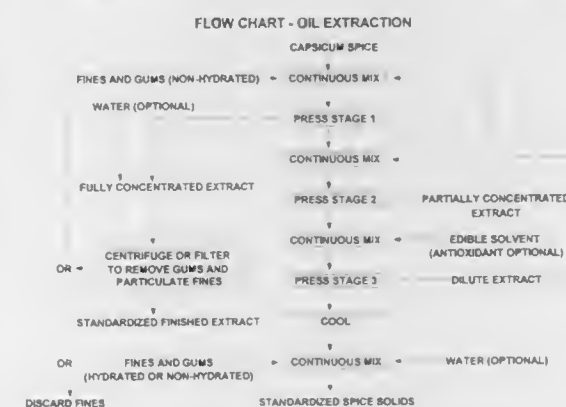
George N. Todd, Kalamazoo, Mich., assignor to Kalamazoo Holdings, Inc., Kalamazoo, Mich.

Filed Dec. 13, 1996, Ser. No. 766,504

Int. Cl.<sup>6</sup> A23L 1/221

U.S. Cl. 426—638

18 Claims



1. A continuous multistage mixing, high pressure pressing, and countercurrent extraction process for the production of a concentrated edible extract and edible residual solids, both of reduced

bacterial content, with the extract having enhanced resistance to oxidative deterioration of carotenoid pigments therein, and both of which contain carotenoid pigments, flavor, and aroma, from plant material solids of the genus Capsicum, comprising the following steps:

subjecting said Capsicum solids to a countercurrent extraction process involving a plurality of mixing and pressing stages, including first and last mixing stages and first and last pressing stages, together with five to about fifty percent by weight of an edible solvent, to produce an extract and residual solids, continuously returning the extract from each pressing stage to the previous mixing stage, and finally separating the extract from the first pressing stage and separating the residual solids from the last pressing stage, all pressing stages being carried out at a temperature of at least 130° F.

5,773,076

**PROCESS FOR RECOVERY OF INSOLUBLE PROTEIN FROM STEEP WATER**

Gin C. Liaw, Eric H. Lutz, both of Decatur, and Munir Cheryan, Urbana, all of Ill., assignors to A.E. Staley Manufacturing Company, Decatur, Ill.

Filed Feb. 1, 1996, Ser. No. 595,380

Int. Cl.<sup>6</sup> A23J 1/14

U.S. Cl. 426—656

10 Claims

1. In a corn wet milling process, in which corn kernels are steeped in an aqueous solution which comprises gluten wash water thereby producing steep water and in which the end products of the process include a corn gluten feed and a corn gluten meal which has a higher protein content than the corn gluten feed, the improvement comprising the steps of:

membrane filtrating said steep water that comprises gluten wash water and insoluble gluten protein, thereby producing a retentate which has a higher concentration of the insoluble gluten protein than the steep water; and incorporating the insoluble gluten protein in the retentate into the corn gluten meal.

5,773,077

**ABRASION-PROTECTIVE CONVERTIBLE WINDOW**  
Stanley Edmond, Woodland Hills, Calif., assignor to Ellay, Inc., Los Angeles, Calif.

Filed Oct. 10, 1995, Ser. No. 544,401

Int. Cl.<sup>6</sup> B05D 3/10; 7/24

U.S. Cl. 427—155

6 Claims



1. A process for manufacturing a window for use in a vehicular convertible top, the window being made by the process comprising:

providing a flexible, optically transparent plastic window sheet suitable for use as a vehicular convertible window; preparing a wax-free liquid coating material comprising an aqueous emulsion of a transparent acrylic polymeric material; applying the liquid coating material to opposite sides of the plastic sheet; and

drying the coating material to a hardened dried film, forming an abrasion-protective coating on opposite faces of the plastic sheet, in which said dried film coating is flexible and optically transparent in its dry thin-film form and adhered to the plastic sheet in its dry form as a semi-permanent coating removable from the plastic sheet by an alkaline aqueous cleaning agent, and in which the dried film coating has a thickness sufficient to prevent abrasion damage to the underlying plastic window sheet.



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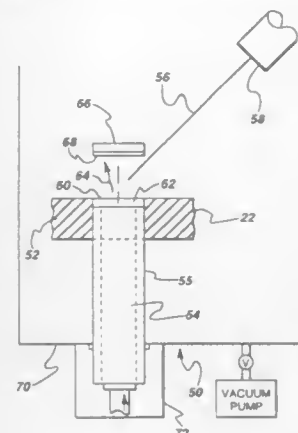
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5,773,078  
METHOD FOR DEPOSITING ZIRCONIUM OXIDE ON A SUBSTRATE  
David William Skelly, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.  
Filed Jun. 24, 1996, Ser. No. 669,207  
Int. Cl.<sup>6</sup> C23C 14/24; B05D 3/06  
U.S. Cl. 427—126.3 20 Claims



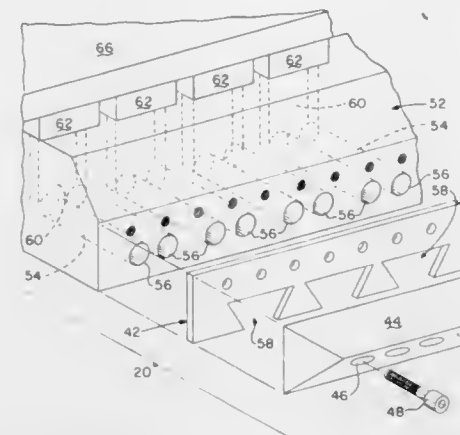
1. An improved method for depositing zirconium oxide from a zirconium oxide source onto a substrate by means of physical vapor deposition, comprising the step of adding zirconium metal to the zirconium oxide source by further using the zirconium metal as an evaporation source adjacent to the zirconium oxide source.

5,773,079  
PROCESS FOR REPAIRING BATTERY SEPARATORS  
Werner Böhnstedt, Henstedt-Ulzburg; Klaus Heinrich Ihmels; Karsten Fischer, both of Hamburg, and Jürgen Ruhoff, Norderstedt, all of Germany, assignors to Daramic, Inc., Germany  
Filed Jun. 5, 1995, Ser. No. 461,369  
Claims priority, application Germany, Dec. 12, 1994, 44 46 675.7  
Int. Cl.<sup>6</sup> B32B 32/00  
U.S. Cl. 427—140 11 Claims

1. Process for repairing manufacturing defects in porous separator webs for accumulators, said defects comprising at least one hole in said porous separator web having a diameter larger than the diameter of the pores in said porous separator web, characterized in that a repair material selected from the group consisting of polymer and resin dispersions, polymerizable monomers and oligomers, and hot-melting compositions based on polyethylene is deposited onto the defect in-line as production of the separator web proceeds and the defect is thus sealed.

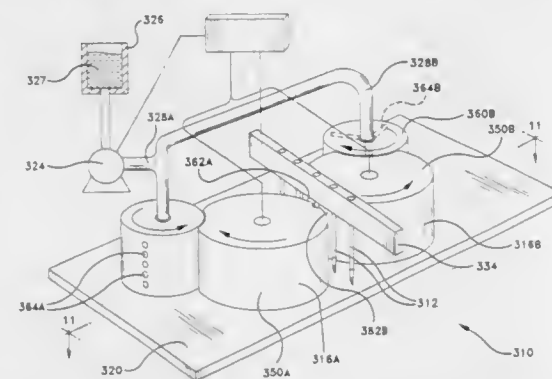
5,773,080  
PATTERN COATING OF THICK FILM PRESSURE SENSITIVE ADHESIVES  
George Simmons, 9440 Headlands Rd., Mentor, Ohio 44060, and John L. Schmitz, 19080 Tilden Rd., Hiram, Ohio 44234  
Filed Apr. 17, 1997, Ser. No. 843,865  
Int. Cl.<sup>6</sup> B05D 5/10 43 Claims

1. A process for pattern coating a plurality of strips of adhesive onto a release web comprising the steps of:  
feeding an adhesive into a feed manifold in a die assembly, the die assembly comprising:  
a die body having at least two exit ports in a front face of the die body; and  
at least two die cavity forming means, each of which receive adhesive exiting from at least one die body exit port, each



die cavity forming means having at least one opening through which the adhesive can exit the die cavity forming means;  
passing a silicone-coated web under the openings of the die cavity forming means in the die assembly and depositing at least two non-contacting adhesive strips thereon;  
drying or curing the adhesive wherein the process of curing is selected from the group consisting of electron beam curing, ultraviolet curing and heat curing; and winding the adhesive coated web.

5,773,081  
METHOD FOR COATING OF OBJECTS USING A ROTATING RESILIENT MATRIX  
Victor A. Williamitis, Dayton, Ohio; Jeanne E. Lambert, Conyers, Ga.; Min Shiu Lee, and Robert A. Taller, both of Sandy, Utah, assignors to Becton Dickinson and Company, Franklin Lakes, N.J.  
Continuation of Ser. No. 751,391, Nov. 18, 1996, abandoned, which is a continuation of Ser. No. 509,393, Jul. 31, 1995, abandoned. This application Jul. 31, 1997, Ser. No. 903,665  
Int. Cl.<sup>6</sup> B05D 1/28  
U.S. Cl. 427—211 8 Claims



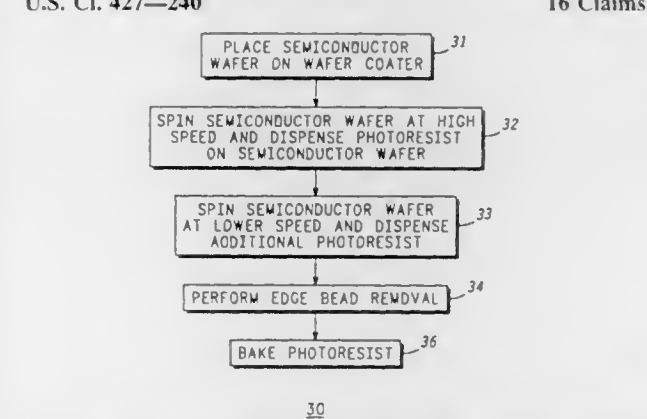
1. A method for applying a coating to an object, comprising:  
providing a first roller having a first porous resilient pad thereon with an unbiased thickness  $t_1$ ;  
rotating the first roller;  
rotating a first coating roller with a plurality of holes therein in counter rotary motion with respect to the first roller so that the first coating roller engages the first roller and compresses the first porous resilient pad in an area of engagement to a thickness  $t_2$ ;  
supplying a coating material to the first coating roller;  
transferring the coating material from the first coating roller to the first porous resilient pad via the plurality of holes in the first coating roller;  
moving an object into engagement with the first roller so the object compresses the first porous resilient pad in an area of

engagement to a thickness  $t_3$  wherein  $t_1$  is greater than  $t_3$  and  $t_3$  is greater than  $t_2$ ; and  
transferring the coating material from the first porous resilient pad to the object.

5,773,082  
METHOD FOR APPLYING PHOTORESIST ON WAFER  
Chi-Fa Ku, Kaohsiung Hsien; Chih-Hsing Hsin, Tao-Yuan Hsien, and Po-Wen Yen, Hsinchu City, all of Taiwan, assignors to United Microelectronics Corp., Hsinchu, Taiwan  
Filed Jan. 16, 1997, Ser. No. 783,906  
Int. Cl.<sup>6</sup> B05D 3/12 13 Claims

1. A method for applying photoresist on a wafer, said method comprising:  
dispensing said photoresist on a portion of the wafer, said wafer is supported by a spinner chuck and said wafer is rotated at a first speed;  
spreading said photoresist on the wafer by rotating the wafer at a second speed higher than the first speed, wherein an acceleration having an acceleration rate of about 5000 to 15000 revolutions per minute is exerted on the wafer, so that the first speed is changed to the second speed; and  
planarizing said photoresist by rotating the wafer at a medium speed greater than or equal to said first speed in the dispensing step and less than or equal to said second speed in the spreading step.

5,773,083  
METHOD FOR COATING A SUBSTRATE WITH A COATING SOLUTION  
Frank W. Fischer, Mesa, and Thomas W. Peterson, Tucson, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.  
Continuation of Ser. No. 693,468, Aug. 2, 1996, abandoned.  
This application Oct. 15, 1997, Ser. No. 950,605  
Int. Cl.<sup>6</sup> B05D 3/12 16 Claims



1. A method for coating a substrate with a coating solution, comprising the steps of:  
pre-wetting a surface of the substrate with the coating solution to form a pre-wetted surface, wherein a first amount of the coating solution is used to pre-wet the surface;  
applying a second amount of coating solution to the pre-wetted surface of the substrate, wherein the second amount is substantially equal to the first amount; and  
spreading the additional coating solution over the prewetted surface of the substrate.

5,773,084

Patent Not Issued For This Number

5,773,085  
METHOD OF MANUFACTURING TERNARY COMPOUND THIN FILMS

Yoji Inoue; Katsu Tanaka; Shinji Okamoto, and Kikuo Kobayashi, all of Tokyo, Japan, assignors to Nippon Iiso Kyokai, Tokyo, Japan  
PCT No. PCT/JP95/01337, § 371 Date Jun. 12, 1996, § 102(e) Date Jun. 12, 1996, PCT Pub. No. WO96/01549, PCT Pub. Date Jan. 18, 1996  
PCT Filed Jul. 4, 1995, Ser. No. 602,834  
Claims priority, application Japan, Jul. 4, 1994, 6-152059  
Int. Cl.<sup>6</sup> C23C 14/24; B05D 5/06 15 Claims

1. A method of manufacturing a ternary compound semiconductor thin film, characterized in that one kind of element belonging to IB group or IIB group and one kind of binary compound including one kind of element belonging to IIIB group and one kind of element selected from the group consisting of S, Se, Te and O are evaporated respectively by means of a vacuum vapor deposition method or molecular beam epitaxial method to produce a ternary compound semiconductor material having a low vapor pressure, and said ternary compound semiconductor material is deposited on a substrate to form said ternary compound semiconductor thin film.

5,773,086  
METHOD OF COATING FLAT GLASS WITH INDIUM OXIDE

Richard J. McCurdy; David A. Strickler, both of Toledo, Ohio, and Kevin D. Sanderson, Omskirk, United Kingdom, assignors to Libbey-Owens-Ford Co., Toledo, Ohio, and Pilkington PLC, St. Helens, England  
Filed Aug. 13, 1996, Ser. No. 694,435  
Int. Cl.<sup>6</sup> C23C 16/40; B05D 5/06 10 Claims

1. A process for applying an indium oxide coating to flat glass comprises directing a dialkyl indium compound in vapour form onto a hot glass surface in the presence of a source of oxygen whereby the indium compound decomposes with formation of said indium oxide coating on the hot glass surface.

5,773,087  
COATED ARTICLE AND METHOD FOR PRODUCING SAME

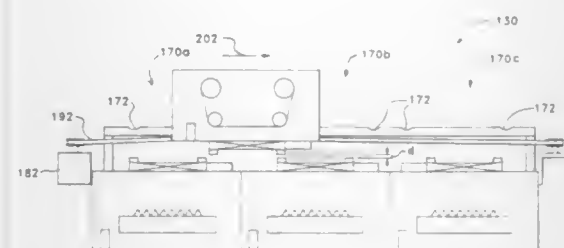
Hideki Kashihara, and Katsuya Yamada, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan  
Division of Ser. No. 977,039, Nov. 16, 1992, abandoned. This application Jul. 29, 1996, Ser. No. 695,212  
Claims priority, application Japan, Nov. 15, 1991, 3-354107  
Int. Cl.<sup>6</sup> B05D 3/12; C25D 5/36 18 Claims

1. A method for producing a coated article comprising a stainless steel base having an etched surface and having on said etched surface a coated layer, said method comprising the steps of:  
sensitizing a stainless steel base through heating;  
treating the resulting sensitized stainless steel base with an acid;  
subjecting the resulting treated stainless steel base to etching;  
subjecting the etched stainless steel base to a solution treatment through heating at 1,000° to 1,100° C.; and  
providing on the resulting etched surface of said stainless steel base a coated layer.

5,773,088

TREATMENT SYSTEM INCLUDING VACUUM  
ISOLATED SOURCES AND METHODPawan K. Bhat, Littleton, Colo., assignor to Materials  
Research Group, Inc., Wheatridge, Colo.

Filed Dec. 5, 1995, Ser. No. 567,494

Int. Cl.<sup>6</sup> H05H 1/24; C23C 16/00; 14/00; B05C 13/00  
U.S. Cl. 427—294 8 Claims

7. A method of treating one or more elongated webs in accordance with a treatment process that requires sequential exposure of a surface which extends along a length of each web to a plurality of treatment sources in an evacuated environment, said method comprising steps of:

- providing a handling chamber having a handling chamber opening and having a first one of said webs positioned in the handling chamber;
- providing a plurality of source chambers such that each of said plurality of said treatment sources is positioned within a different one of said source chambers, each source chamber having a source chamber opening;
- selectively providing movement of the handling chamber so as to temporarily align each of the source chamber openings with the handling chamber opening;
- sequentially exposing said surface of said first web to all of said sources by progressively exposing successive portions of said web surface to each one of said sources through said temporarily aligned openings in cooperation with selectively opening and closing said chamber openings until substantially all of said surface has been exposed to each source; and
- maintaining said handling chamber and said source chambers under vacuum during said exposure and said movement such that each of the treatment sources and the web are maintained under vacuum during said sequential exposure of said surface to said plurality of said treatment sources and the surface is exposed to each said treatment source.

5,773,089

PROCESS FOR TREATING ARAMID SURFACES TO BE  
PLATEDRobert R. Burch, Exton, Pa., and Che H. Hsu, Wilmington,  
Del., assignors to E. I. du Pont de Nemours and Company,  
Wilmington, Del.

Filed Dec. 18, 1996, Ser. No. 769,024

Int. Cl.<sup>6</sup> B05D 3/10; 1/18  
U.S. Cl. 427—304 10 Claims

1. A process for preparing an aramid surface to be plated with a durable metal coating wherein, during the entire course of the process, the aramid surface is kept from contact with metal cations; the process consisting of the steps of:

- contacting the aramid surface with a non-aqueous solution of a base, whose conjugate acid has a pKa in dimethyl sulfoxide of greater than 19, for 1 to 60 seconds at a temperature in the range from 15° C. to 190° C.; and
- washing the base-contacted aramid surface with water until substantially all of the base is removed.

5,773,090

PROCESS FOR COATING PHOSPHATED METAL  
SUBSTRATESGabriele Büttner, Ratingen; Matthias Kimpel, Schwelm, and  
Klausjörg Klein, Wuppertal, all of Germany, assignors to  
Herberts Gelschaft mit Beschränkter Haftung, Wuppertal,  
GermanyPCT No. PCT/EP95/01957, § 371 Date Feb. 26, 1997, § 102(e)  
Date Feb. 26, 1997, PCT Pub. No. WO95/33083, PCT Pub.  
Date Dec. 7, 1995

PCT Filed May 23, 1995, Ser. No. 737,945

Claims priority, application Germany, May 27, 1994, 44 18  
491.3Int. Cl.<sup>6</sup> B05D 3/00; C25D 5/34; 9/02; C23C 8/10  
U.S. Cl. 427—327 18 Claims

1. Process for coating a metal substrate, comprising:  
phosphating the metal substrate in a phosphating solution which contains no nickel;  
treating the phosphated metal substrate with an aqueous solution after phosphating and before application of a first organic coating;  
wherein the treating step is performed with an aqueous solution which contains 5 to 10000 ppm of dissolved bismuth in a form of at least one member selected from the group consisting of inorganic bismuth compounds and organic bismuth compounds, and wherein the bismuth is deposited in a total quantity of 5 to 100 mg/m<sup>2</sup>; and  
applying one or more organic coatings.

5,773,091

ANTI-GRAFFITI COATINGS AND METHOD OF  
GRAFFITI REMOVALDaniel Perlman, Arlington, Mass., and Robert H. Black, New  
Rochelle, N.Y., assignors to Brandeis University, Waltham,  
Mass.

Filed Jul. 11, 1996, Ser. No. 680,265

Int. Cl.<sup>6</sup> B05D 3/00

U.S. Cl. 427—384 18 Claims

1. A method of treating surfaces to increase resistance of said surfaces to graffiti markings and other soiling, and facilitating cleaning of said surfaces, said method comprising the steps of:  
applying a coating material to a surface to form thereon a barrier coat, wherein said coating material comprises water and at least one constituent selected from the group consisting of mineral waxes and synthetic waxes,  
wherein said coating material includes an effective concentration of at least one wax-protective chemical agent selected from the group consisting of photostable wax-soluble/water-insoluble solar UV light absorbers, wax-soluble/water-insoluble free-radical and peroxy-radical scavengers, and wax-soluble/water-insoluble antioxidants.

5,773,092

COMPOSITE POLYESTER/PVA BARRIER FILMS  
Michel Prissette, Bron, and Didier Veyrat, St-Cyr-au-Mont-  
D'Or, both of France, assignors to Rhone-Poulenc Films,  
Miribel, FranceDivision of Ser. No. 414,382, Mar. 31, 1995, Pat. No.  
5,658,676. This application May 7, 1997, Ser. No. 852,534  
Claims priority, application France, Mar. 31, 1994, 94 04267  
Int. Cl.<sup>6</sup> B05D 3/02; 1/28; 5/00

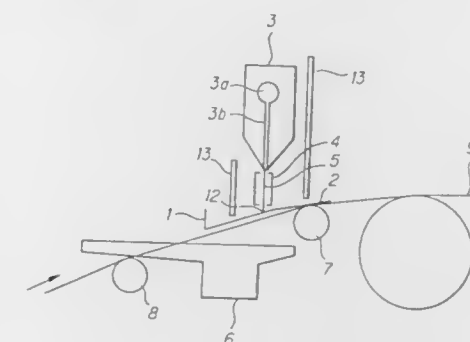
U.S. Cl. 427—385.5 4 Claims

1. A process for the preparation of a polyester-based, biaxially oriented composite film having good gas barrier properties, comprising: coating a polyester base film on at least one of its two face surfaces with an aqueous solution of polyvinyl alcohol which comprises at least 95% of vinyl alcohol recurring structural units, said polyvinyl alcohol exhibiting, in aqueous solution at a concentration of 4% and at 120° C., a viscosity of at least 4 mPa.s; and  
heat-treating the coated film at a temperature of at least 170° C.

5,773,093

APPARATUS FOR CONTROLLING APPLICATION OF  
EXCESS COATING LIQUID IN CURTAIN COATING AND  
METHOD OF COATINGKameo Mitani, and Haruhiko Ichimura, both of Tokyo, Japan,  
assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan  
Filed Apr. 16, 1996, Ser. No. 633,045Claims priority, application Japan, Jun. 2, 1995, 7-135528;  
Jan. 23, 1996, 8-009376Int. Cl.<sup>6</sup> B05D 1/30; B05C 5/00

U.S. Cl. 427—420 10 Claims





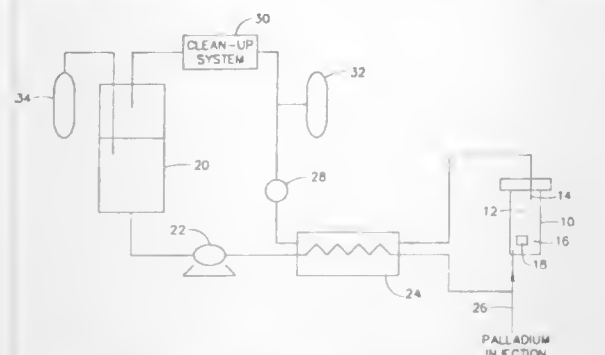
5,773,096

**METHOD OF CATALYST PREPARATION BY HIGH-TEMPERATURE HYDROTHERMAL INCORPORATION OF NOBLE METALS ONTO SURFACES AND MATRICES**  
Samson Hettiarachchi, Menlo Park; Thomas Pompilio Diaz, San Martin, and John Ewing Weber, Fremont, all of Calif., assignors to General Electric Company, Schenectady, N.Y.  
Continuation-in-part of Ser. No. 209,572, Mar. 10, 1994, abandoned, which is a continuation-in-part of Ser. No. 143,513, Oct. 29, 1993, abandoned, and Ser. No. 143,514, Oct. 29, 1993, Pat. No. 5,448,605. This application Jun. 7, 1995, Ser. No. 482,224

Int. Cl.<sup>6</sup> B05D 1/18; G21C 9/00

U.S. Cl. 427—436

6 Claims



1. A method for applying a noble metal on an oxidized surface of a metal substrate, comprising the steps of:  
placing the surface of the metal substrate in contact with a volume filled with high-temperature water;  
injecting a solution of a noble metal compound into said volume for a preset duration;  
causing said noble metal compound to decompose in said high-temperature water to release species of said noble metal which incorporate in said oxidized surface of said metal substrate; and  
removing the surface of the metal substrate from contact with the high-temperature water after expiration of said preset duration.

5,773,097

**VERTICAL ELECTROSTATIC COATER HAVING VORTEX EFFECT**

Joseph Rogari, Trumbull, Conn., assignor to Nordson Corporation, Westlake, Ohio

Continuation of Ser. No. 249,839, May 26, 1994, abandoned. This application Apr. 22, 1996, Ser. No. 636,064

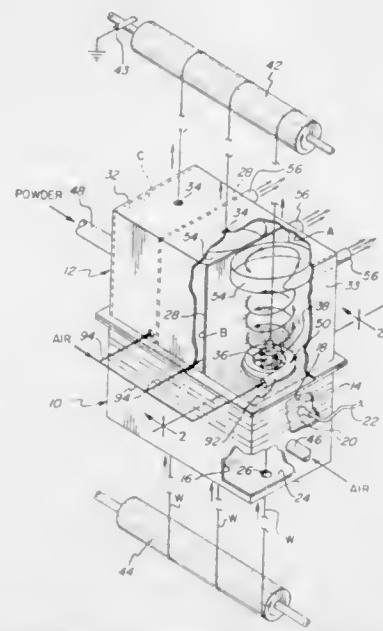
Int. Cl.<sup>6</sup> B05D 1/24; B05B 5/025

U.S. Cl. 427—459

6 Claims

5. A method for electrostatically coating a continuous-length workpiece with a particulate coating material, comprising the steps:

(a) providing an electrostatic fluidized bed system, comprising: a housing, including opposed upper and lower end walls; a generally planar, horizontally disposed porous fluidizing plate lying between said opposed end walls and defining within said housing a fluidization chamber thereabove and an air plenum therebelow, said upper end wall having an opening therein, and said lower end wall and said porous fluidizing plate having openings therein that are aligned with said opening in said upper end wall to define a workpiece travel path portion extending vertically through said housing; a tubular guide extending vertically through said opening in said fluidizing plate and projecting into said fluidization chamber, said tubular guide having an axial bore therethrough for passage of a continuous length workpiece; a vortex-generating device supported concentrically with respect to said tubular guide above said fluidizing plate in said fluidization chamber, said vortex-generating device being constructed to receive a gas



and to discharge it in a generally helical flow path substantially in the form of a vortex about, and aligned substantially axially on, said travel path portion; means for introducing gas into said air plenum for passage upwardly through said fluidizing plate to effect fluidization of a bed of particulate coating material disposed on said fluidizing plate; and means to effect electrostatic charging of such particulate material;  
(b) maintaining above said fluidizing plate a bed of a particulate coating material, the particles of which are capable of acquiring an electrostatic charge;  
(c) operating said vortex-generating device so as to so receive and discharge a gas;  
(d) operating said means for introducing gas so as to so effect fluidization;  
(e) operating said means to effect electrostatic charging so as to effect electrostatic charging of said particulate material; and  
(f) passing a continuous-length workpiece upwardly along said vertical travel path portion while carrying out said steps (c), (d), and (e); wherein the cooperative effects of fluidization and electrostatic charging produce a cloud of electrostatically charged particulate material above said fluidizing plate in said chamber, and wherein said vortex-generating device produces, about said travel path, a gaseous vortex in which the charged particulate material is entrained so as to swirl around said continuous-length workpiece, as it travels upwardly along said travel path portion through said fluidization chamber, for electrostatic attraction of said particulate material to, and deposit thereof upon, said workpiece.

5,773,098

**APPLYING A FLUOROPOLYMER FILM TO A BODY**  
Thomas Ronald Thomas, Dingwall, Scotland, assignor to British Technology Group, Ltd., London, England

Continuation-in-part of Ser. No. 167,966, Apr. 26, 1994, Pat. No. 5,516,561. This application Nov. 21, 1995, Ser. No. 561,384

Claims priority, application United Kingdom, Jun. 20, 1991, 9113350

Int. Cl.<sup>6</sup> B05D 3/04; C08J 7/18

U.S. Cl. 427—490

15 Claims

1. A method of applying a fluoropolymer film to a porous or microporous body, comprising exposing the body to a supply of saturated molecules of the formula  $C_nF_{2n}$ , where  $n=4-8$ , causing scission of the molecules, and allowing the fragments to combine on the surface of the body to form an adherent fluoropolymer layer, and ceasing exposure of the body to the supply of saturated molecules before the pores of the body have been completely closed by the deposited fluoropolymer.

5,773,099

**DENTAL CARE MATERIAL AND MANUFACTURING METHOD**

Naoki Tanaka; Hiroshi Ohtsubo, both of Suwa, and Michio Ito, Siojiri, all of Japan, assignors to Injex Corporation, and Matsumoto Dental College, both of Nagano-ken, Japan  
Division of Ser. No. 378,450, Jan. 25, 1995, Pat. No. 5,613,849.

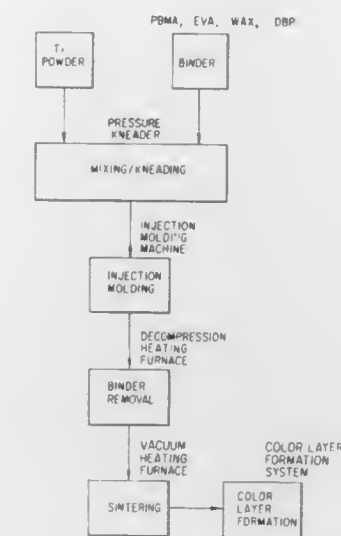
This application Apr. 25, 1996, Ser. No. 637,547

Claims priority, application Japan, Jan. 27, 1994, 6-7892; Oct. 25, 1994, 6-260642

Int. Cl.<sup>6</sup> B22F 3/22

U.S. Cl. 427—529

18 Claims



1. A method for forming a dental care member, comprising the steps of:  
(a) mixing titanium powder and an organic binder to form an injection molding compound;  
(b) molding the injection molding compound to form a molded body, the molded body being one of an orthodontic bracket and a dental implant material;  
(c) removing binder from the molded body, and  
(d) sintering the molded body to form a titanium sintered body.

5,773,100

**PECVD OF SILICON NITRIDE FILMS**

Mei Chang; David N. K. Wang, both of Cupertino; John M. White, Hayward, and Dan Maydan, Los Altos Hills, all of Calif., assignors to Applied Materials, Inc., Santa Clara, Calif.

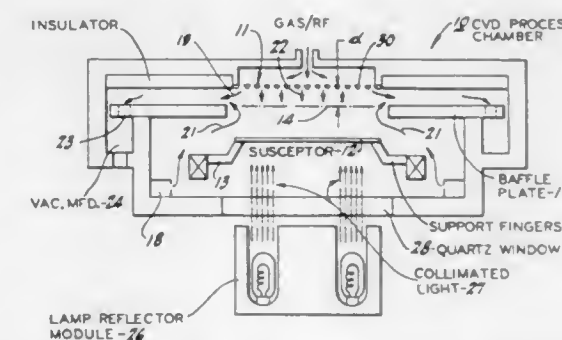
Continuation of Ser. No. 453,135, May 24, 1995, abandoned, which is a continuation of Ser. No. 272,959, Jul. 11, 1994, abandoned, which is a continuation of Ser. No. 809,050, Dec. 17, 1991, abandoned, which is a continuation of Ser. No. 345,977, Apr. 28, 1989, abandoned, which is a continuation of Ser. No. 85,424, Aug. 14, 1987, Pat. No. 4,854,263. This application Nov. 6, 1996, Ser. No. 746,178

Int. Cl.<sup>6</sup> B05D 3/06

U.S. Cl. 427—579

9 Claims

1. A plasma enhanced chemical vapor deposition process for the deposition of compounds of silicon nitride having a substantially uniform thickness on a substrate from a mixture of precursor gases including silane and nitrogen comprising  
activating said precursor gases by passing them through a parallel plate electrode having a face plate including an array of tapered openings therein, wherein the openings for gas inlet are smaller than the openings for gas outlet and the taper is sufficient to increase the dissociation of one or more precursor



gases as they pass through said faceplate, while applying radio frequency energy to the plate.

5,773,101

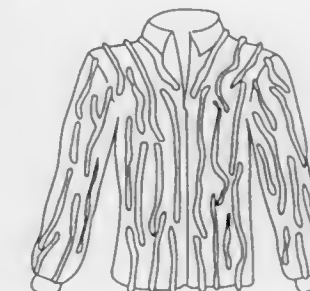
**THREE DIMENSIONAL CAMOUFLAGE MATERIAL**  
Larry O. Sanders, 6582 S. Pontiac Ct., Englewood, Colo. 80111

Filed Jan. 18, 1994, Ser. No. 157,826

Int. Cl.<sup>6</sup> F41H 3/00

U.S. Cl. 428—17

18 Claims



1. A three dimensional camouflage material, comprising a substantially continuous sheet having a pattern, wherein said pattern extends from the plane of said sheet and wherein said pattern is substantially integral with said sheet and wherein said pattern is formed by permanent affixation of multiple folds in said sheet to create affixed portions of said pattern and unaffixed portions of said pattern.

5,773,102

**SOUNDPROOFING LAMINATED GLASS PANE**

Marc Rehfeld, Ezanville, France, assignor to Saint-Gobain Vitrage, S.A., Courbevoie, France

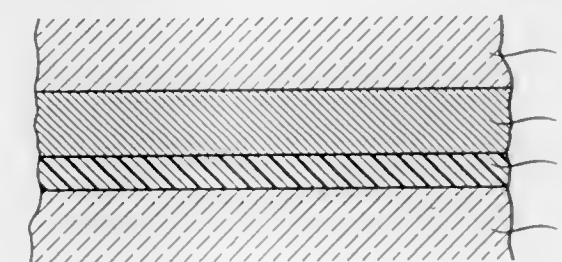
Filed Sep. 16, 1996, Ser. No. 710,328

Claims priority, application France, Sep. 15, 1995, 95 10837

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—34

29 Claims



1. A laminated pane, comprising:  
(i) at least two transparent rigid sheets,  
(ii) at least one high-performance acoustic film, and  
(iii) at least one ordinary standard film, wherein, either

said at least one ordinary standard film, when in a thickness of 2 mm, combined in an assembly laminated with two 4-mm glass plates in order to form a laminated bar 9 cm in length and 3 cm in width and the bar is excited by a shock, has a resonant frequency of the first mode,  $f_1$ , which differs by more than 35% from that of a bar made of monolithic glass, having the same length, the same width and a thickness of 4 mm; or said at least one ordinary standard film, when in a thickness of at most 1 mm, combined in an assembly laminated with two 2.1-mm glass plates to form a laminated sheet, has an acoustic attenuation index shifted, for frequencies above 800 Hz, by more than 6 dB from a reference index which increases by 9 dB per octave up to 2,000 Hz and by 3 dB per octave at higher frequencies.

5,773,103

## INORGANIC MEMBRANES USING POROUS CORDIERITE SUPPORT

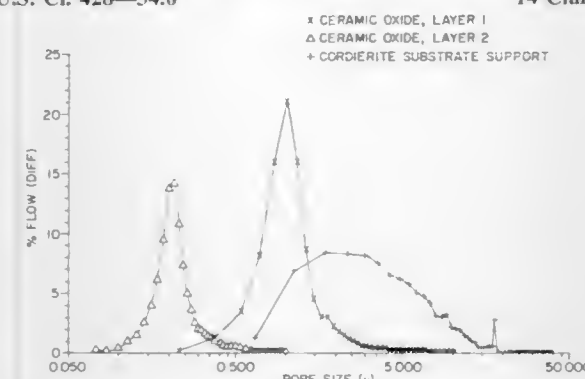
Richard J. Ciora, Jr., Butler, and Paul K. T. Liu, Pittsburgh, both of Pa., assignors to Media and Process Technology Inc., Pittsburgh, Pa.

Filed Jul. 31, 1995, Ser. No. 509,415

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—34.6

14 Claims



1. A ceramic fired composite filter media having a uniform pore size, the media consisting essentially of:
  - (a) a porous cordierite substrate having a surface having pores of non-uniform diameter, said diameter ranging from <1 to 200 μm; and
  - (b) a layer of porous ceramic oxide having pores having a uniform diameter bonded to said surface of said cordierite substrate by heating at a temperature in the range of 1000° to 1500° C., said layer of ceramic oxide comprised of ceramic oxide particles having an average particle size greater than 1 μm to avoid penetration of said pores in said surface of said cordierite.

5,773,104

## HIGH TEMPERATURE AND HIGHLY CORROSIVE RESISTANT SAMPLE CONTAINMENT CARTRIDGE

Timothy N. McKechnie, Huntsville; Richard R. Holmes, Guntersville; Frank R. Zimmerman, Huntsville, and Chris A. Power, Guntersville, all of Ala., assignors to Plasma Processes, Inc., Huntsville, Ala.

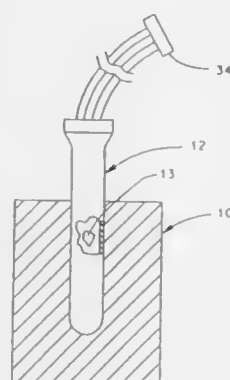
Filed Nov. 13, 1996, Ser. No. 748,573

Int. Cl.<sup>6</sup> A47G 19/22

U.S. Cl. 428—34.6

11 Claims

1. A sample containment cartridge capable of being subjected to temperatures above 1200° C., comprising:
  - a housing having an open end and a closed end, said housing being highly corrosive resistant and capable of withstanding high temperatures;
  - a discrete sample container carried in spring biased relation within said housing to provide shock resistant support of said sample in said housing;



an end cap disposed for secured relation on said open end of said housing to form an enclosed housing;  
said housing comprised of a refractory metal selected from the group consisting of Re, Ta, W, Mo, Pt, Nb and alloys including Mo-40% Re, W-25% Re, W-Ni and Nb-TiHf (WC103) and mixtures thereof, said refractory metal having an inner and outer surface; and  
an inner layer of ceramic material adhered to said inner surface of said refractory metal, said inner layer of ceramic material having an inner and outer surface.

5,773,105

## ABSORBENT PACKET

George E. Klett, Albuquerque, N. Mex., assignor to United Catalysts Inc. - Desiccants, Belen, N. Mex.

Filed Mar. 7, 1996, Ser. No. 612,276

Int. Cl.<sup>6</sup> B65D 81/26

U.S. Cl. 428—34.7

24 Claims

1. An absorbent packet for absorbing water vapor in a container comprising
  - (a) a gas permeable, water impermeable packaging material comprising an inner microporous, gas permeable, liquid water impermeable film, an outer gas permeable support film and a binder that binds the microporous film to the gas permeable support film, wherein said packaging material prevents liquid water which forms within the packet from leaking out of the packet; and
  - (b) an absorbent material contained within the gas permeable, water impermeable packaging material.

5,773,106

## POLYOLEFIN COMPOSITIONS EXHIBITING HEAT RESISTIVITY, LOW HEXANE-EXTRACTIVES AND CONTROLLED MODULUS

Jacquelyn A. deGroot; Pradeep Jain; Lonnie G. Hazlitt, all of Lake Jackson; Seema V. Karande, Missouri City; Laura K. Mergenhausen, Lake Jackson; Dan G. Moldovan, Danbury; Kenneth B. Stewart, and Nicole F. Whiteman, both of Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 327,156, Oct. 21, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 487,819

Int. Cl.<sup>6</sup> B29D 31/00; C08L 23/08; 23/16

U.S. Cl. 428—35.7

16 Claims

1. A molded article comprising a polymer mixture, wherein the polymer mixture comprises
  - (A) from 15 to 60 weight percent, based on the total weight of the mixture, of at least one first ethylene/α-olefin polymer which is a substantially linear ethylene polymer having a density in the range of 0.850 to 0.920 g/cc, wherein the substantially linear ethylene polymer is further characterized as having
    - i. a melt flow ratio,  $I_{10}/I_2 \geq 5.63$ ,

5,773,108

## SELF-COILING COMPOSITE BAND

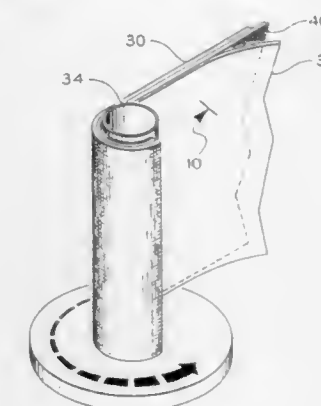
Matthew Casebolt, Fremont, Calif., assignor to Lockheed Martin Corporation, Sunnyvale, Calif.

Filed Jun. 14, 1996, Ser. No. 663,997

Int. Cl.<sup>6</sup> B32B 31/00

U.S. Cl. 428—36.1

18 Claims



- ii. a molecular weight distribution,  $M_w/M_n$ , as determined by gel permeation chromatography and defined by the equation:  $(M_w/M_n) \leq (I_{10}/I_2) - 4.63$ ,
  - iii. a gas extrusion rheology such that the critical shear rate at onset of surface melt fracture for the substantially linear ethylene polymer is at least 50 percent greater than the critical shear rate at the onset of surface melt fracture for a linear ethylene/α-olefin polymer, wherein the substantially linear ethylene polymer and the linear ethylene/α-olefin polymer comprise the same comonomer or comonomers, the linear ethylene/α-olefin polymer has an  $I_2$ ,  $M_w/M_n$ , and density within ten percent of the substantially linear ethylene polymer and wherein the respective critical shear rates of the substantially linear ethylene polymer and the linear ethylene/α-olefin polymer are measured at 190° C. and nitrogen pressures between 250 to 5500 psig using a gas extrusion rheometer equipped with a 20:1 L/D die having a 0.0754 mm diameter and an 180° entrance angle,
  - iv. a single differential scanning calorimetry, DSC, melting peak between -30 and 150° C.; and
  - v. a short chain branching distribution index equal to or greater than about 50 percent; and
- (B) from 40 to 85 weight percent, based on the total weight of the mixture, of at least one second ethylene polymer which is a homogeneously branched ethylene/α-olefin polymer, heterogeneously branched linear ethylene/α-olefin polymer, or linear ethylene homopolymer having a density in the range of 0.930 to 0.965 g/cc; wherein the polymer mixture is characterized as having a density of from 0.890 to 0.930 g/cc, a differential between the densities of the first ethylene/α-olefin polymer and the second ethylene polymer of at least 0.015 g/cc, and an  $I_2$  melt index greater than 10 grams/10 minutes wherein  $I_2$  and  $I_{10}$  are measured in accordance with ASTM D-1238, Condition 190° C./2.16 kilogram, and 190° C./10 kilogram, respectively.

5,773,107

## METHOD OF STORING ACTIVE FILMS

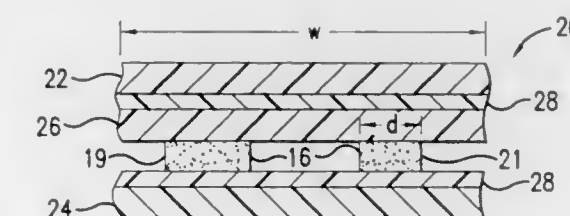
Alan S. Weinberg, Taylors, S.C., assignor to W.R. Grace & Co.-Conn., Duncan, S.C.

Continuation of Ser. No. 409,387, Mar. 23, 1995, abandoned, which is a division of Ser. No. 248,901, May 25, 1994, This application Feb. 12, 1997, Ser. No. 798,721

Int. Cl.<sup>6</sup> B29D 22/00

U.S. Cl. 428—35.9

3 Claims



1. A roll of film comprising:
  - a) a carrier film having a transverse width; and
  - b) at least one strip of oxygen scavenging material with each said strip having two major surfaces and a transverse width less than the transverse width of the carrier film, wherein the strip of oxygen scavenging material is isolated along said two major surfaces from the environment so as to preserve the functionality of said active film.

5,773,109

## HOLLOW, RESIN MECHANICAL PART HAVING A SHAFT INTEGRALLY FORMED THEREWITH AND AN INJECTION MOLDING METHOD FOR PRODUCING THE SAME

Kimihiro Kubo, Yokohama; Masahiko Sato, and Masaaki Kondo, both of Kawasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan  
PCT No. PCT/JP94/02289, § 371 Date Jun. 13, 1996, § 102(e)  
Date Jun. 13, 1996, PCT Pub. No. WO95/28275, PCT Pub. Date Oct. 26, 1995

PCT Filed Dec. 28, 1994, Ser. No. 663,185

Claims priority, application Japan, Apr. 14, 1994, 6-075743  
Int. Cl.<sup>6</sup> B29C 45/00; 49/06

U.S. Cl. 428—36.9

24 Claims

1. A hollow, resin mechanical part having a shaft integrally formed therewith, comprising a hollow, integral, functional segment-shaft structure,
  - said hollow, integral, functional segment-shaft structure comprising at least one functional resin segment, and a resin shaft coaxially, integrally formed with said functional segment,



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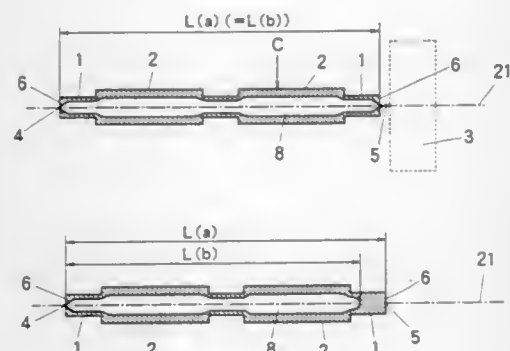
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said hollow, integral, functional segment-shaft structure having a hollow continuously or discontinuously extending substantially along an axis of said segment-shaft structure within at least one member selected from said functional segment and said shaft,

said hollow, integral, functional segment-shaft structure having, in an outer surface thereof, one or two openings communicating with said hollow,

wherein said hollow, integral, functional segment-shaft structure satisfies the relationships defined by the following formula (1):

$$0.9 \leq L(b)/L(a) \leq 1 \quad (1)$$

wherein L(a) represents the entire length of said integral segment-shaft structure as measured along the axis thereof, and L(b) represents the length of said hollow as measured along the axis of said integral segment-shaft structure,

said hollow, integral, functional segment-shaft structure being adapted to be supported by bearing means at said shaft and revolved on the axis of said shaft to thereby exert a function of said functional segment.

9. A method for injection molding a resin while forming a hollow to produce a hollow, resin mechanical part having a shaft integrally formed therewith, comprising a hollow, integral, functional segment-shaft structure,

said hollow, integral, functional segment-shaft structure comprising at least one functional resin segment, and a resin shaft coaxially, integrally formed with said functional segment,

said hollow, integral, functional segment-shaft structure having a hollow continuously or discontinuously extending substantially along an axis of said segment-shaft structure within at least one member selected from said functional segment and said shaft, and having, in an outer surface thereof, one or two openings communicating with said hollow,

said hollow, integral, functional segment-shaft structure being adapted to be supported by bearing means at said shaft and revolved on the axis of said shaft to thereby exert a function of said functional segment,

which method comprises:

(1) providing a mold comprising a fixed mold half and a movable mold half mating with said fixed mold half to thereby provide a mold cavity defined by an inner wall surface of the fixed mold half and an inner wall surface of the movable mold half, said mold cavity being communicated with a gate,

(2) injecting a resin in a molten form into said cavity through said gate to form a molten resin mass in said cavity, and

(3) introducing a hollow-forming fluid under pressure into the molten resin mass through a gate for said mold cavity to form a hollow within said molten resin mass,

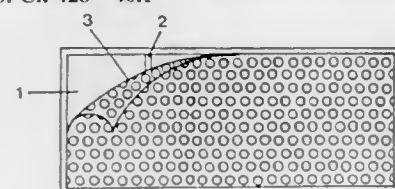
wherein said gate is located in register with a position within a terminal region of said cavity which region has a length such that said hollow, integral segment-shaft structure to be produced satisfies the relationships defined by the following formula (1):

$$0.9 \leq L(b)/L(a) \leq 1 \quad (1)$$

wherein L(a) represents the entire length of said integral segment-shaft structure as measured along the axis thereof,

and L(b) represents the length of said hollow as measured along the axis of said integral segment-shaft structure.

5,773,110  
WINDOW PAINTING APPARATUS AND METHOD  
Rodney M. Shields, Lafayette, Calif., assignor to Creative Minds Foundation, Wilmington, Del.  
Filed Feb. 28, 1994, Ser. No. 203,181  
Int. Cl.<sup>6</sup> B05D 5/00; G09F 19/02  
U.S. Cl. 428—40.1 18 Claims



13. A one-way vision panel assembly bearing an image for application to a window, wherein upon application to the window the image is visible when viewed from one side of the window and the image appears substantially transparent when viewed from the other side of the window, the panel assembly comprising:

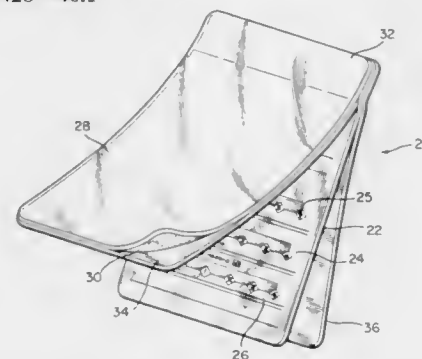
an assembly comprising a panel layer having a first panel side for receiving an image and a second panel side for mounting to a window, said assembly further including a protective liner removably attached to said second panel side;

said assembly is perforated with a plurality of through-holes; a solid backing layer removably attached to a protective liner side of the perforated assembly, wherein:

said solid backing layer effective to catch excess paint which travels through said plurality of through-holes as one or more layers of paint are applied to said first side of said panel layer; and

said solid backing layer, along with said protective liner, are removable to permit said second side of said panel layer to be adhered to the window.

5,773,111  
COLOR CODED WARNING LABEL WITH REMOVABLE COATING  
Blair Meloy Brewster, Brooklyn, N.Y., assignor to Permar Systems, Inc., Wolcott, N.Y.  
Filed Feb. 29, 1996, Ser. No. 608,797  
Int. Cl.<sup>6</sup> G09F 3/00  
U.S. Cl. 428—40.1 17 Claims



1. A color coded self-laminating warning label for indicating a degree of hazard to a user comprising:

a substrate having first and second ends, and a surface for receiving indicia thereon;

a color code printed on a portion of the surface;

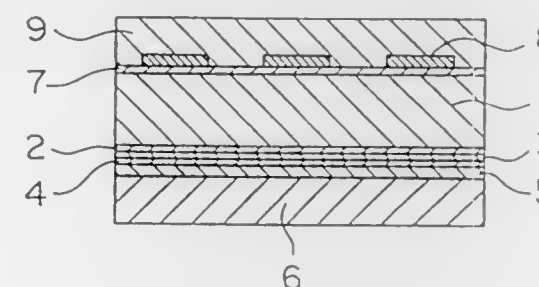
a removable, opaque coating layer overlying the color code;

a sheet of transparent material having a first portion attached to the substrate at the first end and a second portion free from the substrate at the second end; the second portion of the sheet of transparent material overlying the receiving surface of the substrate, the opaque coating layer and the color code;

a layer of adhesive material on a surface of the sheet of transparent material facing the substrate, the opaque coating layer and the color code; and

a removable protective liner covering the adhesive layer on the second portion of the sheet of transparent material.

5,773,112  
LABEL WITH A METALLIC LAYER OF CONTROLLED THICKNESS  
Kohei Tachikawa, Akira Katayama, both of Tokyo, Japan; Toshio Minagawa, and Shigenobu Maruoka, both of Woburn, Mass., assignors to Lintec Corporation, Tokyo, Japan  
Filed Jan. 2, 1997, Ser. No. 778,138  
Claims priority, application Japan, Feb. 29, 1996, 8-069264  
Int. Cl.<sup>6</sup> B32B 7/00  
U.S. Cl. 428—40.1 13 Claims



1. A label comprising:

a transparent or semi-transparent substrate film having a printing layer on one side thereof a print receiving layer between said substrate film and said printing layer;

metallic layer on the other side of said substrate film, said metallic layer having a thickness so as to be 3-70% light transmitting;

a transparent or semi-transparent adhesive layer on a surface of said metallic film opposite said substrate film;

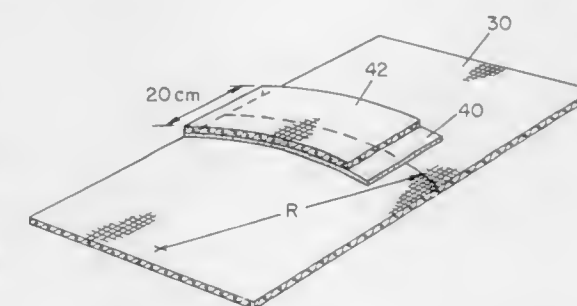
a release liner on a surface of said adhesive layer opposite said metallic film and the formed label has metallic gloss with light reflection in the range of 20 to 80 percent.

5,773,113  
ADHESIVE COMPOSITIONS FOR ELECTRONIC APPLICATIONS  
Sohail Akhter, Brown Deer, Wis., assignor to Brady Precision Tape Co., Milwaukee, Wis.  
Filed Nov. 21, 1996, Ser. No. 754,732  
Int. Cl.<sup>6</sup> C09J 171/10; 175/04  
U.S. Cl. 428—41.8 3 Claims

1. An adhesive tape for electronic parts comprising (a) a base film and (b) an adhesive layer on at least one side of said film, said adhesive layer consisting essentially of about 20 to about 60% by weight of a phenoxy resin, about 20 to about 60% by weight of a thermoplastic urethane elastomer and about 5 to about 50% by weight of a phenolic resin curing agent.

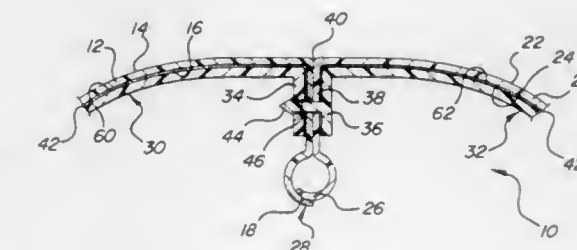
5,773,114  
RADIAL ARC FABRIC SPLICE FOR FABRIC CONVEYOR BELTS

Anthony Dennis Adams, Fairlawn, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio  
Filed Nov. 15, 1996, Ser. No. 756,968  
Int. Cl.<sup>6</sup> B32B 3/00  
U.S. Cl. 428—57 4 Claims



1. A splice for a fabric reinforced conveyor belt comprising a fabric layer having mating ends cut as a single arc of a circle having a radius whose length is greater than the width of the belt.

5,773,115  
FABRICATION OF MULTIPLE COLOR GAUGE AND TEXTURED INTERIOR AUTO COMPONENTS  
Robert A. Ash, Baltimore, Canada, assignor to Davidson Textron Inc., Dover, N.H.  
Division of Ser. No. 641,551, May 1, 1996, Pat. No. 5,705,005.  
This application Oct. 22, 1997, Ser. No. 956,201  
Int. Cl.<sup>6</sup> B32B 3/14 5 Claims



1. An automotive trim panel assembly comprising:

a first coverstock segment having an outer surface and an inner surface and a mating edge disposed along a portion of a common perimeter of said outer surface and inner surface;

a second coverstock segment having an outer surface and an inner surface and a mating edge disposed along a portion of a common perimeter bounding said outer surface and said inner surface, said second coverstock segment bonded to said first coverstock segment along said respective mating edges forming a rough seam that joins said coverstock segments into a composite coverstock and said outer surfaces into a single composite outer surface;

a first rigid substrate component bonded to said first coverstock inner surface;

a second rigid substrate component bonded to said second coverstock inner surface;

each said substrate component including a perimeter with a mating flange extending inward from along a portion of each said substrate perimeter; and

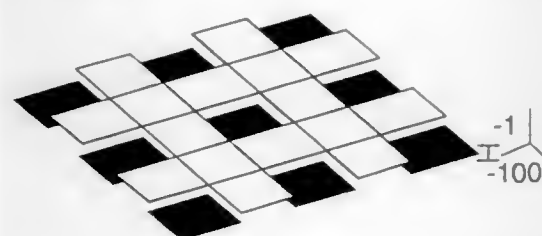
said composite coverstock including an infold formed along said rough seam and projecting inward and sandwiched between said substrate mating flanges forming a pinched junction at said composite outer surface and concealing said rough seam.

5,773,116  
FOCUSED ION BEAM MICROMILLING AND ARTICLES  
THEREFROM

Bruce C. Lamartine, and Roger A. Stutz, both of Los Alamos, N. Mex., assignors to The Regents of the University of California, Ofc. of Technology Transfer, Alameda, Calif.  
Filed Aug. 1, 1996, Ser. No. 695,326  
Int. Cl.<sup>6</sup> B32B 3/00

U.S. Cl. 428—64.1

9 Claims



1. A durable data storage medium comprising a substrate having milled characters therein, said milled characters having an aspect ratio of depth to width of from about 1 to about 50, wherein said milled characters are characters selected from the group consisting of digital characters, alphanumeric characters, glyphical characters and graphical characters.

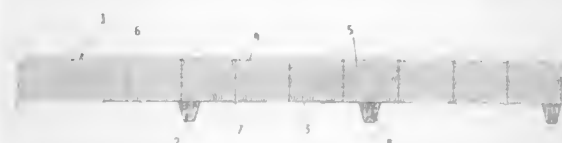
5,773,117  
DEEP RIBBED SANDWICH PANEL AND METHOD FOR  
ITS MANUFACTURE

Giorgio Tognelli, Verderio Superiore, Italy, assignor to Metecno S.p.A., Italy  
PCT No. PCT/EP95/01737, § 371 Date Dec. 27, 1995, § 102(e)  
Date Dec. 27, 1995, PCT Pub. No. WO95/31619, PCT Pub. Date Nov. 23, 1995

PCT Filed May 8, 1995, Ser. No. 564,267  
Claims priority, application Italy, May 13, 1994, VE94A0022  
Int. Cl.<sup>6</sup> B32B 1/04; B31B 1/60

U.S. Cl. 428—75

20 Claims



1. A deep ribbed sandwich panel comprising at least one shaped metal sheet having a top surface and at least one rib which extends above said top surface, and a layer of insulating material consisting of mineral wool fibers, wherein said at least one rib is filled with at least one mineral fiber strip having a cross section complementary to a cross section of said at least one rib, wherein said at least one mineral fiber strip has a fiber axis parallel to the top surface of said at least one shaped metal sheet.

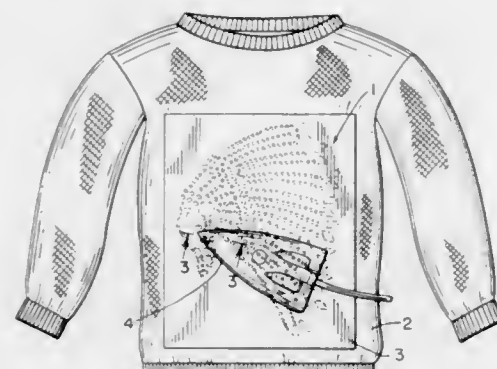
5,773,118  
DECORATIVE FABRIC AND METHOD FOR MAKING  
THE SAME

Marvin Eisenpresser, 4 Willow La., Hewlett Harbor, N.Y. 11557  
Filed Jun. 26, 1995, Ser. No. 494,489  
Int. Cl.<sup>6</sup> B32B 3/14

U.S. Cl. 428—79

10 Claims

1. In combination, a decorative fabric with decal and at least one ornament comprising:  
a fabric;  
a decal bonded to said fabric; and  
at least one ornament affixed to said decal, said ornament overlaying and having the configuration of at least a portion



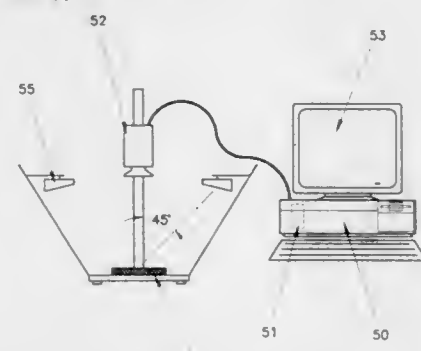
of said decal so that said portion of said decal is hidden between said ornament and said fabric.

5,773,119  
POLYAMIDE FIBER  
Rodney Lee Wells, Chester, Va., assignor to AlliedSignal Inc., Morristown, N.J.

Division of Ser. No. 575,449, Dec. 20, 1995, Pat. No. 5,686,517, which is a continuation of Ser. No. 243,036, May 16, 1994, abandoned. This application Jul. 9, 1997, Ser. No. 890,261

Int. Cl.<sup>6</sup> D02G 3/00; B32B 3/02  
U.S. Cl. 428—85

5 Claims



1. A carpet having face fiber, wherein the face fiber comprises a delustered polyamide fiber that includes as a delusterant 0.3 to 2.0 weight percent calcined kaolin clay having an average particle size of 0.1 to 2.0 microns and less than 0.1 weight percent titanium dioxide, said weight percents being based on the weight of the polyamide fiber, said delustered fiber being characterized by an absence of chalkiness.

5,773,120  
LOOP MATERIAL FOR HOOK-AND-LOOP FASTENING  
SYSTEM

Ganesh Chandra Deka, Duluth; Robert Alan Cool, Alpharetta, and David William Richards, Woodstock, all of Ga., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.  
Filed Feb. 28, 1997, Ser. No. 807,800  
Int. Cl.<sup>6</sup> B32B 3/06; A44B 1/04; 11/25

U.S. Cl. 428—99

43 Claims

1. A loop material suitable for use in a hook-and-loop fastening system, the loop material comprising a bonded carded web having a first side and a second side;

wherein the bonded carded web:  
has a basis weight of from about 15 to about 140 grams per square meter and a thickness of from about 1 mm to about 15 mm;

is comprised of fibers having a denier per filament greater than 2, with from 100 to 0 percent by weight of the fibers being thermoplastic polymer fibers and from 0 to 100 percent by

weight of the fibers being bicomponent thermoplastic polymer fibers, in which the first component has a melting point which is at least about 50° C. lower than the melting point of the second component;

has a plurality of interfiber bonds; and

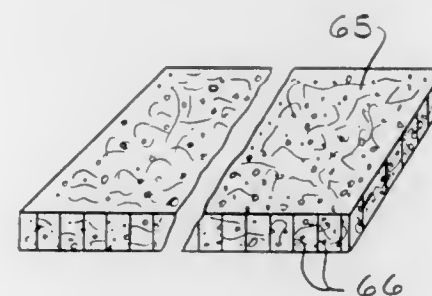
contains a binder at a level of from about 10 to about 50 percent by weight, based on the weight of the bonded carded web, in which the amount of binder at the second side is less than the amount of binder at the first side and the amount of binder at the first side is sufficient to permit multiple attachments of the first side of the first layer to and releases from the hooks without significant distortion of the fibers at the first side.

5,773,121  
SYNTACTIC FOAM CORE INCORPORATING  
HONEYCOMB STRUCTURE FOR COMPOSITES

Charles L. Meter, and Thomas E. Philipps, both of Granville, Ohio, assignors to Isorca Inc., Granville, Ohio  
Continuation-in-part of Ser. No. 600,850, Feb. 13, 1996, which is a continuation-in-part of Ser. No. 282,371, Jul. 29, 1994, Pat. No. 5,587,231. This application Dec. 19, 1996, Ser. No. 769,792

Int. Cl.<sup>6</sup> B32B 3/12; 3/26; 5/16; 18/00  
U.S. Cl. 428—117

20 Claims



1. A syntactic foam core material adapted to providing a low density reinforced syntactic foam core for composite layered structures comprising

a layer of hollow ceramic microspheres,

dry resin powder particles of binder finer in dimension than the diameter of said microspheres thoroughly intermixed in said layer of microspheres to provide a uniform mixture of said powder particles and microspheres,

said microspheres being a major percentage by volume of said mixture,

said syntactic foam core material including a honeycomb structure extending through the body of said layer for reinforcement of said layer,

said mixture of microspheres and resin powder particles having been processed through a cycle of heat softening and setting of said resin particles in interbonded relationship with said microspheres and honeycomb structure,

said resin particles being present in a quantity to interbond said mixture and said honeycomb structure into an integrated rigid layer,

said layer having opposite major surfaces for combination with layers of material on opposite sides thereof in layered composite structures.

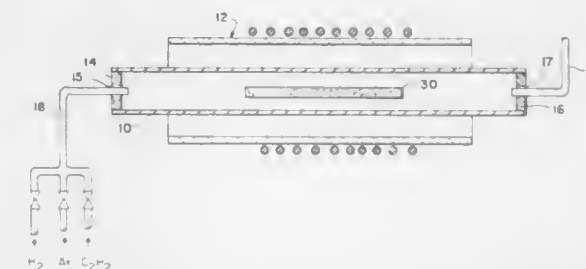
5,773,122  
REINFORCED CARBON COMPOSITES  
James R. Lennox, Saco; Daniel C. Nelson, Old Orchard Beach, and Roger T. Pepper, Saco, all of Me., assignors to Fiber Materials, Inc., Biddeford, Me.

Division of Ser. No. 591,147, Oct. 1, 1990, Pat. No. 5,597,611.

This application Nov. 7, 1996, Ser. No. 744,361

Int. Cl.<sup>6</sup> B32B 5/02; 5/08; 7/04  
U.S. Cl. 428—119

6 Claims



1. A carbon composite comprising a plurality of carbon layers reinforced with carbon fibers and interlinking graphite whiskers between said layers.

5,773,123  
AIR INFILTRATION BARRIER LAMINATE

James Anwyll, Jr., Ponte Veda Beach, Fla., assignor to Anthony Industries, Inc., Adrian, Mich.

Division of Ser. No. 371,835, Jan. 12, 1995, Pat. No. 5,554,246.

This application Mar. 26, 1996, Ser. No. 621,945

Int. Cl.<sup>6</sup> B32B 3/10

U.S. Cl. 428—137

10 Claims

1. An air infiltration barrier laminate, comprising:  
a woven polyolefin fabric  
a layer of resin adhered to the woven polyolefin fabric; and  
a polyolefin film adhered to the layer of resin; said laminate including a multiplicity of perforations therethrough.

5,773,124  
MAGNETIC RECORDING MEDIUM COMPRISING A  
PROTECTIVE LAYER HAVING SPECIFIED  
ELECTRICAL RESISTIVITY AND DENSITY

Fuminori Ishikawa, Hitachiota; Hideaki Tanaka, Katsuta; Toshinori Hirano, Hitachi; Hiroko Saito, Hitachi; Kenichi Gomi, Hitachi; Hiroshi Yashiki; Youichi Inomata, both of Odawara, and Yoshihiro Moriguchi, Hiratsuka, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 18, 1994, Ser. No. 198,592

Claims priority, application Japan, Feb. 22, 1993, 5-031690

Int. Cl.<sup>6</sup> G11B 5/72

U.S. Cl. 428—141

29 Claims

1. A magnetic recording medium comprising, in this order, a nonmagnetic substrate, an underlayer, a metal thin film magnetic layer and a protective layer, the protective layer having (1) a surface opposite the side adjacent the magnetic layer and (2) a remainder;

wherein the electrical resistivity of the surface of the protective layer opposite the side adjacent the magnetic layer is higher than the electrical resistivity of the remainder of the protective layer.



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5,773,125

## SYNDIOTACTIC STYRENIC POLYMER FILM, PROCESS FOR THE PREPARATION OF THE SAME AND PHOTOGRAPHIC MATERIAL

Kiyokazu Hashimoto, and Hiroshi Kawasaki, both of Kana-gawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kana-gawa, Japan

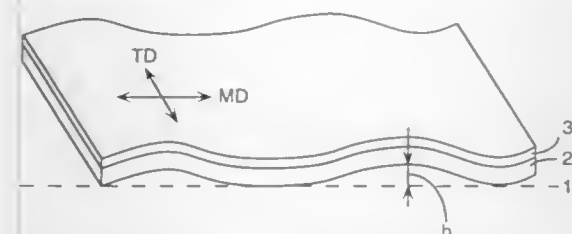
Filed Dec. 20, 1995, Ser. No. 575,501

Claims priority, application Japan, Dec. 20, 1994, 6-316740; Jan. 20, 1995, 7-007344

Int. Cl.<sup>6</sup> B32B 3/10

U.S. Cl. 428—141

19 Claims



1. A syndiotactic styrenic polymer film having a photographic material coated layer, wherein the film has a height of waviness not higher than 18 mm.

5,773,126

## COMPOSITE FILM HAVING A SURFACE SLIP PROPERTY

Yugo Noritake; Toru Sakamoto, and Yasuo Nakai, all of Tokyo-To, Japan, assignors to Dai Nippon Printing Co., Ltd., Japan PCT No. PCT/JP95/02634, § 371 Date Nov. 1, 1996, § 102(e) Date Nov. 1, 1996, PCT Pub. No. WO96/19345, PCT Pub. Date Jun. 27, 1996

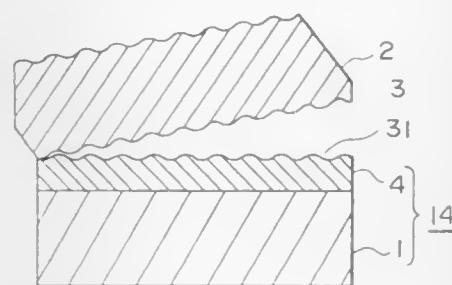
PCT Filed Dec. 22, 1995, Ser. No. 696,881

Claims priority, application Japan, Dec. 22, 1994, 6-335379; Jan. 9, 1995, 7-016370

Int. Cl.<sup>6</sup> G02B 1/10; B32B 54/02; 3/26

U.S. Cl. 428—143

10 Claims



1. A composite film comprising: a substrate film; and a coat layer, provided on said substrate film, having a coefficient of static friction of no more than 0.8 and a haze less than 1.0%, and formed of an ionizing radiation-cured resin, the surface of said coat layer having fine irregularities with a surface center line average height Ra of 0.06 to 0.7 μm and average irregularity pitch Sm of 1000 to 3000 μm.

6. A composite film comprising: a substrate film; and a coat layer, provided on said substrate film, formed of a composition comprising 100 parts by weight of an ionizing radiation-curable resin, 0.3 to 0.8 parts by weight of fine particles having an average particle diameter of 1±0.5 μm, and 0.02 to 0.2 parts by weight of an organic silicone, the coverage of the composition for said coat layer being in the range of from 7 to 30 g/m<sup>2</sup> on a solid basis after curing, and the surface of said coat layer having a coefficient of static friction of no more than 0.8.

5,773,127

## TENSION FLOOR COVERING HAVING ENHANCED EMBOSSED AND DURABILITY

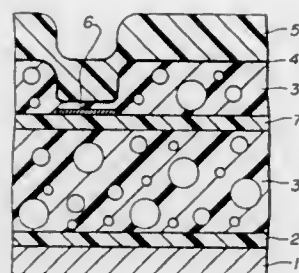
Pamela H. Martin, Liutz; William J. Kauffman, Manheim, and Bruce F. Dietrich, Lancaster, all of Pa., assignors to Arm-strong World Industries, Inc., Lancaster, Pa.

Continuation of Ser. No. 500,552, Mar. 28, 1990, Pat. No. 5,256,465. This application Oct. 18, 1993, Ser. No. 136,939

Int. Cl.<sup>6</sup> B32F 3/26

U.S. Cl. 428—158

14 Claims



1. A floor covering comprising a resilient tension floor structure including an upper foamed thermoplastic layer, a lower foamed thermoplastic layer, and an unfoamed plastic inner layer disposed between the upper and the lower foamed thermoplastic layers, the floor covering having a structural stability such that the floor covering is capable of shrinking at least 0.1%, the upper foamed thermoplastic layer being foamed throughout.

5,773,128

## METHOD FOR FORMING POROUS FILM IN THERMAL TRANSFER RECORDING MEDIUM, METHOD FOR PREPARING THERMAL TRANSFER RECORDING MEDIUM, AND THERMAL TRANSFER RECORDING MEDIUM

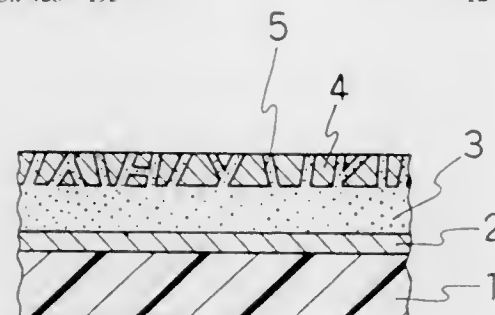
Yoshiyuki Ohata; Yoshihide Kaneshiro, and Tomohiro Shino-hara, all of Osaka, Japan, assignors to Fujicopian Co., Ltd., Osaka, Japan

Filed Aug. 29, 1995, Ser. No. 520,486

Claims priority, application Japan, Aug. 30, 1994, 6-205243 Int. Cl.<sup>6</sup> B32B 3/00; B41M 3/12

U.S. Cl. 428—195

12 Claims



1. A method for forming a porous film in a thermal transfer recording medium having a foundation, a heat-meltable ink layer provided on one side of the foundation and the porous film provided in proximity to the surface of the heat-meltable ink layer, the method comprising the steps of:

coating the heat-meltable ink layer with a water-in-oil emulsion comprising at least one resin selected from the group consisting of cellulose acetate, cellulose acetate propionate, cellulose acetate butyrate, ethyl cellulose, nitrocellulose and ethyl hydroxyethyl cellulose; and drying the resultant coating to form a porous film.

9. A thermal transfer recording medium prepared by a method comprising the steps of: providing a heat-meltable ink layer on one side of a foundation; coating the heat-meltable ink layer with a water-in-oil emulsion comprising at least one resin selected from the group consist-

ing of cellulose acetate, cellulose acetate propionate, cellulose acetate butyrate, ethyl cellulose, nitrocellulose and ethyl hydroxyethyl cellulose;

drying the resultant coating to form a porous film; and heating the heat-meltable ink layer to a temperature not lower than the softening point of the heat-meltable ink layer to allow the porous film to sink into a surface portion of the heat-meltable ink layer.

5,773,129

## POLYPROPYLENE LAMINATED FILM

Kazuki Wakamatsu, Sodegaura; Junichi Kimura, Toyonaka; Makoto Satoh; Yoichi Obata, both of Ichihara, and Minoru Takane, Sodegaura, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 21, 1994, Ser. No. 361,311

Claims priority, application Japan, Dec. 22, 1993, 5-324535 Int. Cl.<sup>6</sup> B32B 7/02; 27/08; 27/32; C08F 210/06

U.S. Cl. 428—213

28 Claims

1. A polypropylene laminated film comprising a layer of a crystalline polypropylene and at least one layer of a random copolymer of propylene and at least one α-olefin having from 4 to 10 carbon atoms formed on at least one side of the layer of the crystalline polypropylene, wherein the random copolymer is obtained by gas phase polymerization substantially in the absence of a liquid medium, and using a catalyst system comprising (i) a solid catalyst component containing magnesium, titanium and a halogen as essential constituents, (ii) an organoaluminum compound and (iii) an electron donative compound, wherein:

- (1) the random copolymer has a content of said at least one α-olefin having from 4 to 10 carbon atoms within the range of from 15 to 30 percent by weight,
- (2) the random copolymer has a melt flow rate of not more than 20 g/10 minutes when determined at 230° C. under a load of 2.16 kg,
- (3) the random copolymer has a molecular weight distribution, Mw/Mn, of not more than 4.5, wherein Mw is a weight average molecular weight of the random copolymer and Mn is a number average molecular weight of the random copolymer,
- (4) the random copolymer satisfies the mathematical expression:

$$B \leq 1.05A - 10,$$

wherein A is a weight percentage of the content of said at least one α-olefin having from 4 to 10 carbon atoms in the random copolymer and B is a weight percentage based on a ratio of a weight of a cold xylene soluble portion of the random copolymer to a weight of the random copolymer.

- (5) a weight percent content of said at least one α-olefin having from 4 to 10 carbon atoms in the cold xylene soluble portion of the copolymer is less than 1.7 times the content of said at least one α-olefin having from 4 to 10 carbon atoms in the random copolymer, and
- (6) the random copolymer has a cold xylene soluble portion of not higher than 14.0% by weight.

5,773,130

## MULTI-COLOR ORGANIC ELECTROLUMINESCENT DEVICE

Franky So, Tempe; Song Q. Shi, Phoenix, and Thomas B. Harvey, III, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 6, 1996, Ser. No. 656,955

Int. Cl.<sup>6</sup> B32B 27/14

U.S. Cl. 428—195

12 Claims

1. A tunable organic light emitting device adjustable to alter a color of light emitted comprising: a first conductive layer;

a first layer of light emissive material for emitting light of a first color when a recombination zone for hole-electron recombinations is positioned therein, the first layer of light emissive material being supported on the first conductive layer;

a second layer of light emissive material for emitting light of a second color, different than the first color, when the recombination zone for hole-electron recombinations is positioned therein, the second layer of light emissive material being positioned on the first layer of light emissive material;

a second conductive layer supported on the second layer of light emissive material; and

a source of current coupled to the first and the second conductive layers to change position of the recombination zone for hole-electron recombinations from the first layer of light emissive material to the second layer of light emissive material, whereby one of the first color is emitted from the first layer or the second color is emitted from the second layer.

5,773,131

## PAPER OR CARDBOARD PRODUCT

Bernhard Dettling, Am Bienenbuckel 19, 77855 Achern, Germany

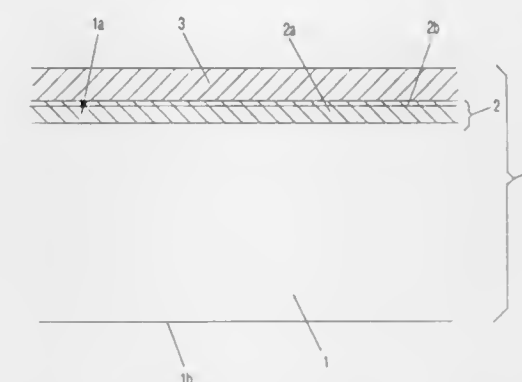
Filed Mar. 9, 1995, Ser. No. 400,922

Claims priority, application Germany, Mar. 9, 1994, 44 07 878.1

Int. Cl.<sup>6</sup> B32B 3/10

U.S. Cl. 428—201

12 Claims



1. A paper product having a flavor seal and a vapor barrier, said paper product produced by the steps of:

providing a paper base body with an upper surface and a bottom surface;

selecting a primer coating mixture from the group consisting of a first composition comprised of water, amorphous silicon dioxide, aluminum oxide, polyvinyl alcohol, and a copolymer of acrylonitrile and butadiene-styrene, and a second composition comprised of water, a silicon compound selected from the group consisting of silicic acid and silica gel, polyvinyl alcohol, and a copolymer of acrylonitrile and butadiene-styrene;

applying the primer coating mixture to at least one of said upper and said bottom surfaces of said paper base body;

polymerizing the primer coating mixture to form an amorphous net structure on said paper base body;

applying a cover coating mixture suitable for generating a vapor seal.

5,773,132

**PROTECTING COPPER DIELECTRIC INTERFACE  
FROM DELAMINATION**

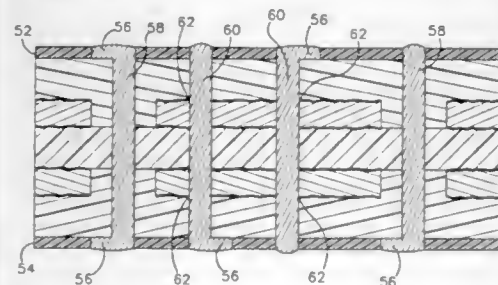
Lawrence Robert Blumberg, Johnson City; William T. Chen, Endicott, and Mark David Poliks, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 28, 1997, Ser. No. 808,141

Int. Cl.<sup>6</sup> B32B 3/00

U.S. Cl. 428—209

21 Claims



19. A circuitized structure comprising at least one sheet of copper having a first roughened surface bonded to one surface of a first dielectric substrate and a second roughened surface having an oxide of CuO and CuO(II) thereon bonded to a first surface of a second substrate and a second surface having electroless plated copper circuitry thereon,

at least one via extending from said second surface of said second dielectric substrate into contact with said copper sheet, copper additively pattern plated into said one via, and a complexing agent disposed on said CuO and CuO(II).

5,773,133

**MAGNETIC RECORDING MEDIUM**

Yuichi Sasaki; Kazuhiro Okamoto; Kazuo Sasaki, and Haruo Ishizaki, all of Miyagi, Japan, assignors to Sony Corporation, Tokyo, Japan

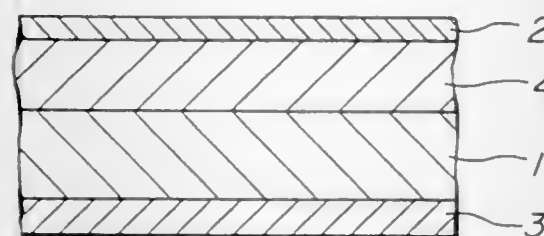
Filed Jul. 18, 1996, Ser. No. 683,210

Claims priority, application Japan, Jul. 19, 1995, 7-182852

Int. Cl.<sup>6</sup> B32B 7/02

U.S. Cl. 428—216

8 Claims



1. A magnetic recording medium comprising:  
a non-magnetic substrate;

a lower layer disposed on top of the non-magnetic substrate, the lower layer comprising a resin, an acicular iron oxide powder and carbon black in a volumetric ratio of acicular iron oxide powder to carbon black ranging from about 90:10 to about 70:30, the acicular iron oxide is not coated with a compound or coupling agent prior to mixing with the resin and carbon black, the acicular iron oxide powder further being characterized as having longer axis length ranging from 0.08 to 0.15  $\mu\text{m}$  and an aspect ratio ranging from 4 to 6, the carbon black further being characterized as having a particle size ranging from 0.01 to 0.04  $\mu\text{m}$ ;

an upper layer disposed on top of the lower layer, the upper layer comprising a ferromagnetic powder and a binder, the upper layer further being characterized as having a thickness ranging from 0.1 to 0.5  $\mu\text{m}$ .

5,773,134

**THERMOPLASTIC RESIN-BASED COMPOSITE  
POLYMERIC FILM**

Yoshinori Inokuchi, and Satoshi Kuwata, both of Gunma-Ken, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1996, Ser. No. 742,322

Claims priority, application Japan, Nov. 2, 1995, 7-285722

Int. Cl.<sup>6</sup> B29D 7/00

U.S. Cl. 428—220

8 Claims

1. A resin film molded from a thermoplastic resin composition which comprises:

- (a) 100 parts by weight of a thermoplastic resin as a matrix; and  
(b) from 0.01 to 5 parts by weight of silicon-based composite particles each consisting of a spherical core particle of a silicone rubber having an average particle diameter in the range from 0.1 to 100  $\mu\text{m}$  and a coating layer of a polyorganosilsesquioxane, dispersed in the matrix wherein the coating amount of the polyorganosilsesquioxane coating layer on the core particles is in the range from 1 to 500 parts by weight per 100 parts by weight of the core particles.

5,773,135

**INSULATED ASSEMBLY INCORPORATING A  
THERMOPLASTIC BARRIER MEMBER**

Luc Lafond, 23 Woodvalley Drive, Etobicoke, Ontario, Canada, M9A 4H4

Continuation-in-part of Ser. No. 477,950, Jun. 7, 1995, Pat.

No. 5,616,415, which is a continuation-in-part of Ser. No.

871,016, Apr. 20, 1992, Pat. No. 5,441,779. This application

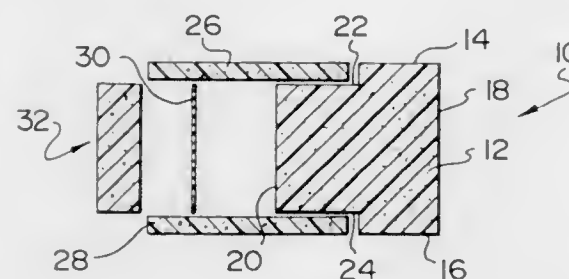
Aug. 9, 1995, Ser. No. 513,180

Claims priority, application Canada, Apr. 22, 1991, 2040636

Int. Cl.<sup>6</sup> B32B 3/26

U.S. Cl. 428—304.4

5 Claims



1. A composite spacer for spacing substrates, said spacer having opposed substrate engaging surfaces, comprising:

- a foam body, said foam body having a pair of first surfaces, each said first surface adapted for sealing engagement with a substrate;  
a pair of second substrate engaging surfaces of a layer of a second material different from said foam, said second surfaces being coplanar with said first surfaces of said foam body; and  
a pair of third substrate-engaging surfaces of a layer of a third material different from said foam material, said third surfaces being coplanar with said first and second surfaces and, whereby said spacer provides a pair of opposed substrate engaging surfaces each having a plurality of discrete component surfaces adapted to seal with said substrates and with said first surfaces in a position to be non-adjacent the space enclosed by the substrates on assembly, and with one of said layers extending in the plane of the assembled substrates.

5,773,136

**POLYMERIC FILMS**

Paul Thomas Alder, and Dawn Janine King, both of Swindon, England, assignors to Hoechst Trespaphan GmbH, Germany  
PCT No. PCT/GB95/03015, § 371 Date Aug. 20, 1996, § 102(e)  
Date Aug. 20, 1996, PCT Pub. No. WO96/20085, PCT Pub.  
Date Jul. 4, 1996

PCT Filed Dec. 21, 1995, Ser. No. 693,258

Claims priority, application United Kingdom, Dec. 23, 1994, 9426093; Nov. 24, 1995, 9524085

Int. Cl.<sup>6</sup> B32B 27/32

U.S. Cl. 428—307.3

20 Claims

1. Multilayer polymeric film comprising a base layer of a propylene polymer, a non-voided intermediate layer on the base layer, and a heat sealable polymer layer on the intermediate layer, the non-voided intermediate layer having an internal cohesive strength less than the bond strength of the intermediate layer to either the base layer or the heat sealable layer and less than the internal cohesive strengths of either the base layer or the heat sealable layer such that the film peels apart by rupture within the thickness of the intermediate layer rather than by delamination of adjacent layers of the film.

5,773,137

**MAGNETIC RECORDING DISK**

Kazuhiro Niitsuma, and Yasushi Endo, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Jun. 21, 1996, Ser. No. 667,499

Claims priority, application Japan, Jun. 21, 1995, 7-179514

Int. Cl.<sup>6</sup> B32B 5/16

U.S. Cl. 428—323

16 Claims

1. A magnetic recording disk comprising a flexible non-magnetic support, a non-magnetic layer of 0.5 to 5  $\mu\text{m}$  thick which is arranged on the support and comprises a non-magnetic inorganic powder in a binder, and a magnetic layer of 0.02 to 0.5  $\mu\text{m}$  thick which is arranged on the non-magnetic layer and comprises a ferromagnetic powder, carbon black and a lubricant dispersed in a binder, wherein the binders of the non-magnetic layer and the magnetic layer both comprise a polymer containing no chlorine atom in its molecular structure and the magnetic layer has an upper surface having a Knoop hardness of 14 to 25.

5,773,138

**ADVANCED COMPATIBLE POLYMER WOOD FIBER  
COMPOSITE**

Kasyap V. Seethamraju, St. Paul; Neil J. Beaverson, Hugo; Kurt E. Heikkila, Circle Pines, all of Minn., and Michael J. Deaner, Osceola, Wis., assignors to Andersen Corporation, Bayport, Minn.

Division of Ser. No. 476,192, Jun. 7, 1995, abandoned, which is a continuation-in-part of Ser. No. 224,396, Apr. 7, 1994,

abandoned, which is a continuation of Ser. No. 938,364, Aug. 31, 1992, abandoned. This application Jan. 7, 1997, Ser. No.

779,685

Int. Cl.<sup>6</sup> B32B 5/16

U.S. Cl. 428—326

1 Claim

1. A composite pellet, capable of formation into a structural member, which pellet comprises a cylindrical extrudate having a radius of about 1 to 5 mm, a length of about 1 to 10 mm; the pellet composition comprising:

- (a) a major proportion of a chemically modified polymer comprising vinyl chloride;  
(b) about 30 to 50 wt.-% of cellulosic fiber having a minimum thickness of 1  $\mu\text{m}$  and a minimum length of 3  $\mu\text{m}$  and a minimum aspect ratio of about 1.8; and  
wherein the polymer comprising vinyl chloride is chemically modified by a reagent that can bond to a cellulosic hydroxyl group resulting in an increase in compatibility between the modified polymer and the fiber, the wood fiber is dispersed throughout a

continuous chemically modified polymer phase and the tensile stress at failure is increased when compared to a composite with unmodified polymer.

5,773,139

**IMPACT RESISTANT TRANSPARENT RESIN LAMINATE**

Koji Ogura, Osaka; Yoshio Tadokoro, Shiga; Yoshihide Amekawa, Ehime, and Fusaharu Noma, Funabashi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 266,344, Jul. 1, 1994, abandoned. This application Nov. 30, 1995, Ser. No. 563,564

Claims priority, application Japan, Jul. 1, 1993, 5-163564; Aug. 25, 1993, 5-210514; Mar. 2, 1994, 6-032501; Mar. 17, 1994, 6-047200

Int. Cl.<sup>6</sup> B32B 27/36

U.S. Cl. 428—332

18 Claims



1. An impact resistant transparent resin laminate comprising at least one methacrylate resin plate and at least one polycarbonate resin plate which are bonded together with a bisphenol epoxy resin base polymer, wherein said bisphenol epoxy resin base polymer is a polymer prepared by polymerizing a mixture of 30 to 80% by weight of a bisphenol epoxy compound having at least two epoxy groups, 20 to 70% by weight of an aliphatic hydrocarbon hardener having at least two amino groups, 0 to 25% by weight of a non-reactive diluent and 0 to 25% by weight of reactive diluent.

5,773,140

**SUPPORTED POLYCRYSTALLINE COMPACTS HAVING  
IMPROVED PHYSICAL PROPERTIES**

David Bruce Cerutti, and Henry Samuel Marek, both of Worthington, Ohio, assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 239,156, May 6, 1994, Pat. No. 5,512,235.

This application Mar. 14, 1996, Ser. No. 616,997

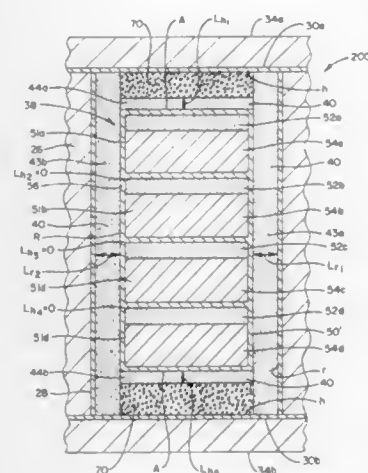
Int. Cl.<sup>6</sup> B24D 3/00

U.S. Cl. 428—332

7 Claims

1. A metal carbide supported compact comprising a sintered polycrystalline compact layer bonded at an interface to a metal carbide support layer, said supported compact characterized as exhibiting essentially constant or increasing principal residual compressive stresses on the surface of said compact layer as





portions of a predefined thickness, W, of said support layer measured from said interface are incrementally removed from said supported compact.

#### 5,773,141 PROTECTED THERMAL BARRIER COATING COMPOSITE

Wayne Charles Hasz, Pownal, Vt.; Marcus Preston Borom, Niskayuna, and Curtis Alan Johnson, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 417,577, Apr. 6, 1995, abandoned.

This application Jun. 19, 1996, Ser. No. 666,055

Int. Cl.<sup>6</sup> B32B 17/06

U.S. Cl. 428—335

6 Claims

1. A composite comprising ceramic thermal barrier coating on a part with a continuous sacrificial oxide coating adjacent to an outer surface of the thermal barrier coating where said thermal barrier coating is a chemically stabilized zirconia selected from the group consisting of yttria-stabilized zirconia, scandia-stabilized zirconia, calcia-stabilized zirconia, and magnesia-stabilized zirconia, where the sacrificial oxide coating is about 0.2–250 micrometers thick, where the sacrificial oxide coating is not mixed with zirconia, and where said sacrificial coating reacts with contaminant compositions to prevent contaminant infiltration into the thermal barrier coating.

#### 5,773,142 BIAXIALLY ORIENTED MULTILAYERED POLYOLEFIN FILM SEALABLE ON BOTH SIDES

Ursula Murschall, Nierstein; Herbert Peiffer, Mainz-Finthen, and Gunter Schloegl, Kelkheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany  
Filed Dec. 6, 1991, Ser. No. 803,443

Claims priority, application Germany, Dec. 6, 1990, 40 38 935.9

Int. Cl.<sup>6</sup> B32B 7/12; B29D 3/00

U.S. Cl. 428—349

11 Claims

1. A transparent, coextruded multilayered polyolefin film which can be sealed on both sides, comprising a base layer comprised of a propylene polymer, and surface layers comprised of sealable olefin polymers, wherein:

- at 120° C., the multilayered film has a shrinkage in the longitudinal direction of more than about 7%, and a shrinkage in the transverse direction of more than about 5%;
- the base layer of the multilayered film comprises a peroxidically degraded propylene polymer, having a degradation factor in the range of from about 3 to 10, and a melting point in the range of from about 162° to 168° C.;

c) the propylene polymer of the base layer is modified by addition of from about 5 to 25% by weight of a hydrocarbon resin;

d) the surface layers of the multilayered film comprise a random ethylene/propylene copolymer having an ethylene content of from about 2 to 8% by weight, a distribution factor  $V_p$  of more than about 8, and a thermooxidation temperature  $T_{OX}$  of more than about 230° C.;

e) the film having a surface gloss (measuring angle 20°) of more than about 100 measured in accordance with the procedures of DIN 67 530; and

f) the film exhibiting a haze (measured on four superimposed film plies) of less than about 22% measured in accordance with the procedures of ASTM-D-1003-52.

#### 5,773,143 ACTIVATED CARBON COATED CERAMIC FIBERS Donn Vermilion, Newark, and Robert Kaufman, Granville, both of Ohio, assignors to Owens-Corning Fiberglass Technology Inc., Summit, Ill.

Filed Apr. 30, 1996, Ser. No. 640,642

Int. Cl.<sup>6</sup> D02G 3/00

U.S. Cl. 428—368

8 Claims

1. Ceramic fibers having a coating hereon, the coating comprising activated carbon.

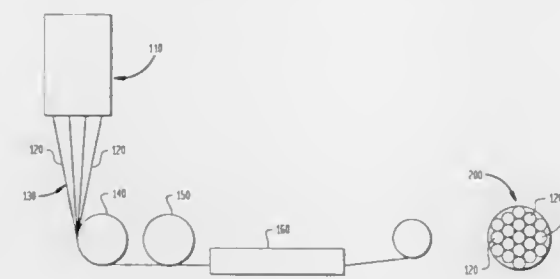
#### 5,773,144 RUBBER-POLYESTER COMPOSITES INCLUDING A FUNCTIONALLY TERMINATED COPOLYESTER Eui Won Choe, Randolph; Charles Edward Forbes, Bridgewater, both of N.J.; Jennifer Ann Filbey, Charlotte, and Stephan Fredrick Sherriff, Salisbury, both of N.C., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Oct. 26, 1995, Ser. No. 548,635

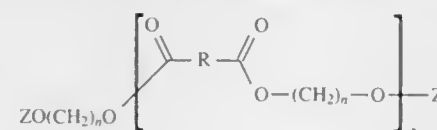
Int. Cl.<sup>6</sup> D02G 3/36; B32B 25/08; 27/08

U.S. Cl. 428—373

12 Claims



1. A reinforced rubber composite comprising a rubber component and a bicomponent fiber in adherent contact therewith, said bicomponent fiber having a core of a linear polyester of an alkyl glycol and an aromatic diacid and disposed thereabout a sheath of an unsaturated acid-terminated or an isocyanate-terminated polyester consisting essentially of the structural formula:



wherein Z represents the reaction residue of diisocyanate or an unsaturated acid with a hydroxy terminated polyester and wherein x is an integer indicating the number of polyester repeating units and is any integer from 5 and above, R is an arylene unit and n is an integer from 2 to 10.

5,773,145

#### POWER CABLE

Yoshiyuki Inoue; Mineya Kuno; Takeshi Fukui, and Shigeki Ohsawa, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 326,346, Oct. 20, 1994, abandoned, which is a continuation of Ser. No. 628,878, Dec. 18, 1990, abandoned. This application Sep. 22, 1997, Ser. No. 934,588

Int. Cl.<sup>6</sup> H01B 3/44; C08L 23/08; 51/06

U.S. Cl. 428—389

9 Claims

1. A power cable comprising a conductor having thereon an insulating layer which comprises a composition comprising from 25 to 35% by weight based on the total amount of said composition of an ethylene-vinyl acetate copolymer resin having a vinyl acetate content of from 25 to 33% by weight, and from 65 to 75% by weight based on the total amount of said composition of polyethylene, said polyethylene containing in the molecule thereof vinyl-trimethoxysilane by copolymerization or graft polymerization, said composition containing an organotin compound as a cross-linking catalyst, said insulating layer is cross-linked by the cross-linking reaction of trimethoxysilane groups in said polyethylene in the presence of water.

5,773,146

#### FORMING SIZE COMPOSITIONS, GLASS FIBERS COATED WITH THE SAME AND FABRICS WOVEN FROM SUCH COATED FIBERS

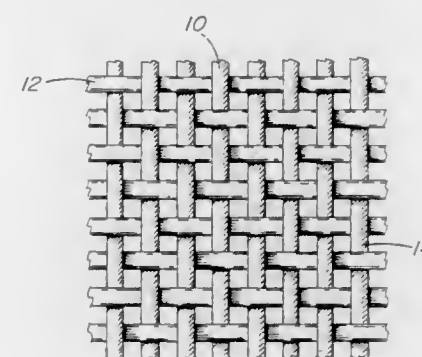
Ernest L. Lawton, Allison Park, and Xiang Wu, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jun. 5, 1995, Ser. No. 463,909

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—392

21 Claims



1. A fiber strand comprising a plurality of fibers having deposited thereon the dried residue of an aqueous forming size composition comprising:

- an oleophobic starch;
- a film-forming material which is a N-vinyl amide polymer;
- a wax component comprising an ester formed from reacting (1) a monocarboxylic acid and (2) a monohydric alcohol;
- an emulsifying agent for the wax component; and
- a cationic lubricant different from the wax component; the aqueous forming size composition being essentially free of: (1) oleophilic starches; (2) polyolefin emulsions; and (3) preservatives selected from the group consisting of organometallic compounds, formaldehydes, derivatives and mixtures thereof.

5,773,147

#### CERAMIC-COATED SUPPORT FOR POWDER METAL SINTERING

Glenn J. Sundberg, Townsend, Mass., assignor to Saint-Gobain/Norton Industrial Ceramics Corp., Worcester, Mass.

Filed Jun. 7, 1995, Ser. No. 484,080

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—408

8 Claims

1. A process comprising the step of:

- sintering a metal-bearing compact in an apparatus comprising:
  - an article having a composition selected from the group consisting of graphite, carbon/carbon, carbon/graphite, and mixtures thereof, and
  - a ceramic coating thereon, wherein the ceramic coating comprises magnesia and alumina present in a molar ratio of between 3:1 and 1:3

at a temperature of at least 1200° C. to form a fully dense component.

5,773,148

#### CHEMICALLY TOUGHENED PANE

Herve Charrue, Rueil-Malmaison; Francoise Rifqi, Paris; Renee Crepet, Villepinte, and Claude Guillemet, Bois Colombes, all of France, assignors to Saint Gobain Vitrage, Courbevoie, France

PCT No. PCT/FR93/01035, § 371 Date Sep. 29, 1995, § 102(e) Date Sep. 29, 1995, PCT Pub. No. WO94/08910, PCT Pub. Date Apr. 28, 1994

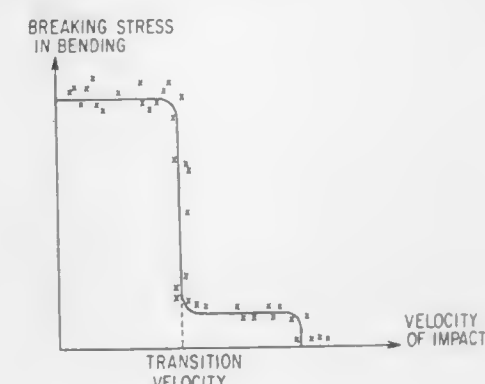
PCT Filed Oct. 21, 1993, Ser. No. 454,190

Claims priority, application France, Oct. 22, 1992, 92/12637

Int. Cl.<sup>6</sup> B32B 17/00

U.S. Cl. 428—410

17 Claims



1. A glass pane, comprising a matrix, wherein at least 96% by weight of said matrix comprises, in percentage by weight:

- 65.0–76.0% SiO<sub>2</sub>;  
1.5–5.0% Al<sub>2</sub>O<sub>3</sub>;  
4.0–8.0% MgO;  
0.0–4.5% CaO;  
10.0–18.0% Na<sub>2</sub>O;  
1.0–7.5% K<sub>2</sub>O; and  
0.0–4.0% B<sub>2</sub>O<sub>3</sub>;

wherein the amount of each component, in percentages by weight, satisfies 0 < (CaO)/(CaO+MgO) < 0.45 and 0.05 < (K<sub>2</sub>O)/(Na<sub>2</sub>O+K<sub>2</sub>O) < 0.35, and said glass pane has been toughened by surface ion exchange for a duration of at least 72 hours.

5,773,149

**THERMAL TRANSFER RECORDING MATERIAL**  
Katsubiro Yoshida, and Kotaro Akashiro, both of Osaka, Japan, assignors to Fujicoplan Co., Ltd., Osaka, Japan  
Division of Ser. No. 505,470, Jul. 21, 1995, Pat. No. 5,658,667.

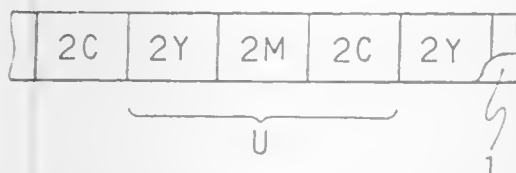
This application Jul. 19, 1996, Ser. No. 684,146

Claims priority, application Japan, Jul. 22, 1994, 6-171271; Aug. 31, 1994, 6-207302; Sep. 16, 1994, 6-221417; Oct. 13, 1994, 6-247963; Nov. 8, 1994, 6-273611; Dec. 20, 1994, 6-316946; May 1, 1995, 7-107556; May 1, 1995, 7-107557; May 1, 1995, 7-107558; May 1, 1995, 7-107559

Int. Cl.<sup>6</sup> B41M 5/26

U.S. Cl. 428—413

5 Claims

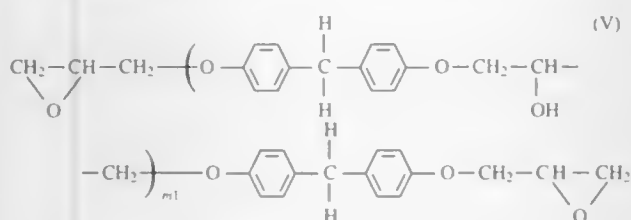


1. A thermal transfer recording material comprising a foundation and a heat-meltable ink layer comprising a vehicle and a pigment provided on the foundation,

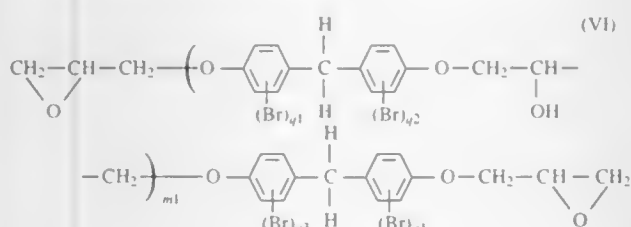
the vehicle comprising not less than 85% by weight of an epoxy resin,

the epoxy resin comprising not less than 50% by weight of at least one of bisphenol F diglycidyl ether and a bromide thereof,

wherein the bisphenol F diglycidyl ether is represented by formula (V):



wherein m1 is an integer of 0 to 33, and the bromide is represented by the formula (VI):



wherein m2 is an integer of 0 to 33, and q1, q2, q3, and q4 are independently an integer of 1 or 2, and

wherein the total amount of the bisphenol F diglycidyl ether of formula (V) wherein m1 is 0 and/or the bromide of formula (VI) wherein m2 is 0 is not more than 2% by weight of the total amount of the bisphenol F diglycidyl ether of formula (V) and/or the bromide of formula (VI).

5,773,150

**POLYMERIC ANTISTATIC COATING FOR CATHODE RAY TUBES**

Hua-Sou Tong, Arlington Heights, Ill., and Chun-Min Hu, Keelung, Taiwan, assignors to Chunghwa Picture Tubes, Ltd., Taiwan

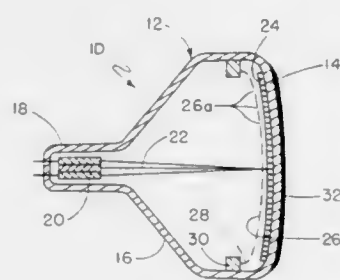
Filed Nov. 17, 1995, Ser. No. 560,478

Int. Cl.<sup>6</sup> H01J 29/28; B32B 27/00

U.S. Cl. 428—429

14 Claims

1. A video display apparatus comprising:



a display panel having an outer and an inner surface, wherein said outer surface is in facing relation to a viewer of the video display apparatus; and

an antistatic coating layer applied to the outer surface of said display panel by either spin or spray coating, said coating layer comprising of a solution of water, alcohol, tetraethoxysilane, nitric acid and an electrically conductive polymer soluble in water and alcohol dissolved in the solution, wherein said conductive polymer comprises a mixture of polyaniline with either polystyrene sulfonic acid or polyacrylic acid in a molecular ratio of 1:1.

5,773,151

**SEMI-INSULATING WAFER**

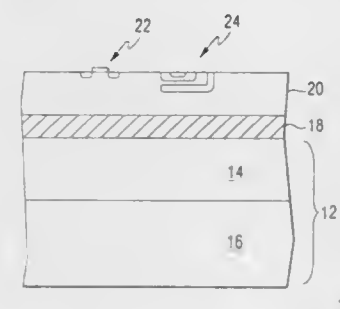
Patrick A. Begley, West Melbourne; Anthony Rivoli, Palm Bay; Gyorgy Bajor, Melbourne, and Rex E. Lowther, Palm Bay, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Jun. 30, 1995, Ser. No. 497,404

Int. Cl.<sup>6</sup> B32B 9/04

U.S. Cl. 428—446

24 Claims



1. A bonded wafer with a semi-insulating layer for reducing losses and crosstalk at high frequencies comprising:

a handle substrate having a noninsulating upper surface;

a planar semi-insulating layer on the noninsulating upper surface

of the handle wafer for reducing losses and crosstalk at high frequencies;

a planar insulating layer on the planar semi-insulating layer; and

a device layer of monocrystalline silicon on the insulating layer.

5,773,152

**SOI SUBSTRATE HAVING A HIGH HEAVY METAL GETTERING EFFECT FOR SEMICONDUCTOR DEVICE**

Kensuke Okonogi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 13, 1995, Ser. No. 543,068

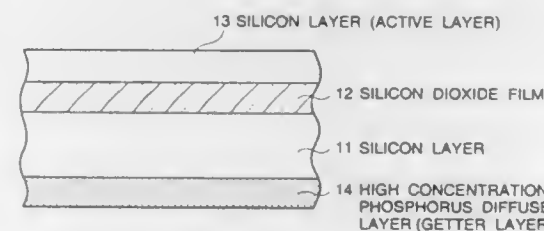
Claims priority, application Japan, Oct. 13, 1994, 6-273132

Int. Cl.<sup>6</sup> B32B 9/04

U.S. Cl. 428—446

12 Claims

1. A silicon-on-insulator substrate comprising an active silicon layer, a buried silicon oxide layer formed directly under said active



silicon layer, and an impurity layer containing a high concentration of impurity therein and formed under said buried silicon oxide layer.

5,773,153

**THERMAL IMAGE TRANSFER RECORDING MEDIUM**  
Keiichi Shiokawa, Shizuoka-ken; Hiroshi Tohmatsu, Numazu; Yoji Ide, Mishima; Yoichi Iwaki, Nishin; Shigekazu Teranishi, Nagoya; Susumu Kawakami, Nissin, and Hironori Hata, Aichi-ken, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

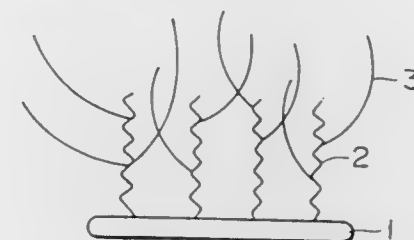
Filed Sep. 8, 1995, Ser. No. 525,139

Claims priority, application Japan, Sep. 9, 1994, 6-242345; Oct. 26, 1994, 6-262176

Int. Cl.<sup>6</sup> B41M 5/26

U.S. Cl. 428—447

10 Claims



1. A thermal image transfer recording medium comprising:

a substrate,

a thermal image transfer ink layer provided on said substrate,

and

a heat resistant protective layer which is provided on the back

side of said substrate, opposite to said thermal transfer ink

layer with respect to said substrate, with which a thermal head

comes into contact, said heat-resistant protective layer comprising a modified copolymer which comprises (a) a main

backbone chain polymer comprising an active-hydrogen-

containing polymer which encompasses no cellulose com-

pounds and (b) a side chain polymer which is a copolymer of

a reactive silicone and a vinyl monomer.

5,773,154

**ARTICLE HAVING A DECORATIVE METAL LAYER, AND METHOD OF PRODUCING THE SAME**

Nobuhiro Takada, Saitama, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan

Continuation of Ser. No. 275,716, Jul. 18, 1994, abandoned.

This application Mar. 27, 1996, Ser. No. 624,754

Claims priority, application Japan, Jul. 23, 1993, 5-202918; Jan. 26, 1994, 6-023521

Int. Cl.<sup>6</sup> B32B 15/08

U.S. Cl. 428—458

11 Claims

1. An article having an exterior surface formed of at least one of a fiber reinforced electrically conductive synthetic resin and a metal, said article comprising:

an insulating synthetic resin coating layer void of electrically

conductive fiber and having a substantially smooth surface

contiguous with the exterior surface;



an electrically conductive metallic decorative layer contiguous with said synthetic resin coating layer, wherein said synthetic resin coating layer electrically insulates said decorative layer from said exterior surface to prevent electrical erosion thereof caused by a potential difference existing between the decorative layer and said exterior surface; and

a protective layer on top of said decorative layer.

5,773,155

**EXTRUSION COMPOSITIONS HAVING HIGH DRAWDOWN AND SUBSTANTIALLY REDUCED NECK-IN**

Lawrence T. Kale; Pradeep Jain, both of Lake Jackson; David C. Kelley, Angleton; Deepak R. Parikh, Lake Jackson; Sharon L. Baker, Lake Jackson, and Osborne K. McKinney, Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 344,262, Nov. 23, 1994, Pat. No. 5,582,923, which is a continuation-in-part of Ser. No. 327,156, Oct. 21, 1994, abandoned, and Ser. No. 84,054, Jun. 29, 1993, Pat. No. 5,395,471, which is a continuation-in-part of Ser. No. 776,130, Oct. 15, 1991, Pat. No. 5,272,236, Ser. No. 939,281, Sep. 2, 1992, Pat. No. 5,278,272, and Ser. No. 55,063, Apr. 28, 1993, Pat. No. 5,562,958. This application Jun. 7, 1995, Ser. No. 485,534

Int. Cl.<sup>6</sup> C08L 23/04; C08J 5/00; B32B 27/32

U.S. Cl. 428—523

16 Claims

1. An ethylene polymer extrusion composition comprising from about 75 to 95 percent, by weight of the total composition, of at least one substantially linear ethylene/α-olefin polymer, wherein the substantially linear ethylene/α-olefin polymer is characterized as having a density in the range of 0.85 g/cc to 0.940 g/cc and is further characterized as having:

(a) a melt flow ratio,  $I_{10}/I_2 \geq 5.63$ ,

(b) a molecular weight distribution,  $M_w/M_n$ , as determined by gel permeation chromatography and defined by the equation:

$$(M_w/M_n) \leq (I_{10}/I_2) - 4.63,$$

(c) a gas extrusion rheology such that the critical shear rate at onset of surface melt fracture for the substantially linear ethylene polymer is at least 50 percent greater than the critical shear rate at the onset of surface melt fracture for a linear ethylene polymer, wherein the substantially linear ethylene/α-olefin polymer and the linear ethylene polymer comprise the same comonomer or comonomers, the linear ethylene polymer has an  $I_2$ ,  $M_w/M_n$  and density within ten percent of the substantially linear ethylene polymer and wherein the respective critical shear rates of the substantially linear ethylene/α-olefin polymer and the linear ethylene polymer are measured at the same melt temperature using a gas extrusion rheometer, and

(d) a single differential scanning calorimetry, DSC, melting peak between -30 and 150° C., and

from about 5 to 25 percent, by weight of the total composition, of at least one high pressure ethylene polymer characterized as having

a melt index,  $I_2$ , less than 6.0 g/10 minutes, a density of at least 0.916 g/cc, a melt strength of at least 9 cN as determined using a Gottfert Rheotens unit at 190° C., a  $M_w/M_n$  ratio of at least 7.0 and a bimodal molecular weight distribution as determined by gel permeation chromatography, wherein the ethylene polymer extrusion composition has a melt index,  $I_2$ , of at least 1.0 g/10 minutes.



5,773,156

## MAGNETORESISTANCE EFFECT ELEMENT

Koichiro Inomata; Keiichi Yusu, both of Yokohama; Roger Highmore, Tokyo; Shiho Okuno, Fujisawa, and Yoshiaki Saito, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

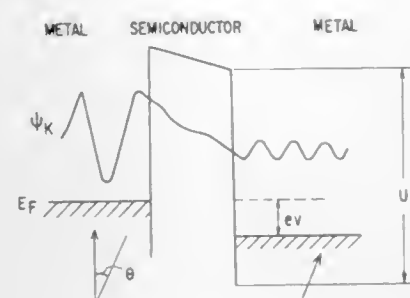
Filed Jan. 25, 1996, Ser. No. 591,350

Claims priority, application Japan, Jan. 26, 1995, 7-010654

Int. Cl.<sup>6</sup> H01F 10/12; 1/00

U.S. Cl. 428—611

20 Claims



1. A magnetoresistance effect element comprising a magnetic body in which magnetic metal particles containing at least one magnetic element selected from the group consisting of Fe, Co, and Ni are dispersed in a semiconductor matrix containing a transition metal and having an effective energy gap of not more than about 1 eV.

5,773,157

## MAGNETIC RECORDING MEDIUM WITH FUNGIRESTANCE AND PROCESS FOR MANUFACTURING SAME

Eiichi Hashimoto, Mihara, and Akihiro Horike, Hino, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 24, 1994, Ser. No. 294,045

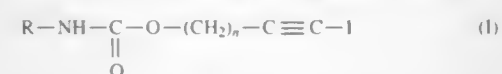
Claims priority, application Japan, Aug. 25, 1993, 5-230767

Int. Cl.<sup>6</sup> G11B 5/72

U.S. Cl. 428—694 BP

7 Claims

1. A magnetic recording medium comprising a non-magnetic substrate and a magnetic coating layer on the substrate, said magnetic coating layer comprising a ferromagnetic powder and a binder, said magnetic recording medium further containing a first compound represented by the following general formula (I) in an amount of 0.005 to 5.0% by weight of the magnetic coating layer:



where R stands for C<sub>1</sub> to C<sub>6</sub> straight or branched alkyl, cyclohexyl or



n is an integer of 1 or 2, and X stands for H, CH<sub>3</sub>, Cl, Br or I, wherein said first compound is incorporated in said magnetic layer.

5,773,158

## RAPID TEMPERATURE RISE HEATER ELEMENT

Kentaro Sawamura; Etsuo Mitsuhashi, both of Chiba; Masaru Nanao, Akita; Nobuyuki Miki, Chiba; Masahiro Kitajima, Akita, and Masatada Yodogawa, Tokyo, all of Japan, assignors to TDK Corporation, Tokyo, Japan

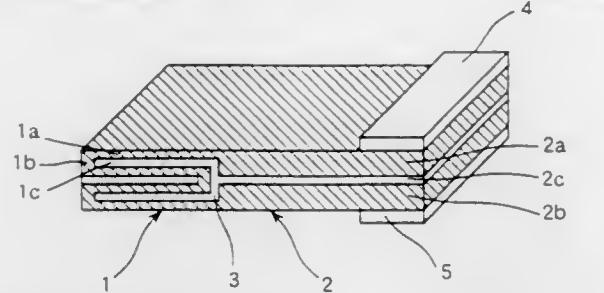
Filed Dec. 27, 1995, Ser. No. 579,422

Claims priority, application Japan, Dec. 27, 1994, 6-326432

Int. Cl.<sup>6</sup> B32B 9/00

U.S. Cl. 428—699

11 Claims



1. A rapid temperature rise heater element comprising an exothermic section and a lead section.

said exothermic section comprising an exothermic section conductor of ceramic material which includes at least four stacked exothermic section conductive layers with an exothermic section insulating layer of ceramic material interposed therebetween and exothermic section conductive layer connections each for connecting adjacent exothermic section conductive layers, each of the exothermic section conductive layers excluding the uppermost and lowermost ones being electrically connected at one end to an upper adjacent exothermic section conductive layer and at another end to a lower adjacent exothermic section conductive layer so that the exothermic section conductive layer is alternately folded as a whole,

said lead section comprising a lead section conductor of ceramic material which includes first and second lead section conductive layers electrically connected to the uppermost and lowermost exothermic section conductive layers, the first and second lead section conductive layers being stacked with a lead section insulating layer of ceramic material interposed therebetween.

5,773,159

## MULTICELL CONFIGURATION FOR LITHIUM CELLS OR THE LIKE

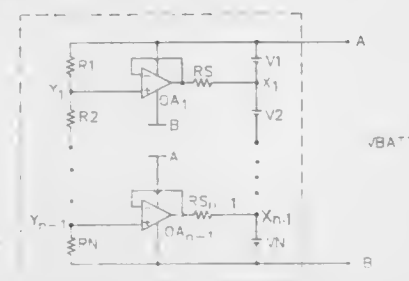
Paul Beard, 1657 Country Club Dr., Milpitas, Calif. 95035

Filed Jul. 18, 1996, Ser. No. 687,007

Int. Cl.<sup>6</sup> H01M 10/44

U.S. Cl. 429—7

30 Claims



1. A multicell battery having positive and negative terminals wherein the voltage of the cells is equalized comprising:

(a) at least two electrochemical cells electrically connected in series, each of said cells having positive and negative terminals such that the positive terminal of a first of said electrochemical cells comprises the positive terminal of the battery, the negative terminal of a second of said electrochemical cells comprises the negative terminal of the battery and a node is

formed by the connection of the negative terminal of said first cell to the positive terminal of said second cell;

(b) at least one operational amplifier having positive and negative input terminals, positive and negative supply terminals and an output terminal, the output terminal being coupled to the negative input terminal, the positive supply terminal being coupled to the positive battery terminal, the negative supply terminal being coupled to the negative battery terminal;

(c) means for coupling the output terminal of said at least one operational amplifier to the node formed between said first and said second electrochemical cells; and

(d) at least two equal valued resistors electrically connected in series across the positive and negative terminals of the battery such that a node is formed between said at least two resistors, said node being electrically connected to the positive terminal of said at least one operational amplifier.

5,773,160

## ELECTROCHEMICAL FUEL CELL STACK WITH CONCURRENT FLOW OF COOLANT AND OXIDANT STREAMS AND COUNTERCURRENT FLOW OF FUEL AND OXIDANT STREAMS

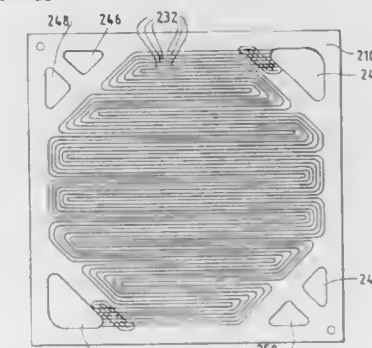
David P. Wilkinson, North Vancouver; Henry H. Voss, West Vancouver; Nicholas J. Fletcher, Vancouver, all of Canada; Mark C. Johnson, Phoenix, Ariz., and Eric G. Pow, Vancouver, Canada, assignors to Ballard Power Systems Inc., Burnaby, Canada

Continuation-in-part of Ser. No. 699,568, Aug. 19, 1996, abandoned, which is a continuation of Ser. No. 265,414, Jun. 24, 1994, Pat. No. 5,547,776. This application Sep. 26, 1996, Ser. No. 721,214

Int. Cl.<sup>6</sup> H01M 8/04

U.S. Cl. 429—13

18 Claims



1. An electrochemical fuel cell stack comprising at least one fuel cell assembly, said assembly comprising:

A. at least one fuel cell comprising:

1. an anode layer comprising at least one fuel stream inlet, at least one fuel stream outlet, and means for flowing a fuel stream from said at least one fuel stream inlet to said at least one fuel stream outlet;

2. a cathode layer comprising at least one oxidant stream inlet, at least one oxidant stream outlet, and means for flowing an oxidant stream from said at least one oxidant stream inlet to said at least one oxidant stream outlet, said oxidant stream comprising oxygen and water formed by the electrochemical reaction of said fuel and said oxygen;

3. an electrolyte interposed between said anode layer and said cathode layer; and

B. a cooling layer disposed adjacent said cathode layer, said cooling layer comprising at least one coolant stream inlet, at least one coolant stream outlet, and means for flowing a coolant stream from said at least one coolant stream inlet to said at least one coolant stream outlet;

wherein said coolant stream flowing means directs said coolant stream such that the coolest region of said cooling layer substantially coincides with the region of said cathode layer in which said oxidant stream has the lowest water content, and the warmest region of said cooling layer substantially coincides with the region

of said cathode layer in which said oxidant stream has the highest water content; and wherein said fuel stream flowing means directs said fuel stream to a region of said anode layer which substantially coincides with the region of said cathode layer in which said oxidant stream has the highest water content and subsequently directs said fuel stream to a region of said anode layer which substantially coincides with the region of said cathode layer in which said oxidant stream has the lowest water content.

5,773,161

## BIPOLAR SEPARATOR

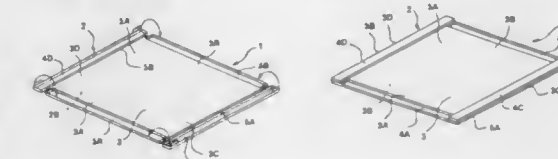
Mohammad Farooque, Huntington; Joel David Doyon, Bantam; Michael Thomas Primerano, Torrington, all of Conn., and G.B. Kirby Meacham, Shaker Heights, Ohio, assignors to Energy Research Corporation, Danbury, Conn.

Filed Oct. 2, 1996, Ser. No. 725,286

Int. Cl.<sup>6</sup> H01M 2/00

U.S. Cl. 429—34

30 Claims



13. A fuel cell assembly adapted to be supplied oxidant and fuel gases comprising:

at least a first bipolar separator, each bipolar separator including: a plate having opposing first and second surfaces which are compatible with a fuel gas and an oxidant gas, respectively, said plate further having a central area, opposing first and second trough areas extending from opposing first and second sides of said central area and opposing third and fourth trough areas extending from opposing third and fourth sides of said central area, said first surface of said plate defining the extent of one surface of said central area and the extents of the inner surfaces of said first, second, third and fourth trough areas, said second surface of said plate defining the extent of another surface of said central area and the extents of the outer surfaces of said first, second, third and fourth trough areas, said central area being bent at said third and fourth sides so that said third and fourth trough areas face and abut said one surface of said central area;

an anode element extending to the ends of said first and second trough areas and between said third and fourth trough areas of said plate of said first bipolar separator, said anode element facing said first surface of said plate of said first bipolar separator and defining therewith channels for receiving fuel gas for said anode element.

5,773,162

## DIRECT METHANOL FEED FUEL CELL AND SYSTEM

Subharao Surampudi, Glendora; Harvey A. Frank, Encino; Sekharipuram R. Narayanan, Altadena; William Chun, Los Angeles; Barbara Jeffries-Nakamura; Andrew Kindler, both of San Marino, and Gerald Halpert, Pasadena, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

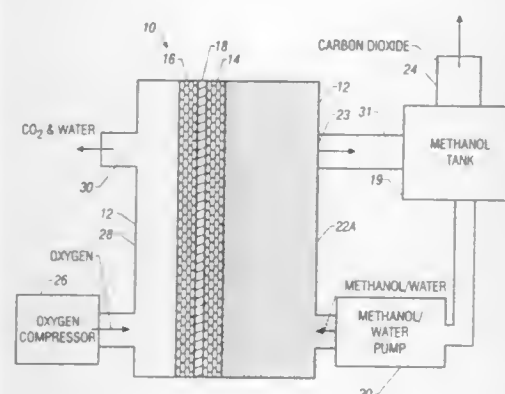
Continuation-in-part of Ser. No. 478,001, Jun. 7, 1995, which is a continuation of Ser. No. 135,007, Oct. 12, 1993, Pat. No. 5,599,638. This application Dec. 8, 1995, Ser. No. 569,452

Int. Cl.<sup>6</sup> H01M 4/88; 8/04

U.S. Cl. 429—39

29 Claims

25. A fuel cell comprising: at least anode and cathode electrodes; a fuel supply conduit; and a flow field element, operating to supply fuel from said fuel supply conduit to at least one of said anode and cathode



electrodes, said flow field element being pressed against said one electrode, and comprising a plurality of island areas, each having a pressing surface and side surfaces, the pressing surface pressed against said one electrode, and a flow field area surrounding said side areas, said flow field in communication with said fuel supply conduit,

wherein said fuel supply conduit includes at least one opening to the flow field which extends in a direction and supplies the fuel to the flow field in said direction, said direction extending in a line which directly intersects one of said side surfaces, such that said fuel supply conduit supplies the fuel directly against said one of said side surfaces.

5,773,163

## SEALED ALKALINE STORAGE BATTERY

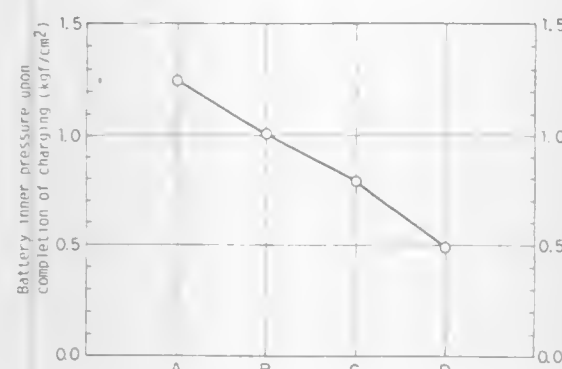
Kohci Suzuki, Yao; Noboru Ito, Toyohashi; Nobuyasu Morishita, Toyohashi, and Munehisa Ikoma, Toyohashi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed May 29, 1997, Ser. No. 864,945

Claims priority, application Japan, Sep. 27, 1996, 8-256631 Int. Cl.<sup>6</sup> H01M 10/24

U.S. Cl. 429—60

11 Claims



1. A sealed alkaline storage battery comprising an electrode group which comprises a plurality of positive electrodes and a plurality of negative electrodes piled up alternately with separators interposed therebetween, an alkaline electrolyte and a sealed battery case containing said electrode group and said alkaline electrolyte, wherein the capacities of said respective negative electrodes are larger than those of the adjacent positive electrodes, except for the negative electrodes positioned at both ends of said electrode group.

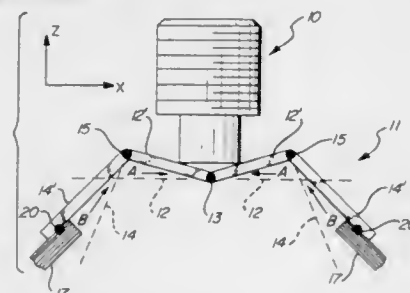
5,773,164  
ROBUST TERMINAL FOR RECHARGEABLE PRISMATIC BATTERIES

Srinivasan Venkatesan, Southfield; Kenneth Laming, Columbus; Lin Higley, Troy, and Michael Marchio, Utica, all of Mich., assignors to Ovonic Battery Company, Inc., Troy, Mich.

Filed Oct. 15, 1996, Ser. No. 732,537 Int. Cl.<sup>6</sup> H01M 2/26

U.S. Cl. 429—161

11 Claims



1. A robust terminal for a prismatic battery, said battery having electrodes electrically connected to said terminal via tabs, said terminal comprising:

- a terminal post; and
- a connector strap mechanically joined to said terminal post, where one or more of said tabs are mechanically joined to said connector strap at tab connection points, said connector strap comprising:
  - a strap base mechanically joined to said terminal post, said strap base capable of deflection about its point of connection with said terminal post; and
  - one or more strap legs, each mechanically joined to said strap base, each of said strap legs capable of deflection about its point of connection with said strap base.

5,773,165

## NONAQUEOUS ELECTROLYTIC SECONDARY CELL

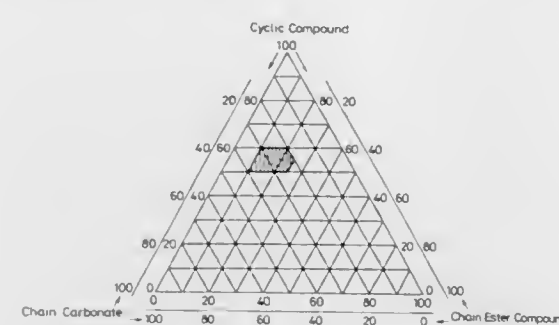
Naoyuki Sugeno, Fukushima, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sep. 20, 1996, Ser. No. 718,242

Claims priority, application Japan, Sep. 27, 1995, 7-249928 Int. Cl.<sup>6</sup> H01M 10/40

U.S. Cl. 429—197

5 Claims



1. A non-aqueous electrolytic secondary cell comprising: a cathode comprising an active material comprising lithium; an anode comprising a carbon material capable of reversibly intercalating lithium; and an electrolyte comprising LiBF<sub>4</sub> dissolved in a mixed solvent, said mixed solvent comprising from about 10 to about 20 volume % of  $\gamma$ -butyrolactone; from about 30 to about 50 volume % of at least one cyclic carbonate selected from the group consisting of ethylene carbonate, propylene carbonate and butylene carbonate; from about 20 to about 40 volume % of dimethyl carbonate; and from about 10 to about 20 volume % of a chain ester selected from the group consisting of methyl acetate, ethyl acetate, propyl acetate, and butyl acetate.

5,773,166

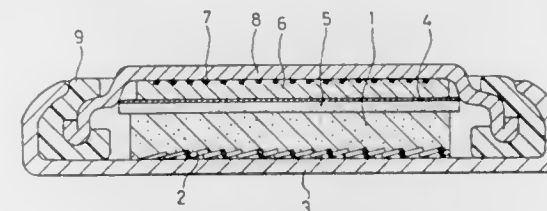
NON-AQUEOUS ELECTROLYTE SECONDARY BATTERY  
Tooru Matsui, Fujiidera, and Kenichi Takeyama, Osaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Nov. 26, 1996, Ser. No. 756,778

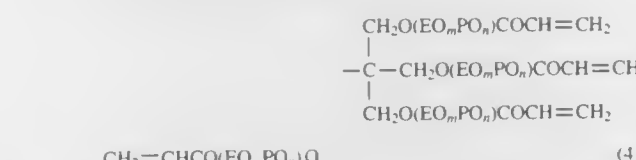
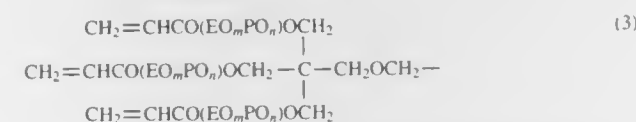
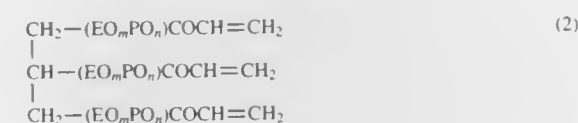
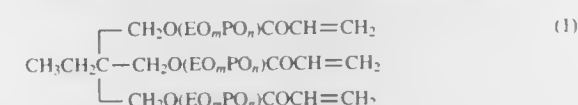
Claims priority, application Japan, Nov. 28, 1995, 7-309381 Int. Cl.<sup>6</sup> H01M 4/60

U.S. Cl. 429—212

3 Claims



1. A non-aqueous electrolyte secondary battery comprising: a positive electrode, an alkali ion-conductive electrolyte, and a negative electrode containing an alkali metal as an active material, said negative electrode being provided with a polymer film thereon, said polymer film being made of a polymeric monomer having molecular weight/terminal polymer functional group number of 500 or less, and having a structure selected from the group consisting of formulas (1)–(4):



wherein EO refers to  $\text{CH}_2\text{CH}_2\text{O}$ , PO refers to  $\text{CH}_2(\text{CH}_3)\text{CHO}$ ,  $(\text{EO}_m\text{PO}_n)$  indicates one of random polymerization and block polymerization, and wherein m and n do not represent 0 at the same time where  $0 \leq m$  and  $0 \leq n$ .

5,773,167  
AMORPHOUS CARBON ELECTRODE AND A SECONDARY BATTERY HAVING SUCH AN ELECTRODE

Naoki Iwasaki, Shiga-ken; Takeharu Inoue, Kyoto-fu; Isamu Sakuma, Shiga-ken; Naoki Shimoyama, Shiga-ken; Jun Tsukamoto, Shiga-ken, and Keizo Ono, Ehime-ken, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jun. 3, 1996, Ser. No. 657,269

Claims priority, application Japan, Jun. 1, 1995, 7-135124; Jun. 27, 1995, 7-161134; Dec. 28, 1995, 7-344125; Dec. 28, 1995, 7-344126

Int. Cl.<sup>6</sup> H01M 4/58

U.S. Cl. 429—218

11 Claims

1. An electrode for a battery having a layer structure and comprising an amorphous carbon material in which:

- 1) said carbon material has an interlayer spacing  $d(002)$  obtained from the x-ray diffraction line assigned to the (002) plane of the carbon, of 0.345 nm to 0.365 nm;
- 2) the ratio of the total nitrogen:total carbon atoms in the amorphous carbon is from 0.005:1 to 0.55:1; and
- 3) the ratio (Ps) of the number of carbon atoms involved in the layer structure to the total number of carbon atoms is from 0.54:1 to 0.85:1.

5,773,168

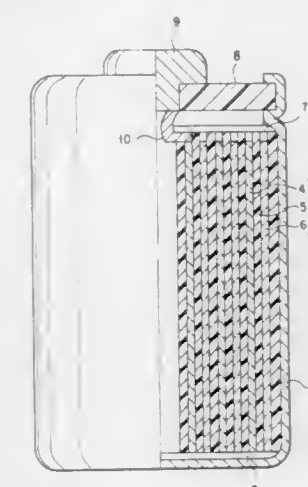
NONAQUEOUS ELECTROLYTE SECONDARY BATTERY AND METHOD FOR MANUFACTURING THE SAME  
Koichi Kubo; Shuji Yamada, both of Yokohama; Masashi Fujiwara; Shinji Arai, both of Chigasaki, and Motoya Kanda, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 22, 1996, Ser. No. 701,717

Claims priority, application Japan, Aug. 23, 1995, 7-214742 Int. Cl.<sup>6</sup> H01M 4/58

U.S. Cl. 429—223

30 Claims



1. A nonaqueous electrolyte secondary battery comprising a positive electrode, a negative electrode and a nonaqueous electrolyte; wherein said positive electrode comprises a lithium-containing nickel oxyfluoride having a composition represented by  $\text{Li}_{1+x}\text{Ni}_{1-y}\text{O}_{u-1}\text{F}_y$ , where the ranges of x, y and u meet the following equations (1) to (3):

$$(y+0.05)/2 \leq x < (y+1)/3 \quad (1)$$

$$y > 0 \quad (2)$$

$$1.9 \leq u \leq 2.1 \quad (3)$$

5,773,169

## ACTIVE MATERIAL AND POSITIVE ELECTRODE FOR ALKALINE STORAGE BATTERY

Hiromu Matsuda, Kawabe-gun; Yukihiko Okada, Katano; Kazuhiro Ohta, Sanda, and Yoshinori Toyoguchi, Yao, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Filed Feb. 19, 1997, Ser. No. 802,156

Claims priority, application Japan, Feb. 29, 1996, 8-043294 Int. Cl.<sup>6</sup> H01M 4/32

U.S. Cl. 429—223

5 Claims

1. An active material for an alkaline storage battery comprising a solid solution nickel hydroxide material having additive elements incorporated therein, said additive elements comprising at least one element selected from group A consisting of Fe, Cr, V, Ti, Y, La, Ce, Al, and Pb, and at least one element selected from group B consisting of Mn and Co.



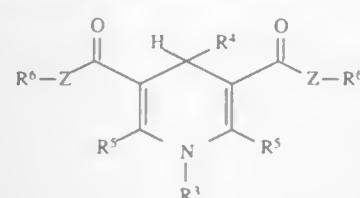
5,773,170  
UV-ABSORBING MEDIA BLEACHABLE BY  
IR-RADIATION

Ranjan C. Patel, Little Hallingbury, and Robert J. D. Nairne, Bishop's Stortford, both of Great Britain, assignors to Minnesota Mining and Manufacturing Co., St. Paul, Minn.  
Filed Apr. 2, 1996, Ser. No. 627,825

Claims priority, application United Kingdom, Apr. 20, 1995, 9508031

Int. Cl.<sup>6</sup> G03F 9/00; B41M 5/20; B32B 3/00  
U.S. Cl. 430—5 35 Claims

1. An image-forming element comprising a substrate, and an image-forming medium comprising:  
(a) a compound absorbing at a first wavelength in the UV/blue region which has the general formula III



wherein R<sup>3</sup> and R<sup>4</sup> are independently members selected from the group consisting of H, alkyl, aryl, alicyclic, and heterocyclic groups;

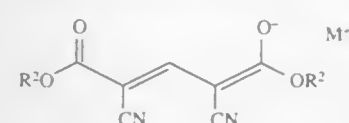
each R<sup>5</sup> and each R<sup>6</sup> are independently members selected from the group consisting of alkyl, aryl, alicyclic and heterocyclic groups; and

Z is a member selected from the group consisting of O and a covalent bond; and

(b) a dye absorbing at a second wavelength which is longer than the first wavelength, wherein irradiation of said dye absorbing at said second wavelength causes bleaching of the absorption of said compound of formula III.

24. An image-forming element comprising a substrate, and an image-forming medium comprising:

(a) a compound absorbing at a first wavelength in the UV/blue region which has the general formula II



wherein each R<sup>2</sup> is independently a member selected from the group consisting of an alkyl group and an aryl group of up to 10 ring carbon atoms; and  
M<sup>+</sup> represents a cation; and

(b) a dye absorbing at a second wavelength which is longer than the first wavelength, wherein irradiation at said second wavelength causes bleaching of the absorption of said compound of formula II.

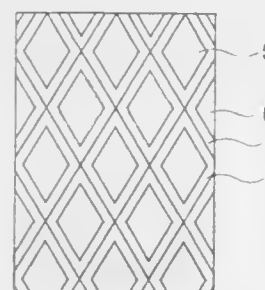
5,773,171  
PHASE SHIFT MASK FOR FORMING CONTACT HOLES  
Il Ho Lee, and Hee Bom Kim, both of Kyongki-do, Rep. of Korea, assignors to Hyundai Electronics Industries Co., Ltd., Kyongki-do, Rep. of Korea  
Filed May 28, 1997, Ser. No. 864,105

Claims priority, application Rep. of Korea, Jun. 29, 1996, 1996-25724

Int. Cl.<sup>6</sup> G03F 9/00 9 Claims  
U.S. Cl. 430—5

1. A phase shift mask for forming contact holes arranged in longitudinal, transversal and diagonal directions, comprising:  
a transparent substrate;

a shifter formed on the transparent substrate and patterned to define windows respectively arranged at contact hole regions where the contact holes are formed; and



the windows consisting of first windows each having a central portion defined by a portion of the shifter and an edge portion defined by an exposed portion of the substrate arranged around the portion of the shifter, and second windows each having a central portion defined by an exposed portion of the substrate and an edge portion defined by a portion of the shifter arranged around the exposed portion of the substrate, the first and second windows being arranged adjacent to each other in longitudinal and transversal directions while being arranged in an alternating manner in the diagonal direction, whereby each of the windows exhibits a minimum light intensity at the edge portion thereof and a maximum light intensity at the central portion thereof.

5,773,172  
COLOR FILTER HAVING NOVEL DYESTUFF  
Akio Karasawa, Yokohama, and Hisato Itoh, Omuta, both of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan  
Continuation of Ser. No. 269,771, Jul. 1, 1994, abandoned.

This application Jun. 6, 1996, Ser. No. 659,616  
Claims priority, application Japan, Jul. 9, 1993, 5-170434; Mar. 18, 1994, 6-048409

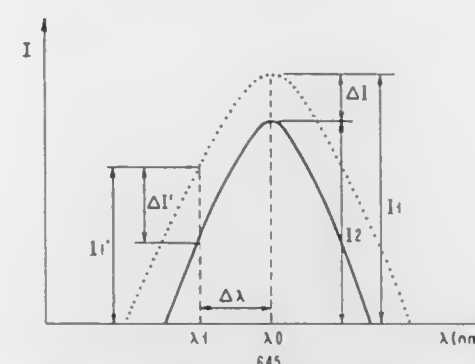
Int. Cl.<sup>6</sup> G03F 9/00 2 Claims  
U.S. Cl. 430—7

1. A color filter comprising an optically transparent substrate and a dyestuff represented by the following formula (5):  
wherein R<sup>1</sup> to R<sup>8</sup> independently represent a hydrogen atom; a halogen atom; an unsubstituted alkyl group which is linear or branched and has 1 to 20 carbon atoms; an alkyl group which is linear or branched and is substituted by at least one of alkoxy, halogen, hydroxyl or amino substituents and has 1 to 30 carbon atoms in total; an unsubstituted cycloalkyl group which has 5 to 12 carbon atoms; a cycloalkyl group which is substituted by at least one of halogen, alkyl or alkoxy substituents and has 5 to 20 carbon atoms in total; an unsubstituted alkoxy group which is linear or branched and has 1 to 10 carbon atoms; or an alkoxy group which is linear or branched and is substituted by at least one of alkoxy or halogen substituents and has 1 to 20 carbon atoms in total; R<sup>9</sup> and R<sup>10</sup> independently represent a hydrogen atom; an unsubstituted alkyl group which is linear or branched and has 1 to 20 carbon atoms; or an alkyl group which is linear or branched and is substituted by at least one of alkoxy or halogen substituents and has 1 to 30 carbon atoms in total with the provision that one of R<sup>9</sup> and R<sup>10</sup> has 3 or more carbon atoms; R<sup>11</sup> and R<sup>12</sup> independently represent a hydrogen atom; an unsubstituted, linear or branched alkyl group having 1 to 20 carbon atoms; a linear or branched alkyl group substituted by at least one of halogen, alkoxy, hydroxyl or amino groups and having 1 to 30 carbon atoms in total; an unsubstituted, linear or branched alkoxy group having 1 to 20 carbon atoms; a linear or branched alkoxy group substituted by at least one of halogen, alkoxy, hydroxyl or amino groups and having 1 to 30 carbon atoms in total; or a halogen atom; and R<sup>16</sup> represents a hydrogen atom or a halogen atom; and X represents —CO—, —COOCH<sub>2</sub>CO— or —COOCH<sub>2</sub>CH<sub>2</sub>CO—.

5,773,173  
FILM THICKNESS INSPECTION METHOD AND  
APPARATUS

Hiroki Nakano, Otsu, and Takeshi Fujiwara, Shiga-ken, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 17, 1996, Ser. No. 664,904  
Claims priority, application Japan, Jun. 16, 1995, 7-150214  
Int. Cl.<sup>6</sup> G01B 11/30 10 Claims  
U.S. Cl. 430—30



10. A filter thickness inspection method for inspecting the thickness of a color filter having picture elements of a first color tone and picture elements of at least one other color tone, the picture elements of the first color tone passing light within a first frequency band centered at a first light frequency, comprising the steps of:

positioning a white light source on one side of the color filter; selectively enabling light from the white light source to pass through at least some of the picture elements of the first color tone and not to pass through any of the picture elements of the at least one other color tone; filtering the light that has passed through the color filter with a light filter that passes light within a second frequency band different from but overlapping the first frequency band, the second frequency band being centered at a second light frequency different from the first light frequency; detecting the filtered light; and evaluating the detected light to evaluate film thickness uniformity.

5,773,174  
METHOD OF FORMING A RESIST PATTERN  
UTILIZING CORRELATION BETWEEN LATENT IMAGE  
HEIGHT, RESIST PATTERN LINEWIDTH AND SURFACE  
MODIFICATION LAYER WIDTH

Taichi Koizumi, Osaka; Takahiro Matsuo, Kyoto, and Masayuki Endo, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 557,701, Nov. 13, 1995. This application  
Jul. 9, 1997, Ser. No. 890,685

Claims priority, application Japan, Nov. 14, 1994, 6-279132  
Int. Cl.<sup>6</sup> G03C 5/00; G03F 7/26 9 Claims  
U.S. Cl. 430—30

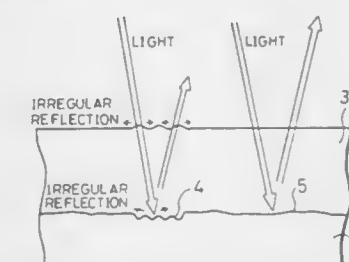
1. A method of forming a resist pattern comprising the steps of:

(a) forming a resist layer on a substrate;  
(b) exposing said resist layer to light to form a predetermined pattern;  
(c) performing a modification layer formation process to form a surface modification layer locally on said resist layer; and  
(d) developing said pattern-exposed resist layer for resist pattern formation;  
(1) determining a height of a latent image formed on said resist layer after said resist layer is exposed to said light;  
(2) determining a relationship between the height of said latent image and an exposing parameter;  
(3) determining a relationship between a surface modification layer-width and said exposing parameter;

(4) correlating the height of said latent image and surface modification layer-width based on relationships determined in steps (2) and (3) above;  
(5) determining a first correlation between said height of said latent image and surface modification layer-width;  
(6) determining a second correlation between the exposing parameter and surface modification layer-width;  
(7) determining an actual latent-image height produced on an exposed resist layer;  
(8) estimating from said first correlation a surface modification layer-width that corresponds to said determined actual latent-image height and to a given value of said exposing parameter;  
(9) estimating from said second correlation an exposing parameter that corresponds to said given value of said exposing parameter and to said estimated resist pattern modification layer-width;  
(10) determining from said second correlation, a value of said exposing parameter that corresponds to a target surface modification layer-width and to said estimated exposing parameter; and  
(11) forming, based on said exposing parameter value found, a surface modification layer.

5,773,175  
PHOTOSENSITIVE BODY FOR  
ELECTROPHOTOGRAPHICAL USE AND  
MANUFACTURING METHOD THEREOF  
Hideaki Taniguchi, Yoshino-gun; Yasutaka Maeda, Soraku-gun; Masayuki Sakamoto, Nabari; Masaya Tsugoshi, Uda-gun, and Makoto Kurokawa, Kitakatsuragi-gun, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan  
Filed Feb. 28, 1996, Ser. No. 608,157  
Claims priority, application Japan, Mar. 3, 1995, 7-044652; Oct. 5, 1995, 7-259053

Int. Cl.<sup>6</sup> G03G 15/00 7 Claims  
U.S. Cl. 430—56



1. A photosensitive body for electrophotographical use, comprising:  
a conductive base body having a first surface part and a second surface part, the second surface part having optical reflective characteristics different from those of the first surface part; and  
a photosensitive layer provided on the conductive base body, wherein the photosensitive layer right on the second surface part has maximum surface roughness of not more than 2.5 μm, and a ratio of the optical reflective index of the second surface part to the optical reflective index of the first surface part is in a range of 0.3 to 0.7.

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5,773,176  
RECHARGEABLE ALKALINE SILVER-ZINC CELL  
WITH IMPROVED NEGATIVE ELECTRODE

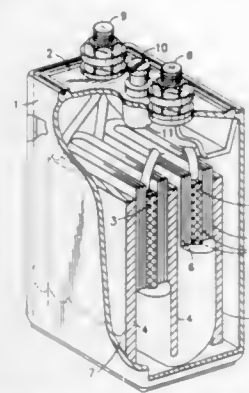
Jose R. Serenyi, Quaker Hill, Conn., assignor to Yardney Technical Products, Inc., Pawcatuck, Conn.

Filed Oct. 2, 1996, Ser. No. 725,069

Int. Cl.<sup>6</sup> H01M 4/24

U.S. Cl. 429—231

14 Claims



1. A rechargeable alkaline silver-zinc electrochemical cell comprising: a positive and a negative electrode having a separator therebetween containing an alkaline electrolyte, said positive electrode containing silver as a positive active material, said negative electrode comprising predominantly zinc or zinc oxide as the negative active material and an additive consisting essentially of bismuth oxide and at least one additional oxide or hydroxide of a metal selected from the group consisting of lead, cadmium and indium, the amount of said bismuth oxide ranging from about 2.0% by wt. to about 10% by wt and the amount of said additional oxide or hydroxide in each instance ranging from about 0.25% by wt. to about 2% by wt. of said negative active material.

5,773,177  
X-RAY MASK STRUCTURE, AND X-RAY EXPOSURE  
PROCESS

Tsutomu Ikeda, Tokyo; Masao Sugata, and Hideo Kato, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

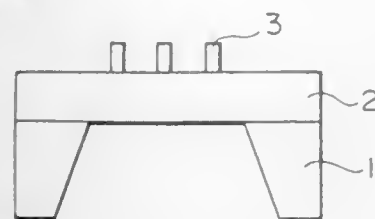
Continuation of Ser. No. 431,463, May 1, 1995, abandoned, which is a continuation of Ser. No. 276,508, Jul. 18, 1994, abandoned, which is a continuation of Ser. No. 940,286, Sep. 3, 1992, abandoned, which is a division of Ser. No. 489,277, Mar. 6, 1990, Pat. No. 5,196,283. This application Nov. 30, 1995, Ser. No. 565,215

Claims priority, application Japan, Mar. 9, 1989, 1-55031; Feb. 23, 1990, 2-41110; Mar. 1, 1990, 2-47238

Int. Cl.<sup>6</sup> G03F 9/00

U.S. Cl. 430—5

12 Claims



1. An X-ray mask structure comprising: an X-ray transmissive membrane, an X-ray absorber held on said X-ray transmissive membrane, and a holding frame that holds said X-ray transmissive membrane, wherein said X-ray transmissive membrane comprises a layer of aluminum nitride, AlN<sub>x</sub>, wherein 0.3<x<1.5 and said X-ray absorber consists of a film of a nitride of heavy metal, MN<sub>y</sub>, wherein 0<y<1 and M is a heavy metal; and wherein said X-ray-transmissive membrane and said X-ray absorber are laminated together in direct contact, without an intermediate layer comprised of at least one of Al, N and M

therebetween, to alleviate strain caused by expansion and shrinkage of said X-ray absorber caused by repeated exposure to X-rays.

5,773,178  
PROCESS FOR PRODUCING A PATTERNED  
ANISOTROPIC POLYMERIC FILM

Atsushi Shiota, Tsukuba, Japan, and Christopher K. Ober, Ithaca, N.Y., assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan, and Cornell Research Foundation, Inc., Ithaca, N.Y.

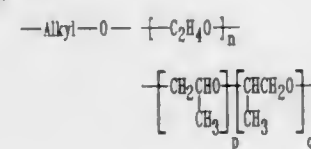
Filed Sep. 13, 1996, Ser. No. 713,875

Int. Cl.<sup>6</sup> G03C 5/16

U.S. Cl. 430—20

Sp:

8 Claims



$$n = 1 - 10$$

$$p + q = n$$

$$p > 0, q > 0$$

1. A process for producing a patterned anisotropic polymeric film comprising the steps of:  
(1) orienting a film comprising a photopolymerizable liquid crystalline monomer having a negative dipole anisotropy in an ac electric field,  
(2) irradiating said film in a pattern-wise manner to polymerize said monomer while maintaining said monomers in a liquid crystalline state.

5,773,179  
LIQUID CRYSTAL POLYMERS

Georg H. R. Mehl, John W. Goodby, and David Lacey, all of Humberside, Great Britain, assignors to The Secretary of State for Defence Defence Evaluation & Research Agency, United Kingdom

PCT No. PCT/GB96/03121, § 371 Date Oct. 22, 1997, § 102(c)

Date Oct. 22, 1997, PCT Pub. No. WO97/23541, PCT Pub. Date Jul. 3, 1997

PCT Filed Dec. 18, 1996, Ser. No. 894,616

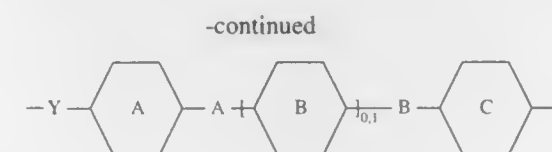
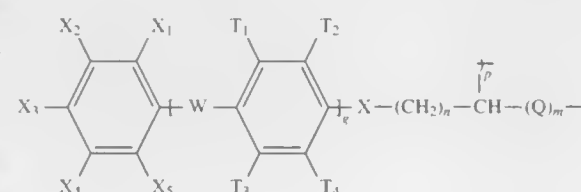
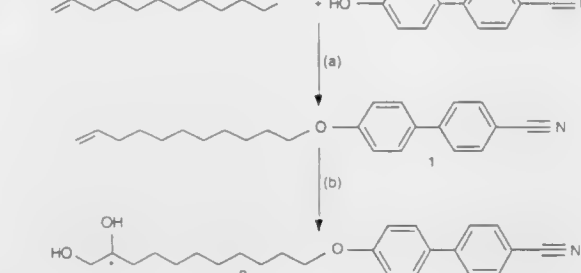
Claims priority, application United Kingdom, Dec. 22, 1995, 9526485

Int. Cl.<sup>6</sup> C09K 19/00; C08G 65/38; B32B 27/06

U.S. Cl. 430—20

20 Claims

1. A material of general formula 1



wherein

X<sub>1</sub>—X<sub>5</sub> are independently selected from H, F, Cl, NO<sub>2</sub>, CF<sub>3</sub>, OR, R, SR, —CO— or —OC— where R is C<sub>1-15</sub> branched or straight chain alkyl;

provided that one of X<sub>1</sub>—X<sub>5</sub> is selected from —CO— or —OC—; p is at least 2;

W= single bond, phenyl, fluorinated phenyl, =, ≡, cyclohexyl, thiophene, CO, OC;

T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> are independently selected from H, F, Cl, NO<sub>2</sub>, CF<sub>3</sub>, OR, R, SR, where R is C<sub>1-15</sub> branched or straight chain alkyl;

g=0 or 1;

X is selected from CO<sub>2</sub> and OOC;

n is selected from 1–5; m is selected from 1–20; Y is selected from O, S, CH<sub>2</sub>, CO<sub>2</sub>, OOC;

Q is CH<sub>2</sub> and when m is greater than 1 then non-adjacent CH<sub>2</sub> groups may be substituted by O or S;

rings A, B and C are independently selected from phenyl, cyclohexyl and pyrimidine and may be independently of each other substituted with at least one of Cl or F;

linking groups A and B may be selected from single bond CO<sub>2</sub>, OOC provided that if ring B is not present then at least one of A or B is a single bond;

Z is selected from CN, F, Cl, NO<sub>2</sub>, R, OR, CO<sub>2</sub>R, CF<sub>3</sub>, OOCR, NCS, SCN, where R= straight chain or branched chain alkyl and may include from 1–16 carbon atoms and including where one or more non-adjacent CH<sub>2</sub> groups may be substituted by CH(CN), CH(CF<sub>3</sub>), CH(Cl), CH(CH<sub>3</sub>) in chiral or non-chiral form.

5,773,181  
NON-UNIFORMLY SUBSTITUTED PHTHALOCYANINE  
COMPOSITIONS PREPARATION METHODS, AND  
ELECTROPHOTOGRAPHIC ELEMENTS

Michel F. Molaire; Jeanne Ellen Kaeding, and William Tod Gruenbaum, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 23, 1995, Ser. No. 448,056

Int. Cl.<sup>6</sup> G03G 5/06

U.S. Cl. 430—78

25 Claims

1. A method for preparing a phthalocyanine composition comprising the steps of:

synthesizing a crystalline product comprising a mixture of phthalocyanines including:

a first phthalocyanine having the general formula



a second phthalocyanine having the general formula



a third phthalocyanine having the general formula



a fourth phthalocyanine having the general formula

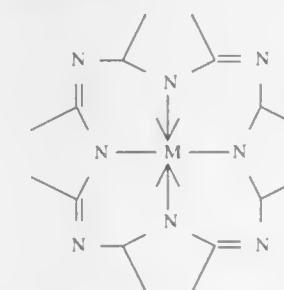


and a fifth phthalocyanine having the general formula



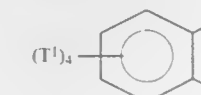
wherein:

each Z, in the above formulas, represents a member selected from the group consisting of moieties having the general structure:



wherein M represents a pair of hydrogen atoms or a covalent or coordinate bonded moiety including an atom selected from the group consisting of Li, Na, K, Be, Mg, Ca, Ba, Sc, Y, La, Ac, Ti, Zr, Hf, V, Nb, Cr, Mo, W, Mn, Tc, Re, Fe, Ru, Os, Co, Rh, Ir, Ni, Pd, Pt, Cu, Ag, Au, Zn, Cd, Hg, Al, Ga, In, Tl, Si, Ge, Sn, Pb, As, and Sb;

each A, in the above formulas, is the same and represents a member selected from the group consisting of moieties having the general structure:



wherein each T<sup>1</sup> is independently selected from the group consisting of H and F; and

each B, in the above formulas, is the same and represents a member selected from the group consisting of moieties having the general structure:

5,773,180  
MEASURING METHOD OF A RELATIVE POSITIONAL  
DEVIATION OF RETICLE PATTERN

Yoshikatu Tomimatu, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1996, Ser. No. 663,812

Claims priority, application Japan, Dec. 13, 1995, 7-324433

Int. Cl.<sup>6</sup> G03F 9/00; G06K 9/00

U.S. Cl. 430—22

6 Claims

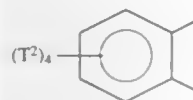
1. A method for measuring a relative positional deviation of a common pattern feature on at least two reticles, comprising the steps of:

forming at least two projected reticle patterns on a wafer by a projection exposure device using two reticles;

measuring a positional deviation of each of the at least two projected reticle patterns from a reference point of the pattern on the wafer; and

determining a difference in positional deviations between the at least two projected reticle patterns from a difference in the positional deviation of each of the last least two projected patterns at a same coordinate position on said wafer.





wherein each  $T^2$  is independently selected from the group consisting of H and F;

preselecting A and B for said first, second, third, fourth, and fifth phthalocyanines such that:

A and B are differently substituted, the  $T^1$  and  $T^2$  moieties of A and B together collectively include H and F;

increasing the amorphousness of said mixture of phthalocyanines as determined by X-ray crystallography using X-radiation characteristic of Cu K $\alpha$  at a wavelength of 1.541 Å of the Bragg angle  $2\theta$  to provide an amorphous pigment mixture;

contacting said amorphous pigment mixture with organic solvent having a gamma, hydrogen bonding parameter of less than 8.0; and

prior to said contacting, substantially excluding said amorphous pigment mixture from contact with organic solvent having a gamma, hydrogen bonding parameter greater than 9.0.

5,773,182

## METHOD OF LIGHT STABILIZING A COLORANT

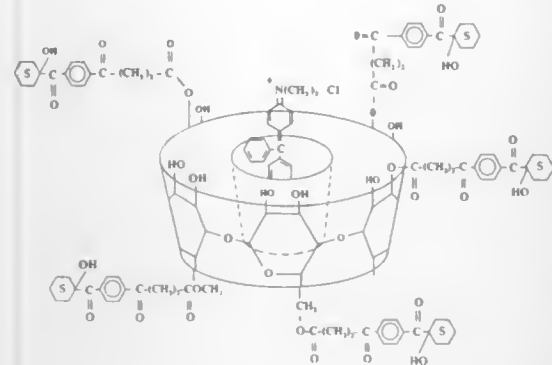
Ronald Sinclair Nohr, Alpharetta, and John Gavin MacDonald, Decatur, both of Ga., assignors to Kimberly-Clark Worldwide, Inc., Neenah, Wis.

Continuation-in-part of Ser. No. 403,240, Mar. 10, 1995, abandoned, which is a continuation-in-part of Ser. No. 373,958, Jan. 17, 1995, abandoned, which is a continuation-in-part of Ser. No. 360,501, Dec. 21, 1994, and Ser. No. 359,670, Dec. 20, 1994, abandoned, which is a continuation-in-part of Ser. No. 258,858, Jun. 13, 1994, abandoned, which is a continuation-in-part of Ser. No. 119,912, Sep. 10, 1993, abandoned, which is a continuation-in-part of Ser. No. 103,503, Aug. 5, 1993, abandoned, said Ser. No. 360,501 is a continuation-in-part of Ser. No. 258,858. This application Jun. 5, 1995, Ser. No. 465,393

Int. Cl.<sup>6</sup> G03G 9/00; G03C 11/18

U.S. Cl. 430—106

18 Claims



1. A method of light-stabilizing a colorant comprising associating the colorant with a stabilizing compound selected from the group consisting of 1-Hydroxy-cyclohexyl-phenyl ketone; a,a-dimethoxy-a-hydroxy acetophenone; 1-(4-Isopropylphenyl)-2-hydroxy-2-methyl-propan-1-one; 1-[4-(2-Hydroxyethoxy)phenyl]-2-hydroxy-2-methyl-propan-1-one; poly[2-Hydroxy-2-methyl-1-[4-(1-methylvinyl)phenyl]propan-1-one]; 2-Hydroxy-1,2-diphenylethanone; or a mixture thereof, wherein said compound has been dehydrated at the position alpha to the carbonyl carbon.

5,773,183

## TONER FOR DEVELOPING ELECTROSTATIC IMAGES

Tadashi Doujo, Kawasaki; Yuichi Mizoo, Toride; Takaaki Kotaki, Yokohama, and Yushi Mikuriya, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1996, Ser. No. 749,640

Claims priority, application Japan, Nov. 20, 1995, 7-323564

Int. Cl.<sup>6</sup> G03G 9/087

U.S. Cl. 430—106

22 Claims

1. A toner for developing an electrostatic image, comprising a binder resin, a colorant and a charge control agent, wherein;

said binder resin comprises a polyester resin; said polyester resin having an acid value of from 15 to 40 and a hydroxyl value of 45 or less; and

said toner has, in its molecular weight distribution as measured by gel permeation chromatography, tetrahydrofuran-soluble matter having a weight average molecular weight  $M_w$  of 100,000 or more, having a ratio of weight average molecular weight  $M_w$  to number average molecular weight  $M_n$ ,  $M_w/M_n$ , of not less than 35, containing from 70% to 94% of a low-molecular weight region component having a molecular weight of less than 150,000, containing from 1% to 10% of a medium-molecular weight region component having a molecular weight of from 150,000 to 500,000, and containing from 5% to 25% of a high-molecular weight region component having a molecular weight of more than 500,000; said high-molecular weight region component being more than said medium-molecular weight region component.

5,773,184

## PROCESSING WHICH ENHANCES PHOTOCONDUCTIVITY OF TYPE I TITANYL PHTHALOCYANINE

Sterritt Ray Fuller, Jr.; Ronald Harold Levin, both of Boulder, and Jennifer Kaye Neely, Arvada, all of Colo., assignors to Lexmark International, Inc., Lexington, Ky.

Continuation of Ser. No. 719,924, Sep. 25, 1996, abandoned.

This application Oct. 2, 1997, Ser. No. 942,952

Int. Cl.<sup>6</sup> C09B 67/16; G03G 5/06

U.S. Cl. 430—135

9 Claims

1. A method for the preparation of a Type I polymorph of titanyl phthalocyanine having enhanced photoconductive properties consisting essentially of the steps of

forming a mixture of Type I titanyl phthalocyanine with a solution of methylene chloride and a dihaloacetic acid, recovering said phthalocyanine by combining said mixture with a solution of water and alcohol, and washing said recovered phthalocyanine, said washed recovered phthalocyanine being a sensitized Type I polymorph of titanyl phthalocyanine.

5,773,185

## TONER FOR DEVELOPING ELECTROSTATIC IMAGES, AND PROCESS FOR PRODUCING THE SAME

Shinya Yachi; Koji Inaba, both of Yokohama, and Kazunori Kato, Mitaka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 655,605, May 30, 1996, Pat. No.

5,679,490, This application Aug. 15, 1997, Ser. No. 911,751

Claims priority, application Japan, May 31, 1995, 7-156772

Int. Cl.<sup>6</sup> G03G 9/093; 9/097

U.S. Cl. 430—137

36 Claims

1. A process for producing a toner, comprising the steps of; preparing a polymerizable monomer composition containing at least styrene monomer-containing polymerizable monomers, a colorant, a polyester resin, a release agent and a polymerization initiator; said polyester resin containing a tetrahydrofuran-soluble matter having a weight average molecular weight  $M_w$  of from 7,000 to 50,000 and an ethyl

alcohol-soluble matter having a weight average molecular weight  $M_w$  of from 1,000 to 7,000;  $M_w/M_n$  being from 1.2 to 10;

dispersing said polymerizable monomer composition in an aqueous medium to form granules of the polymerizable monomer composition;

causing the localization of polyester resin on the surfaces of the particles of the polymerizable monomer composition;

polymerizing the polymerizable monomers present in the granules to produce a binder resin to form toner particles; said binder resin being a styrene polymer, a styrene copolymer, or a mixture of these, and having a weight average molecular weight  $M_w$  of from 10,000 to 1,000,000; and

adding a water-soluble polymerization initiator in the aqueous medium to treat the surfaces of the toner particles.

5,773,186

## HEAT-SENSITIVE RECORDING MATERIAL

Masanobu Takashima, Fujinomiya, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 18, 1997, Ser. No. 801,948

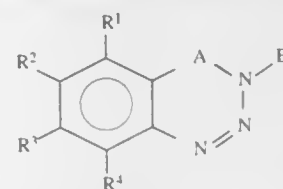
Claims priority, application Japan, Feb. 19, 1996, 8-030899; Feb. 19, 1996, 8-030970

Int. Cl.<sup>6</sup> G03C 1/54

U.S. Cl. 430—138

20 Claims

1. In a heat-sensitive recording material which comprises a substrate and a heat-sensitive recording layer provided thereon, said heat-sensitive recording layer containing a diazo compound and a coupler compound which reacts with said diazo compound to produce color, wherein as the diazo compound, contained is the compound represented by the following general formula (I):



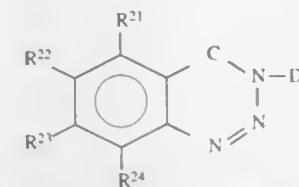
General Formula I

wherein  $R^1$  to  $R^4$  each independently represents a hydrogen atom, an alkyl group, an aryl group,  $-OR^5$ ,  $-SR^6$ ,  $-NR^7R^8$ ,  $-COR^{10}$ , a halogen atom,  $-SO_2R^{10}$ ,  $-CN$ ,  $-NO_2$ , in which  $R^5$  and  $R^6$  each independently represents a hydrogen atom, an alkyl group, an aryl group or an acyl group,  $R^7$  and  $R^8$  each independently represents a hydrogen atom, an alkyl group, an aryl group, an acyl group, an alkylsulfonyl group or an arylsulfonyl group and  $R^9$  and  $R^8$  are coupled together to form an alkylene group which may contain  $-O-$ ,  $-S-$ ,  $-SO_2-$  or  $-NR^9$ , said  $R^9$  representing a hydrogen atom, an alkyl group, an aryl group, an acyl group, an alkylsulfonyl group, an arylsulfonyl group, an alkoxycarbonyl group or an aryloxycarbonyl group,  $R^{10}$  represents a hydrogen atom, a hydroxyl group, an alkyl group, an aryl group, an alkoxyl group, an aryloxy group or  $-NR^7R^8$ , said  $R^7$  and  $R^8$  having the same meanings as defined above;

A represents  $-CO-$  or  $-SO_2-$ ; and

B represents  $-SO_2R^{11}$  or  $-POR^{12}R^{13}$ , in which  $R^{11}$  represents an alkyl group, an aryl group, a heterocyclic group or  $-NR^7R^8$ , said  $R^7$  and  $R^8$  having the same meanings as defined above, and  $R^{12}$  and  $R^{13}$  each independently represents an alkyl group, an aryl group, an alkoxyl group or an aryloxy group.

11. In a heat-sensitive recording material which comprises a substrate and a heat-sensitive recording layer provided thereon, said heat-sensitive recording layer containing a diazo compound and a coupler compound which reacts with said diazo compound to produce color, wherein as the diazo compound, contained is the compound represented by the following general formula (II):



General Formula II

wherein  $R^{21}$  to  $R^{24}$  each independently represents a hydrogen atom, an alkyl group, an aryl group,  $-OR^{25}$ ,  $-SR^{26}NR^{27}R^{28}$ ,  $-COR^{30}$ , a halogen atom,  $-SO_2R^{30}$ ,  $-CN$ ,  $-NO_2$  and at least one of  $R^{21}$  to  $R^{24}$  represents any one of an aryloxy group, an arylthio group and  $-NR^{27}R^{28}$ , in which  $R^{25}$  and  $R^{26}$  each independently represents a hydrogen atom, an alkyl group, an aryl group or an acyl group,  $R^{27}$  and  $R^{28}$  each independently represents a hydrogen atom, an alkyl group, an aryl group, an acyl group, an alkylsulfonyl group or an arylsulfonyl group and  $R^{27}$  and  $R^{28}$  are coupled together to form an alkylene group which may contain  $-O-$ ,  $-S-$ ,  $-SO_2-$  or  $-NR^{29}$ ,  $R^{29}$  representing a hydrogen atom, an alkyl group, an aryl group, an acyl group, an alkylsulfonyl group, an arylsulfonyl group, an alkoxycarbonyl group or an aryloxycarbonyl group, and  $R^{30}$  represents a hydrogen atom, a hydroxyl group, an alkyl group, an aryl group, an alkoxyl group, an aryloxy group or  $-NR^{27}R^{28}$ ,  $R^{27}$  and  $R^{28}$  having the same meanings as defined above;

C represents  $-CO-$  or  $-SO_2-$ ; and

D represents a hydrogen atom, a hydroxyl group, an alkyl group, an aryl group, a heterocyclic group,  $-COR^{31}$  or  $-CR^{32}NR^{33}R^{34}$  in which  $R^{31}$  represents an alkyl group, an aryl group, an alkoxyl group, an aryloxy group or a heterocyclic group and  $R^{32}$  represents  $-O$  or  $-S$ , and  $R^{33}$  and  $R^{34}$  each independently represents a hydrogen atom, an alkyl group, an aryl group, an alkylsulfonyl group or an arylsulfonyl group.

5,773,187

## WATER DEVELOPABLE DIAZONIUM AND MINERAL ACID CONTAINING RECORDING MATERIAL FOR PRODUCING WATER-FREE OFFSET PRINTING PLATES

Willi-Kurt Gries, Wiesbaden; Klaus-Peter Konrad, Ingelheim; Klaus-Juergen Przybilla, Frankfurt am Main, and Hans-Joachim Schlosser, Wiesbaden-Naurod, all of Germany, assignors to Agfa-Gevaert AG, Leverkusen, Germany

Filed May 1, 1996, Ser. No. 640,702

Claims priority, application Germany, May 4, 1995, 195 15 804.0

Int. Cl.<sup>6</sup> G03F 7/021

U.S. Cl. 430—162

26 Claims

1. A water-developable radiation-sensitive recording material comprising in the following order:

a base;

a radiation-sensitive layer comprising a diazonium salt polycondensation product and 3 to 50% by weight, relative to the total weight of the radiation-sensitive layer, of a mineral acid; and

a silicone layer in contact with said radiation sensitive layer.

5,773,188

## LAT IMAGING ONTO INTERMEDIATE RECEPTOR ELEMENTS—LAT DECALCOMANIA™

Ernest W. Ellis, Leverett, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 470,470, Jun. 6, 1995, Pat. No.

5,622,795, which is a division of Ser. No. 105,938, Aug. 13,

1993, abandoned. This application Apr. 21, 1997, Ser. No.

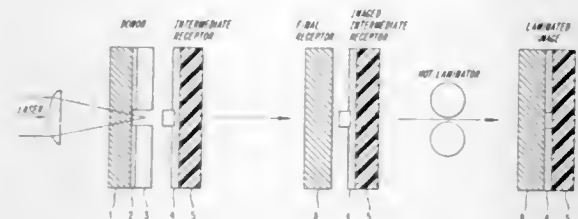
844,611

Int. Cl.<sup>6</sup> G03F 7/34; 7/42

U.S. Cl. 430—201

4 Claims

1. A method for consolidating a contrasting pattern of intelligence borne by a backing therefor with a final receptor base element, comprising (a) imagewise laser-irradiating a LAT imaging



film according to such pattern of intelligence with an intensity sufficient to effect the ablation mass transfer of the volume of the imagewise-exposed area of the laser radiation-ablative mass of said imaging film onto an intermediate receptor element therefor, said intermediate receptor element comprising an adhesively coated LAT image protective overcoat and a base substrate superposed thereon, said ablation mass transfer being onto the adhesive face surface of such intermediate receptor element, and (b) thence imagewise laminating the intermediate receptor thus imaged onto any desired final receptor base element.

5,773,189

## IMAGE FORMATION PROCESS

Takeshi Shibata, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 681,508, Jul. 23, 1996, abandoned.

This application Nov. 14, 1997, Ser. No. 970,748

Claims priority, application Japan, Jul. 25, 1995, 7-189189

Int. Cl.<sup>6</sup> G03C 8/40

U.S. Cl. 430—203

3 Claims

1. An image formation process comprising image exposing a photosensitive element which contains at least a photosensitive silver halide, a binder and a dye donating compound which forms or releases a diffusive dye corresponding or inversely corresponding to an exposure amount, and then transferring the diffusive dye formed or released to a dye fixing element by heat development in the presence of, as a base precursor, a sparingly water-soluble metallic compound and a compound which can react with the metallic ion constituting the sparingly water-soluble metallic compound to form a complex in water as a medium, wherein said process further comprises the step of feeding water to said photosensitive element after image exposure, and the photosensitive element is maintained at a temperature of 40° to 90° C. on undergoing exposure.

5,773,190

## RESIST COMPOSITION

Masayuki Oie, Hideyuki Tanaka, and Nobunori Abe, all of Yokohama, Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 636,201, Apr. 22, 1996, abandoned, which is a continuation of Ser. No. 304,971, Sep. 13, 1994, abandoned, which is a continuation of Ser. No. 895,976, Jun. 9, 1992, abandoned. This application Feb. 10, 1997, Ser. No. 795,266

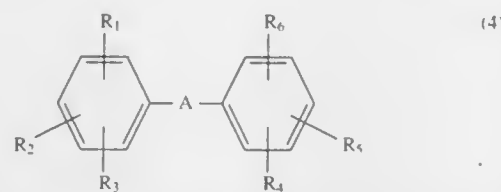
Claims priority, application Japan, Jun. 14, 1991, 3-170723; Jul. 2, 1991, 3-188138

Int. Cl.<sup>6</sup> G03F 7/00

U.S. Cl. 430—270.1

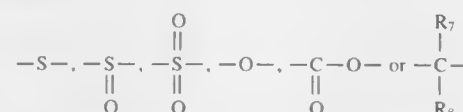
7 Claims

1. A resist composition comprising in admixture:  
(A) 100 parts by weight of an alkali-soluble phenolic resin;  
(B) 0.2–50 parts by weight of a compound which forms an acid upon exposure to active rays and is represented by the following general formula (4):



wherein

R<sub>1</sub> is a halogenated alkoxy group with the proviso that the halogen atom is selected from chlorine and bromine atoms, R<sub>2</sub> through R<sub>6</sub> are independently selected from a hydrogen atom, halogen atoms, a hydroxyl group, alkyl groups, substituted alkyl groups, alkoxy groups and substituted alkoxy groups, and A denotes



and R<sub>7</sub> and R<sub>8</sub> are independently selected from a hydrogen atom, alkyl groups, cycloalkyl groups and alkenyl groups;

(C) 0.01–50 parts by weight of a compound which crosslinks the alkali-soluble phenolic resin in the presence of the acid formed from the compound (b); and

(d) sufficient solvent to dissolve the foregoing composition components.

5,773,191

## RADIATION-SENSITIVE COMPOSITION

Munirathna Padmanaban; Yoshiaki Kinoshita; Satoru Funato; Natsumi Kawasaki; Hiroshi Okazaki, and Georg Pawlowski, all of Saitama, Japan, assignors to Hoechst Japan Limited, Tokyo, Japan

Filed Jul. 24, 1996, Ser. No. 685,850

Claims priority, application Japan, Jul. 26, 1995, 7-211183

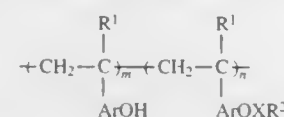
Int. Cl.<sup>6</sup> G03F 7/004; 7/032; 7/30

U.S. Cl. 430—270.1

19 Claims

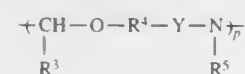
1. A positive-working radiation-sensitive composition comprising:

(a) a copolymer represented by the general formula:



wherein R<sup>1</sup> is a hydrogen atom or a methyl group, R<sup>2</sup> is an alkyl group or a substituted or unsubstituted aryl group, Ar is a substituted or unsubstituted phenylene group or a substituted or unsubstituted cyclohexylene group, X is a divalent group represented by —SO<sub>2</sub>— or —CO—, and m and n are individually an integer not less than 1;

(b) a dissolution inhibitor composed of a compound represented by the general formula:



wherein R<sup>3</sup> is an alkyl group or a substituted or unsubstituted aryl group, R<sup>4</sup> is an alkylene group, a cycloalkylene group, an alkenylene group or an alkynylene group, R<sup>5</sup> is an alkyl group or a cycloalkyl group, Y is —OCO—, —CO— or —NHCO—, and p is an integer not less than 1;

(c) a photosensitive compound capable of generating an acid when exposed to a radiation; and

(e) a solvent.

5,773,192

## ORGANIC SILICON COMPOUND, RESIST, THERMAL POLYMERIZATION COMPOSITION AND PHOTOPOLYMERIZATION COMPOSITION

Shinji Murai, Ichikawa; Yoshihiko Nakano; Ken Uchida, both of Tokyo, and Shuji Hayase, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 490,614, Jun. 15, 1995, Pat. No.

5,624,788. This application Feb. 3, 1997, Ser. No. 794,587

Claims priority, application Japan, Jun. 16, 1994, 6-134095

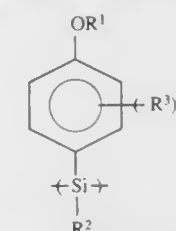
Int. Cl.<sup>6</sup> G03F 7/004; 7/023; 7/027; G08G 7/700

U.S. Cl. 430—270.1

19 Claims

2. A resist comprising

an organic silicon compound having a repeating unit represented by general formula (I) shown below:

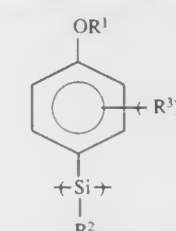


wherein R<sup>1</sup> is a t-butyl group, R<sup>2</sup> is an hydrogen atom, an alkyl group having 1 to 24 carbon atoms, an aryl group having 6 to 24 carbon atoms, or an aralkyl group having 7 to 24 carbon atoms, R<sup>3</sup> is an alkyl group having 1 to 24 carbon atoms, an aryl group having 6 to 24 carbon atoms, an aralkyl group having 7 to 24 carbon atoms or an alkoxy group, and k represents an integer from 0 to 4.

8. A thermal polymerization composition comprising in admixture,

a compound having an unsaturated bond,

an organic silicon compound having a repeating unit represented by general formula (I) shown below:

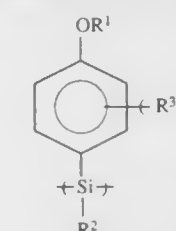


wherein R<sup>1</sup> is a t-butyl group, R<sup>2</sup> is an hydrogen atom, an alkyl group having 1 to 24 carbon atoms, an aryl group having 6 to 24 carbon atoms, or an aralkyl group having 7 to 24 carbon atoms, R<sup>3</sup> is an alkyl group having 1 to 24 carbon atoms, an aryl group having 6 to 24 carbon atoms, a substituted or unsubstituted aralkyl group having 7 to 24 carbon atoms or an alkoxy group, and k represents an integer from 0 to 4.

14. A photopolymerization composition comprising in admixture,

a compound having an unsaturated bond, and

an organic silicon compound having a repeating unit represented by general formula (I) shown below:



wherein R<sup>1</sup> is a t-butyl group, R<sup>2</sup> is an hydrogen atom, an alkyl group having 1 to 24 carbon atoms, an aryl group having 6 to 24 carbon atoms, or an aralkyl group having 7 to 24 carbon atoms, R<sup>3</sup> is an alkyl group having 1 to 24 carbon atoms, an aryl group having 6 to 24 carbon atoms, an aralkyl group having 7 to 24 carbon atoms or an alkoxy group, and k represents an integer from 0 to 4.

5,773,193

## OPTICAL RECORDING LAYERS CONTAINING NO K METALLIZED FORMAZAN DYES MIXED WITH SYMMETRICAL AND UNSYMMETRICAL CYANINE DYES

Derek David Chapman; Michael Paul Cunningham, both of Rochester, and Ramanuj Goswami, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 16, 1996, Ser. No. 734,430

Int. Cl.<sup>6</sup> G03C 1/72; G11B 7/24

U.S. Cl. 430—270.16

14 Claims

1. An optical recording element having a transparent substrate and on the surface of said substrate, a recording layer and a light reflecting layer wherein recording layer comprises a mixture of (a) a metallized formazan dye and (b) a mixture of cyanine dyes, and the unrecorded layer is such that the real part of the refractive index (n) at 780 nm is greater than 1.8 and the imaginary part (k) is less than 0.15 wherein the metallized formazan dye has a k value of 0.00 to 0.02 and the mixture of cyanine dyes is a mixture of symmetrical and unsymmetrical cyanine dyes.

5,773,194

## LIGHT SENSITIVE COMPOSITION, PRESENSITIZED LITHOGRAPHIC PRINTING PLATE AND IMAGE FORMING METHOD EMPLOYING THE PRINTING PLATE

Ryoji Hattori; Tatsuichi Maehashi; Takaaki Kuroki, and Sota Kawakami, all of Hino, Japan, assignors to Konica Corporation, Japan

Filed Aug. 29, 1996, Ser. No. 705,134

Claims priority, application Japan, Sep. 8, 1995, 7-231444

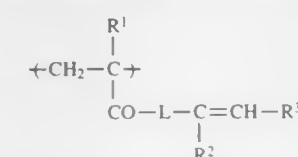
Int. Cl.<sup>6</sup> G03F 7/028; 7/038

U.S. Cl. 430—284.1

10 Claims

1. A light sensitive composition comprising

(a) a vinyl polymer having a unit represented by the following Formula (1) and a carboxyl group, (b) a monomer, oligomer or polymer containing at least one polymerizable double bond in its molecule, (c) a photopolymerization initiator and (d) a polymerization inhibitor, which is a hindered phenol having an acryl, methacryl, vinyl or allyl group.



Formula (1)

wherein R<sup>1</sup> and R<sup>2</sup> independently represent a hydrogen atom or a methyl group; R<sup>3</sup> represents a hydrogen atom, an alkyl group or an aryl group, provided that when R<sup>2</sup> is a methyl group, R<sup>3</sup> is a hydrogen atom; and L represents a divalent linkage group selected from the group consisting of —CH<sub>2</sub>—CH(OH)CH<sub>2</sub>—O—, —OCH<sub>2</sub>—CH(OH)CH<sub>2</sub>—OCO—, —OCH<sub>2</sub>CH<sub>2</sub>—OCONH—, R<sup>4</sup>—NHCOOCH<sub>2</sub>— in which R<sup>4</sup> represents p-phenylene, —OCH<sub>2</sub>CH<sub>2</sub>OCOCH<sub>2</sub>CH<sub>2</sub>COOCH<sub>2</sub>— or —OCH<sub>2</sub>CH<sub>2</sub>OCO—, R<sup>5</sup>—COOCH<sub>2</sub>— in which R<sup>5</sup> represents o-phenylene.



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5,773,195  
CAP PROVIDING FLAT SURFACE FOR DCA AND  
SOLDER BALL ATTACH AND FOR SEALING PLATED  
THROUGH HOLES, MULTI-LAYER ELECTRONIC  
STRUCTURES INCLUDING THE CAP, AND A PROCESS  
OF FORMING THE CAP AND FOR FORMING MULTI-  
LAYER ELECTRONIC STRUCTURES INCLUDING THE  
CAP

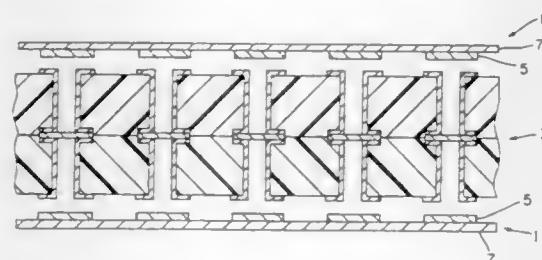
James Steven Kamperman, Endicott; Thomas Patrick Gall,  
Lancaster, and David Brian Stone, Owego, all of N.Y.,  
assignors to International Business Machines Corporation,  
Armonk, N.Y.

Division of Ser. No. 352,144, Dec. 1, 1994, abandoned. This  
application Jun. 7, 1995, Ser. No. 480,300

Int. Cl.<sup>6</sup> G03F 7/00

U.S. Cl. 430—312

11 Claims



1. A process of forming a multi-layer electronic composite structure, said process comprising the steps of:

- providing at least one core including at least one plane of at least one electrically conducting material with a plane of at least one electrically insulating material on both sides of the at least one plane of at least one electrically conducting material, said at least one core including a plurality of plated through holes formed therethrough plated with an electrically conducting material; and
- providing a pad of an electrically-conducting material over at least one of said plated through holes, said pad providing a flat surface for attaching an electronic device, each of said pad also preventing solder from entering said at least one plated through hole and providing an electrical connection between said electronic device and said at least one core, wherein said pad is formed by:
  - forming a panel by providing a plane of an electrically conducting material including a top surface and a bottom surface;
  - depositing a layer of a photosensitive material on said top and bottom surfaces of said plane of at least one electrically conductive plane;
  - exposing said photosensitive material on said bottom surface of said electrically conducting plane to radiation, said radiation causing photochemical reactions to occur within said photosensitive material, said bottom surface being exposed in a pattern matching a pattern of plated through holes formed in said at least one core;
  - exposing all of said photosensitive material to radiation on said top surface of said electrically conducting plane;
  - removing portions of said photosensitive material not exposed to said radiation;
  - depositing an electrically conducting material on portions of said electrically conducting material exposed by removing portions of said photosensitive material not exposed to said radiation;
  - removing all remaining portions of said photosensitive material from said electrically conducting plane;
  - aligning said electrically conducting material deposited on said electrically conducting plane with said plated through holes on said core;
  - joining said plane to said at least one core by laminating said bottom surface of said plane to said core;
  - depositing a layer of a photosensitive material on said top surface of said plane;

- exposing selected portions of said photosensitive material on said top surface of said panel to radiation, said radiation causing photochemical reactions to occur within said photosensitive material;
- developing said photosensitive material to remove portions of said photosensitive material;
- depositing an electrically conducting material where the portions of the photosensitive material were removed;
- removing the remaining portions of the photosensitive material; and
- etching said electrically conducting plane of said panel.

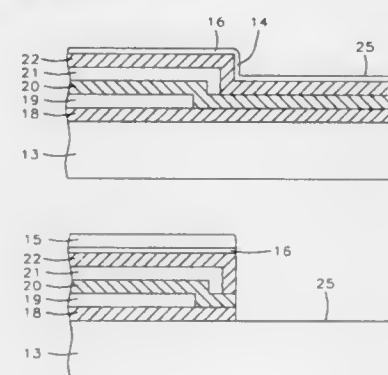
5,773,196  
PREVENTION OF ANTI-REFLECTION COATING  
DAMAGE

Tsu Shih, Changwa, Taiwan, assignor to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chu, Taiwan  
Filed Jul. 22, 1996, Ser. No. 684,806

Int. Cl.<sup>6</sup> G03F 7/00

U.S. Cl. 430—313

4 Claims



1. A method for the manufacture of an integrated circuit, comprising the steps of:

- providing a semiconductor substrate having a cell region and a scribe line region;
- forming alternating layers of metal and insulating materials over said cell region and said scribe line region;
- leaving said metal layers over said scribe line region, but removing said insulating materials from over said scribe line region after deposition of each said layer of insulating material;
- depositing at least one anti-reflective coating over a final metal layer;
- photolithographically patterning said anti-reflective coating, whereby said metal layers in said scribe line region reduce step height between said cell region and said scribe line region preventing damage to said anti-reflective coating; and
- subsequent to patterning said anti-reflective coating, removing said metal layers from over said scribe line region.

5,773,197  
INTEGRATED CIRCUIT DEVICE AND PROCESS FOR  
ITS MANUFACTURE

Kenneth Raymond Carter, San Jose; James Lupton Hedrick, Pleasanton, and Robert Dennis Miller, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 28, 1996, Ser. No. 739,134

Int. Cl.<sup>6</sup> G03C 5/00

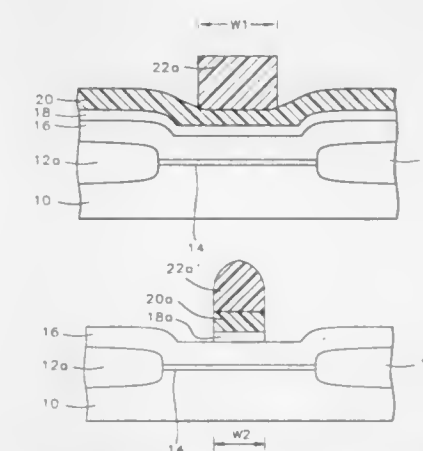
U.S. Cl. 430—313

6 Claims

- A process for forming an integrated circuit comprising:
  - positioning on a substrate a layer of dielectric composition, the composition comprising reactants organic polysilica and a precursor polymer selected from uncondensed polybenzothiazole and polybenzimidazole which is; terminated with

(RO)<sub>m</sub>(R')<sub>n</sub>SiR''— where R and R' are independently a hydrocarbyl group; R'' is hydrido or hydrocarbyl group; m is 1, 2 or 3 and n+m=3;

- heating the composition to react the reactants;
  - lithographically patterning the dielectric layer;
  - depositing a metallic film onto the patterned dielectric layer; and
  - planarizing the film to form the integrated circuit.
4. A process for forming an integrated circuit comprising:
  - depositing a metallic film on a substrate;
  - lithographically patterning the metallic film;
  - depositing on the patterned metallic film, a layer of a dielectric composition comprising reactants organic polysilica and a precursor polymer selected from uncondensed polybenzothiazole and polybenzimidazole which is; terminated with (RO)<sub>m</sub>(R')<sub>n</sub>SiR''— where R and R' are independently a hydrocarbyl group; R'' is hydrido or hydrocarbyl group; m is 1, 2 or 3 and n+m=3;
  - heating the composition to react the reactants.



5,773,198  
METHOD OF FORMING HIGH RESOLUTION  
CIRCUITRY BY DEPOSITING A POLYVINYL ALCOHOL  
LAYER BENEATH A PHOTORESISTIVE POLYMER  
LAYER

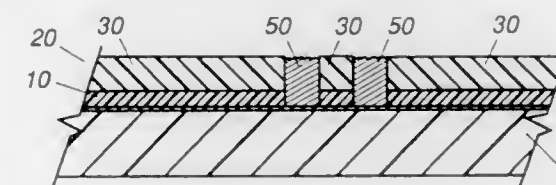
Thomas J. Swirbel, Davie; Anthony B. Suppelsa, and Joaquin Barreto, both of Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 7, 1996, Ser. No. 660,384

Int. Cl.<sup>6</sup> G03C 5/56

U.S. Cl. 430—315

12 Claims



- A method of forming high resolution circuitry, comprising:
  - depositing a thin polyvinyl alcohol layer on a substrate;
  - depositing a photosensitive polymer layer on top of the thin polyvinyl alcohol layer;
  - photodelineating a pattern in the deposited photosensitive polymer layer to reveal portions of the thin polyvinyl alcohol layer;
  - rinsing the revealed portions in a first hot aqueous solution to effect removal of the revealed portions, thereby exposing portions of the substrate;
  - electroplating metal into the photodelineated pattern and onto the exposed portions of the substrate to create a circuitry pattern; and
  - removing the remaining portions of the photosensitive polymer layer and the thin polyvinyl alcohol layer by means of a second hot aqueous solution.

5,773,199  
METHOD FOR CONTROLLING LINEWIDTH BY  
ETCHING BOTTOM ANTI-REFLECTIVE COATING

Kung Linliu, Taipei; Hsu-Li Cheng, Tainan, and Eric S. Jeng, Taipei, all of Taiwan, assignors to Vanguard International Semiconductor Corporation, Hsin-Chu, Taiwan

Filed Sep. 9, 1996, Ser. No. 711,142

Int. Cl.<sup>6</sup> G03F 7/00

U.S. Cl. 430—316

18 Claims

- A method for forming a patterned layer within an integrated circuit comprising:
  - providing a substrate;
  - forming over the substrate a blanket target layer;

forming upon the blanket target layer a blanket focusing layer, the blanket focusing layer being formed from an organic anti-reflective coating (ARC) material, the blanket focusing layer being susceptible to a reproducible negative etch bias within a first etch method employed in forming from the blanket focusing layer a patterned focusing layer, the first etch method being a first plasma etch method employing a reactant gas composition comprising trifluoromethane, carbon tetrafluoride, oxygen and argon;

forming upon the blanket focusing layer a blanket photoresist layer; photoexposing and developing the blanket photoresist layer to form a patterned photoresist layer;

etching through use of the first etch method the blanket focusing layer to form the patterned focusing layer while employing the patterned photoresist layer as a first etch mask layer, the patterned focusing layer having the reproducible negative etch bias with respect to the patterned photoresist layer; and

etching through use of a second etch method the blanket target layer to form a patterned target layer while employing the patterned focusing layer as a second etch mask layer, the patterned target layer having a reproducible second etch bias with respect to the patterned focusing layer, where the reproducible second etch bias does not substantially compensate the reproducible negative etch bias.

5,773,200  
POSITIVE RESIST COMPOSITION SUITABLE FOR LIFT-OFF TECHNIQUE AND PATTERN FORMING METHOD  
Satoshi Okazaki; Kazuhiro Nishikawa; Masaru Kobayashi; Miki Kobayashi; Mitsuo Umemura, all of Usui-gun, and Toshinobu Ishihara, Nakakubiki-gun, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

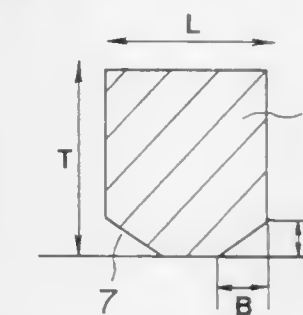
Division of Ser. No. 493,612, Jun. 22, 1995, abandoned. This application Dec. 15, 1995, Ser. No. 573,578

Claims priority, application Japan, Jun. 23, 1994, 6-164634

Int. Cl.<sup>6</sup> G03F 7/38; 7/42; 7/023

U.S. Cl. 430—324

10 Claims



- A method for forming a conductor pattern by a lift-off technique comprising the steps of:
  - forming only one resist layer on one surface of a substrate,

processing the resist layer to form a resist pattern, metallizing the substrate surface including the resist pattern, and stripping off the resist pattern to leave a pattern of metallization on the substrate.

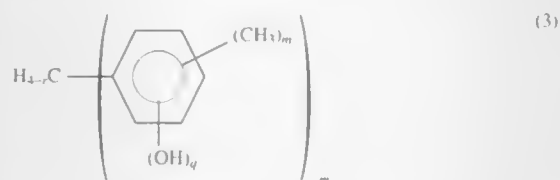
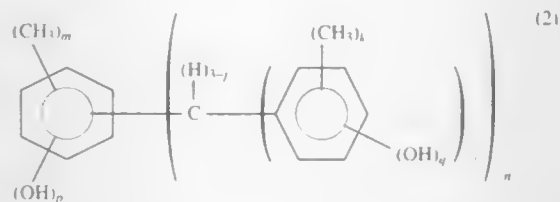
wherein said resist layer is formed from a positive resist composition comprising in admixture:

- (1) 80 parts by weight of an alkali-soluble novolak resin containing a recurring unit of the following general formula (1):



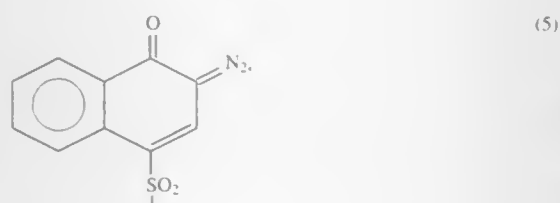
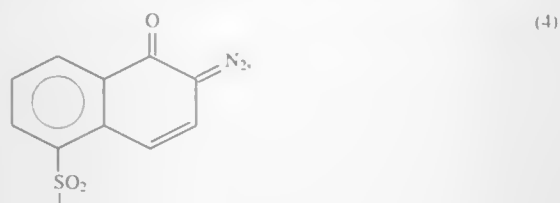
wherein m is an integer of 0 to 3, having a weight average molecular weight calculated as polystyrene of 2,000 to 10,000.

- (2) about 20 to 40 parts by weight of a low nucleus compound having a phenolic hydroxyl group and 2 to 5 benzene rings represented by one of the following general formulae (2) or (3):



wherein j is 1 or 2, each of k, m and p is an integer of 0 to 3, n is an integer of 1 to 4, q is an integer of 1 to 3, r is an integer of 2 or 3, m+p+n ≤ 6, and k+q ≤ 5, as a dissolution promoter, and

- (3) about 15 to 60 parts by weight of a compound having a 1,2-naphthoquinonediazidosulfonyl group in a molecule represented by one of the following general formula (4) or (5), with a degree of esterification of at least 65%:



as a photosensitive agent,

wherein the processing to form the resist layer comprises exposing the resist layer to light through a pattern and then developing the resist layer to form the resist pattern, and also baking the resist layer at a temperature of 100° to 130° C. before exposing the resist layer to light or before developing the resist layer,

wherein said resist pattern is formed with a micro-groove in its surface joining the substrate so that a profile of said resist pattern has a line width of L μm and a thickness of T μm, and the micro-groove has a cut height of A μm and a cut depth of B μm, where T is 20 μm or less and extent of the microgroove is defined by the equations (I) and (II):

$$1/20 \leq A/T \leq 3/4 \quad (I)$$

$$1/10 \leq A/B \leq 2 \quad (II)$$

5,773,201

#### METHOD OF STRIPPING A RESIST MASK

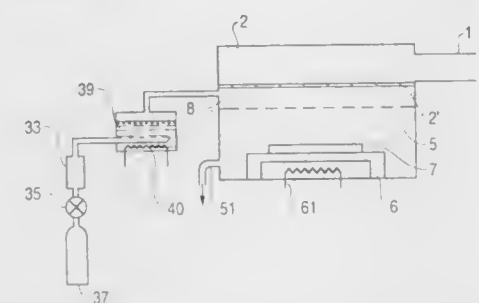
Shuzo Fujimura, Tokyo; Keisuke Shinagawa, Kawasaki, and Naomichi Abe, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 69,402, Apr. 30, 1993, abandoned, which is a continuation of Ser. No. 590,595, Sep. 27, 1990, abandoned, which is a continuation of Ser. No. 232,096, Aug. 15, 1988, abandoned. This application Feb. 9, 1994, Ser. No. 193,893

Claims priority, application Japan, Aug. 19, 1987, 62-203985 Int. Cl.<sup>6</sup> B03F 7/42; C23C 15/00

U.S. Cl. 430—329

19 Claims



1. A downstream ashing method for removing an organic resist film from a semiconductor wafer, said method comprising: placing a semiconductor wafer having an organic resist film thereon in a reaction chamber;

creating a gas plasma containing both electrically neutral species and charged particles by subjecting a gas containing oxygen to electromagnetic power;

ashing the organic resist film on said semiconductor wafer by exposing the wafer with the film thereon to said neutral species while shielding the wafer from said charged particles; and

reducing an activation energy of the ashing reaction between the organic resist film and said neutral species, thereby reducing the temperature necessary to drive the ashing reaction at a predetermined given rate, by causing said gas containing oxygen to also contain a water vapor.

5,773,202

#### METHOD FOR PROCESSING COLOR PHOTOGRAPHIC FILMS USING A PEROXIDE BLEACHING COMPOSITION

Shirleyanne Elizabeth Haye; Terrence Robert O'Toole; David Leroy Cole, and John Michael Buchanan, all of Eastman Kodak Company, Rochester, N.Y. 14650

Continuation-in-part of Ser. No. 391,805, Feb. 21, 1995, abandoned. This application Mar. 29, 1996, Ser. No. 625,055

Int. Cl.<sup>6</sup> G03C 5/44; 5/12

U.S. Cl. 430—393

19 Claims

1. A method for processing a color photographic element comprising:

bleaching an imagewise exposed and developed color photographic film containing a silver halide emulsion having at

least 20 mol % silver bromide, and from 0 to 0.5 mol % silver iodide, with a peroxide bleaching solution consisting essentially of:

a peroxide bleaching agent, and chloride ions present in an amount of at least 0.35 mol/l, said bleaching carried out within about 60 seconds.

liquid layer between said top liquid layer and said support, the top liquid layer containing a given concentration of at least one surfactant, said process being characterized in that a surfactant present in the top liquid layer is introduced into the intermediate liquid layer adjacent to said top liquid layer at a concentration equal to at least 50% of the concentration of said surfactant in said top liquid layer.

5,773,203

#### 4-(N, N-DIALKYLAMINO) ANILINE COMPOUNDS, PHOTOGRAPHIC PROCESSING COMPOSITION CONTAINING THE SAME AND COLOR IMAGE-FORMING METHOD

Keizo Kimura; Shigeo Hirano, and Hiroshi Kawamoto, all of Minami-Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

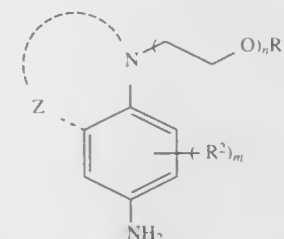
Filed May 14, 1997, Ser. No. 856,015

Claims priority, application Japan, May 16, 1996, 8-121472 Int. Cl.<sup>6</sup> G03C 7/407

U.S. Cl. 430—442

9 Claims

1. A color image-forming method which comprises the setup of developing an image-exposed silver halide color photographic photosensitive material in the presence of an aniline compound represented by the following general formula (I):



wherein R<sup>1</sup> represents a hydrogen atom or substituent, R<sup>2</sup> represents a substituent, Z represents a substituted or unsubstituted ethylene group or substituted or unsubstituted trimethylene group, n represents an integer of 2 to 8, and m represents 0 or an integer of 1 to 3, and when m is 2 or larger, R<sup>2</sup>'s may be the same or different from each other.

5,773,204

#### PHOTOGRAPHIC COATING PROCESS

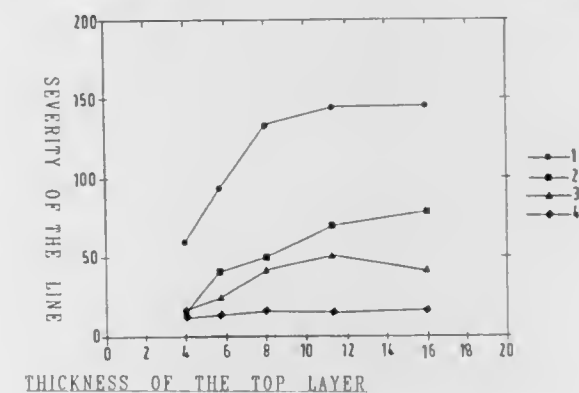
Jean Marie Baumlín, Chalon-sur-Saône, France, assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 538,088, Oct. 2, 1995. This application Mar. 17, 1997, Ser. No. 819,218

Claims priority, application France, Oct. 5, 1994, 94 12091 Int. Cl.<sup>6</sup> G03C 5/18; 5/26

U.S. Cl. 430—449

7 Claims



1. Photographic coating process consisting of depositing on a support an assembly of at least two superimposed liquid layers, at least one of which consists of a photosensitive composition, said assembly including a top liquid layer and at least one intermediate

5,773,205

#### FILM SPOOL CARTRIDGE AND CAMERA CONTAINING DUPLITIZED COLOR SILVER HALIDE PHOTOGRAPHIC ELEMENT

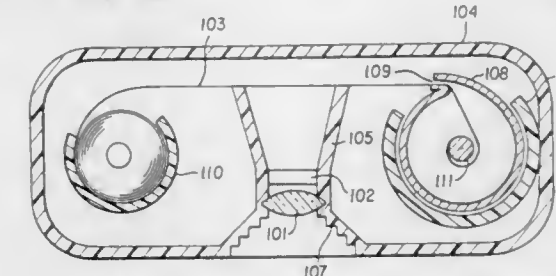
Richard P. Szajewski, Rochester, and Gary L. House, Victor, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 7, 1997, Ser. No. 834,576

Int. Cl.<sup>6</sup> G03C 3/00; 1/46

U.S. Cl. 430—501

22 Claims



1. A film spool cartridge comprising a spindle, a light sensitive silver halide color photographic element wound around said spindle, and an aperture for film transport.

said element exhibiting a sensitivity of at least ISO 25, and comprising a support having thereon at least two color recording units.

each of said at least two color recording units being sensitive to a distinct region of the electromagnetic spectrum, and each comprising at least one silver halide emulsion layer having light sensitive silver halide emulsion grains in reactive association with a compound capable of forming an image dye during a color development step, thereby providing at least two such silver halide emulsion layers sensitive to distinct regions of the electromagnetic spectrum in said element, wherein said support is interposed between two of said silver halide emulsion layers sensitive to distinct regions of the electromagnetic spectrum.

5,773,206

#### INFRARED SENSOR DETECTABLE IMAGING ELEMENTS

Stephen A. Hershey, Fairport; James C. Bolthouse, Spencerport, and Robert E. Dickerson, Hamlin, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 21, 1997, Ser. No. 840,517

Int. Cl.<sup>6</sup> G03C 1/76; 5/16

U.S. Cl. 430—510

11 Claims

1. An element capable of producing silver images having a maximum density of at least 3.0 in response to imagewise exposure to visible light and processing in a reference processing cycle, said element being comprised of a transparent film support and,

coated on the support, hydrophilic colloid layers including, dispersed in at least one layer, compact radiation-sensitive silver halide grains (a) exhibiting a mean size of less than 0.5 μm, (b) containing less than 3 mole percent iodide, based on silver, and (c) coated at a total silver coating coverage of less than 50 mg/dm<sup>2</sup>.

WHEREIN the specular density of the element to infrared radiation in the wavelength range of from 850 to 1100 nm is increased by the presence of compact particles dispersed in at least one of the hydrophilic colloid layers positioned to receive imagewise expo-



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sure to visible light after at least one of the hydrophilic colloid layers containing said radiation-sensitive silver halide grains, said particles (a) being removable from the element during the reference processing cycle, (b) having a mean size of from 0.3 to 1.1  $\mu\text{m}$  and at least 0.1  $\mu\text{m}$  larger than the mean grain size of the radiation-sensitive grains, and (c) having an index of refraction at the wavelength of the infrared radiation that differs from the index of refraction of the hydrophilic colloid by at least 0.2,

said reference processing cycle consisting of  
development 24 seconds at 35° C.  
fixing 20 seconds at 35° C.  
washing 20 seconds at 35° C.  
drying 20 seconds at 65° C.

with up to 6 seconds being taken up in film transport between processing steps, development employing the following composition:

hydroquinone 30 g  
1-phenyl-3-pyrazolidone 1.5 g  
KOH 21 g  
NaHCO<sub>3</sub> 7.5 g  
K<sub>2</sub>SO<sub>3</sub> 44.2 g  
Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> 12.6 g  
NaBr 35.0 g  
5-methylbenzotriazole 0.06 g  
glutaraldehyde 4.9 g  
water to 1 liter at a pH 10.0,

and fixing employing the following composition:

Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub> in water at 60% of total weight 260.0 g  
NaHSO<sub>3</sub> 180.0 g  
boric acid 25.0 g  
acetic acid 10.0 g  
water to 1 liter at a pH of 3.9-4.5.

5,773,207

## PHOTOGRAPHIC EMULSIONS

Richard A. Barcock, Stansted Mountfitchet, and Rachel J. Hobson, Great Dunmow, both of England, assignors to Imation Corp., Oakdale, Minn.

Filed Dec. 16, 1996, Ser. No. 767,464

Claims priority, application United Kingdom, Jan. 9, 1996, 9600396

Int. Cl.<sup>6</sup> G03C 1/043; 1/035

U.S. Cl. 430—567 16 Claims

1. A silver halide photographic emulsion comprising tabular silver halide grains and a block copolymer, wherein said block copolymer was present during the preparation of said tabular silver halide grains and is selected from the group consisting of A—B, A—(B—A)<sub>m</sub>, B—(A—B)<sub>m</sub>, (A—B)<sub>p</sub>—X, (B—A)<sub>p</sub>—X, [A—(B—A)<sub>m</sub>]<sub>p</sub>—X, and [B—(A—B)<sub>m</sub>]<sub>p</sub>—X

where m is an integer of 1 or more, p is an integer of 3 or more,

X represents a p-valent linking group, A represents a poly(tetrahydrofuran) block, and B represents a poly(ethylene oxide) block, wherein said poly(tetrahydrofuran) block and said poly(ethylene oxide) block are connected to each other by either a direct bond or a divalent linking group.

5,773,208

## LATENT IMAGE KEEPING IMPROVEMENT WITH A HEXOSE REDUCTONE AND GREEN SENSITIZED EPITAXIALLY-FINISHED TABULAR GRAIN EMULSIONS

Jeffrey L. Hall, and James H. Reynolds, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

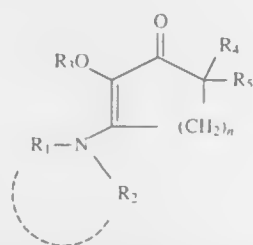
Filed Nov. 27, 1996, Ser. No. 757,362

Int. Cl.<sup>6</sup> G03C 1/06

U.S. Cl. 430—607 39 Claims

1. An emulsion comprising silver halide grains, said grains being tabular and comprising sensitizing dye(s) and silver salt epitaxial deposits, and as addenda

a tetraazaindene and a hexose reductone represented by Formula I:



wherein R<sub>1</sub> and R<sub>2</sub> are the same or different, and may represent H, alkyl, cycloalkyl, aryl, or an alkyl group with a solubilizing group such as —OH, sulfonamide, sulfamoyl, or carbamoyl. R<sub>3</sub> and R<sub>4</sub> may be joined to complete a heterocyclic ring, R<sub>5</sub> and R<sub>6</sub> are H, OH, alkyl, aryl, cycloalkyl, or may together represent an alkylidene group, n is 0, 1, or 2 and R<sub>3</sub> is H, alkyl, aryl, or CO<sub>2</sub>R<sub>6</sub>, where R<sub>6</sub> is alkyl.

5,773,209

## TREATMENT FOR ATHEROSCLEROSIS AND OTHER CARDIOVASCULAR AND INFLAMMATORY DISEASES

Russell M. Medford; R. Wayne Alexander; Sampath Parthasarathy, all of Atlanta, and Bobby V. Khan, Dunwoody, all of Ga., assignors to Emory University, Atlanta, Ga.

Continuation of Ser. No. 317,399, Oct. 4, 1994, which is a continuation-in-part of Ser. No. 240,858, May 10, 1994, which is a continuation-in-part of Ser. No. 969,934, Oct. 30, 1992, Pat. No. 5,380,747. This application Jun. 7, 1995, Ser. No. 484,059

Int. Cl.<sup>6</sup> G01N 33/53

U.S. Cl. 435—724 16 Claims

1. A method for the prediction or assessment of redox-sensitive gene mediated disease in vivo, comprising quantifying the level of oxidized polyunsaturated fatty acid in the tissue or blood.

5,773,210

## ACQUIRED IMMUNE DEFICIENCY SYNDROME (AIDS) VIRAL ENVELOPE PROTEIN AND METHOD OF TESTING FOR AIDS

Robert M. Crowl, Cedar Grove, N.J.; Robert C. Gallo, Bethesda, Md.; E. Prem Reddy, Villanova, Pa.; George M. Shaw, Birmingham, Ala., and Flossie Wong-Staal, Rockville, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Division of Ser. No. 811,896, Dec. 20, 1991, which is a continuation of Ser. No. 244,590, Sep. 13, 1988, which is a continuation of Ser. No. 725,021, Apr. 19, 1985. This application Oct. 6, 1993, Ser. No. 132,406

Int. Cl.<sup>6</sup> C12Q 1/70; G01N 33/53; C12P 21/04; C07K 14/155

U.S. Cl. 435—5 5 Claims

1. A method of testing human blood for the presence of antibodies to the viral etiological agent of AIDS which comprises mixing a composition containing a recombinant polypeptide having a portion of the envelope protein of an acquired immune deficiency syndrome virus with a sample of human blood and determining whether any AIDS antibodies present in the blood sample bind to said polypeptide, said envelope polypeptide portion having the following amino acid sequence of the HTLV-III envelope protein, from amino to carboxyl terminus

ValTrpLysGluAla  
ThrThrThrLeuPheCysAlaSerAspAlaLysAlaTyrAspThrGluValHisAsnVal  
TrpAlaThrHisAlaCysValProThrAspProAsnProGlnGluValValLeuValAsn  
ValThrGluAsnPheAsnMETTrpLysAsnAspMETValGluGlnMETHisGlu  
AspIleLeuSerLeuTrpAspGlnSerLeuLysProCysValLysLeuThrProLeuCys  
ValSerLeuLysCysThrAspLeuLysAsnAspThrAsnThrAsnSerSerGlyArg  
METIleMETGluLysGlyGluIleLysAsnCysSerPheAsnIleSerThrSerLeuArg  
GlyLysValGlnLysGluTyrAlaPhePheTyrLysLeuAspIleLeuProlleAspAsnAsp  
ThrThrSerTyrThrLeuThrSerCysAsnThrSerValIleThrGlnAlaCysProLysVal  
SerPheGluProlleProlleHisTyrCysAlaProAlaGlyPheAlaIleLeuLysCys

-continued

AsnAsnLysThrPheAsnGlyThrGlyProCysThrAsnValSerThrValGlnCysThr  
HisGlylleArgProValValSerThrGlnLeuLeuAsnGlySerLeuAlaGluGlu  
GluValValIleArgSerValAsnPheThrAspAsnAlaLysThrIlelleValGlnLeu  
AsnThrSerValGluIleAsnCysThrArgProAsnAsnAsnThrArgLysLysIleArg  
IleGlnArgGlyProGlyArgAlaPheValThrIleGlyLysIleGlyAsnMETArgGln  
AlaHisCysAsnIleSerArgAlaLysTrpAsnAlaThrLeuLysGlnIleAlaSerLys  
LeuArgGluGlnPheGlyAsnAsnLysThrIlellePheLysGlnSerSerGlyGlyAsp  
ProGluIleValThrHisSerPheAsnCysGlyGlyGluPhePheTyrCysAsnSerThr  
GlnLeuPheAsnSerThrTrpPheAsnSerThrTrpSerThrGluGlySerAsnAsnThr  
GluGlySerAspThrIleThrLeuProCysArgIleLysGlnPheIleAsnMETTrpGln  
GluValGlyLysAlaMETTrpAlaProProlleSerGlyGlnIleArgCysSerSerAsn  
IleThrGlyLeuLeuLeuThrArgAspGlyGlyAsnAsnAsnGlySerGluIlePhe  
ArgProGlyGlyGlyAspMETArgAspAsnTrpArgSerGluLeuTyrLysTyrLys  
ValValLysIleGluProLeuGlyValAlaProThrLysAlaLysArgValValGln  
ArgGluLysArgAlaValGlyIleGlyAlaLeuPheLeuGlyPheLeuGlyAlaAlaGly  
SerThrMETGlyAlaAlaSerMETThrLeuThrValGlnAlaArgGlnLeuLeuSer  
GlyIleValGlnGlnGlnAsnAsnLeuLeuArgAlaIleGluAlaGlnGlnHisLeuLeu  
GlnLeuThrValTrpGlyIleLysGlnLeuGlnAlaArgIleLeuAlaValGluArgTyr  
LeuLysAspGlnGlnLeuLeuGlyIleTrpGlyCysSerGlyLysLeuIleCysThrThr  
AlaValProTrpAsnAlaSerTrpSerAsnLysSerLeuGluGlnIleTrpAsnHisThr  
ThrTrpMETGluTrpAspArgGluIleAsnAsnTyrThrSer.

5,773,211

## DIFFERENTIATION OF HTLV-I AND HTLV-II USING SYNTHETIC PEPTIDES

Jessie W. Shih, Lake Forest; John D. Burczak, Highland Park; Helen H. Lee, Lake Forest, and Debra L. O'Donnell, Antioch, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 170,063, Dec. 20, 1993, abandoned, which is a continuation-in-part of Ser. No. 727,765, Jul. 10, 1991, abandoned. This application Oct. 18, 1996, Ser. No. 732,751

Int. Cl.<sup>6</sup> C12Q 1/70; G01N 33/569; 33/574

U.S. Cl. 435—5 17 Claims

1. A method for differentiating antibodies against HTLV-I from antibodies against HTLV-II in a test sample, comprising:

- determining the presence of antibodies against HTLV-I in said test sample, said determination comprising the steps of:
  - forming a first mixture by contacting said test sample with a peptide consisting of the amino acid sequence corresponding to SEQ. ID. No. 1;
  - incubating said first mixture for a time and under conditions sufficient to form complexes between said peptide and said HTLV-I antibody;
  - contacting said complexes with an indicator reagent comprising a signal generating compound attached to an anti-human IgG antibody, to form a second mixture;
  - incubating said second mixture for a time and under conditions sufficient to form complexes comprising said peptide, said HTLV-I antibody and said IgG antibody;
  - determining the presence of antibodies against HTLV-I in said test sample by detecting signal generated by said signal generating compound;
- determining the presence of antibodies against HTLV-II in said test sample, said determination comprising:
  - forming a first mixture by contacting said test sample with a peptide consisting of the amino acid sequence corresponding to SEQ. ID. No. 15;
  - incubating said first mixture for a time and under conditions sufficient to form complexes between said peptide and said HTLV-II antibody;
  - contacting said complexes with an indicator reagent comprising a signal generating compound attached to an anti-human IgG antibody, to form a second mixture;
  - incubating said second mixture for a time and under conditions sufficient to form complexes comprising said peptide, said HTLV-II antibody and said IgG antibody;
  - determining the presence of antibodies against HTLV-II in said test sample by detecting signal generated by said signal generating compound;
- determining the pattern of reaction of said test sample for antibodies against HTLV-I and HTLV-II to distinguish between HTLV-I and HTLV-II infections.

5,773,212

## BUFFER COMPOSITION FOR REAGENTS FOR IMMUNOASSAY

Steve David Figard, Zion, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 482,710, Jun. 7, 1995, Pat. No. 5,616,460.

This application Oct. 16, 1996, Ser. No. 734,435

Int. Cl.<sup>6</sup> G01N 33/576

U.S. Cl. 435—5 32 Claims

1. An aqueous composition comprising:  
at least one biological buffer in a concentration ranging from about 10 mM to about 500 mM;  
dithiothreitol in a concentration ranging from about 2 mM to about 10 mM; and  
ethylene glycol in a concentration ranging from about 4%, to 8%, wherein % means g/100 ml;  
wherein said composition has a pH of below about 7.2.

5,773,213

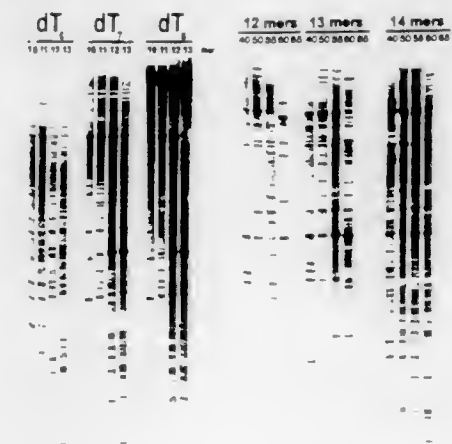
## METHOD FOR CONDUCTING SEQUENTIAL NUCLEIC ACID HYBRIDIZATION STEPS

Steven R. Gullans, Natick; Ryoji Kojima, Boston, and Jeffrey Randall, Acton, all of Mass., assignors to Brigham & Women's Hospital, Boston, Mass.

Filed Jun. 6, 1994, Ser. No. 254,811

Int. Cl.<sup>6</sup> C07H 21/02; 21/04; C12P 19/34; C12Q 1/68

U.S. Cl. 435—6 17 Claims



1. A method of minimizing prior probe interference in processes using successive nucleic acid hybridization steps, comprising the steps of:

- hybridizing, in the first nucleic acid hybridization step of said processes, a first probe or primer to at least one complementary template under stringency conditions that are sufficiently low to allow hybridization to take place, and
- in each successive nucleic acid hybridization step of said processes hybridizing each successive probe or primer to its complementary template under conditions of successively higher stringency, such that the hybridization of the successive probe or primer is favored, while the hybridization of prior-used probes or primers is disfavored;

wherein the length of each successive probe or primer is longer than the length of the immediately prior-used probe or primer, but less than three times of said length and whereby prior-probe interference is minimized.

5,773,214  
MULTIPLE DRUG RESISTANCE GENE OF  
*ASPERGILLUS FLAVUS*

Robert B. Peery, Brownsburg, and Paul L. Skatrud, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 27, 1995, Ser. No. 395,246

Int. Cl.<sup>6</sup> C12Q 1/68; C12N 1/20; 1/14; 15/00

U.S. Cl. 435—6

20 Claims

1. An isolated nucleic acid molecule that encodes a multiple drug resistance protein of *Aspergillus flavus* AFI-MDR-1.

5,773,215  
TUMOR MARKER PROTEIN FOR CANCER RISK  
ASSESSMENT

Margaret Hanausek-Walaszek, Bastrop; Thomas J. Slaga, Austin, and Zbigniew Walaszek, Bastrop, all of Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Continuation-in-part of Ser. No. 236,547, May 2, 1994, abandoned, which is a division of Ser. No. 12,972, Feb. 2, 1993, Pat. No. 5,310,653, which is a continuation of Ser. No. 426,408, Oct. 24, 1989, abandoned. This application Mar. 17, 1995, Ser. No. 405,648

Int. Cl.<sup>6</sup> C12Q 1/68; G01N 33/574

U.S. Cl. 435—6

24 Claims

1. A nucleic acid molecule of less than 2200 base pairs (DNA) or less than 2200 bases (RNA) substantially free of other proteinaceous and nucleic acid materials, wherein said molecule is selected from the group consisting of:

- a DNA segment comprising a sequence region having the sequence of SEQ ID NO: 1; and
- an RNA segment comprising a sequence region having the sequence of SEQ ID NO: 1 with a proviso that in said RNA molecule, the deoxynucleotides A, G, C and T of SEQ ID NO: 1 are replaced by ribonucleotides A, G, C and U, respectively.

5,773,216  
MODIFIED HIV-POL POLYPEPTIDE HAVING  
IMMUNOLOGICAL ACTIVITY FOR USE AS  
DIAGNOSTIC REAGENT

C. Yong Kang, Gloucester, Canada, assignor to University of Ottawa, Ottawa, Canada

PCT No. PCT/CA90/00062, § 371 Date Aug. 21, 1991, § 102(e) Date Aug. 21, 1991, PCT Pub. No. WO90/10230, PCT Pub. Date Sep. 7, 1990

Filed Feb. 23, 1990, Ser. No. 743,357

Claims priority, application Canada, Feb. 23, 1989, 591908; United Kingdom, Apr. 18, 1989, 8908725

Int. Cl.<sup>6</sup> C12Q 1/70

U.S. Cl. 435—5

2 Claims

1. A method of testing for exposure of an organism to HIV, which comprises providing an HIV antigen, contacting said antigen with a sample from said organism and detecting any antigen-antibody complexes created as a result of said contact as indicative of exposure of said organism to HIV, said antigen being a polypeptide having the amino acid sequence of SEQ ID NO:22.

5,773,217  
ACTIVATION OF SPERM NUCLEI AND ACTIVATION  
ASSAYS

Lawrence J. Wagh, Auburndale, Mass., assignor to Brandeis University, Waltham, Mass.

Division of Ser. No. 190,771, Feb. 1, 1994, Pat. No. 5,651,992, which is a continuation-in-part of Ser. No. 13,039, Feb. 3, 1993, Pat. No. 5,480,772. This application May 31, 1995, Ser. No. 455,981

Int. Cl.<sup>6</sup> C12Q 1/68; C12N 1/38; A61K 35/54

U.S. Cl. 435—6

44 Claims

1. A method for activating a nucleus of an animal sperm cell comprising:

- permeabilizing the plasma membrane of said sperm cell to form a permeabilized sperm cell,
- contacting said permeabilized sperm cell with an extract comprising cytoplasm that contains cytosolic factor (CSF) and is prepared from at least one MII-phase egg arrested in meiotic metaphase II of the cell cycle, and
- contacting said CSF-treated sperm cell with the cytoplasm of at least one activated egg.

5,773,218  
METHOD TO IDENTIFY COMPOUNDS WHICH  
MODULATE ICAM-RELATED PROTEIN INTERACTIONS

W. Michael Gallatin, and Rosemary Vazeux, both of Seattle, Wash., assignors to ICOS Corporation, Bothell, Wash.

Division of Ser. No. 286,754, Aug. 5, 1994, which is a continuation-in-part of Ser. No. 102,852, Aug. 5, 1993, abandoned, which is a continuation-in-part of Ser. No. 9,266, Jan. 22, 1993, abandoned, and Ser. No. 894,061, Jun. 5, 1992, abandoned, which is a continuation-in-part of Ser. No. 889,724, May 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 827,689, Jan. 27, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 482,882

Int. Cl.<sup>6</sup> C12Q 1/68

U.S. Cl. 435—6

2 Claims

1. A method for identifying a compound that modulates the interaction of ICAM-R and the 14.3.3 family member HSI-beta comprising the steps of:

- transforming or transfecting appropriate host cells with a DNA construct comprising a reporter gene under the control of a promoter regulated by a transcription factor having a DNA-binding domain and an activating domain;
- expressing in said host cells a first hybrid DNA sequence encoding a first fusion of part or all of ICAM-R and either the DNA binding domain or the activating domain of said transcription factor;
- expressing in said host cells a second hybrid DNA sequence encoding part or all of HSI-beta and the DNA binding domain or activating domain of said transcription factor which is not incorporated in said first fusion;
- evaluating the effect of a putative modulating compound on the interaction between ICAM-R and HSI-beta by detecting binding of HSI-beta to ICAM-R in a particular host cell by measuring the production of reporter gene product in said host cell in the presence or absence of said putative modulator; and
- identifying modulating compounds as those compounds altering production of said reported gene product in comparison to production of said reporter gene product in the absence said modulating compound.

5,773,219  
PROCESS FOR DETECTING ALZHEIMER DISEASE  
USING CULTURED CELLS

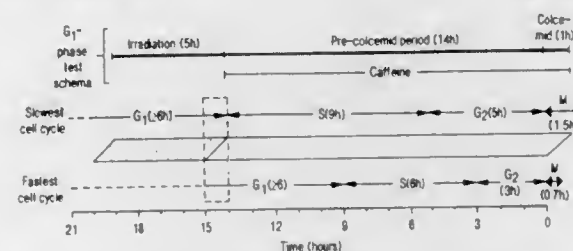
Katherine K. Sanford-Mifflin, Dover, Del.; Ram Parshad, Olney, and Jay H. Robbins, Potomac, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 228,825, Apr. 18, 1994, abandoned, which is a continuation-in-part of Ser. No. 957,315, Oct. 6, 1992, abandoned. This application Mar. 8, 1996, Ser. No. 611,330

Int. Cl.<sup>6</sup> C12Q 1/68; 1/02

U.S. Cl. 435—6

20 Claims



1. A process for indicating a diagnosis of Alzheimer disease in a patient suspected of having Alzheimer disease comprising the steps of:

- obtaining cells from the patient;
- culturing the cells to obtain cell cultures wherein G<sub>1</sub>-phase cells are present;
- irradiating with fluorescent light the cell cultures wherein G<sub>1</sub>-phase cells are present to obtain irradiated cell cultures;
- adding caffeine to approximately half of the irradiated cell cultures;
- incubating the irradiated cell cultures to allow for DNA repair;
- arresting cell division in the irradiated cell cultures;
- counting chromatid breaks and chromatid gaps to determine an amount of chromatid damage in the irradiated cell cultures to which caffeine was added;
- counting chromatid breaks and chromatid gaps to determine an amount of chromatid damage in the irradiated cell cultures to which caffeine was not added;
- determining whether there is a significant increase in the amount of chromatid damage in the irradiated cell cultures to which caffeine was added as compared to the amount of chromatid damage in the irradiated cell cultures to which caffeine was not added;

wherein a significant increase in the amount of chromatid damage in the irradiated cell cultures to which caffeine was added as compared to the amount of chromatid damage in the irradiated cell cultures to which caffeine was not added indicates the diagnosis of Alzheimer disease in patients suspected of having Alzheimer disease.

5,773,220  
DETERMINATION OF ALZHEIMER'S DISEASE RISK  
USING APOLIPOPROTEIN E AND  $\alpha$ -1  
ANTICHYMOTRYPSIN GENOTYPE ANALYSIS

Steven T. DeKosky, and M. Ilyas Kamboh, both of Pittsburgh, Pa., assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed Jul. 25, 1996, Ser. No. 686,336

Int. Cl.<sup>6</sup> C07H 21/04; C12Q 1/68; C12P 19/34; G01N 33/53

U.S. Cl. 435—6

18 Claims

1. A method of detecting if a subject is at increased risk of developing Alzheimer's disease (AD), comprising:

- detecting the presence or absence of one or two APOE4 alleles in the subject; and
- detecting the presence or absence of one or two ACT/A alleles in the subject; and
- determining if the subject is at increased risk of developing Alzheimer's disease, wherein the presence of one or two

APOE4 alleles and two ACT/A alleles in the subject indicates that the subject is at increased risk for developing AD.

5,773,221  
METHOD OF RECOVERING A BIOLOGICAL  
MOLECULE FROM A RECOMBINANT  
MICROORGANISM

Peter S. Carlson, Alexandria; Ernesto J. Quintero, McLean, both of Va.; David M. Manyak, Ellicott City, and Alan B. Churny, Frederick, both of Md., assignors to Oceanix Biosciences Corporation, Hanover, Md.

Filed Dec. 13, 1996, Ser. No. 766,308

Int. Cl.<sup>6</sup> C12Q 1/68

U.S. Cl. 435—6

14 Claims

1. A method of producing a biological molecule from a recombinant microorganism, wherein the recombinant microorganism is produced by a method comprising:

- obtaining an environmental sample having microorganisms, wherein said microorganisms comprise nucleic acid;
- isolating the nucleic acid from said microorganisms;
- inserting the nucleic acid into donor liposomes;
- providing recipient protoplasts;
- fusing said donor liposomes with said recipient protoplasts to produce a recombinant microorganism, wherein the recombinant microorganism produces a biological molecule; and
- recovering or isolating the biological molecule.

5,773,222  
SOLID PHASE IMMUNOLOGICAL ASSAY  
Marion Lesley Scott, Bristol, Great Britain, assignor to  
National Blood Authority, Watford, United Kingdom

PCT No. PCT/GB93/01080, § 371 Date Jan. 11, 1995, § 102(e) Date Jan. 11, 1995, PCT Pub. No. WO93/24839, PCT Pub. Date Dec. 9, 1993

PCT Filed May 26, 1993, Ser. No. 343,580

Claims priority, application United Kingdom, May 27, 1992, 9211176

Int. Cl.<sup>6</sup> G01N 33/53; 33/567; 33/555; 33/542

U.S. Cl. 435—7.1

21 Claims

1. A solid phase method of detection or assay of the presence or amount, in a serum or plasma sample, of a target antibody specific to a cell surface antigen comprising contacting the sample, suspected containing the target antibody, with an immobilised preparation of cells bearing said antigen and detecting antibody bound thereto by means of an indicator, said indicator comprising a binding partner for said antibody bound to labelled latex particles.

5,773,223  
ENDOTHELIN B<sub>1</sub> (ETB<sub>1</sub>) RECEPTOR POLYPEPTIDE  
AND ITS ENCODING NUCLEIC ACID METHODS, AND  
USES THEREOF

Venkatakrishna Shyamala, Oakland, and Patricia Tekamp Olson, San Anselmo, both of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Filed Sep. 2, 1993, Ser. No. 117,361

Int. Cl.<sup>6</sup> C12Q 1/00; C12N 15/12; C07K 14/705

U.S. Cl. 435—7.2

2 Claims

1. A method of screening for a test candidate that binds an endothelin B<sub>1</sub> (ETB<sub>1</sub>) receptor polypeptide and modulates signal transduction activity comprising:

- providing a host cell transformed with a DNA encoding endothelin B<sub>1</sub> receptor (ETB<sub>1</sub>) polypeptide having SEQ ID NO:1;
- exposing said cell to said test candidate; and
- measuring endothelin B<sub>1</sub> receptor signal transduction activity.



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5,773,224

**IMMUNOSELECTION SYSTEM FOR CELL ELUTION**  
Peter Grandics, and Susan Szathmary, both of P.O. Box 188158, Carlsbad, Calif. 92009

Filed Feb. 12, 1996, Ser. No. 598,560  
Int. Cl.<sup>6</sup> G01N 33/53; 33/567; 33/543

U.S. Cl. 435—7.2

15 Claims

1. An immunoselection method for isolating a cell type from a heterogeneous cell suspension by affinity elution, comprising the steps of:

- (a) reacting the cell suspension with a first reagent having specific binding affinity for a cell surface marker of the cell type in the heterogeneous suspension to form first reagent/cell type complexes in cell suspension, the first reagent being an antibody or antibody fragment specific for the cell surface marker;
- (b) reacting the first reagent-cell type complexes with a biotinylated second reagent having specific binding affinity for the first reagent to form biotinylated second reagent/first reagent/cell type complexes in the cell suspension;
- (c) providing a solid capture surface onto which an immobilized ligand is covalently linked, the ligand being heparin;
- (d) noncovalently adsorbing to the solid capture surface a biotinylated antiligand, the biotinylated antiligand being anti-thrombin III;
- (e) adding avidin to the adsorbed ligand-biotinylated antiligand complex formed in step (d) and then adding the cell suspension containing the biotinylated second reagent/first reagent/cell type complexes to the solid capture surface to which the biotinylated second reagent/first reagent/cell type complexes to the biotinylated antiligand through an avidin bridge to bind the cell type to the solid capture surface; and
- (f) eluting the cell type from the solid capture surface by dissociating the heparin-antithrombin III binding pair with soluble heparin, thus producing eluted cells of the cell type.

5,773,225

**SCREENING METHOD FOR THE IDENTIFICATION OF COMPOUNDS CAPABLE OF ABROGATION HIV-1 GAG-CYCLOPHILIN COMPLEX FORMATION**

Jeremy Luban, New York, N.Y., and Stephen P. Goff, Tenafly, N.J., assignors to The Trustees of Columbia University in the City of New York, New York, N.Y.

Filed May 24, 1994, Ser. No. 248,357

Int. Cl.<sup>6</sup> G01N 33/53; C12Q 1/00; C12N 15/00; C07K 1/00

U.S. Cl. 435—7.8

21 Claims

1. A method for identifying compounds capable of interfering with the formation of a complex between an HIV-1 Gag protein and a cyclophilin (CyP), which comprises the following steps:

- a) producing a CyP affinity fusion protein;
- b) pre-incubating a compound with the CyP affinity fusion protein of step (a);
- c) adding an HIV-1 Gag protein to the incubate of step (b) under conditions which permit Gag and the CyP affinity fusion protein to form a complex;
- d) contacting the incubate of step (c) with an affinity medium under conditions that enable the Gag-CyP affinity fusion protein complex to bind to said affinity medium;
- e) determining the amount of said Gag-cyclophilin affinity fusion protein complex formation by comparison to a control sample lacking said compound;

wherein reduced binding of HIV-1 Gag to the cyclophilin affinity fusion protein is indicative of the ability of said compound to inhibit said complex formation.

5,773,226

**RECOMBINANT CALF INTESTINAL ALKALINE PHOSPHATASE**

Jose L. Millan, San Diego, Calif., assignor to La Jolla Cancer Research Foundation, La Jolla, Calif.

Continuation of Ser. No. 368,071, Jan. 3, 1995, Pat. No. 5,707,853, which is a continuation of Ser. No. 213,371, Mar. 14, 1994, abandoned, which is a continuation of Ser. No. 849,219, Mar. 10, 1992, abandoned. This application Jun. 2, 1995, Ser. No. 458,181

Int. Cl.<sup>6</sup> G01N 33/53; C12Q 1/42; C12N 9/16

U.S. Cl. 435—7.9

12 Claims

8. A method for identifying the presence of a ligand in a sample, comprising the steps of:

- a) contacting the sample with a recombinant calf intestinal alkaline phosphatase (cIAP), wherein said recombinant cIAP is attached to a reagent that specifically binds the ligand;
- b) contacting the sample with a substrate for the recombinant cIAP, wherein catalysis of the substrate by cIAP provides a detectable signal; and
- c) detecting the presence of the detectable signal, said signal indicating that the reagent bound to the sample, thereby identifying the presence of the ligand in the sample.

5,773,227

**BIFUNCTIONAL CHELATING POLYSACCHARIDES**

Michael A. Kuhn, Eugene, Oreg.; Tobias Meyer, Durham, N.C., and Nancy L. Allbritton, Menlo Park, Calif., assignors to Molecular Probes, Inc., Eugene, Oreg.

Filed Jun. 23, 1993, Ser. No. 82,269

Int. Cl.<sup>6</sup> G01N 33/566; C07K 17/10; C08B 37/02

U.S. Cl. 435—7.21

17 Claims

1. A compound comprising a water-soluble polysaccharide with molecular weight greater than about 1,000 Daltons that is covalently attached to:

- a) at least one chelating moiety selective for a monovalent or divalent metal ion, wherein the chelating moiety acts as a fluorescent indicator for the monovalent or divalent metal ion; and
- b) at least one targeting peptide which serves to localize the compound to the inside of a cellular organelle.

5,773,228

**ACTIVATION-DEPENDENT PROTEIN EXPRESSED ON THE SURFACE OF ACTIVATED PLATELETS AND ANTIBODIES THERE TO**

Guy L. Reed, Winchester, Mass., and Gary R. Matsueda, Princeton, N.J., assignors to The General Hospital Corporation, Boston, Mass.

Division of Ser. No. 86,472, Oct. 1, 1992, Pat. No. 5,446,132, which is a continuation-in-part of Ser. No. 768,043, Oct. 1, 1991, abandoned. This application Jun. 2, 1995, Ser. No. 460,808

Int. Cl.<sup>6</sup> A61K 51/00; C07K 16/28; G01N 33/50

U.S. Cl. 435—7.21

25 Claims

1. An antibody which specifically binds to a substantially purified protein which is selectively expressed on the surface of thrombin-activated platelets, said protein having a molecular weight of about 250 kd, and being recognized by an antibody having the binding specificity of 8B6.

5,773,229

**MAMMALIAN ADRENOCORTICOTROPIC HORMONE RECEPTORS AND USES**

Roger D. Cone, Oregon City, and Kathleen G. Mountjoy, Portland, both of Oreg., assignors to State of Oregon, Portland, Oreg.

Division of Ser. No. 77,673, Jun. 15, 1993, Pat. No. 5,554,729, which is a division of Ser. No. 866,560, Apr. 10, 1992, Pat. No. 5,280,112. This application Jun. 7, 1995, Ser. No. 478,992

Int. Cl.<sup>6</sup> G01N 33/567

U.S. Cl. 435—7.21

10 Claims

1. A method of screening a compound as an inhibitor of agonist binding to a mammalian adrenocorticotrophic hormone receptor, the method comprising the following steps:

- (a) transforming a eukaryotic cell culture with an expression construct comprising a nucleotide sequence encoding a mammalian adrenocorticotrophic hormone receptor having an amino acid sequence identified as SEQ ID NO:4 or SEQ ID NO:6, said construct being capable of expressing the adrenocorticotrophic hormone receptor in a eukaryotic cell;
- (b) obtaining a membrane preparation from the transformed cells;
- (c) contacting the membrane preparations with the compound and a detectably labeled adrenocorticotrophic hormone receptor agonist; and
- (d) assaying for ability of the compound to inhibit the binding of the detectably-labeled adrenocorticotrophic hormone receptor agonist.

5,773,230

**IMMUNE REACTIVITY TO EXPRESSED ACTIVATED ONCOGENES FOR DIAGNOSIS AND TREATMENT OF MALIGNANCY**

Martin A. Cheever, Mercer Island, and David J. Peace, Seattle, both of Wash., assignors to Washington Research Foundation, Seattle, Wash.

Division of Ser. No. 251,590, May 31, 1994, Pat. No. 5,601,989, which is a division of Ser. No. 820,409, Jan. 13, 1992, Pat. No. 5,320,947, which is a continuation-in-part of Ser. No. 470,645, Jan. 26, 1990, abandoned. This application Jun. 5, 1995, Ser. No. 469,081

Int. Cl.<sup>6</sup> C12Q 1/02; G01N 33/574

U.S. Cl. 435—7.23

3 Claims

1. A method for the detection of a malignancy in a warm-blooded animal, wherein an activated oncogene or cancer-related gene is associated with the malignancy, comprising the steps of:

- (a) isolating T cells from a warm-blooded animal;
- (b) incubating the T cells with at least one protein expression product of an activated oncogene or cancer-related gene associated with the malignancy the product having an altered primary sequence; and
- (c) detecting the presence or absence of proliferation of the T cells, thereby determining the presence or absence of the malignancy.

5,773,231

**TREATMENT FOR ATHEROSCLEROSIS AND OTHER CARDIOVASCULAR AND INFLAMMATORY DISEASES**

Russell M. Medford; R. Wayne Alexander; Sampath Parthasarathy, all of Atlanta, and Bobby V. Khan, Dunwoody, all of Ga., assignors to Emory University, Atlanta, Ga.

Continuation of Ser. No. 317,399, Oct. 4, 1994, which is a continuation-in-part of Ser. No. 240,858, May 10, 1994, abandoned, which is a continuation-in-part of Ser. No. 969,934, Oct. 30, 1992, Pat. No. 5,380,747. This application Jun. 7, 1995, Ser. No. 473,272

Int. Cl.<sup>6</sup> G01N 33/53

U.S. Cl. 435—7.24

14 Claims

1. A method for the evaluation of the sensitization of a host's vascular endothelial cells to polyunsaturated fatty acids or their oxidized counterparts, comprising challenging a host with a poly-

unsaturated fatty acid or oxidized polyunsaturated fatty acid and comparing to a population norm the resulting concentration of cell-surface or circulating VCAM-1 or other mediator of inflammation expressed by a redox-sensitive gene on exposure to the polyunsaturated fatty acid or oxidized polyunsaturated fatty acid.

5,773,232

**METHODS FOR MEASUREMENT OF LYMPHOCYTE FUNCTION**

Majorie L. Wier, Columbia, Md., assignor to Biotechnology Transfer, Inc., Columbia, Md.

Continuation of Ser. No. 621,878, Mar. 26, 1996, abandoned.

This application Sep. 12, 1997, Ser. No. 928,392

Int. Cl.<sup>6</sup> G01N 33/53; 33/553; C12Q 1/70; 1/24

U.S. Cl. 435—7.24

19 Claims

1. A method for rapidly analyzing lymphocytes for lymphocyte activation comprising the steps of:

- incubating a sample containing a mixed population of cell types including a plurality of subsets of lymphocytes where each subset includes lymphocytes with characteristic determinants that distinguish one subset from another, with an inducing agent selected from the group consisting of mitogens and antigens; then
- separating a selected subset of lymphocytes from said sample; then
- lysing lymphocytes in said selected subset to release an intracellular component selected from the group consisting of ATP, NADP, and PCNA; then
- detecting a level of said intracellular component; and
- assessing lymphocyte activation for said selected subset of lymphocytes from said level of intracellular component detected in said detecting step, wherein the total time required for performing all steps is 6–24 hours.

5,773,233

**MONOCLONAL ANTIBODY SPECIFIC TO NITRIFYING BACTERIA AND METHOD FOR DETECTION THEREOF**  
Hiroshi Ohmura; Takekazu Okumura, and Fumiko Nagai, all of Tokyo, Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan

Filed Oct. 30, 1996, Ser. No. 738,654

Claims priority, application Japan, Nov. 2, 1995, 7-309890; Jun. 28, 1996, 3-188444

Int. Cl.<sup>6</sup> G01N 33/53; 33/554; C07K 16/00; C12P 21/08

U.S. Cl. 435—7.32

7 Claims

1. An anti-*Nitrosomonas europaea* monoclonal antibody recognizing *Nitrosomonas europaea* specifically wherein said monoclonal antibody is selected from the group consisting of monoclonal antibody Nem 7  $\alpha$  produced by hybridoma cell line FERM BP-5675 and monoclonal antibody Nem 23  $\alpha$  produced by hybridoma cell line FERM BP-5676.

5,773,234

**METHOD AND DEVICE FOR CHLAMYDIA DETECTION**

Allan D. Pronovost; Robert E. Klepper, both of San Diego, and Catherine Pawlak, Encinitas, all of Calif., assignors to Quidel Corporation, San Diego, Calif.

Filed Aug. 7, 1995, Ser. No. 511,337

Int. Cl.<sup>6</sup> G01N 33/53

U.S. Cl. 435—7.36

14 Claims

1. A method for determining the presence or amount of Chlamydia in a solubilized sample from a patient, said method comprising: providing an endocervical swab sample from the patient; extracting the swab sample by exposing the swab sample to an alkaline solution having a pH of at least 9.0 for a time sufficient to release a chlamydia lipopolysaccharide antigen from the swab sample; neutralizing the extract by contact with a zwitterionic detergent and blocking protein in a zwitterionic buffer;

n is an integer of 1 to 4; R<sub>2</sub><sup>1</sup> is an alkyl group with 1-6 carbon atoms; R<sub>2</sub> is a hydrogen atom or an alkyl group with 1-6 carbon atoms; and \* represents an asymmetric carbon atom.



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5,773,241

## PREPARATION OF BIOACTIVE EXTRACTS

Arthur Dale Ericsson, 6560 Fannin, Suite 720, Houston, Tex. 77030

Continuation of Ser. No. 708,548, Sep. 5, 1996, abandoned.

This application May 12, 1997, Ser. No. 854,473

Int. Cl.<sup>6</sup> A61K 35/00; C12P 1/00

U.S. Cl. 435—41 24 Claims

1. A process for extracting an active principal from an animal material found in nature, said process comprising:

- (a) providing an animal material in a finely divided form suitable for extraction;
- (b) extracting the finely divided animal material in an extraction zone using a solvent to produce a rich solvent and an extract residue;
- (c) fermenting a fermentation feed comprising the rich solvent to produce a fermentation broth comprising a fermentation liquid and a fermentation residue;
- (d) separating the fermentation liquid from the fermentation residue;
- (e) concentrating the fermentation liquid to produce a concentrate;
- (f) extracting the extract residue using a solvent to produce a second rich solvent and a second extract residue;
- (g) extracting the second extract residue using a solvent to produce a third rich solvent and a third extract residue; and
- (h) combining the second rich solvent and the third rich solvent together with the rich solvent to form the fermentation feed.

5,773,242

Patent Not Issued For This Number

5,773,243

## COBRA PRO CVFI

David C. Fritzinger, Alexandria, Va.; Reinhard Bredehorst, and Carl-Wilhelm Vogel, both of Hamburg, Germany, assignors to Georgetown University, Washington, D.C.

Continuation of Ser. No. 43,747, Apr. 7, 1993, abandoned.

This application May 23, 1995, Ser. No. 447,411

Int. Cl.<sup>6</sup> C12P 21/02; C07K 14/46

U.S. Cl. 435—69.1 3 Claims

1. An isolated polypeptide having the amino acid sequence from position about 1 to position about 1620 in SEQ ID NO: 45.

5,773,244

## METHODS OF MAKING CIRCULAR RNA

Manuel Ares, Jr., Santa Cruz, Calif., and Ethan E. Ford, Harbor, N.Y., assignors to Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 63,857, May 19, 1993, abandoned. This application May 1, 1995, Ser. No. 431,896

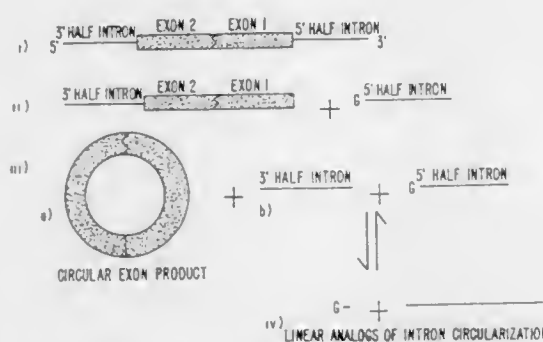
Int. Cl.<sup>6</sup> C12P 21/00; 19/34; C12N 15/00; C07H 21/02

U.S. Cl. 435—69.1 26 Claims

1. A method for producing a circular RNA, said method comprising the steps of:

- (a) providing a target nucleic acid sequence to be made circular;
- (b) making a DNA construct encoding an RNA cyclase ribozyme, wherein the arrangement of regions that code for RNA cyclase ribozyme splicing elements is an encoded 3' portion of an intron, an encoded 3' splice site, the target nucleic acid sequence of step (a), an encoded 5' splice site and an encoded 5' portion of the intron;
- (c) expressing the DNA construct as an RNA; and
- (d) allowing the RNA to self-splice, thereby producing the circular RNA.

13. A method of making a repeating protein product from a circular RNA, the method comprising the steps:



- (a) providing a nucleic acid sequence to be made circular;
- (b) making a DNA construct encoding an RNA cyclase ribozyme, wherein the arrangement of regions that code for RNA cyclase ribozyme splicing elements is an encoded 3' portion of an intron, an encoded 3' splice site, the nucleic acid sequence of step (a), an encoded 5' splice site and an encoded 5' portion of the intron;
- (c) expressing the plasmid as RNA; and
- (d) allowing the RNA to self-splice, thereby producing a circular RNA; and
- (e) translating the circular RNA in an appropriate translation system, thereby producing a repeating protein product from the circular RNA.

5,773,245

## METHODS FOR INCREASING SECRETION OF OVEREXPRESSED PROTEINS

Karl Dane Wittrop, Urbana, and Anne Skaja Robinson, Champaign, both of Ill., assignors to Research Corporation Technologies, Inc., Tucson, Ariz.

Continuation of Ser. No. 89,997, Jul. 6, 1993, abandoned,

which is a continuation of Ser. No. 956,699, Oct. 2, 1992,

abandoned. This application May 15, 1995, Ser. No. 441,139

Int. Cl.<sup>6</sup> C12P 21/02; C12N 15/67

U.S. Cl. 435—69.1 13 Claims

1. A method for increasing secretion of an overexpressed secreted gene product from a yeast host cell which comprises effecting the increased expression of a KAR2 chaperone protein in said yeast host cell.

5,773,246

## METHODS AND COMPOSITIONS USEFUL IN THE RECOGNITION, BINDING AND EXPRESSION OF RIBONUCLEIC ACIDS INVOLVED IN CELL GROWTH, NEOPLASIA AND IMMUNOREGULATION

Jack D. Keene, 6300 Garrett Rd., Durham, N.C. 27707; Todd Levine, 4540 Westminster, St. Louis, Mo. 63108, and Fen-Biao Gao, C/O P.O. Box 3020 Duke University Medical Center, Durham, N.C. 27710, assignors to Jack D. Keene, Durham, N.C.; Todd Levine, St. Louis, Mo., and Fen-Biao Gao, Durham, N.C.

Division of Ser. No. 120,827, Sep. 15, 1993, Pat. No. 5,525,495, which is a continuation-in-part of Ser. No. 881,075, May 11, 1992, Pat. No. 5,444,149. This application Jun. 7, 1995, Ser. No. 478,675

Int. Cl.<sup>6</sup> C12P 21/02; C12N 15/10; 15/11; C07K 14/00

U.S. Cl. 435—69.1 14 Claims

1. A method for obtaining a cDNA library having members encoding a group of structurally or functionally related proteins, from total cell mRNA comprising:

- binding RNA representing total cell mRNA to a protein that binds RNA and has specific binding to untranslated regions of a subset of said total cell mRNA, wherein said protein that binds RNA has been purified to remove any other protein that binds RNA;

separating the resulting bound products; and  
preparing a cDNA library from the resulting bound products.

5,773,247

## RECOMBINANT ANTI-HIV ANTIBODY AND PROCESS FOR PREPARING THE SAME

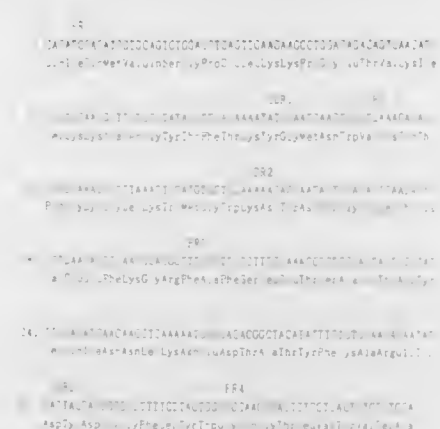
Hiroaki Maeda; Kazuhiko Kimachi; Yasuyuki Eda; Kouichi Shiosaki; Kiyoshi Osatomi, and Sachio Tokiyoshi, all of Kumamoto, Japan, assignors to Juridical Foundation The Chemo-Sero-Therapeutic Research Institute, Kumamoto, Japan

PCT No. PCT/JP93/00039, § 371 Date Jul. 14, 1995, § 102(e) Date Jul. 14, 1995, PCT Pub. No. WO94/15969, PCT Pub. Date Jul. 12, 1994

PCT Filed Jan. 14, 1993, Ser. No. 491,845

Int. Cl.<sup>6</sup> C12P 21/06; 21/08; C12N 5/00; C07H 21/04

U.S. Cl. 435—69.1 10 Claims



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5,773,251

DNA CLONE OF HUMAN TISSUE FACTOR INHIBITOR Tze-Chein Wun, St. Louis; Kuniko K. Kretzmer, Eureka, and George J. Broze, Jr., St. Louis, all of Mo., assignors to G.D. Searle & Co., Chicago, Ill.

Continuation of Ser. No. 355,351, Dec. 13, 1994, abandoned, which is a continuation of Ser. No. 93,285, Jul. 15, 1993, abandoned, which is a continuation of Ser. No. 566,280, Aug. 13, 1990, abandoned, which is a division of Ser. No. 123,753, Nov. 23, 1987, Pat. No. 4,966,852, which is a continuation-in-part of Ser. No. 77,366, Jul. 23, 1987, abandoned. This application Jun. 5, 1995, Ser. No. 463,602

Int. Cl.<sup>6</sup> C12N 15/12

U.S. Cl. 435—69.2

9 Claims

1. An expression vector comprising a purified and isolated DNA encoding mature tissue factor inhibitor (TFI) as shown in FIG. 3.

5,773,252

FIBROBLAST GROWTH FACTOR 15

John M. Greene, Gaithersburg, and Craig A. Rosen, Laytonsville, both of Md., assignors to Human Genome Sciences, Inc., Rockville, Md.

Filed Jun. 5, 1995, Ser. No. 462,169

Int. Cl.<sup>6</sup> C12P 21/00; C12N 5/10; 15/16; 15/63

U.S. Cl. 435—69.4

19 Claims

1. An isolated polynucleotide comprising a polynucleotide sequence of at least 30 nucleotides having at least a 95% sequence identity to a member selected from the group consisting of:

- a polynucleotide sequence encoding a polypeptide comprising amino acid 2 to 252 of SEQ ID NO. 2; and
- the polynucleotide sequence complement of (a).

5,773,253

MYPPPY VARIANTS OF CTLA4 AND USES THEREOF

Peter S. Linsley; Jeffrey A. Ledbetter, both of Seattle, and Robert Peach, Edmonds, all of Wash., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

Continuation-in-part of Ser. No. 228,208, Apr. 15, 1994, which is a continuation-in-part of Ser. No. 8,898, Jan. 22, 1993. This application Jul. 21, 1995, Ser. No. 505,058

Int. Cl.<sup>6</sup> C12N 15/12

U.S. Cl. 435—69.7

17 Claims

1. A CTLA4 mutant molecule reactive with the CD80 antigen, wherein in the extracellular domain of CTLA4 the first tyrosine in the amino acid motif MYPPPY (SEQ ID NO 11) is replaced by an amino acid other than tyrosine.

5,773,254

Patent Not Issued For This Number

5,773,255

GLUCOSE RESPONSIVE INSULIN SECRETING  $\beta$ -CELL LINES AND METHOD FOR PRODUCING SAME

Megan E. Laurance, Portland, Oreg.; David Knaack, Chapatet, R.I.; Deborah M. Fiore, Swansea, Mass., and Orion D. Hegre, Chapatet, R.I., assignors to CytoTherapeutics, Inc., Providence, R.I.

Division of Ser. No. 208,873, Mar. 10, 1994, Pat. No. 5,534,404, which is a continuation of Ser. No. 165,088, Dec. 10, 1993, abandoned. This application Jun. 5, 1995, Ser. No. 464,974

Int. Cl.<sup>6</sup> C12P 21/00; C12Q 1/54

U.S. Cl. 435—70.3

3 Claims

1. A line of  $\beta$  cells capable of maintaining insulin secretion levels of more than about 1300  $\mu$ Units insulin/45 minutes/50,000 cells for more than about 25 passages in culture.

5,773,256

METHODS FOR THE PRODUCTION OF ESTERS OF  $\alpha$ -GLUCOSIDES AND USES THEREOF

Vincent P. Pelenc; Francois M.B. Paul, both of Toulouse, and Pierre F. Monsan, Mondonville, all of France, assignors to Ulice SA, Riom, France

Division of Ser. No. 193,139, May 25, 1994. This application Jun. 5, 1995, Ser. No. 462,669

Claims priority, application France, Aug. 12, 1991, 91/10244

Int. Cl.<sup>6</sup> C12P 19/44; 19/18; 7/64; C07H 13/06

U.S. Cl. 435—74

27 Claims

1. A process for the enzymatic manufacture of  $\alpha$ -glucoside esters, which comprises the following steps 1) placing an acyclic alcohol, or a mixture of acyclic alcohols, having a solubility in water of at least 2.7% v/v at 20° C., in contact with starch, maltodextrins or maltose present in an initial concentration in the reaction of approximately 100 g/l to approximately 400 g/l in the presence of a first purified enzymatic preparation having  $\alpha$ -transglucosylation activity, wherein said preparation is free of  $\beta$ -glucosidase activity so as to produce  $\alpha$ -glucosides; 2) contacting the  $\alpha$ -glucosides so produced with at least one fatty acid and a second enzymatic preparation having lipase activity so as to produce  $\alpha$ -glucoside esters, and 3) recovering the  $\alpha$ -glucoside esters.

5,773,257

METHOD FOR PRODUCING PRIMED NUCLEIC ACID TEMPLATES

Kirk B. Nielson, San Diego, and Eric J. Mathur, Solana, Beach, both of Calif., assignors to Stratagene, La Jolla, Calif.

Division of Ser. No. 224,981, Apr. 7, 1994, Pat. No. 5,646,019, which is a continuation of Ser. No. 425,867, Oct. 24, 1989, abandoned. This application Jun. 6, 1995, Ser. No. 469,564

Int. Cl.<sup>6</sup> C12P 19/34; C07K 14/195

U.S. Cl. 435—91.1

17 Claims

1. A method of preparing a strand of nucleic acid having a nucleotide sequence substantially complementary to a template nucleic acid, which method comprises:

- forming a primer extension reaction admixture whereby nonspecific hybridization of polynucleotide synthesis primer is reduced by admixing said template nucleic acid with a hybridization effective amount of (i) said polynucleotide synthesis primer having a nucleotide sequence complementary to a portion of the template nucleic acid, (ii) an isolated single-stranded nucleic acid binding protein (SSB), (iii) a divalent cation, and (iv) an enzyme capable of inducing polynucleotide synthesis in the presence of a primed template; and
- maintaining the primer extension reaction admixture under polynucleotide synthesizing conditions for a time period sufficient for said enzyme to produce a primer extension product, thereby producing said strand of nucleic acid.

5,773,258  
NUCLEIC ACID AMPLIFICATION USING A  
REVERSIBLY INACTIVATED THERMOSTABLE  
ENZYME

David Edward Birch, Berkeley; Walter Joseph Laird, Pinole, and Michael Anthony Zoccoli, Moraga, all of Calif., assignors to Roche Molecular Systems, Inc., Branchburg, N.J.

Filed Jul. 11, 1996, Ser. No. 680,283

Int. Cl.<sup>6</sup> C12P 19/34; C12N 9/00; 9/99

U.S. Cl. 435—91.2

13 Claims

citraconic anhydride

cis-aconitic anhydride

A scheme for the reversible reaction of citraconic anhydride with lysine residues

citraconic anhydride

1. A method for the amplification of a target nucleic acid contained in a sample comprising the steps of:

- contacting said sample with an amplification reaction mixture containing a primer complementary to said target nucleic acid and a modified thermostable enzyme, wherein said modified thermostable enzyme is produced by a reaction of a mixture of a thermostable enzyme which catalyzes a primer extension reaction and a modifier reagent, wherein said reaction results in a covalent chemical modification of said enzyme which results in essentially complete inactivation of enzyme activity, wherein incubation of said modified enzyme in an aqueous buffer at alkaline pH at a temperature less than about 25° C. results in no significant increase in enzyme activity in less than about 20 minutes, and wherein incubation of said modified enzyme in an aqueous buffer, formulated to about pH 8–9 at 25° C., at a temperature greater than about 50° C. results in at least a two-fold increase in enzyme activity in less than about 20 minutes; and
- incubating the resulting mixture of step (a) at a temperature which is greater than about 50° C. for a time sufficient to reactivate said enzyme and allow formation of primer extension products.

5,773,259

TISSUE REMODELING PROTEINS

Robert B. Kirkpatrick, King of Prussia, Pa., assignor to Smith-Kline Beecham Corporation, Philadelphia, Pa.

Filed Mar. 10, 1997, Ser. No. 815,990

Int. Cl.<sup>6</sup> C12P 19/34; G01N 33/53; C07H 21/02; 21/04

U.S. Cl. 435—91.2

1 Claim

1. A method of diagnosing atherosclerosis by detecting a mutation in chitinase-like protein HC gp-39 in a host comprising:

- synthesizing PCR primers complementary to a nucleic acid encoding a normal chitinase-like protein HC gp-39;
- obtaining nucleic acids from cells of a host;
- amplifying the obtained nucleic acids with the synthesized PCR primers to obtain an amplified product;
- comparing the amplified product to a normal genotype encoding the normal chitinase-like protein HC gp-39 to detect any mutations in the amplified product

(e) and correlating any mutations with the presence of atherosclerosis.

5,773,260

RIBOZYME COMPOSITIONS AND EXPRESSION  
VECTORS

Allan R. Goldberg; Shaji T. George, and Hugh D. Robertson, all of New York, N.Y., assignors to Innovir Laboratories, Inc., New York, N.Y.

Division of Ser. No. 370,546, Jan. 9, 1995, which is a continuation of Ser. No. 212,310, Mar. 14, 1994, abandoned, which is a continuation of Ser. No. 66,897, May 21, 1993, abandoned, which is a division of Ser. No. 495,340, Mar. 19, 1990, Pat. No. 5,225,347, which is a continuation-in-part of Ser. No. 411,713, Sep. 25, 1989, Pat. No. 5,225,337. This application Jun. 2, 1995, Ser. No. 458,404

Int. Cl.<sup>6</sup> C12Q 1/68; C12P 19/34; C12N 15/00; 15/64

U.S. Cl. 435—91.31

20 Claims

1. A method for constructing a vector for delivering a ribozyme to a cell to specifically cleave RNA in the cell comprising: providing cDNA transcribed as hepatitis delta virus RNA having ribozyme activity in combination with nucleotide sequences specifically binding targeted nucleotide sequences in the cell, wherein the hepatitis delta virus RNA contains sufficient sequence and is of appropriate secondary structure to replicate in the cell, and the targeted sequences position the ribozyme activity at a site to be cleaved.

5,773,261

REGIOSELECTIVE  $\alpha$ -HYDROLYSIS OF AMINO ACID  
DIESTERS USING PIG LIVER ESTERASE

Indra Prakash; David J. Ager, both of Hoffman Estates, and David P. Pantaleone, Buffalo Grove, all of Ill., assignors to The NutraSweet Company, Deerfield, Ill.

Filed Aug. 26, 1996, Ser. No. 703,372

Int. Cl.<sup>6</sup> C12P 13/04; 13/14; 13/20; C12N 9/18

U.S. Cl. 435—106

18 Claims

1. A method for the preparation of a  $\gamma$ -ester glutamate which comprises: reacting a diester glutamate comprising an  $\alpha$ -ester group and a  $\gamma$ -ester group with an amount of a pig liver esterase enzyme effective to hydrolyze selectively the  $\alpha$ -ester group and form the  $\gamma$ -ester glutamate.

5,773,262

PROCESS FOR THE PREPARATION OF  
PROANTHOCYANIDINS

Toshiaki Ariga, Noda; Hiroshi Hosoyama, Tokyo, and Katsumi Yuasa, Funabashi, all of Japan, assignors to Kikkoman Corporation, Noda, Japan

Filed Feb. 6, 1997, Ser. No. 796,416

Claims priority, application Japan, Feb. 14, 1996, 8-049664

Int. Cl.<sup>6</sup> C12P 17/16; 17/18; 17/06

U.S. Cl. 435—118

3 Claims

1. A process for preparing a purified proanthocyanidin which comprises extracting plants containing proanthocyanidins with water or an organic solvent to obtain a proanthocyanidin extract, adding yeast to said proanthocyanidin extract, or a concentrated extract thereof, to assimilate sugars and heavy metals contained in said extract or concentrated extract and form a yeast-treated extract, and then concentrating and drying the yeast-treated extract.



5,773,263

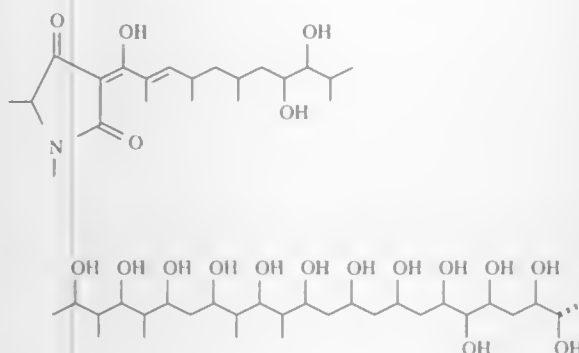
**PRODUCTION AFLASTATIN A FROM STREPTOMYCES SP., A PHARMACEUTICAL COMPOSITION AND METHODS OF USE**

Makoto Ono, Kawasaki; Akinori Suzuki, Chigasaki; Akira Isogai, and Shouhei Sakuda, both of Chiba, all of Japan, assignors to Morinaga & Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1997, Ser. No. 810,368

Claims priority, application Japan, Mar. 4, 1996, 8-073258  
Int. Cl.<sup>6</sup> C12P 17/16; C12N 1/20; A01N 43/36; C07D 205/00  
U.S. Cl. 435—118 13 Claims

1. An antibiotic aflastatin A having the formula:



or its salt.

5,773,264

**PROCESS FOR THE PRODUCTION OF 17  $\alpha$ -HYDROXY-3-METHOXY-8,14-SECO-1,3,5(10),9(11)ESTRATETRAEN-14-ONE BY REDUCTION OF THE CORRESPONDING 17-ONE COMPOUND**

Alfred Weber; Mario Kennecke, and Hans-Jorg Vidic, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

PCT No. PCT/DE95/00200, § 371 Date Sep. 26, 1994, § 102(e)  
Date Sep. 26, 1994, PCT Pub. No. WO93/20222, PCT Pub. Date Oct. 14, 1993

PCT Filed Mar. 24, 1993, Ser. No. 313,063

Claims priority, application Germany, Mar. 28, 1992, 42 10 706.7

Int. Cl.<sup>6</sup> C12P 33/16; 15/00

U.S. Cl. 435—127

1 Claim

1. A process for the production of 17 $\alpha$ -hydroxy-3-methoxy-8,14-seco-1,3,5(10),9(11)-estratetraen-14-one, comprising fermenting 3-methoxy-8,14-seco-1,3,5(10),9(11)-estratetraen-14,17-dione with a live culture of *Kloeckera magna* (ATCC-20109), wherein said substrate is added as an aqueous suspension, without an organic solvent, having an average grain size of 0.2–5  $\mu$ m.

5,773,265

**DNA ENCODING HEPTAPRENYL DIPHOSPHATE SYNTHETASE**

Ayumi Koike, Toyota, Japan; Shusei Obata, New York, N.Y.; Kyoze Ogura, and Tanotoshi Koyama, both of Sendai, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 24, 1995, Ser. No. 506,404

Claims priority, application Japan, Jul. 29, 1994, 6-179336  
Int. Cl.<sup>6</sup> C12P 9/00; 21/06; C12N 9/10; C07H 21/04  
U.S. Cl. 435—131 13 Claims

1. Isolated DNA containing a base sequence encoding a *Bacillus stearothermophilus* protein having heptaprenyl diphosphate synthetase activity, wherein said DNA is selected from the group consisting of SEQ ID NO. 1, SEQ ID NO. 2, and SEQ ID NO. 3.

5,773,266

**IMMOBILIZED LIPASES ON A DRY, POROUS PARTICULATE HYDROPHOBIC SUPPORT AND CONTAINING A NON-IONIC SURFACTANT**

John Anthony Bosley, Islip, and Stephen Raymond Moore, Thrapston, both of United Kingdom, assignors to Loders-Croklaan B.V., Wormerveer, Netherlands

PCT No. PCT/EP94/01308, § 371 Date Nov. 9, 1995, § 102(e)  
Date Nov. 9, 1995, PCT Pub. No. WO94/28118, PCT Pub. Date Dec. 8, 1994

PCT Filed Apr. 22, 1994, Ser. No. 545,818

Claims priority, application European Pat. Off., May 20, 1993, 93303917

Int. Cl.<sup>6</sup> C12P 7/64; C12N 11/14; 11/08; 9/20  
U.S. Cl. 435—134 15 Claims

1. Immobilized lipase on a hydrophobic, porous, dry particulate material having an average pore size of 0.05–5  $\mu$ m, wherein the immobilized lipase on the hydrophobic, porous, dry particulate material contains 0.0001–5 wt. % of a non-ionic surfactant, with an HLB-value of at least 8.0, and containing at least one fatty acid moiety and wherein the immobilized lipase has a water content of less than 10 wt. %.

5,773,267

**D29 SHUTTLE PHASMIDS AND USES THEREOF**

William R. Jacobs, City Island, N.Y., and Graham F. Hatfull, Pittsburgh, Pa., assignors to Albert Einstein College of Medicine of Yeshiva University, a Division of Yeshiva University, Bronx, N.Y., and University of Pittsburgh, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 247,901, May 23, 1994, which is a continuation-in-part of Ser. No. 57,531, Apr. 29, 1993, abandoned, which is a continuation-in-part of Ser. No. 833,431, Feb. 7, 1992, abandoned. This application Mar. 7, 1996, Ser. No. 614,770

Int. Cl.<sup>6</sup> C12N 1/21; 15/11; 15/63; 15/74  
U.S. Cl. 435—172.1 15 Claims

2. A shuttle phasmid comprising a D29 mycobacteriophage which contains an *E. coli* bacteriophage lambda cosmid inserted into a non-essential region of said D29 mycobacteriophage.

5,773,268

**CHROMOSOME 21 GENE MARKER, COMPOSITIONS AND METHODS USING SAME**

Julie R. Korenberg, and Kazuhiro Yamakawa, both of Los Angeles, Calif., assignors to Cedars-Sinai Medical Center, Los Angeles, Calif.

Filed Nov. 9, 1994, Ser. No. 337,690

Int. Cl.<sup>6</sup> C12N 15/12; 15/85; 5/10  
U.S. Cl. 435—172.3 19 Claims

1. An isolated polynucleotide encoding an epilepsy holoprosencephaly related protein, comprising a nucleic acid encoding amino acid SEQ ID No: 2.

5,773,271

**COMPOUNDS FROM BIOPOLYMERS AND EFFECTOR SUBSTANCES WHICH ARE LINKED VIA OPTICALLY ACTIVE AMINO ACID DERIVATIVES, PROCESSES FOR THE PREPARATION THEREOF AND THE USE THEREOF**

Heinz-Jürgen Friesen, and Peter Hermentin, both of Marburg, Germany, assignors to Behring Diagnostics GmbH, Marburg, Germany

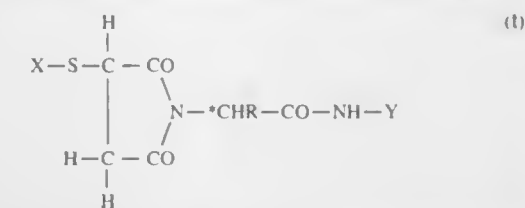
Division of Ser. No. 201,209, Feb. 24, 1994, Pat. No. 5,484,722, which is a division of Ser. No. 549,102, Jul. 6, 1990, Pat. No. 5,321,142. This application Jun. 7, 1995, Ser. No. 483,060

Claims priority, application Germany, Jul. 10, 1989, 39 22 608.5

Int. Cl.<sup>6</sup> C12N 9/96; C07K 16/44

U.S. Cl. 435—188 9 Claims

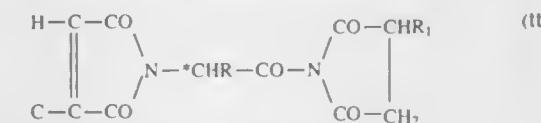
1. A process for the preparation of a conjugate of formula I



wherein \*C is an asymmetric carbon atom,

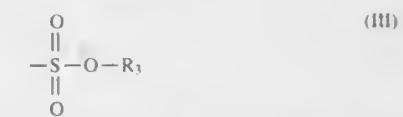
R is a side chain of a natural amino acid, methionine sulfone, or cysteine acid,

X is a radical of a thiol coupling component of a protein, and Y is a radical of an amino coupling component of a protein, which comprises forming an amide in a first reaction step by reacting an amino component Y—NH<sub>2</sub> with the functional active ester group of a compound of formula II



wherein C\* and R are as defined above,

R<sub>1</sub> is hydrogen or a radical of formula III



wherein R<sub>1</sub> is hydrogen or C<sub>1</sub>–C<sub>4</sub>alkyl, and forming a thioether in a second reaction step by Michael addition, by reacting a thiol component X—SH with the maleimido group of the formula II.

5,773,272

**D-AMINO ACID OXIDASE OF *F. SOLANI* AND METHODS FOR ITS RECOMBINANT PRODUCTION**

Takao Isogai, Tsukuba; Hiroki Ono, Osaka, and Hitoshi Kojo, Tsukuba, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation of Ser. No. 361,708, Dec. 22, 1994, Pat. No. 5,602,015, which is a continuation of Ser. No. 126,891, Sep. 27, 1993, abandoned, which is a continuation of Ser. No. 3,854, Jan. 11, 1993, abandoned, which is a continuation of Ser. No. 418,524, Oct. 10, 1989, abandoned. This application Sep. 29, 1995, Ser. No. 536,277

Claims priority, application Japan, Oct. 13, 1988, 63-260332

Int. Cl.<sup>6</sup> C12N 09/20; 15/35; 15/79; C12P 35/00

U.S. Cl. 435—189 4 Claims

1. A process for using a DNA molecule which encodes a D-amino acid oxidase of *F. solani*, which comprises culturing a microorganism transformed by an expression vector comprising a nucleotide sequence having the sequence set forth in SEQ ID NO: 2 or which encodes a D-amino acid oxidase set forth in SEQ ID

14. An apparatus for treating raw garbage comprising:

- a water-draining unit having a throw port through which raw garbage is thrown, for draining off the water contained in the raw garbage thrown through the throw port, to substantially separate the water contained in the raw garbage;
- a pulverizer unit, including a pulverizer rotor, pulverizing the raw garbage from which the water has been drained off by said water-draining unit;
- a microorganism decomposition unit, including a microorganism carrier carrying microorganisms, decomposing the raw garbage from said pulverizer unit;
- a drainpipe for draining the water from said water-draining unit together with decomposition gases generated in said microorganism decomposition unit.



5,773,282

**RECOMBINANT THERMOSTABLE ENZYME FOR CONVERTING MALTOSE INTO TREHALOSE FROM THERMUS AQUATICUS**

Keiji Tsusaki, Michio Kubota, and Toshiyuki Sugimoto, all of Okayama, Japan, assignors to Kabushiki Kaisha Hayashibara Seibutsu Kagaku Kenkyujo, Okayama, Japan

Filed Sep. 29, 1995, Ser. No. 537,002

Claims priority, application Japan, Oct. 1, 1994, 6-260984; Sep. 8, 1995, 7-255829

Int. Cl.<sup>6</sup> C12N 9/24; 15/56

U.S. Cl. 435—252.3

17 Claims

1. A recombinant DNA molecule, comprising a nucleotide sequence from nucleotides 541 to 3429 of SEQ ID NO:5 encoding an enzyme derived from microorganism genus *Thermus*, wherein said enzyme has an activity of converting maltose into trehalose and is stable at a temperature of 55° C.

5,773,283

**SYSTEMS AND METHODS FOR BIODEGRADATION**

George E. Pierce, Lebanon, N.J., assignor to Cytec Technology Corporation, Wilmington, Del.

Continuation-in-part of Ser. No. 357,822, Dec. 16, 1994, Pat. No. 5,688,685, Ser. No. 357,686, Dec. 16, 1994, Pat. No.

5,633,164, Ser. No. 357,700, Dec. 16, 1994, Pat. No. 5,585,272,

and Ser. No. 357,821, Dec. 16, 1994, Pat. No. 5,571,705. This

application Dec. 15, 1995, Ser. No. 573,049

Int. Cl.<sup>6</sup> B09B 3/00; C02F 3/02

U.S. Cl. 435—262

21 Claims

1. A method for the aerobic degradation of at least one compound selected from the group consisting of aromatic, nitro-aromatic, halo-aromatic, halo-nitro-aromatic, aliphatic and halo-aliphatic compounds comprising contacting said compound with a microorganism, said microorganism being a member of the group consisting of microorganisms having ATCC Accession Nos. 55722, 55723, 55726, 55727, 55724, and 55725.

5,773,284

**PHENYL SERINE AMIDES AND THE PREPARATION OF PHENYL SERINES/PHENYL SERINE AMIDES**

Bernardus Kaptein, Sittard, Netherlands, assignor to DSM N.V., Heerlen, Netherlands

Filed Jun. 12, 1996, Ser. No. 662,797

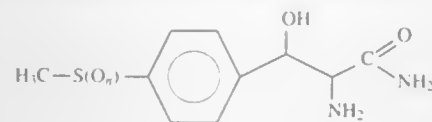
Claims priority, application Belgium, Dec. 17, 1993, 09301405

Int. Cl.<sup>6</sup> C12P 13/06; 7/40; C12N 9/78; C07B 55/00

U.S. Cl. 435—280

14 Claims

1. Threo-phenylserine amide of the general formula (I),



where n=0, 1 or 2 and the  $\alpha$ -amino group is optionally protected.

5,773,285

**STATIC ORGAN CULTURE APPARATUS**

Sung-Su Park, Cheonggu Apt. 103-1306, #929 Mok 6-dong, Yangcheon-gu, Seoul, Rep. of Korea, 158-056

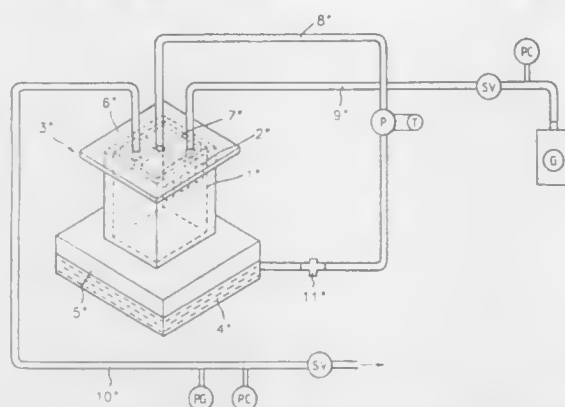
Filed Nov. 9, 1995, Ser. No. 555,600

Claims priority, application Rep. of Korea, Nov. 9, 1994, 1994-29214

Int. Cl.<sup>6</sup> C12M 3/02; 1/16; C12N 5/00

U.S. Cl. 435—286.5

4 Claims



1. An apparatus for culturing an organ tissue slice under the supplies of a liquid culture medium and an oxygenated gas which comprises:

- a sealable chamber having an inner wall which is vertical or slanted inward from a top toward a bottom of the chamber;
- a mesh for holding the tissue slice on an inner side thereof, the mesh conforming to a shape of the inner wall and mounted in the chamber so as to form a layer of open space having substantially uniform thickness ranging from 2 to 3 mm between the inner wall of the chamber and the mesh;
- a medium reservoir connected to and in fluid communication with a bottom of the chamber;
- a conduit extending from the reservoir to a top of the layer of open space;
- means for pumping the medium through the conduit at regular intervals so that the tissue slice is alternately exposed to the medium and to the gas; and
- means for supplying the gas to the chamber.

5,773,286

**INNER SUPPORTED BIOCOMPATIBLE CELL CAPSULES**

Keith E. Dionne, Rehoboth, Mass.; Orion D. Hegre, Chepachet, R.I.; Thomas R. Flanagan, Barrington, R.I.; Tyrone F. Hazlett, Coventry, R.I., and Edward J. Doherty, Mansfield, Mass., assignors to CytoTherapeutics, Inc., Providence, R.I.

Continuation of Ser. No. 176,119, Dec. 30, 1993, abandoned, which is a continuation-in-part of Ser. No. 997,770, Dec. 24, 1992, Pat. No. 5,418,154, which is a continuation-in-part of

Ser. No. 722,852, Jun. 28, 1991, abandoned, which is a continuation-in-part of Ser. No. 638,759, Jan. 8, 1991, Pat.

No. 5,283,187, which is a continuation-in-part of Ser. No. 461,999, Jan. 8, 1990, Pat. No. 5,158,881, which is a

continuation-in-part of Ser. No. 121,626, Nov. 17, 1987, Pat. No. 4,892,538. This application May 24, 1995, Ser. No.

449,568

Int. Cl.<sup>6</sup> C12N 5/00; 11/00; 11/04

U.S. Cl. 435—297.1

10 Claims

1. A biocompatible cell capsule for implantation, comprising:
- a capsule jacket connected to a chamber top at one end and chamber bottom at the other end enclosing a cell chamber,
  - the capsule jacket comprising at least one semipermeable surface across which biologically active molecules can be delivered, and
  - an inner support having two ends and extending through the cell chamber such that one end is connected to the chamber top and other end is connected to the chamber bottom, said inner support providing tensile strength to the capsule, and

said inner support comprising a filling means for introducing cells or cell-sustaining substances into said chamber and a vent means for escape of air from said chamber as the cells or cell-sustaining substances are introduced.

5,773,287

**INCUBATOR**

Peter Michael Binder, Sântisstrasse 74A, D—88662 Überlingen, Germany

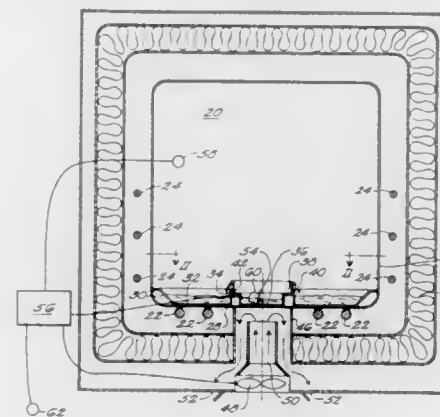
Filed Oct. 2, 1995, Ser. No. 538,020

Claims priority, application Germany, Nov. 19, 1994, 44 41 250.9

Int. Cl.<sup>6</sup> C12M 3/00

U.S. Cl. 435—303.1

32 Claims



1. Incubator, comprising:

- a working space formed inside walls of a tank, said working space having a floor portion;
- a hot air mantle, provided outside the tank in heat conductive contact with the walls, for heating said working space to a predetermined working space temperature;
- a heatable water tub, located inside said working space, said water tub being maintained at a temperature at least substantially equal to the working space temperature in order to generate a high atmospheric humidity within said working space;
- a condensate tub, located inside the working space, said condensate tub having an evaporation surface for receiving condensate and being maintained at a temperature less than the working space temperature; and
- means for maintaining a temperature difference between said heatable water tub and said condensate tub in order to provide a high atmospheric humidity inside said working space while keeping a remainder of said working space relatively free of condensation.

5,773,288

**PLANT GENES AFFECTING GIBBERELIC ACID BIOSYNTHESIS**

Steven P. Briggs, Des Moines, and Robert J. Bensen, Grimes, both of Iowa, assignors to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Continuation-in-part of Ser. No. 261,465, Jun. 17, 1994, Pat.

No. 5,612,191. This application Mar. 16, 1995, Ser. No.

405,254

Int. Cl.<sup>6</sup> C12N 15/82; 15/29; C07K 14/415

U.S. Cl. 435—320.1

7 Claims

1. An isolated DNA molecule capable of hybridizing to a DNA molecule having the An2 nucleotide sequence shown in FIG. 6 (SEQ ID NO:8) under conditions of high stringency, wherein said DNA molecule encodes a product necessary for the conversion of GGPP to ent-kaurene in the biosynthesis of gibberellic acid.

5,773,289

**AAV DIRECTED TARGETED INTEGRATION**

Richard Jude Samulski, and Xiao Xiao, both of Chapel Hill, N.C., assignors to University of Pittsburgh, Pittsburgh, Pa.

Filed Jun. 6, 1995, Ser. No. 469,552

Int. Cl.<sup>6</sup> C12N 15/63; 5/00; 15/00

U.S. Cl. 435—320.1

20 Claims

1. A recombinant AAV vector lacking AAV REP or CAP viral coding regions that upon transfection into a human cell integrates into the p16-p21 region of human chromosome 2, the q12-q13 region chromosome 5, the p12-p13 region of human chromosome 12, the q13 region of human chromosome 22, or the q2-q3 region of a human D-group chromosome, comprising (i) AAV nucleic acid sequences that include at least an adeno-associated virus left and right ITR sequence; and (ii) a nucleic acid sequence encoding a protein of interest.

19. A method of integrating a nucleic acid sequence into the p16-p21 region of human chromosome 2, the p12-p13 region of human chromosome 12, the q13 region of chromosome 22, the q12-q13 region of human chromosome 5 or the 92 region of the human D-group chromosome, comprising transfecting a human cultured human cell with the recombinant AAV vector of claim 1, wherein said nucleic acid sequence is integrated.

5,773,290

**MAMMARY GLAND-SPECIFIC PROMOTERS**

Michael N. Gould, and Kai-Shun Chen, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Oct. 7, 1996, Ser. No. 726,725

Int. Cl.<sup>6</sup> C07H 21/04; C12N 15/70

U.S. Cl. 435—320.1

13 Claims

1. An isolated DNA fragment comprising a promoter, wherein the promoter promotes gene expression in a constant manner throughout the estrous cycle and wherein the promoter is selected from the group consisting of neu-related lipocalin (NRL) or neutrophil gelatinase associated lipocalin (NGAL) promoters.

5,773,291

**NON-MELANOTYTIC MAMMALIAN CELL CONSTITUTIVELY EXPRESSING BIOLOGICALLY ACTIVE HUMAN TYROSINASE AND USE THEREOF**

Brigitte Bouchard, and Alan N. Houghton, both of New York, N.Y., assignors to Cooper & Dunham LLP, New York, N.Y.

Continuation of Ser. No. 166,601, Dec. 13, 1993, abandoned, which is a continuation of Ser. No. 8,255, Jan. 25, 1993, abandoned, which is a continuation of Ser. No. 594,310, Oct. 9,

1990, abandoned, which is a continuation-in-part of Ser. No. 343,960, Apr. 26, 1989, abandoned. This application Jan. 23,

1995, Ser. No. 376,306

Int. Cl.<sup>6</sup> C12N 5/10; 5/16; 5/18; 5/22

U.S. Cl. 435—325

7 Claims

1. A non-melanocytic mammalian cell constitutively expressing a biologically active human tyrosinase which produces and packages melanin.

5,773,292

**ANTIBODIES BINDING PORTIONS, AND PROBES RECOGNIZING AN ANTIGEN OF PROSTATE EPITHELIAL CELLS BUT NOT ANTIGENS CIRCULATING IN THE BLOOD**

Neil H. Bander, Chappaqua, N.Y., assignor to Cornell University, Ithaca, N.Y.

Filed Jun. 5, 1995, Ser. No. 463,500

Int. Cl.<sup>6</sup> C07K 16/28; A61K 39/395; C12N 5/12; G01N 33/53

U.S. Cl. 435—332

19 Claims

1. An isolated antibody or binding portion thereof recognizing an antigen of normal, benign, hyperplastic, and cancerous prostate

epithelial cells or portions thereof but no antigens circulating in blood, said antibody or binding portion thereof being immunoreactive with the prostate epithelial cells at a level 200-500 fold greater than for other tissue, based on immunohistochemical end-point titrations, wherein said antibody or binding portion thereof binds to the same epitope of the prostate-related antigen as those to which monoclonal antibodies produced from hybridoma cell lines having ATCC Designations HB 11424, HB 11425, HB 11426, HB 11427, HB 11892, or HB 11893 bind.

5,773,293

## ANTI-ICAM-4 ANTIBODIES AND HYBRIDOMAS

Patrick D. Kilgannon, Bothell, and W. Michael Gallatin, Mercer Island, both of Wash., assignors to ICOS Corporation, Bothell, Wash.

Continuation-in-part of Ser. No. 245,295, May 18, 1994, Pat. No. 5,700,658, which is a continuation-in-part of Ser. No. 102,852, Aug. 5, 1993, abandoned, which is a continuation-in-part of Ser. No. 9,266, Jan. 22, 1993, abandoned, which is a continuation-in-part of Ser. No. 894,061, Jun. 5, 1992, abandoned, which is a continuation-in-part of Ser. No. 889,724, May 26, 1992, abandoned, which is a continuation-in-part of Ser. No. 827,689, Jan. 27, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 485,604

Int. Cl.<sup>6</sup> C12N 5/12; C07K 16/00; C12P 21/08

U.S. Cl. 435-334

6 Claims

1. A hybridoma designated 127A (A.T.C.C. Accession Number HB11905).

5,773,294

## IN VITRO ACTIVATION OF CYTOTOXIC T CELLS

Per A. Peterson, La Jolla; Michael Jackson, and Pierre Langlade-Demoyen, both of Del Mar, all of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Continuation of Ser. No. 209,797, Mar. 10, 1994, Pat. No. 5,529,921, which is a continuation of Ser. No. 841,662, Feb. 19, 1992, Pat. No. 5,314,813. This application Jun. 24, 1996, Ser. No. 669,685

Int. Cl.<sup>6</sup> C12N 5/06; A61K 35/14

U.S. Cl. 435-348

1 Claim

1. A stable *Drosophila* cell line comprising:

- a human class I MHC gene selected from the group consisting of HLA-A, HLA-B, HLA-C, HLA-E, HLA-F and HLA-G; operably linked to an inducible promoter, wherein said human class I MHC gene has a stop codon engineered into the nucleotide sequence encoding the HLA molecule preceding the transmembrane domain, said human class I MHC gene capable of expressing a soluble human class I MHC molecule consisting of an extracellular domain without a transmembrane domain on induction of the promoter; and
- a human  $\beta$ -2 microglobulin gene, operably linked to a second inducible promoter, capable of expressing a human  $\beta$ -2 microglobulin protein on induction of the second promoter;

wherein the stable *Drosophila* cell line is capable of assembling the soluble human class I MHC molecule and the human  $\beta$ -2 microglobulin protein into empty complexes, and secreting the empty complexes, whereby the secreted empty complexes can bind a selected peptide.

5,773,295

## DETERMINATION OF ACID VALUES IN OIL SEEDS

Ya. I. Turyan, Neve Yaakov 425/72, Jerusalem 97350; O. Yu. Berezin, st. Asher Golan 14/7, 97350 Jerusalem; I. Kuselman, Haim Pazner St. 29/5, Jerusalem 97552, and A. Shenhar, 4 Tiltan, Jerusalem 96926, all of Israel

Filed Oct. 8, 1996, Ser. No. 727,362

Claims priority, application Israel, Oct. 19, 1995, 115677

Int. Cl.<sup>6</sup> G01N 33/02

U.S. Cl. 436-20

9 Claims

7. A method for determination of an acid value of an oilseed which comprises:

- introducing a dried comminuted oilseed sample into a Reagent A comprising about 0.05 to 0.15M triethanolamine, about 1 to 7% by volume water, about 50 to 65% by volume isopropanol and about 28 to 48% by volume heptane to form a first mixture and agitating said first mixture for 1 to 2 minutes to thereby first extract free fatty acids and other acids from the comminuted oilseed sample;
- adding to said first mixture a Reagent B to form a second mixture, wherein Reagent B reextracts said free fatty acids from said first extract and comprises 0.5 to 2.5M sulfuric acid and about 1.3 to 1.5M sodium sulfate in water;
- agitating said second mixture for at least 5 minutes to produce a three phase mixture having a lower phase, a middle phase and an upper heptane phase, thus taking up said free fatty acids into said upper heptane phase;
- removing an aliquot from said upper heptane phase containing said free fatty acids; and
- determining the acid value of said comminuted oilseed sample from said aliquot.

5,773,296

## BEAD DISPENSER AND BEAD DISPENSER SYSTEM FOR IMMUNOASSAY ANALYSIS

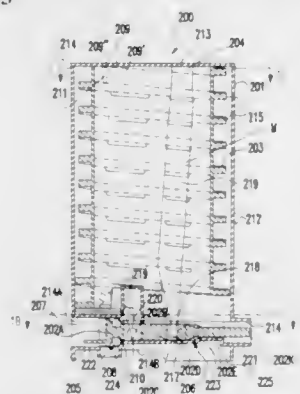
Anthony P. Montalbano, Shelter Island Heights; Chris P. Montalbano; Greg A. Montalbano, both of Great Neck, and Eric C. Fleischer, Rockville Centre, all of N.Y., assignors to DPC Cirrus, Inc., Randolph, N.J.

Filed Jun. 28, 1996, Ser. No. 670,995

Int. Cl.<sup>6</sup> G65N 37/00; B65H 3/60

U.S. Cl. 436-43

25 Claims



21. A method for dispensing beads for heterogenous immunoassays, comprising the steps of:

- providing a bead dispenser system, including:
  - a plurality of bead dispenser devices arranged to supply to a common location, one at a time, beads for heterogenous immunoassay, each dispenser device comprising:
    - a track storing and feeding a plurality of substantially spherical beads by effect of gravity to a lower track end, said beads for a given dispenser device comprising the same biomaterial bound to a surface of said beads,
    - an enclosure sealingly housing said track, comprising: a side wall enclosing outer lateral surfaces of said track, a cover sealingly enclosing an upper track end of said track and upper end of said side wall, and a base including upper and lower sections defining a

plunger chamber, and a first bead chamber defined in said upper section communicating with said lower track end and said first bead chamber being offset along said plunger chamber relative to a bead exit opening in said lower section.

- a plunger sealingly provided in said plunger chamber and being capable of horizontal reciprocal movement within said plunger chamber, said plunger having a through hole defining a second bead chamber normally aligned with said first bead chamber at said lower track end and with a plunger portion concurrently blocking said exit opening via a horizontal biasing means imposing a bias force on said plunger, wherein when a horizontal force is exerted in opposition to and adequate to overcome said normal bias force said plunger being capable of horizontal movement to align said second bead chamber with said exit opening, and wherein said plunger further comprises first and second resilient sealing rings spaced apart and seated on respective first and second collar portions of said plunger, and said plunger chamber having first and second flanges capable of sealingly engaging said first and second resilient sealing rings, respectively, where said first flange is located between said exit opening and said first bead chamber and said second flange is located between said biasing means and a distal end of said plunger at which said horizontal force is exerted;

- means for identifying each of said dispenser devices;
- providing at least one reaction tube;
- providing means for identifying said at least one reaction tube and relating said reaction tube to a related dispenser device having a given biomaterial bound to a surface of the beads;
- providing a tube transport means capable of moving said reaction tube to a bead loading station;
- moving said reaction tube to said bead loading station;
- ejecting a bead from said related bead dispenser into said reaction tube;
- adding a sample of an analyte of interest and a reagent into said reaction tube;
- quantitating the amount of analyte of interest; and
- repeating steps (c)-(h) for each additional reaction tube.

5,773,297

## WATER ANALYSIS SYSTEMS

Richard Lynn Benson, St. Kilda; Ian Donald McKelvie, Nunawading; Alan David Stuart, and Ian Campton Hamilton, both of New Lambton Heights, all of Australia, assignors to ADI Limited, Bondi Junction, Australia

PCT No. PCT/AU94/00616, § 371 Date Jul. 30, 1996, § 102(e) Date Jul. 30, 1996, PCT Pub. No. WO95/10780, PCT Pub. Date Apr. 20, 1995

PCT Filed Oct. 11, 1994, Ser. No. 624,530

Claims priority, application Australia, Oct. 11, 1993, PM1740

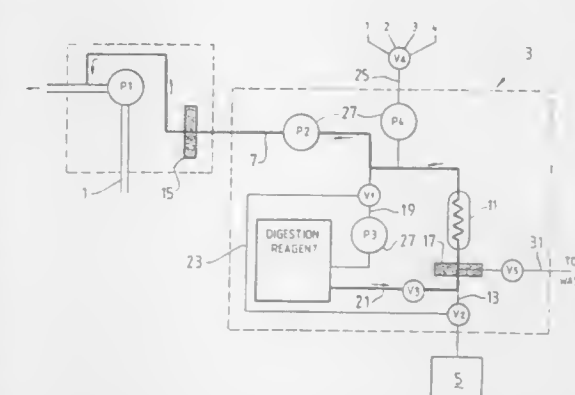
Int. Cl.<sup>6</sup> G01N 35/08

U.S. Cl. 430-52

9 Claims

1. A method of analysing a chemical species in a fluid with an analyser system, the analyser system comprising (i) a sample preparation section having a means for placing the chemical species in a sample of the fluid into an analysable form and (ii) an analyser, the method comprising:

- purging the sample preparation section with the fluid;
- transferring a sample of the fluid into a digester in the sample preparation section via an upstream filtering means and a fluid inlet line and placing the chemical species in the sample into the analysable form by digesting the chemical species with a digestion reagent;



(c) transferring the sample with the chemical species in the analysable form into the analyser and analysing the chemical species in the analyser; and

(d) purging the inlet line and the upstream filtering means with the digestion reagent after transferring the sample to the analyser to dislodge any solids retained in the upstream filtering means and to remove any biological material in the fluid inlet line.

5,773,298

## SUCCESSIVE SAMPLES ANALYSIS METHOD AND ANALYSIS APPARATUS

Anders Lynggaard, Risskov; Theiss Stenström, Sønderborg, both of Denmark; Bo Karlberg, Sollentuna, Sweden, and Ole Ploug, Allerød, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

PCT No. PCT/DK95/00138, § 371 Date Nov. 21, 1996, § 102(e) Date Nov. 21, 1996, PCT Pub. No. WO95/27210, PCT Pub. Date Oct. 12, 1995

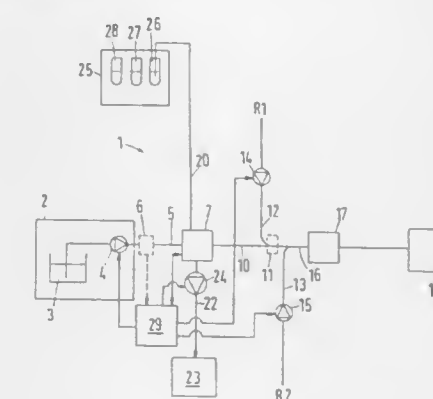
PCT Filed Mar. 29, 1995, Ser. No. 718,477

Claims priority, application Germany, Mar. 31, 1994, 44 11 268.8

Int. Cl.<sup>6</sup> G01N 35/08

U.S. Cl. 436-52

23 Claims



1. An analysis method comprising the steps of introducing several samples in succession into a reaction channel with successive samples being introduced adjoining one another, introducing at least one reagent into the reaction channel for reaction with the samples, moving the samples and reagent through the reaction channel, and passing the samples and reagent from the reaction channel to a detector.



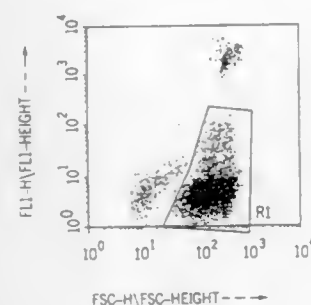
5,773,299  
METHODS FOR THE RAPID ANALYSIS OF THE  
RETICULOCYTES

Young Ran Kim, Sunnyvale, and Johanna Kantor, Palo Alto, both of Calif., assignors to Abbott Laboratories, Abbott Park, Ill.

Division of Ser. No. 426,408, Apr. 21, 1995. This application  
Dec. 20, 1996, Ser. No. 777,727  
Int. Cl.<sup>6</sup> G01N 33/48

U.S. Cl. 436—63

11 Claims



1. A method of enumerating reticulocytes from a whole blood sample while simultaneously differentiating a separate aliquot of the sample to obtain a complete blood cell ("CBC") analysis, wherein said method comprises:

- directing one or more aliquots of the sample to various positions within an automated analyzer for analysis and differentiation;
- combining a reticulocyte aliquot of the sample with a reagent comprising a reticulocyte staining amount of an unsymmetrical cyanine dye, from about 20 mM to about 60 mM of a buffer solution, selected from the group consisting of imidazole, Hepes, Bis-Tris and Tris buffers, and a dye stabilizing amount of a non-ionic surfactant selected from the group consisting of N,N-bis[3-D-Glucon-amidopropyl] choline, n-Dodecyl-D-Maltoside, a polyoxypropylene-polyoxyethylene block copolymer, n-Tetradecyl-D-Maltoside, Decanoyl-N-methyl-glucamide, n-Dodecyl-D-glucopyranoside and n-Decyl-D-glucopyranoside, wherein said reagent has a pH from about 6.0 to about 8.0 and an osmolarity adjusted to about 230 to about 340 mosm/l with a mono-, or di-, valent alkali salt which do not interfere with the cyanine dye or precipitate in the aqueous reagent solution while directing the combined reagent/reticulocyte aliquot to an optical sensing zone of an automated analyzer;
- causing the reagent/reticulocyte aliquot to pass through the sensing zone essentially one cell at a time;
- illuminating the stained sample in said optical sensing zone with an incident light beam to cause fluorescence events;
- measuring the fluorescence events for the reticulocytes in said sample solution as the stained reticulocytes pass through said optical sensing zone; and
- determining the number of reticulocytes present in said sample by counting the measured fluorescence events of the stained reticulocytes.

5,773,300  
NEOPLASIA DIAGNOSTIC METHOD

David A. Federighi, Kirkland, and Stuart L. Bursten, Snoqualmie, both of Wash., assignors to Cell Therapeutics, Inc., Seattle, Wash.

Continuation of Ser. No. 443,655, May 18, 1995, abandoned.  
This application Apr. 23, 1997, Ser. No. 842,150  
Int. Cl.<sup>6</sup> G01N 33/50

U.S. Cl. 436—64

7 Claims

1. A diagnostic assay for determining the presence of a neoplasia or a tumor burden in a mammal comprising (a) measuring the amount of unsaturated free fatty acids (FFAs) linolenate and arachidonate in a body fluid, (b) determining a ratio value com-

prising the sum of linolenate and the sum of arachidonate, and (c) determining the presence of a neoplasia or a tumor burden from said ratio value.

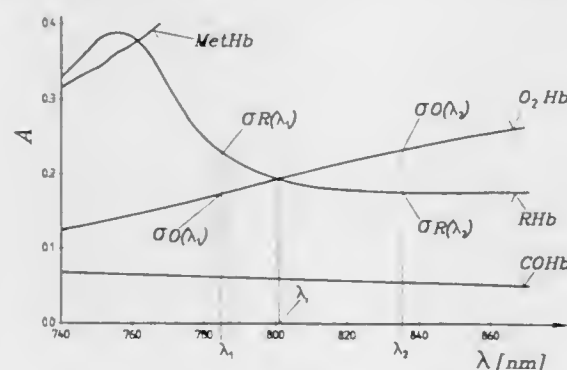
5,773,301  
METHOD FOR OPTICALLY DETERMINING TOTAL  
HEMOGLOBIN CONCENTRATION

Werner Ziegler, Graz, Austria, assignor to AVL Medical Instruments AG, Schaffhausen, Switzerland

Filed Jul. 14, 1997, Ser. No. 892,126  
Claims priority, application Austria, Jul. 12, 1996, 1262/96  
Int. Cl.<sup>6</sup> G01N 21/25

U.S. Cl. 436—66

5 Claims



1. A method for optically determining total hemoglobin concentration (tHb) in a sample of non-hemolyzed whole blood, comprising:

- irradiating said sample of non-hemolyzed whole blood with light of a first measurement wavelength  $\lambda_1 < 805$  nm and a second measurement wavelength  $\lambda_2 > 805$  nm such that the following is valid for the absorption coefficients  $\sigma O(\lambda_1)$ ,  $\sigma O(\lambda_2)$ ,  $\sigma R(\lambda_1)$  and  $\sigma R(\lambda_2)$  of the hemoglobin derivatives  $O_2Hb$  and  $RHb$  at said two measurement wavelengths  $\lambda_1$  and  $\lambda_2$ :  $\sigma O(\lambda_1) - \sigma R(\lambda_2)$  and  $\sigma R(\lambda_1) - \sigma O(\lambda_2)$ , measuring the absorption values  $A_1$  and  $A_2$  at the wavelengths  $\lambda_1$  and  $\lambda_2$  and calculating the sum of said two absorption values  $A_1 + A_2$  as a quantity which is proportional to said total hemoglobin concentration tHb and independent of oxygen saturation  $O_{2sat}$  of said sample of non-hemolyzed whole blood.

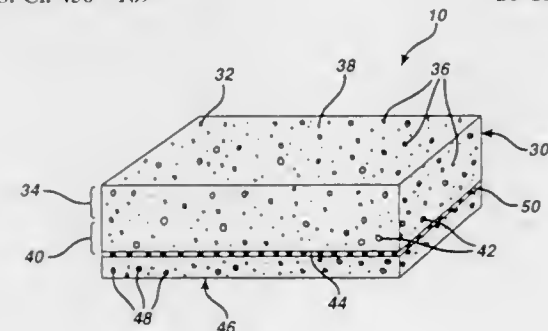
5,773,302  
FLUID CONDUCTING TEST STRIP WITH TRANSPORT  
MEDIUM

David P. Matzinger, Menlo Park; Stephen E. Zweig, Los Gatos, and Yeung S. Yu, Pleasanton, all of Calif., assignors to LifeScan, Inc., Milpitas, Calif.

Continuation of Ser. No. 230,447, Apr. 20, 1994, abandoned, which is a continuation of Ser. No. 881,970, May 12, 1992, abandoned. This application Jun. 22, 1995, Ser. No. 493,435  
Int. Cl.<sup>6</sup> G01N 21/77

U.S. Cl. 436—169

26 Claims



21. A method for measuring the concentration of an analyte in a test sample containing solid color bodies which comprises:

- providing a reagent strip which consists essentially of a testing pad formed from a porous anisotropic membrane impregnated with a color-forming reagent system specific to an analyte which defines a testing surface and a sample receiving surface, and a porous sample transport medium attached to the sample-receiving surface;

contacting a test sample of a biological fluid which contains the analyte and solid color bodies with the transport medium; absorbing the test sample into the transport medium, transporting the test sample to the sample receiving surface, and distributing the test sample across the sample-receiving surface;

transporting and filtering the test sample through the testing pad in a direction which exposes the sample to progressively smaller pores, separating at least some of the solid color bodies from the test sample; and

chemically reacting the testing reagent with the analyte to vary coloration of the testing surface relating the change in coloration of the testing surface to the analyte concentration in the test sample.

5,773,303  
PROCESS AND KIT TO INITIATE A LUMINIFEROUS  
REACTION

Gerd Markowitz, and Dierck Lentfer, both of Rodgau, Germany, assignors to BYK-Sangtec Diagnostica GmbH & Co. KG, Dietzenbach, Germany

PCT No. PCT/EP96/00628, § 371 Date Aug. 18, 1997, § 102(e)  
Date Aug. 18, 1997, PCT Pub. No. WO96/25516, PCT Pub. Date Aug. 22, 1996

PCT Filed Feb. 14, 1996, Ser. No. 894,328

Claims priority, application Germany, Feb. 17, 1995, 195 05 393.1

Int. Cl.<sup>6</sup> G01N 21/76

U.S. Cl. 436—172

2 Claims

1. A starter kit to initiate luminiferous reaction by oxidation of luminescent molecules in analytical tests comprising oxidants and catalysts, wherein as oxidant hydrogen peroxide is present in a concentration of from 0.01 to 0.1% by weight in distilled water and as catalyst deuterioferrihemine is present in an amount of from 200 to 3000 ng/ml in 0.1 to 2N aqueous sodium hydroxide solution.

5,773,304  
METHOD FOR QUANTITATIVELY DETERMINING  
CHOLESTEROL

Koichi Hino; Mitsuhiro Nakamura, and Mitsuhiro Manabe, all of Tokyo, Japan, assignors to Daiichi Pure Chemicals Co., Ltd., Tokyo, Japan

PCT No. PCT/JP95/00641, § 371 Date Sep. 19, 1996, § 102(e)  
Date Sep. 19, 1996, PCT Pub. No. WO96/23902, PCT Pub. Date Aug. 8, 1996

PCT Filed Apr. 3, 1995, Ser. No. 704,681

Claims priority, application Japan, Jan. 31, 1995, 013607  
Int. Cl.<sup>6</sup> G01N 33/533

U.S. Cl. 436—174

7 Claims

1. A method of quantitatively determining the amount of cholesterol in high density lipoproteins, comprising:

- contacting a sample containing high density lipoproteins and lipoproteins other than high density lipoproteins with a surfactant and a reagent, to form a complex of the reagent with the lipoproteins other than the high density lipoproteins; and enzymatically quantitating, in the presence of the complex of the reagent with the lipoproteins other than the high density lipoproteins, the amount of cholesterol in the high density lipoproteins.

5,773,305  
SAMPLE DILUTION MODULE

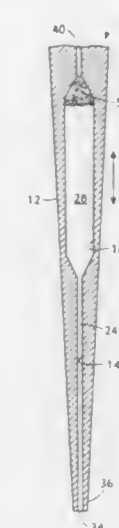
George E. Zabetakis, Bethel, Conn., and Paul Gherson, Yorktown Heights, N.Y., assignors to Bayer Corp., Tarrytown, N.Y.

Filed May 2, 1996, Ser. No. 641,825

Int. Cl.<sup>6</sup> G01N 1/14; B01L 3/02

U.S. Cl. 436—179

19 Claims



1. A method of diluting a sample for analysis in a sample analysis system comprising:

- providing an aspiration probe with two interior sections of different inside diameter, a first interior section with a first diameter being proximate an inlet opening of the probe and a second interior section with a second diameter being located distally of the first section with respect to the inlet opening and being without any mixing element, the second diameter being of greater magnitude than the first diameter;
- aspirating a first predetermined amount of fluid sample into the first interior section of the probe;
- aspirating a second predetermined amount of diluent into the first interior section of the probe;
- drawing the fluid sample and diluent from the first interior section of the probe into the second interior section of the probe; and
- alternately exerting suction and pressure forces on the fluid sample and diluent in the second interior section of the probe to move the fluid sample and diluent back and forth in the second interior section of the probe a first predetermined number of times without agitation of the probe such that the suction and pressure induced back and forth movement of the sample and the diluent in the second interior section of the probe provides substantially uniform mixing of the fluid sample and the diluent in the second interior section of the probe, resulting in a diluted fluid sample.

5,773,306  
METHODS AND KITS FOR THE DETECTION OF  
ENDOTOXIN

Constance F. Neely, Philadelphia, Pa., assignor to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed May 24, 1996, Ser. No. 652,928

Int. Cl.<sup>6</sup> G01N 33/566; 33/567; 33/543

U.S. Cl. 436—518

7 Claims

1. A method of determining endotoxin levels in a sample comprising:

- binding an  $A_1$  adenosine receptor agent to  $A_1$  adenosine receptors;
- contacting the bound agent and  $A_1$  adenosine receptors with a sample so that any endotoxin in the sample displaces the bound agent by binding to the  $A_1$  adenosine receptors; and
- determining the amount of displaced agent.

5,773,307

## METHOD AND DEVICE FOR DETERMINING AN ANALYTE IN A SAMPLE

Bruno Colin, Tassin-la-Demi-Lune; Michel Goudard, Saint-Genis-les-Ollières, and Alain Theretz, Ecully, all of France, assignors to Bio Merieux, Marcy L'Etoile, France  
PCT No. PCT/FR94/01099, § 371 Date Mar. 11, 1996, § 102(e)  
Date Mar. 11, 1996, PCT Pub. No. WO95/08769, PCT Pub. Date Mar. 30, 1995

PCT Filed Sep. 20, 1994, Ser. No. 615,204

Claims priority, application France, Sep. 20, 1993, 93 11363

Int. Cl.<sup>6</sup> G01N 33/553; 33/544; C12M 1/40; B03C 1/00

U.S. Cl. 436—526 17 Claims

1. A method for determining an analyte in a sample which comprises:

- providing said sample in liquid phase, the analyte of which comprises a ligand having at least one anti-ligand specific recognition site;
- providing at least one reagent containing metal particles, in suspension in liquid phase and non-separable from said liquid phase by magnetic or electromagnetic means, and each metal particle containing a metal core to which at least one anti-ligand is fixed directly or indirectly;
- contacting the sample and said at least one reagent containing metal particles, in order to obtain metal clusters;
- placing the metal clusters into a magnetic field generated by a magnetic field generating sensor, in order to assemble the metal clusters; and
- subjecting said sensor to a force caused by the assembled metal clusters, giving a movement or force signal representative of the mass of said assembled metal clusters, correlated with the quantity of analyte present in the sample initially.

5,773,308

## PHOTOACTIVATABLE O-NITROBENZYL POLYETHYLENE GLYCOL-SILANE FOR THE PRODUCTION OF PATTERNED BIOMOLECULAR ARRAYS

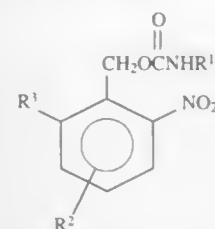
David W. Conrad, Sara K. Gollightley, and John C. Bart, all of Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 10, 1997, Ser. No. 797,325

Int. Cl.<sup>6</sup> C07C 261/00; 269/00; C08F 2/46; C08J 3/28

U.S. Cl. 436—527 21 Claims

1. A compound having the formula:



wherein R<sup>1</sup> is  $-(CH_2CH_2O)_nCH_3$ , where n is an integer from about 6 to about 300, R<sup>2</sup> is a linear linking group having a distal end that is capable of forming a covalent bond with a substrate, and R<sup>3</sup> is NO<sub>2</sub> or H.

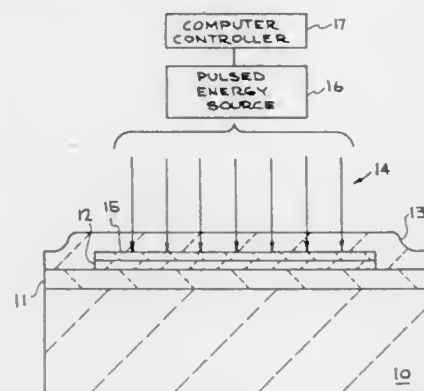
5,773,309

## METHOD FOR PRODUCING SILICON THIN-FILM TRANSISTORS WITH ENHANCED FORWARD CURRENT DRIVE

Kurt H. Weiner, San Jose, Calif., assignor to The Regents of the University of California, Oakland, Calif.  
Continuation of Ser. No. 323,308, Oct. 14, 1994, abandoned.  
This application Aug. 7, 1995, Ser. No. 511,937  
Int. Cl.<sup>6</sup> H01L 21/268

U.S. Cl. 437—21

13 Claims



1. A method for enhancing forward current drive in an amorphous silicon thin film transistor composed of a substrate, a first insulator layer, a layer of amorphous silicon, and a second insulator layer, comprising:  
directing pulsed energy through the second insulator layer onto the top of the amorphous silicon;  
providing means for controlling energy fluence of the pulsed energy directed onto the top surface region;  
melting at least a region of only a top surface of the amorphous silicon by the pulsed energy directed thereon to a depth of about one tenth of the depth of the layer of amorphous silicon; and  
allowing the thus melted region to crystallize.

5,773,310

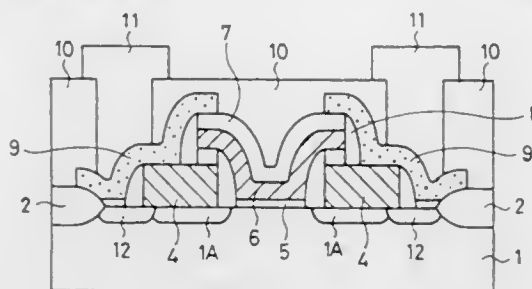
## METHOD FOR FABRICATING A MOS TRANSISTOR

Sung Wook Park, Kyoungki-do, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Ichon-kun, Rep. of Korea  
Filed Jul. 19, 1995, Ser. No. 504,172  
Claims priority, application Rep. of Korea, Jul. 20, 1994, 94-17550

Int. Cl.<sup>6</sup> H01L 21/335; 21/8242

U.S. Cl. 437—40

7 Claims



1. A method for fabricating a transistor, comprising the steps of:  
(a) depositing a first insulating film on a semiconductor substrate of a first conductivity type;  
(b) selectively etching the first insulating film to form a contact hole in the first insulating film, wherein a portion of the semiconductor substrate is exposed through the contact hole, forming an exposed area of the semiconductor substrate for source/drain;

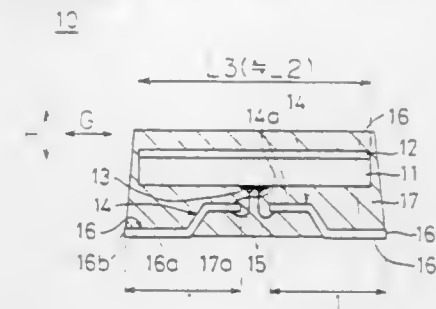
5,773,313

## SEMICONDUCTOR DEVICE AND METHOD OF PRODUCING THE SAME

Mitsutaka Sato, and Junichi Kasai, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan  
Division of Ser. No. 136,462, Oct. 15, 1993, Pat. No. 5,519,251.  
This application Oct. 24, 1995, Ser. No. 547,616  
Claims priority, application Japan, Oct. 20, 1992, 4-281951  
Int. Cl.<sup>6</sup> H01L 21/60

U.S. Cl. 437—216

5 Claims



- (c) implanting dopants into the exposed area of the semiconductor substrate to form source/drain diffusion regions, the dopants having a second conductivity type that is different from the first conductivity type of the semiconductor substrate;
- (d) filling the contact hole with a conductive material, to form a conductor therein;
- (e) subjecting the first insulating film to dry etch to form first insulating film spacers at the sidewalls of the conductor;
- (f) forming a gate oxide film and a conductor oxide film on the semiconductor substrate and the conductor, respectively;
- (g) depositing a conductive layer for a gate electrode and a second insulating film, in sequence, on the structure formed in step (f);
- (h) selectively etching the conductive layer and the second insulating film by use of a gate electrode mask, to form a gate electrode and a second insulating film pattern;
- (i) forming a third insulating film spacer at the sidewall of the gate electrode;
- (j) etching the conductor oxide film on the top of the conductor to expose the conductor; and
- (k) forming a source/drain pad that is connected to the conductor and insulated from the gate electrode.

5,773,311

## METHOD FOR PROVIDING A TEST CONNECTION AND A PERMANENT CONNECTION SITE ON AN UNPACKAGED SEMICONDUCTOR DIE

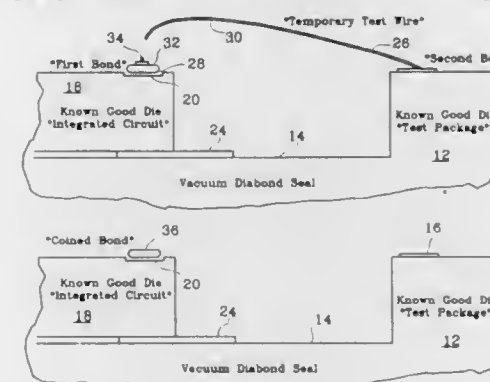
Deborah A. Cullinan, Plymouth, and Thomas J. Dunaway, New Hope, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 26, 1996, Ser. No. 638,420

Int. Cl.<sup>6</sup> H01L 21/60

U.S. Cl. 437—209

10 Claims



1. Method for making a temporary connection to an integrated circuit die, removing said connection and preparing said die to receive a permanent connection, comprising the following steps:  
placing said die in a carrier having provision for connecting leadwires extending from said die to said carrier;  
attaching a leadwire to a connection site at said die, with said leadwire having a uniform portion and a shaped portion so that when sufficient tensile force is applied to said leadwire it will break at said shaped portion leaving said shaped portion attached to said connection site;  
performing testing of said die;  
applying sufficient tensile force to said leadwire to break said leadwire; and  
applying a controlled compressive force to said shaped portion to form said shaped portion into a connection site to receive said permanent connection.

5,773,312

Patent Not Issued For This Number

5,773,314

## PLUG PROTECTION PROCESS FOR USE IN THE MANUFACTURE OF EMBEDDED DYNAMIC RANDOM ACCESS MEMORY (DRAM) CELLS

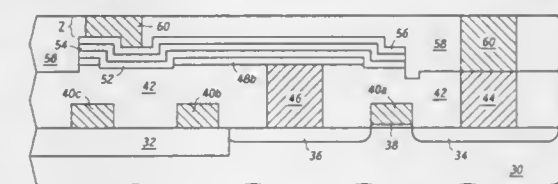
Bo Jiang, Austin; Peter Zurcher, Dripping Springs; Robert E. Jones, Austin, and Bruce E. White, Round Rock, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 25, 1997, Ser. No. 845,457

Int. Cl.<sup>6</sup> H01G 7/06

U.S. Cl. 438—3

39 Claims

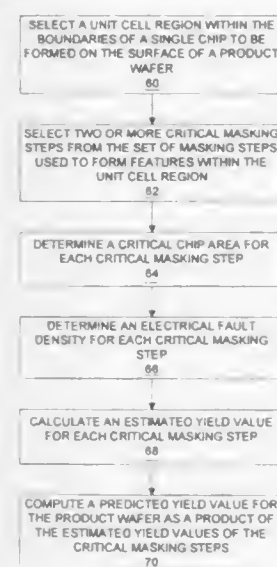


1. A method for forming a semiconductor device, the method comprising the steps of:  
forming a transistor within a substrate, the transistor having a first current electrode and a second current electrode;  
forming a first conductive contact plug to the first current electrode of the transistor;  
forming a second conductive contact plug, separated from the first conductive contact plug, in contact with the second current electrode of the transistor;  
forming a first barrier region and a second barrier region wherein the first barrier region overlies the first conductive contact plug and the second barrier region overlies the second conductive contact plug;  
forming a capacitor dielectric in contact with the first barrier region, the capacitor dielectric being exposed to an ambient



wherein the second barrier region prevents the ambient from coming into substantial contact with the second conductive contact plug whereby oxidation of the first and second conductive plug is substantially avoided;  
forming at least one top electrode conductive layer over the capacitor dielectric; and  
etching portions of the at least one top electrode conductive layer from the semiconductor device whereby a capacitor is formed in electrical contact with the first conductive contact plug.

**5,773,315**  
**PRODUCT WAFER YIELD PREDICTION METHOD EMPLOYING A UNIT CELL APPROACH**  
Richard W. Jarvis, Austin, Tex., assignor to Advanced Micro Devices, Inc.  
Filed Oct. 28, 1996, Ser. No. 736,831  
Int. Cl.<sup>6</sup> H01L 21/66; G01R 31/26  
U.S. Cl. 438—14

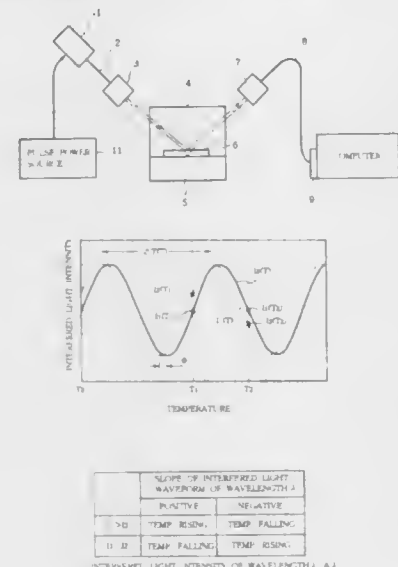


1. A method for determining a predicted yield value for a silicon wafer subjected to a wafer fabrication process, wherein the wafer fabrication process employs a plurality of masking steps in order to form a plurality of identical chips upon a surface of the silicon wafer, the method comprising:

- selecting a first masking step from the plurality of masking steps, wherein the first masking step is used to pattern a previously deposited layer in order to form a plurality of features within a unit cell region upon the surface of the silicon wafer;
- determining a first portion of the unit cell region within which the plurality of features formed have a minimum physical dimension;
- determining a second portion of the unit cell region within which any two of the plurality of features formed are separated by a minimum physical distance;
- summing an area enveloped by the first portion of the unit cell region and an area enveloped by the second portion of the unit cell region in order to determine a critical chip area;
- dividing a total number of defects expected to be present within the previously deposited layer following the first masking step and a subsequent etch step by an area enveloped by the surface of the silicon wafer in order to determine a defect density;
- determining a fraction of the total number of defects expected to be present within the previously deposited layer following the first masking step and the subsequent etch step and expected to render at least one of the plurality of chips inoperative;
- multiplying the defect density by the fraction in order to determine an electrical fault density;

multiplying the critical chip area and the electrical fault density in order to determine a masking step yield value; and  
repeating the preceding steps for a second masking step in order to produce the predicted yield value.

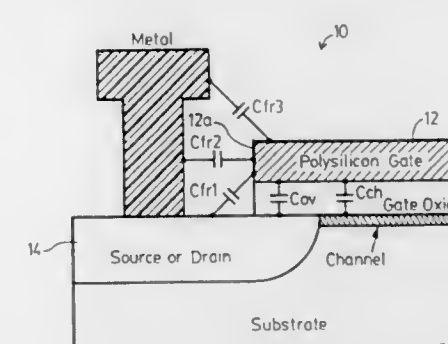
**5,773,316**  
**METHOD AND DEVICE FOR MEASURING PHYSICAL QUANTITY, METHOD FOR FABRICATING SEMICONDUCTOR DEVICE, AND METHOD AND DEVICE FOR MEASURING WAVELENGTH**  
Ryo Kurosaki, Jun Kikuchi, Haruhiko Serizawa, and Shuzo Fujimura, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan  
Filed Mar. 10, 1995, Ser. No. 401,689  
Claims priority, application Japan, Mar. 11, 1994, 6-040274; May 31, 1994, 6-118758; Sep. 20, 1994, 6-225187; Sep. 20, 1994, 6-252903  
Int. Cl.<sup>6</sup> G01R 31/26; H01L 21/66  
U.S. Cl. 438—16



1. A measuring method utilizing a laser beam irradiated upon an object to be measured to measure a physical quantity of the object, said method comprising the steps of:  
irradiating a pulsed laser beam upon the object to be measured, an intensity of the pulsed laser beam being substantially constant within each pulse; and  
measuring a physical quantity of the object by using a first portion of the pulsed laser beam, the first portion occurring immediately after a rise of each pulse of the pulsed laser beam and having a first wavelength, and a second portion of the pulsed laser beam, the second portion occurring within each pulse after the first portion and having a second wavelength.

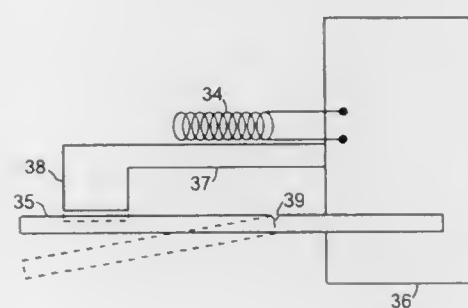
**5,773,317**  
**TEST STRUCTURE AND METHOD FOR DETERMINING METAL-OXIDE-SILICON FIELD EFFECT TRANSISTOR FRINGING CAPACITANCE**  
Koucheng Wu, San Antonio; Yu-Pin Han, Dallas, both of Tex., and Ying-Tsong Loh, Saratoga, Calif., assignors to VLSI Technology Inc., San Jose, Calif.  
Filed Dec. 15, 1995, Ser. No. 572,944  
Int. Cl.<sup>6</sup> H01L 21/66  
U.S. Cl. 438—17

1. A method of determining the fringing capacitance per unit width of a semiconductor process comprising the steps of:  
providing a test chip containing metal-oxide-silicon field effect transistors, the chip including a metal-oxide-silicon field



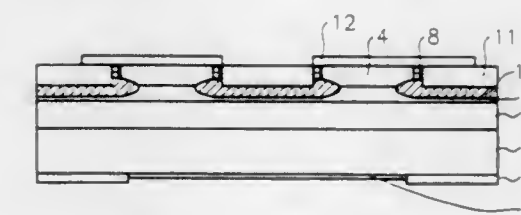
effect transistor having a first channel width and a first gate length, another metal-oxide-silicon field effect transistor having the first channel width and a second gate length, yet another metal-oxide-silicon field effect transistor having a second channel width and the first gate length, and still yet another metal-oxide-silicon field effect transistor having the second channel width and the second gate length, the channel width of the metal-oxide-silicon field effect transistors being greater than the minimum channel width obtainable with the process used to form the chip;  
operating the metal-oxide-silicon field effect transistors in the linear region;  
measuring the capacitance of the metal-oxide-silicon field effect transistors; and  
determining from the measurements the fringing capacitance per unit width for this process from the measured capacitance values.

**5,773,318**  
**IN-SITU TECHNIQUE FOR CLEAVING CRYSTALS**  
Naresh Chand, Berkeley Heights, N.J., and Robert Alan Hamm, Staten Island, N.Y., assignors to Lucent Technologies Inc., Murray Hill, N.J.  
Filed Oct. 30, 1996, Ser. No. 723,660  
Int. Cl.<sup>6</sup> H01L 21/304  
U.S. Cl. 438—33



1. Method for cleaving a crystal body in a high vacuum chamber comprising the steps of:  
mounting the crystal body in a high vacuum chamber,  
mounting adjacent the crystal body a cleaving device, said cleaving device comprising a thermoelectric element and a bearing surface, closing the chamber and evacuating the chamber, and heating the cleaving device thereby causing the thermoelectric element to deflect the bearing surface against the crystal body and fracture the crystal body.

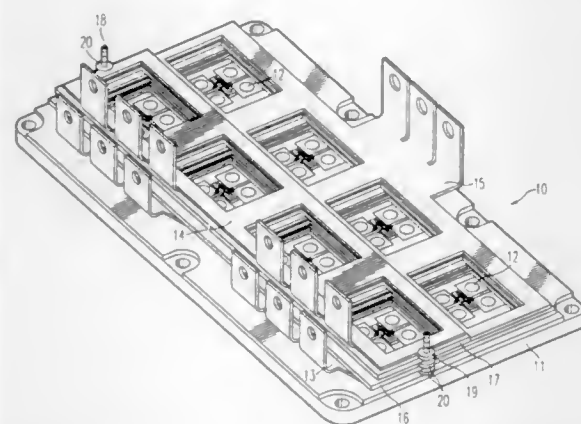
**5,773,319**  
**METHOD FOR PRODUCING A HYDROGENATED VERTICAL-CAVITY SURFACE-EMITTING LASER**  
Hye-Yong Chu, Byung-Su Yoo, and Hyo-Hoon Park, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea  
Filed Apr. 25, 1997, Ser. No. 842,960  
Claims priority, application DPR of Korea, Dec. 5, 1996, 1996-62146  
Int. Cl.<sup>6</sup> H01L 21/20; H01S 3/19  
U.S. Cl. 438—39



1. A method for producing a vertical-cavity surface-emitting laser comprising the steps of:  
sequentially forming a bottom mirror layer, an active layer and a top mirror layer on a compound semiconductor substrate;  
forming an antireflection layer on a rear surface of the compound semiconductor substrate;  
selectively etching predetermined peripheral portions of the antireflection layer, and then forming a first electrode;  
forming a first photoresist pattern on a surface of the top mirror layer to define laser emission portions, and removing the first photoresist pattern after selectively etching portions of the top mirror layer by using the first photoresist pattern as a mask;  
forming a protection layer for hydrogenation barrier over an entire surface of the resultant structure;  
forming a second photoresist pattern on a surface of the protection layer for hydrogenation barrier of a post, and removing the second photoresist pattern after selectively etching the hydrogenated barrier, the top mirror layer and portions of the active layer by using the second photoresist pattern as a mask;  
forming a passivation layer through the hydrogenating of the exposed top mirror layer and the portions of the active layer; exposing the top mirror layer by etching the protection layer for hydrogenation barrier over the surface of the post;  
forming a planarization layer over an entire surface of the resultant structure, and exposing the top mirror layer on the post; and  
forming a second electrode pad to which the exposed top mirror layer contacts.

**5,773,320**  
**METHOD FOR PRODUCING A POWER SEMICONDUCTOR MODULE**  
Reinhold Bayerer, Reichelsheim, Germany, assignor to Asea Brown Boveri AG, Baden, Switzerland  
Filed Nov. 13, 1995, Ser. No. 558,022  
Int. Cl.<sup>6</sup> H01L 21/60  
U.S. Cl. 438—107

1. A method for producing a power semiconductor module in which a plurality of submodules are arranged on a common support and are interconnected by means of a multilayer laminate made of metal layers and insulating layers which are arranged alternately one above the other, said multilayer laminate also providing for external connections, said method comprising the steps of:  
arranging an auxiliary alignment structure with respect to the common support, said auxiliary alignment structure including separate metal layer alignment elements;  
stacking and aligning a first metal layer with respect to one of the metal layer alignment elements of the auxiliary alignments structure arranged on the common support;



stacking and aligning an insulating layer over the aligned first metal layer using the auxiliary alignment structure so that an aligned side of the first metal layer aligned by said one of the metal layer alignment elements is set back from an aligned side of the insulating layer aligned by said auxiliary alignment structure;

stacking and aligning a further metal layer over the insulating layer using another one of the metal layer alignment elements of the auxiliary alignment structure so that the further metal layer has an aligned side set back from the aligned side of the insulating layer in the same manner that the aligned side of the first metal layer is set back from the aligned side of the insulating layer;

fastening the stacked layers together to form the multilayer laminate.

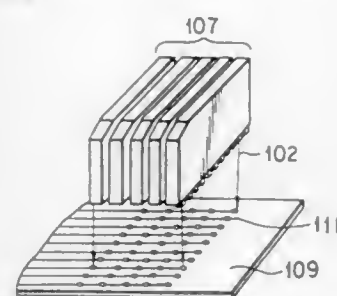
5,773,321  
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICES  
HAVING PARTICULAR TERMINAL GEOMETRY AND  
MOUNTING METHOD

Toshimitsu Ishikawa, Kawaguchi; Atsushi Kitamura, Tokyo, and Kenji Hirayama, Oita, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Division of Ser. No. 348,128, Nov. 28, 1994, Pat. No. 5,616,962, which is a continuation-in-part of Ser. No. 7,877, Jan. 22, 1993, abandoned. This application Dec. 13, 1996, Ser. No. 766,874

Claims priority, application Japan, Jan. 24, 1992, 4-10441

U.S. Cl. 438—109 Int. Cl.<sup>6</sup> H01L 21/60 20 Claims



1. A method of mounting semiconductor integrated circuit devices onto a surface of a printed board, comprising the steps of: applying adhesive soldering paste at a position on the surface of the printed board;

forming a semiconductor device block having a plurality of semiconductor integrated circuit devices of vertical mounting type coupled to each other, each semiconductor integrated circuit device having a plate-like package with two faces and four sides, and a plurality of "L"-shaped outer leads, each of the "L"-shaped outer leads including a first terminal portion projected from one of the four sides, and a second terminal portion extending from a tip end of the first terminal portion

in a direction orthogonal to the first terminal portion in a direction away from the package;

mounting the semiconductor device block onto the surface of the printed board;

replacing only defective semiconductor devices in the semiconductor block, including nondestructively pulling each defective semiconductor device from the mounted semiconductor device block; and

performing a reflow operation for heating to melt the solder paste and fix the "L"-shaped outer leads to the surface of the printed board,

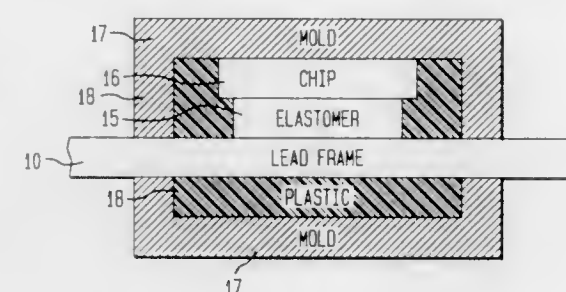
said applying, forming and mounting steps stabilizing the semiconductor device block during the reflow operation step.

5,773,322  
MOLDED ENCAPSULATED ELECTRONIC COMPONENT  
John David Weld, Succasunna, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Division of Ser. No. 784,722, Jan. 16, 1997, abandoned, which is a division of Ser. No. 431,590, May 1, 1995, abandoned.

This application Jun. 27, 1997, Ser. No. 884,095

Int. Cl.<sup>6</sup> H01L 21/44; 21/48; 21/50 U.S. Cl. 438—117 13 Claims



1. The method of forming a molded encapsulated electronic component including a lead frame onto which is mounted an integrated circuit which comprises

maintaining said lead frame in the lower half of an enveloping mold cavity having upper and lower mold halves;

placing on said lead frame a thin, elastomeric, anisotropic, electrically conductive, compliant interconnect having a first and a second face, the first face of said interconnect being in contact with said lead frame;

placing the first face of an integrated circuit, having a first face and a second face on the second face of said interconnect;

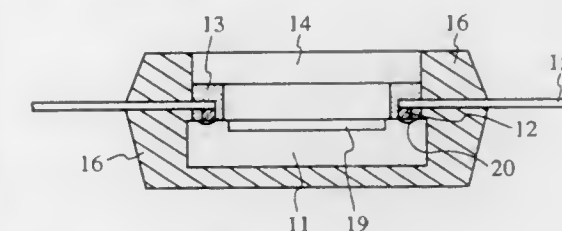
positioning an enclosing upper mold half having a cavity wall adapted to receive said second face of said integrated circuit, on said lower mold half, said upper mold half pressing against said integrated circuit and said elastomeric, anisotropic, electrically conductive, compliant interconnect thereby compressing the latter and maintaining said integrated circuit in a predetermined position within said enclosed mold, said second face of said integrated circuit being coplanar with the cavity wall of said upper mold half;

admitting to the interior of said mold cavity a shear-thinning, thermosetting plastic;

curing said shear thinning, thermosetting plastic thereby forming a molded electronic component including said lead frame bearing said thin compressed, elastomeric anisotropic, compliant, electronically conductive interconnect on which is mounted said integrated circuit wherein said elastomeric, anisotropic, electrically conductive, compliant interconnect is maintained in a compressed state; and,

recovering said molded electronic component including said lead frame bearing said thin, compressed, elastomeric anisotropic, compliant, electrically conductive, interconnect on which is mounted said integrated circuit.

5,773,323  
PACKAGE FOR SOLID STATE IMAGE SENSING  
DEVICE AND METHOD FOR MANUFACTURING  
THEREOF  
Ki-Rok Hur, Cheongju, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea  
Filed Apr. 29, 1996, Ser. No. 639,648  
Claims priority, application Rep. of Korea, Apr. 27, 1995, 1995-10041  
Int. Cl.<sup>6</sup> H01L 21/60 U.S. Cl. 438—123 19 Claims



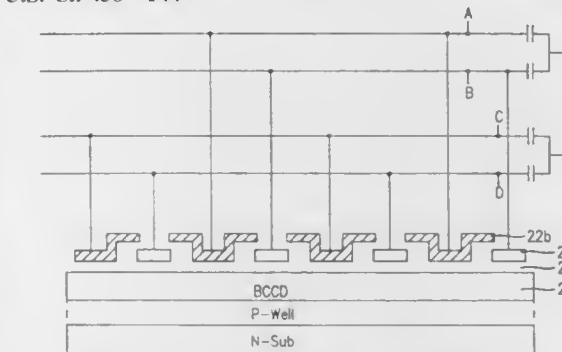
1. A method of manufacturing a solid state image sensing device, comprising the steps of:

(1) forming metallic bonding bumpers on bonding pads of an image sensing device, and disposing inner leads on the bonding bumpers, wherein the inner leads are electrically connected to the bonding bumpers;

(2) forming a dielectric wall sealing the connection of the leads and bumpers in a dielectric wall formation region around a circumference of a light-receiving region of the image sensing device, wherein the dielectric wall formation region is defined with a photoresist mask, wherein the dielectric wall comprises a polymer formed by coating; and

(3) attaching a glass lid which transmits light onto the image sensing device with the dielectric wall, and molding a package body with a molding compound.

5,773,324  
BIDIRECTIONAL HORIZONTAL CHARGE TRANSFER  
DEVICE AND METHOD  
Jee Sung Yoon, Kyungki-do, and Il Nam Hwang, Seoul, both of Rep. of Korea, assignors to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea  
Filed Jul. 30, 1996, Ser. No. 689,083  
Claims priority, application Rep. of Korea, Apr. 3, 1996, 10070/1996  
Int. Cl.<sup>6</sup> H01L 21/339 U.S. Cl. 438—144 9 Claims



1. A bidirectional horizontal charge transfer method comprising the steps of:

forming a charge transfer area within a substrate;

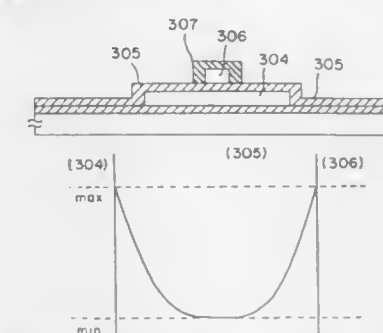
forming first, second, third and fourth poly gates over the charge transfer area;

applying a first clock signal to the first and second poly gates;

applying a second clock signal to the third and fourth poly gates; and

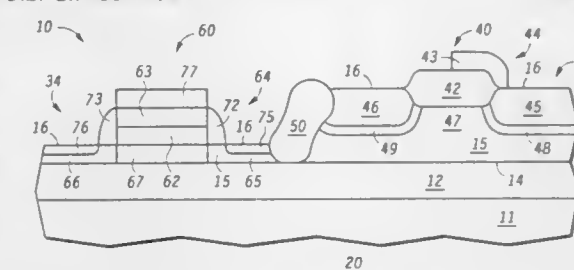
selectively biasing the first and second clock signals so as to selectively change a charge transfer direction.

5,773,325  
METHOD OF MAKING A VARIABLE CONCENTRATION  
SION GATE INSULATING FILM  
Satoshi Teramoto, Kanagawa, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-gen, Japan  
Division of Ser. No. 261,920, Jun. 16, 1994, Pat. No. 5,508,532. This application Feb. 8, 1996, Ser. No. 598,279  
Int. Cl.<sup>6</sup> H01L 21/318 U.S. Cl. 438—151 5 Claims



1. A method of manufacturing an insulated a gate field effect semiconductor device, comprising the step of forming a gate insulating film comprising a material represented as SiO<sub>2</sub>N<sub>x</sub> added with chlorine by utilizing chlorosilane or dichlorosilane as a precursor gas, wherein the distribution of N is varied in a thickness direction of the film so that concentration of N in said gate insulating film is greatest in an interface between said gate insulating film and a gate electrode to be formed in contact with said gate insulating film.

5,773,326  
METHOD OF MAKING AN SOI INTEGRATED CIRCUIT  
WITH ESD PROTECTION  
Percy V. Gilbert, Paul G. Y. Tsui, both of Austin; Stephen G. Jamison, Buda, and James W. Miller, Austin, all of Tex., assignors to Motorola, Inc., Schaumburg, Ill.  
Filed Sep. 19, 1996, Ser. No. 710,702  
Int. Cl.<sup>6</sup> H01L 21/786 U.S. Cl. 438—154 13 Claims



1. A process for forming an integrated circuit comprising the steps of:

providing an SOI substrate which has a semiconductor layer over an insulating layer, the semiconductor layer having a first thickness;

forming a pad layer over the semiconductor layer;

forming an oxidation-resistant layer over the pad layer;

patterning the oxidation-resistant layer to remove a portion of the oxidation-resistant layer that overlies a first portion of the semiconductor layer while leaving a remaining portion of the oxidation-resistant layer over the second portion of the semiconductor layer;

thermally oxidizing the first portion of the semiconductor layer to form an oxide layer over the first portion and thin the first portion such that the first portion of the semiconductor layer is thinner than a second portion of the semiconductor layer; and

forming a first device and an ESD protection device, wherein the first device is formed within the first portion of the semiconductor layer and the ESD protection device is formed within the second portion of the semiconductor layer.



5,773,327

**SEMICONDUCTOR DEVICE AND METHOD OF  
FABRICATING THE SAME**

Shunpei Yamazaki, Tokyo; Hongyong Zhang, and Yasuhiko Takemura, both of Kanagawa, all of Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

Continuation of Ser. No. 195,713, Feb. 14, 1994, abandoned.

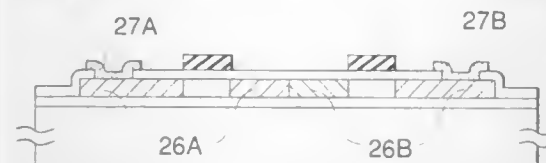
This application Oct. 9, 1996, Ser. No. 728,506

Claims priority, application Japan, Feb. 15, 1993, 5-048534

Int. Cl.<sup>6</sup> H01L 21/84

U.S. Cl. 438—154

28 Claims



1. A method of fabricating a semiconductor device comprising the steps of:

forming a gate insulating film on a semiconductor film comprising silicon;

forming a gate electrode on said gate insulating film;

introducing an impurity into said semiconductor film using said gate electrode as a mask to form a pair of impurity regions in said semiconductor film with a channel region defined therebetween;

disposing a substance containing at least one of nickel, iron, cobalt, platinum and palladium on said pair of impurity regions; and

heating said semiconductor film after introducing said impurity and disposing said substance, thereby crystallizing said channel region in such a manner that crystals grow through said channel region from a portion of said semiconductor film on which said substance have been disposed.

5,773,328

**METHOD OF MAKING A FULLY-DIELECTRIC-  
ISOLATED FET**

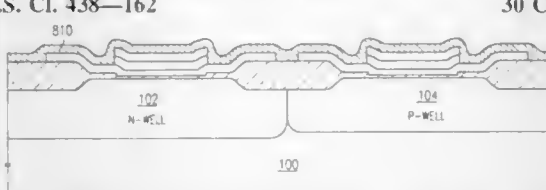
Richard A. Blanchard, Los Altos, Calif., assignor to SGS-Thomson Microelectronics, Inc., Carrollton, Tex.

Continuation-in-part of Ser. No. 397,654, Feb. 28, 1995, Pat. No. 5,668,025. This application Jun. 7, 1995, Ser. No. 474,710

Int. Cl.<sup>6</sup> H01L 21/00

U.S. Cl. 438—162

30 Claims



1. A method for fabricating integrated circuit devices, comprising the steps of:

(a.) providing a monolithic semiconductor material;

(b.) covering part of the surface of said monolithic material with a patterned dielectric layer, said patterned dielectric layer leaving said monolithic material exposed in transistor channel locations;

(c.) forming additional semiconductor material as monocrystalline semiconductor material on said transistor channel locations and as polycrystalline semiconductor material elsewhere, said additional semiconductor material being formed to a thickness which is greater than the thickness of said patterned dielectric layer;

(d.) implanting an oxidizing species at an energy which forms respective buried dielectric layers in said transistor channel locations, patterning said additional semiconductor material to form a patterned thin film layer, and forming a gate dielectric on said additional semiconductor material;

(e.) forming an additional patterned conductive thin film layer on said gate dielectric; and

(f.) implanting dopants of a desired conductivity type into said additional semiconductor material where exposed by said additional patterned conductive thin film layer;

whereby monocrystalline portions of said additional semiconductor material beneath said additional patterned conductive thin film layer form transistor channel regions, and polycrystalline portions of said additional semiconductor material provide source and drain regions adjacent thereto.

5,773,329

**POLYSILICON GROWN BY PULSED RAPID THERMAL  
ANNEALING**

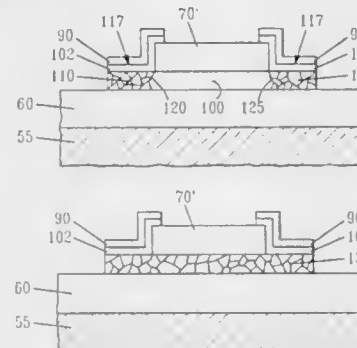
Yue Kuo, Chappaqua, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 24, 1996, Ser. No. 685,728

Int. Cl.<sup>6</sup> H01L 21/268

U.S. Cl. 438—162

17 Claims



12. A method of transforming an amorphous silicon layer to a polysilicon layer comprising the steps of:  
forming a metal layer over said amorphous silicon layer; and  
pulsed rapid thermal annealing said metal and amorphous silicon layers using successive thermal pulses having a duration of approximately one second and separated by approximately five seconds.

5,773,330

**SEMICONDUCTOR DEVICE AND METHOD FOR  
FABRICATING THE SAME**

Chan Kwang Park, Ichon, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyonggi-do, Rep. of Korea

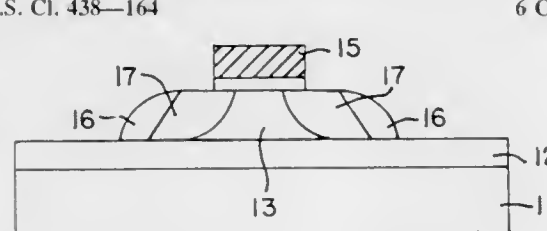
Filed Jun. 27, 1996, Ser. No. 670,167

Claims priority, application Rep. of Korea, Jun. 30, 1995, 95-18864

Int. Cl.<sup>6</sup> H01L 21/84

U.S. Cl. 438—164

6 Claims



1. A method for fabricating a semiconductor device having a silicon-on-insulator structure, comprising the steps of:

depositing a first silicon oxide film over a first silicon substrate and then depositing a silicon substrate layer over the first silicon oxide film;

patterning the silicon substrate layer, thereby forming a second silicon substrate which has a trapezoidal cross-sectional structure and is disposed on the first silicon oxide film at an active region;

5,773,332

**ADAPTABLE COMMUNICATIONS CONNECTORS**

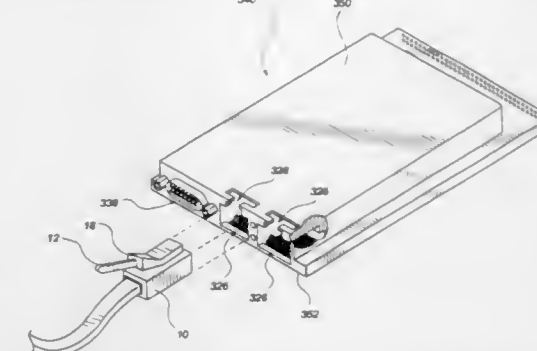
Paul H. Glad, Salt Lake City, Utah, assignor to Xircom, Inc., Thousand Oaks, Calif.

Continuation of Ser. No. 402,084, Mar. 10, 1995, abandoned, which is a continuation-in-part of Ser. No. 151,249, Nov. 12, 1993, Pat. No. 5,411,405. This application Feb. 13, 1997, Ser. No. 799,799

Int. Cl.<sup>6</sup> H01R 23/02

U.S. Cl. 439—344

12 Claims



1. A communications card for use in a data utilization device including a PCMCIA Type III card slot, the communications card for receiving an RJ-xx series plug having a biased clip and for making electrical connection with at least first and second electrical contacts provided on the plug, the communications card comprising:

a first surface forming a first outer surface of the communications card;

a second surface, the second surface being substantially parallel to the first surface and forming a second outer surface of the communications card;

a first end of the communications card which is accessible to the RJ-xx series plug when the communications card is installed in the PCMCIA Type III card slot;

recess means, located at the first end of the communications card, for receiving the RJ-xx series plug, the recess means having dimensions such that the RJ-xx series plug is closely received therein and the recess means is oriented such that the direction which the RJ-xx series plug travels when being inserted into the recess means is substantially parallel to the first surface and the second surface;

a communications device housed between the first surface and the second surface;

a first electrical conductor provided in the recess means, the first electrical conductor being positioned such that it makes electrical continuity with the first electrical contact in the plug when the plug is received in the recess means;

a second electrical conductor provided in the recess means, the second electrical conductor being positioned such that it makes electrical continuity with the second electrical contact in the plug when the plug is received by the recess means;

means for conveying any electrical signal present on the first and second electrical contacts to the communications device; and  
a cutout formed on the first surface adjacent to the recess means, the cutout being generally shaped to receive the biased clip.

5,773,333

**METHOD FOR MANUFACTURING SELF-ALIGNED  
T-TYPE GATE**

Jun Whan Jo, Seoul, Rep. of Korea, assignor to LG Semicon Co., Ltd., Chungcheongbuk-Do, Rep. of Korea

Filed Dec. 30, 1996, Ser. No. 781,900

Claims priority, application Rep. of Korea, Dec. 30, 1995, 69310/1995

Int. Cl.<sup>6</sup> H01L 21/338

U.S. Cl. 438—179

12 Claims

1. A method for manufacturing a self-aligned T-type gate, the method comprising the steps of:

forming a side wall insulating film doped with impurity ions having a conduction type different from that of the second silicon substrate on each side wall of the second silicon substrate;

forming a doped region in the side wall insulating film in such a manner that the impurity ions doped in the side wall insulating film are diffused into the side wall of the second silicon substrate;

sequentially forming a gate oxide film and a gate electrode on a portion of the second silicon substrate; and  
implanting impurity ions in a high concentration in portions of the second substrate not overlapping with the gate electrode, thereby forming source/drain impurity diffusion regions.

5,773,331

**METHOD FOR MAKING SINGLE AND DOUBLE GATE  
FIELD EFFECT TRANSISTORS WITH SIDEWALL  
SOURCE-DRAIN CONTACTS**

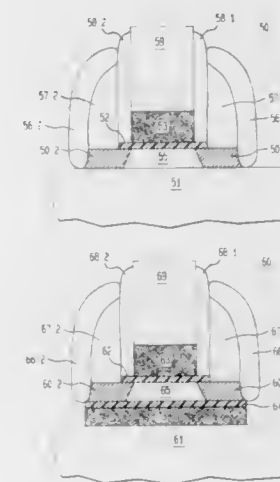
Paul Michael Solomon, Yorktown Heights, and Hon-Sum Philip Wong, Chappaqua, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1996, Ser. No. 767,916

Int. Cl.<sup>6</sup> H01L 21/86

U.S. Cl. 438—164

10 Claims



1. Method for making a field effect transistor (50) on a support structure (51), comprising the steps of:

(a) forming a channel layer (55);

(b) forming a top gate insulator layer (52) on said channel layer (55);

(c) forming a top gate (53) on said top gate insulator layer (52);

(d) forming a gate pillar (59) on said top gate (53);

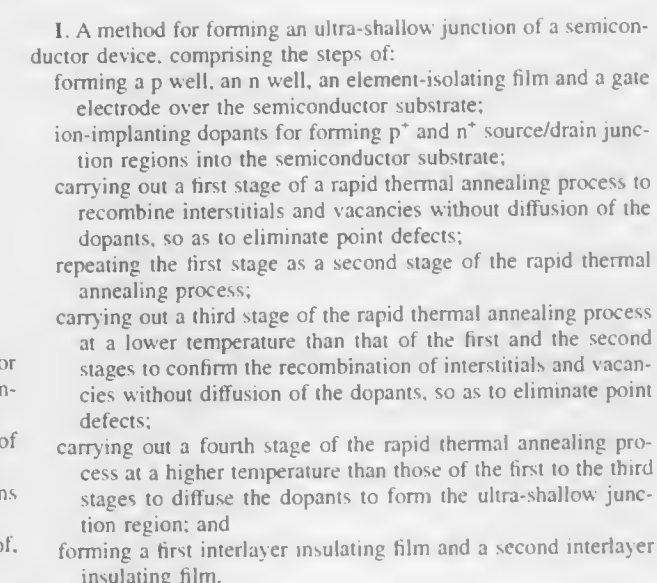
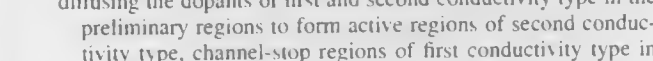
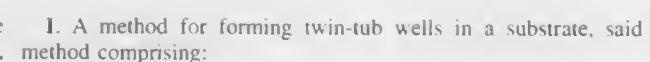
(e) forming insulating sidewall layers (58.1, 58.2) adjacent to said top gate (53) and gate pillar (59);

(f) forming an integral drain region (50.1) and source region (50.2) within said channel layer (55) by introduction of dopants;

(g) forming conductive amorphous silicon sidewalls (57.1, 57.2) on either side of, and adjacent to said insulating sidewall layers (58.1, 58.2), one of said amorphous silicon sidewalls (57.1) being connected to said drain region (50.1) and one (57.2) being connected to said source region (50.2);

(h) etching said channel layer (55) using said top gate (53), gate pillar (59), insulating sidewall layers (58.1, 58.2), and amorphous silicon sidewalls (57.1, 57.2) as mask, thereby transferring the lateral extension of said mask into said channel layer (55), providing for a channel (55) with integral drain region (50.1) and source region (50.2) being raised with respect to said support structure (51).

# UMI



conductivity type into the first region to form a second region of a second conductivity type in the first region;



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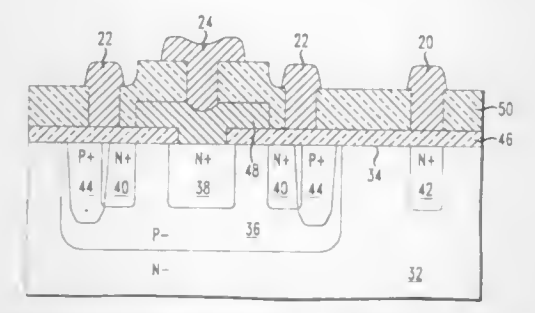
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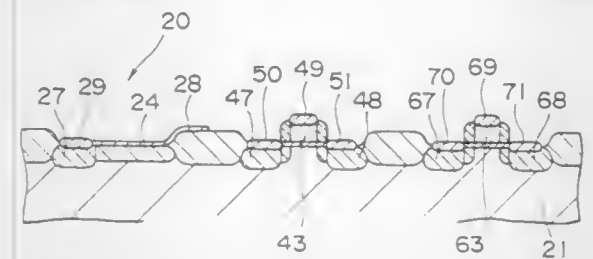
1998

UMI



introducing a first conductivity type dopant into the second region to form a third region of the first conductivity type in the second region;  
introducing a first conductivity type dopant into the second region to form a fourth region of the first conductivity type in the second region, wherein the fourth region is spaced from the third region;  
forming a dielectric layer on the second region; and  
forming an electrode in electrical contact with the third region and the on the dielectric layer in the spaced area between the third and fourth regions, the electrode over the spaced area forming a gate electrode for a MOS transistor including the fourth region as a source, the third region as a drain and the space therebetween forming the MOS channel, the electrode area contacting the third region forming an electrode for an emitter of a bipolar transistor, the third region defined as the bipolar emitter, the first region as the bipolar collector and the second region as the bipolar base.

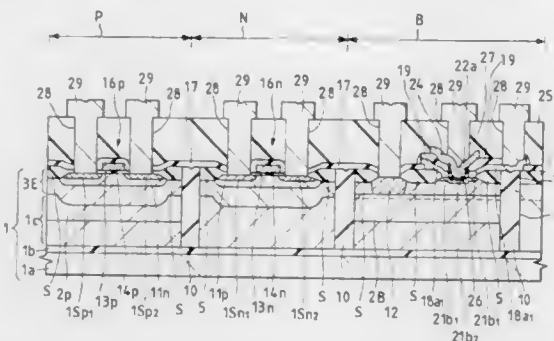
**5,773,339**  
**METHOD OF MAKING DIFFUSED LAYER RESISTORS FOR SEMICONDUCTOR DEVICES**  
Yutaka Okamoto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan  
Filed Sep. 26, 1995, Ser. No. 534,246  
Claims priority, application Japan, Sep. 29, 1994, 6-234813  
Int. Cl.<sup>6</sup> H01L 21/8238; 21/266  
U.S. Cl. 438—210 10 Claims



5. A method for creating a diffused-layer resistor in a CMOS transistor process wherein said method comprises:  
a first process of creating gate electrodes of first and second conductivity-type transistors of CMOS transistors on a semiconductor substrate through gate insulating films along with creating low-concentration diffused layers wherein each of said diffused layers is used as an LDD diffused layer and, at the same time, creating a low-concentration layer on a region on said semiconductor substrate reserved for creation of said diffused-layer resistor and, after that, creating a side wall on a side of each of said gate electrodes;  
a second process of creating a mask creation film on said semiconductor substrate, subsequently, creating a first doping mask to cover a region reserved for creation of said first conduction-type MOS transistor and said region reserved for creation of said diffused-layer resistor, subsequently creating high-concentration diffused layers to be used as source and drain regions on a region reserved for creation of said second conduction-type MOS transistor by using an impurity doping technique and, after that, removing said mask creation film on said region reserved for creation of said second conduction-

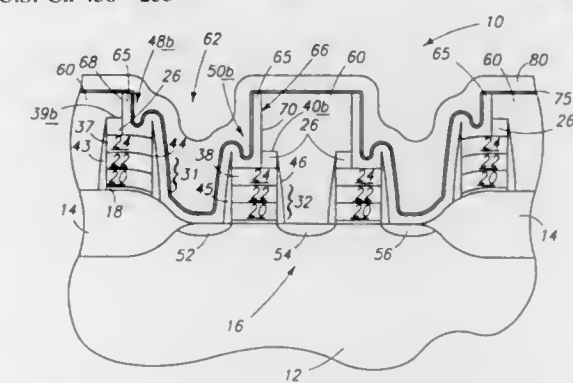
type MOS transistor by means of an etching technique using said first doping mask as an etching mask and, finally, creating a second doping mask to cover part of said region reserved for creation of said diffused-layer resistor and said region reserved for creation of said second conduction-type MOS transistor;  
a third process of creating a high concentration diffused layer on said region reserved for creation of said diffused-layer resistor except said part covered by said second doping mask and, at the same time, creating high-concentration diffused layers to be used as source and drain regions on a region reserved for creation of said second conduction-type MOS transistor by using an impurity doping technique; and  
a fourth process of creating a silicide creating mask from said mask creation film by means of an etching technique using said second doping mask as an etching mask and then creating silicide layers selectively on said high-concentration diffused layers and on each of said gate electrodes by using said silicide creating mask.

**5,773,340**  
**METHOD OF MANUFACTURING A BIMIS**  
Takahiro Kumauchi, Hamura; Takashi Hashimoto, Onie; Osamu Kasahara, Yatsuo-machi; Satoshi Yamamoto, Ome; Yoichi Tamaki, Kokuhunji; Takeo Shiba, Kodaira, and Takashi Uchino, Kunitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed Nov. 28, 1995, Ser. No. 563,335  
Claims priority, application Japan, Dec. 1, 1994, 6-298233  
Int. Cl.<sup>6</sup> H01L 21/8249  
U.S. Cl. 438—234 14 Claims



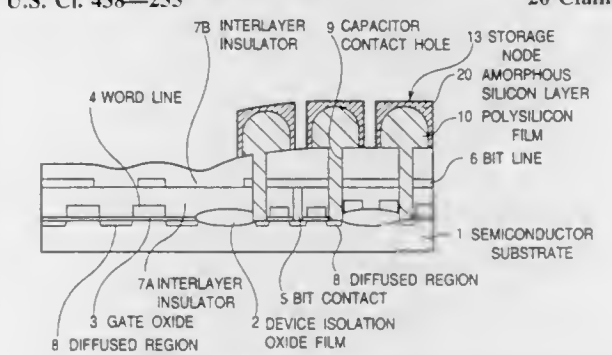
1. A method of manufacturing a semiconductor integrated circuit device comprising the steps of:  
(a) forming a base region of a first conduction type on a main surface of a semiconductor substrate;  
(b) forming a base electrode electrically connected to said base region and formed of polysilicon containing impurities of the first conduction type;  
(c) forming a phosphorus-containing amorphous silicon film on a surface of said base region by CVD at a first temperature;  
(d) subjecting said semiconductor substrate to a first thermal treatment at a second temperature higher than said first temperature so as to convert said amorphous silicon film into a polysilicon film whereby the phosphorus present in said amorphous silicon film is diffused into said base region thereby forming an emitter region; and  
(e) subjecting said semiconductor substrate to a second thermal treatment at a third temperature higher than said second temperature whereby a resistance said base electrode is reduced.

**5,773,341**  
**METHOD OF MAKING CAPACITOR AND CONDUCTIVE LINE CONSTRUCTIONS**  
James E. Green, Caldwell, and Darwin Clappitt, Boise, both of Id., assignors to Micron Technology, Inc., Boise, Id.  
Filed Jan. 18, 1996, Ser. No. 591,226  
Int. Cl.<sup>6</sup> H01L 21/8242  
U.S. Cl. 438—253 26 Claims



1. A semiconductor processing method of forming a capacitor construction comprising the following steps:  
providing a pair of electrically conductive lines having respective electrically insulated outermost surfaces;  
providing a pair of sidewall spacers laterally outward of each of the pair of conductive lines, the spacers having uppermost surfaces;  
etching material over the pair of conductive lines between the respective pairs of sidewall spacers selectively relative to the sidewall spacers to form respective recesses over the pair of conductive lines and extending to beneath the uppermost surfaces of the sidewall spacers, the etching leaving the outermost conductive line surfaces electrically insulated;  
providing a node to which electrical connection to a capacitor is to be made between the pair of conductive lines, one sidewall spacer of each pair of sidewall spacers being closer to the node than the other sidewall spacer of each pair;  
providing an electrically conductive first capacitor plate layer over the node, the one sidewall spacer of each pair of sidewall spacers, and within the respective recesses; and  
providing a capacitor dielectric layer and a second capacitor plate layer over the first capacitor plate layer.

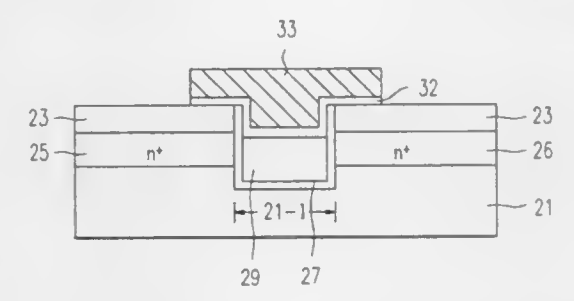
**5,773,342**  
**METHOD FOR FORMING A STORAGE NODE IN A SEMICONDUCTOR MEMORY USING ION IMPLANTATION TO FORM A SMOOTH AMORPHOUS POLYCRYSTALLINE FILM**  
Tadashi Fukase, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan  
Filed May 15, 1997, Ser. No. 856,801  
Claims priority, application Japan, May 16, 1996, 8-121847  
Int. Cl.<sup>6</sup> H01L 21/8242  
U.S. Cl. 438—255 20 Claims



1. A method for forming a storage node in a semiconductor memory having an information storage capacitor formed above a semiconductor substrate, comprising the steps of:

forming an interlayer insulator film above said semiconductor substrate;  
forming a contact hole to penetrate through said interlayer insulator film and to reach said semiconductor substrate;  
depositing a polycrystalline semiconductor film to fill said contact hole and to cover said interlayer insulator film;  
implanting ions into said polycrystalline semiconductor film to convert a surface layer of said polycrystalline semiconductor film into an amorphous state to smooth said surface layer of said polycrystalline film;  
forming on said surface layer of said polycrystalline semiconductor film a resist mask for patterning of said storage node; and  
etching said polycrystalline semiconductor film using said resist mask to form said storage node.

**5,773,343**  
**SEMICONDUCTOR DEVICE HAVING A RECESSED CHANNEL STRUCTURE AND METHOD FOR FABRICATING THE SAME**  
Sung Chul Lee, and Min Gyu Lim, both of Chungcheongbuk-do, Rep. of Korea, assignors to LG Semicon Co., Ltd., Chungcheongbuk-do, Rep. of Korea  
Filed Aug. 8, 1995, Ser. No. 512,644  
Claims priority, application Rep. of Korea, May 12, 1995, 11775/1995  
Int. Cl.<sup>6</sup> H01L 21/8247  
U.S. Cl. 438—259 18 Claims



1. A method for fabricating a semiconductor device having a recessed structure comprising the steps of:  
forming a second conductivity type semiconductor layer on a first conductivity type substrate wherein the second conductivity type semiconductor layer is formed by depositing a polysilicon film on the first conductivity type substrate;  
forming a first insulation film on the second conductivity type semiconductor layer;  
forming a source and a drain by removing portions of the first insulation film and the second conductivity type semiconductor layer;  
forming a second insulation film on an exposed surface of the substrate and the source and drain;  
forming a first gate on the second insulation film;  
forming a dielectric film on a surface of the first gate; and  
forming a second gate on the dielectric film, wherein the first gate fills at least the removed portion of the second conductivity type semiconductor layer.

5,773,344

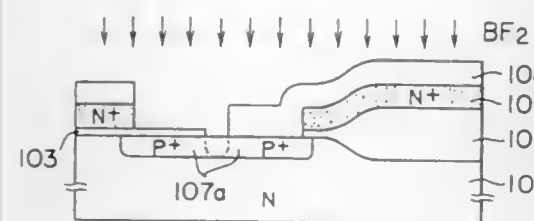
**SEMICONDUCTOR DEVICE HAVING GATE ELECTRODE AND IMPURITY DIFFUSION LAYER DIFFERENT IN CONDUCTIVITY TYPE AND METHOD OF MANUFACTURING SAME**

Fumitomo Matsuo, Kawasaki, and Yukari Unno, Yokohama, both of Japan, assignors to Kabushiki Kaisha Toshiba, Tokyo, Japan

Division of Ser. No. 425,239, Apr. 18, 1995, Pat. No. 5,521,416, which is a continuation of Ser. No. 141,197, Oct. 21, 1993, abandoned. This application May 9, 1996, Ser. No. 646,993 Claims priority, application Japan, Oct. 22, 1992, 4-284702 Int. Cl.<sup>6</sup> H01L 21/336; 21/4763

U.S. Cl. 438—281

54 Claims



1. A method of manufacturing a semiconductor device, the method comprising the steps of:  
forming an oxide film on a semiconductor substrate of a first conductivity type;  
forming a polycrystalline silicon layer of the first conductivity type on the oxide film;  
forming a contact hole passing through the polycrystalline silicon layer and the oxide film to a surface region of the semiconductor substrate;  
forming an impurity diffusion layer of a second conductivity type by ion-implanting and diffusing an impurity of the second conductivity type into the surface region of the semiconductor substrate exposed through the contact hole and by activating the ion-implanted and diffused surface region; and  
forming an electrode wiring layer including a high melting point metal, to form at least first and second two-layer gate electrodes, each being formed of said polycrystalline layer covered by said electrode wiring layer, each gate electrode formed on said oxide film on said semiconductor substrate, said first and second two-layer gate electrodes being separated by said contact hole, wherein the electrode wiring layer that is one of the two layers of the first and second two-layer gate electrodes is formed so that a portion of the electrode wiring layer contacts the impurity diffusion layer via said contact hole for attaining ohmic contact between said first gate electrode and the impurity diffusion layer through said contact hole.

5,773,345

**OPTICAL LINK AMPLIFIER AND A WAVELENGTH MULTIPLEX LASER OSCILLATOR**

Takeshi Ota, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Division of Ser. No. 184,137, Jan. 21, 1994, Pat. No. 5,523,879, which is a continuation-in-part of Ser. No. 873,448, Apr. 24, 1992, Pat. No. 5,510,920. This application Apr. 7, 1995, Ser. No. 418,676

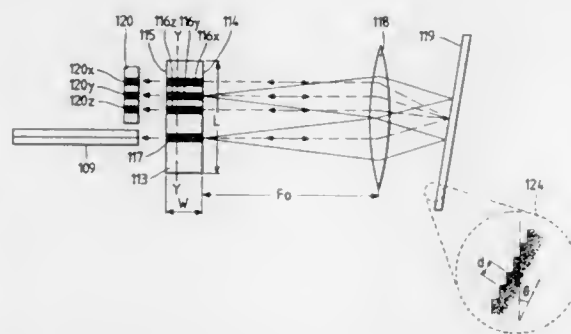
Claims priority, application Japan, Apr. 26, 1991, 3-97406; Jun. 28, 1991, 3-158580; Sep. 30, 1991, 3-251677; Oct. 7, 1991, 3-259429

Int. Cl.<sup>6</sup> H01L 21/20

U.S. Cl. 438—286

5 Claims

1. A method of manufacturing a monolithic wavelength multiplex laser oscillator comprising the steps of:  
forming a semiconductor laser active layer on a substrate;  
forming an optical waveguide by mixed-crystallizing a part of said semiconductor laser active layer; and



forming a diffraction grating by removing a part of the region of said semiconductor laser active layer into which an impurity is diffused.

5,773,346

**SEMICONDUCTOR PROCESSING METHOD OF FORMING A BURIED CONTACT**

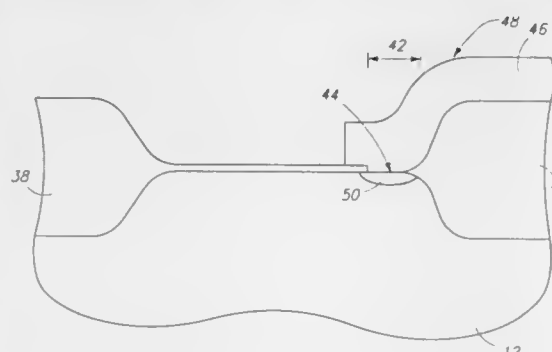
Monte Manning, Kuna, Id., assignor to Micron Technology, Inc., Boise, Id.

Filed Dec. 6, 1995, Ser. No. 567,916

Int. Cl.<sup>6</sup> H01L 21/335

U.S. Cl. 438—297

25 Claims



1. A semiconductor processing method of making ohmic contact between a transistor gate line and a substrate diffusion region comprising the following steps:  
providing a stress relief layer over a bulk semiconductor substrate;  
etching the stress relief layer to expose a bulk red first area of the bulk semiconductor substrate;  
providing an oxidation masking layer over the stress relief layer to cover desired substrate active areas and leave desired substrate field oxide areas exposed, the oxidation masking layer overlying at least a portion of the first area;  
exposing the substrate to oxidation conditions effective to grow field oxide regions in the unmasked field oxide areas;  
after field oxide formation, removing the oxidation masking layer from the substrate and effectively leaving the unoxidized first area exposed, the unoxidized first area effectively defining a buried contact opening area to the bulk semiconductor substrate;  
providing an electrically conductive transistor gate layer over the field oxide regions and buried contact opening area;  
patterning the gate layer into a transistor gate line which overlies both field oxide and the buried contact area, the patterned gate line being in ohmic electrical communication with the buried contact area.

5,773,347

**METHOD OF MANUFACTURING FIELD EFFECT TRANSISTOR**

Masatoshi Kimura, and Takio Ohno, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

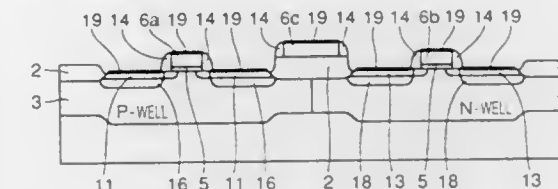
Continuation of Ser. No. 318,408, Oct. 5, 1994, abandoned.

This application Feb. 14, 1996, Ser. No. 601,543

Claims priority, application Japan, Mar. 25, 1994, 6-055909 Int. Cl.<sup>6</sup> H01L 21/335

U.S. Cl. 438—302

3 Claims



1. A method of manufacturing a field effect transistor, comprising the steps of:  
forming a gate electrode having side surfaces and a top surface on a main surface of a semiconductor substrate;  
forming a gate electrode protective layer on said gate electrode; ion-implanting an impurity into the main surface of said semiconductor substrate by rotary implantation at an implantation angle of about 45° to form a first source/drain region having a low impurity concentration using said gate electrode protective layer as a mask;  
depositing an insulating layer on the surface and anisotropically etching the deposited insulating layer to form a sidewall insulating layer in contact with the side surfaces of said gate electrode;  
removing said gate electrode protective layer;  
depositing a metal layer on the surface in contact with the source/drain regions and the top surface of the gate electrode; and  
heat treating to form a metal silicide layer on said source/drain regions and on the top surface of said gate electrode in a self-aligned manner; wherein  
said gate electrode protective layer includes a silicon oxide film formed on the top surface of said gate electrode and an etching stopper layer formed on said oxide film.

5,773,348

**METHOD OF FABRICATING A SHORT-CHANNEL MOS DEVICE**

Shye-Lin Wu, Hsinchu Hsien, Taiwan, assignor to Powerchip Semiconductor Corp., Hsin-chu, Taiwan

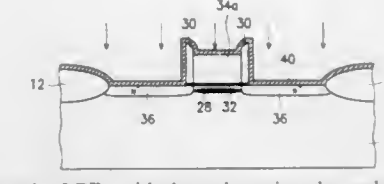
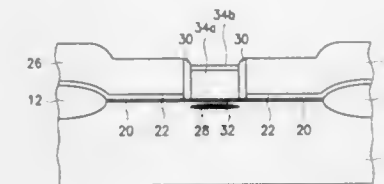
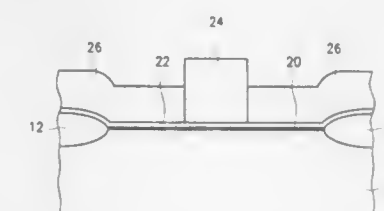
Filed May 21, 1997, Ser. No. 859,754

Int. Cl.<sup>6</sup> H01L 21/336

U.S. Cl. 438—305

15 Claims

1. A method for fabricating a short-channel MOS device on a substrate, comprising the steps of:  
forming a pad oxide layer on the substrate;  
forming a pad nitride layer on the pad oxide layer;  
forming a photoresist layer on the pad nitride layer;  
removing a portion of the photoresist layer by a photolithographic process, a remainder portion of the photoresist layer covering a planned region for a gate of the MOS device and its sidewall spacers;  
selectively depositing a LPD oxide layer on the pad nitride layer by a liquid phase deposition process;  
removing a remainder portion of the photoresist layer;  
forming nitride spacers within the planned gate region against the LPD oxide layer;  
removing a portion of the pad oxide layer located within the planned gate region;  
forming a gate structure of the MOS device on the exposed substrate, the gate structure being laterally sandwiched between the nitride spacers;



- removing the LPD oxide layer by using the pad nitride layer as an etching stop layer;  
removing remainders of the pad nitride layer and the pad oxide layer;  
depositing a refractory metal layer on the gate structure, the nitride spacers and the exposed substrate;  
doping impurities into the refractory metal layer; and  
performing a thermal process to react the refractory metal layer with underlying silicon material to form self-aligned contacts and to drive-in the doped impurities to form shallow junction source and drain regions of the MOS device.

5,773,349

**METHOD FOR MAKING ULTRAHIGH SPEED BIPOLAR TRANSISTOR**

Seog-Heon Ham, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

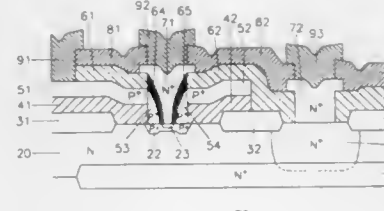
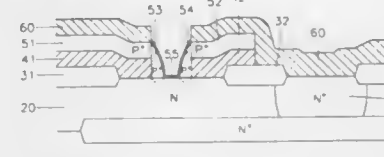
Filed Jun. 17, 1996, Ser. No. 664,861

Claims priority, application Rep. of Korea, Jun. 15, 1995, 1995-15888

Int. Cl.<sup>6</sup> H01L 21/331

U.S. Cl. 438—348

7 Claims



1. A method of producing a bipolar transistor comprising:  
forming a triple layer on an epitaxial layer by successively forming a first insulation layer, a base polysilicon layer of a first conductivity type and a second insulating layer, said epitaxial layer being of a second conductivity type and having an active region and a collector region;  
opening an aperture through said triple layer to expose a portion of said active region of said epitaxial layer;



forming polysilicon sidewalls of said first conductivity type on exposed portions of said triple layer inside said aperture, said polysilicon sidewalls being connected to portions of said base polysilicon layer exposed in said aperture and portions of said exposed portion of said active region adjacent to said triple layer;

introducing impurities of said first conductivity type into remaining portions of said exposed portion of said active region of said epitaxial layer between said polysilicon sidewalls;

forming insulating sidewalls over said polysilicon sidewalls and said portions of said base polysilicon layer exposed in said aperture;

forming an emitter polysilicon layer of said second conductivity type connected to said remaining portions of said exposed portion of said active region of said epitaxial layer;

forming a collector polysilicon layer of said second conductivity type on said collector region of said epitaxial layer, said collector polysilicon layer being insulated from said emitter polysilicon layer; and

forming an emitter region and a base region in said active region of said epitaxial layer by simultaneously diffusing said implanted impurities, impurities of said emitter polysilicon layer, and impurities of said polysilicon sidewalls into said epitaxial layer.

5,773,350

**METHOD FOR FORMING A SELF-ALIGNED BIPOLAR JUNCTION TRANSISTOR WITH SILICIDE EXTRINSIC BASE CONTACTS AND SELECTIVE EPITAXIAL GROWN INTRINSIC BASE**

Francois Herbert, Sunnyvale, and Rashid Bashir, Santa Clara, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

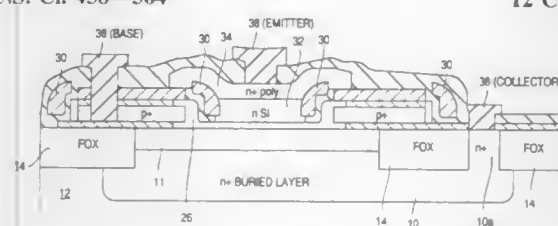
Continuation of Ser. No. 789,052, Jan. 28, 1997, abandoned.

This application Jul. 10, 1997, Ser. No. 891,451

Int. Cl.<sup>6</sup> H01L 21/301

U.S. Cl. 438—364

12 Claims



1. A method of fabricating a bipolar junction transistor having silicide extrinsic base contacts and a selective epitaxial grown intrinsic base region, the method comprising:

forming a buried region of n-type conductivity in a semiconductor substrate;

forming a first layer of silicon oxide on the buried region;

forming a layer of refractory metal silicide on the first silicon oxide layer;

implanting p-type dopant into the refractory metal silicide layer;

forming a second layer of silicon oxide on the doped metal silicide layer;

forming a first layer of silicon nitride on the second layer of silicon oxide;

etching the first silicon nitride, second silicon oxide and metal silicide layers, stopping on the first silicon oxide layer;

etching the first silicon oxide layer to expose the buried region;

growing an epitaxial base region of p-type conductivity selectively on the buried region;

forming a third silicon oxide layer on the epitaxial base region;

forming a second silicon nitride layer on the third silicon oxide layer;

patterning the second silicon nitride layer to form nitride spacers, stopping on the third silicon oxide layer;

etching the third silicon oxide layer to expose the epitaxial base region;

growing an emitter region of n-type conductivity on the epitaxial base region;

forming a layer of polysilicon on the emitter region;

implanting the polysilicon with n-type dopant;

patterning the doped polysilicon layer to define a doped polysilicon region in contact with the emitter region;

depositing a fourth layer of silicon oxide on the structure resulting from previously-recited steps;

performing furnace drive and rapid thermal anneal activation steps;

forming first, second and third contact openings in the structure resulting from the previously-recited steps to expose the doped metal silicide layer, the doped polysilicon region and the buried layer, respectively; and

forming a patterned metallization layer that provides metal contact to the doped metal silicide layer, the doped polysilicon region and the buried layer via the first, second and third contact openings, respectively.

5,773,351

**ISOLATION LAYER OF SEMICONDUCTOR DEVICE AND METHOD FOR FABRICATING THE SAME**

Jong Moon Choi, Seoul, Rep. of Korea, assignor to LG Semiconductor Co., Ltd., Chungcheongbuk-Do, Rep. of Korea

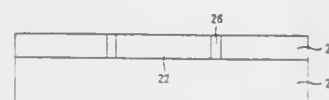
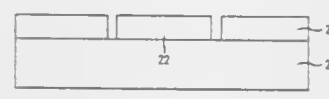
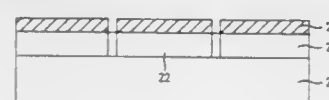
Filed Oct. 22, 1996, Ser. No. 740,146

Claims priority, application Rep. of Korea, Apr. 12, 1996, 1996-11069

Int. Cl.<sup>6</sup> H01L 21/76

U.S. Cl. 438—429

18 Claims



6. A method of fabricating an isolation layer structure of a semiconductor device, the method comprising the steps of:

preparing a first substrate;

forming a first insulating layer having a width narrower than that of the first substrate on the first substrate;

crystal-growing a second substrate on an exposed portion of the first substrate;

selectively removing portions of the second substrate to form a predetermined space at each of multiples sides of the first insulating layer; and

forming a second insulating layer within the spaces at the sides of the first insulating layer.

5,773,352

**FABRICATION PROCESS OF BONDED TOTAL DIELECTRIC ISOLATION SUBSTRATE**

Tomohiro Hamajima, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 23, 1995, Ser. No. 408,959

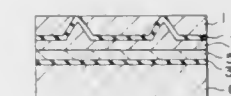
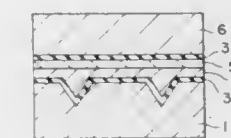
Claims priority, application Japan, Mar. 24, 1994, 6-053435

Int. Cl.<sup>6</sup> H01L 21/76

U.S. Cl. 438—406

11 Claims

1. A fabrication process for a dielectric isolation substrate comprising steps of:



forming an isolation groove on one side of a single-crystalline silicon substrate;

forming a dielectric layer on said one side and within said groove;

depositing a polycrystalline silicon layer on said dielectric layer until at least said groove is buried;

polishing said polycrystalline silicon layer to form a smoothed surface;

forming a buffer layer on the smoothed surface after said polishing of said polycrystalline silicon layer step;

forming a first junction interface by polishing said buffer layer;

forming an oxide layer on one surface of a supporting substrate, thereby forming a second junction interface on a surface of said oxide layer;

fitting said first junction interface on said second junction interface;

annealing said first and second junction interfaces after said fitting step; and

polishing a surface of said single-crystalline silicon substrate to expose the dielectric layer at the bottom of said groove, thereby defining a plurality of single-crystalline silicon islands isolated by said dielectric layer.

5,773,353

**METHOD OF FABRICATING A SEMICONDUCTOR SUBSTRATE**

Oh-Joon Kwon, Daejeon; Jung-Hee Lee, and Yong-Hyun Lee, both of Taegu, all of Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Japan

Filed Nov. 29, 1995, Ser. No. 564,505

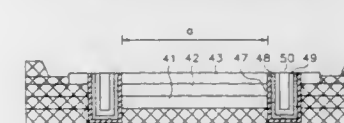
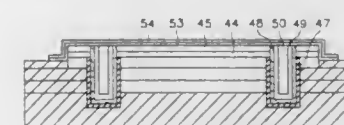
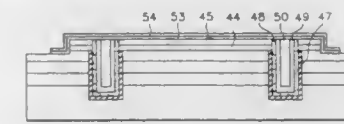
Claims priority, application Rep. of Korea, Dec. 15, 1994, 94

34390

Int. Cl.<sup>6</sup> H01L 21/76

U.S. Cl. 438—426

9 Claims



6. A method of fabricating a semiconductor substrate, comprising the steps of:

providing a first conductivity type semiconductor substrate;

growing a plurality of epitaxial layers of the second conductivity type on the substrate including a top epitaxial layer, at least one of the layers having a higher conductivity than another of the layers;

forming a patterned first protection film on the top epitaxial layer;

forming a trench using the patterned protection film as a mask, wherein the trench defines an active area and an inactive area;

forming a silicon dioxide film and a silicon nitride film onto the inner surface of the trench and doping the films;

filing the trench with silicon oxide;

further patterning the patterned first protection film by removing part of the patterned first protection film from the inactive area;

using the further patterned first protection film as a mask to remove a portion of the thickness of the top epitaxial layer;

forming a second patterned protection film on the further patterned first protection film and on a portion of the resulting thickness of the top epitaxial layer;

forming doped regions by doping the substrate, the resulting exposed remaining portion of the top epitaxial layer and the plurality of epitaxial layers using the second patterned protection film as a mask;

annealing the doped regions to convert the doped regions to porous silicon;

oxidizing the porous silicon; and

removing the further patterned first protection film and the second patterned protection film.

5,773,354

**METHOD OF FORMING SOI SUBSTRATE**

Makoto Hashimoto, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

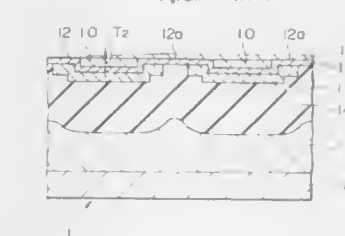
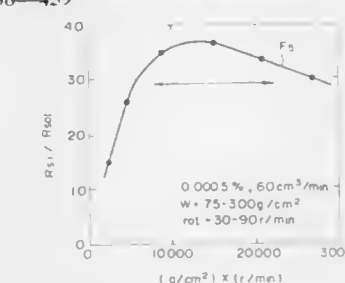
Filed Apr. 1, 1997, Ser. No. 831,414

Claims priority, application Japan, Apr. 1, 1996, 8-078483

Int. Cl.<sup>6</sup> H04L 21/30

U.S. Cl. 438—459

2 Claims



1. A method of forming an SOI substrate comprising the steps of:

covering the surface of a silicon substrate which is formed to have unevenness with an insulator;

laminating another substrate to the silicon substrate; and

chemically polishing the laminated substrates from the rear side of the silicon substrate with a polishing solution comprising an alkali solution using the insulator as a polishing stopper layer, to leave as an SOI layer the projection portion of the first silicon substrate;

wherein the product of the polishing pressure and the rotation speed of a polishing tool in the chemical polishing is set to a value within  $\pm 50\%$  of the optimum value at which the differential coefficient of the rate of reduction in thickness of the silicon substrate with respect to the produce of the polishing

pressure and the rotation speed is equal to that of the rate of reduction in thickness of the SOI layer with respect to the product of the polishing pressure and the rotation speed.

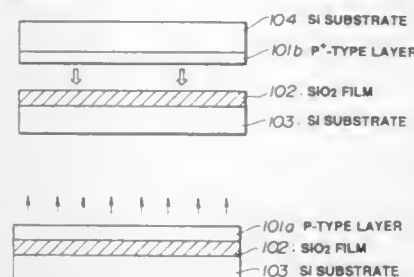
5,773,355  
METHOD FOR MANUFACTURING SEMICONDUCTOR SUBSTRATE

Shunsuke Inoue, Yokohama; Mamoru Miyawaki, Isehara, and Yoshihiko Fukumoto, Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 416,359, Apr. 4, 1995, abandoned.

This application May 29, 1997, Ser. No. 864,904  
Claims priority, application Japan, Apr. 8, 1994, 6-070396  
Int. Cl.<sup>6</sup> H01L 21/76

U.S. Cl. 438—459

10 Claims



1. A method for manufacturing a semiconductor substrate consisting essentially of the steps of:

- forming a semiconductor substrate including an impurity layer with an impurity density at the side of its surface;
- bonding the impurity layer of the semiconductor substrate and an insulating layer provided on another substrate;
- removing the semiconductor substrate except the impurity layer; and
- reducing the impurity density of the remaining impurity layer by out diffusion under a reduced pressure.

5,773,356  
GETTERING REGIONS AND METHODS OF FORMING GETTERING REGIONS WITHIN A SEMICONDUCTOR WAFER

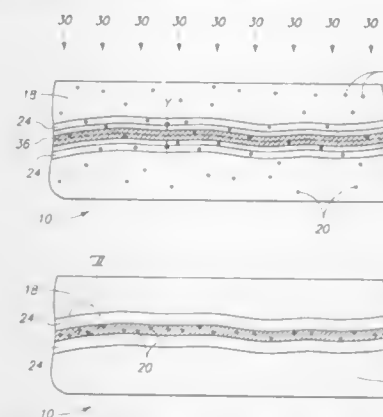
Fernando Gonzalez, and Jeffrey W. Honeycutt, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.

Filed Feb. 20, 1996, Ser. No. 603,470

Int. Cl.<sup>6</sup> H01L 21/322

U.S. Cl. 438—473

11 Claims



1. A method of forming a gettering region within an Si semiconductor wafer comprising the following steps:  
providing a semiconductor material wafer;  
providing a background region within the semiconductor material wafer, the background region being doped with a first-

type conductivity enhancing dopant, the first-type conductivity enhancing dopant being either n-type or p-type;

implanting a second-type conductivity enhancing dopant into the background region to form a second-type implant region entirely contained within the background region, the second-type conductivity enhancing dopant being of an opposite type than the first-type conductivity enhancing dopant of the background region, the first-type background region and the second-type implant region together forming a gettering diode;

implanting a neutral-conductivity-type conductivity enhancing dopant into the second-type implant region to form a metals gettering damage region entirely contained within the second-type implant region, and

applying a voltage bias to the gettering diode to effectively collect electrons within the gettering diode.

5,773,357  
METHOD FOR PRODUCING SILICON FILM TO BURY CONTACT HOLE

Seiichi Shishiguchi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

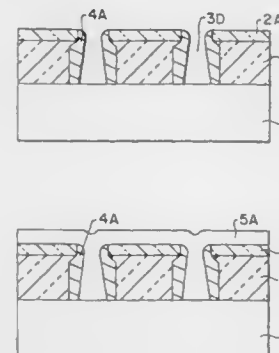
Filed Jan. 25, 1996, Ser. No. 591,795

Claims priority, application Japan, Jan. 25, 1995, 7-009842

Int. Cl.<sup>6</sup> H01L 21/28

U.S. Cl. 438—479

20 Claims



15. A method of producing a semiconductor device, comprising the step of:

- forming a silicon-based film by simultaneously providing a material gas for forming said silicon-based film and an etching gas or etching said silicon-based film, wherein said material gas is supplied at a rate within the surface reaction rate limiting region and said etching gas is supplied at a rate within the gas supply rate limiting region.

5,773,358  
METHOD OF FORMING A FIELD EFFECT TRANSISTOR AND METHOD OF FORMING CMOS INTEGRATED CIRCUITRY

Jeff Zhiqiang Wu, Meridian, and Sittampalam Yoganathan, Boise, both of Id., assignors to Micron Technology, Inc., Boise, Id.

Division of Ser. No. 440,222, May 12, 1995, Pat. No. 5,571,733. This application Aug. 12, 1996, Ser. No. 695,407

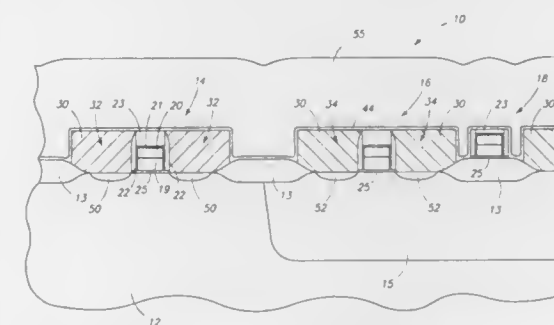
Int. Cl.<sup>6</sup> H01L 21/265

U.S. Cl. 438—564

9 Claims

1. A method of forming a field effect transistor comprising the following steps:

- providing a gate over a semiconductor substrate;
- providing a layer of polysilicon over the substrate, the polysilicon layer defining a pair of polysilicon outward projections extending from the semiconductor substrate adjacent the gate;
- providing a dopant masking cap over the gate;



while the dopant masking cap is over the gate, conductively doping the pair of polysilicon projections with one of an n-type or a p-type conductivity enhancing dopant impurity; providing an outgassing capping layer over the pair of polysilicon; and

after providing the outgassing capping layer, out-diffusing the one of the n-type conductivity enhancing dopant impurity or the p-type conductivity enhancing dopant impurity from the pair of polysilicon projections into the semiconductor substrate to provide one of NMOS or PMOS type diffusion regions, respectively, within the substrate adjacent the gate line.

5,773,359  
INTERCONNECT SYSTEM AND METHOD OF FABRICATION

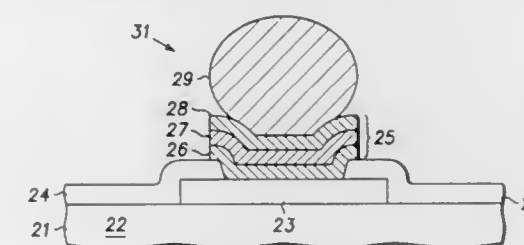
Douglas G. Mitchell, Tempe; Francis J. Carney, Gilbert, and Eric J. Woolsey, Chandler, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 26, 1995, Ser. No. 578,255

Int. Cl.<sup>6</sup> H01L 21/441

U.S. Cl. 438—614

11 Claims



1. A method of manufacturing an interconnect system, the method comprising the steps of:

- providing a substrate;
- disposing an electrically conductive layer over the substrate;
- disposing a first layer over the electrically conductive layer, the first layer comprising a barrier material;
- disposing a second layer over the first layer, the second layer comprising an adhesion material and the barrier material;
- disposing a third layer over the second layer after the step of disposing the second layer, the third layer comprising the adhesion material.

5,773,360  
REDUCTION OF SURFACE CONTAMINATION IN POST-CMP CLEANING

Chung-Long Chang, Dou-Liu; Chen-Hua Yu, and Syun-Ming Jang, both of Hsin-Chu, all of Taiwan, assignors to Taiwan Semiconductor Manufacturing Company, Ltd., Hsin-Chu, Taiwan

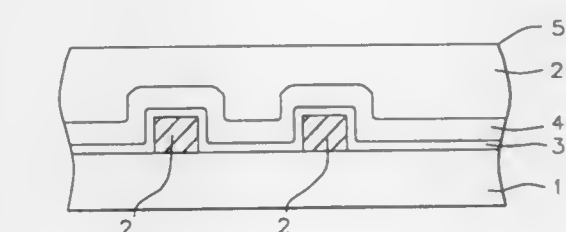
Filed Oct. 18, 1996, Ser. No. 734,067

Int. Cl.<sup>6</sup> H01L 21/461

U.S. Cl. 438—626

15 Claims

1. A process for chem.-mech. polishing comprising the steps of:



providing an integrated circuit having an upper layer of PETEOS or BPTEOS oxide that is non-planar;

providing a slurry and an etchant;

using said slurry and etchant, chem.-mech. polishing said upper layer to remove a first thickness of said upper layer;

scrubbing said polished upper layer to remove particle contaminants;

providing a plasma etcher; and

removing a second thickness of said upper layer by means of dry etching in a gas plasma in said plasma etcher.

5,773,361  
PROCESS OF MAKING A MICROCAVITY STRUCTURE AND APPLICATIONS THEREOF

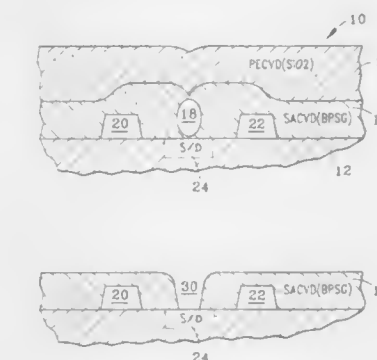
John Edward Cronin, Milton, and Anthony Kendall Stamper, Williston, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 6, 1996, Ser. No. 744,473

Int. Cl.<sup>6</sup> H01L 21/88; 21/94

U.S. Cl. 438—637

14 Claims



1. A method of forming an integrated circuit device comprising the steps of:

providing a layer having a pair of raised features;

depositing a void forming material over said raised layer;

depositing a pinning material over said void forming material to pin a void in said void forming material;

annealing the materials; and

etching to expose the void and remove the void forming material from the area between the raised features to thereby form a contact via.



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JUNE 30, 1998

5,773,362

**METHOD OF MANUFACTURING AN INTEGRATED ULSI HEATSINK**

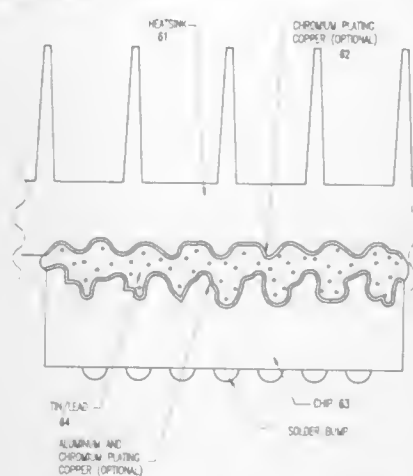
William R. Tonti, Essex Junction, Vt.; Jack A. Mandelman, Stormville, N.Y.; Jerzy M. Zalesinski; Toshiharu Furukawa, both of Essex Junction, Vt.; Son V. Nguyen, Hopewell Junction, N.Y., and Dureseti Chidambarrao, Sandy Hook, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 667,210, Jun. 20, 1996, Pat. No. 5,729,052. This application Apr. 9, 1997, Ser. No. 838,539

Int. Cl.<sup>6</sup> H01L 21/44

U.S. Cl. 438—665

18 Claims



1. A method for fabricating a high power integrated package of an integrated circuit and a heatsink, comprising the steps of: fabricating an integrated circuit wafer up to dicing the wafer into chips;

roughening a backside of the wafer to form an irregular surface; applying a metal to the roughened backside of the wafer; depositing a thermally conductive reflowable material on the metal applied to the backside of the wafer; dicing the wafer into chips; and thermally attaching a chip to a heatsink by reflowing the thermally conductive reflowable material to form a mechanical and thermal bond between the chip and the heatsink.

5,773,363

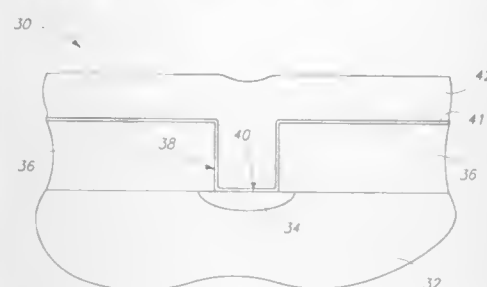
**SEMICONDUCTOR PROCESSING METHOD OF MAKING ELECTRICAL CONTACT TO A NODE**

Garol J. Derderian, and Gurtej S. Sandhu, both of Boise, Id., assignors to Micron Technology, Inc., Boise, Id. Continuation-in-part of Ser. No. 336,260, Nov. 8, 1994, Pat. No. 5,576,071, Ser. No. 506,040, Jul. 24, 1995, and Ser. No. 587,145, Jan. 16, 1996. This application Jun. 13, 1996, Ser. No. 664,105

Int. Cl.<sup>6</sup> H01L 21/70; B05D 3/06

U.S. Cl. 438—672

39 Claims



1. A semiconductor processing method of making electrical contact to a node comprising the following steps: forming an insulating layer relative to a substrate to which electrical connection is to be made;

forming a contact opening in the insulating layer to the substrate;

forming a layer of electrically conductive material to substantially fill the contact opening; the electrically conductive material being undesirably capable of absorbing oxygen, when exposed to an oxygen containing ambient, effective to render such material less electrically conductive; and providing the substrate with the provided layer of electrically conductive material within a reactor, injecting a gas into the reactor and generating a plasma from the gas against the material and exposing the material to the plasma to densify at least an outermost exposed portion of such material and render the layer of material less capable of absorbing oxygen when exposed to an oxygen containing ambient.

5,773,364

**METHOD FOR USING AMMONIUM SALT SLURRIES FOR CHEMICAL MECHANICAL POLISHING (CMP)**

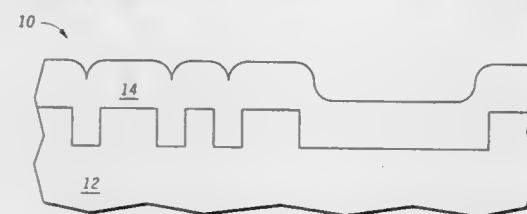
Janos Farkas, Austin, and Melissa Freeman, Round Rock, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 21, 1996, Ser. No. 734,566

Int. Cl.<sup>6</sup> H01L 21/00

U.S. Cl. 438—692

29 Claims



1. A method for polishing a semiconductor wafer, the method comprising the steps of: providing a polishing surface; exposing the polishing surface to a slurry, the slurry containing an ammonium salt with exception of ammonium sulfate and ammonium halides; moving the polishing surface; bringing the semiconductor wafer having a conductive layer into contact with the slurry while the polishing surface is moving; and polishing the conductive layer having a top surface wherein the conductive layer is located on an exposed surface of the semiconductor wafer, the mono-basic ammonium salt within the slurry facilitating removal of a top portion of the conductive layer.

5,773,365

**FABRICATION PROCESS OF SEMICONDUCTOR DEVICE**

Shinya Ito, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

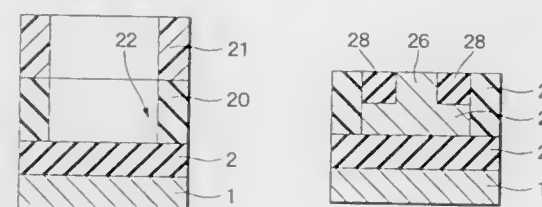
Filed May 28, 1997, Ser. No. 864,975

Claims priority, application Japan, May 29, 1996, 8-135530

Int. Cl.<sup>6</sup> H01L 21/302; 21/4763

U.S. Cl. 438—699

10 Claims



1. A fabrication process of a semiconductor device comprising the steps of:

JUNE 30, 1998

CHEMICAL

5025

5,773,367

**HIGH THROUGHPUT PLANARIZATION ETCH PROCESS FOR INTERLAYER OXIDE FILMS BETWEEN METALS AND PRE-METALS**

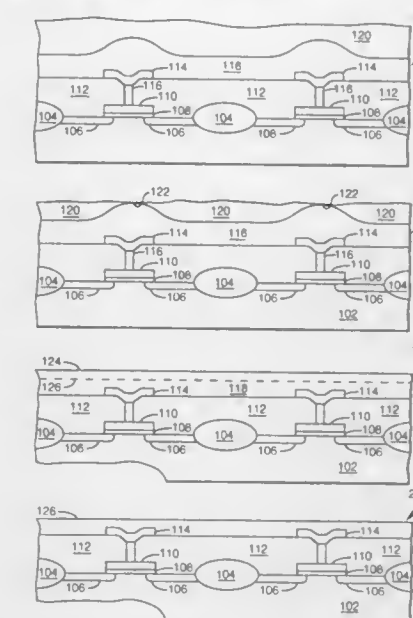
Jang Jen, San Jose, Calif., assignor to Integrated Device Technology, Inc., Santa Clara, Calif.

Filed Sep. 6, 1996, Ser. No. 709,568

Int. Cl.<sup>6</sup> H01L 21/00

U.S. Cl. 438—734

12 Claims



1. A method to planarize a partially completed semiconductor integrated device, comprising:

a first process to etch a first portion of a layer of photoresist on the device;

a second process to etch a remaining portion of the photoresist and to etch a first portion of an oxide layer on the device; and

a third process to etch a second portion of the oxide layer on the device.

5,773,368

**METHOD OF ETCHING ADJACENT LAYERS**

John D. Moran, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 22, 1996, Ser. No. 599,457

Int. Cl.<sup>6</sup> H01L 21/70

U.S. Cl. 438—742

27 Claims

1. A method of patterning adjacent layers, the method comprising the steps of: providing a substrate; disposing a first layer overlying the substrate; disposing a second layer overlying and adjacent to the first layer; patterning the second layer; patterning the first layer after patterning the second layer; and subsequently, patterning the second layer.

5,773,369

**PHOTOELECTROCHEMICAL WET ETCHING OF GROUP III NITRIDES**

Evelyn Lynn Hu, and Milan Singh Minsky, both of Galeta, Calif., assignors to The Regents of the University of California, Oakland, Calif.

Filed Apr. 30, 1996, Ser. No. 641,234

Int. Cl.<sup>6</sup> H01L 21/302

U.S. Cl. 438—746

11 Claims

1. A method of wet etching a Group III Nitride semiconductor layer, comprising the steps of:

forming an interlayer insulation layer on a semiconductor substrate;

forming a groove of a wiring shape in said interlayer insulation layer;

burying a conductor in said groove;

covering a part of said conductor with a masking material;

removing a part of said conductor to form a recess with using said masking material as a mask, thereby defining a first wiring at a lower part of said conductor under said recess and a columnar projection at a side of said recess on said first wiring;

burying an insulation layer in said recess except for the upper surface of said columnar projection; and

forming a second wiring covering at least a part of the exposed upper surface of said columnar projection.

5,773,366

**METHOD FOR FORMING WIRING**

Sung Bo Hwang, Ichon, Rep. of Korea, assignor to Hyundai Electronics Industries Co., Ltd., Kyongki-do, Rep. of Korea

Filed Jun. 7, 1996, Ser. No. 659,884

Claims priority, application Rep. of Korea, Jun. 16, 1995, 95-16038

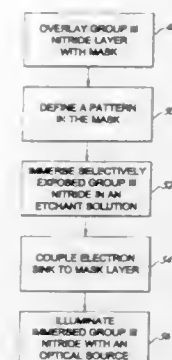
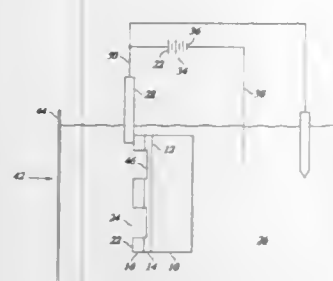
Int. Cl.<sup>6</sup> B44C 1/22

U.S. Cl. 438—718

22 Claims



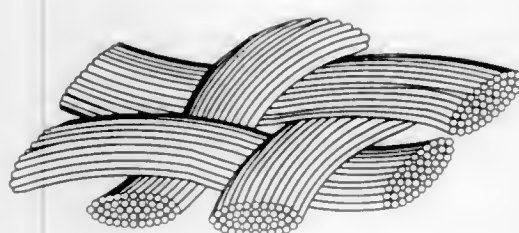
1. A method for forming a tungsten wiring, comprising the steps of: forming a metal wiring layer over a semiconductor substrate; forming a photoresist film pattern adapted to expose a portion of the metal wiring layer corresponding to a metal wiring which will be formed; curing the photoresist film pattern; selectively forming a metal thin film on the exposed portion of the metal wiring layer; treating the metal thin film by use of chlorine-based plasma, thereby forming a metal chlorine thin film; removing the photoresist film pattern; etching the metal wiring layer using the metal chloride thin film as a mask; and removing the metal chloride thin film.



overlying the Group III Nitride semiconductor layer with a mask, wherein the mask defines a pattern to be transferred to the Group III Nitride semiconductor layer and facilitates a flow of photogenerated carriers from an area of the Group III Nitride semiconductor layer to be etched; immersing the Group III Nitride semiconductor layer in an etchant solution, the etchant solution being unable to etch the Group III Nitride semiconductor layer, the etchant solution further being unheated; and illuminating the immersed Group III Nitride semiconductor layer using an optical source containing frequencies above the bandgap of the Group III Nitride semiconductor layer, wherein the step of illuminating etches the Group III Nitride layer.

**5,773,370**  
**ENTANGLED HIGH STRENGTH YARN**  
James Jay Dunbar, Mechanicsville; Chok Bin Tan, Richmond; Gene Clyde Weedon, Richmond; Thomas Yiu-Tai Tam, Richmond; Alfred Lewis Cutrone, Midlothian, and Elizabeth Stroud Bledsoe, Blackstone, all of Va., assignors to AlliedSignal Inc., Morristown, N.J.  
Division of Ser. No. 378,984, Jan. 24, 1995, Pat. No. 5,579,628, which is a continuation of Ser. No. 959,899, Oct. 13, 1992, abandoned. This application Feb. 15, 1996, Ser. No. 601,556  
Int. Cl.<sup>6</sup> D03D 3/00; 15/00; D06C 7/00  
U.S. Cl. 442—60

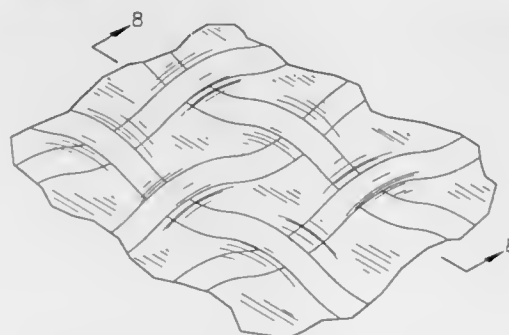
11 Claims



1. An article for protecting an object against a ballistic impact, including at least one multifilament yarn having a longitudinal axis, the yarn comprising at least one type of high strength filament selected from the group consisting of extended chain polyethylene filament, extended chain polypropylene filament, polyvinyl alcohol filament, polyacrylonitrile filament, liquid crystal filament, glass filament and carbon filament, said high strength filament having a tenacity of at least about 7 g/d, a tensile modulus of at least about 150 g/d and an energy-to-break of at least about 8 J/g, wherein the yarn includes a plurality of sections at which the individual filaments are tightly entangled together to form entanglements and a plurality of sections wherein substantially all the individual filaments are substantially parallel to the longitudinal axis of the yarn.

**5,773,371**  
**TECHNIQUE FOR FORMING RESIN-IMPREGNATED FIBERGLASS SHEETS**  
Bernd Karl Appelt, Apalachin; William Thomas Fotorny, Endicott; Robert Maynard Japp, Vestal; Kostantinos Papathomas, Endicott, and Mark David Poliks, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.  
Division of Ser. No. 716,814, Sep. 10, 1996, Pat. No. 5,756,405. This application Jul. 9, 1997, Ser. No. 890,614  
Int. Cl.<sup>6</sup> B32B 31/08  
U.S. Cl. 442—62

4 Claims



1. A laminated substrate comprising, at least one sheet of material comprised of:  
a sheet of cloth having fibers and interstices between the fibers,  
a first coating of selected thermosetting resin surrounding said fibers, but with essentially all of said interstices unfilled,  
a second coating of said selected thermosetting resin disposed over said first coating and essentially filling all said interstices unfilled by said first coating.  
said first coating being cured sufficiently beyond B stage cure so that it has not dissolved in the uncured resin of second coating,  
said second coating being B stage cured,  
a transition zone between said first and second coatings that is smooth, substantially continuous with crosslinking between said first and second coatings providing an essentially continuous polymer of two layers,  
said one sheet being laminated between two sheets of metal, and further characterized by each of said resins being essentially fully cured.

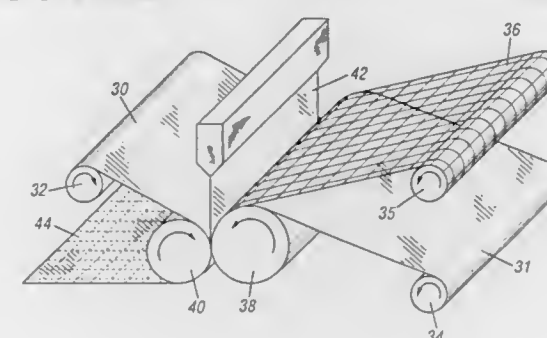
**5,773,372**  
**COATED POLYESTER FIBER FABRIC AND A PRODUCTION PROCESS THEREFOR**  
Masami Ikeyama, Yokaichi, and Jiro Amano, Takatsuki, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan  
Continuation of Ser. No. 318,678, Mar. 1, 1995, abandoned.  
This application Oct. 21, 1996, Ser. No. 731,833  
Claims priority, application Japan, Feb. 15, 1993, 5-25454  
Int. Cl.<sup>6</sup> D06M 13/224; B32B 17/00  
U.S. Cl. 442—164

8 Claims

1. A coated polyester fiber fabric which is resistant to dye migration, produced by coating polyester fibers dyed by a disperse dye, with a coating resin, comprising an organic peroxide in said coating resin, wherein the coating resin is an acrylic resin or a silicone resin and the organic peroxide is selected from the group consisting of benzoyl peroxide, 2,4-dichlorobenzoyl peroxide and toluoyl peroxide.

**5,773,373**  
**REINFORCED LAMINATE WITH ELASTOMERIC TIE LAYER**  
Lyndell Kyle Wynne, Kingwood, Tex., and Abdeally Mohammed, Madras, India, assignors to Reef Industries, Inc., Houston, Tex.  
Filed Jun. 18, 1996, Ser. No. 668,965  
Int. Cl.<sup>6</sup> B32B 5/12  
U.S. Cl. 442—260

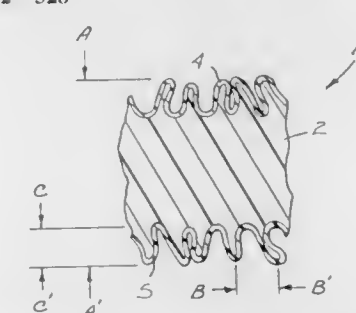
12 Claims



1. A reinforced laminate, comprising:  
a first outer layer of thermoplastic;  
a second outer layer of thermoplastic;  
a reinforcing grid disposed between the first outer layer and the second outer layer;  
a tie layer of elastomeric material disposed between the first outer layer and the second outer layer holding the reinforcing grid but allowing slippage of the reinforcing grid in the tie layer upon tensile loading of the reinforced laminate; and  
wherein the first outer layer, the second outer layer, the reinforcing grid, and the tie layer are laminated together to form a reinforced laminate.

**5,773,374**  
**COMPOSITE MATERIALS AND PROCESS**  
Leigh E. Wood; Dennis L. Krueger; Michael R. Gorman, and Randall L. Alberg, all of P.O. Box 33427, St. Paul, Minn. 55133-3427  
Continuation-in-part of Ser. No. 651,807, May 21, 1996, which is a division of Ser. No. 427,424, Apr. 24, 1995, Pat. No. 5,620,780. This application Mar. 20, 1997, Ser. No. 822,070  
Int. Cl.<sup>6</sup> B32B 3/30  
U.S. Cl. 442—328

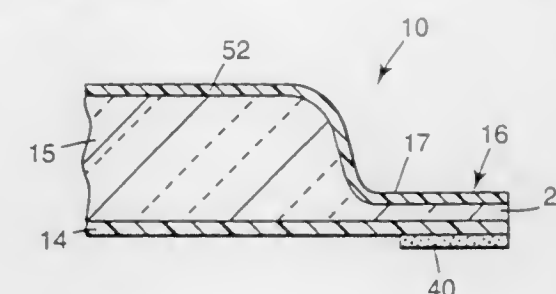
9 Claims



1. A continuous nonwoven film laminate comprising at least one fibrous nonwoven layer laminated to an elastic film layer comprising at least one discrete elastomeric core containing region capable of elastic elongation and a matrix of thermoplastic polymeric material, which polymeric matrix material is less elastic than the elastomeric core material, said matrix material providing at least two nonelastic film regions comprising nonelastic matrix material wherein said film has been stretched in the transverse direction past the inelastic deformation limit of the matrix material around said at least one elastomeric core forming at least one elastic region which laminate is extensible in the transverse direction and nonextensible in the longitudinal direction.

**5,773,375**  
**THERMALLY STABLE ACOUSTICAL INSULATION**  
Michael D. Swan, and Ruth A. Ebbens, both of P.O. Box 33427, St. Paul, Minn. 55133-3427  
Filed May 29, 1996, Ser. No. 655,047  
Int. Cl.<sup>6</sup> D04H 1/56; 1/00; 1/300  
U.S. Cl. 442—340

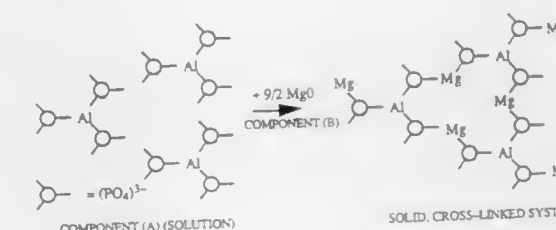
17 Claims



1. A thermally stable acoustical insulation microfiber web for attenuation of sound waves comprising a melt-blown polypropylene microfiber web having an average effective fiber diameter of less than about 15 microns, a thickness of at least about 0.5 cm, a density of less than 50 kg/m<sup>3</sup> and a pressure drop of at least about 1 mm water at a flow rate of about 32 liters/min., said polypropylene microfibers formed of polypropylene homopolymers, copolymers or blends thereof with a nonvolatile thermal stabilizer or antioxidant is uniformly distributed throughout the microfibers such that the microfibers are thermally stable for at least 10 days at 135° C.

**5,773,376**  
**PROCESS FOR PRODUCING A MAINLY INORGANIC FOAM, AND THUS PRODUCED MASS OR MOULDED PART**  
Gerhard Melcher, Waldgasse 40/24, A-1100 Wien 10, Austria  
Filed Sep. 24, 1996, Ser. No. 676,221  
Claims priority, application Australia, Jan. 21, 1994, A 110/94  
Int. Cl.<sup>6</sup> C04B 28/34; 38/02; 38/10; B32B 3/26  
U.S. Cl. 501—84

20 Claims



1. A process for producing an inorganic solid foamed mass which comprises mixing components (A) and (B) to form a foam and allowing said foam to set to form said solid foamed mass, wherein component (A) comprises an aqueous acidic phosphate solution of mainly polyvalent cations and phosphoric acid wherein between 0.8 to 1.75 protons of the phosphoric acid molecule of said phosphate are neutralized by the cations, and which also contains one or more fillers in the form of granules, platelets or powders dispersed therein, and having a viscosity at room temperature in the range of 2,000 mPa.s to 60,000 mPa.s; and wherein component (B) comprises an oxide, hydroxide or polyvalent salt of a weak acid as hardener, and a foaming agent, a carbonate which develops a gas under hardening conditions within 5 seconds to 10 minutes and in amount to neutralize the secondary phosphate groups to form a cross-linked structure upon setting for a period of 20 seconds to 10 minutes said cross-linked structure is relatively elastic with respect to a cross-linked foamed structure obtained when the tertiary phosphate groups are neutralized.



5,773,377

LOW TEMPERATURE SINTERED, RESISTIVE  
ALUMINUM NITRIDE CERAMICS

Jonathan H. Harris, Scottsdale; Robert A. Youngman, Paradise Valley, both of Ariz.; Subhash L. Shinde, Cortland Manor, N.Y.; Lester W. Herron, Hopewell Junction, N.Y., and Benjamin V. Fasano, New Windsor, N.Y., assignors to Crystalline Materials Corporation, Phoenix, Ariz., and International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 173,906, Dec. 22, 1993, abandoned. This application Jun. 12, 1995, Ser. No. 489,610

Int. Cl.<sup>6</sup> C04B 35/582; 35/581

U.S. Cl. 501—98.4

50 Claims



1. A resistive, sintered aluminum nitride ceramic body having a density of at least about 90% of theoretical, and a thermal conductivity of at least about 100 W/m-K, wherein said body has a microstructure containing aluminum nitride grains and a second phase having at least one calcium containing component, said at least one calcium containing component of said second phase being in contact with the aluminum nitride grains at a dihedral angle sufficient to provide a resistivity of at least about  $10^5 \Omega\text{-cm}$  and comprising at least one composition defined by the region including and within lines D-E-F-H-B in FIG. 4.

5,773,378

## SPENT CATALYST DISTRIBUTION

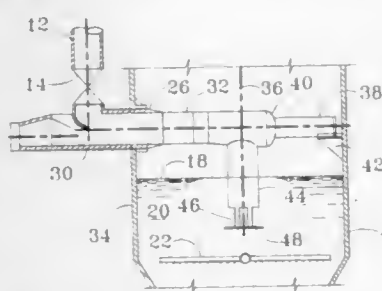
Benjamin Karl Bussey; Philip E. Glasgow; Steven A. Kalota, and Phillip K. Niccum, all of Houston, Tex., assignors to The M. W. Kellogg Company, Houston, Tex.

Filed Oct. 30, 1996, Ser. No. 740,540

Int. Cl.<sup>6</sup> B01J 20/34

U.S. Cl. 502—41

6 Claims



1. In a method for operating a regenerator of a fluid catalytic cracking unit comprising introducing spent catalyst to a dense phase bed in the regenerator, supplying regeneration air to an air distribution grid in a lower portion of the dense phase bed to burn off coke deposited on the spent catalyst and regenerate the catalyst, recovering regenerated catalyst from the dense phase bed, and recovering an off gas from a dilute phase above the dense phase bed of the regenerator, the improvement comprising: splitting the regeneration air to feed regeneration air into a spent catalyst distributor and an air distribution grid;

conveying the spent catalyst horizontally or horizontally and downwardly to the spent catalyst distributor using from 10 to 50 percent of the regeneration air; discharging spent catalyst into the dense phase bed; and supplying the remaining 50 to 90 percent of the regeneration air to the air distribution grid.

5,773,379

THERMAL REGULATION PROCESS FOR A SOLID IN A  
HEAT EXCHANGER USING CYLINDRICAL TUBE  
SURFACES

Régis Bonifay, Asnières; Thierry Gauthier, Saint Genis Laval; Renaud Pontier, Vienne, and Frédéric Hoffmann, Paris, all of France, assignors to Institut Français Du Pétrole, Rueil Malmaison, France

PCT No. PCT/FR94/00522, § 371 Date Nov. 13, 1995, § 102(e) Date Nov. 13, 1995, PCT Pub. No. WO94/26845, PCT Pub. Date Nov. 24, 1994

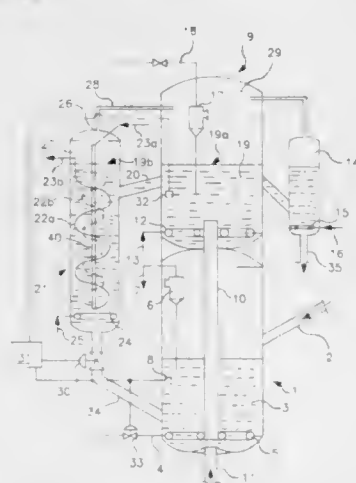
PCT Filed May 4, 1994, Ser. No. 545,870

Claims priority, application France, May 10, 1993, 9305685

Int. Cl.<sup>6</sup> B01J 20/34

U.S. Cl. 502—44

14 Claims



1. A process for thermal regulation or control in a continuous fluidized bed regeneration process for a used catalyst containing coke,

comprising regenerating the catalyst in at least one dense fluidized bed regeneration zone;

extracting at least a portion of said catalyst from said zone; transporting said portion of catalyst in the regeneration zone and a portion of regeneration fumes by a downwardly inclined conduit to an external thermal exchange zone, having an axis of symmetry, an upper extremity and a lower extremity, and containing at least one thermal exchange tube array wherein a vaporizable cooling fluid circulates, said conduit connecting the dense bed of the regeneration zone to the thermal exchange zone and opening thereinto at a junction point located under the level of the dense bed of the regeneration zone and so disposed to provide a dense bed zone of catalyst bounded by the lower extremity of the thermal exchange zone to above the junction point, the upper level of said zone being established substantially to the level of the catalyst in the regeneration zone;

providing a release zone open volume above said dense bed to the upper extremity of the exchange zone;

cooling the catalyst in said dense bed thermal exchange zone under indirect thermal exchange conditions and with fluidization, in the presence of a fluidization gas;

circulating the catalyst downwards counter-currently to the fluidization gas flow direction, and separating the catalyst from the fluidization gas and any regeneration fumes in said release zone volume;

evacuating said gases and fumes from the release zone and transporting the resultant evacuated gases to a dilute phase

5,773,382

HIGH PERFORMANCE VPO CATALYST AND PROCESS  
OF PREPARATION THEREOF

Scott F. Mitchell, St. Charles; Robert A. Keppel, Chesterfield, and Michael J. Mummey, Foley, all of Mo., assignors to Huntsman Petrochemical Corporation, Austin, Tex.

Continuation of Ser. No. 306,489, Sep. 15, 1994, Pat. No. 5,641,722. This application Jan. 3, 1997, Ser. No. 775,938

Int. Cl.<sup>6</sup> B01J 27/198

U.S. Cl. 502—209

11 Claims

1. A process for the preparation of a phosphorus/vanadium oxide catalyst comprising the steps of:

preparing a modified catalyst precursor composition comprising a mixture of a particulate phosphorus/vanadium oxide catalyst precursor and a volatile pore modification agent in proportions sufficient to provide a pore modification agent concentration of between about 8% and about 16% by weight, said pore modification agent having a vapor pressure of at least about 1 mm Hg at a temperature between about 150° C. and about 250° C. and being subject to vaporization, decomposition and/or oxidation at a temperature below 300° C. without leaving a substantial residue;

forming said modified catalyst precursor composition into a predetermined shape under compression, thereby producing a shaped porous catalyst precursor body comprising said catalyst precursor composition and containing said volatile pore modification agent; and

heating said precursor body while passing a stripping gas consisting essentially of air thereover for removal of at least about 80% by weight of said volatile pore modification agent at a temperature not greater than about 300° C., said porous body being heated at a rate of between about 1° and about 3° C. per minute to a hold temperature that is below a threshold temperature at which the pore modification agent is subject to catalytic oxidation in the presence of the phosphorus/vanadium oxide catalyst precursor.

5,773,380

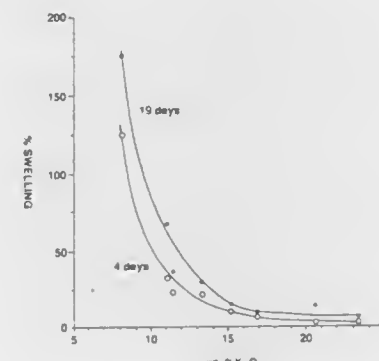
COMPOSITIONS USING HIGH-POTASSIUM ZEOLITE A  
James Neil Pryor, West Friendship, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Filed May 26, 1995, Ser. No. 451,629

Int. Cl.<sup>6</sup> B01J 29/04

U.S. Cl. 502—62

16 Claims



1. A composition comprising molecular sieve particles in a thermoplastic organic resin matrix wherein at least a portion of said molecular sieve particles are zeolite A particles which contain at least 15 wt. % K<sub>2</sub>O (dry basis).

5,773,383

METHOD OF MAKING SOLID ACID CATALYSTS WITH  
METAL CORES

George Dan Suciu, 417 Prospect St., Ridgewood, N.J. 07450-5100

Filed Sep. 15, 1995, Ser. No. 528,937

Int. Cl.<sup>6</sup> B01J 21/02

U.S. Cl. 502—355

6 Claims

1. A process for converting a metallic precursor into a solid acid catalyst having a structure including a metal core having essentially an entire outer surface covered by a layer of metal oxide including multiple active sites exhibiting Lewis Acidity, comprising:

(a) oxidizing a region located directly underneath an outer surface of said metallic precursor to form a layer of metal oxide,

(b) halogenating said layer of metal oxide to form said metal oxide layer including multiple active sites exhibiting Lewis Acidity.

6. A process for converting a metallic precursor into a solid acid catalyst having a structure including a metal core having essentially an entire outer surface covered by a layer of metal oxide including multiple active sites exhibiting Lewis Acidity comprising simultaneously oxidizing and halogenating a region located directly underneath an outer surface of said metallic precursor by reacting said metallic precursor with oxychlorinating reagents selected from the group consisting of inorganic metallic oxychlorides, organic acid chlorides, organic fluorides and mixtures thereof.

5,773,381

## ZEOLITE L PREPARATION

Johannes Petrus Verduijn, Spijkenisse, and Pieter Ernst Gellings, Oostvoorne, both of Netherlands, assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 374,396, Jan. 17, 1995, abandoned, which is a continuation of Ser. No. 176,813, Jan. 3, 1994, abandoned, which is a division of Ser. No. 443,987, Nov. 30, 1989, Pat. No. 5,300,720, which is a division of Ser. No. 160,362, Feb. 25, 1988, Pat. No. 4,894,214. This application Jun. 2, 1995, Ser. No. 458,629

Claims priority, application United Kingdom, Feb. 25, 1987, 87-04365; Jan. 4, 1988, 88-00051

Int. Cl.<sup>6</sup> B01J 21/00

U.S. Cl. 502—74

9 Claims

1. A catalyst substantially free of pollucite comprising a catalytically active metal and a zeolite L containing caesium in which said zeolite L has been crystallized from a synthesis mixture with a molar composition, expressed as oxides, of:

	K <sub>2</sub> O/SiO <sub>2</sub>	0.15 to 0.40
	K <sub>2</sub> O/Cs <sub>2</sub> O	3 to 10
	H <sub>2</sub> O/K <sub>2</sub> O	40 to 100
and	SiO <sub>2</sub> /Al <sub>2</sub> O <sub>3</sub>	7 to 13

and containing at least 0.5 ppm by weight of divalent metal cations in an effective amount to obtain substantially only zeolite L.

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5,773,384

**SORBENTS FOR REMOVING TOXICANTS FROM BLOOD OR PLASMA, AND METHOD OF PRODUCING THE SAME**

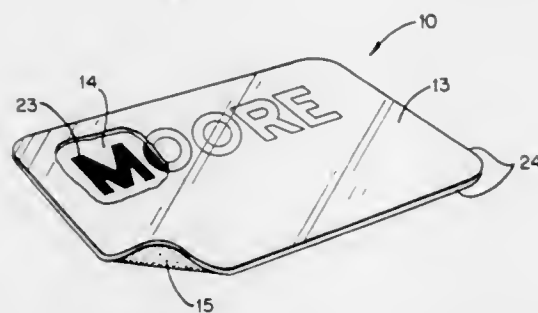
Vadim A. Davankov; Maria P. Tsyurupa; Ludmila A. Pavlova, and Dzidra R. Tur, all of Moscow, Russian Federation, assignors to White Eagle International Technologies Group, Inc., New York, N.Y.

Filed Nov. 25, 1996, Ser. No. 756,445  
Int. Cl.<sup>6</sup> B01J 20/26; C08F 5/20

U.S. Cl. 502—402

24 Claims

1. A sorbent for removing toxicants from blood or plasma, comprising a plurality of beads composed of hypercrosslinked polystyrene resin and having a surface which is modified, wherein said surface of the beads comprising deposited high molecular weight poly (N-trifluoroalkoxy) phosphazene, deposited by treating the beads with a solution of phosphazene in an organic solvent and evaporating the solvent.



a pressure sensitive adhesive disposed in association with said thermally sensitive material.

5,773,385

**THERMOSENSITIVE RECORDING MEDIUM**

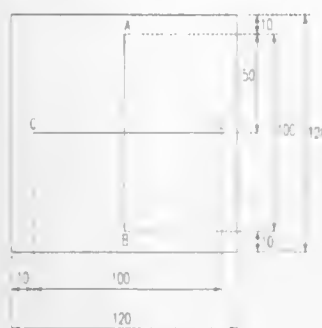
Yoshinori Katoh, and Takanori Motosugi, both of Numazu, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1996, Ser. No. 614,968

Claims priority, application Japan, Mar. 10, 1995, 7-078446  
Int. Cl.<sup>6</sup> B41M 5/40

U.S. Cl. 503—200

12 Claims



1. A thermosensitive recording medium, comprising a support, an intermediate layer disposed thereon, and a thermal recording layer disposed on said intermediate layer, said support comprising a plastic film or a synthetic paper having a thickness of less than or equal to 150  $\mu$ m, and said intermediate layer comprising hollow particles having a volume ratio of hollow particle to total intermediate layer material, of greater than or equal to 20% and having a thermal conductivity of said intermediate layer together with said support of less than or equal to 0.55 kcal/mh°C.

5,773,386

**DURABLE IMAGE DIRECT THERMAL LABEL**

Joseph W. Langan, Cheektowaga, N.Y., assignor to Moore U.S.A. Inc., Grand Island, N.Y.

Filed Feb. 26, 1997, Ser. No. 806,939  
Int. Cl.<sup>6</sup> B41M 5/40

U.S. Cl. 503—226

12 Claims

1. A thermal sensitive label, comprising:  
a substantially transparent synthetic material substrate having first and second faces;  
a thermally sensitive material disposed in association with said first face so that when heat is applied to said second face an image will form on said thermally sensitive material and said image will be readable from said second face without significant distortion; and

5,773,387

**HERBICIDAL COMPOSITION COMPRISING TWO 1,3,5-TRIAZINE SULFONYLUREA DERIVATIVES**

Vladimir Iosifovich Sorokin, Moscow, Russia, assignor to Labatt Brewing Company Limited, London, Canada

PCT No. PCT/RU93/00210, § 371 Date Nov. 15, 1995, § 102(c)  
Date Nov. 15, 1995, PCT Pub. No. WO94/05154, PCT Pub. Date Mar. 17, 1994

PCT Filed Sep. 2, 1993, Ser. No. 392,868

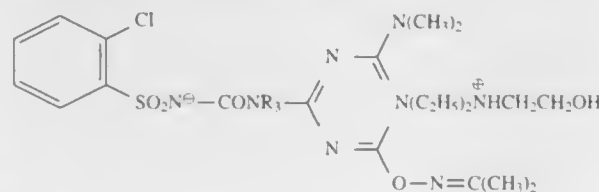
Claims priority, application Russian Federation, Sep. 4, 1992, 5061714

Int. Cl.<sup>6</sup> A01N 43/68; 43/70

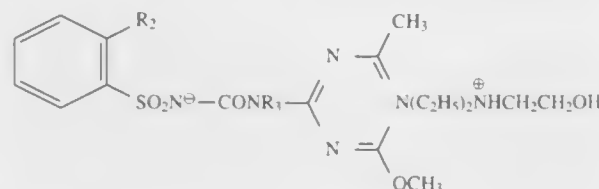
U.S. Cl. 504—134

18 Claims

1. A herbicidal composition comprising: from 1.5 to 30 parts by weight of a compound of formula (I)



wherein R<sub>1</sub> is hydrogen or methyl;  
from 1.5 to 30 parts by weight of a compound of formula (II)



wherein R<sub>1</sub> is hydrogen or methyl and R<sub>2</sub> is chlorine, methoxy-carbonyl or 2-chloroethoxy;

from 1.0 to 5.0 parts by weight of a surfactant selected from the group consisting of:  
bis-polyoxyethylated alkylamines, sodium bis(2-ethylhexyl)succinate sulfonate,  
polyethyleneglycol monoalkyl ethers, and  
alkylaryl ethers of polyethyleneglycol or polypropyleneglycol;  
from 20 to 40 parts by weight of triethyleneglycol; and sufficient water to bring the total weight to 100 parts.

5,773,388

**PYRIMIDINE DERIVATIVES, HERBICIDES AND PLANT GROWTH REGULATORS**

Jun Satow; Yasuo Kondo; Yoshihiro Kudo; Takumi Mikashima, all of Funabashi; Tsutomu Nawamaki, Shiraoka-machi; Yoichi Ito, Shiraoka-machi; Kazuhisa Sudo, Shiraoka-machi; Kunimitsu Nakahira, Shiraoka-machi; Shigeomi Watanabe, Shiraoka-machi, and Kimihiro Ishikawa, Shiraoka-machi, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

PCT No. PCT/JP94/01311, § 371 Date Feb. 9, 1996, § 102(e)  
Date Feb. 9, 1996, PCT Pub. No. WO94/01311, PCT Pub. Date Aug. 9, 1994

PCT Filed Aug. 9, 1994, Ser. No. 592,298

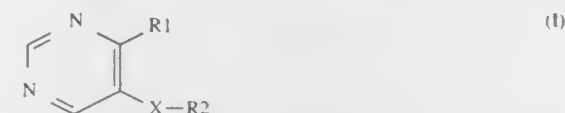
Claims priority, application Japan, Aug. 10, 1993, 5-198328;  
Nov. 1, 1993, 5-273392; Jul. 26, 1994, 6-174575

Int. Cl.<sup>6</sup> C07D 239/26; A01N 43/54

U.S. Cl. 504—239

12 Claims

1. A pyrimidine compound of the formula (I):



wherein:

R<sup>1</sup> is C<sub>1</sub>—C<sub>6</sub> haloalkyl, C<sub>3</sub>—C<sub>6</sub> cycloalkyl, C<sub>3</sub>—C<sub>6</sub> cycloalkyl substituted by lower alkyl, C<sub>3</sub>—C<sub>6</sub> halocycloalkyl or phenyl substituted by halogen, C<sub>1</sub>—C<sub>4</sub> alkoxy, C<sub>1</sub>—C<sub>3</sub> haloalkyl, C<sub>1</sub>—C<sub>3</sub> haloalkoxy or phenyl;

R<sup>2</sup> is hydrogen, C<sub>1</sub>—C<sub>6</sub> alkyl, C<sub>3</sub>—C<sub>6</sub> cycloalkyl, C<sub>3</sub>—C<sub>6</sub> cycloalkyl (C<sub>1</sub>—C<sub>4</sub>)alkyl, C<sub>1</sub>—C<sub>6</sub> haloalkyl, C<sub>3</sub>—C<sub>6</sub> halocycloalkyl, C<sub>3</sub>—C<sub>6</sub> alkenyl, C<sub>3</sub>—C<sub>6</sub> alkynyl, C<sub>1</sub>—C<sub>2</sub> sulfonyl (C<sub>1</sub>—C<sub>4</sub>)alkyl, C<sub>4</sub> alkylthiol (C<sub>3</sub>—C<sub>6</sub>)cycloalkyl, phenyl or phenyl substituted by halogen, C<sub>1</sub>—C<sub>4</sub> alkyl, C<sub>1</sub>—C<sub>4</sub> alkoxy, C<sub>1</sub>—C<sub>3</sub> haloalkyl, C<sub>1</sub>—C<sub>3</sub> haloalkoxy or phenyl; and

X is carbonyl or —C(R<sub>3</sub>)OH where R<sub>3</sub> is hydrogen, C<sub>1</sub>—C<sub>6</sub> alkyl, C<sub>3</sub>—C<sub>6</sub> alkenyl, C<sub>3</sub>—C<sub>6</sub> alkynyl, phenyl or phenyl substituted by halogen, C<sub>1</sub>—C<sub>4</sub> alkyl, C<sub>1</sub>—C<sub>4</sub> alkoxy, C<sub>1</sub>—C<sub>3</sub> haloalkyl, C<sub>1</sub>—C<sub>3</sub> haloalkoxy or phenyl;

with the proviso that when the carbon atom is an optically active carbon the racemic mixture and both the optical isomers thereof are included.

5,773,389

**SUBSTITUTED 2,6-SUBSTITUTED PYRIDINE COMPOUNDS**

Yuen-Lung Lawrence Sing, St. Louis, and Len F. Lee, St. Charles, both of Mo., assignors to Rohm and Haas Company, Philadelphia, Pa.

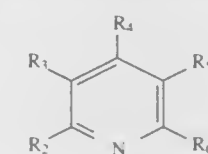
Division of Ser. No. 14,589, Feb. 8, 1993, Pat. No. 5,424,274, which is a division of Ser. No. 779,783, Oct. 21, 1991, Pat. No. 5,219,824, which is a division of Ser. No. 611,809, Nov. 13, 1990, Pat. No. 5,100,461, which is a division of Ser. No. 134,231, Dec. 24, 1987, Pat. No. 4,988,384, which is a continuation-in-part of Ser. No. 12,930, Feb. 9, 1987, abandoned. This application Jan. 31, 1995, Ser. No. 381,596

Int. Cl.<sup>6</sup> C07D 413/04; 413/14; 417/04; A01N 43/40

U.S. Cl. 504—244

21 Claims

1. A compound represented by the formula



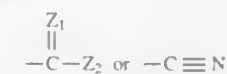
wherein:

R<sub>3</sub> is selected from the group consisting of 4,5-dihydro-2-oxazolyl; 4,5-dihydro-2-thiazolyl; and the above mentioned heterocycles substituted with a substituent selected from

lower alkyl, alkoxy and trifluoroacetyl; and 1-amino- 4,5-dihydro-1H-imidazolyl;

R<sub>4</sub> is selected from C<sub>1</sub>—C<sub>4</sub> straight or branched chain alkyl, C<sub>3</sub>—C<sub>4</sub> cycloalkyl, cycloalkylalkyl, alkylthioalkyl, and bis-(alkylthio)alkyl;

R<sub>5</sub> is the same as R<sub>3</sub> or is



where Z<sub>1</sub> is NR<sub>7</sub> where

R<sub>7</sub> is lower alkyl, and Z<sub>2</sub> is selected from alkoxy, alkenoxy, alkyloxy, alkylthio, pyrazolyl, haloalkoxy, cyanoalkoxy, chloro, and —NHR<sub>8</sub> where R<sub>8</sub> is lower alkyl;

R<sub>2</sub> and R<sub>6</sub> are independently selected from fluorinated methyl, chlorofluorinated methyl, chlorinated methyl, and lower alkyl, provided that one of R<sub>2</sub> and R<sub>6</sub> must be fluorinated or chlorofluorinated methyl.

5,773,390

**CHEMICAL ADDITIVE FOR REMOVING SOLIDS FROM A WELL DRILLING SYSTEM**

Darrell P. Salisbury, Sugar Lane, and Robert L. Sloan, Katy, both of Tex., assignors to Well-Flow Technologies, Inc., Houston, Tex.

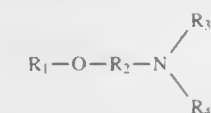
Continuation-in-part of Ser. No. 484,821, Jun. 7, 1995, abandoned, which is a continuation-in-part of Ser. No. 270,006, Jul. 1, 1994, abandoned. This application Jan. 8, 1997, Ser. No. 780,317

Int. Cl.<sup>6</sup> C09K 7/04

U.S. Cl. 507—246

20 Claims

1. A chemical additive for cleaning a wellbore and drilling equipment, comprising:  
an ether amine having the formula:



wherein R<sub>1</sub> is a hydrocarbon group; R<sub>2</sub> is a hydrocarbon group; R<sub>3</sub> is an alkyl group, an alkenyl group, a hydroxyalkyl group, or an oligomer of hydroxyalkyl groups; R<sub>4</sub> is an alkyl group, an alkenyl group, a hydroxyalkyl, or an oligomer of hydroxyalkyl groups; and  
an alcohol selected from the group consisting of alkenes, cycloalkylenes and mixtures thereof.

5,773,391

**HIGH OLEIC POLYOL ESTERS, COMPOSITIONS AND LUBRICANTS, FUNCTIONAL FLUIDS AND GREASES CONTAINING THE SAME**

Saurabh S. Lawate, Concord, and Kasturi Lal, Willoughby, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 794,105, Feb. 3, 1997, abandoned, which is a continuation of Ser. No. 339,821, Nov. 15, 1994, abandoned. This application Nov. 7, 1997, Ser. No. 966,769

Int. Cl.<sup>6</sup> C10M 129/78

U.S. Cl. 508—257

29 Claims

1. A composition comprising:  
a polyol ester derived from  
(A) an aliphatic or alicyclic polyol containing from 2 to about 10 hydroxyl groups and  
(B) an aliphatic monocarboxylic acid mixture derived from a high oleic vegetable oil wherein the oleic content is at least 72 percent and the vegetable oil is canola oil, sunflower oil or peanut oil; with



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at least one antioxidant selected from the group consisting of phenolics, aromatic amines and tocopherols and at least one metal deactivator selected from the group consisting of benzotriazole and benzotriazole derivatives and wherein all the hydroxyl groups of the polyol are esterified with the acid mixture.

5,773,392

**OIL SOLUBLE COMPLEXES OF PHOSPHORUS-CONTAINING ACIDS USEFUL AS LUBRICATING OIL ADDITIVES**

Michael Gerald Romanelli, Brooklyn, N.Y.; Ricardo Alfredo Bloch, Scotch Plains, N.J.; Jack Ryer, East Brunswick, N.J., and Raymond Frederick Watts, Long Valley, N.J., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Continuation of Ser. No. 353,401, Dec. 9, 1994, abandoned.

This application Sep. 18, 1996, Ser. No. 716,582

Int. Cl.<sup>6</sup> C10M 137/00; 137/14

U.S. Cl. 508—348

11 Claims

1. An oil-soluble additive wherein the additive comprises the complex of a substantially oil-insoluble phosphorus-containing acid and an alcohol formed at temperature from about -10° to 50° C., the alcohol being a single alcohol or mixtures of alcohols represented by (I) or (II), where (I) and (II) are:



where:

m+n is an integer from 1 to 4;

m is 0 or an integer from 1 to 4;

n is 0 or an integer from 1 to 4;

q is 0 or an integer from 1 to 6;

R is a C<sub>1</sub>-C<sub>50</sub> hydrocarbyl group in structure (I) and is a C<sub>1</sub>-C<sub>50</sub> hydrocarbyl group or hydrogen in structure (II);

X is sulfur, oxygen, nitrogen, or -CH<sub>2</sub>-;

r is 0, or an integer from 1 to 5 providing when X is oxygen or nitrogen, r is 1, when X is sulfur, r is 1 to 3, when X is -CH<sub>2</sub>-; r is 1 to 5;

s is 0, or an integer from 1 to 12;

t is 0, or an integer from 1 to 2 providing when X is sulfur, oxygen, or -CH<sub>2</sub>-; t is 1, when X is nitrogen, t is 1 or 2;

y is 0, or an integer from 1 to 10; and

R<sub>1</sub> and R<sub>2</sub> are independently a C<sub>1</sub>-C<sub>6</sub> alkyl or hydrogen.

9. A concentrate composition comprising the additive of claim 1 and a minor amount of lubrication oil or solvent.

5,773,393

**OIL COMPOSITIONS USEFUL IN HYDRAULIC FLUIDS**

Paul Ernest Adams, Willoughby, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 494,113, Jun. 23, 1995, abandoned, and a continuation of Ser. No. 760,667, Sep. 16, 1991, abandoned. This application Jun. 17, 1997, Ser. No. 877,090

Int. Cl.<sup>6</sup> C10M 133/16; 133/04

U.S. Cl. 508—551

49 Claims

1. A composition comprising at least about 70% by weight of an oil of lubricating viscosity and an amount effective to inhibit metal corrosion of a soluble additive mixture comprising

(A) at least one amide compound derived from a mono- or polycarboxylic acid or reactive derivative of said mono- or polycarboxylic acid and at least one alkanolamine; and

(B) at least about 0.5 mole of at least one amine per mole of amide wherein the lubricating composition is substantially non-aqueous.

**5,773,394**  
**CONDUCTING POLYMER-THICKENED GREASE COMPOSITIONS**

George Tin Yau Wan, Houten, and Dick Meijer, Nieuwegein, both of Netherlands, assignors to SKF Industrial Trading & Development Company B.V., Netherlands

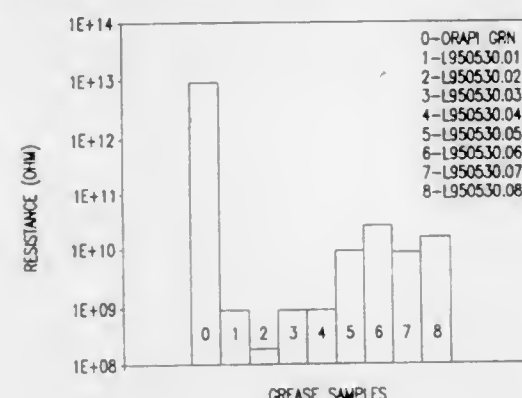
Filed Mar. 10, 1997, Ser. No. 814,031

Claims priority, application Netherlands, Dec. 3, 1996, 1002587

Int. Cl.<sup>6</sup> C10M 119/02

U.S. Cl. 508—591

20 Claims



1. Method of preparing an electrically conducting lubricant and grease composition, comprising mixing a copolymer or homopolymer of propylene with a weight average molecular weight of 200,000 or more and a copolymer or homopolymer of propylene with a weight average molecular weight of 100,000 or less to form a polymeric thickener and mixing with the polymeric thickener a lubricating base oil and an electrically conducting component.

5,773,395

**MICROEMULSION ALL PURPOSE LIQUID CLEANING COMPOSITIONS**

Maria Jose Charlez, and Abraham Cazes, both of Mexico, Mexico, assignors to Colgate-Palmolive Co., Piscataway, N.J.

Filed Nov. 21, 1996, Ser. No. 753,160

Int. Cl.<sup>6</sup> C11D 1/22; 3/50; 9/02; 3/43

U.S. Cl. 510—101

8 Claims

1. A microemulsion composition consisting essentially of:

(a) 0.25 wt. % to 7 wt. % of an anionic surfactant;

(b) 0.1 wt. % to 10 wt. % of a cosurfactant which is a water soluble glycol ether;

(c) 0.5 wt. % to 20 wt. % of a perfume containing 5 wt. % to 40 wt. % of an eucalyptus oil and 1 wt. % to 20 wt. % of limonene and said perfume having a pine like odor;

(d) 2.3 wt. % to 9.6 wt. % of a coconut fatty acid;

(e) 0.75 wt. % to 7 wt. % of a C<sub>18</sub> saturated fatty acid;

(f) 0.1 wt. % to 5 wt. % of potassium hydroxide;

(g) 0.1 wt. % to 8 wt. % of a solubilizing agent selected from the group consisting of C<sub>2</sub>-C<sub>4</sub>; and

(h) the balance being water, wherein said composition does not contain pine oil.

**5,773,396**  
**CONTACT LENS CLEANING AND WETTING SOLUTIONS CONTAINING A NON-AMINE POLYETHYLENEOXY ADDUCT HAVING A HLB VALUE OF AT LEAST ABOUT 18, A SURFACE ACTIVE AGENT HAVING A HLB OF LESS THAN 18, AND WETTING AGENT**

Hong J. Zhang, Andover; Edward J. Ellis, Lynnfield; Stanley J. Wrobel, Andover, and Chimpiramma Potini, Methuen, all of Mass., assignors to Polymer Technology Corporation, Wilmington, Mass.

Continuation of Ser. No. 469,024, Jun. 6, 1995, abandoned, which is a continuation of Ser. No. 350,749, Dec. 7, 1994, abandoned, which is a continuation of Ser. No. 80,425, Jun. 18, 1993, abandoned. This application Dec. 9, 1996, Ser. No. 762,533

Int. Cl.<sup>6</sup> C11D 10/02

U.S. Cl. 510—115

10 Claims

1. An improved aqueous composition for cleaning and wetting a contact lens comprising from about 0.001 to about 5 weight percent of an anionic, nonionic, or amphoteric surface active agent having cleaning activity for contact lens deposits and having an HLB value of less than 18, and from about 0.1 to about 10 weight percent of a wetting agent selected from the group consisting of a cellulosic material, a silicone polymer containing an alkeneoxide side chain, polyvinyl alcohol, polyvinyl pyrrolidone, and mixtures thereof; wherein the improvement comprises the inclusion of from about 0.001 to about 10 weight percent of a non-amine polyethyleneoxy-containing material having an HLB value of at least about 18 selected from the group consisting of an ethoxylated glucose derivative, an ethoxylated ether of sorbitol, a copolymer comprising ethyleneoxy and propyleneoxy monomeric units, and mixtures thereof.

5,773,397

**BUBBLE BATH COMPOSITION**

Norihiro Tanaka; Narushi Takahashi; Junko Suzuki, and Hidenori Yorozu, all of Ichikai-machi, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed May 23, 1996, Ser. No. 652,122

Claims priority, application Japan, May 23, 1995, 6-123758; Jun. 8, 1995, 6-141440; Jul. 11, 1995, 6-174567

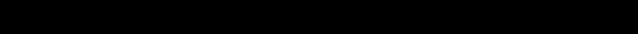
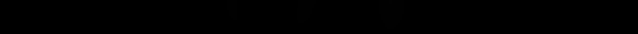
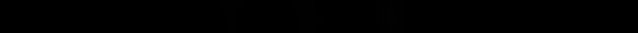
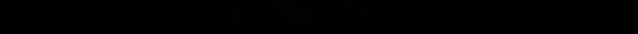
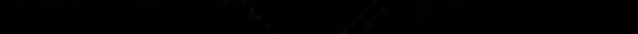
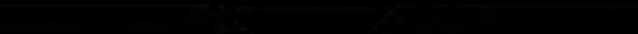
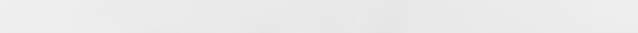
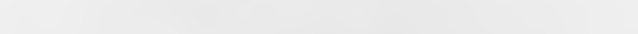
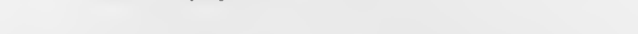
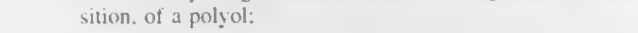
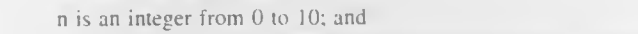
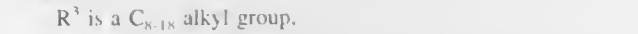
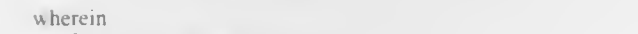
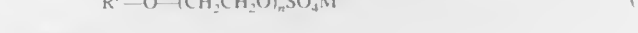
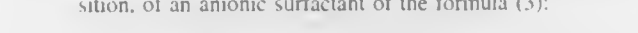
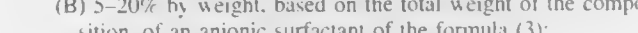
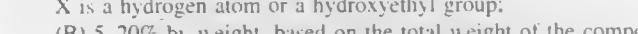
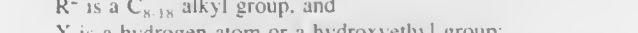
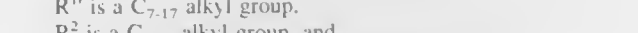
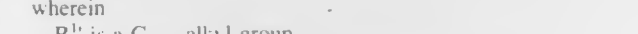
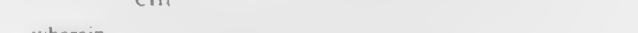
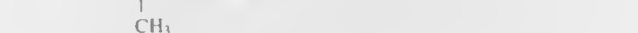
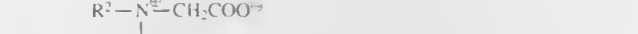
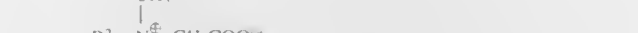
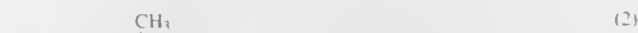
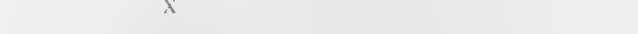
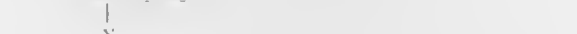
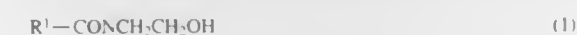
Int. Cl.<sup>6</sup> A61K 7/50

U.S. Cl. 510—119

17 Claims

1. A composition comprising:

(A) 10-30% by weight, based on the total weight of the composition, of an alkylalkanolamide surfactant of the formula (1) or a betaine surfactant of the formula (2):



wherein the ratio by weight of component (A) to component (B) is greater than or equal to 1 and the composition has a viscosity of less than or equal to 1000 cp at 20° C.

5,773,398

**CLEANING COMPOSITION BASED ON AN ALIPHATIC HYDROCARBON COMPOUND COMPRISING AT LEAST TWO AROMATIC SUBSTITUENTS**

Jean-Luc Joye, Paris, and Marie-Madeleine Vincent, Athis Mons, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jul. 29, 1996, Ser. No. 681,748

Int. Cl.<sup>6</sup> C11D 3/18; 1/86

U.S. Cl. 510—245

26 Claims

1. A cleaning composition, comprising:

1% to 99% by volume of at least one compound (a) having an aliphatic hydrocarbon chain substituted by at least two aryl or alkylaryl radicals, the aromatic nucleus of at least two aryl or alkylaryl radicals having 6 carbon atoms; and 99% to 1% by volume of at least one polar aprotic compound (b) which is an alkylene glycol ether at least partly soluble in water and in compound (a).

5,773,399

**STABILIZATION OF OXIDATION-SENSITIVE INGREDIENTS IN PERCARBONATE DETERGENT COMPOSITIONS**

Gerard Marcel Baillely, and Richard Timothy Hartshorn, both of Newcastle upon Tyne, Great Britain, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US94/13653, § 371 Date May 21, 1996, § 102(e) Date May 21, 1996, PCT Pub. No. WO95/16019, PCT Pub. Date Jun. 15, 1995

PCT Filed Dec. 1, 1994, Ser. No. 648,111

Claims priority, application European Pat. Off., Dec. 10, 1993, 93309960

Int. Cl.<sup>6</sup> C11D 3/08; 3/395

U.S. Cl. 510—315

17 Claims

1. A granular composition comprising from 0.04% to about 15% by weight of oxidation-sensitive ingredients in combination with a detergent composition, the detergent composition comprising:

(a) from 10% to 85% by weight of the detergent composition of particles which comprise, by weight of the particles (a):

(i) from 5% to 80% of a builder which is selected from the group consisting of zeolite builders, carbonate builders, and mixtures thereof;

(ii) from about 2% to about 15% of a silicate;

(iii) from 5% to 60% of a detergent surfactant, or mixtures of detergent surfactants;

(iv) from 0% to 70% of a water-soluble sulfate salt, said sulfate salt being contaminated with no more than 60 ppm iron and no more than 5 ppm copper; and

(v) when said water-soluble sulfate salt is present at a level of 1% or greater in said particle, from 0.3% to 15% of a chelant;

(b) from 3% to 50% by weight of the detergent composition of percarbonate bleach particles having an average particle size in the range from 500 micrometers to 1000 micrometers, not more than 10% by weight of said percarbonate particles being smaller than 200 micrometers and not more than 10% by weight of said percarbonate particles being larger than 1250 micrometers, wherein said percarbonate particles optionally include a coating, and further wherein the coating, if included, consists of water-soluble carbonates, water-soluble sulfates, water-soluble citrates, dehydrated or partially hydrated zeolites, water-soluble surfactants, or mixtures thereof;

(c) from 12% to 35% by weight of the detergent composition of particles consisting essentially of water-soluble sulfate, said sulfate particles being dry-blended with particles (a) and (b).

said sulfate particles being contaminated with no more than 40 ppm iron and no more than 5 ppm copper, said sulfate particles having an average particle size in the range from 250 micrometers to 1400 micrometers, not more than 25% by weight of said sulfate particles being larger than 1000 micrometers and not more than 2% of said sulfate particles being smaller than 250 micrometers; and

(d) optionally, adjunct ingredients; wherein the oxidation-sensitive ingredients comprise optical brighteners, perfumes, enzymes, fabric softeners, or mixtures thereof.

5,773,400

**NIL-PHOSPHATE GRANULAR DETERGENT COMPOSITIONS WHICH CONTAIN PERCARBONATE AND SULFATE PARTICLES**

Gerard Marcel Bailley, and Richard Timothy Hartshorn, both of Newcastle upon Tyne, Great Britain, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US94/13700, § 371 Date May 21, 1996, § 102(e) Date May 21, 1996, PCT Pub. No. WO95/16018, PCT Pub. Date Jun. 15, 1995

PCT Filed Dec. 10, 1993, Ser. No. 648,112

Claims priority, application European Pat. Off., Dec. 10, 1993, 93309961

Int. Cl.<sup>6</sup> C11D 3/04; 3/395

U.S. Cl. 510—315 12 Claims

1. A nil-phosphate granular detergent composition comprising:
- (a) from 10% to 85% by weight of the detergent composition of particles which comprise, by weight of particle:
- (i) from 5% to 80% of a builder selected from the group consisting of zeolite builders, carbonate builders, silicate builders, and mixtures thereof;
- (ii) from 5% to 60% of a deterative surfactant, or mixtures of deterative surfactants;
- (iii) from 0% to 70% of a water-soluble sulfate salt, the sulfate salt being contaminated with no more than 60 ppm iron and no more than 5 ppm copper; and
- (iv) when the water-soluble sulfate salt is present at a level of 1% or greater in the particle, from 0.3% to 15% of a chelant;
- (b) from 3% to 50% by weight of the detergent composition of percarbonate bleach particles having an average particle size in the range from 500 micrometers to 1000 micrometers, not more than 10% by weight of the percarbonate particles being smaller than 200 micrometers and not more than 10% by weight of the particles being larger than 1250 micrometers, wherein the percarbonate particles optionally include a coating, and further wherein the coating, if included, consists of water-soluble carbonates, water-soluble sulfates, water-soluble citrates, dehydrated or partially hydrated zeolites, water-soluble surfactants, or mixtures thereof;
- (c) from 5% to 35% by weight of the detergent composition of particles consisting essentially of water-soluble sulfate, the sulfate particles being dry-blended with particles (a) and (b), the sulfate particles being contaminated with no more than 40 ppm iron and no more than 5 ppm copper, the sulfate particles having an average particle size in the range from 250 micrometers to 1400 micrometers, not more than 25% by weight of the sulfate particles being larger than 1000 micrometers and not more than 2% of the sulfate particles being smaller than 250 micrometers; and
- (d) optionally, adjunct ingredients.

5,773,401

**DETERGENT COMPOSITION CONTAINING POLYCARBOXYLATE AGENT HAVING SPECIFICALLY DEFINED PARAMETERS**

Susumu Murata, Amagasaki, Japan; David Johnathan Kitko, Cincinnati, Ohio, and Toshiko Shigematsu, Nara, Japan, assignors to The Procter & Gamble Company, Cincinnati, Ohio

PCT No. PCT/US95/06812, § 371 Date Feb. 28, 1997, § 102(e) Date Feb. 28, 1997, PCT Pub. No. WO95/33815, PCT Pub. Date Dec. 14, 1995

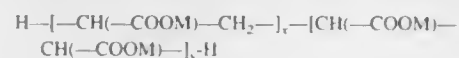
PCT Filed May 30, 1995, Ser. No. 750,445

Claims priority, application Australia, Jun. 3, 1994, PM6108

Int. Cl.<sup>6</sup> C11D 3/37; 3/12; 3/39; 3/395

U.S. Cl. 510—361 12 Claims

1. A laundry detergent composition, comprising:
- (i) at least 10% detergent surfactant; and
- (ii) at least 10% detergent builder system comprising a copolymer of maleic acid and acrylic acid of the formula



wherein M is a counterion, the molecular weight (MW) of the copolymer is from 5000 to 15,000, and the mole ratio R of x to y is from about 3:7 to 7:3, and further wherein the copolymer has an Index Ratio (IR) of not less than 110, wherein IR=Binding Index (BI)×Dispersing Index (DI)/100.

5,773,402

**HYPOCHLORITE-COMPRISING COMPOSITIONS FOR IMPROVED MILDNESS TO THE SKIN**

Anna Lucia D'Orazio, Procter & Gamble Italia S.p.A. Via Cesare Pavese 385, I-00144 Roma, Italy

PCT No. PCT/US94/10247, § 371 Date Sep. 11, 1996, § 102(e) Date Sep. 11, 1996, PCT Pub. No. WO95/08612, PCT Pub. Date Mar. 30, 1995

PCT Filed Sep. 12, 1994, Ser. No. 617,774

Claims priority, application European Pat. Off., Sep. 20, 1993, 9381093

Int. Cl.<sup>6</sup> C11D 3/395; 1/83

U.S. Cl. 510—380 6 Claims

1. A cleaning composition having reduced skin irritation, comprising:
- a) a hypochlorite compound wherein the amount of active chlorine is from about 0.4% to about 5% of the composition;
- b) from 2% to about 5% of an amine oxide having the formula:



wherein R<sub>1</sub> is C<sub>8</sub>-C<sub>18</sub> alkyl; R<sub>2</sub> and R<sub>3</sub> are each independently C<sub>1</sub>-C<sub>4</sub> alkyl;

c) from about 1% to about 8% of an alkyl sulfate having the formula:



wherein R<sub>4</sub> is C<sub>6</sub>-C<sub>10</sub> alkyl;

d) from about 0.5% to about 0.9% of an alkali metal salt of a C<sub>8</sub>-C<sub>18</sub> fatty acid;

and

e) the balance carriers and adjunct ingredients.

5,773,403

**CLEANING AND DRYING SOLVENT**

Masamichi Hijino, Hachiohji; Michio Shirai, Kodaira, and Kunihiko Uzawa, Osaka, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 119,121, Sep. 16, 1993, abandoned. This application Jul. 20, 1995, Ser. No. 504,915

Claims priority, application Japan, Jan. 21, 1992, 4-29998; Feb. 7, 1992, 4-56867; Apr. 9, 1992, 4-117009; May 15, 1992, 4-148633; Jun. 5, 1992, 4-171721

Int. Cl.<sup>6</sup> C11D 7/50; 7/60; B01D 12/00

U.S. Cl. 510—411 9 Claims

1. A method of cleaning and drying an object which comprises contacting the object with a solvent, wherein said solvent consists essentially of hexamethyldisiloxane and ethanol.

said hexamethyldisiloxane and said ethanol being present in respective amounts of 55 to 70% by weight and 30 to 45% by weight based on the weight of the solvent and forming azeotropic or azeotropic-like combination.

wherein said hexamethyldisiloxane is at least 99.0% weight pure, the amount of ingredients having boiling points ranging from 210° to 230° C. in said solvent is less than 0.01% by weight, and said solvent does not contain any ingredients having boiling points higher than 230° C.

5,773,404

**AZEOTROPIC COMPOSITION**

Hirokazu Aoyama; Satoshi Ide, and Akinori Yamamoto, all of Settsu, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

PCT No. PCT/JP95/00705, § 371 Date Oct. 11, 1996, § 102(e) Date Oct. 11, 1996, PCT Pub. No. WO95/28373, PCT Pub. Date Oct. 26, 1995

PCT Filed Apr. 10, 1995, Ser. No. 722,023

Claims priority, application Japan, Apr. 13, 1994, 6-075124

Int. Cl.<sup>6</sup> C11D 17/00; C07C 23/06

U.S. Cl. 510—415 24 Claims

1. An azeotropic composition comprising cis-1,1,2,2,3,4-hexafluorocyclobutane and at least one compound selected from the group consisting of methanol, ethanol, isopropanol, n-propanol, tert-butanol, cyclopentane, n-octane, isooctane, n-heptane and methylcyclohexane.

5,773,405

**CLEANER COMPOSITIONS CONTAINING SURFACTANT AND POLY (OXYALKYLENE)-SUBSTITUTED REACTIVE DYE COLORANT**

John D. Bruhnke, Spartanburg, S.C., assignor to Milliken Research Corporation, South Carolina, Calif.

Filed Mar. 13, 1997, Ser. No. 816,083

Int. Cl.<sup>6</sup> C11D 17/00; 3/00; 3/40; D06P 5/13

U.S. Cl. 510—519 18 Claims

1. A surface cleaner composition comprising:
- a) from 0.1 to 70% of tensoactive, or mixtures thereof;
- b) from 0 to 95% builder/softener;
- c) from 0 to 99.9% solvent;
- d) from 0 to 50% hydrotrope; and
- e) from 1 ppm to 5000 ppm of a poly(oxyalkylene)-substituted colorant which is liquid in its undiluted state having the structure ABXYZ, where
- AB is a reactive dye moiety wherein
- A is an organic chromophore, and
- B is an electrophilic group covalently bonded to A directly or through a linking group;
- X is a nucleophilic linking group covalently bonding B and Y, selected from the group consisting of NR, O, S, and 4-oxyanilino (—HN—Ph—O); where R is selected from the group consisting of H, alkyl, aryl, and YZ;
- Y is a poly(oxyalkylene)-containing moiety; and

Z is a terminal group for Y.

5,773,406

**FOAMING COMPOSITION**

Stephen F. Gross, Souderton, Pa., assignor to Henkel Corporation, Plymouth Meeting, Pa.

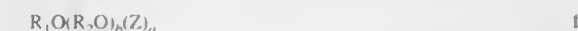
Continuation of Ser. No. 503,745, Jul. 18, 1995, abandoned. This application Jan. 31, 1997, Ser. No. 791,972

Int. Cl.<sup>6</sup> C11D 17/4; 1/83

U.S. Cl. 510—426 11 Claims

1. A foaming composition having enhanced levels of foaming and foam stability consisting essentially of:

(a) an alkyl polyglycoside having the general formula I:



wherein R<sub>1</sub> is a monovalent organic radical having from about 6 to about 30 carbon atoms; R<sub>2</sub> is a divalent alkylene radical having from 2 to 4 carbon atoms; Z is a saccharide residue having 5 or 6 carbon atoms; b is a number having a value from 0 to about 12; a is a number having a value from 1 to about 6, and

(b) a fatty alcohol sulfate consisting of a mixture of a lauryl sulfate and a n-decyl sulfate in a wt-% actives ratio of from 5:1 to 1:5, wherein components (a) and (b) are combined in a wt-% actives ratio of from about 1:10 to about 10:1.

5,773,407

**ANTIFORM DELIVERY SYSTEM**

Kuo-Tsai G. Lai; Wen P. Liao, both of Clifton Park, and Frank J. Traver, Troy, all of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Sep. 27, 1996, Ser. No. 722,589

Int. Cl.<sup>6</sup> C11D 17/00; 3/38

U.S. Cl. 510—466 20 Claims

1. A method for preparing an encapsulated antifoam composition comprising:

- (a) preparing an aqueous emulsion comprising:
- (i) an antifoam composition and
- (ii) an alkylalkoxysilane; and
- (b) adding to said aqueous emulsion a silicone condensation cure catalyst whereby said antifoam composition is encapsulated by the reaction product of said alkylalkoxysilane and said silicone condensation cure catalyst.

5,773,408

**DRYER-ACTIVATED FABRIC CONDITIONING COMPOSITIONS CONTAINING UNCOMPLEXED CYCLODEXTRIN**

Toan Trinh, Maineville, and Helen Bernardo Tordil, West Chester, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 590,711, Jan. 24, 1996, Pat. No. 5,681,806, which is a continuation of Ser. No. 278,703, Jul. 21, 1994, abandoned, which is a continuation of Ser. No. 40,703, Mar. 31, 1993, abandoned. This application Apr. 22, 1997, Ser. No. 840,527

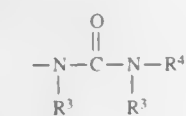
Int. Cl.<sup>6</sup> C11D 3/382

U.S. Cl. 510—520 10 Claims

1. An article of manufacture comprising:
1. a fabric conditioning composition comprising:
- i. from about 30% to about 95% of fabric softening agent; and
- ii. an effective amount of uncomplexed cyclodextrin having a particle size of less than about 12 microns;



$X_1$  is  $R_1R_2$ , wherein  $R_1$  is an H or alkyl group and  $R_2$  is an H, alkyl,  $CH_3CO$ , alky-CO or phenyl-CO group; or 0 to 10 amino acids, which can be protected by acetylation at an N-terminus;



1. A method of combatting mammalian neoplasia in a mammalian subject in need of such treatment, comprising administering to the subject an effective amount of a composition comprising a non-naturally occurring, anti-neoplastically effective, non-oncocytologically proliferative lytic peptide, wherein the peptide is selected from SEQ ID Nos. 1-3, 5-38 and 40.

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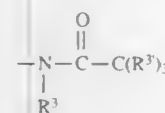
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JUNE 30, 1998

wherein  $R^3$  and  $R^4$  are defined above, orwherein  $R^3$  is F, Cl, Br, or I, and  $R^3$  is as defined above, $R^2$  is hydrogen or methyl, $R^2$ ,  $R^{2'}$ , and  $R^{2''}$  are each the same or different and each is hydrogen,

alkyl,

aryl, or

heteroaryl with the proviso that at least one of  $R^2$ ,  $R^{2'}$ , and  $R^{2''}$ is aryl or heteroaryl, and  $R^{2''}$  is hydrogen or methyl, $n$  is zero, and $n'$  is zero or an integer of 1, 2, or 3;AA<sup>2</sup> is

Apa,

Ahp,

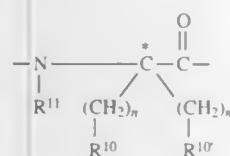
Dip,

D-Phe,

Phe,

HomoArg,

Arg, or

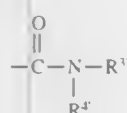
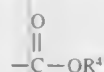
wherein  $R^{11}$  is hydrogen or methyl, $n$  is zero, $R^{10}$  is hydrogen or methyl, $n'$  is zero or an integer of 1, 2, 3, 4, or 5, and $R^{10'}$  is alkyl,

OH,

wherein  $R^{11'}$  and  $R^4$  are each the same or different and each is hydrogen,

alkyl, or

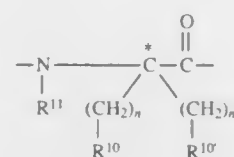
aryl,

wherein  $R^{1'}$  and  $R^4$  are as defined above,wherein  $R^4$  is as defined above: $-\text{S}(\text{O})_m\text{R}^{1'}$  wherein  $m$  is zero or an integer of 1 of 2 and  $R^{1'}$  is as defined above except that  $R^{1'}$  is not hydrogen;AA<sup>3</sup> is

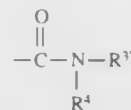
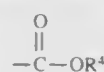
Lys,

Tyr,

Phe, or

wherein  $R^{11}$  is hydrogen or methyl, $n$  is zero, $R^{10}$  is hydrogen or methyl, $n'$  is zero or an integer of 1, 2, or 3, and $R^{10'}$  is alkyl,

aryl,

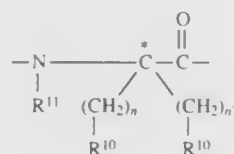
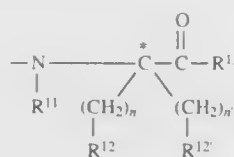
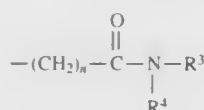
wherein  $R^{1'}$  and  $R^4$  are as defined above:wherein  $R^4$  is as defined above;AA<sup>4</sup> and AA<sup>5</sup> are each

Phe,

Lys,

Glu,

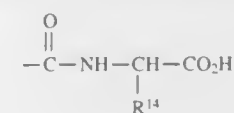
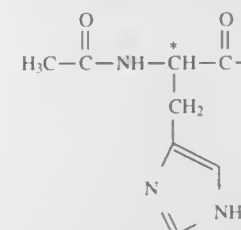
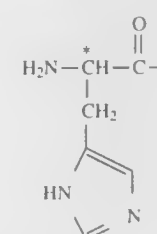
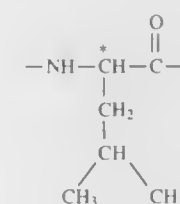
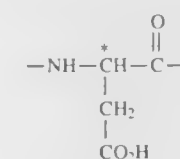
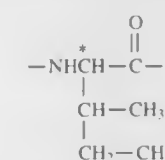
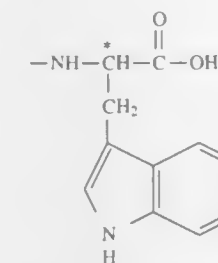
Pro, or

wherein  $R^{11}$  is hydrogen or methyl, $n$  is zero, $R^{10}$  is hydrogen or methyl, $n'$  is zero, and $R^{10'}$  is alkyl,or cycloalkyl, or one of AA<sup>2</sup> or AA<sup>4</sup> is absent;AA<sup>6</sup> iswherein  $R^{11}$  is hydrogen or methyl, $n$  is zero, $R^{12}$  is hydrogen, or methyl, $n'$  is zero or an integer of 1, 2, or 3, $R^{12'}$  is aryl or heteroaryl, $R^{13}$  is $-(\text{CH}_2)_n-\text{CO}_2\text{H}$  wherein  $n$  is zero or an integer of 1, 2, 3, 4, 5, or 6, $-(\text{CH}_2)_n-\text{OH}$  wherein  $n$  is zero or an integer of 1, 2, 3, 4, 5, or 6, or

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wherein  $n$ ,  $R^3$ , and  $R^4$  are defined above,wherein  $R^{14}$  is hydrogen or  $-\text{CH}_2\text{CO}_2\text{H}$ ,stereochemistry at  $\text{C}^*$  in AA<sup>1</sup> is D,stereochemistry at  $\text{C}^*$  in AA<sup>2</sup>, AA<sup>3</sup>, AA<sup>4</sup>, or AA<sup>5</sup> is D or Land stereochemistry at  $\text{C}^*$  in AA<sup>6</sup> is L; with the exclusion of compounds wherein AA<sup>1</sup> iswherein  $\text{CH}$  is D or L stereochemistry, orwherein  $\text{CH}$  is D or L stereochemistry,AA<sup>2</sup> iswherein  $\text{CH}$  is D or L stereochemistry,AA<sup>3</sup> iswherein  $\text{CH}$  is D or L stereochemistry,AA<sup>4</sup> and AA<sup>5</sup> are eachwherein  $\text{CH}$  is D or L stereochemistry, andAA<sup>6</sup> iswherein  $\text{CH}$  is D or L stereochemistry but wherein only one of AA<sup>1</sup> or AA<sup>2</sup> or AA<sup>3</sup> or AA<sup>4</sup> or AA<sup>5</sup> or AA<sup>6</sup> are of D-stereochemistry; or a pharmaceutically acceptable salt thereof in unit dosage form.

5,773,415

USE OF DES-ASPARTATE-ANGIOTENSIN I AS ANTI-CARDIAC HYPERTROPHIC AGENT

Meng Kwoon Sim, Singapore, Singapore, assignor to National University of Singapore, Singapore

PCT No. PCT/SG96/00004, § 371 Date May 19, 1997, § 102(e)

Date May 19, 1997, PCT Pub. No. WO96/37213, PCT Pub.

Date Nov. 28, 1996

PCT Filed May 22, 1996, Ser. No. 776,026

Claims priority, application Singapore, May 25, 1995,

9500519-5

Int. Cl.<sup>6</sup> A61K 38/00

U.S. Cl. 514-15

6 Claims

1. A method of treating cardiac hypertrophy, which comprises administering to a subject in need thereof an effective amount of des-Aspartate-angiotensin I.

5,773,416

METHODS FOR RESTORING OR ENHANCING REPRODUCTIVE FUNCTION IN REPRODUCTIVELY IMPAIRED HOSTS

Farid F. Chehab, San Francisco, Calif., assignor to The Regents of the University of California, Oakland, Calif.

Filed Oct. 22, 1996, Ser. No. 735,038

Int. Cl.<sup>6</sup> A61K 38/00

U.S. Cl. 514-21

26 Claims

1. A method for restoring reproductive function in a reproductively impaired male or female host, wherein the host is reproductively impaired as a result of a hormonal deficiency, said method comprising administering a leptin compound to the host for a time and in an amount sufficient to restore or enhance reproductive function.

5,773,417

HUMAN SERUM ALBUMIN-PORPHYRIN COMPLEXES WITH THE ABILITY TO BIND OXYGEN AND THERAPEUTIC USES THEREOF

Joseph Bonaventura, Beaufort, N.C., assignor to Duke University, Durham, N.C.

Continuation of Ser. No. 279,371, Jul. 22, 1994, abandoned.

This application Aug. 6, 1997, Ser. No. 906,828

Int. Cl.<sup>6</sup> A61K 38/00;35/16; C07K 1/00

U.S. Cl. 514-21

42 Claims

18. A method for replacing or increasing the circulatory blood volume or increasing oxygen delivery to tissues in a mammal comprising administering to said mammal an amount of a complex of human serum albumin and porphyrin effective to replace or increase the circulatory blood volume or increase oxygen delivery to tissues, which complex reversibly binds oxygen.



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5,773,418

**FIBRIN SEALANT COMPOSITIONS AND METHODS FOR UTILIZING SAME**

Peter A. D. Edwardson, Chester; John E. Fairbrother; Ronald S. Gardner, both of Clwyd; Derek A. Hollingsbee, South Wirral, and Stewart A. Cederholm-Williams, Oxford, all of United Kingdom, assignors to Bristol-Myers Squibb Company, Skillman, N.J.

Continuation of Ser. No. 138,674, Oct. 18, 1993, which is a continuation-in-part of Ser. No. 958,212, Oct. 8, 1992, abandoned. This application Nov. 20, 1997, Ser. No. 975,095 Int. Cl.<sup>6</sup> A61K 35/14;38/36

U.S. Cl. 514—21

3 Claims

1. A method of applying an adjuvant selected from the group consisting of antibiotics, anticancer agents, histamine H<sub>2</sub>-antagonists, fibronectin and fibrinolytic inhibitors to a desired site with a fibrin sealant comprising a fibrin polymer, the method comprising

co-applying said adjuvant with nondynamic fibrin monomer; and

converting said fibrin monomer to said fibrin polymer concurrently with said co-applying step whereby fibrin sealant with an adjuvant is provided.

5,773,419

**METHOD OF TREATING CANCER WITH TANNIC ACID**

Juan Falcon, 6522 Yosemite Dr., Tampa, Fla. 33634

Filed Mar. 3, 1995, Ser. No. 398,600

Int. Cl.<sup>6</sup> A61K 31/70;31/335

U.S. Cl. 514—25

16 Claims

1. A method of treating a cancer sensitive to tannic acid in a patient comprising non-topical administering to a patient in need thereof an effective amount of at least about 5% of a composition comprising tannic acid, wherein the cancer is selected from the group consisting of bladder, breast, kidney, leukemia, myeloma, liposarcoma, lymphoma, colon, penis, tongue, prostate and uterus cancers.

5,773,420

**ACYLATED BENZYLGLYCOSIDES AS INHIBITORS OF SMOOTH MUSCLE CELL PROLIFERATION**

Thomas T. Nguyen, Philadelphia, Pa., and John W. Ellingboe, Ridgewood, N.J., assignors to American Home Products Corporation, Madison, N.J.

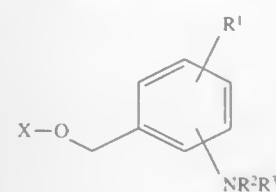
Filed Oct. 20, 1995, Ser. No. 531,142

Int. Cl.<sup>6</sup> A61K 31/70; C07H 17/00

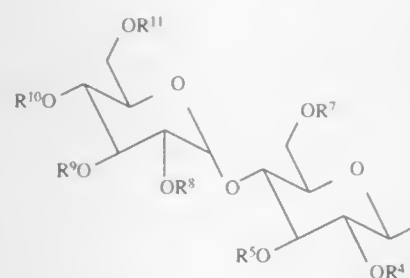
U.S. Cl. 514—25

38 Claims

I. A compound of the general formula I

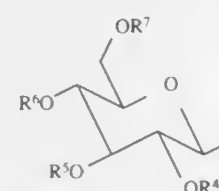


where X is



or

-continued



R<sup>1</sup> is H, alkyl having 1 to 6 carbon atoms, halo, CF<sub>3</sub>, CN, NO<sub>2</sub>, or alkoxy having 1 to 6 carbon atoms;

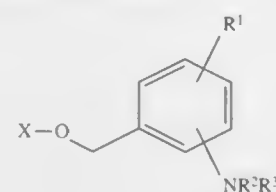
R<sup>2</sup> is H, an acyl group having 1 to 6 carbon atoms, phenylsulfonyl, or phenylsulfonyl substituted with NO<sub>2</sub>; and

R<sup>3</sup> is H, an acyl group having 1 to 8 carbon atoms, alkylsulfonyl having 1 to 6 carbon atoms, benzoyl, benzoyl substituted with NH<sub>2</sub>, NO<sub>2</sub>, CN, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, C<sub>2</sub>-C<sub>15</sub> acylamino, CF<sub>3</sub>, C<sub>1</sub>-C<sub>6</sub> alkanesulfonylamino, acetyl(methanesulfonyl)amino, halo, or OH, phenylsulfonyl, or phenylsulfonyl substituted with C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, C<sub>2</sub>-C<sub>15</sub> acylamino, NO<sub>2</sub>, CN, CF<sub>3</sub>, C<sub>1</sub>-C<sub>6</sub> alkanesulfonylamino, acetyl(methanesulfonyl)amino, OH, or halo;

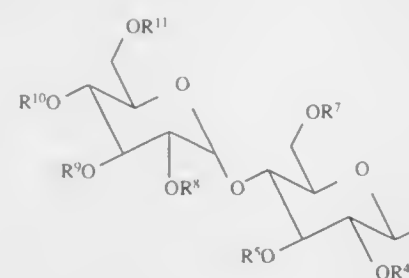
R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, and R<sup>9</sup> are each, independently, an acyl group having 1 to 6 carbon atoms; and

R<sup>10</sup> and R<sup>11</sup> are each, independently, an acyl group having 1 to 6 carbon atoms, or the R<sup>10</sup> and R<sup>11</sup> groups on the 4' and 6' positions of the maltose or the 4 and 6 positions of the glucose form an isopropylidene group; or a pharmaceutically acceptable salt thereof.

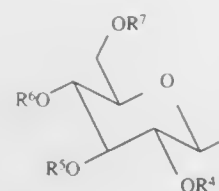
36. A method of treating a human suffering from a condition which is characterized by excessive smooth muscle proliferation, the method comprising administering to the human an effective amount of a compound of formula I



where X is



or



R<sup>1</sup> is H, alkyl having 1 to 6 carbon atoms, halo, CF<sub>3</sub>, CN, NO<sub>2</sub>, or alkoxy having 1 to 6 carbon atoms;

R<sup>2</sup> is H, an acyl group having 1 to 6 carbon atoms, phenylsulfonyl, or phenylsulfonyl substituted with NO<sub>2</sub>; and

R<sup>3</sup> is H, an acyl group having 1 to 8 carbon atoms, alkylsulfonyl having 1 to 6 carbon atoms, benzoyl, benzoyl substituted with NH<sub>2</sub>, NO<sub>2</sub>, CN, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, C<sub>2</sub>-C<sub>15</sub> acylamino, CF<sub>3</sub>, C<sub>1</sub>-C<sub>6</sub> alkanesulfonylamino, acetyl(methane-

5,773,423

**A3 ADENOSINE RECEPTOR AGONISTS**

Kenneth A. Jacobson, Silver Spring, Md.; Carola Gallo-Rodriguez, Buenos Aires, Argentina; Philip J. M. van Galen, Oss, Netherlands; Dag K. J. E. von Lubitz, Alexandria, Va., and Heaok Kim Jeong, Rockville, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 463,324, Dec. 6, 1993, abandoned, which is a continuation-in-part of Ser. No. 91,109, Jul. 13, 1993, abandoned. This application Jul. 13, 1994, Ser. No.

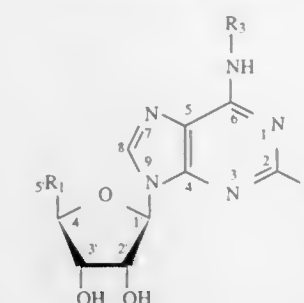
274,628

Int. Cl.<sup>6</sup> A61K 31/70

U.S. Cl. 514—45

50 Claims

I. A compound of the formula



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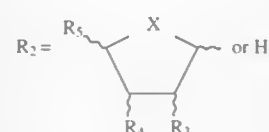
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X is CH<sub>2</sub>, O or S;  
R<sub>3</sub> is H, OH or a halogen;  
R<sub>4</sub> is H, OH or a halogen; and  
R<sub>5</sub> is CH<sub>3</sub>, CF<sub>3</sub>, CH<sub>2</sub>OH or CH<sub>2</sub>OY and Y is a carbon ester or phosphorus and a pharmaceutically acceptable carrier.

5,773,425

## ANTINEOPLASTIC USES OF ALOE PRODUCTS

Bill H. McAnally, Grand Prairie; Robert H. Carpenter, Bastrop, and Harley R. McDaniel, Dallas, all of Tex., assignors to Carrington Laboratories, Inc., Irving, Tex.  
Division of Ser. No. 159,830, Dec. 1, 1993, Pat. No. 5,441,943, which is a division of Ser. No. 864,583, Apr. 7, 1992, Pat. No. 5,308,838, which is a division of Ser. No. 558,905, Jul. 27, 1990, Pat. No. 5,118,673, which is a continuation-in-part of Ser. No. 229,164, Aug. 5, 1988, Pat. No. 5,106,616, which is a continuation-in-part of Ser. No. 144,872, Jan. 14, 1988, Pat. No. 4,851,224, which is a continuation-in-part of Ser. No. 869,261, Jun. 5, 1986, Pat. No. 4,735,935, which is a continuation-in-part of Ser. No. 810,025, Dec. 17, 1985, abandoned, which is a continuation-in-part of Ser. No. 754,859, Jul. 12, 1985, abandoned, which is a continuation-in-part of Ser. No. 750,321, Jun. 28, 1985, abandoned, which is a continuation-in-part of Ser. No. 649,967, Sep. 12, 1984, abandoned, which is a continuation of Ser. No. 375,720, May 7, 1982, abandoned. This application Jun. 5, 1995, Ser. No. 463,202

Int. Cl.<sup>6</sup> A61K 31/715

U.S. Cl. 514—54

6 Claims

1. A method for treating an animal having a tumor selected from the group consisting of sarcoma, carcinoma and lymphoma, said method comprising:

administering to said animal an amount of an acetylated mannan derivative sufficient to inhibit the growth of said tumor.

5,773,426

## PROTEOGLUCAN AND ANTIDIABETIC DRUG THEREOF

Hiroaki Nanba, Amagasaki, Japan, assignor to Masaki Shirota, Paramus, N.J.

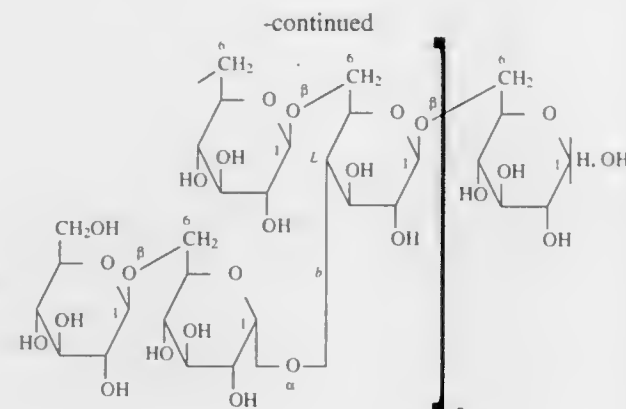
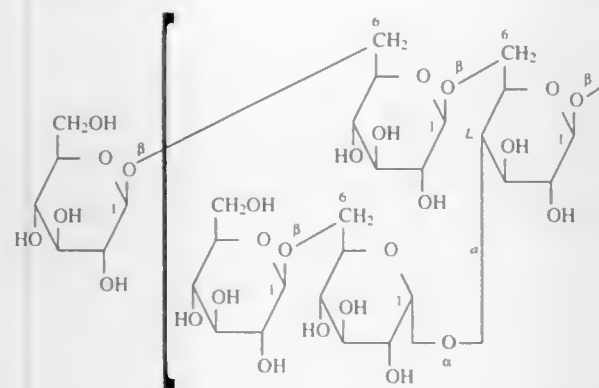
Filed Jun. 7, 1996, Ser. No. 660,405

Int. Cl.<sup>6</sup> A61K 31/715;35/78; C07K 4/10

U.S. Cl. 514—54

4 Claims

1. A Proteoglucon wherein the formula of the glucan part of said proteoglucon is:



wherein n is an integral number ranging from 100 to 200 and wherein said proteoglucon has an average molecular weight of 2x10<sup>5</sup> and gives positive results in anthrone sulfuric acid method and Lowry's method.

5,773,427

## PREVENTION OF FIBER-INDUCED INTESTINAL GAS PRODUCTION BY CHITOSAN

Charles E. Day, 1224 Bear Creek Rd., Leitchfield, Ky. 42754  
Filed May 31, 1996, Ser. No. 656,577

Int. Cl.<sup>6</sup> A61K 31/73;31/715

U.S. Cl. 514—55

18 Claims

1. A method of reducing flatulence which results upon oral ingestion by a human being of an orally-ingestible dietary fiber other than chitosan, comprising the step of (a) admixing a flatulence-reducing amount of chitosan with the dietary fiber other than chitosan before oral ingestion thereof and (b) orally ingesting the admixture of step (a).

5,773,428

## MATRIX METALLOPROTEINASE INHIBITORS

Arlindo Lucas Castelhana, New York, N.Y.; Teng Jiam Liak, Mississauga; Stephen Horne, Burlington, both of Canada; Alexander Krantz, Menlo Park; Zhengyu Yuan, Fremont, both of Calif.; Jian Jeffrey Chen, Santa Clara; Paul David Cannon, San Carlos, both of Calif., and Hal Van Wart, Los Altos, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

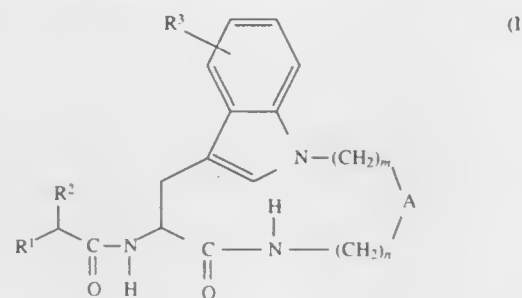
Continuation-in-part of Ser. No. 382,818, Feb. 3, 1995, which is a continuation-in-part of Ser. No. 102,655, Aug. 5, 1993, abandoned. This application Feb. 5, 1996, Ser. No. 597,062

Int. Cl.<sup>6</sup> A61K 31/395; C07D 487/04

U.S. Cl. 514—80

35 Claims

1. A compound of formula (I) as a single stereoisomer or as a mixture of stereoisomers:



wherein:  
m is 2, 3, 4, 5, or 6; and  
n is 0, 1, 2, 3, or 4; such that:  
when m is 2, 3 or 4; n is 1, 2, 3, or 4; and

5,773,430

## SERINE PROTEINASE INHIBITORY ACTIVITY BY HYDROPHOBIC TETRACYCLINE

Sanford R. Simon, Stony Brook; Elizabeth J. Roemer, Port Jefferson; Lorne M. Golub, and Nungavaram S. Ramamurthy, both of Smithtown, all of N.Y., assignors to Research Foundation of State University of New York, Albany, N.Y.

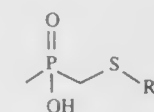
Filed Mar. 13, 1997, Ser. No. 816,551

Int. Cl.<sup>6</sup> A61K 31/65

U.S. Cl. 514—152

18 Claims

1. A method of inhibiting excess leukocyte elastase activity in a biological system comprises administering, to a biological system subject to excess leukocyte elastase activity, a leukocyte elastase activity inhibitory amount of hydrophobic tetracycline.



A is —CH<sub>2</sub>—, —O—, or —N(R<sup>11</sup>)—, where R<sup>11</sup> is hydrogen or alkyl;

R<sup>1</sup> is

a) —CH<sub>2</sub>—R<sup>4</sup> where R<sup>4</sup> is mercapto, acetylthio, carboxy, aminocarbonyl, N-hydroxyformylamino, alkoxy-carbonyl, aryloxy-carbonyl, aralkoxy-carbonyl, benzyloxyaminocarbonyl, or

in which R<sup>5</sup> is optionally substituted aryl, wherein the aryl group is quinol-2-yl, naphth-1-yl, naphth-2-yl, pyridyl or phenyl;

b) —CH(R<sup>7</sup>)—R<sup>8</sup> where R<sup>7</sup> is alkyl, hydroxy, amino, alkylamino, arylamino, alkylsulphonylamino, aralkylsulphonylamino, alkoxy-carbonyl, aminocarbonyl, aralkyl or carboxy; or R<sup>7</sup> is —CH<sub>2</sub>NHR, where R is hydrogen, alkyl, aryl, 2-benzoxazole, —SO<sub>2</sub>R<sup>9</sup>, —SO<sub>2</sub>NHR<sup>9</sup>, —SO<sub>2</sub>OR<sup>9</sup>, —C(O)R<sup>9</sup>—C(O)NHR<sup>9</sup>, —C(O)OR<sup>9</sup>, where R<sup>9</sup> is alkyl, trifluoromethyl, aryl, aralkyl, aralkenyl or arylcarbonylaminoalkyl; and R<sup>8</sup> is carboxy, hydroxyaminocarbonyl, alkoxy-carbonyl or aralkoxy-carbonyl; or

c) —NH—CH(R<sup>9</sup>)—R<sup>10</sup> where R<sup>9</sup> is hydrogen, alkyl or aralkyl, and R<sup>10</sup> is carboxy, alkoxy-carbonyl or aralkoxy-carbonyl, phosphonyl, dialkylphosphonyl, or methoxy-phosphonyl;

R<sup>2</sup> is alkyl, alkenyl, trifluoromethylalkyl, cycloalkyl, cycloalkylalkyl, hydroxyalkyl, alkoxyalkyl, aralkoxyalkyl, aryl, aryloxyalkyl or aralkyl; and

R<sup>3</sup> is hydrogen, hydroxy, halo, alkyl, alkoxy or aralkoxy; when n is 0; m is 4, 5 or 6; and

A is —CH(R<sup>12</sup>)— where R<sup>12</sup> is carboxy, alkoxy-carbonyl or optionally substituted carbamoyl; and

R<sup>1</sup>, R<sup>2</sup> and R<sup>3</sup> are as defined above;

or a pharmaceutically acceptable salt thereof;

and wherein alkyl is a moiety having from 1 to 6 carbon atoms;

alkoxy is a moiety of the formula —OR<sub>a</sub>, wherein R<sub>a</sub> is alkyl;

aryl is a monovalent unsaturated aromatic carbocyclic radical having one or two rings or a monovalent unsaturated aromatic heterocyclic radical optionally substituted with aryl;

optionally substituted aryl is a mono-, di-, or tri-substituted aryl with halo, hydroxy, lower alkyl alkoxy, trifluoromethyl, aryloxy, amino, aryl, acetamido, or cyano;

aralkyl is a moiety of the formula —R<sub>a</sub>R<sub>b</sub>, wherein R<sub>a</sub> is alkylene containing 1 to 6 carbon atoms and R<sub>b</sub> is aryl; and cycloalkyl is a moiety having from 3 to 6 carbon atoms.

31. A pharmaceutical composition comprising a compound or salt of claim 1 and a pharmaceutically acceptable excipient.

5,773,429

## DRUG COMBINATION FOR TREATING CALCIUM LOSS

Richard C. Fuisz, McLean, Va., assignor to Fuisz Technologies Ltd., Chantilly, Va.

Filed Dec. 11, 1996, Ser. No. 762,672

Int. Cl.<sup>6</sup> A61K 31/66;31/445

U.S. Cl. 514—102

6 Claims

1. A pharmaceutical composition comprising an effective amount of alendronate salt for reducing calcium loss and an effective amount of gastric propulsive agent to prevent gastric reflux caused by alendronate salt.

5,773,432

## METHOD FOR LOWERING PLASMA LEVELS OF LIPOPROTEIN(A)

Katalin Kauser, El Sobrante, and Gabor M. Rubanyi, Alamo, both of Calif., assignors to Schering Aktiengesellschaft, Berlin, Germany

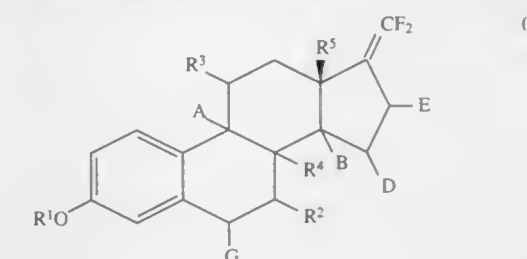
Filed Oct. 30, 1996, Ser. No. 739,840

Int. Cl.<sup>6</sup> A61K 31/56

U.S. Cl. 514—182

22 Claims

1. A method of lowering plasma levels of Lp(a) in a human, which method comprises administering to the human in need thereof an effective amount of a compound of formula (I):



wherein:

R<sup>1</sup> is hydrogen or alkyl;

A, B, D, E, G, R<sup>2</sup> and R<sup>3</sup> each are hydrogen, and R<sup>4</sup> is hydrogen in the β-position; or

R<sup>2</sup> with R<sup>4</sup>, R<sup>4</sup> with A, A with R<sup>3</sup>, B with D, D with E, or G with R<sup>2</sup> is a bond, and the other substituents are each hydrogen; or

R<sup>2</sup> is alkyl in the β-position and A, B, D, E, G, R<sup>3</sup> and R<sup>4</sup> are each hydrogen; or

R<sup>3</sup> is alkoxy in the β-position and A, B, D, E, G, R<sup>2</sup> and R<sup>4</sup> are each hydrogen; or

R<sup>4</sup> is hydrogen in the α-position and A, B, D, E, G, R<sup>2</sup> and R<sup>3</sup> are each hydrogen; and

R<sup>5</sup> is methyl or ethyl.



5,773,433

SUBSTITUTED TETRACYCLIC OXAZEPINE AND  
THIAZEPINE DERIVATIVES

Francisco Javier Fernández-Gadea, Toledo, Spain; Victor Karel Sipido, Merksem, Belgium; José Ignacio Andrés-Gil, Madrid, Spain, and Theo Frans Meert, Rumst, Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium  
PCT No. PCT/EP95/04197, § 371 Date Apr. 25, 1997, § 102(e)  
Date Apr. 25, 1997, PCT Pub. No. WO96/14321, PCT Pub. Date May 17, 1996

PCT Filed Oct. 25, 1995, Ser. No. 817,989

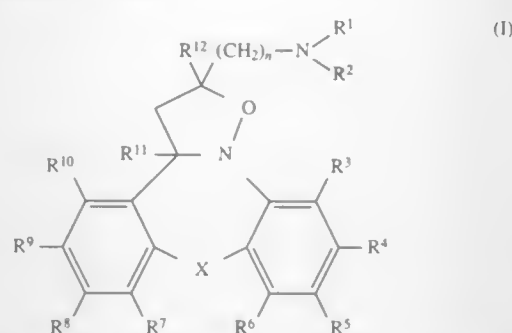
Claims priority, application European Pat. Off., Nov. 2, 1994, 94203177

Int. Cl.<sup>6</sup> C07D 498/04; 513/04; A61K 31/55

U.S. Cl. 514—211

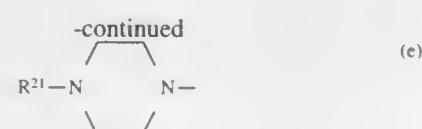
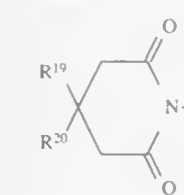
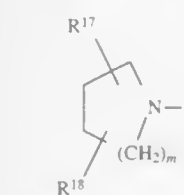
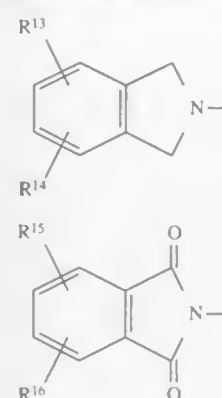
21 Claims

1. A compound of formula



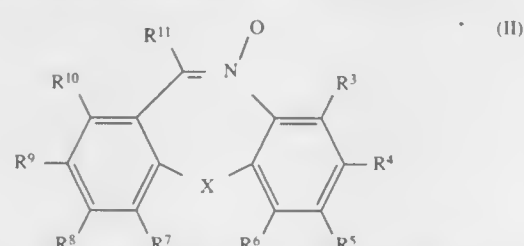
the pharmaceutically acceptable acid or base addition salts and the stereochemically isomeric forms thereof, and also the N-oxide forms thereof, wherein:

R<sup>1</sup> and R<sup>2</sup> each independently are hydrogen; C<sub>1-6</sub>alkyl; C<sub>1-6</sub>alkylcarbonyl; trihalomethylcarbonyl; C<sub>1-6</sub>alkyl substituted with hydroxy, C<sub>1-6</sub>alkoxy, carboxyl, C<sub>1-6</sub>alkylcarbonyloxy, C<sub>1-6</sub>alkyloxycarbonyl or aryl; or R<sup>1</sup> and R<sup>2</sup> taken together with the nitrogen atom to which they are attached may form a morpholinyl ring or a radical of formula:



wherein:

R<sup>13</sup>, R<sup>14</sup>, R<sup>15</sup> and R<sup>16</sup> each independently are hydrogen, halo, trifluoromethyl, or C<sub>1-6</sub>alkyl;  
m is 1, 2, or 3;  
R<sup>17</sup>, R<sup>18</sup>, R<sup>19</sup> and R<sup>20</sup> each independently are hydrogen or C<sub>1-6</sub>alkyl; or  
R<sup>19</sup> and R<sup>20</sup> taken together may form a bivalent radical C<sub>4-6</sub>alkanediyl;  
R<sup>21</sup> is hydrogen; C<sub>1-6</sub>alkyl; C<sub>1-6</sub>alkylcarbonyl; trihalomethylcarbonyl;  
C<sub>1-6</sub>alkyloxycarbonyl; aryl; di(aryl)methyl; C<sub>1-6</sub>alkyl substituted with hydroxy, C<sub>1-6</sub>alkoxy, carboxyl, C<sub>1-6</sub>alkylcarbonyloxy, C<sub>1-6</sub>alkyloxycarbonyl or aryl;  
R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, R<sup>9</sup> and R<sup>10</sup> each independently are hydrogen, halo, cyano, hydroxy, trifluoromethyl, trifluoromethoxy, carboxyl, nitro, amino, mono- or di(C<sub>1-6</sub>alkyl)amino, C<sub>1-6</sub>alkylcarbonylamino, aminosulfonyl, mono- or di(C<sub>1-6</sub>alkyl)-aminosulfonyl, C<sub>1-6</sub>alkyl, C<sub>1-6</sub>alkoxy, C<sub>1-6</sub>alkylcarbonyl, C<sub>1-6</sub>alkyloxycarbonyl;  
R<sup>11</sup> is hydrogen, C<sub>1-6</sub>alkyl or trifluoromethyl;  
R<sup>12</sup> is hydrogen, C<sub>1-6</sub>alkyl, cyano or trifluoromethyl;  
n is zero, 1, 2, 3, 4, 5, or 6;  
X is O, S, S(=O) or S(=O)<sub>2</sub>;  
aryl is phenyl; or phenyl substituted with 1, 2 or 3 substituents selected from halo, hydroxy, C<sub>1-6</sub>alkyl and trifluoromethyl.  
6. An intermediate of formula



wherein R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup>, R<sup>7</sup>, R<sup>8</sup>, R<sup>9</sup> and R<sup>10</sup> each independently are hydrogen, halo, cyano, hydroxy, trifluoromethyl, trifluoromethoxy, carboxyl, nitro, amino, mono- or di(C<sub>1-6</sub>alkyl)amino, C<sub>1-6</sub>alkylcarbonylamino, aminosulfonyl, mono- or di(C<sub>1-6</sub>alkyl)-aminosulfonyl, C<sub>1-6</sub>alkyl, C<sub>1-6</sub>alkoxy, C<sub>1-6</sub>alkylcarbonyl, C<sub>1-6</sub>alkyloxycarbonyl;

R<sup>11</sup> is hydrogen, C<sub>1-6</sub>alkyl or trifluoromethyl;  
X is O, S, S(=O) or S(=O)<sub>2</sub>;  
an acid or base addition salt thereof or a stereoisomeric form thereof.

5,773,434

FACILITATION OF AMPA RECEPTOR-MEDIATED  
SYNAPTIC TRANSMISSION IN BRAIN AS A  
TREATMENT FOR SCHIZOPHRENIA

John Larson, Costa Mesa; Gary Lynch, Irvine, both of Calif., and Gary A. Rogers, 3056 Foothill Rd., Santa Barbara, Calif. 93105, assignors to Gary A. Rogers, Santa Barbara, and The Regents of the University of California, Oakland, both of Calif.

Filed Aug. 30, 1995, Ser. No. 521,022

Int. Cl.<sup>6</sup> A61K 31/55; 31/54

U.S. Cl. 514—212

22 Claims

1. A method for treating schizophrenia in a subject, said method comprising pharmacologically amplifying natural stimulators of AMPA receptors in said subject to enhance the mediation by said receptors of excitatory synaptic response, said amplification being sufficient to reduce the symptoms of schizophrenia.

5,773,435

## PRODRUGS FOR β-LACTAMASE AND USES THEREOF

John Kadow, Wallingford; Takushi Kaneko, Guilford, both of Conn.; Peter D. Senter, Seattle, and Vivekanada M. Vrudhula, Edmonds, both of Wash., assignors to Bristol-Myers Squibb Company, Princeton, N.J.

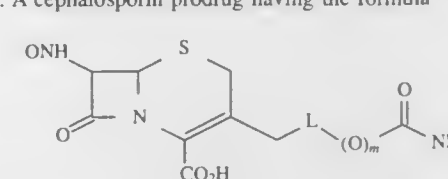
Continuation of Ser. No. 770,371, Oct. 8, 1991, abandoned, which is a continuation-in-part of Ser. No. 609,663, Nov. 6, 1990, abandoned, which is a continuation-in-part of Ser. No. 211,301, Jun. 29, 1988, Pat. No. 4,975,278, which is a continuation-in-part of Ser. No. 161,068, Feb. 26, 1988, abandoned, which is a continuation-in-part of Ser. No. 81,382, Aug. 4, 1987, abandoned. This application Feb. 9, 1993, Ser. No. 16,208

Int. Cl.<sup>6</sup> A61K 47/48; C07D 501/54

U.S. Cl. 514—214

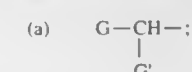
35 Claims

1. A cephalosporin prodrug having the formula

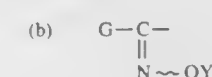


wherein

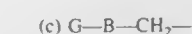
Q is hydrogen, an amine protecting group selected from the group consisting of a lower alkonyl, substituted lower alkonyl; aroyl, substituted aroyl; aralkyl, substituted aralkyl, aralkylidene, substituted aralkylidene; halogenated alkyl; alkoxy carbonyl substituted alkoxy carbonyl; aralkoxy carbonyl substituted aralkoxy carbonyl; an unsubstituted substituted trialkylsilyloxycarbonyl trialkylsilyloxycarbonyl; trialkylsilyl and trialkylsilyl groups, or R—C(O)—, wherein R is



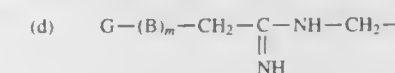
wherein G is a substituted or unsubstituted aryl, heterocyclic, cyclohexadienyl group; the substituents for the groups are 1 to 3 of the same or different groups selected from halogen, hydroxy, amino, alkoxy, alkylamino, dialkylamino, alkanoyloxy, carboxy, nitro, cyano, and alkoxy carbonyl; G' is hydrogen, hydroxy, amino, monoalkylamino, dialkylamino, alkanoylamino, alkanoyloxy, carboxy, or sulfo;



wherein G is as defined above, and Y is hydrogen, C<sub>1-6</sub> alkyl, or C<sub>1-6</sub>alkanoyl;



wherein G is as defined above, B is oxygen or sulfur; and



where G, and B are as defined above, and m is 0 or 1;

L is a direct bond or —S—(CH<sub>2</sub>)<sub>n</sub>—;

R is a compound having one functional group selected from amino, carboxyl, and hydroxyl groups, that is cytotoxic when released from said cephalosporin-prodrug;

n is 2, 3, or 4; and

m is 0 or 1 with the proviso that, when L is a direct bond, m is 1; or

a pharmaceutically acceptable salt thereof.

5,773,436

USE OF SEROTONIN ANTAGONISTS FOR TREATING  
FIBROMYALGIA

Wolfgang Müller, Binningen, Switzerland, and Thomas Stratz, Bad Säckingen, Germany, assignors to Novartis AG, Basle, Switzerland

PCT No. PCT/EP95/01264, § 371 Date Dec. 9, 1996, § 102(e)  
Date Dec. 9, 1996, PCT Pub. No. WO95/27490, PCT Pub. Date Oct. 19, 1995

PCT Filed Apr. 6, 1995, Ser. No. 721,988

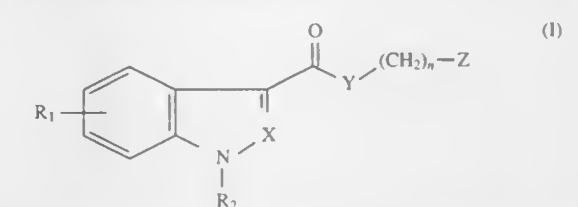
Claims priority, application United Kingdom, Apr. 7, 1994, 9406857

Int. Cl.<sup>6</sup> A61K 31/55; 31/415

U.S. Cl. 514—214

3 Claims

1. A method for treating fibromyalgia comprising administering to a subject in need of such treatment a therapeutically effective amount of a compound of formula 1:



wherein

R<sub>1</sub> is hydrogen, halogen, hydroxy, alkoxy(1-4C), amino, alkyl(1-4C)amino or dialkyl(1-4C)amino.

R<sub>2</sub> is hydrogen, alkyl(1-7C), alkenyl(3-6C), alkynyl(3-10C), cycloalkyl(3-7C), cycloalkyl(3-7C)alkyl(1-4C), phenyl, phenylalkyl(1-3C), alkyl(1-6C)carbonyl, alkyl(1-6C)oxy carbonyl, carbamoyl, sulfamoyl or mono- or dialkyl(1-6C)carbamoyl or -sulfamoyl.

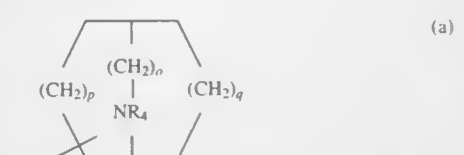
X is CH or N and

Y is NR<sub>3</sub> or O, R<sub>3</sub> being hydrogen or alkyl(1-6C), or

X+Y together are C-A-N or C-A-CH, wherein A is CH=CH or (CH<sub>2</sub>)<sub>m</sub>, m being 2 or 3.

n is 0, 1 or 2 and

Z is a radical of formula (a)

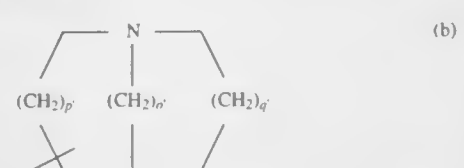


wherein o is 0, p is 0, 1 or 2 and q is 0, 1 or 2, or

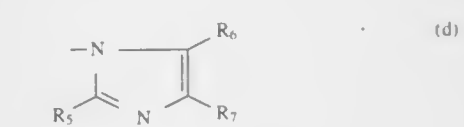
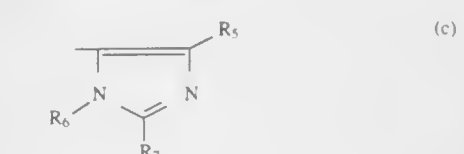
o is 1, p is 0 and q is 0 or 1, and

R<sub>4</sub> is hydrogen, alkyl(1-7C), cycloalkyl(3-6C), phenylalkyl(1-4C) optionally mono- or di- substituted by halogen, alkyl(1-4C) or alkoxy(1-4C).

or a radical of formula (b)



wherein o' is 1, 2 or 3, p' is 0 or 1 and q' is 0 or 1, or a radical of formula (c) or (d)



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wherein one of  $R_5$ ,  $R_6$  and  $R_7$  is hydrogen, alkyl(1-6C), cycloalkyl(3-7C), alkenyl(2-6C), phenyl or phenylalkyl(1-3C) and the 2 others independently are hydrogen or alkyl(1-6C), provided that Z is not (d) when n is 0 and Y is  $NR_3$  or (with X) N-A-C, in free form or in pharmaceutically acceptable salt or complex form.

5,773,437

## ALKYLENEDIAMINE DERIVATIVES

Mitsuo Masaki, Chiba; Norihisa Miyake, Saitama; Atsushi Tendo, Saitama; Michiko Ishida, Saitama; Haruhiko Shinozaki, Saitama; Yutaka Nomura, Chiba, and Yasunori Goto, Tokyo, all of Japan, assignors to Nippon Chemiphar Co., Ltd., Tokyo, Japan

PCT No. PCT/JP95/00632, § 371 Date Sep. 30, 1996, § 102(e) Date Sep. 30, 1996, PCT Pub. No. WO95/26959, PCT Pub. Date Oct. 12, 1995

PCT Filed Mar. 31, 1995, Ser. No. 722.112

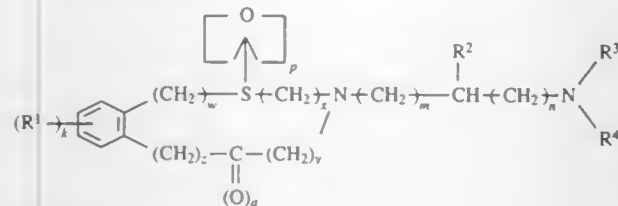
Claims priority, application Japan, Mar. 31, 1994, 6-085831; Apr. 18, 1994, 6-103345

Int. Cl.<sup>6</sup> A61K 31/54; C07D 279/02

U.S. Cl. 514—224.2

4 Claims

1. An alkylenediamine derivative having the formula



in which

$R^1$  represents an atom or a group selected from the group consisting of hydrogen, alkyl having 1-8 carbon atoms, halogen, haloalkyl having 1-4 carbon atoms, hydroxyl, alkoxy having 1-8 carbon atoms, aryloxy having 4-10 carbon atoms, aralkyloxy having 5-14 carbon atoms, its alkyl portion having 1-4 carbon atoms, nitro, amino, cyano, alkylamino having 1-8 carbon atoms, aralkylamino having 5-14 carbon atoms, its alkyl portion having 1-4 carbon atoms, arylamino having 4-10 carbon atoms, aliphatic acylamino having 1-8 carbon atoms, carboxyl, alkoxy carbonyl having 2-9 carbon atoms, aralkyloxy carbonyl having 6-15 carbon atoms, its alkyl portion having 1-4 carbon atoms, aryloxy carbonyl having 5-11 carbon atoms, carbamoyl, sulfo, alkoxy sulfonyl having 1-8 carbon atoms, aralkyloxy sulfonyl having 5-14 carbon atoms, its alkyl portion having 1-4 carbon atoms, aryloxy sulfonyl having 4-10 carbon atoms, sulfonamide, and 1H-tetrazol-5-yl;

$R^2$  represents an aryl group having 4-10 carbon atoms, aralkyl group having 5-14 carbon atoms, its alkyl portion having 1-4 carbon atoms, or an aromatic heterocyclic group each of which may have one to five same or different substituents selected from the group consisting of alkyl having 1-8 carbon atoms, halogen, haloalkyl having 1-4 carbon atoms, hydroxyl, alkoxy having 1-8 carbon atoms, aryloxy having 4-10 carbon atoms, aralkyloxy having 5-14 carbon atoms, its alkyl portion having 1-4 carbon atoms, nitro, amino, cyano, alkylamino having 1-8 carbon atoms, aralkylamino having 5-14 carbon atoms, its alkyl portion having 1-4 carbon atoms, arylamino having 4-10 carbon atoms, aliphatic acylamino having 1-8 carbon atoms, carboxyl, alkoxy carbonyl having 2-9 carbon atoms, aralkyloxy carbonyl having 6-15 carbon atoms, its alkyl portion having 1-4 carbon atoms, aryloxy carbonyl having 5-11 carbon atoms, carbamoyl, sulfo, alkoxy sulfonyl having 1-8 carbon atoms, aralkyloxy sulfonyl having 5-14 carbon atoms, its alkyl portion having 1-4 carbon atoms, aryloxy sulfonyl having 4-10 carbon atoms, sulfonamide and 1H-tetrazol-5-yl;

each of  $R^3$  and  $R^4$  independently represents hydrogen, alkyl having 1-8 carbon atoms, aralkyl having 5-14 carbon atoms, its alkyl portion having 1-4 carbon atoms, or aryl having 4-10 carbon atoms, or  $R^3$  and  $R^4$  form in combination with the nitrogen atom to which  $R^3$  and  $R^4$  are attached, a hetero ring which may contain another nitrogen, oxygen or sulfur as the ring-forming atom in addition to the former nitrogen atom and which may have a substituent selected from the group consisting of alkyl having 1-8 carbon atoms which may have one or two aryl having 4-10 carbon atoms as substituent, phenyl, hydroxyl, alkoxy having 1-8 carbon atoms, which may have one or two aryl having 4-10 carbon atoms as substituent, aryloxy having 4-10 carbon atoms, carboxyl and cyano,

provided that where  $R^2$  is phenyl,  $R^3$  and  $R^4$  cannot both be hydrogen;

k is an integer of 1 to 4;

each of m and n independently represents an integer of 0-4, under the condition that the total number of m and n is in the range of 0-4;

p is 0, 1 or 2;

q is 0 or 1; and

each of w, x, y and z independently is an integer of 0 to 1, under the condition that the total number of w, x, y and z is 1.

5,773,438

## SYNTHETIC MATRIX METALLOPROTEASE INHIBITORS AND USE THEREOF

Daniel E. Levy, Alameda, Calif.; Damian Grobelny, Watsonia North, Australia; Cho Tang, Moraga, Calif.; Kevin R. Holme, Alameda, Calif.; Richard E. Galaray, Guilford, Conn.; Gregory S. Schultz, Gainesville, Fla.; Asaad Nematalia, Alameda, Calif., and John H. Musser, San Carlos, Calif., assignors to Glycomed Incorporated, Alameda, Calif., and The University of Florida, Gainesville, Fla.

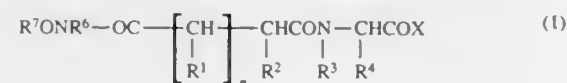
Division of Ser. No. 184,727, Jan. 21, 1994, which is a continuation-in-part of Ser. No. 44,324, Apr. 7, 1993, abandoned, which is a continuation-in-part of Ser. No. 817,039, Jan. 7, 1992, Pat. No. 5,268,384, which is a continuation-in-part of Ser. No. 477,751, Feb. 9, 1990, abandoned, which is a continuation-in-part of Ser. No. 747,752, Aug. 20, 1991, Pat. No. 5,189,178, which is a continuation-in-part of Ser. No. 615,798, Nov. 21, 1990, Pat. No. 5,183,900, which is a continuation-in-part of Ser. No. 881,630, May 12, 1992, Pat. No. 5,270,326, which is a continuation of Ser. No. 616,021, Nov. 21, 1990, Pat. No. 5,114,953. This application Jun. 5, 1994, Ser. No. 464,927

Int. Cl.<sup>6</sup> A61K 31/535; 31/40; C07D 265/28; 207/32

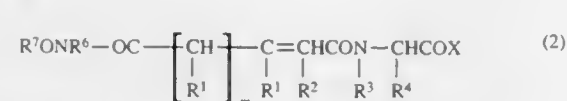
U.S. Cl. 514—237.8

23 Claims

1. A method to treat disease in an animal, wherein said disease is caused by unwanted mammalian matrix metalloprotease activity and is selected from the group consisting of skin disorders, keratoconus, restenosis, rheumatoid arthritis, wounds, cancer, angiogenesis and shock, said method comprising administering to an animal suffering from said disease an effective amount, and for an effective time a synthetic mammalian matrix metalloprotease inhibitor, wherein said inhibitor is of the formula:



or



wherein each  $R^1$  is independently H or alkyl (1-8C) and  $R^2$  is H or alkyl (1-8C) or

$-NHZ$  wherein Z is  $-R^{11}$ ,  $-COR^{11}$ , and  $-COOR^{11}$  where  $R^{11}$  is an alkyl group; or wherein the proximal  $R^1$  and  $R^2$  taken together are  $-(CH_2)_p-$  wherein p=3-5;

$R^3$  is H or alkyl (1-4C);

$R^4$  is fused or conjugated unsubstituted or substituted bicycloaryl methylene;

n is 0, 1 or 2; m is 0 or 1; and

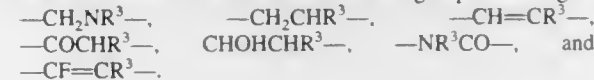
X is  $-OR^5$ ,  $-NHR^5$ ,  $-M$  or  $-NH(CH_2)_pM$ , wherein  $R^5$  is H or substituted or unsubstituted alkyl (1-12C), aryl (6-12C), aryl alkyl (6-16C);

M is selected from the group consisting of the following: an amino acid group, amide of an amino acid group, a cyclic amine having a nitrogen as part of the ring, and a heterocyclic amine having a nitrogen as part of the ring and the ring containing an additional heteroatom;

q is an integer of from 1-8; and

$R^6$  is H or lower alkyl (1-4C) and  $R^7$  is H, lower alkyl (1-4C), or an acyl group, and wherein

the  $-CONR^7-$  amide bond shown is optionally replaced by a modified isosteric bond selected from the group consisting of



Z is NH and  $R^{10}$  is hydrogen, straight-chain or branched  $C_1-C_4$ -alkyl, phenyl, benzyl, pyridyl or benzhydryl, r is 0, 1, 2, 3 or 4 and  $R^{11}$  is hydrogen, straight-chain or branched  $C_1-C_4$ -alkyl, phenyl, or



and the benzene rings present in  $R^8$ ,  $R^{10}$  and  $R^{11}$  can also be substituted by one or two of the following radicals:  $NH_2$ ,  $OCH_3$ ,  $OCH_2CH_3$ , Cl, Br,  $OCF_3$ , F,  $CH_3$ ,  $C_2H_5$ ,  $NO_2$ ,  $-COOR^1$  or  $-CONHR^1$  and

$R^4$  and  $R^5$  which can be identical or different, are hydrogen, trifluoromethyl, or a fused-on benzene ring and the tautomeric, isomeric and enantiomeric forms thereof and the physiologically tolerated salts thereof.

5,773,440

## METHODS FOR USING (2-IMIDAZOLIN-2-YLAMINO) QUINOXALINE DERIVATIVES

James A. Burke, Tustin; Michael E. Garst, Newport Beach, and Larry A. Wheeler, Irvine, all of Calif., assignors to Allergan, Waco, Tex.

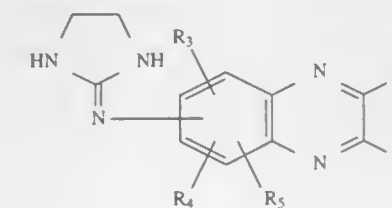
Division of Ser. No. 693,745, Aug. 7, 1996, Pat. No. 5,703,077, which is a division of Ser. No. 458,949, Jun. 2, 1995, Pat. No. 5,587,376, which is a division of Ser. No. 390,265, Feb. 15, 1995, Pat. No. 5,561,132, which is a continuation of Ser. No. 135,716, Oct. 13, 1993. This application Jun. 23, 1997, Ser. No. 880,473

Int. Cl.<sup>6</sup> A61K 31/495

U.S. Cl. 514—249

18 Claims

1. A method of treating a mammal comprising administering to a mammal an effective amount to provide a desired therapeutic effect in said mammal of a compound selected from the group consisting of those having the formula



, and pharmaceutically acceptable acid addition salts thereof and mixtures thereof, wherein  $R_1$  and  $R_2$  each is independently selected from the group consisting of H, alkyl radicals containing 1 to 4 carbon atoms and alkoxy radicals containing 1 to 4 carbon atoms, the 2-imidazolin-2-ylamino group may be in any of the 5-, 6-, 7- or 8-positions of the quinoxaline nucleus, and  $R_3$ ,  $R_4$  and  $R_5$  each is located in one of the remaining 5-, 6-, 7- and 8-positions of the quinoxaline nucleus and is independently selected from the group consisting of Cl, Br, H and alkyl radicals containing 1 to 3 carbon atoms, said desired therapeutic effect being a reduction in at least one effect of an inflammatory disorder.

5,773,441

## 2-ACYLAMINOPROPANAMIDES AS GROWTH HORMONE SECRETAGOGUES

Philip Arthur Hipskind, New Palestine, and Jeffrey Alan Dodge, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Aug. 20, 1996, Ser. No. 700,206

Int. Cl.<sup>6</sup> A61K 31/495; 31/50; 31/445

U.S. Cl. 514—253

9 Claims

1. A method for stimulating the secretion of growth hormone in a mammal, which method comprises administering to a mammal in

where

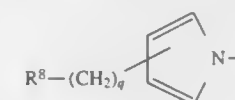
$R^1$  is hydrogen or  $C_1-C_4$ -alkyl,

n is 0 or 1,

m is 0, 1, 2, 3 or 4,

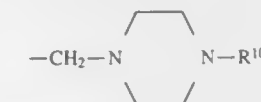
$R^2$  is methyl or phenyl, which can be substituted by one or two straight-chain  $C_1-C_4$ -alkyl radicals,

$R^3$  is



where

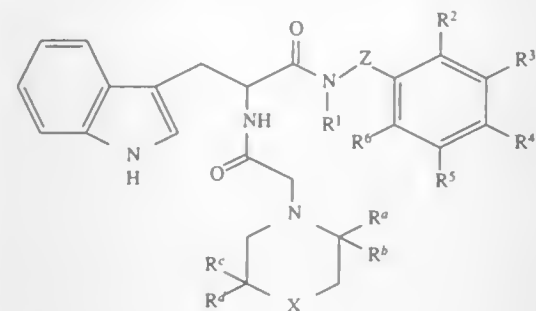
q is 0 and  $R^8$  is H,  $-COO(CH_2)_pR^{10}$ ,  $-CONH(CH_2)_pR^{10}$ ,  $-CH_2-NR^{10}R^{11}$ ,  $-CH_2NH-CY-(CH_2)_pR^{11}$ ,  $-CH=NOR^{10}$ ,  $-CH_2-NH-CY-Z-(CH_2)_pR^{11}$ ,  $-CH_2-NH-CO-CF_3$ , or



where Y is O

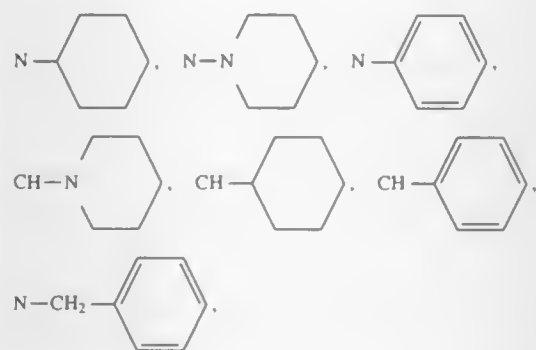


need of said treatment an effective amount of a compound of the formula



wherein:

R<sup>1</sup> is hydrogen, C<sub>1</sub>-C<sub>6</sub> alkyl, or C<sub>2</sub>-C<sub>6</sub> alkanoyl;  
R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, and R<sup>6</sup> are independently selected from the group consisting of hydrogen, halo, C<sub>1</sub>-C<sub>6</sub> alkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, C<sub>1</sub>-C<sub>6</sub> alkylamino, C<sub>1</sub>-C<sub>6</sub> alkylthio, amino, and trifluoromethyl;  
R<sup>7</sup> and R<sup>8</sup> are each hydrogen or together form an oxo group;  
R<sup>9</sup> and R<sup>10</sup> are each hydrogen or together form an oxo group;  
Z is a bond or C<sub>1</sub>-C<sub>6</sub> alkylidene;  
n is 0-6; and  
X is



N-R<sup>7</sup>, CH-NR<sup>8</sup>R<sup>9</sup>, or CH-R<sup>10</sup>

where R<sup>7</sup>, R<sup>8</sup>, R<sup>9</sup>, and R<sup>10</sup> are independently selected from the group consisting of hydrogen and C<sub>1</sub>-C<sub>6</sub> alkyl;  
or a pharmaceutically acceptable salt or solvate thereof.

5,773,442

#### BENZAMIDINE DERIVATIVES AND PHARMACEUTICAL COMPOSITION CONTAINING THEM

Seiji Akamatsu; Yuji Matsumoto; Masato Ichihara; Tomihisa Kawasaki; Seiji Kaku, all of Ibaraki, and Isao Yanagisawa, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

PCT No. PCT/JP96/00274, § 371 Date Aug. 4, 1997, § 102(e) Date Aug. 4, 1997, PCT Pub. No. WO96/24583, PCT Pub. Date Aug. 15, 1996

PCT Filed Feb. 8, 1996, Ser. No. 875,702

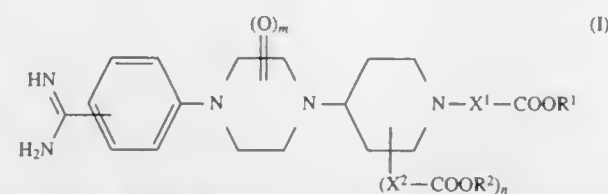
Claims priority, application Japan, Feb. 10, 1995, 7-022640; Apr. 6, 1995, 7-081426

Int. Cl.<sup>6</sup> C07D 211/58; 211/60; 401/04; A61K 31/495

U.S. Cl. 514-255

20 Claims

1. A benzamide derivative of the following general formula (I), salt thereof, hydrate thereof or solvate thereof:



wherein R<sup>1</sup> and R<sup>2</sup> are the same or different and each represents a hydrogen atom or an ester residue;

X<sup>1</sup> represents a lower alkylene group;

X<sup>2</sup> represents a single bond or a lower alkylene group;

m represents 0, 1 or 2;

n represents 0 or 1, provided that n=1 when m=0.

5,773,443

#### TRIAZOLE ANTIFUNGAL AGENTS

Stephen J. Ray, and Kenneth Richardson, both of Groton, Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 432,414, May 1, 1995, Pat. No. 5,567,817, which is a continuation of Ser. No. 139,972, Oct. 20, 1993, abandoned, which is a division of Ser. No. 956,569, Oct. 5, 1992, Pat. No. 5,278,175, which is a continuation of Ser. No. 646,564, Jan. 25, 1991, abandoned. This application

Jul. 18, 1996, Ser. No. 683,694

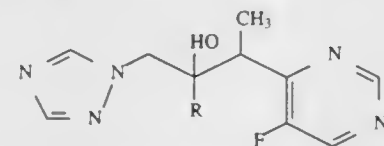
Claims priority, application United Kingdom, Feb. 2, 1990, 9002375

Int. Cl.<sup>6</sup> A61K 31/505; C07D 403/10

U.S. Cl. 514-256

4 Claims

1. A compound of the formula



or a pharmaceutically acceptable salt thereof, wherein:  
R is phenyl substituted by two fluoro substituents.

5,773,444

#### QUINAZOLINES AS INHIBITORS OF ENDOTHELIN CONVERTING ENZYME

Kyunghye Ahn; Xue-Min Cheng; Annette Marian Doherty; Edward Faith Elslager; Brian Kornberg; Chitase Lee; Daniele Leonard; Sham Nikam, and Leslie Morton Werbel, all of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

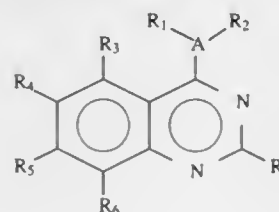
Division of Ser. No. 363,104, Dec. 22, 1994, Pat. No. 5,658,902. This application Apr. 14, 1997, Ser. No. 837,176

Int. Cl.<sup>6</sup> A61K 31/505; 31/535; 31/495

U.S. Cl. 514-260

5 Claims

1. A method of treating diseases associated with elevated levels of endothelin comprising administering to a host suffering therefrom a therapeutically effective amount of an inhibitor of endothelin converting enzyme of the formula



wherein:  
A is N;

R is lower alkyl, halo-lower alkyl, aryl, wherein aryl is unsubstituted or substituted, aryl-lower alkyl, wherein aryl is unsubstituted or substituted, heteroaryl, wherein heteroaryl is 2- or 3-thienyl, 2- or 3-furanyl, 2- or 3-pyrrolyl, 2-, 4-, or 5-imidazolyl, 3-, 4-, or 5-pyrazolyl, 2-, 4-, or 5-thiazolyl, 3-, 4-, or 5-isothiazolyl, 2-, 4-, or 5-oxazolyl, 3-, 4-, or 5-isoxazolyl, 3- or 5-1,2,4-triazolyl, 4- or 5-1,2,3-triazolyl, tetrazolyl, 2-, 3-, or 4-pyridinyl, 3-, 4-, or 5-pyridazinyl, 2-pyrazinyl, 2-, 4-, or 5-pyrimidinyl, 2-, 3-, 4-, 5-, 6-, 7-, or 8-quinolinyl, 1-, 3-, 4-, 5-, 6-, 7-, or 8-isquinolinyl, 2-, 3-, 4-, 5-, 6-, or 7-indolyl, N-formyl-2-, 3-, 4-, 5-, 6-, or 7-indolyl, 2-, 3-, 4-, 5-, 6-, or 7-benzothienyl, 2-, 4-, 5-, 6-, or 7-benzoxazolyl, 2-, 4-, 5-, 6-, or 7-benzimidazolyl, or 2-, 4-, 5-, 6-, or 7-benzothiazolyl, unsubstituted or substituted by 1 to 2 substituents selected from the group consisting of lower alkyl, lower alkoxy, trifluoromethyl, nitro, halogen, CN, SO<sub>2</sub>H, SO<sub>2</sub>NH<sub>2</sub>, SO<sub>2</sub>CH<sub>3</sub>, COOH, COO-lower alkyl, CONH<sub>2</sub>, CO-lower alkyl, NH<sub>2</sub>, NH-lower alkyl, N,N-di-lower alkyl, NH-aralkyl, N-di-aralkyl, and N,N-lower alkyl-aralkyl, or heteroaryl-lower alkyl wherein heteroaryl is as defined above;

R<sup>1</sup> is a 5-7 membered saturated heterocyclic ring fused to a benzene ring, wherein the fused 5-7 membered saturated heterocyclic ring is selected from the group consisting of: dihydrobenzofuran, dihydroisobenzofuran, dihydrobenzothiophene, dihydroisobenzothiophene, indoline, isoindoline, chroman, isochroman, thiochroman, isothiochroman, tetrahydroquinoline, and tetrahydroisquinoline, wherein said heterocyclic ring is attached directly to A or through an alkyl group linking A with the ring at a carbon atom, a 5-7 membered saturated heterocyclic ring optionally interrupted by a second heteroatom selected from nitrogen, oxygen and sulfur wherein the 5-7 membered heterocyclic ring is selected from the group consisting of: pyrrolidine, pyrrolizidine, imidazolidine, oxazolidine, thiazolidine, piperidine, piperazine, morpholine, thiomorpholine, and homopiperidine, and wherein the second heteroatom atom is nitrogen, said second nitrogen atom may be substituted by alkyl, carboxyalkyl or lower alkyl-carboxyalkyl and wherein the carbon atoms of the above 5-7 membered heterocyclic ring may be substituted independently by alkyl, amino, aminoalkyl, monoalkylaminoalkyl, dialkylaminoalkyl, carboxy, carboxyalkyl, alkylcarboxyalkyl, thio, thioalkyl, alkylthioalkyl, hydroxy, hydroxyalkyl, alkoxy or alkoxyalkyl wherein said heterocyclic ring is attached directly to A or through an alkyl group linking A with the ring at a carbon atom or 5,6 or 6,6-membered heterocyclic bicyclic rings, having at least 1 heteroatom, selected from the group consisting of 1-aza-bicyclo[3.2.1]octane and 1-aza-bicyclo[2.2.2]octane said heterocyclic bicyclic rings being optionally substituted by alkyl, amino, aminoalkyl, monoalkylaminoalkyl, dialkylaminoalkyl, carboxy, carboxyalkyl, alkylcarboxyalkyl, thio, thioalkyl, alkylthioalkyl, hydroxy, hydroxyalkyl, alkoxy, or alkoxyalkyl, wherein said rings are attached directly to A or through an alkyl group linking A and the ring at a carbon atom;

R<sub>2</sub> is a hydrogen atom or lower alkyl;

R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub> and R<sub>6</sub> are each independently hydrogen, halo, lower alkyl, cycloalkyl, halo-lower alkyl, lower alkoxy, hydroxyalkyl, aminoalkyl, lower alkyl aminoalkyl, di-lower alkyl aminoalkyl, nitro, cyano, SO<sub>2</sub>NR<sub>11</sub>R<sub>12</sub>, SO<sub>2</sub>R<sub>9</sub>, CO<sub>2</sub>R<sub>9</sub>, CONR<sub>11</sub>R<sub>12</sub>, or NR<sub>11</sub>R<sub>12</sub> in which R<sub>11</sub> and R<sub>12</sub> are each independently hydrogen, lower alkyl, aryl as defined above, heteroaryl as defined above or aralkyl, or a pharmaceutically acceptable acid addition or base salt thereof; with the following provisos:

(a) when R<sub>1</sub> is morpholine or piperazine R is not 5-nitro-2-pyrrolyl, 5-nitro-2-imidazolyl, 5-nitro-2-thiazolyl or 5-nitro-2-oxazolyl;

(b) when R<sub>1</sub> is a pyrrolidine optionally substituted by alkyl or carboxy-lower alkyl and R<sub>3</sub> and R<sub>6</sub> are as defined above, then R is halo-lower alkyl, aryl as defined above, aryl-lower alkyl, heteroaryl as defined above, or heteroaryl-lower alkyl wherein heteroaryl is as defined above;

(c) when R<sub>1</sub> is piperidine R cannot be lower alkyl; and

(d) when R<sub>1</sub> is 1-aza-bicyclo[3.2.1]octane or 1-aza-bicyclo[2.2.2]octane R is not lower alkyl.

5,773,445

#### 3-METHOXY-PHENYL-ACRYLIC ACID METHYL ESTERS

Herbert Gayer, Monheim; Peter Gerdes, Aachen; Otto Schallner, Monheim; Stefan Dutzmann, Hilden; Heinz-Wilhelm Dehne, Bonn, and Gerd Hüssler, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

PCT No. PCT/EP94/03773, § 371 Date May 20, 1996, § 102(e) Date May 20, 1996, PCT Pub. No. WO95/14674, PCT Pub. Date Jun. 1, 1995

PCT Filed Nov. 14, 1994, Ser. No. 649,594

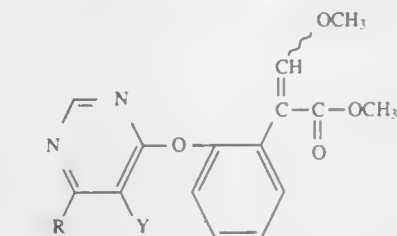
Claims priority, application Germany, Nov. 25, 1993, 43 40 181.3

Int. Cl.<sup>6</sup> C07D 239/34; 239/70; 403/12; A01N 43/54

U.S. Cl. 514-269

5 Claims

1. A methyl 3-methoxy-2-phenyl-acrylate of the formula (I)



in which

Y represents fluorine, chlorine, bromine or iodine.

R represents fluorine, chlorine, bromine, iodine or a radical of the formula Ar-Z—, in which

Ar represents aryl having 6 to 10 carbon atoms which is optionally monosubstituted to polysubstituted by identical or different substituents, or represents furanyl, thienyl, pyrrolyl, oxazolyl, thiazolyl, isoxazolyl, isothiazolyl, pyrazolyl, imidazolyl, oxadiazolyl, thiadiazolyl, triazolyl, pyridyl, pyridazinyl, pyrimidinyl, pyrazinyl or triazinyl, each of which is optionally monosubstituted or polysubstituted by identical or different substituents and/or benzo-fused, substituents in each case being selected from the group consisting of:

halogen, cyano, nitro, hydroxyl, amino, formyl, carbamoyl, thio-carbamoyl, in each case straight-chain or branched alkyl, alkoxy, alkylthio, alkylsulfinyl or alkylsulfonyl, each of which has 1 to 6 carbon atoms, in each case straight-chain or branched alkenyl or alkenyloxy, each of which has 2 to 6 carbon atoms, in each case straight-chain or branched halogenoalkyl, halogenoalkoxy, halogenoalkylthio, halogenoalkylsulfinyl or halogenoalkylsulfonyl, each of which has 1 to 6 carbon atoms and 1 to 13 identical or different halogen atoms, in each case straight-chain or branched halogenoalkenyl or halogenoalkenyloxy, each of which has 2 to 6 carbon atoms and 1 to 13 identical or different halogen atoms, in each case straight-chain or branched N-alkylamino, dialkylamino, alkylcarbamoyl, alkylcarbamoyloxy, alkoxy-carbamoyl, alkylsulfonyloxy, hydroximinooalkyl or alkoxyiminooalkyl, each of which has 1 to 6 carbon atoms in the individual alkyl moieties, or in each case divalent alkylene or dioxyalkylene, each of which has 1 to 6 carbon atoms and each of which is optionally monosubstituted or polysubstituted by identical or different substituents selected from the group consisting of halogen, straight-chain or branched alkyl having 1 to 4 carbon atoms, straight-chain or branched halogenoalkyl having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, cycloalkyl having 3 to 7 carbon atoms, 1-pyrrolidinyl, 1-piperidinyl, 1-perhydroazepinyl, 4-morpholinyl, and phenyl, phenoxy, benzyl, benzyloxy, phenylethyl or phenylethyloxy, each of which is optionally monosubstituted or polysubstituted in the phenyl moiety by identical or different substituents

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ents selected from the group consisting of halogen, straight-chain or branched alkyl having 1 to 4 carbon atoms, straight-chain or branched halogenoalkyl having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, straight-chain or branched alkoxy having 1 to 4 carbon atoms, and straight-chain or branched halogenoalkoxy having 1 to 4 carbon atoms and 1 to 9 identical or different halogen atoms, and

Z represents oxygen, sulfur or a group of the formula  $\text{—S(O)—}$ ,  $\text{—SO}_2\text{—}$ ,  $\text{—NH—}$ ,  $\text{—N(CH}_3\text{)—}$ ,  $\text{—CH}_2\text{O—}$ , or  $\text{—CH}_2\text{—S—}$ .

5,773,446

## DIAMINO PYRIMIDINES

Raffaello Masciadri, Basel, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 2, 1996, Ser. No. 758,993

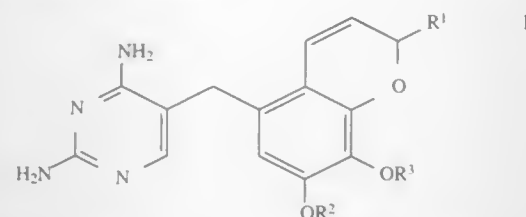
Claims priority, application Switzerland, Dec. 4, 1995, 3425/95

Int. Cl.<sup>6</sup> C07D 405/06; A61K 31/505

U.S. Cl. 514—275

13 Claims

1. A compound of formula I



wherein either

R<sup>1</sup> is straight-chain C<sub>5-10</sub>-alkyl, branched C<sub>3-5</sub>-alkyl, C<sub>3-6</sub>-cycloalkyl or C<sub>3-5</sub>-ω-carboxyalkyl and each of R<sup>2</sup> and R<sup>3</sup> is C<sub>1-5</sub>-alkyl; or

R<sup>1</sup> is hydrogen, R<sup>2</sup> is C<sub>3-5</sub>-ω-carboxyalkyl and R<sup>3</sup> is C<sub>1-5</sub>-alkyl; or their pharmaceutically acceptable acid addition salts.

5,773,447

## COMPOUNDS FOR TREATING DISORDERS OF LIPID METABOLISM AND THEIR PREPARATION

Gerhard Rackur, Idstein; Hans Georg Böger, Waldems Esch; Norbert Krass, Frankfurt; Axel Hoffmann, Frankfurt, and Michael Leineweber, Frankfurt, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jun. 13, 1997, Ser. No. 874,255

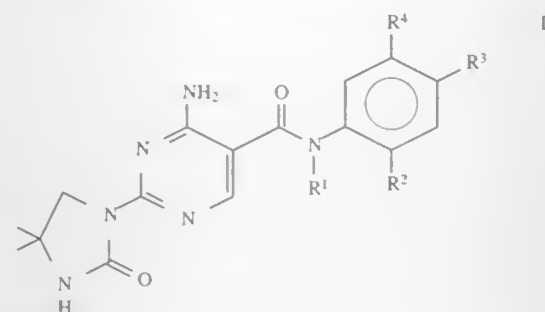
Claims priority, application Germany, Jun. 24, 1996, 196 25 088.9

Int. Cl.<sup>6</sup> A61K 31/505; C07D 239/02

U.S. Cl. 514—275

15 Claims

1. A tertiary 4-amino-2-ureidopyrimidine-5-carboxamide compound of formula I



wherein

R<sup>1</sup> is (C<sub>1-6</sub>)-alkyl wherein one or more or all hydrogens are replaced by fluorine.

R<sup>2</sup> is selected from the group consisting of fluorine, chlorine, bromine, hydrogen,  $\text{—O—(C}_1\text{—C}_6\text{)—alkyl}$  and (C<sub>1-6</sub>)-alkyl.

wherein one or more or all of the hydrogens of the alkyl radical optionally are replaced by fluorine.

R<sup>3</sup> is selected from the group consisting of fluorine, chlorine, bromine, hydrogen,  $\text{—O—(C}_1\text{—C}_6\text{)—alkyl}$  and (C<sub>1-6</sub>)-alkyl, wherein one or more or all of the hydrogens of the alkyl radical optionally are replaced by fluorine.

R<sup>4</sup> is CF<sub>3</sub> or OCF<sub>3</sub>.

or a physiologically tolerable acid addition salt thereof.

5,773,448

## PHARMACEUTICAL COMPOUNDS

Peter Thaddeus Gallagher, Yateley; William Martin Owton, Lightwater, and Colin William Smith, Bracknell, all of United Kingdom, assignors to Eli Lilly and Company Limited, Hampshire, England

Continuation of Ser. No. 771,339, Dec. 16, 1996, abandoned.

This application Apr. 14, 1997, Ser. No. 833,239

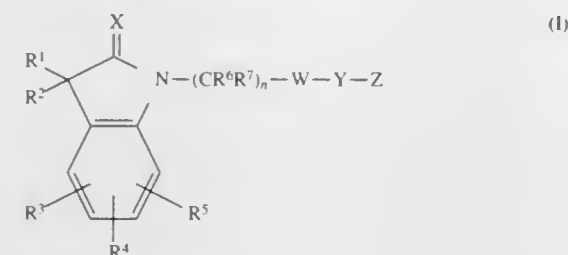
Claims priority, application United Kingdom, Dec. 19, 1995, 9525963

Int. Cl.<sup>6</sup> A61K 31/445; C07D 401/06

U.S. Cl. 514—323

6 Claims

1. A compound of the formula:





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R<sup>8</sup> and R<sup>9</sup> are each independently selected from hydrogen, hydroxy, halo, amino, oxo (=O), nitrile, hydroxy- (C<sub>1</sub>-C<sub>6</sub>)-alkyl, (C<sub>1</sub>-C<sub>6</sub>)-alkoxy, (C<sub>1</sub>-C<sub>6</sub>)-alkylamino, di-(C<sub>1</sub>-C<sub>6</sub>)-alkylamino, (C<sub>1</sub>-C<sub>6</sub>)-alkoxy, (C<sub>1</sub>-C<sub>6</sub>)-alkyl-O-C(=O)-, (C<sub>1</sub>-C<sub>6</sub>)-alkyl-O-C(=O)-(C<sub>1</sub>-C<sub>6</sub>)-alkyl, (C<sub>1</sub>-C<sub>6</sub>)-alkyl-C(=O)-O-, (C<sub>1</sub>-C<sub>6</sub>)-alkyl-C(=O)-(C<sub>1</sub>-C<sub>6</sub>)-alkyl-O-, (C<sub>1</sub>-C<sub>6</sub>)-alkyl-C(=O)-, (C<sub>1</sub>-C<sub>6</sub>)-alkyl-C(=O)-, and the radicals set forth in the definition of R<sup>6</sup>;

or R<sup>8</sup> and R<sup>9</sup>, together with the carbon to which they are attached, form a (C<sub>3</sub>-C<sub>6</sub>) saturated carbocyclic ring that forms a spiro compound with the nitrogen-containing ring to which they are attached;

R<sup>10</sup> is NHC(=O)R<sup>12</sup>, NHCH<sub>2</sub>R, NHO<sub>2</sub>R or one of the radicals set forth in any of the definitions of R<sup>6</sup>, R<sup>8</sup> and R<sup>9</sup>;

R<sup>11</sup> is oximino (=NOH) or one of the radicals set forth in any of the definitions of R<sup>6</sup>, R<sup>8</sup> and R<sup>9</sup>; and

R<sup>12</sup> is (C<sub>1</sub>-C<sub>6</sub>)-alkyl, hydrogen, phenyl(C<sub>1</sub>-C<sub>6</sub>)-alkyl or phenyl optionally substituted with (C<sub>1</sub>-C<sub>6</sub>)-alkyl;

with the proviso that (a) when m is 0, R<sup>11</sup> is absent, (b) neither R<sup>8</sup>, R<sup>9</sup>, R<sup>10</sup> nor R<sup>11</sup> can form, together with the carbon to which it is attached, a ring with R<sup>7</sup>, (c) when R<sup>8</sup> and R<sup>9</sup> are attached to the same carbon atom, then either each of R<sup>8</sup> and R<sup>9</sup> is independently selected from hydrogen, fluoro, (C<sub>1</sub>-C<sub>6</sub>)-alkyl, hydroxy-(C<sub>1</sub>-C<sub>6</sub>)-alkyl and (C<sub>1</sub>-C<sub>6</sub>)-alkoxy-(C<sub>1</sub>-C<sub>6</sub>)-alkyl, or R<sup>8</sup> and R<sup>9</sup>, together with the carbon to which they are attached, form a (C<sub>3</sub>-C<sub>6</sub>) saturated carbocyclic ring that forms a spiro compound with the nitrogen-containing ring to which they are attached, (d) the nitrogen of formula I can not be double bonded to both Q and the substituted benzyl group to which it is attached, and (e) when neither X<sup>1</sup>, X<sup>2</sup> nor X<sup>3</sup> is a fluorinated alkoxy group, at least one of R<sup>6</sup> and R<sup>7</sup> is an aryl group substituted with a fluorinated alkoxy group; or a pharmaceutically acceptable salt thereof.

5,773,451

**SUBSTITUTED ARYLTHIOALKYLTHIOPYRIDINES**  
Bernhard Kohl, Constance, Germany, assignor to BYK Gulden Lomberg Chemische Fabrik GmbH, Constance, Germany  
PCT No. PCT/EP95/02098, § 371 Date Dec. 20, 1995, § 102(e)  
Date Dec. 20, 1995, PCT Pub. No. WO95/01351, PCT Pub. Date Jan. 12, 1995

PCT Filed Jun. 28, 1994, Ser. No. 564,285

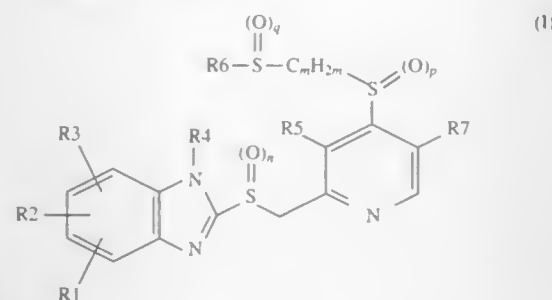
Claims priority, application Switzerland, Jun. 29, 1993, 1995/93

Int. Cl.<sup>6</sup> C07D 401/12; A61K 31/04

U.S. Cl. 514—338

I. A compound of formula I

16 Claims



in which

R<sup>1</sup> is hydrogen, 1-4C-alkyl or 1-4C-alkoxy,

R<sup>2</sup> is hydrogen, 1-4C-alkyl, 1-4C-alkoxy, halogen, trifluoromethyl, 1-4C-alkoxy which is completely or predominantly substituted by fluorine, or chlorodifluoromethoxy or 2-chloro-1,1,2-trifluoroethoxy, or, together with R<sup>3</sup>, bonded to adjacent ring carbons, is 1-2C-alkylenedioxy which, optionally, is completely or partly substituted by fluorine, or chlorotrifluoroethylenedioxy,

R<sup>3</sup> is hydrogen, 1-4C-alkoxy which is completely or predominantly substituted by fluorine, or chlorodifluoromethoxy or 2-chloro-1,1,2-trifluoroethoxy or, together with R<sup>2</sup>, bonded to

adjacent ring carbons, is 1-2C-alkylenedioxy which, optionally, is completely or partly substituted by fluorine, or chlorotrifluoroethylenedioxy,

R<sup>4</sup> is hydrogen or 1-4C-alkyl,R<sup>5</sup> is hydrogen, 1-4C-alkyl or 1-4C-alkoxy,

R<sup>6</sup> is a cyclic or bicyclic radical which is substituted by R<sup>8</sup> and R<sup>9</sup> and is a member selected from the group consisting of benzene, furan, thiophene, pyrrole, oxazole, isoxazole, thiazole, thiazoline, isothiazole, imidazole, imidazoline, pyrazole, triazole, tetrazole, thiadiazole, oxadiazole, pyridine, pyridine N-oxide, pyrimidine and benzimidazole,

R<sup>7</sup> is hydrogen, 1-4C-alkyl or 1-4C-alkoxy,

R<sup>8</sup> is hydrogen, 1-4C-alkyl, hydroxyl, 1-4C-alkoxy, halogen, nitro, carboxyl, 1-4C-alkoxycarbonyl, guanidino, 1-4C-alkyl which is substituted by R<sup>10</sup>, or —N(R<sup>11</sup>)R<sup>12</sup>,

R<sup>9</sup> is hydrogen, 1-4C-alkyl, 1-4C-alkoxy, fluorine or trifluoromethyl,

R<sup>10</sup> is hydroxyl, 1-4C-alkoxy, carboxyl, 1-4C-alkoxycarbonyl or —N(R<sup>11</sup>)R<sup>12</sup>, in which

R<sup>11</sup> is hydrogen, 1-4C-alkyl or —CO—R<sup>13</sup> andR<sup>12</sup> is hydrogen or 1-4C-alkyl, or in which

R<sup>11</sup> and R<sup>12</sup>, together and including the nitrogen atom to which they are both bonded, are a piperidino or morpholino radical,

R<sup>13</sup> is hydrogen, 1-4C-alkyl or 1-4C-alkoxy,

m is a number from 2 to 7,

n is the number 0 or 1,

p is the number 0 or 1 and

q is the number 0 or 1, or a salt thereof.

5,773,452

**HETEROCYCLIC COMPOUNDS AND THEIR USE**

Per Sauerberg, Farum; Preben H. Olesen, Kbh. NV, both of Denmark, and Charles H. Mitch, Columbus, Ind., assignors to Novo Nordisk A/S, Bagsvaerd, Denmark

PCT No. PCT/DK94/00095, § 371 Date Oct. 31, 1995, § 102(e)  
Date Oct. 31, 1995, PCT Pub. No. WO94/20495, PCT Pub. Date Sep. 15, 1994

Continuation of Ser. No. 26,708, Mar. 5, 1993, Pat. No.

5,376,668. This PCT application Apr. 4, 1994, Ser. No.

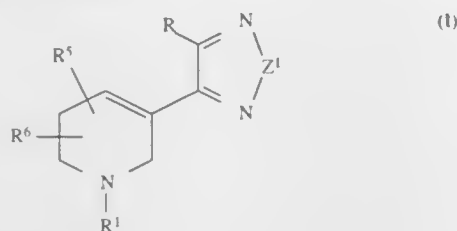
513,851

Int. Cl.<sup>6</sup> A61K 31/44; C07D 413/04

U.S. Cl. 514—340

I. A compound of formula I

34 Claims



wherein

Z<sup>1</sup> is oxygen or sulphur;

R is —Z<sup>2</sup>—C<sub>3-7</sub>-cycloalkyl optionally substituted with C<sub>1-6</sub>-alkyl, —Z<sup>2</sup>—C<sub>4-10</sub>-(cycloalkylalkyl), —Z<sup>2</sup>—C<sub>4-10</sub>-(cycloalkenylalkyl), or —Z<sup>2</sup>—C<sub>4-10</sub>-(methylenecycloalkylalkyl), wherein Z<sup>2</sup> is oxygen or sulfur;

R<sup>5</sup> and R<sup>6</sup> may be present at any appropriate position and independently are (1) hydrogen, (2) straight or branched C<sub>1-5</sub>-alkyl, (3) straight or branched C<sub>2-5</sub>-alkenyl, (4) straight or branched C<sub>2-5</sub>-alkynyl, (5) straight or branched C<sub>1-10</sub>-alkoxy, (6) straight or branched C<sub>1-5</sub>-alkyl substituted with —OH, (7) —OH, (8) halogen, (9) —NH<sub>2</sub> or (10) carboxy; and

5,773,455

**INHIBITORS OF PRENYL TRANSFERASES**

Zheng Xin Dong, Framingham, and Sun H. Kim, Needham, both of Mass., assignors to Biomeasure, Incorporated, Milford, Mass.

Filed Jun. 28, 1996, Ser. No. 672,474

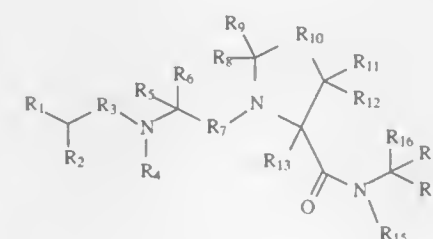
Int. Cl.<sup>6</sup> A01N 43/78; C07D 277/04

U.S. Cl. 514—365

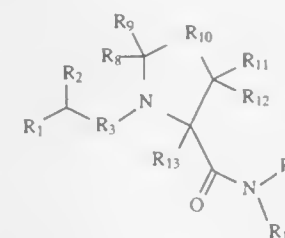
23 Claims

I. A compound of formula I or formula II

formula I



formula II



5,773,453

**METHODS FOR ADMINISTRATION OF ANTILIPEMIC DRUGS**

L. Jackson Roberts, II; Jason D. Morrow, both of Nashville, Tenn., and Eric H. Kuhrt, Woodside, Calif., assignors to Vanderbilt University, Nashville, Tenn., and Lipoprotein Technologies, Inc., Woodside, Calif.

Filed Apr. 19, 1995, Ser. No. 425,057

Int. Cl.<sup>6</sup> A61K 31/44; 31/19; 31/415

U.S. Cl. 514—356

6 Claims

I. A method of reducing cutaneous flushing in a patient to whom niacin is administered, comprising

administering to said patient two or more doses of an amount of a nonsteroidal anti-inflammatory drug effective to reduce cutaneous flushing caused by the niacin prior to administering the niacin,

wherein the nonsteroidal anti-inflammatory drug is a member selected from the group consisting of aspirin, ibuprofen, indomethacin, phenylbutazone, and naproxen, and

wherein the dose for each member is in the range shown below for that member:

Aspirin	10–160 mg
Ibuprofen	5–160 mg
Indomethacin	2–10 mg
Phenylbutazone	1–100 mg
Naproxen	5–100 mg.

wherein

R<sub>1</sub> is H or NR<sub>20</sub>R<sub>21</sub>;

R<sub>2</sub> is (CH<sub>2</sub>)<sub>m</sub>SR<sub>22</sub>, (CH<sub>2</sub>)<sub>m</sub>SSR<sub>22</sub>, substituted or unsubstituted heterocycle, or substituted or unsubstituted heterocycle lower alkyl, where m is 1–6 and said substituent is lower alkyl, lower alkenyl, aryl, or aryl lower alkyl;

each of R<sub>3</sub> and R<sub>7</sub>, independently, is CH<sub>2</sub> or C(O);each of R<sub>4</sub> and R<sub>15</sub>, independently, is H or lower alkyl;

each of R<sub>5</sub> and R<sub>16</sub>, independently, is H or a substituted or unsubstituted moiety selected from lower alkyl, thio lower alkyl, cycloalkyl, cycloalkyl lower alkyl, aryl, and aryl lower alkyl, where said substituent is lower alkyl, hydroxy, halo, C(O)NR<sub>23</sub>R<sub>24</sub>, or COOH;

each of R<sub>6</sub>, R<sub>8</sub>, R<sub>9</sub>, R<sub>11</sub>, R<sub>12</sub>, R<sub>13</sub>, and R<sub>17</sub>, independently, is H or a substituted or unsubstituted moiety selected from lower alkyl, lower alkenyl, thio lower alkyl, cycloalkyl, aryl, and aryl lower alkyl, where said substituent is lower alkyl, halo, C(O)NR<sub>25</sub>R<sub>26</sub>, or COOH;

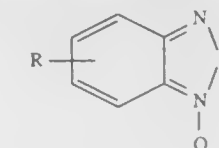
R<sub>10</sub> is S, SO, or SO<sub>2</sub>;

R<sub>18</sub> is COOR<sub>27</sub> or C(O)NR<sub>28</sub>R<sub>29</sub>, or, together with R<sub>16</sub>, forms —COOCH<sub>2</sub>CH<sub>2</sub>—.

R<sub>19</sub> is a substituted or unsubstituted moiety selected from lower alkyl, lower alkenyl, aryl, and aryl lower alkyl, where said substituent is lower alkyl, halo, or alkoxy; and

each of R<sub>20</sub>, R<sub>21</sub>, R<sub>22</sub>, R<sub>23</sub>, R<sub>24</sub>, R<sub>25</sub>, R<sub>26</sub>, R<sub>27</sub>, R<sub>28</sub>, and R<sub>29</sub>, independently, is H or lower alkyl;

provided that if R<sub>2</sub> is (CH<sub>2</sub>)<sub>m</sub>SH and R<sub>3</sub> is thio lower alkyl, the free thio groups of R<sub>2</sub> and R<sub>3</sub> can form a disulfide bond; or a pharmaceutically acceptable salt thereof.



where R<sub>1</sub> is H, CO<sub>2</sub>H or CO<sub>2</sub>M where M is a Group 1 or Group II cation.

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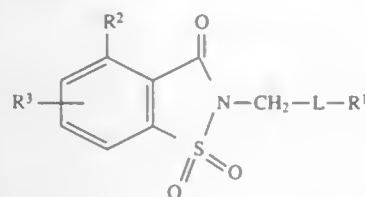
5,773,456  
SACCHARIN DERIVATIVE PROTEOLYTIC ENZYME  
INHIBITORS

Richard Paul Dunlap, Penfield; Albert Joseph Mura, Rochester; Dennis John Hlasta, Clifton Park; Ranjit Chimanlal Desai, Colonie, and Lee Hamilton Latimer, Brighton, all of N.Y., assignors to Sanofi, Paris Cedex, France

Division of Ser. No. 445,240, May 19, 1995, Pat. No. 5,578,623, which is a division of Ser. No. 289,113, Aug. 11, 1994, Pat. No. 5,464,852, which is a division of Ser. No. 113,508, Aug. 27, 1993, Pat. No. 5,380,737, which is a continuation of Ser. No. 793,035, Nov. 15, 1991, abandoned, which is a continuation-in-part of Ser. No. 514,920, Apr. 26, 1990, abandoned, and a continuation-in-part of Ser. No. 608,068, Nov. 1, 1990, abandoned, and a continuation-in-part of Ser. No. 782,016, Oct. 24, 1991, Pat. No. 5,128,339, and a continuation-in-part of Ser. No. 514,920, Apr. 26, 1990, abandoned, and a continuation-in-part of Ser. No. 347,125, May 4, 1989, abandoned, and a continuation-in-part of Ser. No. 347,126, May 4, 1989, abandoned. This application Sep. 25, 1996, Ser. No. 719,216

Int. Cl.<sup>6</sup> A61K 31/535; 31/495; 31/445; 31/425  
U.S. Cl. 514—373

1. A compound having the structural formula



wherein

L is SO<sub>n</sub>, wherein n is 0, 1 or 2;

L—R<sup>1</sup> is a SO<sub>n</sub>-heterocyclyl leaving group, and H—L—R<sup>1</sup> is the conjugate acid thereof which has a pK<sub>a</sub> value less than or equal to 5;

R<sup>2</sup> is primary or secondary alkyl of two to four carbon atoms, primary alkylamino of one to three carbon atoms, primary alkylmethylamino of two to four carbon atoms, diethylamino or primary alkoxy of one to three carbon atoms; and

R<sup>3</sup> is from one to three substituents at any or all of the 5-, 6- and 7-positions and is selected from the group consisting of hydrogen, lower-alkyl, cycloalkyl, amino-lower-alkyl, lower-alkylamino-lower-alkyl, di-lower-alkylamino-lower-alkyl, hydroxy-lower-alkyl, lower-alkoxy-lower-alkyl, perfluoro-lower-alkyl, perchloro-lower-alkyl, formyl, cyano, carboxy, aminocarbonyl, R-oxycarbonyl, B=N wherein B=N is amino, lower-alkylamino, di-lower-alkylamino, carboxy-lower-alkylamino, 1-pyrrolidinyl, 1-piperidinyl, 1-azetidyl, 4-morpholinyl, 1-piperazinyl, 4-lower-alkyl-1-piperazinyl, 4-benzyl-1-piperazinyl or 1-imidazolyl, 1-lower-alkyl-2-pyrrolyl, lower-alkylsulfonylamino, perfluoro-lower-alkylsulfonylamino, perchloro-lower-alkylsulfonylamino, nitro, hydroxy, lower-alkoxy, cycloalkoxy, B=N-lower-alkoxy, hydroxy-lower-alkoxy, polyhydroxy-lower-alkoxy or acetal or ketal thereof, lower-alkoxy-lower-alkoxy, poly-lower-alkoxy-lower-alkoxy, hydroxy-poly-lower-alkylenoxy, lower-alkoxy-poly-lower-alkylenoxy, B=N-carbonyloxy, carboxy-lower-alkoxy, R-oxycarbonyl-lower-alkoxy, methyl-enedioxy, R-thio, R-sulfinyl, R-sulfonyl, perfluoro-lower-alkylsulfonyl, perchloro-lower-alkylsulfonyl, aminosulfonyl, lower-alkylaminosulfonyl, di-lower-alkylaminosulfonyl and halo; wherein R is lower-alkyl, phenyl, benzyl or naphthyl; or phenyl or naphthyl having one or two substituents selected from the group consisting of lower-alkyl, lower-alkoxy and halo;

or a pharmaceutically acceptable acid addition salt thereof if the compound has a basic functional group or a pharmaceutically acceptable base addition salt thereof if the compound has an acidic functional group.

5,773,457  
COMPOSITIONS

Cesar Roberto Dias Nahoum, SmithKline Beechman Corporation Corporate Intellectual Property, UW2220 P.O. Box 1539, King of Prussia, Pa. 19406-0939, assignor to Cesar Roberto Dias Nahoum, Rio de Janeiro, Brazil

Continuation of Ser. No. 381,945, Feb. 15, 1995. This application May 18, 1995, Ser. No. 444,130

Int. Cl.<sup>6</sup> A61K 31/415

U.S. Cl. 514—397

15 Claims

1. A method of treating sexual dysfunction in a mammal in need thereof which comprises administering to said mammal an effective amount of an H<sub>3</sub> agonist.

5,773,458  
1-AZABICYCLOHEPTANE DERIVATIVES

Annamarie L. Sabb, Pennington, and Reinhardt P. Stein, Monmouth Junction, both of N.J., assignors to American Home Products Corporation, Madison, N.J.

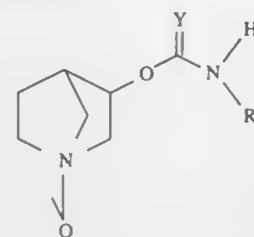
Filed Oct. 17, 1997, Ser. No. 953,601

Int. Cl.<sup>6</sup> A61K 31/40; C07D 487/04

U.S. Cl. 514—413

23 Claims

1. A compound of the formula:



where

R is H, alkyl of 1 to 6 carbon atoms, haloalkyl or 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, alkenyl of two to 6 carbon atoms or alkenyl of 2 to 6 carbon atoms;

Y is oxygen, sulfur or NR<sub>2</sub> where R<sub>2</sub> is H or alkyl of 1 to 6 carbon atoms;

or a pharmaceutically acceptable salt thereof.

5,773,459  
UREA- AND THIOUREA-TYPE COMPOUNDS

Peng Cho Tang, Moraga, and Gerald McMahon, Kenwood, both of Calif., assignors to Sugen, Inc., Redwood City, Calif.

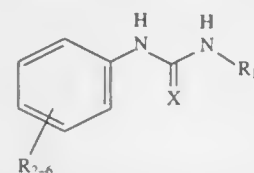
Filed Jun. 7, 1995, Ser. No. 486,816

Int. Cl.<sup>6</sup> A61K 31/38; C07D 333/10

U.S. Cl. 514—445

18 Claims

1. A method for treating a cell proliferative or cell differentiation disorder by inhibiting a tyrosine kinase associated with said disorder, wherein said disorder is selected from the group consisting of a cancer, restenosis, retinopathy, psoriasis, hyperimmune response, hepatic cirrhosis, a mesangial cell proliferative disorder, a HER2 disorder, an EGFR disorder, an IGFR disorder, a PDGFR disorder, a met disorder, a Src disorder, and a KDR/Flk-1 disorder, comprising the step of administering a therapeutically effective amount of a compound of the formula



or a pharmaceutically acceptable salt thereof to a patient in need of such treatment, wherein;

X is oxygen or sulfur

R<sub>1</sub> is selected from the group consisting of optionally substituted aryl, alkylaryl, and heteroaryl and

R<sub>2-6</sub> are independently selected from the group consisting of hydroxy, hydrogen, alkyl, alkoxy, cyano, nitro, halo trihalomethyl, amide, carboxamide, sulfonyl, and sulfoxamide.

5,773,460  
RHODAMINE DERIVATIVES FOR PHOTODYNAMIC  
THERAPY OF CANCER AND IN VITRO PURGING OF  
THE LEUKEMIAS

Louis Gaboury; Luc Villeneuve; Richard Giasson; Tiechao Li, all of Montréal, and Ajay Kumar Gupta, Pointe-Claire, all of Canada, assignors to Université De Montréal, Montreal, Canada

Division of Ser. No. 300,179, Sep. 2, 1994, Pat. No. 5,556,992.

This application Jul. 1, 1996, Ser. No. 674,247

Int. Cl.<sup>6</sup> A61K 31/35; C07D 311/82

U.S. Cl. 514—454

13 Claims

1. A photodynamic pursuing method of treating a cancer patient to destroy human cancer cells which comprises administration of a photoactivable rhodamine derivatives selected from the group consisting of 2-(4,5-dibromo-6-amino-3-imino-3H-xanthen-9-yl)-benzoic acid methyl ester hydrochloride; 2-(4,5-dibromo-6-amino-3-imino-3H-xanthen-9-yl)-benzoic acid ethyl ester hydrochloride; 2-(4,5-dibromo-6-amino-3-imino-3H-xanthen-9-yl)-benzoic acid n-butyl ester hydrochloride; 2-(6-ethyl amino-3-ethyl imino-3H-xanthen-9-yl)-benzoic acid n-butyl ester hydrochloride; in an amount to achieve appropriate intracellular levels of said derivative and application of irradiation of a suitable wavelength and intensity to photoactivate said derivative to induce cell killing.

5,773,461  
7-DEOXY-6-SUBSTITUTED PACLITAXELS

Mark D. Wittman, Cheshire; Thomas J. Altstadt, Middletown; John F. Kadow, Wallingford, all of Conn.; David G. I. Kingston, Blacksburg, Va., and Xian Liang, Boulder, Colo., assignors to Bristol-Myers Squibb Company, Princeton, N.J., and Virginia Tech Intellectual Properties, Inc., Blacksburg, Va.

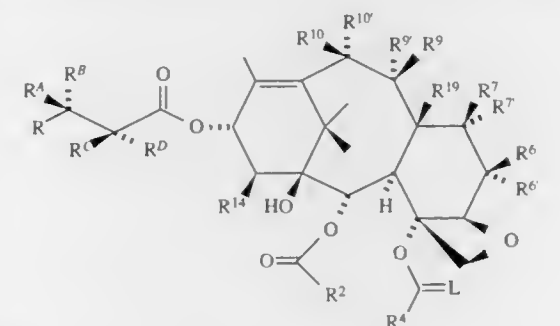
Filed Jun. 4, 1997, Ser. No. 868,758

Int. Cl.<sup>6</sup> A61K 31/335; C07D 305/14

U.S. Cl. 514—449

10 Claims

1. A compound of formula I, or a pharmaceutically acceptable salt thereof



wherein:

R is hydrogen, C<sub>1-6</sub> alkyl, C<sub>2-6</sub> alkenyl, C<sub>2-6</sub> alkynyl, C<sub>3-6</sub> cycloalkyl, C<sub>3-6</sub> cycloalkenyl, cyclic 3-7 membered ring containing either one or two heteroatoms, heteroaryl or —Z<sup>1</sup>—R<sup>3</sup>;

Z<sup>1</sup> is a direct bond, C<sub>1-6</sub> alkyl, or —O—C<sub>1-6</sub> alkyl;

R<sup>3</sup> is aryl, substituted aryl, C<sub>3-6</sub> cycloalkyl, C<sub>3-6</sub> cycloalkenyl, cyclic 3-7 membered ring containing either one or two heteroatoms, or heteroaryl;

R<sup>4</sup> and R<sup>6</sup> are independently hydrogen, —NHC(O)R, —NHC(O)OR, —NHC(O)NHR, —NHC(O)N(R)<sub>2</sub>, —NHS(O)<sub>m</sub> R, —NHP(=O)(OR)<sub>2</sub>, —NHP=S(OR)<sub>2</sub>, where m is 1 or 2;

R<sup>C</sup> and R<sup>D</sup> are independently hydrogen, hydroxy, fluoro, —OC(O)R<sup>4</sup>, —OC(O)OR<sup>4</sup>, OP(O)(OH)<sub>2</sub>, —OCH<sub>2</sub> OP(O)(OH)<sub>2</sub>, —OCH<sub>2</sub> OCH<sub>2</sub> OP(O)(OH)<sub>2</sub>, —(OCH<sub>2</sub>)<sub>n</sub> OC=OCH<sub>2</sub> NHR<sup>4</sup>, —(OCH<sub>2</sub>)<sub>n</sub> OC(=O)CH<sub>2</sub> NR<sup>6</sup> R<sup>7</sup>, where n is 0-3, —OCOCH<sub>2</sub> CH<sub>2</sub> NH<sub>3</sub><sup>+</sup> HCOO<sup>-</sup>, —OCOCH<sub>2</sub> CH<sub>2</sub> COOH, —OCO(CH<sub>2</sub>)<sub>n</sub> COOH, —OC(O)CH(R<sup>4</sup>)NH<sub>2</sub>, —OC(O)(CH<sub>2</sub>)<sub>n</sub> NR<sup>6</sup> R<sup>7</sup>, where n is 0-3, —OC(O)CH<sub>2</sub> CH<sub>2</sub> C(O)OCH<sub>2</sub> CH<sub>2</sub> OH or —OC(O)—Z—C(O)—R<sup>3</sup>;

Z is ethylene, propylene, —CH=CH—, 1,2-cyclohexane or 1,2-phenylene;

R<sup>1</sup> is —OH, —OH base, —NR<sup>2</sup> R<sup>3</sup>, —OR<sup>3</sup>, —SR<sup>3</sup>, or —OCH<sub>2</sub> C(O)NR<sup>4</sup> R<sup>5</sup>;

R<sup>2</sup> is —H or —CH<sub>3</sub>;

R<sup>3</sup> is —(CH<sub>2</sub>)<sub>n</sub> NR<sup>6</sup> R<sup>7</sup> or (CH<sub>2</sub>)<sub>n</sub> N<sup>+</sup> R<sup>6</sup> R<sup>7</sup> R<sup>8</sup>, where n is 1-3;

R<sup>4</sup> is —H or —C<sub>1</sub>—C<sub>4</sub> alkyl;

R<sup>5</sup> is —H, —C<sub>1</sub>—C<sub>4</sub> alkyl, benzyl, hydroxyethyl, —CH<sub>2</sub> CO<sub>2</sub> H or dimethylaminoethyl;

R<sup>6</sup> and R<sup>7</sup> are independently —H, —CH<sub>3</sub>, —CH<sub>2</sub> CH<sub>3</sub>, benzyl or R<sup>6</sup> and R<sup>7</sup> together with the nitrogen of NR<sup>6</sup> R<sup>7</sup> form a pyrrolidino, piperidino, morpholino, or N-methylpiperizino group;

R<sup>8</sup> is —CH<sub>3</sub>, —CH<sub>2</sub> CH<sub>3</sub> or benzyl;

X is halide;

base is NH<sub>3</sub>, (HOC<sub>2</sub>H<sub>4</sub>)<sub>3</sub> N, N(CH<sub>3</sub>)<sub>3</sub>, CH<sub>3</sub> N(C<sub>2</sub>H<sub>5</sub>)<sub>2</sub> NH, NH<sub>2</sub> (CH<sub>2</sub>)<sub>6</sub> NH<sub>2</sub>, N-methylglucamine, NaOH or KOH;

R<sup>6</sup> and R<sup>7</sup> are independently —H or —C<sub>1</sub>—C<sub>3</sub> alkyl, or R<sup>6</sup> and R<sup>7</sup> taken together with the nitrogen of NR<sup>6</sup> R<sup>7</sup> form a pyrrolidino, piperidino, morpholino or N-methylpiperizino groups;

R<sup>8</sup> is —H, —CH<sub>3</sub>, —CH<sub>2</sub> CH(CH<sub>3</sub>)<sub>2</sub>, —CH(CH<sub>3</sub>)CH<sub>2</sub> CH<sub>3</sub>, —CH(CH<sub>3</sub>)<sub>2</sub>, —CH<sub>2</sub> phenyl, —(CH<sub>2</sub>)<sub>3</sub> NH<sub>2</sub>, —(CH<sub>2</sub>)<sub>4</sub> NH<sub>2</sub>, —CH<sub>2</sub> CH<sub>2</sub> COOH, —(CH<sub>2</sub>)<sub>3</sub> NHC(=NH)NH<sub>2</sub>, the residue of the amino acid proline, —OC(O)CH=CH<sub>2</sub>, —C(O)CH<sub>2</sub> CH<sub>2</sub> C(O)NHCH<sub>2</sub> CH<sub>2</sub> SO<sub>3</sub> —Y<sup>+</sup> or —OC(O)CH<sub>2</sub> CH<sub>2</sub> C(O)NHCH<sub>2</sub> CH<sub>2</sub> CH<sub>2</sub> SO<sub>3</sub> —Y<sup>+</sup>;

Y<sup>+</sup> is Na<sup>+</sup> or N<sup>+</sup>(Bu)<sub>4</sub>;

R<sup>2</sup> is R<sup>4</sup>, R<sup>4</sup> or R<sup>5</sup>;

R<sup>4</sup> is C<sub>1-6</sub> alkyl, C<sub>2-6</sub> alkenyl, C<sub>2-6</sub> alkynyl, C<sub>3-6</sub> cycloalkyl, C<sub>3-6</sub> cycloalkenyl, C<sub>3-6</sub> heteroaryl, —O—C<sub>1-6</sub> alkyl, —O—C<sub>2-6</sub> alkenyl, —O—C<sub>2-6</sub> alkynyl, —CH<sub>2</sub> OCH<sub>3</sub>, —CH<sub>2</sub> OCH<sub>2</sub> OCH<sub>3</sub>, —CH<sub>2</sub> OCH<sub>2</sub> OCH<sub>2</sub> CH<sub>3</sub>, —CH<sub>2</sub> CH<sub>2</sub> OCH<sub>3</sub>, —CHOCH<sub>2</sub> (an oxirane) or —S—C<sub>1-6</sub> alkyl;

L is O or S;

R<sup>6</sup> and R<sup>6</sup> ' are independently hydrogen, hydroxy, —O—C<sub>1-6</sub> alkyl, —OC(O)R<sup>4</sup>, —(O)OR<sup>4</sup>, —OC(O)NHR<sup>4</sup>, —OC(O)NR<sup>6</sup> R<sup>7</sup>, —OCH<sub>2</sub> OR, —OC(R<sup>4</sup>)<sub>2</sub> OR, —OCH<sub>2</sub> OR, —OCH<sub>2</sub> OCH<sub>2</sub> OCH<sub>3</sub>, —OCH<sub>2</sub> OCH<sub>2</sub> OCH<sub>2</sub> CH<sub>3</sub>, —OCH<sub>2</sub> OCH<sub>2</sub> CH<sub>2</sub> OCH<sub>3</sub>, —OCH<sub>2</sub> OCH<sub>2</sub> CH<sub>2</sub> OH, —OCH<sub>2</sub> SR, —OCH<sub>2</sub> OCH<sub>2</sub> SCH<sub>3</sub>, OP(O)(OH)<sub>2</sub>, —OCH<sub>2</sub> OP(O)(OH)<sub>2</sub>, —OCH<sub>2</sub> OCH<sub>2</sub> OP(O)(OH)<sub>2</sub>, —(OCH<sub>2</sub>)<sub>n</sub> OC=OCH<sub>2</sub> NHR<sup>4</sup>, —(OCH<sub>2</sub>)<sub>n</sub> OC(=O)CH<sub>2</sub> NR<sup>6</sup> R<sup>7</sup>, where n is 0-3, —C<sub>1-6</sub> alkyl, —CH<sub>2</sub> OR, —CH<sub>2</sub> SCH<sub>3</sub>, —CH<sub>2</sub> OCH<sub>2</sub> SCH<sub>3</sub>, —OC(R<sup>4</sup>)<sub>2</sub> SR, —OCH<sub>2</sub> SR, —OCOCH<sub>2</sub> CH<sub>2</sub> NH<sub>3</sub><sup>+</sup> HCOO<sup>-</sup>, —OCOCH<sub>2</sub> CH<sub>2</sub> COOH, —OCO(CH<sub>2</sub>)<sub>3</sub> COOH, —OC(O)(CH<sub>2</sub>)<sub>n</sub> NR<sup>6</sup> R<sup>7</sup>, where n is 0-3, —OC(O)—Z—C(O)—R<sup>3</sup> or —C(O)CH<sub>2</sub> CH<sub>2</sub> C(O)OCH<sub>2</sub> CH<sub>2</sub> OH, provided that both R<sup>6</sup> and R<sup>6</sup> ' cannot be hydrogen, R<sup>6</sup> and R<sup>6</sup> ' together can form an oxo group or a thiocarbonyl group, or R<sup>6</sup> and R<sup>6</sup> ' together can form a carbon nitrogen double bond of formula —C=N—R, —C=N—OR or —C=N—NHR —C=N—NR<sup>6</sup> R<sup>7</sup>, where R is as previously defined, provided it is not hydrogen;

R<sup>7</sup> ' is hydrogen; R<sup>7</sup> is hydrogen or when taken together with R<sup>19</sup> can form a cyclopropane ring;

R<sup>9</sup> and R<sup>9</sup> ' are independently hydrogen, hydroxy, or together form an oxo (keto) group;

R<sup>10</sup> and R<sup>10</sup> ' are independently hydrogen, hydroxy, —OC(O)R<sup>4</sup>, —OC(O)OR<sup>4</sup>, C<sub>1-6</sub> alkyl, —OCH<sub>2</sub> OCH<sub>3</sub>, —OCH<sub>2</sub> OCH<sub>2</sub> OCH<sub>3</sub>, —OCH<sub>2</sub> OCH<sub>2</sub> OCH<sub>2</sub> CH<sub>3</sub>, —OCH<sub>2</sub> OCH<sub>2</sub> CH<sub>2</sub> OCH<sub>3</sub>, —OCH<sub>2</sub> OCH<sub>2</sub> CH<sub>2</sub> OH, —OCH<sub>2</sub> SCH<sub>3</sub>, —OCH<sub>2</sub> OCH<sub>2</sub> SCH<sub>3</sub>, —OC(O)NR<sup>6</sup> R<sup>7</sup>, —OP(O)(OH)<sub>2</sub>,



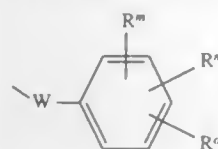
—OCH<sub>2</sub> OP(O)(OH)<sub>2</sub>, —OCH<sub>2</sub> OCH<sub>2</sub> OP(O)(OH)<sub>2</sub>,  
—(OCH<sub>2</sub>)<sub>n</sub> OC=OCH<sub>2</sub> NHR<sup>1</sup>, —(OCH<sub>2</sub>)<sub>n</sub> OC(=O)CH<sub>2</sub>  
NR<sup>6</sup>, R<sup>7</sup>, where n is 0–3, C<sub>1–6</sub> alkyl, —(CH<sub>2</sub>)<sub>3</sub> C(O)R<sup>4</sup>,  
—(CH<sub>2</sub>)<sub>3</sub> C(O)OR<sup>4</sup>, —(CH<sub>2</sub>)<sub>3</sub> CN, —OCOCH<sub>2</sub> CH<sub>2</sub> NH<sub>3</sub><sup>+</sup>,  
HCOO, —OCOCH<sub>2</sub> CH<sub>2</sub> COOH, —OCO(CH<sub>2</sub>)<sub>3</sub> COOH,  
—OC(O)—Z—C(O)—R<sup>1</sup>—OC(O)(CH<sub>2</sub>)<sub>n</sub> NR<sup>6</sup> R<sup>7</sup>, where n  
is 0–3, or —OC(O)CH<sub>2</sub> CH<sub>2</sub> C(O)OCH<sub>2</sub> CH<sub>2</sub> OH;

R<sup>14</sup> is hydrogen, hydroxy, —OC(O)R<sup>4</sup>, —OC(O)OR<sup>4</sup>,  
—O—C<sub>1–6</sub> alkyl, —OCH<sub>2</sub> OCH<sub>3</sub>, —OCH<sub>2</sub> OCH<sub>2</sub> OCH<sub>3</sub>,  
—OCH<sub>2</sub> OCH<sub>2</sub> OCH<sub>2</sub> CH<sub>3</sub>, —OC(H)<sub>2</sub> OCH<sub>2</sub> CH<sub>2</sub> OCH<sub>3</sub>,  
—OCH<sub>2</sub> OCH<sub>2</sub> CH<sub>2</sub> OH, —OCH<sub>2</sub> SCH<sub>3</sub>, —OCH<sub>2</sub> OCH<sub>2</sub>  
SCH<sub>3</sub>, OP(O)(OH)<sub>2</sub>, OCH<sub>2</sub> OP(O)(OH)<sub>2</sub>, —OCH<sub>2</sub> OCH<sub>2</sub>  
OP(O)(OH)<sub>2</sub>, —(OCH<sub>2</sub>)<sub>n</sub> OC=OCH<sub>2</sub> NHR<sup>1</sup>, or —(OCH<sub>2</sub>)<sub>n</sub>  
OC(=O)CH<sub>2</sub> NR<sup>6</sup> R<sup>7</sup>, where n is 0–3;

R<sup>19</sup> is methyl, hydroxymethyl, or R<sup>19</sup> and R<sup>7</sup> together can form  
a cyclopropane ring with the proviso that when these substitu-  
ents are cyclopropane ring then R<sup>7</sup> is hydrogen;

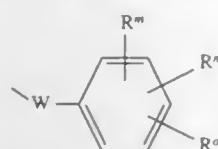
R<sup>x</sup> is C<sub>1–6</sub> alkyl, C<sub>2–6</sub> alkenyl, C<sub>2–6</sub> alkynyl, C<sub>3–6</sub> cyclo alkyl,  
any of which groups can be optionally substituted with one to  
six of the same or different halogen atoms;

R<sup>y</sup> is a radical of the formula



wherein W is a bond and R<sup>m</sup>, R<sup>n</sup>, and R<sup>o</sup> are independently  
hydrogen, nitro, cyano, azido, amino, C<sub>1–6</sub> alkylamino, di-C<sub>1–6</sub>  
alkylamino, halogen, C<sub>1–6</sub> alkyl, hydroxy or C<sub>1–6</sub> alkoxy; and

R<sup>y</sup> is a radical of the formula



wherein W is C<sub>1–6</sub> alkyl or —OC<sub>1–6</sub> alkyl, and R<sup>m</sup>, R<sup>n</sup>, and R<sup>o</sup> are  
independently hydrogen, nitro, cyano, azido, amino, C<sub>1–6</sub> alkyl-  
amino, di-C<sub>1–6</sub> alkylamino, halogen, C<sub>1–6</sub> alkyl, hydroxy or C<sub>1–6</sub>  
alkoxy.

5,773,462

# BIFLAVANOLS AND DERIVATIVES THEREOF AS ANTIVIRAL AGENTS

Yuh-Meei Lin, Naperville; Michael T. Flavin; Ralph Schure,  
both of Darien; David E. Zembower, Oak Park, and Gen-  
Xian Zhao, Woodridge, all of Ill., assignors to MediChem  
Research, Inc., Lemont, Ill.

Filed Jun. 21, 1996, Ser. No. 668,284

Int. Cl.<sup>6</sup> C07D 407/10; A61K 31/35

U.S. Cl. 514—456

10 Claims

1. A method for treating an influenza infection in a mammal  
which comprises administering to said mammal an effective thera-  
peutic amount of a biflavanoid selected from the group consisting  
of robustaflavone, amentoflavone, and derivative or salt thereof.

5,773,463  
INDANE AND TETRAHYDRONAPHTHALENE  
DERIVATIVES AS CALCIUM CHANNEL ANTAGONISTS  
John David Harling, and Barry Sidney Orlek, both of Essex,  
England, assignors to SmithKline Beecham p.l.c., Brentford,  
England

PCT No. PCT/EP94/02409, § 371 Date Jan. 22, 1996, § 102(e)  
Date Jan. 22, 1996, PCT Pub. No. WO95/04028, PCT Pub.  
Date Feb. 9, 1995

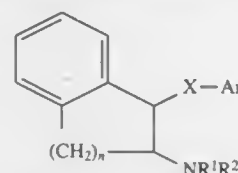
PCT Filed Jul. 21, 1994, Ser. No. 583,026

Claims priority, application United Kingdom, Jul. 28, 1993,  
9315566

Int. Cl.<sup>6</sup> A61K 31/135; C07C 217/52

U.S. Cl. 514—473 17 Claims

1. Method of treatment of a condition or disease related to the  
accumulation of calcium in the brain cells of a mammal which  
comprises administering to a subject in need thereof an effective  
amount of a compound of formula (I):



Formula (I)

wherein

X represents O, S or NH;

R<sup>1</sup> and R<sup>2</sup> each independently represent hydrogen, C<sub>1–6</sub>alkyl,  
C<sub>3–6</sub>cycloalkyl, or C<sub>1–4</sub>alkyl-C<sub>3–6</sub>cycloalkyl;  
n is 1, 2 or 3; and

Ar represents a phenyl optionally substituted by 1 to 3 substitu-  
ents selected from:

halo, C<sub>1–4</sub>alkyl, C<sub>1–4</sub>alkoxy, C<sub>1–2</sub>alkylenedioxy, trifluoromethyl,  
trifluoromethoxy, CN, NO<sub>2</sub>, amino, mono- or di-alkylamino,  
optionally substituted benzoyl and Ph(CH<sub>2</sub>)<sub>2</sub>Y(CH<sub>2</sub>)<sub>2</sub>— where  
Ph is optionally substituted phenyl, Y is oxygen or a bond and  
r and s each independently represent 0–4 provided that the  
sum of r+s is not greater than 4, or

Ar represents an optionally substituted unsaturated monocyclic  
heteroaryl ring system containing 5 or 6 ring members, or an  
optionally substituted, unsaturated or partially saturated bicy-  
clic aryl or heteroaryl ring system containing 8–10 ring mem-  
bers,

or a pharmaceutically acceptable salt thereof.

5,773,464

# C-10 EPOXY TAXANES

Michael A. Walker, Durham, and John F. Kadow, Wallingford,  
both of Conn., assignors to Bristol-Myers Squibb Company,  
Princeton, N.J.

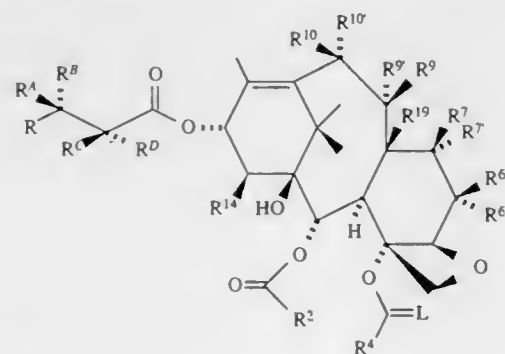
Filed Aug. 29, 1997, Ser. No. 920,451

Int. Cl.<sup>6</sup> A61K 31/335; C07D 315/00

U.S. Cl. 514—475

22 Claims

1. A compound of formula I, or a pharmaceutically acceptable  
salt thereof



wherein:

R is phenyl, p-fluorophenyl, C<sub>3–6</sub> cycloalkyl, C<sub>1–6</sub> alkyl or C<sub>1–6</sub>  
alkenyl;

R<sup>A</sup> is hydrogen;

R<sup>B</sup> is independently —NHC(O)Ph or —NHC(O)O—(C<sub>1–6</sub> alkyl);

R<sup>C</sup> is hydrogen;

R<sup>D</sup> is hydroxy;

R<sup>E</sup> is phenyl;

R<sup>F</sup> is methyl;

L is O;

R<sup>G</sup> and R<sup>H</sup> are each hydrogen;

R<sup>I</sup> is hydrogen; R<sup>J</sup> is hydrogen, hydroxy, —OCH<sub>2</sub>OCH<sub>3</sub>,  
—OCH<sub>2</sub>SCH<sub>3</sub> or when taken together with R<sup>I9</sup> forms a  
cyclopropane ring;

R<sup>K</sup> and R<sup>L</sup> together form an oxo (keto) group;

R<sup>M</sup> and R<sup>N</sup> together form an epoxide group which can be  
optionally substituted with C<sub>1–6</sub> alkyl;

R<sup>O</sup> is hydrogen; and

R<sup>P</sup> is methyl or when taken together with R<sup>J</sup> forms a cyclopro-  
pane ring.

5,773,465

# TARTRONIC ACIDS, THEIR ACETALIC ETHERS AND O-ESTERS

Carmelo A. Gandolfi; Lorella Cotini; Marco Mantovanini;  
Gianfranco Caselli; Gaetano Clavenna, and Claudio Omini,  
all of Milano, Italy, assignors to Dompé Farmaceutici S.p.A.,  
Milano, Italy

Division of Ser. No. 424,471, May 23, 1995, Pat. No.

5,656,656. This application Mar. 12, 1997, Ser. No. 814,903

Claims priority, application Italy, Nov. 5, 1992,

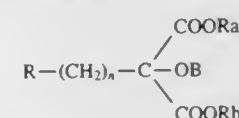
M192A02533; Jun. 21, 1993, M193A01330

Int. Cl.<sup>6</sup> A61K 31/225; 31/23; 31/325; C07C 271/22

U.S. Cl. 514—478

17 Claims

1. A compound of formula (I):



(I)

in which:

Ra and Rb are independently hydrogen, an alkali or alkaline-  
earth metal, an ammonium or C<sub>1–10</sub> alkylammonium cation,  
a C<sub>1–4</sub> alkyl group, a C<sub>1–4</sub> alkoxyethyl, allyl or  
p-methoxybenzyl group;

B is hydrogen or a C<sub>2–12</sub> acyl group;

R is a group of formula (II):



(II)

in which R<sub>1</sub> is hydrogen, C<sub>1–4</sub> alkyl, phenyl or benzyl; R<sub>2</sub> is  
tert-butoxycarbonyl (BOC), 9-fluorenylmethoxycarbonyl  
(Fmoc), benzyloxycarbonyl, p-methoxybenzyloxycarbonyl,  
aminocarbonyl, or C<sub>1–4</sub> alkylaminocarbonyl;

R<sub>3</sub> is hydrogen, C<sub>1–4</sub> alkyl, tert-butoxycarbonyl (BOC),  
9-fluorenylmethoxycarbonyl (Fmoc), benzyloxycarbonyl,  
p-methoxybenzyloxycarbonyl, aminocarbonyl, or C<sub>1–4</sub>  
alkylaminocarbonyl;

m is zero or an integer from 1 to 3;

n is zero or an integer from 1 to 12;

or an optically active form, enantiomer, diastereomer thereof  
or a pharmaceutically acceptable salt thereof.

5,773,466

# PHARMACEUTICAL PRODUCT COMPRISING SYMPATHOMIMETIC DRUG HAVING THERAPEUTIC PROPERTIES ON THE HUMAN SENSIBILITY AND AUTOCINESIS IN GENERAL

Maurizio Santini, via Vanvitelli, 19, 20129 - Milano, Italy  
Division of Ser. No. 307,377, Sep. 16, 1994, Pat. No. 5,599,836,  
which is a division of Ser. No. 945,665, Sep. 16, 1992, Pat. No.  
5,352,698. This application Nov. 1, 1996, Ser. No. 742,031  
Claims priority, application Italy, Sep. 17, 1991, M191A2444  
Int. Cl.<sup>6</sup> A61K 31/27; 31/22

U.S. Cl. 514—478

4 Claims

1. A method of treatment of a human subject affected by pain  
from dynociceptors and/or dysmechanociceptors, from either a cen-  
tral or peripheral cause, of hemiplegia, multiple sclerosis, paraple-  
gia, chronic rheumatoid arthritis, chronic arthrosis, chronic coxa-  
rthrosis, chronic relapsing sciatica, which consists of administering  
to said human subject a composition which is a member selected  
from the group consisting of a composition containing:

- 0.3–9 mgs for supra cutem administration or 0.25–0.75 mgs  
of carbachol per dose for i.m. administration;
- 0.3–9 mgs for supra cutem administration or 0.25–0.75 mgs  
of methacholine per dose for i.m. administration;
- 0.3–9 mgs of the ethyl ether of beta-methyl-choline chloride  
per dose for supra cutem administration, and
- 0.3–15 mgs for supra cutem administration or 5–15 mgs of  
bethanechol per dose for i.m. administration.

5,773,467

# BENZOFURAN SULPHONANMIDES

Hazel Joan Dyke; Hannah Jayne Kendall; Christopher Lowe,  
and John Gary Montana, all of Cambridge, United King-  
dom, assignors to Chiroscience, Ltd., Cambridge, United  
Kingdom

Filed Dec. 5, 1996, Ser. No. 761,102

Claims priority, application United Kingdom, Dec. 5, 1995,

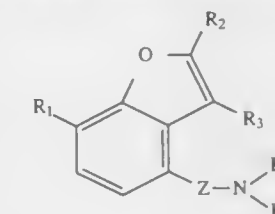
9524832; May 20, 1996, 9610515; May 22, 1996, 9610712

Int. Cl.<sup>6</sup> A61K 31/34; C07D 307/86; 307/78

U.S. Cl. 514—469

25 Claims

1. A compound having the following formula:



wherein Z is SO<sub>2</sub>.

R<sub>1</sub> represents alkoxy optionally substituted with one or more  
halogens, OH or thioalkyl;

R<sub>2</sub> and R<sub>3</sub> are the same or different and are each selected from  
the group consisting of H, R<sub>6</sub>, COR<sub>6</sub>, C(=NOR<sub>11</sub>)R<sub>6</sub>, CN,  
CO<sub>2</sub>H, CO<sub>2</sub>R<sub>10</sub>, CONH<sub>2</sub>, CONHR<sub>6</sub> and CON(R<sub>6</sub>)<sub>2</sub>;

R<sub>4</sub> is selected from the group consisting of H, arylalkyl, het-  
eroarylalkyl, heterocycloalkyl, S(O)<sub>m</sub>R<sub>10</sub> and alkyl optionally  
substituted with one or more substituents selected from the  
group consisting of hydroxy, alkoxy, CO<sub>2</sub>R<sub>7</sub>, SO<sub>2</sub>NR<sub>11</sub>R<sub>12</sub>,  
CONR<sub>11</sub>R<sub>12</sub>, CN, carbonyl oxygen, NR<sub>8</sub>R<sub>9</sub>, COR<sub>10</sub> and  
S(O)<sub>m</sub>R<sub>10</sub>;

R<sub>5</sub> is selected from the group consisting of aryl, heteroaryl,  
heterocyclo, arylalkyl, heteroarylalkyl and heterocycloalkyl;  
in R<sub>4</sub> and/or R<sub>5</sub>, the aryl/heteroaryl/heterocyclo portion is option-  
ally substituted with one or more substituents alkyl-R<sub>13</sub> or  
R<sub>13</sub>;

R<sub>6</sub> represents R<sub>10</sub> optionally substituted at any position with R<sub>14</sub>;

R<sub>7</sub> is selected from the group consisting of alkyl, arylalkyl, heteroarylalkyl, and heterocycloalkyl;

R<sub>8</sub> is selected from a group consisting of H, aryl, heteroaryl, heterocyclo, alkyl, arylalkyl, heteroarylalkyl, heterocycloalkyl, alkylcarbonyl, alkoxy, carbonyl, arylsulfonyl, heteroarylsulfonyl, heterocyclosulfonyl, arylcarbonyl, heteroarylcarbonyl, heterocyclocarbonyl and alkylsulfonyl;

R<sub>10</sub> is selected from a group consisting of alkyl, cycloalkyl, aryl, heteroaryl, heterocyclo, arylalkyl, heteroarylalkyl and heterocycloalkyl;

R<sub>9</sub>, R<sub>11</sub> and R<sub>12</sub> are the same or different and are each H or R<sub>10</sub>;

R<sub>13</sub> is selected from the group consisting of H, aryl, heteroaryl, heterocyclo, hydroxy, alkoxy, aryloxy, heteroaryloxy, heterocycloxy, arylalkyloxy, heteroarylalkyloxy, heterocycloalkyloxy, CO<sub>2</sub>R<sub>7</sub>, CONR<sub>11</sub>R<sub>12</sub>, SO<sub>2</sub>NR<sub>11</sub>R<sub>12</sub>, halogen, —CN, —NR<sub>8</sub>R<sub>9</sub>, COR<sub>10</sub>, S(O)<sub>n</sub>R<sub>10</sub> and carbonyl oxygen;

R<sub>14</sub> is selected from the group consisting of OH, carbonyl oxygen, OR<sub>10</sub>, NR<sub>8</sub>R<sub>9</sub>, CN, CO<sub>2</sub>H, CO<sub>2</sub>R<sub>10</sub>, CONR<sub>11</sub>R<sub>12</sub> and COR<sub>10</sub>;

m is an integer of up to 2; and

n represents 0–2;

or a pharmaceutically-acceptable salt thereof.

5,773,468

# IRREVERSIBLE HIV PROTEASE INHIBITOR HAVING AN ANTI-AIDS ACTIVITY AND PROCESS FOR THE PREPARATION THEREOF

Sung Chun Kim; Young Chan Son; Ho Il Choi; Heungsik Yoon; Chi Hyo Park; Nakyeon Choy; Chang Sun Lee, all of Daejeon; Jong Sung Koh, Seoul; Kwang Yul Moon, Daejeon; Won Hee Jung, Daejeon, and Chung Ryeol Kim, Daejeon, all of Rep. of Korea, assignors to LG Chemical Limited, Seoul, Rep. of Korea

Continuation-in-part of Ser. No. 473,877, Jun. 7, 1995, which is a continuation-in-part of Ser. No. 341,352, Nov. 17, 1994, which is a continuation-in-part of Ser. No. 159,382, Nov. 30, 1993. This application Dec. 14, 1995, Ser. No. 572,402

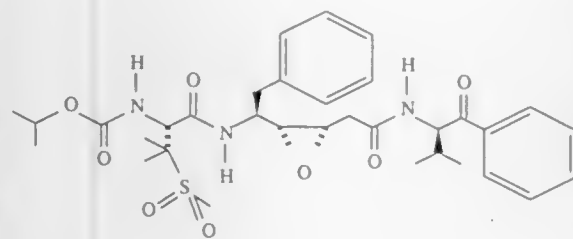
Claims priority, application Rep. of Korea, Oct. 26, 1995, 95-37292

Int. Cl.<sup>6</sup> A01N 43/20; 31/34

U.S. Cl. 514—475

3 Claims

1. A cis-epoxide compound of formula (I) and pharmaceutically acceptable salts, hydrates and solvates thereof:



## 5,773,469 DIARYL ANTIMICROBIAL AGENTS

Ramesh M. Kanojia, Somerville, N.J.; James P. Demers, New York City, N.Y.; Dennis J. Illasta, Doylestown, Pa.; Sigmond G. Johnson, Three Bridges, N.J., and Dieter H. Klaubert, Eugene, Oreg., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

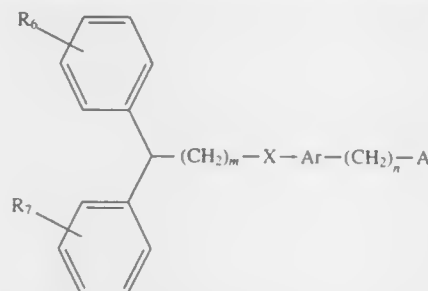
Filed Jun. 18, 1996, Ser. No. 665,653

Int. Cl.<sup>6</sup> A61K 31/135; C07C 217/02; 321/28

U.S. Cl. 514—486

6 Claims

1. A compound selected from those of the Formula III



wherein

R<sub>6</sub> and R<sub>7</sub> are independently selected from H, halogen, C<sub>1-6</sub>alkyl and C<sub>1-6</sub>alkoxy;

m is 1 or 2;

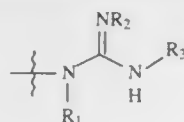
X is selected from O and S;

Ar is selected from 1,2-phenylene, 1,3-phenylene, or 1,4-phenylene;

wherein Ar may optionally be further substituted with one to three substituents selected from halogen, C<sub>1-6</sub>alkyl, hydroxy, or C<sub>1-6</sub>alkoxy;

n is 1, 2, or 3;

and A is selected from NR<sub>1</sub>R<sub>2</sub>, N+R<sub>1</sub>R<sub>2</sub>R<sub>3</sub>Z<sup>-</sup>,



and amidino;

wherein R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> are independently H, C<sub>1-6</sub>alkyl, t-butoxycarbonyl or aryl-C<sub>1-6</sub>alkyl and wherein Z<sup>-</sup> is a pharmaceutically acceptable anion;

and the pharmaceutically acceptable salts and prodrug forms thereof.

5,773,470

## MEDICINAL USE OF N-PHENYL-2-CYANO-3-HYDROXYCROTONAMIDE DERIVATIVES

Rudolf Schleyerbach, Hofheim am Taunus; Robert Ryder Bartlett, Darmstadt, both of Germany; Elizabeth Anne Kuo, and Edward James Little, both of Wiltshire, Great Britain, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 350,740, Dec. 7, 1994, which is a continuation of Ser. No. 50,561, Apr. 20, 1993, abandoned, which is a continuation of Ser. No. 963,476, Oct. 21, 1992, abandoned.

This application Jul. 29, 1997, Ser. No. 902,626

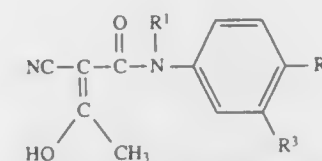
Claims priority, application Germany, Oct. 23, 1991, 41 34 934.2

Int. Cl.<sup>6</sup> A61K 31/275

U.S. Cl. 514—523

5 Claims

1. A method of treating rheumatic diseases, autoimmune diseases, or rejection reactions of an organ recipient to a transplanted organ which comprises administering to a host an effective amount of an N-phenyl-2-cyano-3-hydroxycrotonamide of the formula I



or one of its physiologically tolerable salts, in which

R<sup>1</sup> is:

- a hydrogen atom or
- (C<sub>1</sub>–C<sub>4</sub>)-alkyl, which is straight-chain or branched.

R<sup>2</sup> is a radical of the group:

- W(CH<sub>2</sub>)<sub>n</sub>CX<sub>3</sub>, wherein

W is:

- an oxygen atom or
  - a sulfur atom,
- X is fluorine, chlorine, or iodine,  
n is an integer from 1 to 3,

- WCX<sub>3</sub>, wherein

W is:

- an oxygen atom or
  - a sulfur atom,
- X is fluorine, chlorine, or iodine.

- CX<sub>3</sub>, wherein X is fluorine, chlorine, or iodine,

- (CH<sub>2</sub>)<sub>n</sub>CX<sub>3</sub>, wherein X is fluorine, chlorine, or iodine, and  
n is an integer from 1 to 3,

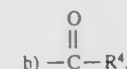
- fluorine, chlorine, or iodine,

- CN or

- NO<sub>2</sub>.

R<sup>3</sup> is a radical of the group:

- (C<sub>3</sub>–C<sub>6</sub>)-cycloalkyl, or



R<sup>4</sup> is:

- a hydrogen atom,
- (C<sub>1</sub>–C<sub>4</sub>)-alkyl, which is straight-chain or branched, or
- (C<sub>3</sub>–C<sub>6</sub>)-cycloalkyl.

5,773,471

## TREATMENT OF OPTIC NERVE DISORDER WITH PROSTANOIC ACID COMPOUNDS

Yoshihisa Oguchi; Yukihiko Mashima; Yoshiki Hiida; Tomihiko Tanino, all of Tokyo; Ryuji Ueno, Nishinomiya; Hiroyoshi Osama, and Tohru Hirato, both of Sanda, all of Japan, assignors to R-Tech Ueno, Ltd., Osaka-fu, Japan

Filed Mar. 8, 1996, Ser. No. 613,048

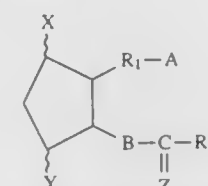
Claims priority, application Japan, Mar. 10, 1995, 7-051031; Jul. 14, 1995, 7-178954

Int. Cl.<sup>6</sup> A61K 31/215; 31/19

U.S. Cl. 514—530

17 Claims

1. A method for treatment of optic nerve disorder wherein visual field is contracted, or visual acuity is damaged, or retinal photo receptor cells may be damaged which comprises administering, to a subject in need of such treatment, a prostanoid acid compound of the formula (I) in an amount effective for relieving contraction of visual field, or for relieving damage of visual acuity, or for protecting retinal photo receptor cells



wherein X and Y are hydrogen, hydroxy, halogen, lower alkyl, hydroxy(lower)alkyl or oxo with the proviso that at least one of X and Y is a group other than hydrogen and that the five-membered ring may have at least one double bond,

- (I)  
A is COOH, a salt or ester thereof,  
B is —CH—CH<sub>2</sub>—, —CH=CH—, or —C≡C—,  
z is



wherein R<sub>3</sub> is lower alkyl or hydrogen

R<sub>1</sub> is a bivalent saturated or unsaturated, lower or medium aliphatic hydrocarbon residue which is unsubstituted or substituted with halogen, oxo or aryl, and R<sub>1</sub> is a saturated or unsaturated, lower or medium aliphatic hydrocarbon residue which is unsubstituted or substituted with oxo, hydroxy, halogen, lower alkoxy, lower alkanoyloxy, cyclo(lower)alkyl, aryl or aryloxy.

5,773,472

## METHOD AND MEANS FOR PREVENTION OF CATARACT

Johan Stjernschantz, and Bahram Resul, both of Upsala, Sweden, assignors to Pharmacia AB, Upsala, Sweden

PCT No. PCT/SE94/01035, § 371 Date Jun. 4, 1996, § 102(e) Date Jun. 4, 1996, PCT Pub. No. WO95/12401, PCT Pub. Date May 11, 1995

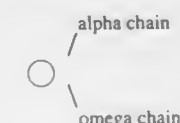
PCT Filed Nov. 3, 1994, Ser. No. 632,486

Claims priority, application Sweden, Nov. 3, 1993, 9303627 Int. Cl.<sup>6</sup> A61K 31/215; 31/19

U.S. Cl. 514—530

11 Claims

1. A method of preventing cataract by administering to the eye a composition comprising a prostaglandin and an ophthalmically compatible carrier, in an amount effective to prevent cataract, the prostaglandin being a compound of formula (I)



wherein

is a ring having 5 to 7 members and containing an alpha beta unsaturated ketone, optionally being substituted with one or more alkyl groups of 1 to 6 carbon atoms, and

each of alpha chain and omega chain is individually of the formula Z-R wherein Z is a carbon chain of 4 to 10 carbon atoms, optionally including a heteroatom selected from the group consisting of O, S and N, and R is selected from the group consisting of hydrogen, an alkyl group of 1 to 10 carbon atoms, C(O)—O—R<sub>2</sub> in which R<sub>2</sub> is hydrogen or an alkyl group of 1 to 10 carbon atoms, and ring structures selected from the group consisting of phenyl, aromatic heterocyclic groups having 5 to 6 ring atoms, and cycloalkyl and cycloalkene groups having 3 to 7 ring atoms, the ring structures optionally being substituted with one or more alkyl groups of 1 to 10 carbon atoms,

or an ester, amide or salt of a compound of formula (I).

5,773,473

## CREATINE SUPPLEMENT

Jerold L. Green, and Tory E. Green, both of 205 E. 38th St., Scottsbluff, Nebr. 69361

Filed Apr. 15, 1997, Ser. No. 842,688

Int. Cl.<sup>6</sup> A61K 31/195

U.S. Cl. 514—565

19 Claims

1. An internal creatine supplement consisting essentially of: 25–50% creatine monohydrate by weight; and 50–75% of a glycol by weight;

said creatine and glycol in a pharmaceutically acceptable vehicle for internal administration.



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5,773,474

POTENT INDUCERS OF TERMINAL DIFFERENTIATION  
AND METHOD OF USE THEREOF

Ronald Breslow, Englewood, N.J.; Paul A. Marks, Bridgewater, Conn., and Richard A. Rifkind, New York, N.Y., assignors to The Trustees of Columbia University in the City of New York and Sloan-Kettering Institute for Cancer Research, New York, N.Y.

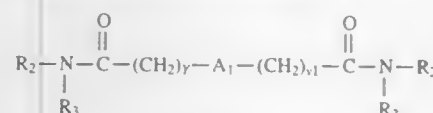
Continuation of Ser. No. 164,639, Dec. 9, 1993, abandoned, which is a continuation of Ser. No. 701,323, May 6, 1991, abandoned, which is a continuation of Ser. No. 270,963, Nov. 14, 1988, abandoned. This application Jun. 7, 1995, Ser. No. 485,620

Int. Cl.<sup>6</sup> A61K 31/165; C07C 235/74  
U.S. Cl. 514—616

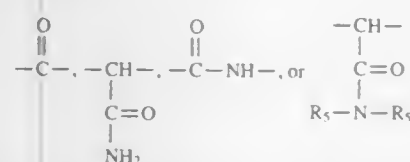
17 Claims

K-135 conc.	cell count	B+ cells
1mM	2.4x10 <sup>6</sup>	68-69
2mM	1.9x10 <sup>6</sup>	77-80
3mM	1.2x10 <sup>6</sup>	78-81
4mM	0.5x10 <sup>6</sup>	3-4
5mM	0.2x10 <sup>6</sup>	0-1
Control cell		0-1
5mM HMBA		89-88

1. A compound having the structure:



wherein each of R<sub>2</sub> and R<sub>3</sub> is a hydrogen atom or a methyl, ethyl, or propyl group and is the same or different, and wherein each of y and x<sub>1</sub> is independently 4, 5, 6 or 7;  
wherein A<sub>1</sub> is



wherein R<sub>5</sub> is a hydrogen atom or a methyl, ethyl or propyl group.

5,773,475

ANTICONVULSANT ENANTIOMERIC AMINO ACID  
DERIVATIVES

Harold Kohn, Houston, Tex., assignor to Research Corporation Technologies, Inc., Tucson, Ariz.

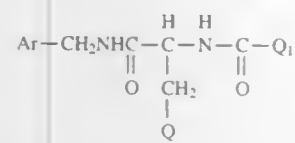
Filed Mar. 17, 1997, Ser. No. 818,688

Int. Cl.<sup>6</sup> A61K 31/16; 31/165; C07C 233/05

U.S. Cl. 514—616

13 Claims

1. A compound in the R configuration having the formula:



wherein

Ar is phenyl which is unsubstituted or substituted with at least one halo group;  
Q is lower alkoxy, and  
Q<sub>1</sub> is methyl.

5,773,476

METHODS AND COMPOSITIONS FOR INHIBITING  
CELL PROLIFERATIVE DISORDERS

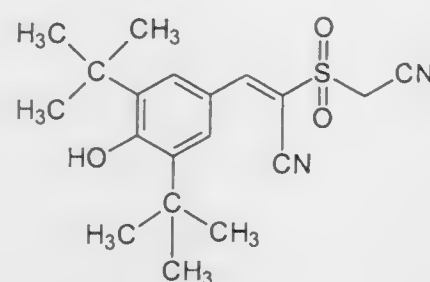
Hui Chen, Palo Alto, Calif.; Aviv Gazit; Alexander Levitzki, both of Jerusalem, Israel; Klaus Peter Hirth, San Francisco, Calif.; Elaina Mann, Alameda, Calif.; Laura K. Shawver, San Francisco, Calif.; Jianming Tsai, San Francisco, Calif., and Peng Cho Tang, Moraga, Calif., assignors to Sugen, Inc., Redwood City, and Yissum Research and Development Company of the Hebrew University of Jerusalem, Jerusalem, both of Israel

Continuation of Ser. No. 399,967, Mar. 7, 1995, which is a continuation-in-part of Ser. No. 207,933, Mar. 7, 1994, abandoned. This application Jun. 7, 1995, Ser. No. 486,775

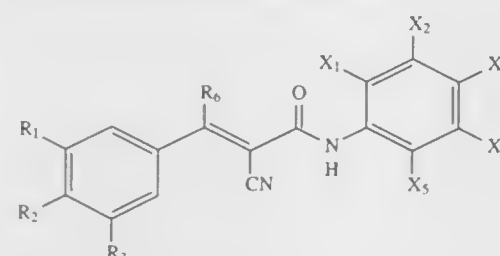
Int. Cl.<sup>6</sup> A01N 37/18

U.S. Cl. 514—620

17 Claims



1. A compound having the chemical formula:



or a pharmaceutically acceptable salt thereof, wherein

R<sub>1</sub>, R<sub>2</sub>, and R<sub>3</sub> are each independently selected from the group consisting of alkyl, alkenyl, alkynyl, alkoxy, alkylaryl, halogen, hydrogen, OH, amine, thioether, SH and NH<sub>2</sub>;

R<sub>6</sub> is selected from the group consisting of alkyl, alkenyl, alkynyl, alkylaryl, halogen, hydrogen, amine, thioether, SH and NH<sub>2</sub>; and

X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, X<sub>4</sub>, and X<sub>5</sub> are each independently selected from the group consisting of hydrogen, halogen, trihalomethyl, alkyl, alkenyl, alkynyl, alkoxy, and NO<sub>2</sub>, provided that at least one of X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, X<sub>4</sub>, and X<sub>5</sub> is a trihalomethyl.

5,773,477

COMBINATION THERAPY TO TREAT OSTEOPOROSIS -  
POLYPHOSPHONATES AND ESTROGEN AGONISTS

David B. MacLean, Providence, R.I., and David D. Thompson, Gales Ferry, Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Feb. 21, 1997, Ser. No. 803,707

Int. Cl.<sup>6</sup> A61K 31/135; 31/66

U.S. Cl. 514—648

4 Claims

1. A method for treating or preventing osteoporosis comprising administering to a mammal in need of such treatment an enhanced effective amounts of a compound of formula I

5,773,480

TRIFLUOROSTYRENE AND SUBSTITUTED  
TRICHLOROSTYRENE COPOLYMERIC  
COMPOSITIONS AND ION-EXCHANGE MEMBRANES  
FORMED THEREFROM

Charles Stone, Vancouver; Alfred E. Steck, West Vancouver, and Jinzhu Wei, Burnaby, all of Canada, assignors to Ballard Power Systems Inc., Burnaby, Canada

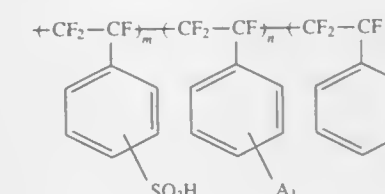
Continuation-in-part of Ser. No. 480,098, Jun. 6, 1995, Pat. No. 5,600,185, which is a continuation-in-part of Ser. No. 124,924, Sep. 21, 1993, Pat. No. 5,422,411. This application Dec. 18, 1996, Ser. No. 768,615

Int. Cl.<sup>6</sup> C08J 5/22

U.S. Cl. 521—27

14 Claims

1. A polymeric composition comprising:



where m, n and p are each an integer greater than zero, and A<sub>1</sub> is selected from the group consisting of fluorine and CF<sub>3</sub>.

5,773,478

COMPOSITION COMPRISING METHYLPHENIDATE  
AND ANOTHER DRUG

Andrew John McGlashan Richards, and Nicholas Robert Pope, both of Cambridge, United Kingdom, assignors to Medeva Europe Limited, London, United Kingdom

Filed Jul. 15, 1996, Ser. No. 679,878

Claims priority, application United Kingdom, Jul. 14, 1995, 9514450; Apr. 23, 1996, 9608390

Int. Cl.<sup>6</sup> A01N 33/02; 43/06; A61K 31/135; 9/16

U.S. Cl. 514—649

11 Claims

1. A product comprising d-threo-methylphenidate and another drug, wherein said drug undergoes P<sub>450</sub> metabolism or interferes with P<sub>450</sub> metabolism.

5,773,479

PREVENTION AND TREATMENT OF PATHOLOGIES  
ASSOCIATED WITH ABNORMALLY PROLIFERATIVE  
SMOOTH MUSCLE CELLS

David J. Grainger; James C. Metcalfe, and Peter L. Weissberg, all of Cambridge, England, assignors to NeoRx Corporation, Seattle, Wash.

Division of Ser. No. 300,357, Sep. 2, 1994, Pat. No. 5,472,985, which is a continuation of Ser. No. 61,714, May 13, 1993, abandoned. This application Nov. 21, 1995, Ser. No. 560,808

Int. Cl.<sup>6</sup> A61K 31/135

U.S. Cl. 514—651

5 Claims

1. A method to treat atherosclerosis comprising the systemic administration to a mammal of an amount of trans-2-[4-(1,2-diphenyl-1-butenyl)phenoxy]-N,N-dimethyl-ethylamine or an analog thereof that is effective to inhibit or reduce lesion formation or development in, or lipid accumulation by, a vessel of said mammal.

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5,773,482

**THERMAL INSULATING FOAMED MATERIAL,  
METHOD FOR PRODUCING THE SAME, AND  
THERMAL INSULATING CABINET**

Takayoshi Ueno, Katano; Takashi Hashida; Masaaki Suzuki, both of Osaka; Fumihiro Inagaki, Otokuni-gun; Nobuo Sonoda, Settsu; Hideo Nakamoto, Osaka; Tomohisa Tenra, Yao; Tsukasa Takushima, Higashiosaka, and Yoshio Kishimoto, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., and Matsushita Refrigeration Company, both of Osaka, Japan

PCT No. PCT/JP96/02386, § 371 Date May 22, 1997, § 102(e) Date May 22, 1997, PCT Pub. No. WO97/09361, PCT Pub. Date Mar. 13, 1997

PCT Filed Aug. 26, 1996, Ser. No. 809,959

Claims priority, application Japan, Sep. 1, 1995, 7-225486; Dec. 19, 1995, 7-329998

Int. Cl.<sup>6</sup> C08G 18/00

U.S. Cl. 521—99

26 Claims

1. A thermal insulating foamed material comprising a foamed urethane resin composition having closed cells, said foamed urethane resin composition containing a carbon dioxide fixation catalyst and cyclic carbonate compounds as products of reactions between carbon dioxide and epoxides in the presence of said carbon dioxide fixation catalyst, said cyclic carbonate compounds comprising at least two members of a reaction product of an epoxide compound, having high reactivity with carbon dioxide, and carbon dioxide and a reaction product of an epoxide compound, having low reactivity with carbon dioxide, and carbon dioxide.

5,773,483

**PROCESS FOR PREPARING A FLEXIBLE FOAM**

Berend Eling, Bertem, and Eric Huygens, Heverlee, both of Belgium, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 223,805, Apr. 6, 1994, abandoned, which is a continuation-in-part of Ser. No. 83,828, Jun. 25, 1993, abandoned. This application Nov. 1, 1995, Ser. No. 551,690

Claims priority, application United Kingdom, Apr. 13, 1993, 9307556; Jan. 25, 1994, 9401339

Int. Cl.<sup>6</sup> C08J 9/08; C08G 18/22

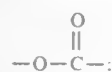
U.S. Cl. 521—125

6 Claims

1. A method for the preparation of flexible polyurethane foams by reacting a polyisocyanate containing at least 85% by weight of 4,4'-diphenylmethane diisocyanate or a liquid variant thereof wherein said liquid variant is selected from the group consisting of liquid products obtained by introducing uretonimine and carbodiimide groups into said polyisocyanate and liquid products obtained by reacting a polyisocyanate with one or more polyols with a polyol composition comprising at least one poly(oxyethylene-oxyalkylene) polyol having an average nominal hydroxyl functionality of from 2 to 6, a number average hydroxyl equivalent weight of from 1000 to 3000, and an average oxyethylene content of from 50 to 85% by weight and with water in the presence of a catalytically effective amount of an alkali or alkaline earth metal carboxylate salt, wherein the anion of said carboxylate salt is selected from those having the formula R—E—A—COO<sup>-</sup> wherein:

A is a hydrocarbon diradical having 1-6 carbon atoms;

E is —O— or



and

R is X—R<sub>1</sub>—(OR<sub>2</sub>)<sub>n</sub>,<sup>13</sup> wherein

X is —CH<sub>3</sub> or —OH, R<sub>1</sub> is a hydrocarbon diradical having 1-8 carbon atoms,

R<sub>2</sub> is a hydrocarbon radical having 2-4 carbon atoms and n is 2 to 10.

5,773,484

**ENOL-ETHER CAPPED POLYETHERS AND  
SURFACTANTS PRODUCED THEREFROM**

Glenn A. Miller, Charleston, W. Va., assignor to OSI Specialties, Inc., Greenwich, Conn.

Filed Dec. 20, 1996, Ser. No. 772,856

Int. Cl.<sup>6</sup> C08J 9/02

U.S. Cl. 521—174

22 Claims

1. A method for producing polyurethane foam comprising mixing together a polyether polyol, an organic diisocyanate, at least one catalyst, a blowing agent, and a polyether-polysiloxane copolymer surfactant of the average formula: M<sup>n</sup>D<sup>m</sup>T<sup>p</sup>M<sup>n</sup> wherein:

M<sup>n</sup> represents (CH<sub>3</sub>)<sub>3</sub>SiO<sub>1/2</sub> or R(CH<sub>3</sub>)<sub>2</sub>SiO<sub>1/2</sub>;

D represents (CH<sub>3</sub>)<sub>2</sub>SiO<sub>2/2</sub>;

D<sup>m</sup> represents (CH<sub>3</sub>)<sub>2</sub>(R)SiO<sub>2/2</sub>;

T represents CH<sub>3</sub>SiO<sub>3/2</sub>;

x is from about 20 to about 220;

y is from about 5 to about 34;

z is less than 4;

R is selected from the group consisting of alkyl, aryl and aralkyl groups of 1 to 18 carbons and polyether-containing substituents selected from the following two groups (1) and (2):

(1) B—O(C<sub>2</sub>H<sub>4</sub>O)<sub>a</sub>(C<sub>3</sub>H<sub>6</sub>O)<sub>b</sub>R<sup>n</sup> polyethers having average molecular masses above 3000 daltons wherein

B is an alkyl bridging group of C<sub>2</sub> to C<sub>4</sub>;

a' and b' are independently 0 or positive numbers, provided that the total molecular weight of the polyether is above 3000 daltons;

R<sup>n</sup> represents —H, an alkyl group of 1-18 carbon atoms, —C(O)R<sup>n</sup>, —C(O)OR<sup>n</sup> or —C(O)NHR<sup>n</sup> or X;

X is a group produced by reacting a compound of the formula M<sup>n</sup>D<sup>m</sup>T<sup>p</sup>M<sup>n</sup> wherein R<sup>n</sup> is —OH, with an enol-ether capping moiety which is R<sup>n</sup>—C=CR<sup>n</sup>—O—R<sup>n</sup> or cyclic —(CR<sup>n</sup>)<sub>2</sub>—, —Z—(CR<sup>n</sup>)<sub>2</sub>—, CR<sup>n</sup>=CR<sup>n</sup>—O—;

r is 1 to 5, s and r' are 0 through 1, and Z is O, S, or SiR<sup>n</sup>;

R<sup>n</sup> represents —H, or mono-functional alkyl, aralkyl or aryl groups of up to 8 carbons; and

(2) B—O(C<sub>2</sub>H<sub>4</sub>O)<sub>a</sub>(C<sub>3</sub>H<sub>6</sub>O)<sub>b</sub>R<sup>n</sup> polyethers having average molecular masses in the range 300-3000 daltons wherein a" and b" are independently 0 or positive numbers, provided that the total molecular weight of the polyether is between 300 and 3000 daltons; and the B, R<sup>n</sup> and R<sup>n</sup> moieties are as defined above; with the provisos that (i) an average of at least one R group per silicone backbone must be a polyether from either group (1) or group (2); (ii) there may be more than one polyether from either group; (iii) up to 20% of the propylene oxide (C<sub>3</sub>H<sub>6</sub>O) moieties may be replaced with higher alkylene oxide moieties; and (iv) at least one pendant polyether must be capped with an X moiety.

5,773,485

**ACRYLIC SYRUP CURABLE TO A CROSSLINKED  
VISCOELASTOMERIC MATERIAL**

Greggory S. Bennett, Hudson, Wis.; Louis E. Winslow, Stillwater, and Gaddam N. Babu, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

PCT No. PCT/US95/09502, § 371 Date Aug. 23, 1995, § 102(e) Date Aug. 23, 1995

Continuation-in-part of Ser. No. 282,058, Jul. 29, 1994, abandoned. This PCT application Jul. 28, 1995, Ser. No. 522,294

Int. Cl.<sup>6</sup> C08F 2/50; 2/16/36; C08J 131/02

U.S. Cl. 522—8

14 Claims

1. A syrup curable to a crosslinked viscoelastomeric material comprising:

a) about 65 to 99.9 weight percent of a solvent monomer mixture comprising

1) 95 to 99.9999 parts by weight of at least one free radically-polymerizable ethylenically unsaturated monomer, and

2) 0.0001 to 5 parts by weight of an ethylenically unsaturated monomer comprising a radiation-sensitive hydrogen abstracting group;

b) about 0.1 to 35 weight percent of a solute polymer comprising 1) 9s to 99.9999 weight percent mer units derived from one or more free radically-polymerizable ethylenically unsaturated monomers, and

2) about 0.001 to 5 weight percent mer units derived from an ethylenically unsaturated monomer comprising a radiation-sensitive hydrogen abstracting group.

said polymer having a molecular weight of at least 500,000;

c) from 0.01 to 5 parts by weight of a free radically-polymerizable polyethylenically unsaturated monomer selected from the group consisting of acrylate monomers and divinyl monomers; and

d) from 0.0001 to 3 parts by weight of a saturated energy-activated initiator of polymerization;

wherein the parts by weight of said free radically-polymerizable polyethylenically unsaturated monomer and said saturated energy-activated initiator of polymerization are based upon 100 parts by weight of said solvent monomer mixture and said solute polymer.

5,773,486

**METHOD FOR THE MANUFACTURE OF OPTICAL  
GRATINGS**

Edwin Arthur Chandross, Berkeley Heights; Mark Anthony Paczkowski, Andover, and Debra Ann Simoff, South Plainfield, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 26, 1996, Ser. No. 720,253

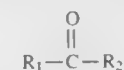
Int. Cl.<sup>6</sup> C08F 2/46

U.S. Cl. 522—33

15 Claims

1. Method for the manufacture of a fiber grating in the core of a coated optical fiber comprising the step of exposing the core of the optical fiber to a pattern of UV radiation by directing the radiation through the coating of the optical fiber, the method characterized in that the coating of the optical fiber is a polymer containing 0.1-10% of a photoinitiator selected from the group consisting of:

(1) aliphatic ketones, and mixtures thereof, having the formula:



where R<sub>1</sub> and R<sub>2</sub> are the same or different alkyl moieties selected from the group consisting of methyl, ethyl, propyl, isopropyl, isobutyl, sec-butyl, t-butyl, pentyl and neopentyl, and

(2) cycloaliphatic ketones as defined in (1), with R<sub>1</sub> and R<sub>2</sub> joined, and further where the molecular weight of the photoinitiator is greater than 100.

5,773,487

**FINISHING COMPOSITION WHICH IS CURABLE BY UV  
LIGHT AND METHOD OF USING SAME**

Andrew A. Sokol, North Olmstead, Ohio, assignor to UV Coatings, Inc., Beachwood, Ohio

Continuation-in-part of Ser. No. 38,518, Mar. 29, 1993, Pat. No. 5,453,451, which is a continuation of Ser. No. 701,442, May 15, 1991, abandoned. This application Sep. 26, 1995, Ser. No. 533,679

Int. Cl.<sup>6</sup> C08F 2/46

U.S. Cl. 522—42

11 Claims

1. A sprayable, substantially solvent-free coating composition for applying to a substrate, consisting essentially of:

from about 80 to about 99.5 percent by weight, based on the total composition weight, of a polymerizable compound which comprises a mixture of acrylate, the acrylate mixture comprising a first acrylate and a second acrylate which has a

lower molecular weight as compared to the first acrylate, the second acrylate being present in the composition in an amount effective to control pre-polymerization viscosity to a value in a range from about 2 centipoises to about 1500 centipoises at 25° C. to facilitate ease of application,

from about 0.1 to about 15 percent by weight, based on the total composition weight, of a photoinitiator which initiates a polymerization reaction in the composition when it is exposed to ultraviolet light; and

wherein the composition is curable upon exposure to ultraviolet light without requiring evaporation of a solvent therefrom.

5,773,488

**HYDROPHILIZATION OF HYDROPHOBIC POLYMERS**

Klas Allmér, Täby, Sweden, assignor to Amersham Pharmacia Biotech AB, Upsala, Sweden

PCT No. PCT/SE95/00403, § 371 Date Jan. 6, 1997, § 102(e) Date Jan. 6, 1997, PCT Pub. No. WO95/29203, PCT Pub. Date Nov. 2, 1995

PCT Filed Apr. 13, 1995, Ser. No. 727,386

Claims priority, application Sweden, Apr. 20, 1994, 9401327 Int. Cl.<sup>6</sup> C08J 7/04; 7/18

U.S. Cl. 522—46

17 Claims

1. A method for hydrophilizing a hydrophobic plastic surface which includes a hydrophobic polymer having hydrogens bound to sp<sup>3</sup>-hybridized carbon atoms, comprising

(i) contacting the plastic surface which includes a hydrophobic polymer having hydrogens bound to sp<sup>3</sup>-hybridized carbon atoms with a liquid comprising water or a mixture of water and a water-miscible organic solvent having dissolved therein (a) a hydrogen-abstracting ultraviolet initiator, and (b) a hydrophilic polymer which has one or more alkene groups, and (ii) irradiating the solution with ultraviolet light which activates the initiator.

5,773,489

**DENTAL INORGANIC-ORGANIC COMPOSITE FILLERS**

Hisashi Sato, Tokyo, Japan, assignor to GC Corporation, Tokyo, Japan

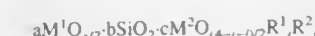
Filed Aug. 14, 1996, Ser. No. 689,779

Claims priority, application Japan, Aug. 23, 1995, 7-235987 Int. Cl.<sup>6</sup> A61K 6/00

U.S. Cl. 523—115

5 Claims

1. Dental inorganic-organic composite fillers having a mean particle size of from 0.1 to 50 μm which do not scatter a visible light of from 360 to 830 nm in the particles thereof, have a refractive index n<sub>D</sub> by the D-line of sodium in the range of 1.460 ≤ n<sub>D</sub> ≤ 1.600, and which are obtained by grinding a material represented by the following mean empirical formula:



wherein

M<sup>1</sup> is one or more members selected from the group consisting of Ti, Zr, Y, La, Ta and Al, which is bonded to Si or M<sup>2</sup> via the crosslinked oxygen; and x is a valence of M<sup>1</sup>;

M<sup>2</sup> is Si and/or Ti;

R<sup>1</sup> is a non-reactive group; and

R<sup>2</sup> is an organic reactive group having been reacted with an organic compound;

i is 0, 1, or 2; and j is 1, 2, or 3, provided that i and j are satisfied with 1 ≤ (i+j) ≤ 3; and

a, b, and c are each a molar ratio, provided that a, b, and c are satisfied by 0 ≤ a/(a+b) ≤ 0.65 and 0.02 ≤ c/(a+b) ≤ 3.0.



(II) 1. A composition comprising (a) 100 pbw polyphthalamide; (b) from about 10 to about 100 pbw of a bromine-containing organic compound selected from the group consisting of brominated polystyrene and polydibromostyrene; (c) from about 0.5 to about 50 pbw sodium antimonate; and (d) from about 0.1 to about 10 pbw calcium oxide.

5,773,501

**FLAME RETARDANT STYRENE RESIN COMPOSITION**  
Kenji Watanabe, and Michio Yasuda, both of Osaka, Japan, assignors to Daicel Chemical Industries, Ltd., Tokyo, Japan. Continuation of Ser. No. 368,388, Dec. 30, 1994, abandoned, which is a continuation of Ser. No. 731,425, Jul. 17, 1991, abandoned. This application Dec. 6, 1996, Ser. No. 762,850. Claims priority, application Japan, Aug. 17, 1990, 2-216765. Int. Cl.<sup>6</sup> C08K 3/22; C08L 9/06.

U.S. Cl. 524—411

9 Claims

1. A flame-retardant styrene resin composition comprising 100 parts by weight of a styrene resin consisting of a mixture of an ABS resin and an AS resin, 3-50 parts by weight of a halogen-containing flame retardant selected from the group consisting of a brominated bisphenol A epoxy resin, a tetrabromobisphenol A carbonate digomer, tetrabromobisphenol A, bis(tribromophenoxy)ethane, and mixtures thereof and 0.50 to 15 parts by weight of antimony trioxide having an average particle size of from 5.2-9 microns.

5,773,502

**FIRE RETARDANT BLENDS**

Tohru Takekoshi, Scotia; Farid Fouad Khouri, Clifton Park, both of N.Y.; Franciscus Petrus Maria Merx, and Johannes Jacobus Maria De Moor, both of Bergen op Zoom, Netherlands, assignors to General Electric Company, Schenectady, N.Y.

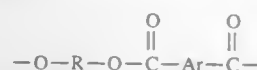
Filed Oct. 14, 1997, Ser. No. 950,092

Int. Cl.<sup>6</sup> C08K 5/03

U.S. Cl. 524—411

20 Claims

1. A substantially flame retardant composition comprising:  
(a) a thermoplastic polyester material comprising structural units of Formula I



Formula I

wherein R represents a divalent hydrocarbon radical containing from about 2 to about 20 carbon atoms, and Ar represents a C<sub>6</sub>-C<sub>15</sub> substituted or unsubstituted divalent aromatic radical;

- (b) from about 5% to about 20% by weight of the thermoplastic polyester material of a halogenated organic fire retardant;  
(c) from about 1% to about 5% by weight of the thermoplastic polyester material of an antimony oxide;  
(d) from about 0.25% to about 5% by weight of the thermoplastic polyester and copolyester of an organo clay; and  
(e) from about 0.02% to about 2% of the thermoplastic polyester material of a fluorocarbon polymer.

5,773,503

**COMPACTED MINERAL FILLER PELLET AND METHOD FOR MAKING THE SAME**

William P. Steen, Littleton, and David R. Bloomfield, Castle-rock, both of Colo., assignors to Luzenac America, Inc., Englewood, Colo.

Filed Dec. 11, 1996, Ser. No. 764,619

Int. Cl.<sup>6</sup> C08K 3/34; C09C 1/02

U.S. Cl. 524—445

19 Claims

15. A method to make a polymeric compound having improved physical properties, comprising:

- (a) providing mineral filler particles having a median particle size of from about 0.2 μm to about 20 μm, wherein said mineral filler particles are selected from the group consisting of talc, clay, kaolin, montmorillonite, bentonite and wollastonite;  
(b) mixing said mineral filler particles with a compaction additive to form a filler/additive mixture, wherein said compaction additive is selected from the group consisting of sulfonates, amines and amides;

- (c) forming said filler/additive mixture into compacted mineral filler pellets in the absence of a polymer; and  
(d) mixing said pellets with a polymer to form a compound, wherein said compound has at least one improved physical property selected from the group consisting of increased long term heat aging (LTHA), less yellow coloration, increased blue coloration, increased whiteness and increased scratch resistance.

5,773,504

**HETEROGENEOUS SILICA CARBON BLACK-FILLED RUBBER COMPOUND**

Richard Robinson Smith, Cuyahoga Falls, and Kevin James Pyle, Uniontown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 527,395, Sep. 13, 1995. This application Apr. 11, 1997, Ser. No. 827,767

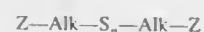
Int. Cl.<sup>6</sup> C08K 3/00

U.S. Cl. 524—492

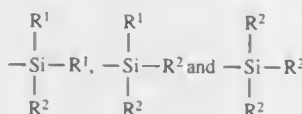
23 Claims

1. A process for the production of a heterogeneous silica/carbon black-filled rubber compound comprising

- (a) intimately dispersing 0.5 to 50 phr of a silica coupler selected from the group consisting of organosilicon compounds of the formula:



in which Z is selected from the group consisting of



where

R<sup>1</sup> is an alkyl group of 1 to 4 carbon atoms, cyclohexyl or phenyl;

R<sup>2</sup> is alkoxy of 1 to 8 carbon atoms, or cycloalkoxy of 5 to 8 carbon atoms;

Alk is a divalent hydrocarbon of 1 to 18 carbon atoms and n is an integer of 2 to 8;

and substantially all of the silica filler, wherein the weight ratio of said sulfur containing organosilicon compound to silica filler ranges from 1:100 to 1:5, in a first rubber by mixing at a rubber temperature of from 130° C. to 180° C. for a period of from 10 seconds to 20 minutes to form a silica-filled compound;

(b) separately and intimately dispersing the majority of carbon black in a second rubber, which is different from said first rubber to form a carbon black-filled compound

(c) mixing said silica-filled compound with said carbon black-filled compound to form a heterogeneous silica/carbon black-filled rubber compound.

5,773,505

**POLYMER EMULSIONS WITH BIMODAL MOLECULAR-WEIGHT DISTRIBUTION**

Horst Pennewiss, Darmstadt; Claudia Beyer, Seebeim-Jugenheim, both of Germany; Ruediger Jelitte, Bridgewater, N.J.; Bernhard Will, Wiesbaden, Germany; Clemens Auschra, Mainz, Germany, and Juergen Omeis, Bickenbach, Germany, assignors to Roehm GmbH Chemische Fabrik, Darmstadt, Germany

Filed Nov. 12, 1996, Ser. No. 744,141

Claims priority, application Germany, Nov. 11, 1995, 195 42 120.5

Int. Cl.<sup>6</sup> C08L 53/00

U.S. Cl. 524—505

9 Claims

1. A polymer emulsion comprising

5,773,508

**COATING VARNISH COMPOSITION AND ANTIFOULING COATING COMPOSITION**

Kazuyoshi Tendo, Ishioka; Seiji Tai; Koichi Kamijima, both of Hitachi, and Hiroyuki Tanaka, Mito, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Sep. 28, 1995, Ser. No. 535,581

Claims priority, application Japan, Sep. 29, 1994, 6-233940; Sep. 29, 1994, 6-233941; Sep. 29, 1994, 6-233942

Int. Cl.<sup>6</sup> C08L 33/04; C09D 5/16

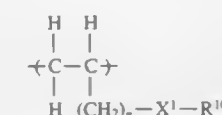
U.S. Cl. 524—549

12 Claims

1. An antifouling coating composition comprising

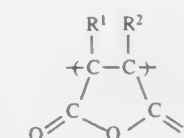
- (i) a biodegradable polymer (A) comprising at least one constituent unit (a) represented by the formula:

(IV)

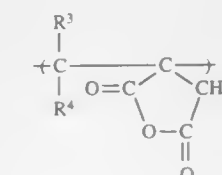


wherein n is zero or 1; X<sup>1</sup> is an oxygen atom, a sulfur atom or —NH—; and R<sup>10</sup> is a straight, branched or cyclic alkyl group, an aryl group, a heterocyclic group, an aralkyl group or an acyl group, R<sup>10</sup> being able to be substituted with an alkoxy-carbonyl group, and at least one constituent unit (b) selected from the group consisting of formulae (I), (II) and (III):

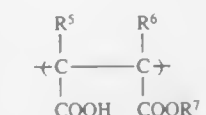
(I)



(II)



(III)



wherein in the formula (I), R<sup>1</sup> and R<sup>2</sup> are independently a hydrogen atom, a chlorine atom, a bromine atom, a methyl group, an ethyl group or a phenyl group; in the formula (II), R<sup>3</sup> and R<sup>4</sup> are independently a hydrogen atom, a chlorine atom, a bromine atom, or a substituted or unsubstituted methyl or ethyl group; and in the formula (III), R<sup>5</sup> and R<sup>6</sup> are independently a hydrogen atom, a methyl group or an ethyl group, and R<sup>7</sup> is a straight, branched or cyclic alkyl group, an aryl group, a heterocyclic group or an aralkyl group, which may have one or more substituents, and provided that when a constituent unit represented by formula (I) is a constituent unit of the polymer (A), in formula (IV) there is excluded the case where n is zero, X<sup>1</sup> is an oxygen atom and R<sup>10</sup> is an alkyl group having 1 or 2 carbon atoms or an acyl group having 1 to 5 carbon atoms, and

- (ii) an antifouling agent.

- 1.) a continuous phase comprising poly(meth)acrylic acid esters and one or more d-oligomers, the poly(meth)acrylic acid esters and oligomers having a bimodal molecular-weight (M<sub>w</sub>) distribution,  
2.) a graft or block polymerizate of an olefin copolymerizate and one or more methacrylic acid esters, and  
3.) a disperse phase of at least one olefin copolymerizate, wherein said disperse phase is distributed in the continuous phase.

5,773,506

**PRESSURE SENSITIVE ADHESIVE COMPRISING A BLOCK COPOLYMER HAVING LOW MOLECULAR WEIGHT ENDBLOCKS AND ENDBLOCK-COMPATIBLE TACKIFIER OR OIL**

Mark K. Nestegard, and Jingjing Ma, both of Woodbury, Minn., assignors to Minnesota Mining and Manufacturing, St. Paul, Minn.

Continuation of Ser. No. 601,813, Feb. 15, 1996, abandoned, which is a continuation of Ser. No. 397,819, Mar. 3, 1995, abandoned. This application Dec. 9, 1996, Ser. No. 762,053

Int. Cl.<sup>6</sup> C08L 93/04; 53/02; 57/02; C08K 5/01

U.S. Cl. 524—505

7 Claims

1. A method of reducing the elastic index of a block copolymer pressure sensitive adhesive composition comprising the steps of:

- (1) providing a block copolymer comprising at least one endblock and at least one midblock, wherein said at least one endblock comprises a polymerized monovinyl aromatic having a number average molecular weight less than 8,000 and said at least one midblock comprises a polymerized conjugated diene or hydrogenated derivative thereof;  
(2) providing a tackifier or oil that is sufficiently compatible with said at least one endblock; and  
(3) mixing said tackifier or oil with the block copolymer and forming a blend of an effective amount of said tackifier or oil with said at least one endblock so as to reduce the elastic index of the resulting adhesive composition by at least about 10%.

5,773,507

**ANTI-STATIC COMPOSITION AND PROCESS FOR MAKING SAME**

Michael J. Incorvia, Lansdale, and Stephen A. Fischer, Yardley, both of Pa., assignors to Henkel Corporation, Plymouth Meeting, Pa.

Filed Aug. 25, 1995, Ser. No. 519,324

Int. Cl.<sup>6</sup> C08L 51/00

U.S. Cl. 524—538

25 Claims

1. An antistatic composition comprising a crosslinked thermosetting resin formed by reacting, in the presence of a water-soluble solvent, (a) a polyaminoamide having unreacted primary and secondary amine groups and (b) a polychlorohydrin derivative which is a chlorine-terminated alkoxylated polyol having, on average, at least 1.5 chlorine end groups and from 2 to about 200 moles of alkoxyate, wherein the polyol is selected from the group consisting of glycerol, trimethylol propane, pentaerythritol, dipentaerythritol, and mixtures thereof; and wherein said resin consists of the reaction product of components (a) and (b).



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5,773,509

**HEAT RESISTANT RESIN COMPOSITION, HEAT RESISTANT FILM ADHESIVE AND PROCESS FOR PRODUCING THE SAME**

Tatsuhiro Yoshida, Kawasaki; Keizo Takahama, Yokohama, and Syusaku Okamoto, Kawasaki, all of Japan, assignors to Sumitomo Bakelite Company Limited, Tokyo, Japan  
Filed Mar. 7, 1995, Ser. No. 399,644

Claims priority, application Japan, Mar. 8, 1994, 6-036887; Jun. 23, 1994, 6-141912; Jul. 18, 1994, 6-164975; Jul. 22, 1994, 6-170924

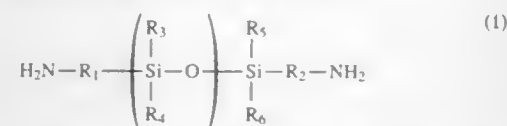
Int. Cl.<sup>6</sup> C08L 77/00; C08G 73/10

U.S. Cl. 524—600

12 Claims

1. A heat resistant resin composition which comprises, as the main components,

- (A) 100 parts by weight of an organic solvent-soluble polyimide resin having a glass transition temperature of 350° C. or less, said polyimide resin comprising, as the main acid component, 4,4'-oxydiphthalic dianhydride and, as the amine components, (i) a diaminosiloxane compound of formula (1)



wherein, R<sub>1</sub> and R<sub>2</sub> represent independently divalent aliphatic groups having 1 to 4 carbon atoms or divalent aromatic groups; R<sub>3</sub>, R<sub>4</sub>, R<sub>5</sub> and R<sub>6</sub> represent independently monovalent aliphatic or aromatic groups; and m represents an integer of 1 to 20, and (ii) 1,3-bis(3'-aminophenoxy)benzene,

(B) 5 to 100 parts by weight of an epoxy compound having at least two epoxy groups in one molecule,

(C) 0.1 to 20 parts by weight of a compound having an active hydrogen group which can react with the epoxy compound (B); and

(D) 0.1 to 50 parts by weight of a silane coupling agent.

5,773,510

**PROCESSES FOR THE PREPARATION OF BRANCHED POLYMERS**

Peter M. Kazmaier, Mississauga; Karen A. Moffat, Brantford; Marko D. Saban, Etobicoke; Richard P. N. Veregin, Mississauga; Michael K. Georges, Guelph; Gordon K. Hamer, Mississauga, all of Canada; Toyofumi Inoue, Kanagawa-Ken, Japan, and Stephan V. Drappel, Toronto, Canada, assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 30, 1995, Ser. No. 413,645

Int. Cl.<sup>6</sup> C08F 279/00; 279/02; 283/01

U.S. Cl. 525—26

25 Claims

1. A process for the preparation of branched thermoplastic resins comprising:

heating a mixture of an unsaturated resin, a free radical initiator, and a stable free radical agent, wherein a free radical initiator fragment and the stable free radical agent add to unsaturated bonds of the unsaturated resin;

adding to the heated mixture at least one polymerizable monomer; and

cooling the mixture, and wherein the resulting product is a branched thermoplastic resin with arms or branches comprised of polymerized monomer with substantially uniform length and narrow polydispersity.

5,773,511

**RESIN COMPOSITION USED IN COATING COMPOSITION FOR COATING POLYOLEFIN RESIN MOLDINGS, COATING COMPOSITION COMPRISING SUCH RESIN COMPOSITION, AND PROCESS FOR COATING SUCH COATING COMPOSITION**

Yoshiaki Marutani, and Mika Ohsawa, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima-Ken, Japan

Filed Nov. 20, 1995, Ser. No. 560,618

Claims priority, application Japan, Nov. 24, 1994, 6-290101; Nov. 8, 1995, 7-289757

Int. Cl.<sup>6</sup> C08L 23/26; 23/36; 61/28

U.S. Cl. 525—66

18 Claims

1. A resin composition used in a coating composition for polyolefin resin moldings, comprising:

- (1) 40–90 wt. % of a grafted and chlorinated polyolefin oligomer obtained by graft polymerizing a vinyl polymerizable monomer to a chlorinated polyolefin, said grafted and chlorinated polyolefin oligomer having a primary hydroxyl group at a position of 15 to 40 atoms away from the vinyl graft polymer chain grafted to the chlorinated polyolefin, a number average molecular weight of 5,000 to 50,000, a weight average molecular weight of 5,000 to 100,000, 0.4 to 2.5 mole/kg-resin of a primary hydroxyl group, 50 to 95 wt. % of said vinyl graft polymer chain, and 5 to 50 wt. % of the chlorinated polyolefin used as a starting material, and
- (2) 60 to 10 wt. % of an imino, methylol or complete alkoxy melamine resin having a weight average molecular weight of 300 to 20,000.

5,773,512

**COMPOUNDS AND METHODS**

Balan Chenera, Audubon; John Elliott, Wayne; Michael Moore, Media, and Joseph Weinstock, Phoenixville, all of Pa., assignors to SmithKline Beecham Corp., Philadelphia, Pa.

PCT No. PCT/US94/14414, § 371 Date Jun. 12, 1996, § 102(e) Date Jun. 12, 1996, PCT Pub. No. WO95/16712, PCT Pub. Date Jun. 22, 1995

PCT Filed Dec. 15, 1994, Ser. No. 663,148

Int. Cl.<sup>6</sup> C08F 8/00; C08L 83/00

U.S. Cl. 525—100

26 Claims

1. A method for preparing a resin-bound compound, wherein the compound is an aromatic carbocycle comprising an aromatic carbon atom and at least one substituent, X, A, B or C, said method comprising the steps of:

- (i) coupling the aromatic carbon to a polymeric resin support through a silane linker to give a resin-bound aryl silane intermediate; and
- (ii) performing additional synthetic chemistry on at least one substituent, X, A, B or C, in order to modify said substituent, with the proviso that not all of substituents X, A, B or C are hydrogen and not all of X, A, B or C are alkyl.

5,773,513

**HYDROXY FUNCTIONAL ACRYLIC POLYMER PREPARED VIA SKEW FEED POLYMERIZATION**

Jozef Huybrechts, Oud-Turnhout, Belgium, and Kerstin Stranmaier, Hennef, Germany, assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 4, 1996, Ser. No. 627,529

Int. Cl.<sup>6</sup> C08K 5/05

U.S. Cl. 525—161

11 Claims

1. A waterborne coating composition comprising:

- a) 30–95 weight percent solids of a copolymer, comprising,
- i) 20–70 weight percent of a vinyl aromatic,
- ii) 10–80 weight percent of a reaction product of a monoepoxyester and an unsaturated acid functional monomer,

iii) 0–40 weight percent of a hydroxy functional monomer, and

iv) 0–70 weight percent of other polymerisable compounds, wherein the copolymer is prepared by a skew feed polymerization process having a plurality of feed streams charged to a reactor and one feed stream comprises,

- 1) 5–60 weight percent of the unsaturated acid functional monomer,
- 2) 40–95 weight percent of the reaction product of a monoepoxyester and an unsaturated acid functional monomer, and
- 3) 0–55 weight percent of the other polymerisable compounds; and the remaining feed streams comprise the balance of components i–iv; and

b) 5–70 weight percent solids of a curing agent.

5,773,514

Patent Not Issued For This Number

5,773,515

**ENGINEERED POLYOLEFIN MATERIALS**

Satchit Srinivasan, Carrollton, and Edward Szczepaniak, Arlington, both of Tex., assignors to Solvay Engineered Polymers, Grand Prairie, Tex.

Filed Aug. 25, 1994, Ser. No. 296,293

Int. Cl.<sup>6</sup> C08L 23/04

U.S. Cl. 525—240

4 Claims

1. A thermoplastic material consisting essentially of a blend of about 50–80% by weight of a homopolymer of propylene having an isotactic index which is greater than 0.93 or a crystallinity which is greater than 56%; about 12–22% by weight of a copolymer of ethylene and butene produced with a metallocene or Kaminsky catalyst and having a molecular weight distribution (Mw/Mn) which is less than or equal to 3; about 11–23% by weight of a copolymer of ethylene and octene produced with a metallocene or Kaminsky catalyst and having a molecular weight distribution (Mw/Mn) which is less than or equal to 3; and about 0.1 to 10% by weight of filler.

5,773,516

**PROPYLENE POLYMERS**

Stephan Hüffer, Ludwigshafen; Meinolf Kersting, Neustadt; Franz Langhauser; Rainer Alexander Werner, both of Bad Dürkheim; Stefan Seelert, Frankenthal; Patrik Müller, Kaiserslautern, and Jürgen Kerth, Carlsberg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Dec. 6, 1996, Ser. No. 761,341

Int. Cl.<sup>6</sup> C08F 10/00; 4/64

U.S. Cl. 525—242

9 Claims

1. A propylene polymer which comprises from 25 to 97% by weight of a propylene polymer (I) containing from 0 to 15% by weight of copolymerized C<sub>2</sub>-C<sub>10</sub>-alk-1-enes and also comprises from 3 to 75% by weight of a further propylene polymer (II) containing from 15 to 80% by weight of copolymerized C<sub>2</sub>-C<sub>10</sub>-alk-1-enes, obtained by two-stage polymerization of propylene and C<sub>2</sub>-C<sub>10</sub>-alk-1-enes in the presence of a Ziegler-Natta catalyst system which comprises a titanium-containing solid component a) comprising a compound of magnesium, a halogen, silica gel as support and a carboxylic ester as electron donor compound, and also as cocatalysts an aluminum compound b) and a further electron donor compound c), where, in a first polymerization stage, propylene is polymerized in the presence or absence of further C<sub>2</sub>-C<sub>10</sub>-alk-1-enes at from 50° to 100° C., pressures in the range from 15 to 40 bar and a mean residence time of from 0.5 to 5 hours and subsequently, in a second polymerization stage, a mixture of propylene and further C<sub>2</sub>-C<sub>10</sub>-alk-1-enes is polymerized at from 30° to 100° C., pressures in the range from 15 to 40 bar and mean residence times of from 0.5 to 5 hours onto the propylene polymer (I) obtained from the first polymerization stage, and the silica gel used as support for the titanium-containing solid component has a mean particle diameter of from 5 to 200 μm, a mean particle diameter of the primary particles of from 1 to 10 μm and voids or channels having a mean diameter of from 1 to 10 μm, which voids or channels have a macroscopic volume as a proportion of the total particle in the range from 5 to 20%.

5,773,517

PROCESS FOR THE PRODUCTION OF  
THERMOPLASTIC RESIN COMPOSITIONHaruhisa Masuda; Takashi Oku, and Tsugunori Kashimura,  
all of Kurashiki, Japan, assignors to Kuraray Co., Ltd.,  
Kurashiki, JapanPCT No. PCT/JP96/02962, § 371 Date Jun. 11, 1997, § 102(e)  
Date Jun. 11, 1997, PCT Pub. No. WO97/13801, PCT Pub.  
Date Apr. 17, 1997

PCT Filed Oct. 14, 1996, Ser. No. 849,243

Claims priority, application Japan, Oct. 12, 1995, 7-264276  
Int. Cl.<sup>6</sup> C08L 67/02

U.S. Cl. 525—90

8 Claims

1. A process for producing thermoplastic resin compositions, which comprises the successive steps of:  
mixing under melting conditions a polyester resin (I) and an addition polymer (II) having on only one end thereof 0.5 to 1 group of a functional group capable of reacting with polyester resin in a ratio by weight between the former and the latter of 97/3 to 20/80, and  
solid phase polymerizing the mixture,

to obtain a thermoplastic resin composition comprising:

- (1) a high molecular polyester resin (I') derived from said polyester resin (I),
- (2) said addition polymer (II) having on only one end thereof 0.5 to 1 group of a functional group capable of reacting with polyester resins, and
- (3) a di-block copolymer (III) consisting essentially of a polyester block (i) derived from said polyester resin (I) and a polymer block (ii) derived from said addition polymer (II);

in said thermoplastic resin composition the ratio between the sum of the weight of said polyester resin (I') and the weight of said polyester block (i) contained in said block copolymer (III) and the sum of the weight of said addition polymer (II) and the weight of said polymer block (ii) contained in said block copolymer (III) being 97/3 to 20/80 and the molar ratio between said block copolymer (III) and said addition polymer (II) being at least 20/80.

5,773,518

ESTERIFIED STYRENE/MALEIC ANHYDRIDE  
POLYMERCharles R. Keil, Foothill Ranch, and Randall William Kautz,  
Irvine, both of Calif., assignors to Morton International,  
Inc., Chicago, Ill.Division of Ser. No. 711,297, Sep. 6, 1996, Pat. No. 5,698,370,  
which is a continuation of Ser. No. 386,974, Feb. 10, 1995,  
Pat. No. 5,576,145. This application Aug. 15, 1997, Ser. No.  
911,890Int. Cl.<sup>6</sup> C08F 8/14

U.S. Cl. 525—327.7

8 Claims

1. A polymer comprising a backbone formed of monomers between about 45 and about 65 mole percent of which are selected from the group consisting of styrene, C<sub>1</sub>–C<sub>6</sub>-substituted styrene and mixtures thereof and between about 35 and about 55 mole percent of which monomers are selected from the group consisting of maleic anhydride, alkyl-substituted maleic anhydride, aromatic-substituted maleic anhydride and mixtures thereof, monomers of said group ii) providing anhydride groups to the backbone of said polymer, said anhydride groups being mono-esterified to between about 50 and about 65 mole percent with an alkyl, aryl, cycloalkyl, alkylaryl, or arylalkyl first alcohol a) having a molecular weight of at least 100 or mixture of said first alcohols a), and said anhydride groups being mono-esterified to between about 15 and about 50 mole percent of a C<sub>1</sub>–C<sub>3</sub>-alkyl second alcohol b) or mixture of said second alcohols b), said polymer being mono-esterified to at least about 80 mole percent total of said anhydride groups, said polymer having a weight average molecular weight of between about 80,000 and about 200,000, and an acid number of between about 170 and about 220.

5,773,519

PROCESS FOR PRODUCING MODIFIED CROSS-  
LINKED POLYMER PARTICLESNobuyuki Ito, Yokkaichi; Masayuki Hattori, Aichi-ken; Tohru  
Masukawa, Yokkaichi; Satoshi Ishikawa, Suzuka, and  
Minoru Kondoh, Yokkaichi, all of Japan, assignors to Japan  
Synthetic Rubber Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 389,193, Feb. 15, 1995, abandoned.

This application Mar. 10, 1997, Ser. No. 814,480

Claims priority, application Japan, Feb. 15, 1994, 6-039340  
Int. Cl.<sup>6</sup> C08F 267/06; 289/00

U.S. Cl. 525—276

20 Claims

1. A process for producing modified cross-linked polymer particles, comprising the steps of:

- (1) polymerizing a monomer mixture comprising 50% by weight or more of at least one cross-linking monomer selected from the group consisting of divinylbenzene, ethylene glycol dimethacrylate and trimethylolpropane trimethacrylate in the presence of seed polymer particles to form cross-linked polymer particles (A), wherein 3–100 parts by weight of said cross-linking monomer is added to one part by weight of said seed polymer particles; and
- (2) polymerizing 0.01 to 900 parts by weight of a monomer component (B) containing 50% by weight or more of at least one monomer selected from the group consisting of aromatic monoalkenyl compounds, acrylic acid esters, methacrylic acid esters, fluoroalkyl acrylates, fluoroalkyl methacrylates, unsaturated carboxylic acids, conjugated diene compounds, vinyl esters and organosilane compounds, in the presence of 100 parts by weight of said cross-linked polymer particles (A).

5,773,520

IMPACT ADDITIVE OF THE CORE/SHELL TYPE FOR  
THERMOPLASTIC POLYMERSChris Bertelo, Scotch Plains, N.J.; Gilles Meunier, Mazerolles,  
France; André Lermite, Lescar, France; Pascale Dargelos,  
Billere, France, and Xavier Drujon, Jurancon, France,  
assignors to Elf Atochem North America, Inc., Philadelphia,  
Pa.

Filed Oct. 28, 1996, Ser. No. 738,768

Claims priority, application France, Oct. 27, 1995, 95 12706  
Int. Cl.<sup>6</sup> C08L 69/00

U.S. Cl. 525—309

7 Claims

1. Impact additive of the core/shell type composed of a core based on alkyl acrylate or on a polyorganosiloxane rubber and a shell based on poly(alkyl methacrylate), or on a styrene-acrylonitrile copolymer, characterized in that the said impact additive comprises from:

- a) 70% to 90% by weight of a crosslinked elastomeric core which is composed:
  - 1) of 20% to less than 100% by weight of a nucleus composed of a copolymer (I) of n-alkyl acrylate, the alkyl group of which has a carbon number ranging from 5 to 12, of a polyfunctional crosslinking agent possessing unsaturated groups in its molecule, at least one of which is of a vinyl group, and optionally of a polyfunctional grafting agent possessing unsaturated groups in its molecule, at least one of which is an allyl group.
  - 2) of more than 0 and 80% by weight, of a covering composed of a copolymer (II) of n-alkyl acrylate, the alkyl group of which has a carbon number ranging from 4 to 12, or of a grafting agent possessing allyl groups, the said covering containing a molar amount of grafting agent ranging from 0.05% to 2.5%, said grafting agent having only allyl functional groups, all having the same reactivity,
- b) 30% to 10% by weight of a shell grafted onto the said core composed of a polymer of an alkyl methacrylate, the alkyl group of which has a carbon number ranging from 1 to 4, or alternatively of a statistical copolymer of an alkyl methacrylate, the alkyl group of which has a carbon number ranging from 1 to 4, and of an alkyl acrylate, the alkyl group of which has a carbon number ranging from 1 to 8, containing a molar

amount of alkyl acrylate ranging from 5% to 40%, or alternatively composed of a styrene-acrylonitrile copolymer.

5,773,521

COUPLING TO PRODUCE INSIDE-OUT STAR  
POLYMERS WITH EXPANDED CORESRonald James Hoxmeier, and Arthur R. Bean, Jr., both of  
Houston, Tex., assignors to Shell Oil Company, Houston,  
Tex.

Filed Dec. 19, 1995, Ser. No. 574,795

Int. Cl.<sup>6</sup> C08F 297/04

U.S. Cl. 525—316

14 Claims

1. A process comprising:
- a) introducing into a polymerization zone at least one polymerizable first monomer selected from the group consisting of conjugated alkenes, monoalkenyl aromatic compounds and mixtures thereof under polymerization conditions employing an organolithium initiator;
  - b) polymerizing said at least one polymerizable monomer with said organolithium initiator, thereby forming a first polymerization mixture;
  - c) thereafter combining with said first polymerization mixture a mixture of at least one monoalkenyl aromatic compound and at least one polyalkenyl aromatic compound to produce a second polymerization mixture a molar ratio of said monoalkenyl aromatic compound to said polyalkenyl aromatic compound being about 4:1;
  - d) thereafter combining at least one polymerizable second monomer selected from the group consisting of conjugated alkenes, monoalkenyl aromatic compounds and mixtures thereof with said second polymerization mixture under polymerization conditions and polymerizing to give a polymer product.

5,773,522

## POLYMER-BOUND CAMPTOTHECIN DERIVATIVES

Francesco Angelucci, and Antonino Suarato, both of Milan,  
Italy, assignors to Pharmacia S.p.A., Milan, Italy  
PCT No. PCT/EP94/03154, § 371 Date Jun. 8, 1995, § 102(e)  
Date Jun. 8, 1995, PCT Pub. No. WO95/10304, PCT Pub.  
Date Apr. 20, 1995

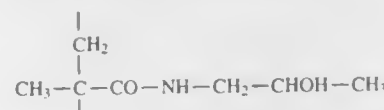
PCT Filed Sep. 21, 1994, Ser. No. 448,330

Claims priority, application United Kingdom, Oct. 8, 1993,  
9320781Int. Cl.<sup>6</sup> C08F 20/56; 120/56; 220/56; A01N 43/42

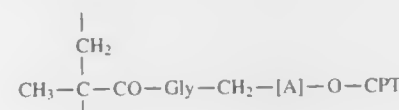
U.S. Cl. 525—329.4

10 Claims

1. A polymeric conjugate which consists essentially of:
- (i) from 60 to 99 mol % of N-(2-hydroxypropyl)methacryloylamide units of formula 1:

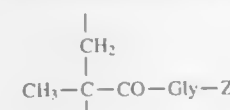


- (ii) from 1 to 40 mol % of 20-O-(N-methacryloyl)glycylaminoacyl)camptothecin units of formula 2



wherein is a spacer group having respective terminal amino and carbonyl groups which are separated by at least three atoms and O-CPT is a camptothecin, the C-20 hydroxy group of the camptothecin being linked to the terminal carbonyl group of the spacer group; and

- (iii) from 0 to 10 mol % of N-methacryloyl)glycine or N-(2-hydroxy-propyl)methacryloyl)glycinamide units of formula 3:



wherein Z is hydroxy or a radical of the formula —NH—CH<sub>2</sub>—CH(OH)—CH<sub>3</sub>.

5,773,523

1,3,4-THIAZOLE ETHER CURING SYSTEMS FOR  
CHLORINE CONTAINING POLYMERSThomas J. Karol, Norwalk; Ronald J. Tepper, Fairfield, and  
Lester A. Dow, Newtown, all of Conn., assignors to R.T.  
Vanderhilt Company, Inc., Norwalk, Conn.

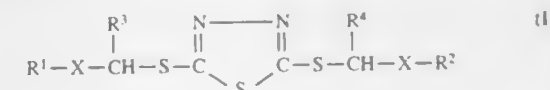
Filed Dec. 14, 1995, Ser. No. 574,567

Int. Cl.<sup>6</sup> C08K 5/46; 5/47; C08F 8/30; 8/34

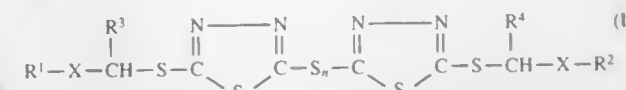
U.S. Cl. 525—330.4

10 Claims

1. A curable composition comprising a major amount of chlorinated polymer selected from the group consisting of polychloroprene, chlorinated polyolefins, chlorosulfonated polyolefins, epichlorohydrin, copolymers of epichlorohydrin and ethylene oxide or propylene oxide and mixtures thereof, and an ether derivative of 2,5-dimercapto-1,3,4-thiadiazole having the formulae I and II



and



wherein n=1–2, X represents O or S, R<sup>1</sup> and R<sup>2</sup> represent linear or branched chain alkyl groups having 1 to 8 carbon atoms and R<sup>3</sup> and R<sup>4</sup> represent hydrogen or alkyl groups having 1 to 8 carbon atoms and wherein the ether derivative is present in an amount effective to cure said chlorinated polymer.

5,773,524

## EPOXIDIZED LIQUID ELASTOMERIC COPOLYMERS

Thomas S. Coolbaugh; Frederick C. Loveless, both of Yardley,  
Pa.; Demetrios N. Matthews, Ewing, and Leslie R. Rudnick,  
Lawrenceville, both of N.J., assignors to Mobil Oil Corpora-  
tion, Fairfax, Va.Continuation-in-part of Ser. No. 382,814, Feb. 3, 1995, Pat.  
No. 5,545,783, which is a division of Ser. No. 179,051, Jan. 7,  
1994, Pat. No. 5,387,730, which is a division of Ser. No.  
992,341, Dec. 17, 1992, Pat. No. 5,288,937, which is a continu-  
ation of Ser. No. 907,959, Aug. 6, 1992, Pat. No. 5,210,359,  
which is a division of Ser. No. 466,135, Jan. 16, 1990, Pat. No.  
5,149,895. This application Aug. 11, 1995, Ser. No. 514,200Int. Cl.<sup>6</sup> C08F 36/14; 236/14

U.S. Cl. 525—332.8

1 Claim

1. An epoxidized liquid star-branched block polymer which prior to epoxidation comprises at least two alternating blocks

I-B

wherein each free end of the polymer is an I block, and  
I is a block of at least one polymerized conjugated diene having at least five (5) carbon atoms and the following formula





wherein  $R^1$ - $R^6$  are each hydrogen or a hydrocarbyl group, provided that at least one of  $R^1$ - $R^6$  is a hydrocarbyl group and provided that the structure of the residual double bond in the polymerized block I has the following formula



wherein  $R'$ ,  $R''$ ,  $R'''$  and  $R^{IV}$  are each hydrogen or a hydrocarbyl group, provided that either both  $R'$  and  $R''$  are hydrocarbyl groups or both  $R'''$  and  $R^{IV}$  are hydrocarbyl groups;

B is a block of a polymer of at least one conjugated diene, different from the diene used to polymerize the block I, having at least four (4) carbon atoms and the following formula



wherein  $R^7$ - $R^{12}$  are each hydrogen or a hydrocarbyl group, provided that the structure of the residual double bond in the polymerized block B has the following formula



wherein  $R^a$ ,  $R^b$ ,  $R^c$  and  $R^d$  are each hydrogen (H) or a hydrocarbyl group, provided that one of  $R^a$  or  $R^b$  is hydrogen, one of  $R^c$  or  $R^d$  is hydrogen and at least one of  $R^a$ ,  $R^b$ ,  $R^c$  or  $R^d$  is a hydrocarbyl group.

5,773,525

**PROCESS OF OXYALKYLATION EMPLOYING SOLID, HETEROGENEOUS OXYALKYLATION CATALYSTS**  
José F. Pazos, Havertown, Pa., assignor to Arco Chemical Technology, L.P., Greenville, Del.

Division of Ser. No. 554,010, Nov. 6, 1995, Pat. No. 5,679,764.  
This application Jun. 20, 1997, Ser. No. 880,040

Int. Cl.<sup>6</sup> C08G 65/28

U.S. Cl. 525-409

3 Claims

1. A process for the preparation of a polyoxyalkylene polyether having low unsaturation, comprising:

- preparing an oligomeric polyoxyalkylene polyether by:
  - contacting a hydroxyl-functional starter having a first molecular weight with a catalytically effective amount of a solid, essentially insoluble oxyalkylation catalyst consisting essentially of magnesium oxide having a particle size of from 100 to 1000 mesh, wherein said amount of magnesium oxide is about 1 weight percent or more based on the weight of said oligomeric polyoxyalkylene polyether;
  - oxyalkylating said starter with one or more alkylene oxides to form an oligomeric polyoxyalkylene polyether of second molecular weight, said second molecular weight being higher than said first molecular weight; and
  - separating said solid oxyalkylation catalyst from said oligomeric polyoxyalkylene polyether;
- adding to said oligomeric polyoxyalkylene polyether a catalytically effective amount of a double metal cyanide complex catalyst;
- oxyalkylating said oligomeric polyoxyalkylene polyether with one or more alkylene oxides; and
- recovering a polyoxyalkylene polyether having an unsaturation lower than 0.020 meq/g and a molecular weight higher than the molecular weight of said oligomeric polyoxyalkylene polyether.

# 5,773,526 METHOD AND DEVICE FOR ANAEROBIC FERMENTATION OF SOLID ORGANIC WASTE SUBSTANCES

Meine Van Dijk, Harich, and Jelle Faber, Elahuizen, both of Netherlands, assignors to Paques Solid Waste Systems B.V., Balk, Netherlands

PCT No. PCT/NL95/00284, § 371 Date Apr. 3, 1997, § 102(e) Date Apr. 3, 1997, PCT Pub. No. WO96/07726, PCT Pub. Date Mar. 14, 1996

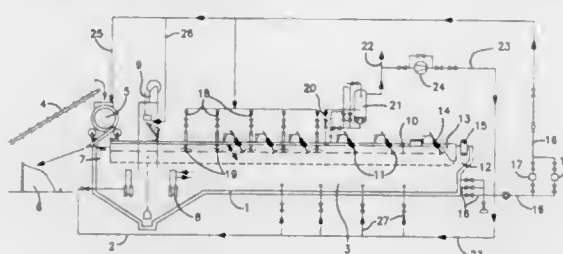
PCT Filed Aug. 25, 1995, Ser. No. 809,041

Claims priority, application Netherlands, Sep. 7, 1994, 9401454

Int. Cl.<sup>6</sup> C12M 1/113; C02F 11/04

U.S. Cl. 210-603

9 Claims



1. Method for the anaerobic fermentation of solid organic substances in a reactor tank (1) in which there is a mixture of the solid organic substances and an anaerobic fluid, in which a layer of material (10) floating on an anaerobic methane-generating fluid is moved from a supply end (7) to a discharge end (14) of said reactor tank and a methane-forming reaction is induced in the anaerobic methane-generating fluid under the floating layer (10), and in which fluid is sprayed in and/or on the floating layer (10), characterized in that the fluid sprayed in and/or on the floating layer is extracted from the anaerobic methane-generating zone under the floating layer (10) in order to induce fermentation in the floating layer and also, by means of percolation, to remove acid fermentation products from the floating layer and to drive them to the anaerobic methane-generating zone under the floating layer, and in that the floating layer (10) is moved in such a controlled manner that the said fermentation reaction can take place in the floating layer.

7. Reactor for the anaerobic fermentation of solid organic substances, comprising a reactor tank (1) with a supply end (7) for a mixture of solid waste and anaerobic methane generating fluid and a discharge end (14) for a layer (10) floating on the anaerobic methane-generating fluid, means (11) for moving the floating layer from the supply end (7) to the discharge end (14), and means (19) for spraying fluid in and/or on the floating layer and means (12, 13) for discharging the floating layer out of the reactor, via a water seal (14), at the discharge end independent of the fluid and slurry located under the floating layer, characterized in that the means (19) for spraying fluid in and/or on the floating layer are connected to leads (18) which can withdraw the fluid from the anaerobic methane-generating zone under the floating layer (10).

5,773,527

**NON-CROSSLINKED, POLYBRANCHED POLYMERS**  
Donald A. Tomalia; David M. Hestrand, both of Midland, and Rui Yin, Mount Pleasant, all of Mich., assignors to Dendritech, Inc., Midland, Mich.

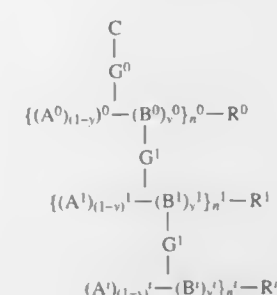
Continuation-in-part of Ser. No. 4,849, Jan. 19, 1993, abandoned, which is a continuation-in-part of Ser. No. 739,167, Aug. 1, 1991, abandoned, which is a continuation-in-part of Ser. No. 573,362, Aug. 27, 1990, abandoned. This application Jan. 20, 1995, Ser. No. 376,100

Int. Cl.<sup>6</sup> C08G 73/04

U.S. Cl. 525-417

28 Claims

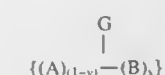
1. A composition of matter comprising non-crosslinked poly-branched polymers having the general formula



wherein:

C is a core molecule; each  $\{(A)-(B)\}$  branch is a linear polymer or copolymer chain; each R is the residual moiety of an initiator;

A and B are polymerizable monomers or comonomers capable of withstanding the conditions required for branching therefrom or grafting thereto, at least during the polymerization of the  $\{(A)-(B)\}$  linear polymer chain and during its grafting to a prior  $\{(A)-(B)\}$  branch; each G is a grafting component, and the designation



indicates that G can extend from either an (A) unit or a (B) unit; n is the degree of polymerization of the indicated generation comb branches; y is the fraction of B units in the indicated generation branch, and has a value of 0.01 to 1; the superscripts 0, 1 and i designate the comb branch generation level, with i beginning at "2" and continuing for the number of reiterative branch set generations in the polymer; and at least n' and n' are  $\geq 2$ .

5,773,528

**DUAL CURE EPOXY BACKSEAL FORMULATION**  
Julio M. Alvarado, Hopewell Junction; Kathleen L. Covert, Kirkwood, both of N.Y., and Joseph P. Kuczynski, Wellington, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 286,591, Aug. 14, 1994, Pat. No. 5,547,713, which is a continuation of Ser. No. 919,653, Jul. 24, 1992, abandoned, which is a division of Ser. No. 607,435, Oct. 31, 1990, abandoned. This application Mar. 19, 1996, Ser. No. 618,545

Int. Cl.<sup>6</sup> C08F 20/00

U.S. Cl. 525-438

5 Claims

1. A liquid coating composition consisting essentially of:  
(i) from 77.3 to 87.0 weight percent of a liquid, multifunctional, bisphenol A epoxy;  
(ii) from 9.7 to 19.3 weight percent of a liquid, multifunctional, hydroxyl-containing organic material chosen from the group consisting of polyether polyols and polyester polyols;  
(iii) from 1.25 to 1.70 weight percent of a complex sulfonium salt photoinitiator selected from the group consisting of sulfonium salts of formulae  $Ar_3S^+X^-$ , wherein Ar is aryl or aryl substituted with butoxy, chloro, phenoxy, acetoxy, thiomethoxy or acetamido and X is selected from the group consisting of  $BF_4$ ,  $PF_6$ ,  $AsF_6$ ,  $SbF_6$  and  $CF_3SO_3$ ;

(iv) from 0.5 to 1.0 weight percent of a complex iodonium salt photoinitiator selected from the group consisting of iodonium salts of formulae  $Ar_2I^+X^-$ , wherein Ar is aryl or aryl substituted with methyl, heptyl, nitro, chloro, trifluoromethyl, phenoxy, thio, bromo, methoxy, carboxy, methoxycarbonyl or acetamido and X is selected from the group consisting of  $BF_4$ ,  $PF_6$ ,  $AsF_6$ , and  $CF_3SO_3$ ; and

(v) from 0.5 to 1.0 weight percent of a complex cupric salt initiator of formula,  $Cu(II)(Y^b)_2$ , wherein Y is an organic or inorganic anion and the product of a times b is -2, said complex cupric salt and said complex iodonium salt generating a Brønsted acid in the presence of heat and said hydroxyl-containing organic material.

# 5,773,529 METHOD AND APPARATUS WHICH REMOVES ODOR AND POLLUTANTS WHEN PREPARING CULLET FOR USE IN AN ELECTROSTATIC BED FILTER

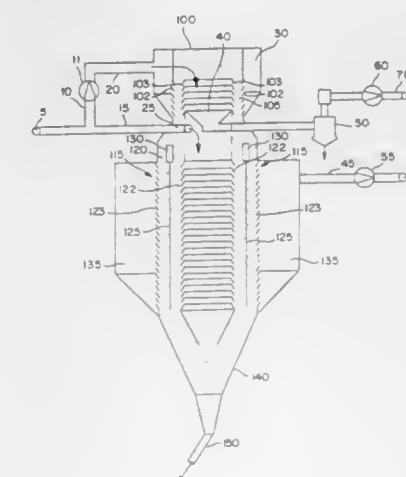
Jeffrey C. Alexander, Kent, United Kingdom, assignor to Sandvik AB, Sandviken, Sweden

Division of Ser. No. 570,984, Dec. 12, 1995. This application Sep. 25, 1996, Ser. No. 719,516

Int. Cl.<sup>6</sup> C03B 3/02

U.S. Cl. 65-168

5 Claims



1. An apparatus for treating cullet before use as a raw material in glass manufacturing process comprising:

- a housing comprising an outer conduit and an inner conduit each of which contains apertures along its length and between which is confined a moving bed of cullet,
- a source of hot gases,
- means of moving the hot gases so that they pass through apertures of the outer conduit, the moving bed of cullet, and the apertures of the inner conduit to pyrolyze odor creating impurities within the cullet and entrain volatile products of pyrolysis into gases leaving the moving bed and
- an incinerator to remove odor creating impurities from gases leaving the moving bed.

5,773,530

## PYRAZOLOPYRIDINE ADENOSINE ANTAGONISTS

Atsushi Akahane, Hyogo; Shintaro Nishimura, Osaka; Hiromichi Itani, Hyogo, all of Japan, and Kieran P.M. Durkin, Folsom, Calif., assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

PCT No. PCT/JP94/02230, § 371 Date Sep. 13, 1996, § 102(e) Date Sep. 13, 1996, PCT Pub. No. WO95/18128, PCT Pub. Date Jul. 6, 1995

PCT Filed Dec. 26, 1994, Ser. No. 663,119

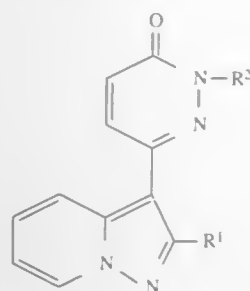
Claims priority, application United Kingdom, Dec. 29, 1993, 9326524; Mar. 4, 1994, 9404323

Int. Cl.<sup>6</sup> C07D 403/04; A13/14; A61K 31/50

U.S. Cl. 544—238

10 Claims

1. A pyrazolopyridine compound of the following formula:



wherein

R<sup>1</sup> is aryl, and

R<sup>2</sup> is cyclo (lower) alkyl or cyclo (lower) alkenyl, each of which may have 1 to 3 suitable substituent(s) selected from the group consisting of oxo, lower alkylenedioxy group, hydroxy, lower alkanoyloxy, tri (lower) alkylsilyloxy, hydroxy (lower) alkyl, lower alkanoyl, carboxy, protected carboxy, hydroxysulfonyl, lower alkyl, lower alkylidene, lower alkanoyl (lower) alkyl, carboxy (lower) alkyl, protected carboxy (lower) alkyl, lower alkanoyl (lower) alkylidene, carboxy (lower) alkylidene, protected carboxy (lower) alkylidene, cyano, cyano (lower) alkyl, cyano (lower) alkylidene, lower alkylidene substituted with unsaturated 3 to 8 -membered heteromonocyclic group containing 1 to 4 nitrogen atom(s) which may have 1 to 4 lower alkyl, lower alkylidene substituted with unsaturated 3 to 8-membered heteromonocyclic group containing 1 to 2 oxygen atom(s) and 1 to 3 nitrogen atom(s) which may have 1 to 4 lower alkyl, lower hydroxyimino, lower alkoxyimino, lower alkanoyl (lower) alkoxyimino, carboxy (lower) alkoxyimino, protected carboxy (lower) alkoxyimino, hydroxysulfonyl (lower) alkoxyimino, lower alkanoyloxyimino, and hydroxysulfonyloxyimino.

5,773,531

## UNSATURATED POLYESTER RESIN COMPOSITION

Stuart B. Smith, Conyers, Ga., assignor to Hehr International Inc., Conyers, Ga.

Division of Ser. No. 629,894, Apr. 10, 1996. This application Aug. 29, 1997, Ser. No. 920,697

Int. Cl.<sup>6</sup> C08F 20/00

U.S. Cl. 525—445

18 Claims

1. A liquid curable unsaturated polyester resin 2 composition of improved physical and chemical properties, which composition comprises:

- an unsaturated polyester resin containing ethylenic unsaturation and prepared by the reaction of a hydroxy acid and a dihydroxy alcohol;
- a styrene monomer in an amount of less than about 40% by weight of the composition;
- a liquid acrylic-urethane additive prepolymer prepared by the reaction of a diisocyanate in a stoichiometric or greater amount with a high functionality polyhydroxyl acrylate monomer;

d) an inhibitor in an amount to retard the premature reaction of the prepolymer and the styrene monomer; and

e) a peroxide catalyst in an amount to promote the curing of the styrene monomer, the polyester resin, and the acrylic-urethane prepolymer.

5,773,532

## PROCESS FOR PRODUCING A POLYORGANOSILOXANE-BASED THERMOPLASTIC RESIN

Motoki Okaniwa; Norifumi Sumimoto; Yoshihisa Ohta; Nobuo Kawahashi, and Kazuki Iwai, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 545,210, Oct. 19, 1995, abandoned. This application Jan. 16, 1997, Ser. No. 784,960

Claims priority, application Japan, Nov. 4, 1994, 6-295625

Int. Cl.<sup>6</sup> C08F 283/00

U.S. Cl. 525—479

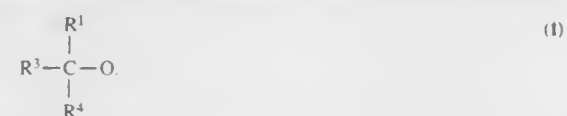
13 Claims

1. A process for producing a polyorganosiloxane-based thermoplastic resin, which comprises graft polymerizing by emulsion polymerizing

(3) a vinyl monomer, using

(4) an initiator obtained by a redox reaction of an organic peroxide with a reducing agent,

said initiator consisting essentially of the structural formula (I):



wherein R<sup>1</sup>, R<sup>3</sup>, and R<sup>4</sup> represent independently hydrogen atoms or alkyl groups having 1 to 10 carbon atoms,

in the presence of (2) a polyorganosiloxane prepared from monomers free of graft-crosslinking groups,

wherein said vinyl monomer (3) grafted onto polyorganosiloxane (2) consists of a monomer selected from the group consisting of aromatic alkenyl compounds, alkyl methacrylic acid esters, alkyl acrylic acid esters, vinyl cyanide compounds, and mixtures thereof, wherein:

the methacrylic acid esters are selected from the group consisting of methyl methacrylate, ethyl methacrylate, 2-ethylhexyl methacrylate and butyl methacrylate; and

the acrylic acid esters are selected from the group consisting of methyl acrylate, ethyl acrylate and butyl acrylate.

5,773,533

## EPOXY RESIN REACTED WITH CARBOXY-FUNCTIONAL PHOSPHINIC OR PHOSPHONIC ACID AND HARDENER

Sebastian Hörold, Erfstadt, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Mar. 27, 1997, Ser. No. 827,434

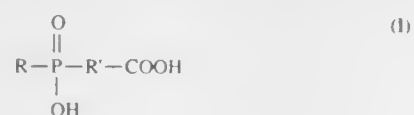
Claims priority, application Germany, Apr. 1, 1996, 196 13 067.0

Int. Cl.<sup>6</sup> C08G 59/14; C08L 63/00; 63/02

U.S. Cl. 525—533

9 Claims

1. A flame-resistant epoxy resin mixture comprising an epoxy resin reacted with a phosphorus-containing compound and a hardener, the phosphorus-containing compound having the formula 1 or II



5,773,535

## (II) ZIEGLER-NATTA CATALYST SYSTEMS CONTAINING SPECIFIC ORGANOSILICON COMPOUNDS

Holger Friedrich, Bobenheim-Roxheim; Stephan Hüffer, Ludwigshafen, and Roland Hingmann, Ladenburg, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 10, 1997, Ser. No. 814,798

Claims priority, application Germany, Mar. 14, 1996, 196 09 952.8

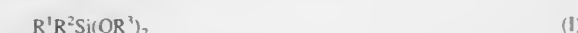
Int. Cl.<sup>6</sup> C08F 4/656

U.S. Cl. 526—124.6

9 Claims

1. A catalyst system of the Ziegler-Natta type comprising as active constituents

- a titanium-containing solid component prepared using a titanium compound, a compound of magnesium, a halogenating agent and an electron donor component,
- an aluminum compound and
- as further electron donor component, an organosilicon compound of the general formula (I)



where

R<sup>1</sup> is a C<sub>1</sub>–C<sub>10</sub>-alkyl radical or a C<sub>3</sub>–C<sub>8</sub>-cycloalkyl radical,

R<sup>2</sup> is a 2,4,4,6,6-pentamethylheptyl radical and

R<sup>3</sup> is a C<sub>1</sub>–C<sub>8</sub>-alkyl radical.

5,773,534

## PREPARING CROSSLINKABLE POLYMERS EMPLOYING MACROMONOMER CHAIN TRANSFER AGENTS

Joseph A. Antonelli, Riverton, N.J.; Charles T. Berge, Wilmington, Del.; Michael J. Darmon, Aston, Pa., and Christopher E. Murphy, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 455,756, May 31, 1995, abandoned, which is a continuation of Ser. No. 887,626, May 22, 1992, abandoned. This application Nov. 7, 1996, Ser. No. 746,262

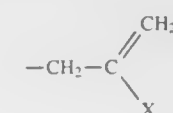
Int. Cl.<sup>6</sup> C08F 2/38; 2/400; 30/08; 20/54; 20/08

U.S. Cl. 526—82

30 Claims

1. A method of free radical polymerization of unsaturated monomers to make a polymer having reactive functionality, comprising reacting:

- for chain transfer, a macromonomer, or a molecular weight distribution of macromonomers, having the following end group:



wherein:

X is independently selected from at least one of —CONR<sub>2</sub>, —COOR, OR<sup>1</sup>, —OCOR, —OCOR<sup>1</sup>, —NR<sub>2</sub>COOR<sup>1</sup>, halo, cyano, and a substituted aryl;

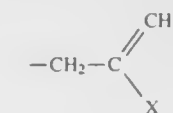
R is independently selected from the group consisting of hydrogen, silyl, substituted alkyl, alkyl ether, substituted benzyl and substituted aryl, wherein substituted means with a substituent selected from the group consisting of epoxy, hydroxy, isocyanato, cyano, amino, silyl, acid, halo, and acyl;

R<sup>1</sup> is the same as R except not H; and

each alkyl is independently selected from the group consisting of branched, unbranched, or cyclical hydrocarbons having 1 to 12 carbon atoms; and halo is bromo, iodo, chloro or fluoro; except excluding the use of pure dimer when X is substituted aryl and excluding macromonomers in which X is COOCH<sub>3</sub>; with

- a mixture of monomers, the same or different, at least a portion of which have a reactive functionality which, on the polymerization product, is capable of crosslinking with itself or another polymer; and

- forming a polymer wherein substantially all terminal groups are



5,773,537

## ZIEGLER-NATTA CATALYST SYSTEMS CONTAINING SPECIFIC ORGANOSILICON COMPOUNDS

Patrik Mueller, Kaiserslautern; Klaus-Dieter Hungenberg, Birkenau; Juergen Kerth, Carlsberg, and Ralf Zolk, Weisenheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation-in-part of Ser. No. 516,962, Aug. 18, 1995, abandoned, which is a continuation of Ser. No. 335,827, Nov. 16, 1994, abandoned. This application Dec. 28, 1995, Ser. No. 579,890

Claims priority, application Germany, May 19, 1992, 42 16 548.2

Int. Cl.<sup>6</sup> B01J 31/00; 37/00; C08F 4/02; 4/60

U.S. Cl. 526—125.3

5 Claims

1. A Ziegler-Natta catalyst composition, comprising



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- a) a titanium-containing solid component, said component being prepared from a titanium compound, a compound of magnesium, a halogenating agent and an electron donor component, b) an aluminum compound and c) as a further electron donor component dimethoxyisobutylsecbutylsilane.

5,773,538

## PROCESS FOR POLYMERIZATION OF OLEFINIC MONOMERS

Andrew Edward Feiring, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 16, 1997, Ser. No. 895,598

Int. Cl.<sup>6</sup> C08F 4/06

U.S. Cl. 526—146

14 Claims

1. A polymerization process, comprising, contacting, at a temperature of about 50° C. to about 150° C., a free radically polymerizable olefin with a fluorinated alkyl sulfonyl chloride or bromide and a lower valent metal compound, provided that said fluorinated alkyl sulfonyl chloride or bromide contains more fluorine atoms than hydrogen atoms.

5,773,539

## CATALYTIC COMPONENT BASED ON VANADIUM AND ITS USE IN THE PREPARATION OF EP(D)M

Tiziano Tanaglia, Bologna; Silvia Prevlati, Ferrara; Luigi Abis, Novara, and Liliana Gila, Cameriano, all of Italy, assignors to Enichem Elastomeri S.r.l., Milan, Italy

Filed Jan. 15, 1997, Ser. No. 782,294

Claims priority, application Italy, Feb. 16, 1996, MI96/A294

Int. Cl.<sup>6</sup> C08F 4/68

U.S. Cl. 526—169.2

14 Claims

1. A compound of Vanadium having general formula VL<sub>3</sub>, wherein V is trivalent Vanadium and L is a ligand having general formula (I)



wherein R is selected from H or C<sub>1</sub>-C<sub>20</sub> monofunctional hydrocarbyl radicals; n is an integer between 2 and 13 excluding 4 and 5.

5,773,540

## MOLD ASSEMBLY FOR THERMO-FORMING MACHINE

Jere F. Irwin; Gerald M. Corbin, both of Yakima, and Dale L. Vantrease, Naches, all of Wash., assignors to Irwin Research and Development, Inc., Yakima, Wash.

Continuation of Ser. No. 632,930, Apr. 16, 1996, abandoned.

This application Oct. 30, 1997, Ser. No. 960,950

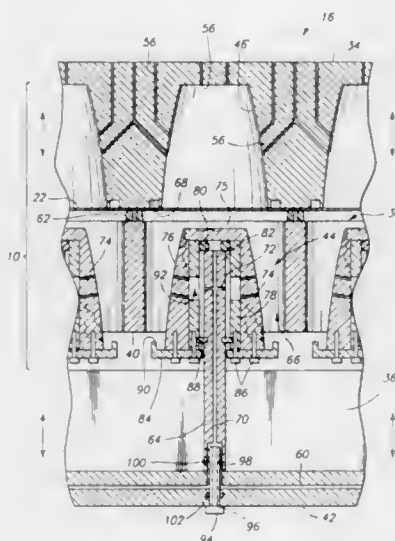
Int. Cl.<sup>6</sup> B29C 51/26

U.S. Cl. 425—387.1

16 Claims

1. A thermo-forming press mold assembly having a first platen and a second platen movably engageable therebetween, comprising:

- a first die member configured to be carried by the first platen; a second die member configured to be compliantly carried by the second platen, and constructed and arranged to mate in substantially aligned registry with the first die member as the first and second platens are movably engaged; a multidimensional resilient member disposed between the second die member and the second platen, the resilient member constructed and arranged to impart substantially aligned registry by providing vertical and lateral compliance between the



first and second die members when brought together about a web of plastic material to be formed as the first and second platens are movably engaged to form an article from the web therebetween during a thermo-forming cycle.

5,773,541

## PREPARATION OF COPOLYMERS OF VINYL ESTERS AND MONOETHYLENICALLY UNSATURATED CARBOXYLIC ACIDS AND THEIR USE

Dieter Boeckh, Limburgerhof; Axel Kistenmacher, Ludwigshafen; Walter Denzinger, Speyer; Iris Rau, Frankenthal; Angelika Funhoff, Schriesheim; Richard Baur, Mutterstadt; Alexander Kud, Eppelsheim, and Volker Schwendemann, Nuestadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP95/00575, § 371 Date Aug. 21, 1996, § 102(e) Date Aug. 21, 1996, PCT Pub. No. WO95/22569, PCT Pub. Date Aug. 24, 1995

PCT Filed Feb. 17, 1995, Ser. No. 693,220

Claims priority, application Germany, Feb. 22, 1994, 44 05 621.4

Int. Cl.<sup>6</sup> C08F 2/00

U.S. Cl. 526—209

7 Claims

1. A process for preparing a copolymer of at least one vinyl ester and at least one monoethylenically unsaturated carboxylic acid by free-radical copolymerization in aqueous medium in the presence of an initiator, which comprises copolymerizing

- (a) 20 to 80% mol of at least one vinyl ester of an aliphatic monocarboxylic acid having at least 2 carbon atoms; (b) 80–20 mol % of a monoethylenically unsaturated carboxylic acid; (c) 0–30 mol % of a copolymerizable monoethylenically unsaturated monomer; and (d) 0–10 mol % of a monomer which contain at least two non-conjugated ethylenic double bonds in the molecule, in the presence of a sulfur compound with a reducing action, and of 0.05–30% by weight, based on the monomers, of at least one surface-active agent;

wherein said initiator is selected from the group consisting of alkali metal peroxodisulfate and ammonium peroxodisulfate; and wherein the molar ratio of peroxodisulfate to the sulfur compound with a reducing action is from 1:1.5 to 1:20.

5,773,542

PROCESS FOR PRODUCING POLYMER PARTICLES  
Takashi Koudate; Yasunori Hosokawa, and Yoko Hanada, all of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Mar. 22, 1996, Ser. No. 620,302

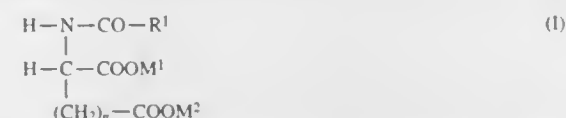
Claims priority, application Japan, Mar. 23, 1995, 7-064420

Int. Cl.<sup>6</sup> C08F 2/00

U.S. Cl. 526—215

8 Claims

1. A process for producing polymer particles which comprises polymerizing a water-soluble polymerizable monomer in a system comprising a hydrophobic organic solvent inert to the polymerization and an aqueous solution of the water-soluble polymerizable monomer, and as a dispersant an anionic surface active agent represented by formula (I):



wherein R<sup>1</sup> represents a straight-chain or branched alkyl, alkenyl or 2-hydroxyalkyl group having 5 to 29 carbon atoms; M<sup>1</sup> and M<sup>2</sup>, which may be the same or different, each represent an alkali metal ion, an ammonium ion or a hydrogen atom; and n represents 1 or 2.

5,773,543

## ALLYLIC CHAIN TRANSFER AGENTS

Ezio Rizzardo, Wheelers Hill; San Hoa Thang, Clayton South; Graeme Moad, Kallista, all of Australia, and Charles Thomas Berge, Wilmington, Del., assignors to Commonwealth Scientific and Industrial Research Organisation, Campbell, Australia

PCT No. PCT/AU94/00672, § 371 Date Aug. 1, 1996, § 102(e) Date Aug. 1, 1996, PCT Pub. No. WO95/12568, PCT Pub. Date May 11, 1995

PCT Filed Nov. 2, 1994, Ser. No. 635,907

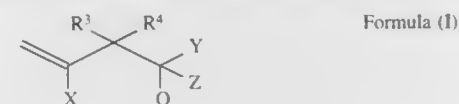
Claims priority, application Australia, Nov. 3, 1993, PM2188

Int. Cl.<sup>6</sup> C08F 2/38

U.S. Cl. 526—215

17 Claims

1. A process for the free radical initiated polymerization of ethylenically unsaturated monomer species characterised by the use of compounds of Formula (I) as chain transfer agents.



wherein

X is selected from hydrogen; CN; optionally substituted aryl; COOH; COOR; C(O)NHR<sup>6</sup>; C(O)NR<sup>7</sup>R<sup>8</sup>; and halogen;

Q is selected from COOR<sup>1</sup>; CN; and C(O)NR<sup>7</sup>R<sup>8</sup>;

Y is selected from hydrogen; C<sub>1</sub> to C<sub>6</sub> alkyl; C<sub>1</sub> to C<sub>6</sub> alkyl substituted with one or more substituents selected from hydroxy, amino, C<sub>1</sub> to C<sub>6</sub> alkoxy, C<sub>1</sub> to C<sub>6</sub> alkoxycarbonyl, halogen, CN and optionally substituted aryl; C<sub>1</sub> to C<sub>6</sub> alkenyl; and C<sub>1</sub> to C<sub>6</sub> alkynyl;

Z is selected from COOR<sup>2</sup>; CN; and optionally substituted aryl;

R<sup>3</sup> and R<sup>4</sup> may be the same or different and are selected from hydrogen, C<sub>1</sub> to C<sub>4</sub> alkyl and halogen; or R<sup>3</sup> and R<sup>4</sup> together with the carbon atom to which they are attached form part of a carbocyclic or heterocyclic ring structure;

R is selected from C<sub>1</sub> to C<sub>18</sub> alkyl; C<sub>1</sub> to C<sub>12</sub> alkyl substituted with one or more substituents selected from hydroxy, amino, C<sub>1</sub> to C<sub>6</sub> alkoxy, phenyl, halogen, NCO, CN, and COOR<sup>5</sup>;

R<sup>1</sup> and R<sup>2</sup> may be the same or different and are selected from C<sub>1</sub> to C<sub>18</sub> alkyl; C<sub>1</sub> to C<sub>12</sub> alkyl substituted with one or more substituents selected from hydroxy, C<sub>1</sub> to C<sub>6</sub> alkoxy, C<sub>1</sub> to C<sub>6</sub> alkoxy, amino, halogen, Si(R<sup>9</sup>)<sub>3</sub>, Si(OR<sup>9</sup>)<sub>3</sub>, optionally substituted aryl, CN and NCO;

R<sup>5</sup> is selected from hydrogen and C<sub>1</sub> to C<sub>6</sub> alkyl;

R<sup>6</sup> is selected from hydrogen and C<sub>1</sub> to C<sub>18</sub> alkyl;

R<sup>7</sup> and R<sup>8</sup> may be the same or different and are selected from C<sub>1</sub> to C<sub>18</sub> alkyl; and

R<sup>9</sup> is selected from C<sub>1</sub> to C<sub>18</sub> alkyl; C<sub>1</sub> to C<sub>18</sub> cycloalkyl; and optionally substituted aryl.

5,773,544

## POLYCHLOROPRENE COMPOSITION

Lance Alan Christell, Prospect, and Richard Misak Tabibian, Louisville, both of Ky., assignors to Dupont Dow Elastomers, Wilmington, Del.

Continuation-in-part of Ser. No. 611,114, Mar. 5, 1996, abandoned, which is a continuation-in-part of Ser. No. 411,183, Mar. 27, 1995, Pat. No. 5,527,846. This application Jan. 10, 1997, Ser. No. 781,737

Int. Cl.<sup>6</sup> C08F 2/38; 4/32; 1/36/18

U.S. Cl. 526—223

6 Claims

1. An elastomer composition which comprises a mercaptan-modified or xanthogen disulfide-modified crystalline 2-chloro-1,3-butadiene homopolymer having a gel content of 5–80 percent by weight which is prepared by free radical emulsion polymerization at a temperature of 5° C.–20° C., to a conversion of 70–95 percent, in the presence of 2.5×10<sup>-4</sup>–5.5×10<sup>-4</sup> moles of mercaptan or xanthogen disulfide modifier per mole of 2-chloro-1,3-butadiene.

5,773,545

## POLYMERS OF ALKYL-1-VINYLMIDAZOLES, THE PREPARATION AND USE THEREOF

Christian Schade, Ludwigshafen; Hans-Ulrich Jäger, Neustadt, and Jürgen Detering, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP94/03868, § 371 Date May 20, 1996, § 102(e) Date May 20, 1996, PCT Pub. No. WO95/15345, PCT Pub. Date Jun. 8, 1995

PCT Filed Nov. 23, 1994, Ser. No. 646,262

Claims priority, application Germany, Dec. 2, 1993, 43 41 072.3

Int. Cl.<sup>6</sup> C08F 26/06; 2/38

U.S. Cl. 526—262

10 Claims

1. A polymer of alkyl-1-vinylimidazoles, which is obtain by free-radical polymerization of a monomer mixture comprising:

- (a) 10–100% by weight of at least one alkyl-vinylimidazole, (b) 0–90% by weight of 1-vinylpyrrolidone, 1-vinylcaprolactam, 1-vinyltriazole, 1-vinylimidazole, 1-vinylloxazolidinone or a mixture thereof; and (c) 0–30% by weight of other monoethylenically unsaturated monomers, in water, at least one C<sub>1-4</sub> alcohol or a mixture thereof, in the presence of a polymerization regulator, wherein said polymer is soluble in water, at least one C<sub>1-4</sub> alcohol or a mixture thereof.

5,773,546

## PROCESS FOR POLYMERIZATION OF WATER-SOLUBLE AND WATER-INSOLUBLE CARBOXYLIC ACID POLYMERS AND COPOLYMERS IN A SILICONE OIL SOLVENT

Anthony S. Tomlin, Island Lake, and Milan F. Sojka, Algonquin, both of Ill., assignors to AMCOL International Corporation, Arlington Heights, Ill.

Continuation of Ser. No. 486,455, Jun. 7, 1995, Pat. No. 5,618,877, which is a continuation-in-part of Ser. No. 327,580, Oct. 24, 1994, abandoned. This application Sep. 30, 1996, Ser. No. 723,866

Int. Cl.<sup>6</sup> C08F 20/20

U.S. Cl. 526—318.43

8 Claims

1. A water-viscosifying copolymer, capable of viscifying water when added thereto in an effective amount, comprising a cross-linked copolymer of a carboxylic acid monomer and a poly-

functional cross-linker monomer having at least two unsaturated carbon-carbon double bonds, wherein said carboxylic acid monomer and said polyfunctional cross-linker monomer are present at a mole ratio of 1:0.03 to 1:0.1, respectively, polymerized in a silicone solvent, in the presence of an effective amount of an initiator to form said water-viscosifying copolymer.

5,773,547

# ETHYLENE POLYMER HAVING AN INTRINSIC VISCOSITY OF AT LEAST 4 DL/G AND A METHOD FOR THE PREPARATION THEREOF

Godefridus A. H. Nooyen, Helden, and Hendrikus Oostra, Susteren, both of Netherlands, assignors to DSM N.V., Heerlen, Netherlands

PCT No. PCT/NL93/00026, § 371 Date Oct. 7, 1994, § 102(e) Date Oct. 7, 1994, PCT Pub. No. WO93/15118, PCT Pub. Date Aug. 5, 1993

PCT Filed Jan. 26, 1993, Ser. No. 256,935

Claims priority, application Netherlands, Jan. 28, 1992, 9200150; Mar. 23, 1992, 9200530

Int. Cl.<sup>6</sup> C08F 10/02; 11/002

U.S. Cl. 526—352

9 Claims

1. A pulverulent ethylene polymer having an intrinsic viscosity of at least 4 dl/g, a maximum draw ratio of at least 20, a bulk density of at most 300 kg/m<sup>3</sup> and having an amount of catalyst residues of less than 50 ppm.

5,773,548

# CATALYST FOR PREPARING ORGANOSILOXANES OR POLYORGANOSILOXANES

Harald Schickmann, Meissen; Robert Lehnert, Dresden; Heinz-Dieter Wendt, Radebeul; Holger Rautschek, Nuenchritz; Harald Roesler, Dresden, and Hans-Guenther Srebny, Duellman, all of Germany, assignors to Huels Silicone GmbH, Nuenchritz, Germany

PCT No. PCT/EP94/02032, § 371 Date Jan. 11, 1996, § 102(e) Date Jan. 11, 1996, PCT Pub. No. WO95/01983, PCT Pub. Date Jan. 19, 1995

PCT Filed Jun. 22, 1994, Ser. No. 569,139

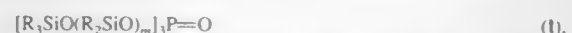
Claims priority, application Germany, Jul. 10, 1993, 43 23 183.7; Jul. 10, 1993, 43 23 184.5; Jul. 10, 1993, 43 23 185.3; Dec. 27, 1993, 43 44 664.7

Int. Cl.<sup>6</sup> C08G 77/06

U.S. Cl. 528—18

13 Claims

1. A catalyst obtained by reaction of phosphonitrilic chloride with a compound of the general formula



where R are, independently of one another, identical or different, unsaturated and/or saturated monovalent hydrocarbon radicals having from 1 to 6 carbon atoms or hydrogen, with the proviso that only one hydrogen atom is bound to each silicon atom and m has a value between 0 and 1000.

5,773,549

# PROCESS FOR HYDROTREATING AN ORGANIC FEEDSTOCK CONTAINING A HALOGENATED COMPONENT AND CONTAMINATED WITH DISTILLABLE OXYGEN AND NITROGEN COMPOUNDS HAVING BOILING POINTS LOWER THAN THE HALOGENATED COMPOUNDS

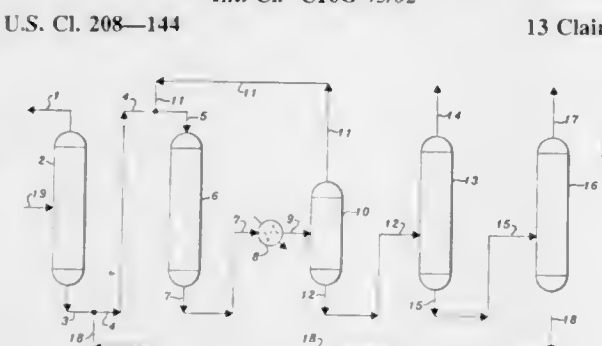
Mark D. Moser, Elk Grove Village; Tom N. Kalnes, La Grange, and Chwu-Ching Jan, Elk Grove Village, all of Ill., assignors to UOP LLC, Des Plaines, Ill.

Continuation-in-part of Ser. No. 572,259, Dec. 13, 1995, abandoned, which is a continuation-in-part of Ser. No. 151,700, Nov. 15, 1993, abandoned. This application Mar. 24, 1997, Ser. No. 822,532

Int. Cl.<sup>6</sup> C10G 45/02

U.S. Cl. 208—144

13 Claims



1. A process for treating a halogenated organic stream containing at least one distillable compound having a boiling point lower than the halogenated compounds contained in said halogenated organic stream and selected from the group consisting of an oxygen compound and a nitrogen compound to produce an anhydrous liquid stream comprising hydrogenated hydrocarbonaceous compounds and a hydrogen halide compound which process comprises the steps of:

- (a) fractionating said halogenated organic stream containing at least one distillable compound having a boiling point lower than the halogenated compounds contained in said halogenated organic stream and selected from the group consisting of an oxygen compound and a nitrogen compound to produce a halogenated organic stream having a reduced concentration of oxygen and nitrogen compounds and a stream comprising at least one distillable compound having a boiling point lower than the halogenated compounds contained in said halogenated organic stream and selected from the group consisting of oxygen compounds and nitrogen compounds;
- (b) contacting said halogenated organic stream having a reduced concentration of oxygen and nitrogen compounds produced in step (a) and a hydrogen-rich, gaseous recycle stream with a hydrogenation catalyst in a hydrogenation reaction zone at hydrogenation reaction conditions to increase the hydrogen content of said halogenated organic stream having a reduced concentration of oxygen and nitrogen compounds and to thereby produce a hydrogen halide compound; and
- (c) condensing at least a portion of the resulting effluent from said hydrogenation reaction zone to produce said hydrogen-rich, gaseous recycle stream and an anhydrous liquid stream comprising hydrogenated hydrocarbonaceous compounds and a hydrogen halide compound.

5,773,550

# POLYADDITION PRODUCT CONTAINING ISOCYANURATE GROUPS AND URETDIONE GROUPS, AND A PROCESS FOR PREPARING SAME

Elmar Wolf, Recklinghausen, Germany, assignor to Huels Aktiengesellschaft, Marl, Germany

Filed Feb. 14, 1997, Ser. No. 799,878

Claims priority, application Germany, Feb. 19, 1996, 196 06 030.3

Int. Cl.<sup>6</sup> C08G 18/12

U.S. Cl. 528—59

22 Claims

1. An isocyanurate- and uretdione-group-containing polyaddition product comprising the reaction product of:

- i) an isophorone diisocyanate which contains isocyanurate groups and uretdione groups; and
- ii) a component selected from the group consisting of a diol, a disecundary diamine, a linear hydroxyl-containing polyester and a mixture thereof.

wherein said isophorone diisocyanate comprises not more than 2% by weight of free isophorone diisocyanate and  $\geq 5$  wt. % of isophorone diisocyanate isocyanurate,

wherein said isophorone diisocyanate is reacted with said diol component ii) in an NCO/OH ratio of 1:0.5–1:0.95 and/or an NCO/NH ratio of 0.5:1 0.95:1.

5,773,551

# METHOD OF UTILIZING ISOCYANATE LINKAGES FOR FORMING MULTI-TIER CASCADE POLYMERS

George R. Newkome, Temple Terrace, and Claus Weis, Tampa, both of Fla., assignors to University of South Florida, Tampa, Fla.

Continuation-in-part of Ser. No. 626,395, Apr. 2, 1996, Pat. No. 5,703,271. This application Aug. 28, 1996, Ser. No. 704,834

Int. Cl.<sup>6</sup> C08G 18/71

U.S. Cl. 528—69

4 Claims

1. A method of making a cascade polymer by reacting a terminal isocyanate on at least one of the branches of a multi-branched monomer building block which includes at least two protected hydride sites with a terminal reactive branch of a multi-branched compound having an alkyl central group forming an amide, or urethane bond there between.

5,773,552

# PHENOLIC POLYMERS MADE BY ARAKYLATION REACTIONS

David A. Hutchings, Tucker; Jeffrey L. Mills, Newnan, both of Ga., and Kenneth Bourlier, Randolph, N.J., assignors to Georgia-Pacific Resins Inc., Atlanta, Ga.

Division of Ser. No. 501,516, Jul. 12, 1995, Pat. No. 5,674,970. This application Jan. 3, 1997, Ser. No. 775,377

Int. Cl.<sup>6</sup> C08G 59/00

U.S. Cl. 528—97

10 Claims

1. A phenol aralkylation polymer formed by reacting 1 mole of bisphenol A with from about 0.3 to 0.8 moles of an aryl diolefin to obtain a bisphenol A/aryl diolefin polymer and then aralkylating the polymer with at least one styrene derivative selected from the group consisting of p-t butyl styrene, t-butyl styrene, vinyl toluene,  $\alpha$ -methyl styrene, and styrene wherein from 20 to 100 percent of the open reactive sites of the polymer are occupied by styrene derived moieties.

5,773,553

# POLYIMIDE CURING PROCESS AND IMPROVED THERMAL INK JET PRINTHEAD PREPARED THEREBY

Timothy J. Fuller, Pittsford, and Ram S. Narang, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 13, 1996, Ser. No. 678,357

Int. Cl.<sup>6</sup> C08G 73/10; C08K 5/24

U.S. Cl. 528—170

12 Claims

1. A process which comprises reacting a polyimide precursor with borane, thereby forming a polyimide.

5,773,554

# COPOLYESTERS BASED ON 1,4-CYCLOHEXANEDIMETHANOL HAVING IMPROVED STABILITY

James Palmer Dickerson; Andrew Edwin Brink; Alan Joseph Oshinski, and Kab Sik Seo, all of Kingsport, Tenn., assignors to Eastman Chemical Company, Kingsport, Tenn.

Division of Ser. No. 670,949, Jun. 26, 1996, Pat. No. 5,656,715. This application May 1, 1997, Ser. No. 848,783

Int. Cl.<sup>6</sup> C08G 63/00

U.S. Cl. 528—271

6 Claims

1. A method of melt processing a copolyester having a moisture content of 0.02 weight % or more comprising:

- (a) one or more dicarboxylic acids, and
- (b) a glycol component comprising from about 60 to 100 mole % 1,4-cyclohexanedimethanol, wherein said melt processing comprises injection molding, calendaring, extrusion of rotational molding.

5,773,555

# METHOD AND APPARATUS FOR THE PRODUCTION OF POLYAMIDES

Friedrich Weger, and Rainer Hagen, both of Berlin, Germany, assignors to Karl Fischer Industrieanlagen GmbH, Berlin, Germany

Filed Mar. 13, 1996, Ser. No. 614,497

Claims priority, application Germany, Mar. 14, 1995, 195 10 698.9

Int. Cl.<sup>6</sup> C08G 69/08; 73/10

U.S. Cl. 528—310

14 Claims

1. Method of manufacturing polyamide, comprising:

- (a) producing a polyamide granulate by melt phase polycondensation; and
- (b) post-condensing said polyamide granulate in the solid state by
  - (1) heating said polyamide granulate to a first temperature, from about 70° C. to about 150° C., and maintaining said first temperature for a predetermined period of time sufficient to decompose oligomers present with the polyamide granulate, and
  - (2) subsequently heating said polyamide granulate to a second temperature until the desired average degree of polycondensation is achieved, said second temperature from about 170° C. to about 10° C. below the melting point of said polyamide.



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## LOW-FLAMMABILITY POLYAMIDE MOLDING MATERIALS

Hans-Jerg Kleiner, Kronberg; Wlfrid Budzinsky, and Günther Kirsch, both of Bad Soden, all of Germany, assignors to Tlcona GmbH, Germany

Filed Feb. 27, 1997, Ser. No. 806,479

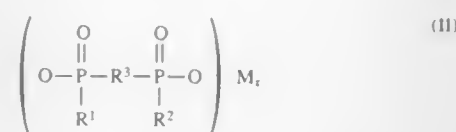
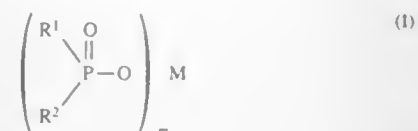
Claims priority, application Germany, Feb. 29, 1996, 196 07 635.8

Int. Cl.<sup>6</sup> C08G 69/42;79/02; C08K 5/53

U.S. Cl. 528—321

13 Claims

1. A molding composition comprising a polyamide and a phosphinic acid salt of the formula (I) and/or a diphosphinic acid salt of the formula (II)



where

R<sup>1</sup> and R<sup>2</sup> are identical or different and are C<sub>1</sub>–C<sub>10</sub>-alkyl,

R<sup>3</sup> is C<sub>1</sub>–C<sub>10</sub>-alkylene, linear or branched, arylene, alkylarylene or arylalkylene,

M is a calcium or aluminum ion;

m is 2 or 3;

n is 1 or 3;

x is 1 or 2.

5,773,557

## ACRYLIC/LACTAM RESIN COMPOSITIONS AND METHOD OF PRODUCING SAME

Bill R. Edwards, 401 E. High St., Baldwin City, Kans. 66006

Division of Ser. No. 136,632, Oct. 14, 1993, Pat. No. 5,399,593.

This application Mar. 16, 1995, Ser. No. 405,118

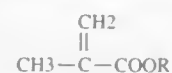
Int. Cl.<sup>6</sup> C08G 69/14

U.S. Cl. 528—323

49 Claims

1. A polymerization syrup formulated by maintaining, at ambient temperature, a polymerization mixture for a period of time effective to form the polymerization syrup having a desired viscosity, the polymerization mixture consisting essentially of:

from about 300 to about 2970 parts by volume of an acrylic monomer represented by the formula



wherein R is an alkyl moiety containing 1 to about 18 carbon atoms;

from about 30 to about 2700 parts by volume of a lactam monomer containing from 3 to about 12 carbon atoms in the lactam ring;

from about 0.03 to about 40 parts by volume of a mercaptan chain transfer agent; and

from about 0.03 to about 40 parts by volume of a crosslinking agent capable of crosslinking the acrylic monomer and the lactam monomer.

5,773,558

## TRANSPARENT, COLORLESS, AMORPHOUS POLYAMIDES AND MOLDED ARTICLES

Hans Dalla Torre, Domat/EMS, Switzerland, assignor to EMS-Inventa AG, Zürich, Switzerland

Continuation-in-part of Ser. No. 555,790, Nov. 9, 1995, Pat. No. 5,696,202. This application Sep. 24, 1997, Ser. No. 936,807

Claims priority, application Sweden, Feb. 1, 1995, 00270/95;

European Pat. Off., Sep. 19, 1995, 95114719

Int. Cl.<sup>6</sup> C08G 69/26

U.S. Cl. 528—335

16 Claims

1. Transparent colorless, amorphous polyamide or blends or alloys thereof with at least one homopolyamide, the transparent polyamide has a relative solution viscosity of higher than 1.5 characterized in that

the polyamide is made substantially of at least one unbranched aliphatic diamine, having from 8 to 14 carbon atoms and further of at least one cycloaliphatic dicarboxylic acid having 8 to 22 carbon atoms and having at least one cyclohexane ring,

wherein said acid can be replaced by a maximum of 20 mol % of at least one aromatic dicarboxylic acid and

wherein the polyamide or their blends or alloys optionally contain processing and/or usage dictated additives.

5,773,559

## POLYIMIDE BLOCK COPOLYMER AND LIQUID CRYSTAL ALIGNMENT LAYER FORMING AGENT

Tsuyoshi Miyamoto, Yokohama; Masayuki Kimura, Yokkaichi; Kazuhiro Eguchi, Tsuchiura, and Yasuo Matsuki, Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Jan. 31, 1996, Ser. No. 594,521

Claims priority, application Japan, Jan. 31, 1995, 7-032875

Int. Cl.<sup>6</sup> C08G 73/10;69/26

U.S. Cl. 528—353

25 Claims

1. A process of producing a polyamic acid block copolymer comprising a first polyamic acid block and a second polyamic acid block having a different structure from the first block, comprising the following steps:

providing a first polyamic acid prepolymer having amino groups at its ends by reaction between at least one tetracarboxylic compound and at least one diamine compound,

providing a second polyamic acid prepolymer different from the first prepolymer and having carboxylic reactive groups at its ends by reaction between at least one tetracarboxylic compound and at least one diamine compound, and

reacting the first polyamic acid prepolymer with the second polyamic acid prepolymer to obtain the polyamic acid block copolymer.

5,773,560

## SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL AND COLOR IMAGE FORMING METHOD

Masahiro Asami, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 25, 1997, Ser. No. 900,860

Claims priority, application Japan, Jul. 25, 1996, 8-196767

Int. Cl.<sup>6</sup> G03C 8/40

U.S. Cl. 430—203

10 Claims

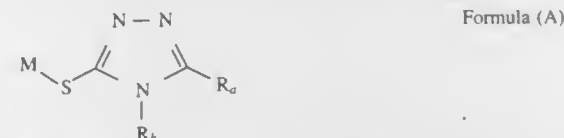
1. A silver halide color photographic light-sensitive material which is capable of forming an image by:

after exposing a light-sensitive material, which comprises a first support having thereon at least one photographic light-sensitive layer comprising a light-sensitive silver halide emulsion, a developing agent, a compound capable of forming a dye upon coupling reaction with an oxidation product of the developing agent and a binder;

attaching said light-sensitive material to a processing material, which comprises a second support having thereon a base and/or a base precursor, in such a way that the coated surfaces of the two materials faced each other, in the presence of a small amount of water which corresponds to from 1/10 to 1 time water necessary for giving maximum swelling of all coated layers constituting the light-sensitive material and the processing material; and

then heating the light-sensitive material and the processing material,

wherein at least one photographic constituent layer contains a compound represented by the formula (A):



where R<sub>a</sub> represents an alkyl group having 4 or more carbon atoms, an aralkyl group having 7 or more carbon atoms, an aryl group having 6 or more carbon atoms or a heterocyclic group having 4 or more carbon atoms; R<sub>b</sub> represents an alkyl group, an aralkyl group, an aryl group or a heterocyclic group; and M represents a hydrogen atom, a silver atom or an alkali metal atom.

5,773,561

## POLYMER SEALANTS/ADHESIVES AND USE THEREOF IN ELECTRONIC PACKAGE ASSEMBLY

Krishna Gandhi Sachdev, Hopewell Junction; Michael Berger, Gardiner; Patrick A. Colco, Fishkill, and Frank L. Pompeo, Middletown, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 2, 1996, Ser. No. 692,033

Int. Cl.<sup>6</sup> C08G 73/10;69/26

U.S. Cl. 528—353

21 Claims

1. A composition curable to form a siloxane-containing polyimide adhesive comprising:

an aromatic dietherdianhydride;

a flexible aromatic diamine; and

a polysiloxane diamine having a vinyl group as part of the structure, the composition having a dianhydride to total diamine molar ratio of about 0.95:1 to 1.05:1 and in which the reactant in molar excess is capped with a monoanhydride or monoamine compound.

5,773,562

## MELT-STABLE SEMI-CRYSTALLINE LACTIDE POLYMER FILM AND PROCESS FOR MANUFACTURE THEREOF

Patrick Richard Gruber, St. Paul; Jeffrey John Kolstad, Wayzata; Christopher M. Ryan, Dayton; Eric Stanley Hall, Crystal, and Robin Sue Eichen Conn, Minneapolis, all of Minn., assignors to Cargill, Incorporated, Minneapolis, Minn.

Continuation of Ser. No. 110,394, Aug. 23, 1995, Pat. No. 5,536,807, which is a continuation-in-part of Ser. No. 955,690,

Oct. 2, 1992, Pat. No. 5,338,822. This application Feb. 28,

1996, Ser. No. 607,090

Int. Cl.<sup>6</sup> C08G 63/08;63/82

U.S. Cl. 528—354

28 Claims

1. A film having a net endotherm greater than about 10 joules per gram of polymer that contains chains including lactic acid residuals; said film further comprising:

(a) a melt stable polymer composition including at least 5% by weight, of a melt stable first polymer component including polymer chains with at least lactic acid residuals, based on total weight of melt stable polymer in said melt stable polymer composition;

(i) said first polymer component being formed from at least:

(A) a source of (R)-lactic acid residuals; and

(B) a source of (S)-lactic acid residuals;

(ii) said first polymer component having (R)-lactic acid residuals and (S)-lactic acid residuals in a distribution in the polymer such that sequences of a major lactic acid residual have at least a 0.5 probability of including a sequence of at least 10 of the major lactic acid residuals consecutively;

(b) said first polymer component having a number average molecular weight of at least 40,000 and no greater than about 300,000; and,

(c) said first melt stable polymer composition having a lactide concentration, if present at all, of less than about 2% by weight of melt stable polymer including polymer chains with lactic acid residuals, in said first polymer component;

(d) said melt stable first polymer component being a material in a form sufficiently melt stable such that a devolatilized sample of it, when isolated and prior to formation of said melt stable polymer composition, will show formation of less than 1% lactide presence, by weight, after heating for 1 hour at 180° C.

5,773,563

## ABSORBABLE ε-CAPROLACTONE POLYMERS

Shalaby W. Shalaby, Anderson, S.C., assignor to Poly-Med, Inc., Pendleton, S.C.

Continuation-in-part of Ser. No. 212,714, Mar. 14, 1994, Pat. No. 5,569,992. This application Jun. 3, 1996, Ser. No. 660,089

Int. Cl.<sup>6</sup> C08G 63/08

U.S. Cl. 528—354

14 Claims

1. Crystalline nitrogenous polyesters comprising predominantly ε-caprolactone polymer sequences linked ionically or covalently to amine-bearing structures which represent 1 to 20 percent of the total weight.

5,773,564

## ABSORBENT GELLING MATERIALS OF CROSSLINKED POLYASPARTATE

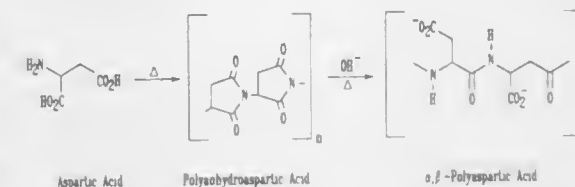
C. Steven Sikes, Mobile, Ala., assignor to University of South Alabama, Mobile, Ala.

Filed Feb. 2, 1996, Ser. No. 596,439

Int. Cl.<sup>6</sup> C08G 63/44

U.S. Cl. 528—363

11 Claims



1. A crosslinked polymer comprising a homopolymer of aspartic acid, said homopolymer being crosslinked with a crosslinking compound, said crosslinking compound having at least two amine functional groups, said crosslinked homopolymer exhibiting at least one of the following two minimum characteristics, (1) a saline gel volume, as measured by blue-dextran method of at least 15, and (2) a gel strength in excess of 300 N/m<sup>2</sup> as measured by a pulse shearometer when swollen to the maximum gel volume of said crosslinked homopolymer, and wherein said crosslinked homopolymer is water insoluble.

5,773,565  
SALTS OF POLYASPARTIC ACID BY HIGH  
TEMPERATURE REACTION

Louis L. Wood, Rockville, Md., assignor to Bayer AG, Leverkusen, Germany  
Continuation of Ser. No. 287,154, Aug. 8, 1994, which is a continuation of Ser. No. 199,652, Feb. 22, 1994, Pat. No. 5,367,047, which is a division of Ser. No. 7,376, Jan. 21, 1993, Pat. No. 5,288,783, which is a continuation-in-part of Ser. No. 882,919, May 14, 1992, abandoned. This application Aug. 6, 1996, Ser. No. 692,768  
Int. Cl.<sup>6</sup> C08G 73/10; 69/10

U.S. Cl. 528—363 10 Claims

1. A process for the preparation of a salt of polyaspartic acid comprising reacting maleic acid and ammonia in a molar ratio of 1:1–2.1, heating to remove water forming a melt of maleic acid and ammonia, removing water as the reaction proceeds, bringing the temperature to 190° to 300° C. and converting the resultant polymer into a salt of polyaspartic acid by basic hydrolysis.

5,773,566  
RESISTIVE MATERIAL COMPOSITION, RESISTIVE  
PASTE, AND RESISTOR

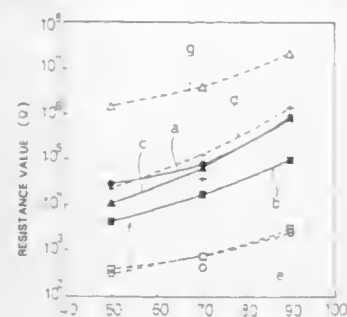
Keisuke Nagata, Kyoto, and Hiroji Tani, Nagaokakyo, both of Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Apr. 17, 1996, Ser. No. 633,883

Claims priority, application Japan, Apr. 18, 1995, 7-117817

Int. Cl.<sup>6</sup> H01B 1/08; 1/14; 1/20; B32B 9/00

U.S. Cl. 252—519 18 Claims



CONTENT OF NON-REDUCIBLE GLASS PART (WT %) P15

1. A resistive material composition comprising a first resistive material of the general formula  $\text{Ca}_x\text{Sr}_{1-x}\text{RuO}_3$  in which  $x$  is from about 0.25 to 0.75, and a characteristic-improving additive of the general formula  $\text{La}_y\text{Sr}_{1-y}\text{CoO}_3$  in which  $y$  is from about 0.40 to 0.60.

5,773,567  
CARBOXYLIC AMIDE-CONTAINING POLYMERS FOR  
USE AS FUEL OR LUBRICATING OIL ADDITIVES AND  
PROCESSES FOR THEIR PREPARATION

Jacob Emert, Brooklyn, N.Y.; Richard H. Schlosberg, Bridge-water; David E. Gindelberger, Bedminster, both of N.J., and Roy L. Pruett, Harrisburg, N.C., assignors to Exxon Chemical Patents Inc., Linden, N.J.

Filed Jun. 17, 1996, Ser. No. 663,465

Int. Cl.<sup>6</sup> C08G 67/02

U.S. Cl. 528—392 23 Claims

1. A process for producing a saturated polymer monosubstituted with a carboxylic amide useful as a lubricating oil additive, which comprises reacting a monounsaturated hydrocarbon polymer with carbon monoxide and a polyamine containing at least two amino groups at least one of which is a reactive amino group, in the presence of a catalyst comprising at least one member selected from the group consisting of the transition metals of Group 8 to 10 and the metal compounds thereof.

5,773,568  
METHODS FOR PREPARING CONDUCTIVE  
POLYANILINES

Alan G. MacDiarmid, Drexel Hill, Pa.; You Nan Xia, Cambridge, Mass., and Joanna M. Wiesinger, Ambler, Pa., assignors to The Trustees of the University of Pennsylvania, Philadelphia, Pa.

PCT No. PCT/US94/09194, § 371 Date Apr. 15, 1995, § 102(e) Date Apr. 15, 1996, PCT Pub. No. WO95/05405, PCT Pub. Date Feb. 23, 1995

Continuation-in-part of Ser. No. 105,743, Aug. 12, 1993, Pat. No. 5,403,913. This PCT application Aug. 12, 1994, Ser. No. 591,598

Int. Cl.<sup>6</sup> C08F 6/00; C08L 79/00

U.S. Cl. 528—495 17 Claims

1. A method for processing polyaniline, comprising contacting a substantially solid polyaniline having a determinable conductivity with a phenolic compound comprising aromatic substituted phenols wherein the aromatic substituent is a 5 or a 6 carbon ring structure and from 1–3 aromatic rings are present as substituents under conditions which are effective to increase said conductivity by at least a factor of 10 while maintaining said polyaniline in either a gelatinous or solid state.

5,773,569  
COMPOUNDS AND PEPTIDES THAT BIND TO THE  
ERYTHROPOIETIN RECEPTOR

Nicholas C. Wrighton, Palo Alto; William J. Dower, Menlo Park; Ray S. Chang, Colma; Arun K. Kashyap, Fremont, all of Calif.; Linda K. Jolliffe, Bellemeade, N.J.; Dana Johnson, Upper Black Eddy, and Linda Mulcahy, Yardley, both of Pa., assignors to Affymax Technologies N.V., Greenford, England  
Continuation-in-part of Ser. No. 155,940, Nov. 19, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 484,635

Int. Cl.<sup>6</sup> C07K 7/00; C12N 15/09

U.S. Cl. 530—300 8 Claims

1. A peptide of 10 to 40 amino acid residues in length that binds to erythropoietin receptor and comprises a sequence of amino acids  $\text{X}_1\text{X}_2\text{X}_3\text{X}_4\text{GPX}_5\text{TWX}_6\text{X}_7$  (SEQ ID NO:252) where each amino acid is indicated by standard one letter abbreviation;  $\text{X}_6$  is independently selected from any one of the 20 genetically coded L-amino acids;  $\text{X}_3$  is C;  $\text{X}_4$  is R, H, L, or W;  $\text{X}_5$  is M, F, or I;  $\text{X}_7$  is D, E, I, L, or V; and  $\text{X}_8$  is C.

5,773,570  
VACCINE COMPOSITIONS AND METHODS USEFUL IN  
INDUCING IMMUNE PROTECTION AGAINST  
ARTHRITIS-GENIC PEPTIDES INVOLVED IN THE  
PATHOGENESIS OF RHEUMATOID ARTHRITIS

Dennis A. Carson, Del Mar, and Salvatore Albani, San Diego, both of Calif., assignors to The Regents of the University of California, Oakland, Calif.

Continuation-in-part of Ser. No. 246,988, May 20, 1994, abandoned. This application Mar. 15, 1996, Ser. No. 618,464

Int. Cl.<sup>6</sup> A61K 39/295; 39/00; 39/116; 39/38

U.S. Cl. 424—201.1 8 Claims

1. A vaccine useful in inducing immune protection against arthritogenic peptides in a host comprising isolated and purified bacterial dnaJp1 peptide having the amino acid sequence of SEQ ID NO:4 in a pharmaceutically acceptable carrier.

5,773,571  
PEPTIDE NUCLEIC ACIDS

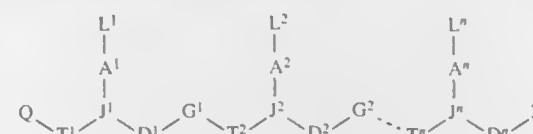
Peter E. Nielsen, Hjørtelundvej 509, DK 2980 Kokkedal; Ole Buchardt, Søndergårdsvej 73, DK 3500 Værløse; Michael Egholm, Johnstrup Alle 3, DK 1923 Frederiksberg, and Rolf H. Berg, Strandvaenget 6, DK 2960 Rungsted Kyst, all of Denmark

Division of Ser. No. 954,363, Apr. 26, 1993, Pat. No. 5,539,082, which is a continuation-in-part of Ser. No. 108,591, Nov. 22, 1993. This application Feb. 1, 1996, Ser. No. 595,387

Int. Cl.<sup>6</sup> C12Q 1/68; C07K 5/00

U.S. Cl. 530—300 11 Claims

1. A compound having the formula:



wherein:

n is at least 2,

each of  $L^1-L^n$  is independently selected from the group consisting of hydrogen, hydroxy,  $(C_1-C_4)$ alkanoyl, naturally occurring nucleobases, non-naturally occurring nucleobases, aromatic moieties, DNA intercalators, nucleobase-binding groups, heterocyclic moieties, and reporter ligands, at least one of  $L^1-L^n$  being a naturally occurring nucleobase, a non-naturally occurring nucleobase, a DNA intercalator, or a nucleobase-binding group;

each of  $T^1-T^n$  is  $(CR^6R^7)_y$  where  $R^6$  is hydrogen and  $R^7$  is selected from the group consisting of the side chains of naturally occurring alpha amino acids, or  $R^6$  and  $R^7$  are independently selected from the group consisting of hydrogen,  $(C_2-C_6)$ alkyl, aryl, aralkyl, heteroaryl, hydroxy,  $(C_1-C_6)$ alkoxy,  $(C_1-C_6)$ alkylthio,  $NR^8R^9$  and  $SR^5$  or  $R^6$  and  $R^7$  taken together complete an alicyclic or heterocyclic system;

each  $R^3$  and  $R^4$  is independently selected from the group consisting of hydrogen,  $(C_1-C_4)$ alkyl, hydroxy- or alkoxy- or alkylthio-substituted  $(C_1-C_4)$ alkyl, hydroxy, alkoxy, alkylthio and amino;

$R^5$  is hydrogen,  $(C_1-C_6)$ alkyl, hydroxy-, alkoxy-, or alkylthio-substituted  $(C_1-C_6)$ alkyl;

each of  $D^1-D^n$  is  $(CR^6R^7)_z$ , where  $R^6$  and  $R^7$  are as defined above;

each of  $y$  and  $z$  is zero or an integer from 1 to 10, the sum  $y+z$  being greater than 2 but not more than 10;

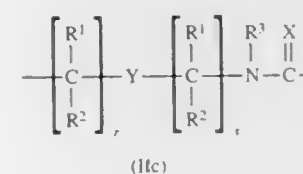
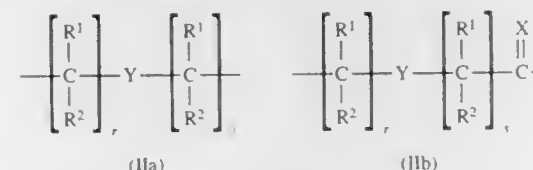
each of  $G^1-G^n$  is  $-NR^3CO-$  in either orientation, where  $R^3$  is as defined above;

each of  $A^1-A^n$  and  $J^1-J^n$  are selected such that:

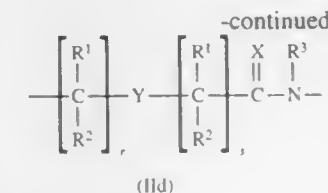
(a) A is a group of formula (IIa), (IIb) or (IIc), and J is N or  $R^3N$ , provided that at least one A is a group of formula (IIc) wherein S is an integer from 1 to 5; or

(b) A is a group of formula (IIa) and J is CH; or

(c) A is a group of formula (IIa) or (IIb) and J is N or  $R^3N$ , provided at least one of  $y$  or  $z$  is not 1 or 2;



(IIc)



(IId)

wherein:

X is O, S, Se,  $NR^3$ ,  $CH_2$  or  $C(CH_3)_2$  where  $R^3$  is as defined above;

Y is a single bond, O, S or  $NR^4$  where  $R^4$  is as defined above; each of  $r$  and  $s$  is zero or an integer from 1 to 5;

each  $R^1$  and  $R^2$  is independently selected from the group consisting of hydrogen,  $(C_1-C_4)$ alkyl which may be hydroxy- or alkoxy- or alkylthio-substituted, hydroxy, alkoxy, alkylthio, amino and halogen;

Q is  $-CO_2H$ ,  $-CONR^8R^9$ ,  $-SO_3H$  or  $-SO_2NR^8R^9$  or an activated derivative of  $-CO_2H$  or  $-SO_3H$ ; and

Z is  $-NHR^{10}R^{11}$  or  $-NR^{10}C(O)R^{11}$ , where  $R^8$ ,  $R^9$ ,  $R^{10}$  and  $R^{11}$  are independently selected from the group consisting of hydrogen, alkyl, amino protecting groups, reporter ligands, intercalators, chelators, peptides, proteins, carbohydrates, lipids, steroids, oligonucleotides and soluble and non-soluble polymers.

5,773,572  
FRAGMENTS OF PRION PROTEINS

Robert Vincent Fishleigh; Barry Robson, both of Cheshire, and Roger Paul Mee, Manchester, all of England, assignors to Proteus Molecular Design Limited, Macclesfield, England  
PCT No. PCT/GB92/02246, § 371 Date Jun. 2, 1994, § 102(e) Date Jun. 2, 1994, PCT Pub. No. WO93/11155, PCT Pub. Date Jun. 10, 1993

PCT Filed Dec. 3, 1992, Ser. No. 244,701

Claims priority, application United Kingdom, Dec. 3, 1991, 9125747; Jul. 10, 1992, 9214663

Int. Cl.<sup>6</sup> C07K 14/435; C07H 21/04

U.S. Cl. 530—324 13 Claims

1. A synthetic polypeptide having at least one antigenic site of a prion protein, wherein the polypeptide is a fragment of a prion protein and is selected from the group consisting of:

$X-(\text{Pro}-\text{Gly}-\text{Gly}-R_{20})-\text{Trp}-\text{Asn}-\text{Thr}-\text{Gly}-\text{Gly}-\text{Ser}-$

$\text{Arg}-\text{Tyr}-\text{Pro}-\text{Gly}-\text{Gln}-\text{Gly}-\text{Ser}-\text{Pro}-\text{Gly}-\text{Gly}-\text{Asn}-$

$\text{Arg}-\text{Tyr}-\text{Pro}-\text{Pro}-\text{Gln}-\text{Gly}-(\text{Gly}-R_{21}-R_{22}-\text{Trp})-Y$

(formula Va (SEQ ID NO:56));

$X-(\text{Gly}-\text{Gly}-R_{21}-R_{22}-\text{Trp})-\text{Gly}-\text{Gln}-\text{Pro}-\text{His}-$

$\text{Gly}-\text{Gly}-\text{Gly}-R_{23}-\text{Trp}(\text{Gly}-\text{Gln}-\text{Pro}-\text{His})-Y$

(formula Vb (SEQ ID NO:57));

$X-(\text{Gly}-\text{Gly}-\text{Gly}-\text{Trp})-\text{Gly}-\text{Gln}-\text{Gly}-\text{Gly}-R_{24}-R_{25}-$

$\text{His}-R_{26}-\text{Gln}-\text{Trp}-\text{Asn}-\text{Lys}-\text{Pro}-R_{27}-\text{Lys}-\text{Pro}-\text{Lys}-$

$\text{Thr}-R_{28}-R_{29}-\text{Lys}(-\text{His}-R_{40}-\text{Ala}-\text{Gly})-Y$

(formula Vc (SEQ ID NO:58))

wherein  $R_{20}$ ,  $R_{21}$ ,  $R_{23}$  and  $R_{24}$  are each independently either Gly or absent;

$R_{22}$  either Gly or Thr;

$R_{25}$  is either Thr or Ser;

$R_{26}$  is an amino acid residue selected from Gly, Ser and Asn;

$R_{27}$  and  $R_{28}$  are each independently either Asn or Ser;

$R_{29}$  is an amino acid residue selected from Met, Leu and Phe;

$R_{30}$  is either Val or Met;

further wherein one or more residues within parentheses are present or absent with the proviso that if they are present they are



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attached to the rest of the peptide in sequence; and X and Y are each independently absent or independently are one or more additional amino acid residues, with the proviso that when present neither X nor Y provide or form part of an antigenic property of the prion protein which, in the corresponding portion of sequence of a natural prion protein, is contiguous with the sequence to which X and Y are attached; and



wherein F and G are each independently a synthetic polypeptide comprising a fragment of a prion protein selected from the group consisting of Formulae Va, Vb and Vc; L is a linking sequence; a, b and c are each independently 0 or 1; and m and n are each positive numbers.

5,773,573

## HIV PEPTIDES

Rupert Holms, 66 Regent's Park Road, London NW1 75X, Great Britain

Filed Jun. 5, 1995, Ser. No. 461,564

Claims priority, application United Kingdom, Jun. 8, 1994, 9411534

Int. Cl.<sup>6</sup> A61K 38/04; 39/21; 39/38; C07K 5/00

U.S. Cl. 530—327 1 Claim

1. A purified peptide consisting of the amino acid sequence: ThrGluLysLysArgArgGluThrValGluArgGluLysGlu (SEQ ID NO. 2).

5,773,574

## POLYPEPTIDES FOR PROMOTING CELL ATTACHMENT

Mark H. Ginsberg; Edward F. Plow, both of San Diego, and Ronald Bowditch, Encinitas, all of Calif., assignors to The Scripps Research Institute, La Jolla, Calif.

Continuation-in-part of Ser. No. 725,600, Jul. 3, 1991, abandoned, which is a continuation-in-part of Ser. No. 620,668, Dec. 3, 1990, abandoned. This application Nov. 27, 1991, Ser. No. 803,623

Int. Cl.<sup>6</sup> A61K 38/08; C07K 7/06

U.S. Cl. 530—327 4 Claims

1. An isolated polypeptide consisting of the amino acid residue sequence AspArgXaa,ProHisXaa<sub>2</sub>Arg (SEQ ID NO:1), wherein Xaa<sub>1</sub> and Xaa<sub>2</sub> are any amino acid residue and said polypeptide binds GPIIb-IIIa in an ArgGlyAsp-independent manner.

5,773,575

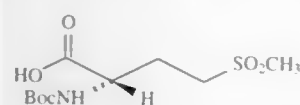
PROCESS FOR PEPTIDE SEGMENT CONDENSATION  
Guo-Jie Ho, Rahway; David J. Mathre, Skillman; Zhiguo Song, Edison, and Khateeta Emerson, Iselin, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 222,767, Apr. 4, 1994, Pat. No. 5,502,165. This application Oct. 1, 1996, Ser. No. 721,989

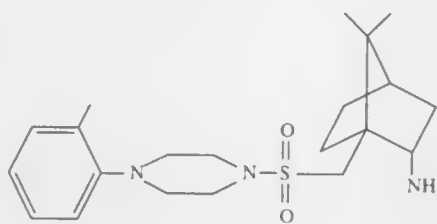
Int. Cl.<sup>6</sup> C07C 231/02; C07K 1/08

U.S. Cl. 530—341 20 Claims

1. A process for forming an amide product comprising reacting a carboxylic acid and an amine, in the presence of a coupling reagent selected from EDC, DCC or diisopropylcarbodiimide and an additive, in a bi-phasic 1:1 (v/v) mixture of water and an organic solvent selected from an oxygenated organic solvent or an aromatic solvent, provided that the carboxylic acid is not



and the amine is not



5,773,576

CODED THIN LAYER CHROMATOGRAPHY SUPPORT  
Andrea Junker-Buchheit, Bad König; Heinz-Emil Hauck, Gross Umstadt, and Willi Jost, Langen, all of Germany, assignors to Merck Patent Gesellschaft mit Beschränkter Haftung, Germany

PCT No. PCT/EP94/02871, § 371 Date May 15, 1996, § 102(e) Date May 15, 1996, PCT Pub. No. WO95/07459, PCT Pub. Date Mar. 16, 1995

PCT Filed Aug. 30, 1994, Ser. No. 612,882  
Claims priority, application Germany, Sep. 9, 1993, 43 30 564.4

Int. Cl.<sup>6</sup> G01N 30/90

U.S. Cl. 422—70 9 Claims

1. A coded thin layer chromatography material which comprises a support coated with a sorbent layer consisting essentially of sorbent particles and a binder wherein the sorbent layer has an alphanumeric identifier or a bar coding thereon formed by a process consisting essentially of exposing the sorbent layer to laser light in an alphanumeric or bar coding pattern such that the coding is readable in either visible or ultraviolet light.

5,773,577

PRODUCTS COMPRISING SUBSTRATES CAPABLE OF ENZYMIC CROSS-LINKING

Joseph Cappello, San Diego, Calif., assignor to Protein Polymer Technologies, San Diego, Calif.

Continuation-in-part of Ser. No. 205,518, Mar. 3, 1994, abandoned. This application Mar. 2, 1995, Ser. No. 397,633

Int. Cl.<sup>6</sup> C07K 14/00; A61K 38/00

U.S. Cl. 530—350 29 Claims

1. A recombinant protein polymer of a molecular weight in the range of 15 to 250 kD comprised of naturally occurring repetitive units from 3 to 18 amino acids and at least two enzyme recognition sequences separated by at least 25 intervening amino acids, said recognition sequences comprising a glutamine capable of enzyme catalyzed isopeptide formation.

5,773,578

PROTEINS PRODUCED BY HUMAN LYMPHOCYTES, DNA SEQUENCE ENCODING THESE PROTEINS AND THEIR PHARMACEUTICAL AND BIOLOGICAL USE

Thierry Hercend, Maisons Alfort, and Frédéric Triebel, Neuilly, both of France, assignors to Institut National de la Santé Et de la Recherche Médicale, Paris Cedex, and Institut Gustave Roussy, Villejuif Cedex, both of France

Continuation of Ser. No. 854,644, Sep. 8, 1992, abandoned. This application Apr. 4, 1995, Ser. No. 416,478

Claims priority, application France, Jan. 8, 1990, 90 00 126  
Int. Cl.<sup>6</sup> C07K 14/47; 14/705

U.S. Cl. 530—350 2 Claims

1. A peptide, which is the soluble portion of the LAG-3 protein, having the amino acid sequence of residues 1–420 of SEQ ID NO:7, or a fragment thereof selected from the group consisting of:

JUNE 30, 1998

CHEMICAL

5085

residues 1 to 142 of SEQ ID NO:7;  
residues 143 to 232 of SEQ ID NO:7;  
residues 233 to 342 of SEQ ID NO:7;  
residues 343 to 413 of SEQ ID NO:7; and  
residues 42 to 71 of SEQ ID NO:7.

5,773,579

## LUNG CANCER MARKER

Richard M. Torczynski, Farmers Branch, and Arthur P. Bolton, Dallas, both of Tex., assignors to Cytoclonal Pharmaceuticals, Inc., Dallas, Tex.

PCT No. PCT/US95/09145, § 371 Date Jan. 21, 1997, § 102(e) Date Jan. 21, 1997, PCT Pub. No. WO96/02552, PCT Pub. Date Feb. 1, 1996

Division of Ser. No. 276,919, Jul. 19, 1994, Pat. No. 5,589,579. This PCT application Jul. 19, 1995, Ser. No. 776,088

Int. Cl.<sup>6</sup> C07K 14/00; C07H 21/00

U.S. Cl. 530—350 12 Claims

1. An isolated protein comprising a membrane ion and a phosphorylation site comprising the amino acids Arg-Arg-Lys-Ser, said protein further characterized by carbonic anhydrase activity and specificity for expression in non-small cell lung cancer.

5,773,580

## HUMAN PROTEIN KINASE C INHIBITOR HOMOLOG

Janice Au-Young, Berkeley; Phillip R. Hawkins, Mountain View, and Jennifer L. Hillman, San Jose, all of Calif., assignors to Incyte Pharmaceuticals, Inc., Palo Alto, Calif.

Division of Ser. No. 666,798, Jun. 18, 1996, Pat. No. 5,648,238. This application Jul. 14, 1997, Ser. No. 892,692

Int. Cl.<sup>6</sup> C07K 1/00

U.S. Cl. 530—350 2 Claims

1. A purified polypeptide having the amino acid sequence of SEQ ID NO:2.

5,773,581

## CONJUGATE OF A SOLUTION STABLE G-CSF DERIVATIVE AND A WATER-SOLUBLE POLYMER

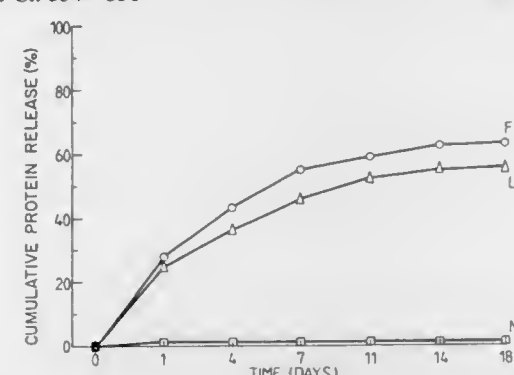
Roger Camble; David Timms, and Anthony James Wilkinson, all of Macclesfield, England, assignors to Zeneca Limited, London, Great Britain

Continuation of Ser. No. 155,327, Nov. 22, 1993, abandoned, which is a division of Ser. No. 734,225, Jul. 22, 1991, Pat. No. 5,320,840. This application Jun. 7, 1995, Ser. No. 488,457

Claims priority, application United Kingdom, Jul. 23, 1990, 9016138; Aug. 23, 1990, 9018414; Aug. 23, 1990, 9018415; Aug. 23, 1990, 9018416; Aug. 23, 1990, 9018417; Aug. 23, 1990, 9018418

Int. Cl.<sup>6</sup> A61K 38/19; C07K 1/113; 14/535

U.S. Cl. 530—351 10 Claims



1. An acid stable physiologically active substance which is a derivative of naturally occurring G-CSF having at least one of the

biological properties of naturally occurring G-CSF and a solution stability of at least 35% at 5 mg/ml, the derivative having Cys<sup>17</sup> of the native sequence replaced by a Ser<sup>17</sup> residue, Asp<sup>27</sup> of the native sequence replaced by a Ser<sup>27</sup> residue and at least one further modification selected from:

a) Pro<sup>60</sup> of the native sequence replaced by a Ser<sup>60</sup> residue; and  
b) Pro<sup>65</sup> of the native sequence replaced by a Ser<sup>65</sup> residue;  
said derivative being covalently conjugated to a water soluble polymer.

5,773,582

## TUMOR NECROSIS FACTOR MUTEINS

Hang-Cheol Shin, Kwangmyung; Nam-Kyu Shin, Seoul; Inkyung Lee, Incheon, and Sungzong Kang, Seoul, all of Rep. of Korea, assignors to Hanil Synthetic Fiber Co., Ltd., Kyungsangnam-do, Rep. of Korea

Continuation of Ser. No. 193,336, Feb. 8, 1994, abandoned. This application Oct. 4, 1995, Ser. No. 538,875

Claims priority, application Rep. of Korea, Feb. 9, 1993, 1993-1751

Int. Cl.<sup>6</sup> C07K 14/52; A61K 38/19

U.S. Cl. 530—351 9 Claims

1. A polypeptide human TNF mutein comprising an amino acid sequence represented by the amino acid sequence of SEQ ID NO: 1 wherein at least one of the following amino acid replacements occurs:

38th Alanine by Aspartic acid;  
39th Asparagine by Valine;  
40th Glycine by Aspartic acid, Lysine or Valine;  
41st Valine by Serine;  
52nd Serine by Isoleucine;  
53rd Glutamic acid by Lysine or Leucine;  
54th Glycine by Aspartic acid;  
56th Tyrosine by Glutamic acid or Phenylalanine;  
85th Valine by Glutamic acid or Arginine;  
86th Serine by Lysine, Glutamic acid or Aspartic acid;  
87th Tyrosine by Glutamic acid or Arginine;  
88th Glutamine by Glutamic acid;  
127th Glutamic acid by Alanine, Valine or Lysine;  
128th Lysine by Alanine, Valine, or Glutamic acid;  
129th Glycine by Glutamic acid, Lysine or Valine; and  
156th Alanine by Aspartic acid.

5,773,583

METHODS AND MATERIALS RELATING TO THE FUNCTIONAL DOMAINS OF DNA BINDING PROTEINS  
Vikas P. Sukhatme, Newton Center, Mass., assignor to Arch Development Corporation, Chicago, Ill.

Division of Ser. No. 40,548, Mar. 31, 1993, which is a continuation-in-part of Ser. No. 249,584, Sep. 26, 1988, Pat. No. 5,206,152, which is a continuation-in-part of Ser. No. 179,587, Apr. 8, 1988, abandoned. This application Jun. 6, 1995, Ser. No. 466,344

Int. Cl.<sup>6</sup> A61K 38/16

U.S. Cl. 530—358 17 Claims

1. A purified polypeptide comprising an amino acid sequence selected from the group consisting of SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:3 and SEQ ID NO:5.

5,773,584

Patent Not Issued For This Number

5,773,585

GLUTAMATE DEHYDROGENASE FROM  
PSEUDOMONAS

Noriyuki Hongo; Shizuo Hattori; Kazumi Yamamoto; Shinichi Teshima, and Yoshihisa Kawamura, all of Tsuruga, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan. Continuation of Ser. No. 386,768, Feb. 10, 1995, abandoned. This application Jun. 21, 1996, Ser. No. 667,357. Claims priority, application Japan, Feb. 16, 1994, 6-019448; Jun. 6, 1994, 6-123883.

Int. Cl.<sup>6</sup> C12N 9/02

U.S. Cl. 435—189

5 Claims

1. An isolated, purified, water soluble glutamate dehydrogenase produced by *Pseudomonas* sp. 433-3 having the following physicochemical properties;

(a) it catalyzes the following reaction

L-Glutamic acid+H<sub>2</sub>O+NAD<sup>+</sup>=α-Ketoglutaric acid+NH<sub>3</sub>+NADH;

(b) it has a substrate specificity to L-glutamic acid; it requires NADP<sup>+</sup> and NADH as coenzymes and does not act on NADP<sup>+</sup> and NADPH;

(c) it is thermally stable up to about 60° C. at a pH of 8.3 for ten minutes; and

(d) it is not activated by ADP.

5,773,586

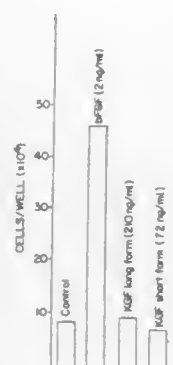
CONJUGATES COMPRISING TRUNCATED KERATINOCYTE GROWTH FACTOR (KGF) HAVING INCREASED BIOLOGICAL ACTIVITY AND A TOXIN  
Denis J. Gospodarowicz, Lafayette, and Frank R. Maslarsz, San Francisco, both of Calif., assignors to Chiron Corporation, Emeryville, Calif.

Division of Ser. No. 410,941, Mar. 27, 1995, Pat. No. 5,677,278, which is a continuation of Ser. No. 86,427, Jun. 29, 1993, abandoned. This application Jun. 6, 1995, Ser. No. 468,546.

Int. Cl.<sup>6</sup> C07K 14/475; C12N 15/00

U.S. Cl. 530—399

10 Claims



1. A conjugate comprising:

(a) a keratinocyte growth factor fragment that exhibits at least a 2-fold increase in mitogenic activity as compared to a mature, recombinant, full-length keratinocyte growth factor wherein the fragment lacks the first 23 N-terminal amino acid residues of the mature, full-length keratinocyte growth factor but retains the remainder of the molecule, and further wherein said fragment has at least 98% sequence identity with the amino acid sequence depicted at amino acid residues 55-194, inclusive, of SEQ ID NO: 1; and

(b) a toxin molecule.

5,773,587

HYDROPHILIC POLYMER COATED PERFLUOROCARBON  
POLYMER MATRICES FOR BIOAFFINITY  
SEPARATIONS

Christopher Robin Lowe, Hempstead, United Kingdom; Norman A. Parris, Hockessin, Del.; Ian Pitfield, Dorset, and Duncan Ross Purvis, Cambridgeshire, both of United Kingdom, assignors to DVC, Inc., Wilmington, Del.

Continuation of Ser. No. 311,840, Sep. 23, 1994, abandoned, which is a continuation of Ser. No. 52,308, Apr. 22, 1993, abandoned. This application Aug. 6, 1996, Ser. No. 689,160. Int. Cl.<sup>6</sup> C07K 17/08; 1/22; C12N 11/08; G01N 33/545.

U.S. Cl. 530—413

6 Claims

1. A method for making adsorbent particles comprising the sequential steps:

(1) dispersing porous particles of inert perfluorocarbon polymer in water-miscible organic solvent to wet the surfaces of the porous particles;

(2) separating the porous perfluorocarbon polymer particles, the surfaces of which are wetted with the water-miscible solvent, from the water-miscible solvent in the dispersion from step (1);

(3) forming a dispersion of the miscible solvent-wetted perfluorocarbon polymer particles from step (2) in an aqueous solution of hydrophilic polymer having a molecular weight of at least 1,000 up to the point of insolubility of the polymer in water, the chains of the polymer containing a plurality of hydroxyl groups at least one of which is located at an end of a polymer chain, by which the hydrophilic polymer is adsorbed onto the wetted surfaces of the perfluorocarbon polymer;

(4) admixing a homobifunctional cross-linking agent with the dispersion from step (3) to effect cross-linking of the adsorbed hydrophilic polymer adsorbed on the surfaces of the fluorocarbon polymer;

(5) separating the cross-linked hydrophilic polymer-coated particles from the dispersion from step (4);

(6) activating hydroxyl groups on the surface of the cross-linked hydrophilic polymer to provide for covalent bonding thereto of a ligand or ligand binder; and

(7) covalently bonding a ligand or ligand binder to the activated hydroxyl groups on the surface of the hydrophilic polymer.

5,773,588

METHOD FOR PURIFYING SOMATOTROPIN  
MONOMERS

Dennis C. Owsley, St. Louis, Mo., and Suvit Kulvaranon, Kingwood, Tex., assignors to Monsanto Company, St. Louis, Mo. Continuation of Ser. No. 246,028, May 19, 1994, abandoned.

This application Dec. 4, 1995, Ser. No. 566,591.

Int. Cl.<sup>6</sup> C07K 1/30

U.S. Cl. 530—419

17 Claims

1. A process of separating somatotropin monomer from an aqueous solution of somatotropin monomer and somatotropin oligomers having a concentration of urea in excess of 3.5 molar comprising mixing the solution with an acid in an amount to lower the pH below about 7.7 to precipitate selectively the oligomers and then removing the resulting precipitated oligomers.

5,773,589

STEAM REFORMING CATALYSTS FOR LOWER  
HYDROCARBONS

Kazuo Shoji; Ryuichi Mogami; Toru Numaguchi, all of Chiba; Toshio Matsuhisa, Kanagawa; Hideaki Yanaru, Chiba; Yasuo Nishioka, Yamaguchi, and Yasuhiro Izawa, Chiba, all of Japan, assignors to Toyo Engineering Corporation, and Catalysts and Chemicals, Inc., Far East, both of Tokyo, Japan.

Filed May 1, 1997, Ser. No. 848,917

Claims priority, application Japan, May 16, 1996, 8-121442. Int. Cl.<sup>6</sup> B01J 21/04; 23/40; 23/755.

U.S. Cl. 502—328

6 Claims

1. A catalyst thereby for steam-reforming of lower hydrocarbons, comprising: a support comprising Al<sub>2</sub>O<sub>3</sub> and 0.5 to 25 percent by weight, per the catalyst, of CaO, at least part of CaO forming a compound(s) with Al<sub>2</sub>O<sub>3</sub>, and Ni as the active component, a void fraction X of pores with a diameter of 0.5 to 20 μm being 0.08 or larger, a void fraction Y of pores with a diameter of less than 0.5 μm being 0.15 or larger, an entire void fraction Z of all the pores being 0.23 to 0.8, Z not being less than the sum total of X and Y.

5,773,590

METHODS OF SEPARATING LIGNIN SOLIDS AND  
BLACK LIQUOR FROM TALL OIL FATTY ACIDS

Paul R. Hart, The Woodlands, Tex., assignor to BetzDearborn Inc., Trevose, Pa.

Filed Apr. 8, 1997, Ser. No. 835,779

Int. Cl.<sup>6</sup> C07G 1/00; C08L 97/00

U.S. Cl. 530—500

4 Claims

1. In a process for the separation of black liquor, containing lignin, from tall oil, the step of adding to a process stream containing lignin, black liquor, and tall oil, a separation aid selected from the group consisting of C<sub>4</sub>–C<sub>6</sub> alkyl phenol-formaldehyde resin alkoxylates, poly (propylene oxide) ethoxylates, and ethanol amine condensates and combinations thereof, whereby the separation into phases of black liquor, containing lignin, and tall oil is enhanced.

5,773,591

PROCESS FOR PREPARING COUMARIN SULFONATES  
Mohammad Aslam; Michael T. Sheehan, and George Kvackovsky, all of Corpus Christi, Tex., assignors to Hoechst Celanese Corp., Somerville, N.J.

Filed Mar. 7, 1997, Ser. No. 813,106

Int. Cl.<sup>6</sup> C07D 311/20; 335/06

U.S. Cl. 534—557

19 Claims

1. A process for preparing sulfonic acid ester or amide of fused benzo-heterocyclic diazo diketo compounds comprising the steps of:

(a) subjecting a substituted benzo-heterocyclic β-keto-enol compound to suitable diazo transfer conditions in the presence of a diazo transfer agent for a sufficient period of time and under suitable conditions of temperature and pressure to form the corresponding diazo diketo compound;

(b) subjecting said diazo diketo compound to suitable halosulfonation conditions in the presence of a halosulfonation agent for a sufficient period of time and under suitable conditions of temperature and pressure to form the corresponding halosulfonyl diazo diketo compound; and

(c) subjecting said halosulfonyl diazo diketo compound to suitable substitution reaction in the presence of an alcohol or an amine and a suitable base for a sufficient period of time and under suitable conditions of temperature and pressure to form the corresponding sulfonic acid ester or amide of the fused benzo-heterocyclic diazo diketo compound.

5,773,592

## PRO DRUGS FOR SELECTIVE DRUG DELIVERY

Randell Lee Mills, R.D. #2, Cochranville, Pa. 19330

Continuation of Ser. No. 446,439, Dec. 4, 1989, Pat. No. 5,428,163, which is a continuation-in-part of Ser. No. 948,326, Dec. 31, 1986, abandoned, and a continuation-in-part of Ser. No. 175,970, Mar. 31, 1988, abandoned. This application May 30, 1995, Ser. No. 450,672.

Int. Cl.<sup>6</sup> C07C 245/00; A01N 33/26; C12Q 1/70

U.S. Cl. 534—573

26 Claims

1. A chemical compound having the formula A-B-C, where A is a chemiluminescent moiety which reacts with peroxides and oxygen free radicals and is capable of transferring energy from its own excited state to B;

B is a photochromic moiety covalently bonded to A which receives energy from A to achieve an excited state, wherein the emission spectrum of A overlaps the absorption-release reaction spectrum of B in the wavelength range of 250 nm to 420 nm; and

C is a biologically active agent covalently bonded to B, wherein relaxation of the excited state of B causes heterolytic cleavage of the covalent bond between B and C, thereby releasing C from B.

5,773,593

## BIS-AZO DYES AND INKS BASED THEREON

Peter Gregory, Bolton; Ronald Wynford Kenyon, Bridport, and Paul Wight, Prestwich, all of United Kingdom, assignors to Zeneca Limited, London, England.

Filed Dec. 18, 1996, Ser. No. 769,701

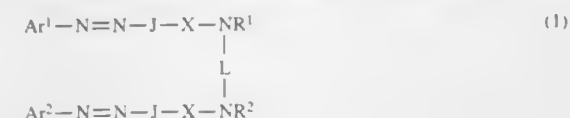
Claims priority, application United Kingdom, Dec. 19, 1995, 9525882.

Int. Cl.<sup>6</sup> C09B 33/10; C09D 11/00; D06P 5/00

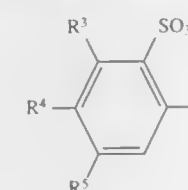
U.S. Cl. 534—796

9 Claims

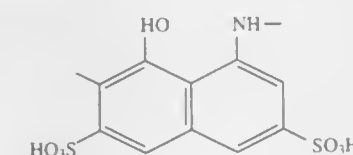
1. A bisazo compound of formula (1) or a salt thereof:



wherein Ar<sup>1</sup> and Ar<sup>2</sup>, which may be the same as different, represent groups of the formula:



wherein each of R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup>, independently, represents H, halogen, alkyl, alkoxy or acylamino; J represents



L represents a divalent organic linking group other than phenylene and each of R<sup>1</sup> and R<sup>2</sup>, independently, represents H or optionally substituted hydrocarbyl or R<sup>1</sup> and/or R<sup>2</sup> together with L and the attached nitrogen atom(s) form a 5- or 6-membered ring; and



VOL

1  
2  
1  
1

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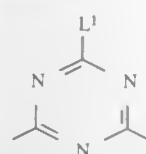
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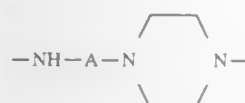
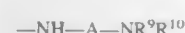
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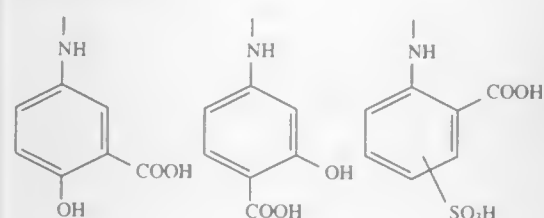
X represents



wherein  $L^1$  represents  $-SR^6$  or  $-NR^7R^8$  in which each of  $R^6$ ,  $R^7$  and  $R^8$ , independently, represents H or optionally substituted hydrocarbyl or  $R^7$  and  $R^8$  together with the attached nitrogen atom form a 5- or 6-membered ring; provided that L comprises the residue

and/or  $L^1$  is

wherein A represents an optionally substituted alkylene group containing 2 or more carbon atoms and each of  $R^9$  and  $R^{10}$ , independently, represents H or optionally substituted hydrocarbyl or  $R^9$  and  $R^{10}$  together with the attached nitrogen atom form a 5- or 6-membered ring, the compounds of Formula (I) being free from fibre-reactive groups and any carboxyl substituents present in the compounds being attached in the form of one or more residue of the following formulae:



5,773,594

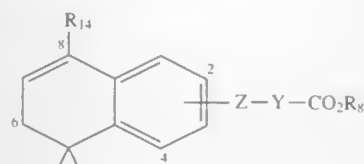
ALKYL OR ARYL SUBSTITUTED  
DIHYDRONAPHTHALENE DERIVATIVES HAVING  
RETINOID AND/OR RETINOID ANTAGONIST-LIKE  
BIOLOGICAL ACTIVITY

Alan T. Johnson, Rancho Santa Margarita; Min Teng, Aliso Viejo; Vidyasagar Vuligonda, Irvine; Richard L. Beard, Newport Beach; Samuel J. Gillett, El Cerrito; Tien T. Duong, Irvine, and Roshantha A. Chandraratna, Mission Viejo, all of Calif., assignors to Allergan, Irvine, Calif.

Filed Jun. 21, 1996, Ser. No. 667,663  
Int. Cl.<sup>6</sup> C07C 245/10

U.S. Cl. 534-298

1. A compound of the formula



where Z is  $C(CH_3)=CH-CH=CH-C(CH_3)=CH-$ ,  $-N=N-$ ,  $CO-CH=CH-$ , or  $COO-$ ; Y is phenyl or when Y is  $C(CH_3)=CH-CH=CH-C(CH_3)=CH-$  then Y represents a direct valence bond between Z and  $CO_2R_8$ ;  $R_8$  is hydrogen or lower alkyl, and

$R_{14}$  is  $CH_2COOR_8$ , 2-thiazolyl or 2-thienyl, or a pharmaceutically acceptable salt of said compound.

5,773,595

## CATIONIC SUGAR SURFACTANTS

Manfred Weuthen, Solingen; Joerg Kahre, Monheim; Hermann Hensen, Haan, and Holger Tesmann, Juechen, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Germany

PCT No. PCT/EP95/01318, § 371 Date Oct. 18, 1996, § 102(e) Date Oct. 18, 1996, PCT Pub. No. WO95/29183, PCT Pub. Date Nov. 2, 1995

PCT Filed Apr. 11, 1995, Ser. No. 722,086

Claims priority, application Germany, Apr. 20, 1994, 44 13 686.2

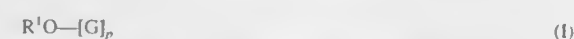
Int. Cl.<sup>6</sup> C07H 15/02; I/00

U.S. Cl. 536-17.9

4 Claims

1. A cationic sugar surfactant made by the process which comprises the steps of

(a) reacting an alkyl or alkenyl oligoglycoside of the formula (I):



wherein  $R^1$  is an alkyl or an alkenyl radical having from 4 to 22 carbon atoms, G is sugar unit having 5 or 6 carbon atoms and p is a number from 1 to 10 with chloroacetic acid, chloroacetic anhydride or chloroacetic acid methyl ester; (b) reacting the product from step (a) with a tertiary amine of the formula (II):



wherein each of  $R^2$  and  $R^1$  is an alkyl or alkenyl radical having from 1 to 22 carbon atoms.

5,773,596

## PREPARATION OF GANGLIOSIDE HAVING CERAMIDE MOIETY LABELED WITH FLUORESCENCE

Takao Iida, and Yutaka Ohira, both of Tsukuba, Japan, assignors to Daikin Industries, Ltd., Osaka, Japan

PCT No. PCT/JP95/00951, § 371 Date Nov. 20, 1996, § 102(e) Date Nov. 20, 1996, PCT Pub. No. WO95/32211, PCT Pub. Date Nov. 30, 1995

PCT Filed May 18, 1995, Ser. No. 737,828

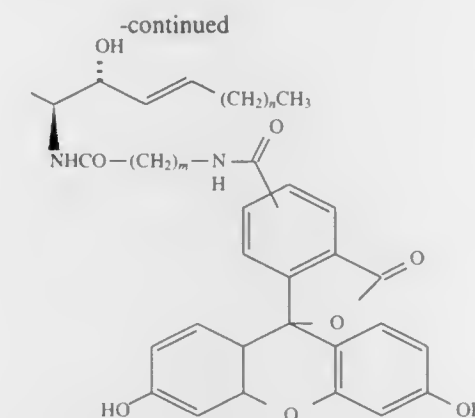
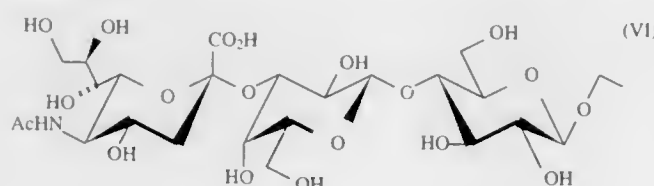
Claims priority, application Japan, May 20, 1994, 6-106970

Int. Cl.<sup>6</sup> C07H 15/00

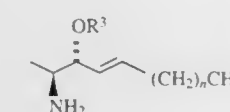
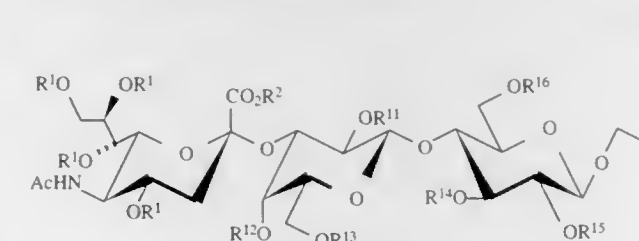
U.S. Cl. 536-18.6

3 Claims

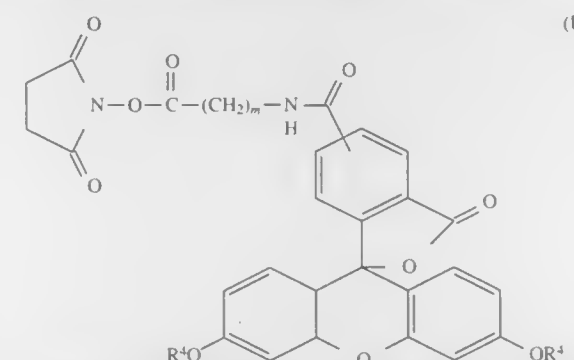
1. A process for preparing a fluorescein ganglioside GM3 of the formula (VI):



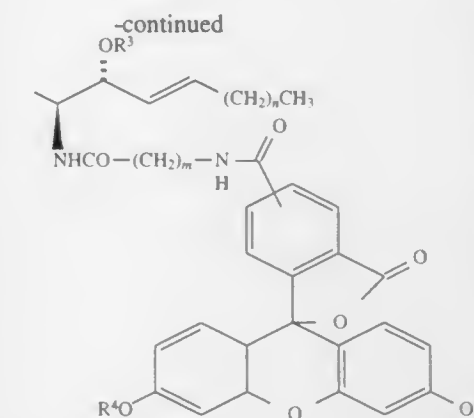
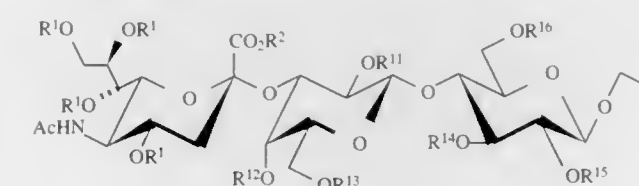
wherein m is an integer of at least two and n is an integer of 0 to 12, comprising the steps of  
reacting a compound of the formula (III):



wherein n is an integer of 0 to 12,  $R^1$ ,  $R^{11}$ ,  $R^{12}$ ,  $R^{13}$ ,  $R^{14}$ ,  $R^{15}$ ,  $R^{16}$  and  $R^3$  are protecting groups for the hydroxyl groups, and  $R^2$  is a protecting group for the carboxyl group with a compound of the formula (IV):



wherein m is an integer of at least two, and  $R^4$  is a protecting group for the hydroxyl group to obtain a compound of the formula (V):



wherein  $R^1$ ,  $R^{11}$ ,  $R^{12}$ ,  $R^{13}$ ,  $R^{14}$ ,  $R^{15}$ ,  $R^{16}$ ,  $R^3$ ,  $R^4$ , m and n are the same as defined above, and  
removing the protecting groups for the hydroxyl and carboxyl groups in the compound of the formula (V) to obtain the fluorescein ganglioside GM3.

5,773,597

Patent Not Issued For This Number

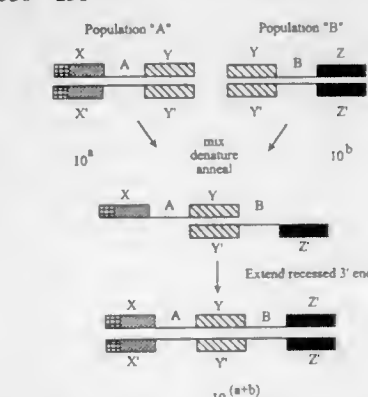
5,773,598

SYSTEMATIC EVOLUTION OF LIGANDS BY  
EXPONENTIAL ENRICHMENT: CHIMERIC SELEX  
Donald Burke, Ted Tarasow, Bruce E. Eaton, and Larry Gold, all of Boulder, Colo., assignors to NeXstar Pharmaceuticals, Inc., Boulder, Colo.

Continuation of Ser. No. 284,063, Aug. 2, 1994, Pat. No. 5,637,459, which is a continuation-in-part of Ser. No. 714,131, Jun. 10, 1991, Pat. No. 5,475,096, which is a continuation-in-part of Ser. No. 536,428, Jun. 11, 1990, abandoned. This application Jun. 5, 1995, Ser. No. 464,102

Int. Cl.<sup>6</sup> C07H 21/02; 21/04; C12P 19/34; C12Q 1/68  
U.S. Cl. 536-231

5 Claims



1. A chimeric nucleic acid ligand having high binding affinity for first and second target molecules identified according to a method comprising:

- preparing a chimeric nucleic acid ligand library generated according to a method comprising:
  - generating a first library of nucleic acid ligands selected through the SELEX procedure for binding to said first target molecule, said nucleic acid ligands having a 3' fixed sequence, and producing the double-stranded form of said first library of nucleic acid ligands;
  - generating a second library of nucleic acid ligands selected through the SELEX procedure for binding to said second target molecule, said nucleic acid ligands having a 5' fixed sequence identical to the 3' fixed sequence of the nucleic

acid ligands of said first library, and producing the double-stranded form of said second library of nucleic acid ligands;

- iii) mixing said first and second libraries under conditions which promote interlibrary annealing;
  - iv) forming chimeric nucleic acid ligands by enzymatically extending the recessed 3' ends while copying the 5' extensions of each annealed pair to yield a double-stranded nucleic acid ligand library; and
  - v) amplifying said double-stranded chimeric nucleic acid ligand library;
- b) contacting said amplified chimeric nucleic acid ligand library with said first and second target molecules, wherein chimeric nucleic acid ligands having an increased affinity to said first and second target molecules may be partitioned from the remainder of the chimeric nucleic acid ligand library;
- c) partitioning said increased affinity chimeric nucleic acid ligands from the remainder of said chimeric nucleic acid ligand library; and
- d) amplifying said increased affinity chimeric nucleic acid ligands to yield a mixture of chimeric nucleic acid ligands enriched in members which bind to said first and second target molecules, whereby a chimeric nucleic acid ligand having high binding affinity to said first and second target molecules is identified.

5,773,599

**48 KD CELLULAR PHOSPHOPROTEIN CTBP**

Govindaswamy Chinnadurai, St. Louis, Mo., assignor to Saint Louis University, St. Louis, Mo.

Filed Nov. 6, 1995, Ser. No. 553,999

Int. Cl.<sup>6</sup> C07H 21/04; G01N 33/536; C07K 14/00

U.S. Cl. 536—23.1 2 Claims

1. An isolated protein molecule consisting of SEQ ID NO:2.

5,773,600

**DNA ENCODING PERTUSSIS TOXIN MUTEINS**

Walter Neal Burnette, III, Thousand Oaks, Calif., assignor to Amgen Inc., Thousand Oaks, Calif.

Continuation of Ser. No. 34,460, Mar. 18, 1993, abandoned, which is a continuation of Ser. No. 232,482, Aug. 17, 1988, abandoned, which is a continuation-in-part of Ser. No. 44,037, Sep. 4, 1987, abandoned. This application Jun. 6, 1995, Ser. No. 468,679

Int. Cl.<sup>6</sup> C07H 21/04; C12N 15/31; A61K 39/10

U.S. Cl. 536—23.7 4 Claims

1. A recombinant DNA molecule comprising a nucleotide sequence encoding a mutant S1 subunit of Bordetella exotoxin which differs from the native sequence of the S1 subunit by comprising a residue other than arginine substituted for arginine at the ninth position from the mature N-terminus, wherein a holotoxin of Bordetella exotoxin comprising said mutant S1 subunit elicits Bordetella exotoxin-neutralizing antibodies and lacks enzymatic activity associated with Bordetella exotoxin reactivity.

5,773,601

**INVERTED CHIMERIC AND HYBRID OLIGONUCLEOTIDES**

Sudhir Agrawal, Shrewsbury, Mass., assignor to Hybridon, Inc., Cambridge, Mass.

Continuation of Ser. No. 516,454, Aug. 17, 1995, Pat. No. 5,652,356. This application Jul. 1, 1997, Ser. No. 886,860

Int. Cl.<sup>6</sup> C07H 21/04

U.S. Cl. 536—24.5 2 Claims

1. A modified oligonucleotide having from about 15 to about 35 nucleotides, such modified oligonucleotide comprising a 2'-O-substituted RNA region in between two oligodeoxyribonucleotide

phosphorothioate regions, wherein the 2'-O-substituted RNA region has from about 4 to about 13 2'-O-substituted ribonucleosides, each of which has a 2'-O-substitution selected from a hydroxy group, an amino group, a halo group and an -O-lower alkyl group containing 1-6 saturated or unsaturated carbon atoms or an -O-aryl or allyl group having 2-6 carbon atoms, wherein such alkyl, aryl or allyl group may be unsubstituted or may be substituted with halo, hydroxy, trifluoromethyl, cyano, nitro, acyl, acyloxy, alkoxy, carboxyl, carbalkoxyl, or amino groups; and wherein each of the oligodeoxyribonucleotide phosphorothioate regions has from about 5 to about 15 phosphorothioate-linked nucleosides.

5,773,602

**DNA FRAGMENTS OBTAINED FROM A NOVEL HUMAN IMMUNODEFICIENCY VIRUS DESIGNATED LAV<sub>MAL</sub>**

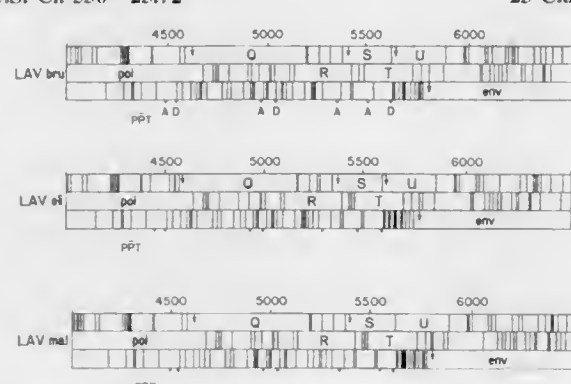
Marc Alizon; Pierre Sonigo, both of Paris; Simon Wain-Hobson, Montigny les Bretonneux, and Luc Montagnier, Le Plessis Robinson, all of France, assignors to Institut Pasteur, Paris, France

Continuation of Ser. No. 988,530, Dec. 10, 1992, abandoned, which is a continuation of Ser. No. 656,797, Feb. 19, 1991, abandoned, which is a division of Ser. No. 38,330, Apr. 13, 1987, Pat. No. 5,030,714. This application Nov. 18, 1993, Ser. No. 154,397

Claims priority, application France, Jun. 23, 1986, 86401380.0

Int. Cl.<sup>6</sup> C07H 21/04; 21/02

U.S. Cl. 536—23.72 23 Claims



1. A DNA fragment having a nucleotide sequence selected from the group consisting of:

- a sequence having nucleotides 1 to 96, which is the long terminal repeat R region of LAV<sub>MAL</sub>;
- a sequence having nucleotides 97 to 179, which is the 5' long terminal repeat U5 region of LAV<sub>MAL</sub>;
- a sequence having nucleotides 8676 to 9133, which is the 3' long terminal repeat U3 region of LAV<sub>MAL</sub>;
- a sequence having nucleotides 9134 to 9229, which is the 3' long terminal repeat U3 region of LAV<sub>MAL</sub>;
- a sequence having nucleotides 5405 to 5620, which is the tat coding region of LAV<sub>MAL</sub>;
- a sequence having nucleotides 5134 to 5421, which is the vpr coding region of LAV<sub>MAL</sub>;
- a sequence having nucleotides 8380 to 9006, which is the nef coding region of LAV<sub>MAL</sub>;
- a sequence having nucleotides 350 to 1864, which is the gag coding region of LAV<sub>MAL</sub>;
- a sequence having nucleotides 1663 to 4668, which is the pol coding region of LAV<sub>MAL</sub>;
- a sequence having nucleotides 5799 to 8375, which is the env coding region of LAV<sub>MAL</sub>;
- a sequence having nucleotides 764 to 1501, which is the gag p25 coding region of LAV<sub>MAL</sub>;
- a sequence having nucleotides 1502 to 1864, which is the gag p13 coding region of LAV<sub>MAL</sub>;
- a sequence having nucleotides 5799 to 5885, which corresponds to amino acids 1-33 of the env coding region of LAV<sub>MAL</sub>;

a sequence having nucleotides 5886 to 7337, which corresponds to amino acids 34 to 530 of the gp110 env coding region of LAV<sub>MAL</sub>;

a sequence having nucleotides 5895 to 6176, which corresponds to amino acids 37 to 130 of the env coding region of LAV<sub>MAL</sub>;

a sequence having nucleotides 6399 to 6635, which corresponds to amino acids 211 to 289 of the env coding region of LAV<sub>MAL</sub>;

a sequence having nucleotides 7212 to 7337, which corresponds to amino acids 488 to 530 of the env coding region of LAV<sub>MAL</sub>;

a sequence having nucleotides 7215 to 7604, which corresponds to amino acids 490 to 620 of the env coding region of LAV<sub>MAL</sub>; and

a sequence having nucleotides 7782 to 7844, which corresponds to amino acids 680 to 700 of the env coding region of LAV<sub>MAL</sub>.

5,773,603

**METHOD FOR TREATING ALLERGIC DISEASES WITH ADENOSINE DERIVATIVES**

Toshio Yamada, Katoh-Gun, Japan, assignor to Nippon Zoki Pharmaceutical Co., Ltd., Osaka, Japan

Division of Ser. No. 141,597, Oct. 27, 1993, Pat. No. 5,705,491.

This application May 30, 1995, Ser. No. 443,876

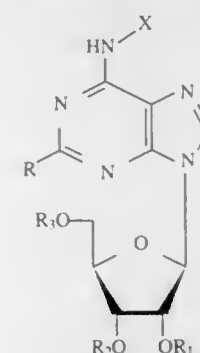
Claims priority, application Japan, Oct. 27, 1992, 4-312764; Oct. 27, 1992, 4-312765

Int. Cl.<sup>6</sup> A61K 31/70; C07H 19/167

U.S. Cl. 514—46 6 Claims

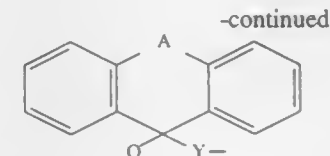
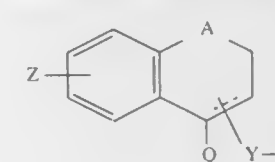
1. A method of treating a patient affected with an allergic disease wherein said method comprises:

- (a) administering to said patient a pharmaceutically effective amount of an adenosine deaminase inhibitor containing at least one of the compounds represented by formula (I) or a pharmaceutically acceptable salt thereof:



wherein each of R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> may be the same or different and each of R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> is hydrogen or alkyl;

R is hydrogen, alkyl, alkenyl, alkynyl, hydroxyalkynyl, alkoxy, phenyl, hydroxy, amino, alkylamino, phenylamino or halogen; X is hydrogen, alkyl, alkynyl, allyl, methallyl, cycloalkyl, alkyl having one or more hydroxy groups, phenyl, substituted phenyl, alkyl having one or more phenyl substituents, alkyl having one or more substituted phenyl groups, bicycloalkyl, naphthylalkyl, acenaphthylalkyl or a compound represented by Formula (II) or Formula (III):



(III)

wherein

Z is hydrogen, hydroxy or lower alkoxy;

Q is hydrogen or hydroxy;

A is —CH<sub>2</sub>—, —O—, —S— or a single bond forming a five-membered ring;

Y is (CH<sub>2</sub>)<sub>n</sub>— or a single bond;

n is an integer from 1 to 3; and

at least one of R<sub>1</sub>, R<sub>2</sub> and R<sub>3</sub> is an alkyl;

wherein said at least one compound represented by Formula (I) is present in the adenosine deaminase inhibitor in a pharmaceutically effective amount.

5,773,604

**POLYOL COMPOSITION, PROCESS FOR ITS PREPARATION AND ITS APPLICATIONS**

Philippe Lefevre, Merville, and Jean-Paul Salome, Vieux-Berquin, both of France, assignors to Roquette Freres, Lestrem, France

Filed Jun. 6, 1995, Ser. No. 467,320

Claims priority, application France, Oct. 11, 1994, 94 13583

Int. Cl.<sup>6</sup> C08B 37/00; 31/00; C07H 1/00

U.S. Cl. 536—104 12 Claims

1. Polyol composition exhibiting an optical density lower than or equal to 0.100 in an S test.

5,773,605

**SULFATED GLYCOSAMINOGLYCANOID DERIVATIVES OF THE HEPARIN SULFATE TYPE**

Maurice Petitou, Paris, France, and Constant Adriaan Anton van Boeckel, Oss, Netherlands, assignors to Akzo Nobel N.V., Arnhem, Netherlands

Continuation of Ser. No. 333,448, Nov. 2, 1994, Pat. No.

5,529,985, which is a continuation of Ser. No. 325,841, Oct. 19, 1994, Pat. No. 5,543,403, which is a continuation-in-part of Ser. No. 795,595, Nov. 21, 1991, abandoned, which is a continuation-in-part of Ser. No. 690,035, Apr. 23, 1991, abandoned. This application May 23, 1996, Ser. No. 652,737

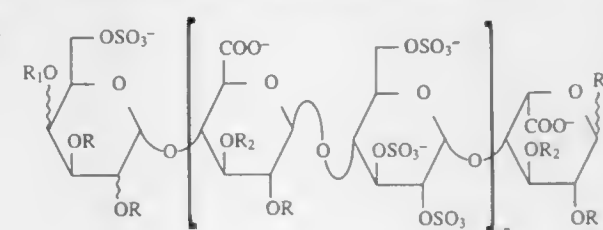
Claims priority, application European Pat. Off., Aug. 23, 1990, 90201006

Int. Cl.<sup>6</sup> C07H 11/00; 13/02; 1/00

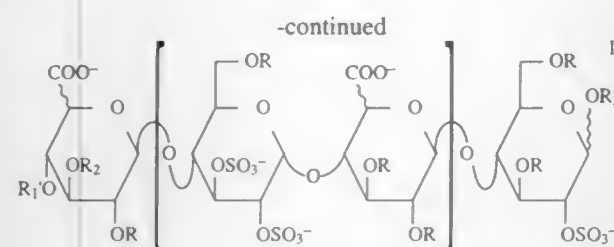
U.S. Cl. 536—118 1 Claim

1. A process for the preparation of a sulfated compound derived from a glycosaminoglycan, comprising coupling of protected monosaccharides to give protected disaccharides, which are optionally further coupled to tetra-, penta- or hexasaccharides; cleaving the protective groups partially or completely and sulfating free hydroxy groups; cleaving any remaining protective groups; and optionally converting the compound obtained into a pharmaceutically acceptable salt.

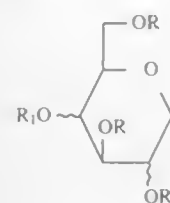
wherein said compound produced by the above process comprises a saccharide unit having the formula I or II



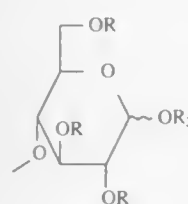




in which the twatched lines denote an  $\alpha$  or  $\beta$  bond, each of the groups R are independently selected from the group consisting of alkyl and sulfate; n is 1 or 2; R<sub>1</sub> is selected from the group consisting of alkyl, aryl and aralkyl, and R<sub>1</sub>' has the same meaning as R, or is aryl, aralkyl or



wherein R and R<sub>1</sub> have the previously given meanings; R<sub>2</sub> is alkyl; R<sub>3</sub> is alkoxy or



wherein the twatched line, R and R<sub>2</sub> have the previously given meanings, and the charged moieties are compensated by counterions.

5,773,606

## CATALYST REGENERATION

Ronny Leontina Marcel Vercauteren, Sint-Niklaas, and Myriam Elseviers, Kampenhout, both of Belgium, assignors to Cerestar Holding B.V., AA Sas Van Gent, Netherlands

Filed Oct. 31, 1995, Ser. No. 550,707

Claims priority, application United Kingdom, Oct. 31, 1994, 9421894

Int. Cl.<sup>6</sup> C07H 1/00

U.S. Cl. 536—124

19 Claims

1. A process for the epimerisation of a saccharide which comprises the steps of

- (a) contacting an aqueous feed comprising an aqueous solution of the saccharide with a supported hexavalent molybdenum catalyst; and
- (b) regenerating the activity of the supported hexavalent molybdenum catalyst by interrupting the said aqueous feed and treating said supported hexavalent molybdenum catalyst with an aqueous solution of peroxide having a pH of 0.5 to 7 as an oxidizing agent.

5,773,607  
PROCESSES FOR PREPARING 2'-DEOXY-2'-  
FLUOROFORMYCIN AND STEREOISOMERS  
THEREOF

Tomio Takeuchi; Sumio Umezawa, both of Tokyo; Tsutomu Tsuchiya, Yokohama, and Yoshiaki Takahashi, Tokyo, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

Continuation of Ser. No. 240,777, May 12, 1994, abandoned.

This application Mar. 22, 1996, Ser. No. 620,396

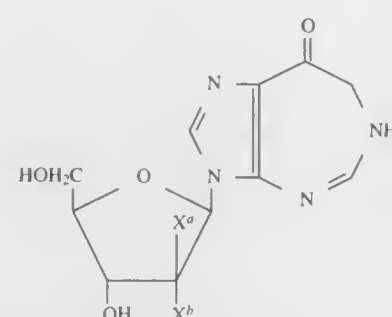
Claims priority, application Japan, Nov. 14, 1991, 3-352588  
Int. Cl.<sup>6</sup> C07H 1/00; 19/00

U.S. Cl. 536—124

2 Claims

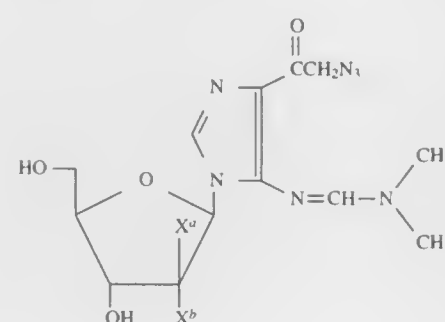
1. A process for preparing 3-(2-deoxy-2-fluoro- $\beta$ -D-ribofuranosyl or -arabinofuranosyl)-6,7-dihydroimidazo-(4,5-d)[1,3]diazepin-8-(3H)-one represented by the formulae (VI)

(VI)



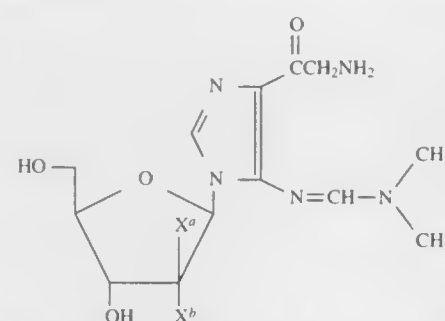
wherein x<sup>a</sup> is a hydrogen atom x<sup>b</sup> is a fluorine atom, or x<sup>a</sup> is a fluorine atom and x<sup>b</sup> is a hydrogen atom, which comprises consecutive steps of reducing the azide group (—N<sub>3</sub>) of a compound of a formulae (VII)

(VII)



wherein x<sup>a</sup> and x<sup>b</sup> are as defined above, to produce a compound of a formula (VIII)

(VIII)



and then cyclizing compound of the above formula (VIII) to produce a compound of the above formula (VI).

5,773,608  
PROCESS FOR PREPARING STABILIZED CHITIN  
DERIVATIVE COMPOUNDS

Shasy-Fong Yen, Atlanta, and Mary Sou, Alpharetta, both of Ga., assignors to CIBA Vision Corporation, Duluth, Ga.

Continuation-in-part of Ser. No. 516,420, Aug. 17, 1995. This application Jul. 3, 1996, Ser. No. 675,748

Int. Cl.<sup>6</sup> C08B 37/08; A61K 31/73

U.S. Cl. 536—124

15 Claims

1. A process for preparing a sterilized polysaccharide composition, said composition comprising a polysaccharide selected from the group consisting of N-alkyl chitosan, 6-O-alkyloxy chitosan, N,O-alkyl chitosan, N,N-dialkyl chitosan, N-halo-chitosan, O-carboxymethyl chitosan, N,O-carboxymethyl chitosan, N-carboxymethyl chitosan, N,O-sulfur chitosan, 1-deoxygalactitol-yl-chitosan, 1-deoxygalactitol-yl-chitosan, N,O-ethylamine chitosan and mixtures thereof, which process comprises the steps of:

- a) forming a suspension of said polysaccharide in a solvent, said polysaccharide being substantially insoluble in said solvent;
- b) sterilizing said suspension, thereby forming a sterilized suspension; and
- c) thereafter, solubilizing said polysaccharide, thereby forming a sterilized polysaccharide solution.

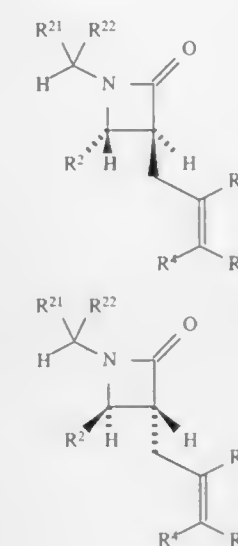
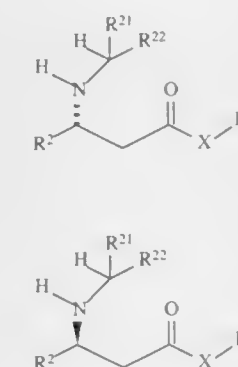


FIG. DG<sub>1</sub>

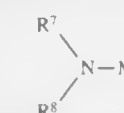
where the variables are defined below, which comprises a series of reactions, the reactions beginning with a compound represented by the structures in FIGS. DG<sub>0</sub>, below,

FIG. DG<sub>0</sub>



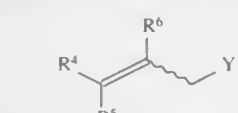
where R<sup>2</sup> and R<sup>3</sup> are defined independently and are lower alkyl, alkylaryl, or optionally substituted aryl; where R<sup>21</sup> and R<sup>22</sup> are defined independently and are H, -(C<sub>1</sub>-C<sub>8</sub>)alkyl, -(C<sub>3</sub>-C<sub>8</sub>)cycloalkyl, -(C<sub>1</sub>-C<sub>8</sub>)alkyl-(C<sub>3</sub>-C<sub>8</sub>)cycloalkyl, -(C<sub>6</sub>-C<sub>12</sub> aryl), -(C<sub>1</sub>-C<sub>8</sub>)alkyl-(C<sub>6</sub>-C<sub>12</sub> aryl), or the aryl or alkyl is substituted with one to three of the following groups, -(C<sub>6</sub>-C<sub>12</sub> aryl), -(C<sub>1</sub>-C<sub>3</sub>)alkyl, -(C<sub>1</sub>-C<sub>3</sub>) alkoxy, halogen, trifluoromethyl; and where X is O, NH, S; are dissolved in a suitable organic solvent, and then added, in a cool temperature to control exothermic formations under an inert atmosphere, to a solution of a compound of the description in FIG. GRX, dissolved in a suitable organic solvent,

FIG. GRX



where R<sup>7</sup> and R<sup>8</sup> are defined independently and are -(C<sub>1</sub>-C<sub>8</sub>)alkyl, -(C<sub>3</sub>-C<sub>8</sub>)cycloalkyl, -(C<sub>1</sub>-C<sub>8</sub>)alkyl-M is Li, Na, or K; the resulting anion or dianion is then reacted with a compound represented by the structure shown in FIG. GYX below,

FIG. GYX



where R<sup>4</sup>, R<sup>5</sup>, and R<sup>6</sup> are independent and are H, alkyl, alkylaryl, or optionally substituted aryl, and where Y is halogen, —OTs, —OMs, or —OTf; to obtain the desired compound or compounds.

5,773,610

OPTICALLY ACTIVE 3-(1-(ALKYLAMINO))ALKYL  
PYRROLIDINES

William W. McWhorter, Parchment; Thomas J. Fleck, Scotts, and Bruce A. Pearlman, Kalamazoo, all of Mich., assignors to Pharmacia & Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 58,611, May 6, 1993, abandoned. This application Nov. 1, 1995, Ser. No. 549,793

Int. Cl.<sup>6</sup> C07D 205/08

U.S. Cl. 540—200

6 Claims

1. The process for the preparation of a compound or the compounds represented by the structures on the left side, or the right side of FIG. DG<sub>1</sub>, below, or, if the starting materials are a racemic mixture, the reaction may produce a mixed ratio of compounds represented on both sides of the FIG. DG<sub>1</sub>, below,

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5,773,611

**CERAMIDES, PROCESS FOR THEIR PREPARATION AND THEIR APPLICATIONS IN THE COSMETIC AND DERMOPHARMACEUTICAL FIELDS**

Alexandre Zysman, Paris; Guy Vanlerberghe, Claye-Souilly, and Didier Semeria, Courty, all of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 463,514, Jun. 5, 1995, abandoned, which is a division of Ser. No. 384,434, Feb. 2, 1995, Pat. No. 5,618,523, which is a continuation of Ser. No. 837,935, Feb. 20, 1992, abandoned. This application Feb. 26, 1997, Ser. No. 811,596

Claims priority, application France, Feb. 21, 1991, 91 02091 Int. Cl.<sup>6</sup> A61K 7/00; 7/48

U.S. Cl. 424—401

13 Claims

1. Composition for cosmetic or dermopharmaceutical use, comprising, in the presence of an adjuvant selected from the group consisting of mineral, animal and vegetable oils and waxes, fatty acids, fatty acid esters, fatty alcohols, solvents, water, thickeners, emulsifiers, moisturizing products, demulcents, sunscreen agents, germicides, colorants, preservatives, perfumes, propellants and surface-active agents, 0.05 to 20% by weight of 2-oleoyl-1,3-octadecanediol (erythro/threo; D,L)

in the form of a racemic mixture of the erythro and threo diastereoisomers in the erythro:threo proportions of 85:15 to 60:40.

5,773,612

**INDOL-2-ONE DERIVATIVES**

Jean Wagnon, Montpellier; Bernard Tonnerre, Vailhauques; Alain Di Malta, Saint Clement De Riviere; Richard Roux, Vailhauques; Marie-Sophie Amiel, Perols, and Claudine Serradeil-Legal, Escalquens, all of France, assignors to Sanofi, Paris, France

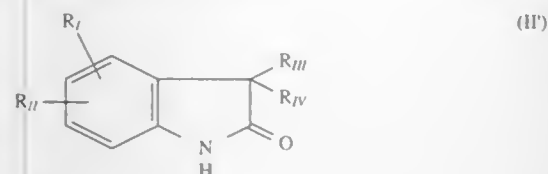
Division of Ser. No. 500,924, Jul. 31, 1995, Pat. No. 5,594,023. This application Apr. 30, 1996, Ser. No. 640,080

Claims priority, application France, Dec. 24, 1993, 93/15638 Int. Cl.<sup>6</sup> C07D 209/34; 209/30

U.S. Cl. 544—62

3 Claims

1. A compound of formula (II')



in which:

R<sub>I</sub> and R<sub>II</sub> are each independently a hydrogen, a halogen, a (C<sub>1</sub>–C<sub>7</sub>)alkyl, a (C<sub>1</sub>–C<sub>7</sub>)alkoxy, a trifluoromethyl, a nitro, an amino, a hydroxyl or a benzyloxy, with the proviso that R<sub>I</sub> and R<sub>II</sub> are not simultaneously hydrogen;

R<sub>III</sub> is a phenyl monosubstituted or polysubstituted by a halogen, a (C<sub>1</sub>–C<sub>7</sub>)alkyl, a hydroxyl, a (C<sub>1</sub>–C<sub>7</sub>)alkoxy, a benzyloxy or an acetoxy;

R<sub>IV</sub> is an azido, an amino, a 2,2-dimethylhydrazino group, a group NR<sub>7</sub>R<sub>8</sub>, a group NR<sub>9</sub>R<sub>10</sub> or NR<sub>9</sub>R<sub>11</sub>, a heterocyclic radical R<sub>12</sub> or a piperazin-1-yl radical substituted in the 4-position by a (C<sub>2</sub>–C<sub>10</sub>)alkylene group substituted by an amino group which is free or carries a protective group;

R<sub>XI</sub> is a (C<sub>3</sub>–C<sub>7</sub>)cycloalkylmethyl, a group OR<sub>13</sub>, a group CH<sub>2</sub>R<sub>16</sub> or a group ω-R<sub>17</sub>R<sub>18</sub>N(C<sub>1</sub>–C<sub>4</sub>)alkylcarbonyl; and R<sub>7</sub> is a (C<sub>1</sub>–C<sub>7</sub>)alkoxycarbonyl group;

R<sub>8</sub> is a (C<sub>1</sub>–C<sub>7</sub>)alkoxycarbonylamino group; or an N-methyl-N-(C<sub>1</sub>–C<sub>7</sub>)alkoxycarbonylamino group;

R<sub>9</sub> is a hydrogen atom; or a (C<sub>1</sub>–C<sub>7</sub>)alkyl group;

R<sub>10</sub> is a group CR<sub>18</sub>R<sub>19</sub>R<sub>20</sub>; a group (CH<sub>2</sub>)<sub>p</sub>R<sub>25</sub>; a (C<sub>2</sub>–C<sub>10</sub>)alkylene group substituted by R<sub>21</sub>; a group CH<sub>2</sub>CN; a group C(CH<sub>3</sub>)(CH<sub>2</sub>OH)<sub>2</sub> or C(CH<sub>3</sub>OH)<sub>3</sub>; a non-aromatic C<sub>3</sub>–C<sub>18</sub>carbocyclic radical; a phenyl group which is unsubstituted or monosubstituted or polysubstituted by a halogen, a

(C<sub>1</sub>–C<sub>7</sub>)alkyl group, a hydroxyl group, a (C<sub>1</sub>–C<sub>7</sub>)alkoxy group, a benzyloxy group, an acetoxy group, a nitro group or an amino group which is free or substituted by one or two (C<sub>1</sub>–C<sub>7</sub>)alkyl groups; a benzyl group in which the phenyl group is unsubstituted or monosubstituted or polysubstituted by a halogen atom, a (C<sub>1</sub>–C<sub>7</sub>)alkyl group, a hydroxyl group, a (C<sub>1</sub>–C<sub>7</sub>)alkoxy group, a benzyloxy group, an acetoxy group, a nitro group or an amino group which is free or substituted by one or two (C<sub>1</sub>–C<sub>7</sub>)alkyl groups; a phenethyl group in which the phenyl group is unsubstituted or monosubstituted or polysubstituted by a halogen atom, a (C<sub>1</sub>–C<sub>7</sub>)alkyl group, a hydroxyl group, a (C<sub>1</sub>–C<sub>7</sub>)alkoxy group, a benzyloxy group, an acetoxy group, a nitro group or an amino group which is free or substituted by one or two (C<sub>1</sub>–C<sub>7</sub>)alkyl groups; or a phenethyl group in which the phenyl group is substituted by a 3,4-methylenedioxy group or a 3,4-ethylenedioxy group;

R<sub>12</sub> is a morpholin-4-yl group; a thiomorpholin-4-yl group; an azetidin-1-yl group which is unsubstituted or substituted in the 2-position by a carboxyl group or substituted in the 3-position by an amino group which is free or carries a protective group; a perhydroazepin-1-yl group; a piperazin-1-yl group which is unsubstituted or substituted in the 4-position by R<sub>25</sub>; a piperid-1-yl group which is unsubstituted or substituted by R<sub>26</sub>; a pyrrolidin-1-yl group which is unsubstituted or substituted by R<sub>27</sub>; or a thiazolidin-3-yl group which is unsubstituted or substituted by R<sub>27</sub>;

R<sub>13</sub> is a hydrogen atom; a (C<sub>1</sub>–C<sub>7</sub>)alkyl group; a benzyl group; an allyl group; or a tetrahydropyran-2-yl group;

R<sub>18</sub> is a (C<sub>1</sub>–C<sub>7</sub>)alkyl group; a phenyl group; a benzyl group; a cyclohexylmethyl group; a phenethyl group; an imidazol-4-ylmethyl group which is free or carries a protective group; an indol-3-ylmethyl group which is free or carries a protective group; a hydroxymethyl group which is free or carries a protective group; a 2-hydroxyethyl group which is free or carries a protective group; a 1-hydroxyethyl group which is free or carries a protective group; a 4-hydroxybenzyl group which is free or carries a protective group; a mercaptomethyl group which is free or carries a protective group; a 2-mercaptoethyl group which is free or carries a protective group; a 2-methylthioethyl group; a 2-methylsulfinyethyl group; a 2-methylsulfonyl group; a 4-aminobutyl group which is free or carries a protective group; a 3-aminopropyl group which is free or carries a protective group; a carboxymethyl group which is free or carries a protective group; a 2-carboxyethyl group which is free or carries a protective group; a carbamoylmethyl group; a 2-carbamoyl group; a 3guanidinopropyl group which is free or carries a protective group; or a non-aromatic C<sub>3</sub>–C<sub>15</sub>, carbocyclic radical;

R<sub>19</sub> is a hydrogen atom; R<sub>19</sub> can also be a (C<sub>1</sub>–C<sub>7</sub>)alkyl group if R<sub>18</sub> is a (C<sub>1</sub>–C<sub>7</sub>)alkyl group; or

R<sub>18</sub> and R<sub>19</sub>, together with the carbon atom to which they are bonded, form a non-aromatic C<sub>3</sub>–C<sub>15</sub>, carbocyclic radical;

R<sub>20</sub> is R<sub>24</sub>; a group CH<sub>2</sub>OR<sub>15</sub>; or an aminomethyl group in which the amino group is free or substituted by one or two (C<sub>1</sub>–C<sub>7</sub>)alkyl groups or by a protective group;

R<sub>21</sub> is R<sub>36</sub>; a group OR<sub>37</sub>; a cyano group; a group S(C<sub>1</sub>–C<sub>7</sub>) alkyl a group SO(C<sub>1</sub>–C<sub>7</sub>)alkyl; or a group SO<sub>2</sub>(C<sub>1</sub>–C<sub>7</sub>)alkyl;

R<sub>25</sub> is a (C<sub>1</sub>–C<sub>7</sub>)alkyl group; a phenyl group; a benzyl group; a formyl group; a (C<sub>1</sub>–C<sub>7</sub>)alkylcarbonyl group; a (C<sub>1</sub>–C<sub>7</sub>)alkoxycarbonyl group; or a benzyloxycarbonyl group; R<sub>26</sub> is R<sub>24</sub>; an amino group which is free or substituted by one or two (C<sub>1</sub>–C<sub>7</sub>)alkyl groups or by a protective group; a group OR<sub>13</sub> or a group CH<sub>2</sub>OR<sub>15</sub>;

R<sub>27</sub> is R<sub>24</sub>; a group CH<sub>2</sub>R<sub>24</sub>; a group CH<sub>2</sub>OR<sub>15</sub>; or an aminomethyl group in which the amino group is free or substituted by one or two (C<sub>1</sub>–C<sub>7</sub>)alkyl groups or by a protective group;

R<sub>38</sub> is a piperid-4-yl group which is unsubstituted or substituted in the 1-position by a (C<sub>1</sub>–C<sub>7</sub>)alkoxycarbonyl group or by a (C<sub>1</sub>–C<sub>7</sub>)alkyl group; or a pyrid-2-yl group;

R<sub>32</sub> and R<sub>33</sub> each independently represent a hydrogen atom; or a (C<sub>1</sub>–C<sub>7</sub>)alkyl group; R<sub>33</sub> can also be an acetyl group; a phenyl group; a benzyl group; a (C<sub>1</sub>–C<sub>7</sub>)alkoxycarbonyl group; a benzyloxycarbonyl group; a (C<sub>1</sub>–C<sub>6</sub>)alkylene group substituted by R<sub>24</sub>; a (C<sub>2</sub>–C<sub>6</sub>)alkylene group substituted by a hydroxyl or a (C<sub>1</sub>–C<sub>7</sub>)alkoxy group; or a (C<sub>2</sub>–C<sub>6</sub>)alkylene

5,773,614

**PROCESS FOR THE PREPARATION OF AN ANTIVIRAL AGENT**

Jollie D. Godfrey, Jr., Trenton, and Richard H. Mueller, Rm-goes, both of N.J., assignors to Bristol-Myers Squibb Co., Princeton, N.J.

Continuation-in-part of Ser. No. 416,403, Apr. 3, 1995, abandoned. This application Sep. 13, 1996, Ser. No. 713,333

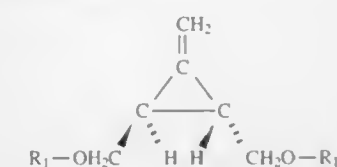
Int. Cl.<sup>6</sup> C07D 473/18; 473/40; C07C 69/78; 49/753

U.S. Cl. 544—276

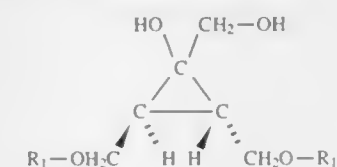
8 Claims

7. A process for preparing the antiviral agent [1R-(1α,2β,3α)]-2-amino-9-[2,3-bis(hydroxymethyl)cyclobutyl]-1,9-dihydro-6H-purine-6-one which comprises:

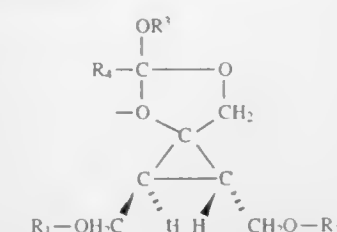
a) oxidizing the optically active 3-methylene (1R-trans) compound of the formula



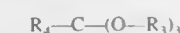
wherein R<sub>1</sub> is a hydroxy protecting group with osmium tetroxide to give the optically active diol of the formula



b) converting the diol product from step (a) to the cyclic orthoester of the formula

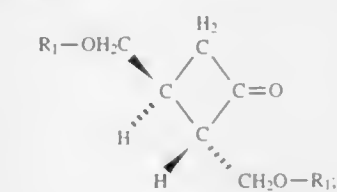


by treating the product from step (a) with a trimethyl or triethyl orthoester of the formula



in the presence of an acid catalyst wherein R<sub>3</sub> is methyl or ethyl and R<sub>4</sub> is straight or branched chain alkyl or 1 to 6 carbons or phenyl;

c) treating the cyclic orthoester product from step (b) with a Lewis acid catalyst to give the optically active cyclobutanone of the formula



d) treating the optically active cyclobutanone product from step (c) with a reducing agent to give the optically active cyclobutanol of the formula

group substituted by an amino group which is free or substituted by one or two (C<sub>1</sub>–C<sub>7</sub>)alkyl groups or by a protective group; or

R<sub>32</sub> and R<sub>33</sub>, together with the nitrogen atom to which they are bonded, form a heterocyclic radical R<sub>12</sub>;

R<sub>24</sub> is a carboxyl group; a (C<sub>1</sub>–C<sub>7</sub>)alkoxycarbonyl; a benzyloxy-carbonyl group; or a carbamoyl group which is free or substituted by one or two (C<sub>1</sub>–C<sub>7</sub>)alkyl groups;

R<sub>36</sub> is a carboxyl group; a (C<sub>1</sub>–C<sub>7</sub>)alkoxycarbonyl group; a benzyloxy-carbonyl group; or a carbamoyl group which is free or substituted by one or two (C<sub>1</sub>–C<sub>7</sub>)alkyl groups; where R<sub>38</sub> and R<sub>39</sub> each independently represent a hydrogen atom; or a (C<sub>1</sub>–C<sub>7</sub>)alkyl group; R<sub>39</sub> can also be a (C<sub>1</sub>–C<sub>6</sub>)alkylene group substituted by R<sub>24</sub>; a (C<sub>2</sub>–C<sub>6</sub>)alkylene group substituted by a hydroxyl group or a (C<sub>1</sub>–C<sub>7</sub>)alkoxy group; or a (C<sub>2</sub>–C<sub>6</sub>)alkylene group substituted by an amino group which is free or substituted by one or two (C<sub>1</sub>–C<sub>7</sub>)alkyls or by a protective group; and

R<sub>37</sub> is R<sub>13</sub>; a (C<sub>1</sub>–C<sub>7</sub>)cycloalkyl; a (C<sub>1</sub>–C<sub>6</sub>)alkylene substituted by R<sub>24</sub>; a (C<sub>2</sub>–C<sub>6</sub>)alkylene substituted by a hydroxyl or a (C<sub>1</sub>–C<sub>7</sub>)alkoxy; or a (C<sub>2</sub>–C<sub>6</sub>)alkylene substituted by an amino group which is free or substituted by one or two (C<sub>1</sub>–C<sub>7</sub>)alkyls or by a protective group; and

p is an integer which can vary from 0 to 3.

5,773,613

**TRYPTOANTHRINIMINE DERIVATIVE AND ELECTROPHOTOSENSITIVE MATERIAL USING THE SAME**

Hirofumi Kawaguchi; Nobuko Akiba; Yukimasa Watanabe; Hiroaki Iwasaki; Yasuyuki Hanatani; Yasufumi Mizuta; Fumio Sugai; Sakae Saito; Syunichi Matsumoto; Toshiyuki Fukami; Ichiro Yamazato; Hisakazu Uegaito, and Yuji Tanaka, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 28, 1995, Ser. No. 563,545

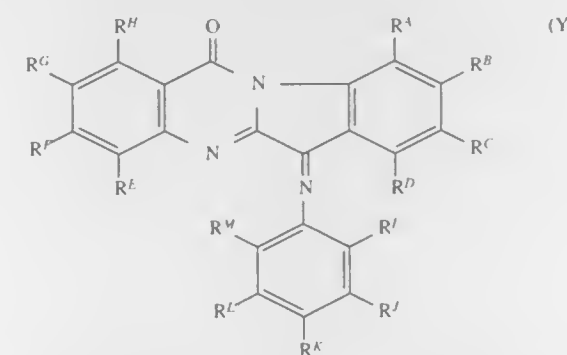
Claims priority, application Japan, Nov. 29, 1994, 6-295382; Feb. 28, 1995, 7-039641; Feb. 28, 1995, 7-039644; Jul. 17, 1995, 7-180305; Jul. 17, 1995, 7-180306

Int. Cl.<sup>6</sup> C07D 487/02; G03G 5/06

U.S. Cl. 544—246

7 Claims

1. A tryptanthrinimine compound represented by the formula (Y):



wherein R<sup>A</sup>, R<sup>B</sup>, R<sup>C</sup>, R<sup>D</sup>, R<sup>E</sup>, R<sup>F</sup>, R<sup>G</sup> and R<sup>H</sup> are the same or different and indicate a hydrogen atom, an alkyl group, an alkoxy group, or a nitro group; and R<sup>I</sup>, R<sup>J</sup>, R<sup>K</sup>, R<sup>L</sup> and R<sup>M</sup> are the same or different and indicate a hydrogen atom, an alkyl group, an aryl group which may have a substituent, an aralkyl group, an alkoxy group, a phenoxy group, an alkyl halide group or a halogen atom.



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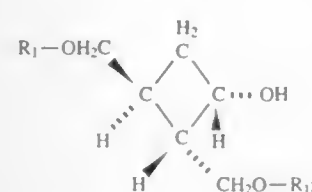
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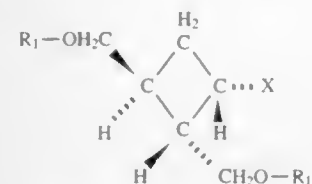
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1998

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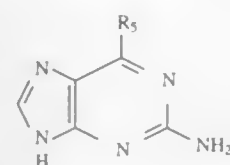


e) treating the optically active cyclobutanol product from step (d) with a sulfonylating reagent to give the optically active cyclobutane compound of the formula

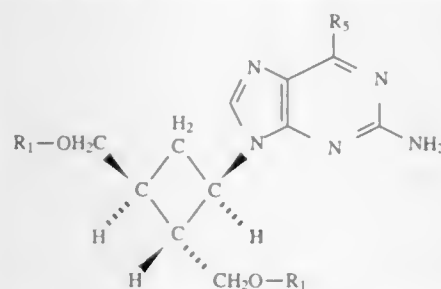


wherein X is a leaving group selected from the group consisting of p-toluenesulfonyloxy, methanesulfonyloxy, trifluoromethanesulfonyloxy, p-nitrobenzenesulfonyloxy, and fluorsulfonyloxy;

f) reacting the product from step (e) with the purine of the formula



to give the optically active compound of the formula



wherein R<sub>5</sub> is a protected hydroxy or chloro group; and g) treating the product step (f) to remove the R<sub>1</sub> hydroxy protecting groups and to convert the R<sub>5</sub> group to a 6-oxo.

5,773,615  
INTERMITTENT ELECTROLYTIC PACKED BED  
SUPPRESSOR REGENERATION FOR ION  
CHROMATOGRAPHY

Hamish Small, Leland, Mich.; John M. Riviello, Santa Cruz, and Steven B. Rabin, Mountain View, both of Calif., assignors to Dionex Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 397,998, Mar. 3, 1995, Pat. No. 5,633,171. This application Feb. 13, 1996, Ser. No. 600,856

Int. Cl.<sup>6</sup> G01N 30/02

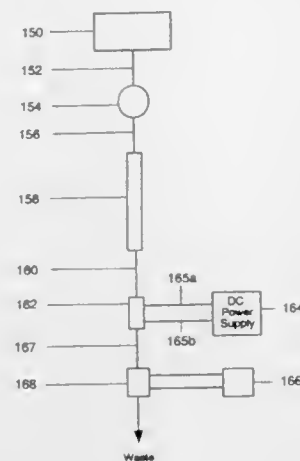
U.S. Cl. 436—161

11 Claims

1. A method of anion or cation analysis by ion chromatography using periodic electrolytic chemical regeneration of a packed bed suppressor, said method comprising

(a) chromatographically separating ionic species in a first liquid sample in a water-containing first eluent solution comprising electrolyte, to form a first chromatography effluent including separated ionic species.

(b) flowing said first chromatography effluent through a first packed bed suppressor including first suppressor ion exchange



resin with first exchangeable ions to convert said electrolyte to weakly ionized form during suppression, thereby depleting at least some of said first exchangeable ions on said first suppressor ion exchange resin, said first chromatography effluent exiting as a first suppressor effluent,

(c) flowing the first suppressor effluent including the separated ionic species from said first packed bed suppressor through a first detector in which the separated ionic species are detected to form a detector effluent, and

(d) applying an electrical potential through said first packed resin bed suppressor while flowing an aqueous liquid stream therethrough to electrolyze water in said aqueous liquid stream and thereby regenerate the first exchangeable ions on said first suppressor ion exchange resin, the application of said electrical potential being discontinued during steps (a), (b) and (c).

5,773,616

CERTAIN BRIDGED 4-PHENYL-2-  
AMINOMETHYLIMIDAZOLES; NEW DOPAMINE  
RECEPTOR SUBTYPE SPECIFIC LIGANDS

Jun Yuan, Clinton, and Andrew Thurkauf, Danbury, both of Conn., assignors to Neurogen Corporation, Branford, Conn. Continuation of Ser. No. 389,111, Feb. 15, 1995, abandoned.

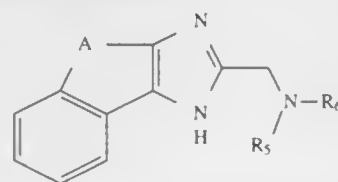
This application Jun. 5, 1995, Ser. No. 463,759

Int. Cl.<sup>6</sup> C07D 403/14; 401/14

U.S. Cl. 544—295

8 Claims

1. A compound of the formula:



or the pharmaceutically acceptable salts thereof wherein:

A represents —CH=CH—, or A represents —X—CH<sub>2</sub>—, where X is methylene or oxygen, provided that when X is oxygen, the oxygen is adjacent the 6-membered ring; and

NR<sub>5</sub>R<sub>6</sub> represents piperazinyl substituted in the 4-position with 2-pyrimidinyl or optionally substituted phenyl;

piperidinyl substituted in the 4-position with 2-pyrimidinyl or optionally substituted phenyl; or

1, 2, 3, 6-tetrahydropyridyl substituted in the 4-position with 2-pyrimidinyl or optionally substituted phenyl.

5,773,617

DEALLYLATION REAGENT AND DEALLYLATION  
METHOD USING SAID REAGENT

Jean-Marie Bernard, Mornant; Errol Blart, Maison-Alfort; Jean-Pierre Genet, Verrières-le-Buisson; Sandrine Lemaire-Audoire, Neuilly-sur-Seine, and Monique Savignac, Gify/Yvette, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie Cedex, France

PCT No. PCT/FR94/00397, § 371 Date Feb. 22, 1996, § 102(e) Date Feb. 22, 1996, PCT Pub. No. WO94/24088, PCT Pub. Date Oct. 27, 1994

PCT Filed Apr. 8, 1994, Ser. No. 532,630

Claims priority, application France, Apr. 9, 1993, 93 04233

Int. Cl.<sup>6</sup> C07C 209/62; C07K 1/06; 1/12

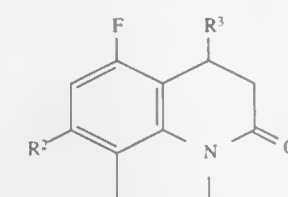
U.S. Cl. 544—401

28 Claims

1. A process for the treatment of a molecule containing at least one allylic function other than ester, comprising reacting said molecule with a reagent in order to remove the allylic function wherein said reagent comprises:

- a solvent system;
- a catalyst containing at least one element from column VIII of the Periodic Table of the Elements, said element from column VIII of the Periodic Table being coordinated with at least one coordination agent which is soluble in said solvent system, wherein said coordination agent is a pnictine; and
- a compound which is at least partially soluble in said solvent system and which contains at least one nucleophilic function, wherein said nucleophile is soft and has a nucleophilicity which is at least equal to that of diethylamine, and further wherein said nucleophile presents a function which corresponds to atoms from a row of the Periodic Table at least equal to the third.

28. A process for preparing a compound of formula (If):



wherein:

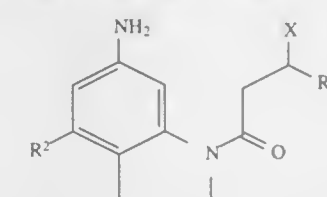
R<sup>2</sup> represents a hydrogen atom or a halogen atom; and R<sup>3</sup> represents

a hydrogen atom,

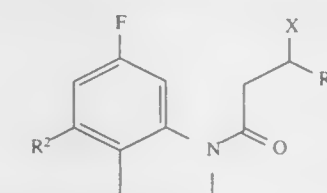
an alkyl group having from 1 to 6 carbon atoms, or a cycloalkyl group having from 3 to 7 carbon atoms;

which comprises the steps:

diazotising a compound of formula (V):



wherein X represents a chlorine or bromine atom and R<sup>2</sup> and R<sup>3</sup> are as defined above, in the presence of a fluorine-containing compound capable of generating a fluorine anion, and heating the product to give a compound of formula (VI):



wherein X, R<sup>2</sup> and R<sup>3</sup> are as defined above, and then ring-closing said compound of formula (VI) to give said compound of formula (If).

5,773,618

TRICYCLIC COMPOUNDS HAVING FUNGICIDAL  
ACTIVITY, THEIR PREPARATION AND THEIR USE

Hideo Takeshita, Kusatsu; Chiaki Imai; Hiroshi Ohta, both of Shiga-ken; Shigehiro Kato, Ohmihachiman, and Hiroyuki Itoh, Moriyama, all of Japan, assignors to Sankyo Company, Limited, Tokyo, Japan

Filed May 14, 1997, Ser. No. 855,915

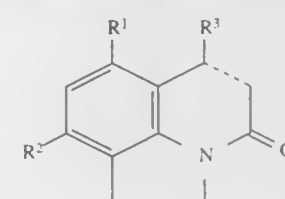
Claims priority, application Japan, May 15, 1996, 8-120301; Mar. 4, 1997, 9-048828

Int. Cl.<sup>6</sup> C07D 221/04; 209/04

U.S. Cl. 546—98

48 Claims

1. A compound of formula (I):



wherein:

R<sup>1</sup> represents

a halogen atom,

an alkyl group having from 1 to 6 carbon atoms,

a haloalkyl group having from 1 to 6 carbon atoms,

an alkoxy group having from 1 to 6 carbon atoms,

a haloalkoxy group having from 1 to 6 carbon atoms,

a cycloalkyl group having from 3 to 7 carbon atoms, or

a cycloalkyloxy group having from 3 to 7 carbon atoms;

R<sup>2</sup> represents a hydrogen atom or a halogen atom;

R<sup>3</sup> represents

a hydrogen atom,

an alkyl group having from 1 to 6 carbon atoms, or

a cycloalkyl group having from 3 to 7 carbon atoms; and

the dotted line represents a single or double carbon—carbon bond; and salts thereof.

5,773,619

PROCESS FOR THE PREPARATION OF AZABICYCLOC  
DERIVATIVES

Steven Mark Bromidge, Sawbridgeworth; Martyn Voyle, Welwyn; Erol Ali Faruk, Enfield; Mark Jason Hughes, Welwyn; John Kitteringham, Hertford, and Gary Thomas Borrett, Stansted, all of England, assignors to SmithKline Beecham p.l.c., Brentford, England

Filed May 12, 1995, Ser. No. 439,616

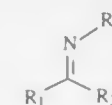
Claims priority, application United Kingdom, May 14, 1994, 9409705

Int. Cl.<sup>6</sup> C07D 453/02

U.S. Cl. 546—133

22 Claims

1. A process for the preparation of a compound of formula (I) or a pharmaceutically acceptable salt thereof:



wherein

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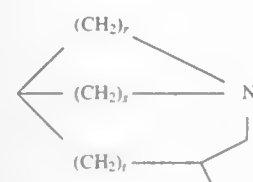
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 $R_1$  represents

in which r represents 2, s represents 2 and t represents 0;

 $R_2$  is a group  $OR_4$ , where  $R_4$  is  $C_{1-4}$  alkyl,  $C_{2-4}$  alkenyl or  $C_{2-4}$  alkynyl or a group  $OCOR_5$  where  $R_5$  is hydrogen or  $R_4$ ; and  $R_3$  is CN;

said process comprising reacting a compound of formula (II):



wherein  $R_1$  is  $R_1'$ , and  $R_3'$  is CN, with a source of nitrous acid, and thereafter converting the resulting  $=NOH$  group to  $=NR_2$ , wherein  $R_2$  is as defined in formula (I), converting  $R_1'$  and  $R_3'$  when other than  $R_1$  and  $R_3$  to  $R_1$  and  $R_3$ , and thereafter optionally forming a pharmaceutically acceptable salt.

5,773,620

**QUATERNARY AMMONIUM SALTS OF AROMATIC AMINE COMPOUNDS, THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS IN WHICH THEY ARE PRESENT**

Xavier Emonds-Alt, Combaillaux; Vincenzo Proietto, Saint Georges D'Orques; Didier Van Broeck, Murviel Les Montpellier, and Jean-Claude Breliere, Montpellier, all of France, assignors to Elf Sanofi, Paris, France

Division of Ser. No. 345,341, Nov. 21, 1994, Pat. No. 5,674,881, which is a continuation of Ser. No. 26,154, Mar. 3, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 482,546

Claims priority, application France, Mar. 3, 1992, 92 02542; Oct. 29, 1992, 92 12941

Int. Cl.<sup>6</sup> C07D 211/32

U.S. Cl. 546—234

3 Claims

1. N-[4-(4-Phenylpiperidin-1-yl)-2-(3,4-dichlorophenyl)butyl]-N-methyl-3-isopropoxyphenyl-acetamide or a pharmaceutically acceptable salt thereof.

5,773,621

**GAS DISPERSION PIPE FOR GAS-LIQUID CONTACT, AND DEVICE FOR GAS-LIQUID CONTACT MAKING USE THEREOF**

Haruo Nisino; Akitaka Ide, and Toshiaki Urata, all of Yokohama, Japan, assignors to Chiyoda Corporation, Kanagawa, Japan

PCT No. PCT/JP95/01183, § 371 Date Feb. 9, 1996, § 102(e) Date Feb. 9, 1996, PCT Pub. No. WO95/34370, PCT Pub. Date Dec. 21, 1995

PCT Filed Jun. 13, 1995, Ser. No. 592,305

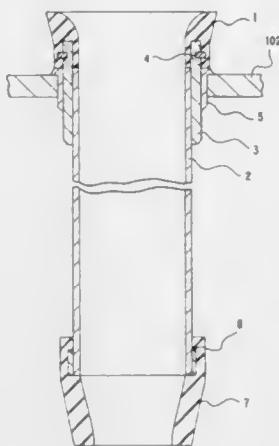
Claims priority, application Japan, Jun. 13, 1994, 6-154262; Jun. 13, 1994, 6-154263; Nov. 22, 1994, 6-311311

Int. Cl.<sup>6</sup> B01D 47/10

U.S. Cl. 55—244

11 Claims

1. For use in a flue gas treatment device having its interior divided by vertically spaced partition plates into a plurality of separate chambers, a plurality of gas dispersion pipes, each comprising:



a generally straight, axially elongated, hollow cylindrical pipe body mounted for vertical disposition by a hole formed in one of said partition plates;

a contraction pipe portion detachably connected to a top end of said pipe body and being formed as an annular member formed of resilient material having a downwardly constricting, curvilinear circumferential surface extending to, and being substantially flush with, an interior surface of said hollow cylindrical pipe body; and

means for detachably connecting said contraction pipe portion to said pipe body including:

a reinforcement pipe concentrically attached to said pipe body adjacent the top end thereof,

an annular positioning ring attached to, and extending radially outwardly from, said reinforcement pipe; and

annular recess means formed about a bottom end of said contraction pipe member for receiving said top end of said reinforcement pipe and said annular ring.

5,773,622

**CONTINUOUS PROCESS FOR THE PREPARATION OF 4-AMINO-2,2,6,6-TETRAMETHYLPYPERIDINE**

Udo Jegelka; Gerhard Bachstaedter, both of Recklinghausen; Stefan Frentzen, Raesfeld; Guenter Kreilkamp, Marl, and Gerhard Thelen, Nottuln, all of Germany, assignors to Huels Aktiengesellschaft, Marl, Germany

Filed Dec. 2, 1996, Ser. No. 758,859

Claims priority, application Germany, Nov. 30, 1995, 195 44 599.6

Int. Cl.<sup>6</sup> C07D 211/56

U.S. Cl. 546—244

21 Claims

1. A process for the continuous preparation of 4-amino-2,2,6,6-tetramethylpiperidine (TAD), comprising: passing triacetoneamine (TAA), ammonia and hydrogen over a catalyst of at least two layers in a reactor, wherein at least one catalyst layer comprises at least one element of the 4th, 5th, or 6th row of the 8th transition group of the Periodic Table or combinations of these metal elements on a suitable support, where the catalyst content with respect to each individual catalytically active element changes independently from the reactor inlet to the reactor outlet.

5,773,623

**METHINE DYES CONTAINING A 5- OR 6- MEMBERED CARBOCYCLIC OR HETEROCYCLIC RADICAL**  
Andreas Johann Schmidt, Freinsheim, and Rüdiger Sens, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Mar. 29, 1996, Ser. No. 624,332

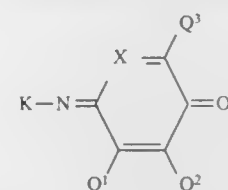
Claims priority, application Germany, Apr. 3, 1995, 19512398.0

Int. Cl.<sup>6</sup> C07D 213/74; 413/12; B41M 5/035; 5/26

U.S. Cl. 546—278.4

10 Claims

1. A methine dye of the formula I:

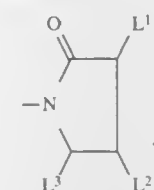


where

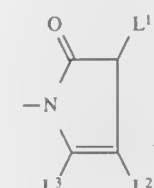
K is a 5- or 6-membered carbocyclic or heterocyclic radical,

X is nitrogen or a radical of formula  $C-Q^1$ , and

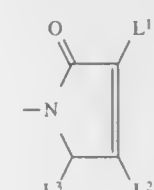
$Q^1$ ,  $Q^2$  and  $Q^3$  are each, independently, hydrogen,  $C_1-C_6$ -alkyl with or without interruption by 1 or 2 ether oxygen atoms, benzyl,  $C_3-C_8$ -cycloalkyl, substituted or unsubstituted phenyl,  $C_1-C_6$ -fluoroalkyl,  $C_1-C_6$ -alkoxy, benzyloxy, substituted or unsubstituted phenoxy,  $C_1-C_6$ -alkylthio, halogen, cyano, formylamino or a radical of the formula  $R^3$ ,  $-CO-OR^1$ ,  $-CO-NHR^1$ ,  $-CO-NH-CO-R^4$ ,  $-CO-NH-SO_2R^4$ ,  $-NH-CO-R^1$ ,  $-NH-CO-OR^1$ ,  $-NH-CO-NR^1R^2$ ,  $-NH-CS-OR^1$ ,  $-NH-CS-NR^1R^2$ ,  $-NH-CO-R^4$ ,  $-NH-SO_2-R^1$ ,  $-NH-SO_2-R^4$  or  $-NH-SO_2-NR^1R^2$ , where  $R^1$  and  $R^2$  are each, independently,  $C_1-C_3$ -alkyl with or without substitution and with or without interruption by from 1 to 3 ether oxygen atoms,  $C_3-C_8$ -cycloalkyl or substituted or unsubstituted phenyl, or else  $-NR^1R^2$  is amino,  $R^3$  is



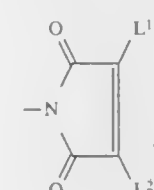
(IIIa)



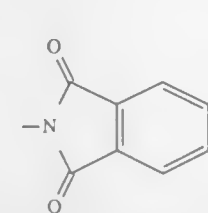
(IIIb)



(IIIc)



(IIId)



-continued

(IIIe)

where  $L^1$ ,  $L^2$  and  $L^3$  are each, independently, hydrogen or  $C_1-C_4$ -alkyl, and  $R^4$  is a 5- or 6-membered heterocyclic radical which is or is not benzofused and has one or more hetero atoms selected from the group consisting of nitrogen, oxygen and sulfur, or  $Q^1$  and  $Q^2$  are together with the carbon atoms to which they are attached a 5- or 6-membered carbocyclic or heterocyclic ring,

with the proviso that at least one of  $Q^1$ ,  $Q^2$  and  $Q^3$  is  $R^3$ .

8. A process for transferring dyes from a transfer to a plastic-coated paper by diffusion or sublimation with the aid of an energy source, which comprises using a transfer on which there is or are one or more methine dyes as claimed in claim 1.

5,773,624

**METHOD FOR PREPARING 5-AMINO-1,2,4-THIAZOL ACETIC ACID DERIVATIVES**

Takashi Inagaki; Yasuyuki Kurita; Akihito Mizutani, and Masao Kondo, all of Osaka-fu, Japan, assignors to Katayama Seiyakusyo Co., Ltd., Osaka, Japan

Filed Mar. 7, 1997, Ser. No. 813,199

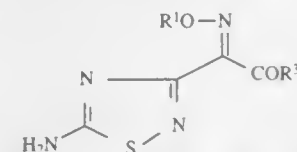
Claims priority, application Japan, Mar. 15, 1996, 8-059044; Nov. 12, 1996, 8-300121

Int. Cl.<sup>6</sup> C07D 285/08

U.S. Cl. 548—128

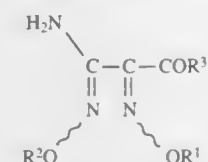
4 Claims

1. A method of preparing 2-substituted hydroxyimino-2-(5-amino-1,2,4-thiazol-3-yl)acetic acid derivatives (anti-isomer) of the general formula (VI):



(VI)

wherein  $R^1$  is lower alkyl or fluoromethyl,  $R^3$  is lower alkyloxy or amino, which comprises reacting of 2-substituted hydroxy-imino-2-substituted carbonyl-acetamide-O-substituted oxime (V) of the general formula (V):



(V)

wherein  $R^1$  and  $R^3$  have the same meanings as above and  $R^2$  is alkylsulfonyl or arylsulfonyl, with MSCN wherein M is alkaline metal or ammonium.

5,773,625

**PROCESS FOR THE PREPARATION OF DISUBSTITUTED CARBONATES**

Denton C. Langridge, Wildwood, Ill., assignor to Abbott Laboratories, Abbott Park, Ill.

Filed Oct. 2, 1997, Ser. No. 942,828

Int. Cl.<sup>6</sup> C07D 277/24; C07C 69/76; 205/12

U.S. Cl. 548—203

10 Claims

1. A process for the preparation of a compound having the formula:



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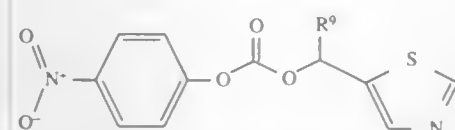
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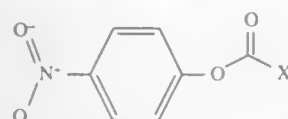
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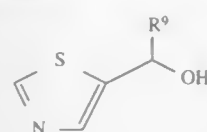
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wherein said process comprises reacting a nitrophenyl chloroformate compound having the formula:



wherein X is a halogen atom, with a hydroxymethylthiazole compound having the formula:



wherein the thiazolyl ring is unsubstituted or substituted with a lower alkyl group; in the presence of pyridine, and wherein the pyridine is present in a catalytic amount; wherein R<sup>9</sup> is hydrogen or lower alkyl.

5,773,626

**METHOD FOR PRODUCING 1,2-BENZISOTHAZOL-3-ONES**

Hirokazu Kagano; Hiroshi Goda; Katsuhiko Yoshida; Mikio Yamamoto, and Shigeki Sakaue, all of Hyogo-ken, Japan, assignors to Sumitomo Seika Chemicals Co., Ltd., Hyogo-ken, Japan

Division of Ser. No. 467,829, Jun. 6, 1995, Pat. No. 5,633,384. This application Sep. 18, 1996, Ser. No. 718,132

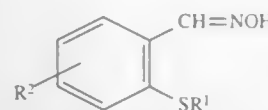
Claims priority, application Japan, Jul. 5, 1994, 6-177499; Jul. 18, 1994, 6-188883; Nov. 9, 1994, 6-301348

Int. Cl.<sup>6</sup> C07D 275/04

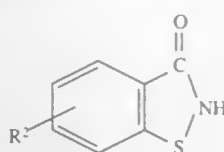
U.S. Cl. 548—209

4 Claims

1. A method for producing a 1,2-benzisothiazol-3-one represented by formula (III), comprising reacting a 2-(alkylthio)benzaldehyde oxime represented by the following formula (II):



wherein R<sup>1</sup> represents an alkyl group having 1 to 4 carbon atoms, and R<sup>2</sup> represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, an alkoxy group having 1 to 4 carbon atoms, a nitro group, a carboxyl group an ester wherein said ester is methoxycarbonyl, ethoxycarbonyl, propoxycarbonyl, or butoxycarbonyl, or a halogen atom, with a halogenating agent selected from the group consisting of chlorine, bromine, sulfuryl chloride and sulfuryl bromide to give a 1,2-benzisothiazol-3-one represented by the following formula (III):



wherein R<sup>2</sup> is defined as above.

**5,773,627  
METHODS OF INHIBITING CORROSION USING HALO-BENZOTRIAZOLES**

Sydia B. Anderson, Doylestown, and Michael A. Cady, Yardley, both of Pa., assignors to BetzDearborn Inc., Trevose, Pa. Continuation-in-part of Ser. No. 778,705, Jan. 3, 1997, which is a continuation-in-part of Ser. No. 407,173, Mar. 21, 1995, abandoned. This application Mar. 19, 1997, Ser. No. 820,738 Int. Cl.<sup>6</sup> C07D 249/18

U.S. Cl. 548—257

13 Claims

1. A process for preparing halo-benzotriazole comprising mixing an aqueous solution of sodium hypochlorite with an aqueous slurry of a benzotriazole and maintaining the mixture at a temperature of from about 30° to about 50° C. for a period of time sufficient to form said halo-benzotriazole solution.

5,773,628

**1,2-DIOXETANE COMPOUNDS WITH HALOALKOXY GROUPS, METHODS PREPARATION AND USE**

Hashem Akhavan-Tafti; Zahra Arghavani, both of Sterling Heights; Robert A. Eickholt, and Khaledur S. Rashid, both of Troy, all of Mich., assignors to Tropix, Inc., Bedford, Mass.

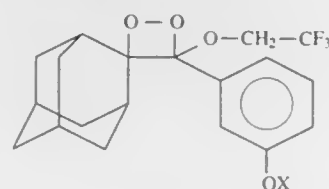
Filed Nov. 14, 1994, Ser. No. 339,085

Int. Cl.<sup>6</sup> C07D 321/00; C09K 3/00; C07C 43/176; C12Q 1/25

U.S. Cl. 549—221

5 Claims

1. A dioxetane of the formula



wherein X is a group which is removable by admixture of said dioxetane with an enzyme specific for said group X in an aqueous composition or X is H.

5,773,629

**SYNTHESIS OF (4S, 5R) -2, 4-DIPHENYL-5-CARBOXY- OXAZOLINE DERIVATIVE AS TAXOL SIDE-CHAIN PRECURSOR**

Yuh-Lin Allen Yang, Hsin-Chu Hsien, and Ay-Hua Gau, Tai-Tung Hsien, both of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

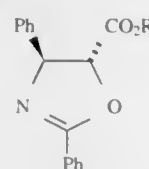
Filed Jun. 14, 1996, Ser. No. 663,736

Int. Cl.<sup>6</sup> C07D 263/16

U.S. Cl. 548—239

15 Claims

1. A process for the preparation of an oxazoline compound of the following formula (II):



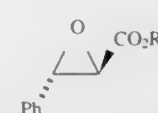
wherein

Ph is phenyl,

and

R is C<sub>1</sub>-C<sub>4</sub> alkyl,

said process comprising the step of contacting an epoxide compound of the following formula (I):



wherein Ph and R are as defined above, with benzonitrile in the presence of a strong acid selected from the group consisting of sulfuric acid, perchloric acid, phosphoric acid, polyphosphoric acid, formic acid, boron trifluoride, methanesulfonic acid, and trifluoromethanesulfonic acid to form said oxazoline compound of the formula (II).

5,773,630

**PROCESS FOR THE PREPARATION OF N-SUBSTITUTED CYCLIC IMIDES**

Torsten Groth, Köln; Karl-Erwin Piejko, Bergisch Gladbach; Winfried Joentgen, Köln; Josef Käsbauer, Wermelskirchen; Bernd Alig, Königswinter, and Werner Strüver, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 6, 1996, Ser. No. 595,982

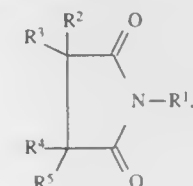
Claims priority, application Germany, Feb. 13, 1995, 195 04 623.4

Int. Cl.<sup>6</sup> C07D 207/36

U.S. Cl. 548—545

11 Claims

1. A process for the preparation of an N-substituted cyclic imide of the formula

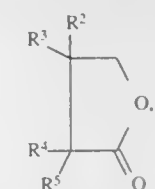


in which

R<sup>1</sup> is a C<sub>1</sub>-C<sub>20</sub>-alkyl, C<sub>3</sub>-C<sub>8</sub>-cycloalkyl, C<sub>3</sub>-C<sub>12</sub>-alkenyl, C<sub>7</sub>-C<sub>12</sub>-aralkyl or C<sub>6</sub>-C<sub>10</sub>-aryl radical, each of which can optionally be substituted, or a nitrile group and R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> independently of one another are each hydrogen, a C<sub>1</sub>-C<sub>12</sub>-alkyl or C<sub>3</sub>-C<sub>12</sub>-alkenyl radical, each of which can optionally be substituted, or a halogen, it also being possible for R<sup>2</sup> and R<sup>3</sup> together to be C<sub>1</sub>-C<sub>6</sub>-alkylene which can optionally be substituted, and for R<sup>3</sup> and R<sup>4</sup> together to be a covalent bond,

with the proviso that at least one of the following three conditions is satisfied:

- R<sup>2</sup> and R<sup>3</sup> together are C<sub>1</sub>-C<sub>6</sub>-alkylene which can optionally be substituted,
- R<sup>3</sup> and R<sup>4</sup> together are a covalent bond and
- at least one of the radicals R<sup>2</sup> to R<sup>5</sup> is C<sub>2</sub>-C<sub>12</sub>-alkenyl, wherein a cyclic acid anhydride of the formula



in which

R<sup>2</sup> to R<sup>5</sup> are as defined for the formula (I), is reacted with an amine of the formula



in which

R<sup>1</sup> is as defined for the formula (I), in the presence of a solvent and an acid catalyst, at 80° to 200° C. and with removal of the water formed, wherein the molar ratio of acid anhydride (II) to amine (III) is adjusted to 0.5-5:1 and the

5,773,631

**3-ARYLBENZOFURANONES AS STABILISERS**

Peter Nesvadba; Samuel Evans, both of Marly, Switzerland; Christoph Kröhnke, Breisach, Germany, and Jürg Zingg, Reinach, Switzerland, assignors to Ciba Specialty Chemicals Corporation, Tarrytown, N.Y.

Division of Ser. No. 304,468, Sep. 12, 1994, Pat. No. 5,516,920. This application Feb. 26, 1996, Ser. No. 606,896

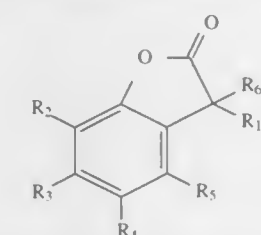
Claims priority, application Switzerland, Sep. 17, 1993, 2810/93.7

Int. Cl.<sup>6</sup> C07D 409/04

U.S. Cl. 549—43

6 Claims

1. A compound of formula I

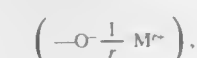


wherein R<sub>1</sub> is thienyl, benzo[b]thienyl, naphtho[2,3-b]thienyl, each unsubstituted or substituted by C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> alkylthio, hydroxy, halogen, amino, C<sub>1</sub>-4 alkylamino, phenylamino or di(C<sub>1</sub>-C<sub>4</sub>alkyl)amino;

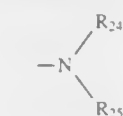
R<sub>2</sub>, R<sub>3</sub>, R<sub>4</sub>, and R<sub>5</sub> are each independently of one another hydrogen, chloro, hydroxy, C<sub>1</sub>-C<sub>25</sub> alkyl, C<sub>7</sub>-C<sub>9</sub> phenylalkyl, unsubstituted or C<sub>1</sub>-C<sub>4</sub> alkyl-substituted phenyl, unsubstituted or C<sub>1</sub>-C<sub>4</sub> alkyl-substituted C<sub>5</sub>-C<sub>8</sub> cycloalkyl; C<sub>1</sub>-C<sub>18</sub> alkoxy, C<sub>1</sub>-C<sub>18</sub> alkylthio, C<sub>1</sub>-C<sub>4</sub>alkylamino, di(C<sub>1</sub>-C<sub>4</sub>alkyl)amino, C<sub>1</sub>-C<sub>25</sub> alkanoyloxy, C<sub>1</sub>-C<sub>25</sub> alkanoylamino, C<sub>3</sub>-C<sub>25</sub> alkenoyloxy, C<sub>3</sub>-C<sub>25</sub> alkanoyloxy which is interrupted by oxygen, sulfur or >N—R<sub>14</sub>, C<sub>6</sub>-C<sub>9</sub> cycloalkylcarbonyloxy, benzoyloxy or C<sub>1</sub>-C<sub>12</sub> alkyl-substituted benzoyloxy; or each pair of substituents R<sub>2</sub> and R<sub>3</sub> or R<sub>3</sub> and R<sub>4</sub> or R<sub>4</sub> and R<sub>5</sub>, together with the linking carbon atoms, forms a benzene ring, R<sub>d</sub> is additionally —(CH<sub>2</sub>)<sub>n</sub>—COR<sub>15</sub> or —(CH<sub>2</sub>)<sub>n</sub>OH;

R<sub>14</sub> is hydrogen or C<sub>1</sub>-C<sub>8</sub> alkyl;

R<sub>15</sub> is hydroxy,



C<sub>1</sub>-C<sub>18</sub> alkoxy or



R<sub>24</sub> and R<sub>25</sub> are each independently of the other hydrogen or C<sub>1</sub>-C<sub>18</sub> alkyl,

M is a metal cation of valency r<sub>1</sub>

p is 0, 1 or 2;

q is 1, 2, 3, 4, 5 or 6;

r is 1, 2, or 3; and

R<sub>8</sub> is hydrogen.

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5,773,632

**PROCESS FOR THE PREPARATION OF THE ENOL LACTONE OF 2-OXOCYCLOHEXYLIDENE ACETIC ACID AND APPLICATION TO THE PREPARATION OF 2-CUOMARANONE**

Nathalie Carmona; Laurent Carmona, both of Venette; Alain Perrard, Sainte Foy les Lyon, and Jean-Claude Vallejos, Marseille, all of France, assignors to Clariant Chimie S.A., Puteaux, France

Filed Jun. 26, 1997, Ser. No. 883,594

Claims priority, application France, Jul. 9, 1996, 96 08528

Int. Cl.<sup>6</sup> C07D 307/83

U.S. Cl. 549—307

20 Claims

1. A process for the preparation of the enol lactone of 2-oxocyclohexylidene acetic acid, characterised in that

(i) glyoxylic acid is allowed to react with cyclohexanone in the presence of a halogen acid in order to obtain a crude reaction product B1, then

(ii) said crude reaction product B1 is allowed to react, after solubilisation in an organic solvent, in the presence of a strong acid soluble in said organic solvent or of strongly acid resins, in order to obtain the enol lactone of 2-oxocyclohexylidene acetic acid which is isolated if desired.

5,773,633

**PROCESS FOR CRYSTALLIZING CHROMAN-1 FROM AN IMPURE MIXTURE**

Gaylord Michael Kissinger, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Aug. 1, 1995, Ser. No. 509,890

Int. Cl.<sup>6</sup> C07D 311/58

U.S. Cl. 549—406

8 Claims

1. A process for the crystallization of chroman-1 from an impure mixture containing the chroman-1, which comprises;

providing a crude mixture containing chroman-1 in solution; heating the crude mixture to a temperature above that required for a the saturation level of any component of the crude mixture;

mixing with the crude mixture, from 10 to 30 percent by weight of the mixture of acetone, whereby a clear solution free of solids is obtained;

reducing the temperature of the solution slowly, to the point where chroman-1 crystal nucleation occurs; and

reducing the temperature of the nucleated solution at a rate of about 0.01° to about 1.0° C. to a temperature of 25° to 50° C., whereby crystals of chroman-1 precipitate from the solution.

5,773,634

**TERTIARY BUTYL ALCOHOL ABSORPTION PROCESS FOR RECOVERING PROPYLENE AND ISOBUTANE**

David Durham Chess, Houston; David George Pottratz, Beaumont; Eileen Tovan Nguyen, Houston, and William Kemp Culbreth, III, Beaumont, all of Tex., assignors to Huntsman Specialty Chemicals Corporation, Austin, Tex.

Filed Nov. 14, 1996, Ser. No. 749,190

Int. Cl.<sup>6</sup> C07D 301/19; C07C 27/10

U.S. Cl. 549—529

3 Claims

1. A method which comprises the steps of:

a) reacting oxygen with isobutane in an oxidation reactor to provide a gaseous reaction product comprising inert gases and vaporized and/or entrained isobutane and a liquid reaction product comprising isobutane, tertiary butyl alcohol, tertiary butyl hydroperoxide and oxygen-containing by-products,

b) charging the liquid reaction product to a distillation zone and separating it therein into a lower boiling isobutane fraction and a higher boiling fraction comprising tertiary butyl alcohol and tertiary butyl hydroperoxide and oxygen-containing by-products,

c) cooling the gaseous reaction product by an amount sufficient to condense isobutane contained therein,

d) returning the isobutane condensate to the oxidation reactor, and

e) charging the remaining gases, including entrained and/or vaporized isobutane, to a tertiary butyl alcohol absorber and absorbing substantially all of the residual isobutane in tertiary butyl alcohol to form a solution of isobutane in tertiary butyl alcohol, and an off-gas fraction.

5,773,635

**PREPARATION OF POLYENECARBONYL COMPOUNDS HAVING A HIGH CONTENT OF THE ALL-E ISOMER, AND OF THEIR ACETALS OR KETALS**

Walter Dohler, Heidelberg; Wolfgang Krause, Brühl; Joachim Paust, Neuhofen; Otto Würz, Friedelsheim; Udo Rheude, Otterstadt; Wolfram Burst, Mannheim; Günter Däuwel, Lustadt; Armin Bertram, Frankenthal; Bernhard Schulz, Schwetzingen; Günter Wegner; Peter Münster, both of Römerberg; Hansgeorg Ernst, Speyer; Arno Kochner, Waldsee, and Heinz Etzrodt, Neustadt, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

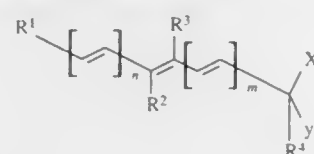
Filed Jul. 6, 1995, Ser. No. 498,840

Int. Cl.<sup>6</sup> C07C 51/16

U.S. Cl. 554—134

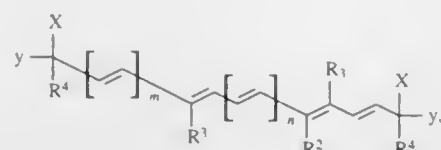
12 Claims

1. A process for preparing polyenecarbonyl compounds of the formula III or the formula IX,



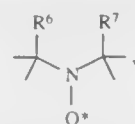
(III)

or



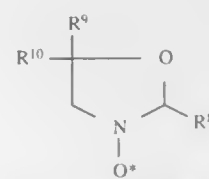
(IX)

where R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup> and R<sup>4</sup> are hydrogen or an organic radical, n is an integer of from 3–10, m is an integer of from 0 to 10, n+m being at least 2, x and y are C<sub>1</sub>–C<sub>4</sub>-alkoxy or x and y together are oxygen or a radical —O—CH<sub>2</sub>—CH<sub>2</sub>—O—, —O—CH<sub>2</sub>—C(CH<sub>3</sub>)<sub>2</sub>—CH<sub>2</sub>—O—, —O—CH=CH—O— or —O—CH<sub>2</sub>—CH<sub>2</sub>—CH<sub>2</sub>—O— which may be substituted by one or more methyl groups, and the hydrogen atoms in the brackets can be partly substituted by a methyl group, said compounds having a high all-E content and their acetals or ketals by a Horner-Emmons reaction or an aldol condensation of a suitable carbonyl compound with a suitable dialkyl phosphonate or of a suitable CH-acidic compound, which comprises carrying out the reaction, for the purposes of the preferred formation of a double bond having E configuration and in order to maintain the E configuration of the double bonds in the starting compounds as completely as possible, in the presence of one or more agents selected from the group consisting of oxygen, an oxygen-inert gas mixture, nitric oxide, a nitric oxide-inert gas mixture, a stable radical of the formula I



(I)

where R<sup>6</sup> and R<sup>7</sup> are a C<sub>1</sub>–C<sub>4</sub>-alkyl group or else R<sup>6</sup> and R<sup>7</sup> are an ethylene group, propylene group, vinylene group or propenylene group, which can be substituted by alkyl, aryl, hydroxyl, alkoxy, silyloxy, oxo, amino, mercapto, alkylmercapto, cyano, carboxyl, aminocarbonyl (carbamoyl), heteroaryl or alkylcarbonyloxy groups; a stable radical of the formula II



(II)

where R<sup>8</sup>, R<sup>9</sup> and R<sup>10</sup> can have the meanings indicated above for R<sup>6</sup> and R<sup>7</sup>; the stable radical 2,2-diphenyl-1-picrylhydrazyl, a hydrogen peroxide-urea adduct quinone, quinone derivatives and a coenzyme Q10 hydroquinone, the oxygen, the nitric oxide, the stable radicals or the hydrogen peroxide-urea adduct and the quinones, quinone derivatives or coenzyme Q10 hydroquinone being used in amounts from 0.3 to 10 mol %, based on the carbonyl compound employed.

5,773,636

**PROCESS FOR THE PRODUCTION OF FATTY ACID LOWER ALKYL ESTERS**

Guenther Demmering, Solingen; Christian Pelzer, Linnich, and Lothar Friesenhagen, Düsseldorf, all of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf, Germany

Filed Aug. 5, 1996, Ser. No. 640,921

Claims priority, application Germany, Nov. 8, 1993, 43 38 111.7

Int. Cl.<sup>6</sup> C11C 1/00

U.S. Cl. 554—169

23 Claims

1. A process for the production of fatty acid lower alkyl esters consisting essentially of the steps of:

A) treating at least one fatty acid ester of glycerol with from about 0.3 to about 3% by weight, based on the weight of ester, of a mineral acid at an elevated temperature;

B) removing the acid from the treated fatty acid ester; and

C) reacting the treated fatty acid ester with at least one lower aliphatic alcohol without the use of any added catalyst to transesterify the fatty acid ester.

5,773,637

**PERFLUOROALKYL SULFONATES, THEIR PREPARATION AND USE**

Walter Vladimir Cicha, Newark, Del.; Andreas Josef Kornath, Kamen, Germany; Ronald James McKinney; V. N. Mallikarjuna Rao, both of Wilmington, Del.; Joseph Stuart Thrasher, and Alfred Waterfield, both of Tuscaloosa, Ala., assignors to E.I. du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 6, 1996, Ser. No. 708,997

Int. Cl.<sup>6</sup> C07F 9/00; 7/00; 9/70; 7/22

U.S. Cl. 556—1

13 Claims

1. A process for preparing a perfluoroalkyl sulfonate of the formula

R<sub>n</sub>MX<sub>b</sub>·O<sub>g</sub>, comprising: reacting a reagent of the formula R<sub>n</sub>MX<sub>b</sub>O<sub>g</sub> and a second reagent of the formula R'<sub>h</sub>E[(SO<sub>2</sub>)<sub>i</sub>(R<sub>f</sub>)<sub>j</sub>]<sub>k</sub>, where R is selected from the group consisting of C<sub>1</sub> to C<sub>6</sub> alkyl, C<sub>1</sub> to C<sub>6</sub> perfluoroalkyl, cyclopentadienyl, phenyl and perfluorophenyl;

M is selected from the group consisting of transition metals of groups 3 to 12, main group elements of group 13 to 16, and lanthanide metals;

X is selected from the group consisting of F, Cl and Br; R<sub>f</sub> is selected from the group consisting of C<sub>6</sub>F<sub>2h+1</sub>, wherein h' is an integer from 1 to 10, and perfluorophenyl;

R' is selected from the group consisting of C<sub>h</sub>H<sub>2h+1</sub>, wherein j is an integer from 1 to 4, and phenyl;

E is B;

a is an integer from 0 to 3;

b is an integer from 2 to 6;

c is an integer from 1 to 6;

d is an integer from 1 to 3;

e is an integer from 1 to 4;

g is an integer from 0 to 1;

x is an integer from 0 to 3; and

y is an integer from 1 to 3.

6. A process for changing the fluorine content of a halogenated hydrocarbon containing from 1 to 6 carbon atoms, in the presence of a catalyst, characterized by:

using a perfluoroalkyl sulfonate of the formula R<sub>n</sub>XM<sub>b</sub>·O<sub>g</sub>[(SO<sub>2</sub>)<sub>i</sub>(R<sub>f</sub>)<sub>j</sub>]<sub>k</sub> as a catalyst,

where R is selected from the group consisting of C<sub>1</sub> to C<sub>6</sub> alkyl, C<sub>1</sub> to C<sub>6</sub> perfluoroalkyl, cyclopentadienyl, phenyl and perfluorophenyl;

M is selected from the group consisting of transition metals of groups 3 to 12, main group elements of group 13 to 16, and lanthanide metals;

X is selected from the group consisting of F, Cl and Br;

R<sub>f</sub> is selected from the group consisting of C<sub>6</sub>F<sub>2h+1</sub>, C<sub>6</sub>F<sub>2h</sub>, wherein h is an integer from 0 to 10, perfluorophenyl, C<sub>6</sub>F<sub>4</sub>(CF<sub>3</sub>)<sub>2</sub>, wherein i is an integer from 0 to 6, provided that when E is boron, R<sub>f</sub> is selected from the group consisting of C<sub>6</sub>F<sub>2h+1</sub>, wherein h' is an integer from 1 to 10, and perfluorophenyl;

R' is selected from the group consisting of C<sub>h</sub>H<sub>2h+1</sub>, wherein j is an integer from 1 to 4, and phenyl;

E is selected from the group consisting of B and Si;

a is an integer from 0 to 3;

b is an integer from 2 to 6;

c is an integer from 1 to 6;

d is an integer from 1 to 3;

e is an integer from 1 to 4; and

g is an integer from 0 to 1.

13. A perfluoroalkyl sulfonate selected from the group consisting of TaCl<sub>5</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, Ta<sub>2</sub>F<sub>5</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>5</sub>, TaF<sub>5</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>5</sub>, NbCl<sub>5</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, NbF<sub>5</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>5</sub>, NbF<sub>5</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, TiF<sub>5</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>2</sub>, TiF<sub>5</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, Ti<sub>2</sub>Cl<sub>7</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, Ti<sub>2</sub>Cl<sub>12</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, BiF<sub>4</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, BiF<sub>5</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, Bi(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, Pb<sub>2</sub>F<sub>9</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, Pb<sub>2</sub>F<sub>17</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, Sn<sub>2</sub>F<sub>7</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, TeF<sub>6</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>2</sub>, ZrCl<sub>4</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, CrF<sub>3</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, AsF<sub>5</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>2</sub>, AsF<sub>6</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>2</sub>, As(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, SbF<sub>5</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, SbF<sub>6</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, SbF<sub>3</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, Sb<sub>2</sub>F<sub>7</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, Ge<sub>3</sub>F<sub>13</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>7</sub>, MoCl<sub>5</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>2</sub>, AsF<sub>6</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, HfCl<sub>4</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, V<sub>2</sub>F<sub>7</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, VO(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>, VOF(SO<sub>2</sub>CF<sub>3</sub>)<sub>2</sub>, and In<sub>2</sub>Cl<sub>3</sub>(SO<sub>2</sub>CF<sub>3</sub>)<sub>3</sub>.

5,773,638

**GELATION ADDITIVE FOR HYDRAULIC FRACTURING FLUIDS**

Jeffrey C. Dawson, Spring, and Hoang Van Le, Houston, both of Tex., assignors to BJ Services Company, Houston, Tex.

Continuation of Ser. No. 502,352, Jul. 14, 1995, abandoned. This application May 16, 1997, Ser. No. 858,018

Int. Cl.<sup>6</sup> C07F 7/00

U.S. Cl. 556—51

31 Claims

1. A method of formulating an organo-zirconium compound comprising:

combining in solution an amount of an aldehyde or dialdehyde with an amount of a zirconium salt and allowing the solution to react.

10. A method of formulating zirconium compound comprising: preparing an aqueous solution of glyoxal, heating the solution to a temperature of at least 200° F., then admixing to the solution an amount of zirconium carbonate and allowing the solution to react to form a precipitate of the zirconium compound and carbon dioxide gas, and allowing the carbon dioxide gas to evolve from the solution.

18. A method of preparing a zirconium crosslinker for use in crosslinking viscous polymer gels comprising the steps of:

combining in solution an amount of an aldehyde or dialdehyde with an amount of a zirconium salt and allowing the solution to react to form a precipitate of the zirconium compound and carbon dioxide gas, and allowing the carbon dioxide gas to evolve from the solution;



neutralizing the combined solution after the reaction is complete so that the precipitate is dissolved.

5,773,639

# LAYER FORMING MATERIAL AND WIRING FORMING METHOD

Akemi Kawaguchi; Yuka Terai, and Kousaku Yano, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 19, 1996, Ser. No. 618,165

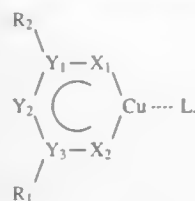
Claims priority, application Japan, Mar. 20, 1995, 7-060750

Int. Cl.<sup>6</sup> C07F 1/08; C23C 16/00

U.S. Cl. 556—113

3 Claims

1. A chemical vapor deposited layer forming material comprising a compound represented by the following chemical formula:



wherein  $X_1$  and  $X_2$  are elements selected from the group consisting of O, S, Se, Te and Po of the same or different types which are coordinate-bonded to Cu, each of  $Y_1$ ,  $Y_2$  and  $Y_3$  is Si, L is a group which has a double or a triple bond and which is able to supply electrons to Cu, and each of  $R_1$  and  $R_2$  is an optional element or compound.

5,773,640

# N-[N-(3,3-DIMETHYLBUTYL)-L-ASPARTYL]-L-HEXAHYDROPHENYLALANINE 1-METHYL ESTER USEFUL AS A SWEETENING AGENT, ITS METHOD OF PREPARATION

Claude Nofre, 119 Cours Albert Thomas, 69003 Lyons, and Jean-Marie Tinti, 5 Impasse de la Drelatière, 69680 Chassieu, both of France

PCT No. PCT/FR95/00588, § 371 Date Nov. 7, 1996, § 102(e) Date Nov. 7, 1996, PCT Pub. No. WO95/30688, PCT Pub. Date Nov. 16, 1995

PCT Filed May 5, 1995, Ser. No. 737,138

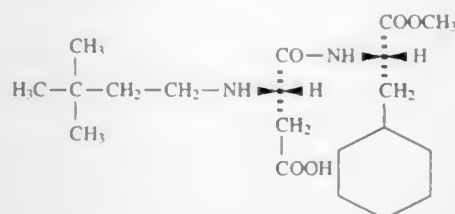
Claims priority, application France, May 9, 1994, 94 05675

Int. Cl.<sup>6</sup> C07C 229/00

U.S. Cl. 560—125

17 Claims

1. A sweetening compound characterized in that it is N-[N-(3,3-dimethylbutyl)-L- $\alpha$ -aspartyl]-L-hexahydrophenylalanine 1-methyl ester of formula:



5,773,641

# SYNTHESIS OF ESTERS OF MERCAPTOCARBOXYLIC ACIDS

Yves Labat, and Jean-Pierre Muller, both of Pau, France, assignors to Elf Atochem S.A., France

Filed Aug. 18, 1995, Ser. No. 516,699

Claims priority, application France, Aug. 19, 1994, 94 10145

Int. Cl.<sup>6</sup> C07C 319/12

U.S. Cl. 560—147

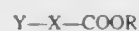
13 Claims

1. In a process for the preparation of an ester of mercaptocarboxylic acid of formula:



(I)

in which X denotes a linear or branched alkylene radical containing from 1 to 4 carbon atoms and R a linear or branched alkyl radical containing from 1 to 18 carbon atoms, comprising reacting ammonium hydrosulphide or an alkali or alkaline-earth metal hydrosulphide with the corresponding halocarboxylic ester of formula:



(II)

in which R and X have the same meanings as above and Y denotes a chlorine or bromine atom, the improvement comprising conducting the reaction in an anhydrous or substantially anhydrous alcoholic medium and under a hydrogen sulphide pressure of at least 10 bars absolute.

5,773,642

# PROCESS FOR THE PREPARATION OF CARBOXYLIC ACIDS OR THE CORRESPONDING ESTERS IN THE PRESENCE OF A SOLUBLE CATALYST BASED ON IRIIDIUM AND IODIDES

Philippe Denis, Decines; Dominique Nobel, Salindres; Robert Perron, Charly; Philippe Perrona, Lyon, and Joël Schwartz, Caluire, all of France, assignors to Acetex Chimie, Paris La Defense 2, France

PCT No. PCT/FR95/00625, § 371 Date May 14, 1997, § 102(e) Date May 14, 1997, PCT Pub. No. WO95/31426, PCT Pub. Date Nov. 23, 1995

PCT Filed May 15, 1995, Ser. No. 737,507

Claims priority, application France, May 13, 1994, 94 05896; Oct. 21, 1994, 94 12712

Int. Cl.<sup>6</sup> C07C 67/36; 51/12

U.S. Cl. 560—232

21 Claims

1. A process for the preparation of carboxylic acids or their corresponding esters, said process comprising the step of: contacting at least one alcohol with carbon monoxide, in the liquid phase, in a reaction mixture comprising water, an ester, a carboxylic acid, iodides, and a catalyst system comprising an iridium compound and a halogenated promoter at conditions effective to produce carboxylic acids or their corresponding esters.

said reaction mixture comprising:

- a water content of greater than 0 up to 10%;
- a halogenated promoter concentration of greater than 0 up to 10%;
- an ester concentration of 2% to 40%; and
- an atomic ratio of iodides to iridium of greater than 0 up to 10.

5,773,643

# PROCESS FOR PREPARATION OF ISOCYANATE COMPOUNDS

Toyokazu Yagii; Teruo Itokazu, both of Otake, and Kiyokazu Murata, Himeji, all of Japan, assignors to Daicel Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 97,151, Jul. 26, 1993, abandoned, which is a continuation-in-part of Ser. No. 750,509, Aug. 27, 1991, abandoned, which is a continuation-in-part of Ser. No. 453,954, Dec. 20, 1989, abandoned, which is a continuation-in-part of Ser. No. 261,832, Sep. 9, 1988, abandoned. This application Dec. 19, 1994, Ser. No. 358,680

Claims priority, application Japan, Jan. 13, 1987, 62-4085; Jun. 18, 1987, 62-152032; Nov. 11, 1987, 62-284442; Dec. 16, 1987, 62-316180; WIPO, Jan. 13, 1988, PCT/JP88/00026; Japan, Jan. 13, 1989, 1-7252; Jun. 1, 1989, 1-139505

Int. Cl.<sup>6</sup> C07C 263/00

U.S. Cl. 560—345

20 Claims

1. A process for the preparation of a diisocyanate compound, which comprises a three-stage process defined by the combination of the following steps wherein each step represents one of the three stages:

- preparing dimethyl carbonate by a method selected from the group consisting of:
  - a method wherein carbon monoxide and oxygen are reacted with methanol,
  - a method wherein propylene oxide is reacted with carbon dioxide to prepare propylene carbonate, and then, the propylene carbonate is reacted with methanol, and
  - a method wherein a nitrous acid ester is catalytically reacted with carbon monoxide;
- reacting the dimethyl carbonate with an aliphatic diamine in the presence of an alkali catalyst to prepare a corresponding urethane compound; and
- thermally decomposing the urethane compound under a reduced pressure of 1 to 700 Torr in a high-boiling point solvent.

5,773,644

# CYCLOPROPYL ALKANOIC ACID DERIVATIVES

Barbara B. Chen, Glenview, Ill.; Helen Y. Chen, Livingston, N.J.; Michael Clare, Skokie, Ill.; Shashidhar N. Rao, Mundelein, Ill., and Mark A. Russell, Gurnee, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

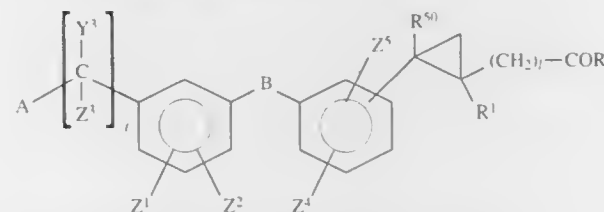
Filed Mar. 27, 1997, Ser. No. 825,040

Int. Cl.<sup>6</sup> C07C 241/00; 229/00; C07D 239/00

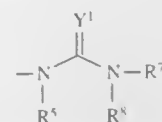
U.S. Cl. 562—439

31 Claims

1. A compound of the formula



or a pharmaceutically acceptable salt thereof, wherein A is



wherein  $Y^1$  is selected from the group consisting of N— $R^2$ , O, and S;

$R^2$  is selected from the group consisting of H; alkyl; aryl; hydroxy; alkoxy; cyano; nitro; amino; aminocarbonyl; alk- enyl; alkynyl; alkyl optionally substituted with one or more

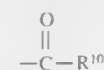
substituent selected from lower alkyl, halogen, hydroxyl, haloalkyl, cyano, nitro, carboxyl, amino, alkoxy, aryl or aryl optionally substituted with one or more halogen, haloalkyl, lower alkyl, alkoxy, cyano, alkylsulfonyl, alkylthio, nitro, carboxyl, amino, hydroxyl, sulfonic acid, sulfonamide, aryl, fused aryl, monocyclic heterocycles, or fused monocyclic heterocycles; aryl optionally substituted with one or more substituent selected from halogen, haloalkyl, hydroxy, lower alkyl, alkoxy, methylenedioxy, ethylenedioxy, cyano, nitro, alkylthio, alkylsulfonyl, sulfonic acid, sulfonamide, carboxyl derivatives, amino, aryl, fused aryl, monocyclic heterocycles and fused monocyclic heterocycle; monocyclic heterocycles; and monocyclic heterocycles optionally substituted with one or more substituent selected from halogen, haloalkyl, lower alkyl, alkoxy, amino, nitro, hydroxy, carboxyl derivatives, cyano, alkylthio, alkylsulfonyl, sulfonic acid, sulfonamide, aryl or fused aryl; or

$R^2$  taken together with  $R^7$  forms a 4–12 membered dinitrogen containing heterocycle optionally substituted with one or more substituent selected from the group consisting of lower alkyl, hydroxy and phenyl;

or  $R^2$  taken together with  $R^7$  forms a 5 membered heteroaromatic ring;

or  $R^2$  taken together with  $R^7$  forms a 5 membered heteroaromatic ring fused with a phenyl group;

$R^7$  (when not taken together with  $R^2$ ) and  $R^8$  are independently selected from the group consisting of H; alkyl; alkenyl; alkynyl; aralkyl; cycloalkyl; bicycloalkyl; aryl; acyl; benzoyl; alkyl optionally substituted with one or more substituent selected from lower alkyl, halogen, hydroxy, haloalkyl, cyano, nitro, carboxyl derivatives, amino, alkoxy, thio, alkylthio, sulfonyl, aryl, aralkyl, aryl optionally substituted with one or more substituent selected from halogen, haloalkyl, lower alkyl, alkoxy, methylenedioxy, ethylenedioxy, alkylthio, haloalkylthio, thio, hydroxy, cyano, nitro, carboxyl derivatives, aryloxy, amido, acylamino, amino, alkylamino, dialkylamino, trifluoroalkoxy, trifluoromethyl, sulfonyl, alkylsulfonyl, haloalkylsulfonyl, sulfonic acid, sulfonamide, aryl, fused aryl, monocyclic heterocycles, fused monocyclic heterocycles; aryl optionally substituted with one or more substituent selected from halogen, haloalkyl, lower alkyl, alkoxy, methylenedioxy, ethylenedioxy, alkylthio, haloalkylthio, thio, hydroxy, cyano, nitro, carboxyl derivatives, aryloxy, amido, acylamino, amino, alkylamino, dialkylamino, trifluoroalkoxy, trifluoromethylsulfonyl, alkylsulfonyl, sulfonic acid, sulfonamide, aryl, fused aryl, monocyclic heterocycles, or fused monocyclic heterocycles; monocyclic heterocycles; monocyclic heterocycles optionally substituted with one or more substituent selected from halogen, haloalkyl, lower alkyl, alkoxy, aryloxy, amino, nitro, hydroxy, carboxyl derivatives, cyano, alkylthio, alkylsulfonyl, aryl, fused aryl; monocyclic and bicyclic heterocycloalkyls;  $-SO_2R^{10}$  wherein  $R^{10}$  is selected from the group consisting of alkyl, aryl and monocyclic heterocycles, all optionally substituted with one or more substituent selected from the group consisting of halogen, haloalkyl, alkyl, alkoxy, cyano, nitro, amino, acylamino, trifluoroalkyl, amido, alkylaminosulfonyl, alkylsulfonyl, alkylsulfonylamino, alkylamino, dialkylamino, trifluoromethylthio, trifluoroalkoxy, trifluoromethylsulfonyl, aryl, aryloxy, thio, alkylthio, and monocyclic heterocycles; and



wherein  $R^{10}$  is defined above;

or  $NR^7$  and  $R^8$  taken together form a 4–12 membered mononitrogen containing monocyclic or bicyclic ring optionally substituted with one or more substituent selected from lower alkyl, carboxyl derivatives, aryl or hydroxy and wherein said ring optionally contains a heteroatom selected from the group consisting of O, N and S;

$R^5$  is selected from the group consisting of H, alkyl, alkenyl, alkynyl, benzyl, and phenethyl; or

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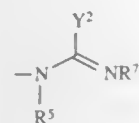
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1998

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A is



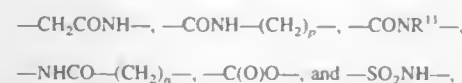
wherein Y<sup>2</sup> is selected from the group consisting of alkyl; cycloalkyl; bicycloalkyl; aryl; monocyclic heterocycles; alkyl optionally substituted with aryl which can also be optionally substituted with one or more substituent selected from halo, haloalkyl, alkyl, nitro, hydroxy, alkoxy, aryloxy, aryl, or fused aryl; aryl optionally substituted with one or more substituent selected from halo, haloalkyl, hydroxy, alkoxy, aryloxy, aryl, fused aryl, nitro, methylenedioxy, ethylenedioxy, or alkyl; alkynyl; alkenyl; —S—R<sup>9</sup> and —O—R<sup>9</sup> wherein R<sup>9</sup> is selected from the group consisting of H; alkyl; aralkyl; aryl; alkenyl; and alkynyl; or R<sup>9</sup> taken together with R<sup>7</sup> forms a 4-12 membered mononitrogen containing sulfur or oxygen containing heterocyclic ring; and

R<sup>5</sup> and R<sup>7</sup> are as defined above;

or Y<sup>2</sup> (when Y<sup>2</sup> is carbon) taken together with R<sup>7</sup> forms a 4-12 membered mononitrogen containing ring optionally substituted with alkyl, aryl or hydroxy;

Z<sup>1</sup>, Z<sup>2</sup>, Z<sup>4</sup> and Z<sup>5</sup> are independently selected from the group consisting of H; alkyl; hydroxy; alkoxy; aryloxy; arylalkyloxy; halogen; haloalkyl; haloalkoxy; nitro; amino; aminoalkyl; alkylamino; dialkylamino; cyano; alkylthio; alkylsulfonyl; carboxyl derivatives; acetamide; aryl; fused aryl; cycloalkyl; thio; monocyclic heterocycles; fused monocyclic heterocycles; and A, wherein A is defined above;

B is selected from the group consisting of



wherein p is an integer selected from the group consisting of 0, 1 and 2; wherein R<sup>11</sup> is selected from the group consisting of H, alkyl, alkenyl, alkynyl, benzyl and phenethyl; wherein n is an integer selected from the group consisting of 0, 1, 2 and 3;

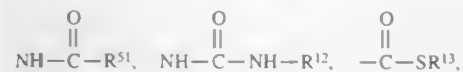
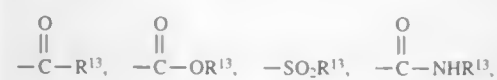
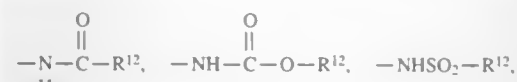
l is an integer 0, 1, 2, or 3;

t is an integer 0, 1 or 2;

R<sup>50</sup> is selected from the group consisting of H, alkyl and aryl;

R is X—R<sup>3</sup> wherein X is selected from the group consisting of O, S and NR<sup>4</sup>, wherein R<sup>3</sup> and R<sup>4</sup> are independently selected from the group consisting of hydrogen; alkyl; alkenyl; alkynyl; haloalkyl; aryl; arylalkyl; sugars; steroids and in the case of the free acid, all pharmaceutically acceptable salts thereof; Y<sup>3</sup> and Z<sup>3</sup> are independently selected from the group consisting of H, alkyl, aryl, cycloalkyl and aralkyl;

R<sup>1</sup> is selected from the group consisting of hydrogen; alkyl; amino,

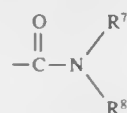


R<sup>12</sup> is selected from the group consisting of H, alkyl, cycloalkyl, alkylaryl and aryl;

R<sup>51</sup> is selected from the group consisting of N-substituted piperidinyl, piperidinyl and morpholinyl;

R<sup>13</sup> is selected from the group consisting of hydrogen; alkyl; alkenyl; alkynyl; aryl; carboxyl derivatives; haloalkyl; monocyclic heterocycles; monocyclic heterocycles optionally substituted with alkyl, halogen, haloalkyl, cyano, hydroxy, aryl, fused aryl, nitro, alkoxy, aryloxy, alkylsulfonyl, arylsulfonyl, sulfonamide, thio, alkylthio, carboxyl derivatives, amino, amido; alkyl optionally substituted with halo, haloalkyl, hydroxy, alkoxy, aryloxy, thio, alkylthio, arylthio, alkylsulfoxide, alkylsulfonyl, arylsulfoxide, arylsulfonyl, cyano, nitro, amino, alkylamino, dialkylamino, alkylsulfonamide, arylsulfonamide, acylamide, carboxyl derivatives, sulfonamide, sulfonic acid, phosphonic acid derivatives, phosphinic acid derivatives, aryl, arylthio, arylsulfoxide, or arylsulfone all optionally substituted on the aryl ring with halo, haloalkyl, cyano, nitro, hydroxy, carboxyl derivatives, alkoxy, aryloxy, amino, alkylamino, dialkylamino, amido, aryl, fused aryl, monocyclic heterocycles; and fused monocyclic heterocycles, monocyclic heterocyclicthio, monocyclic heterocyclicsulfoxide, and monocyclic heterocyclic sulfone, which can be optionally substituted with halo, haloalkyl, nitro, hydroxy, alkoxy, fused aryl, or alkyl;

aryl optionally substituted in one or more positions with halo, haloalkyl, alkyl, alkoxy, aryloxy, methylenedioxy, ethylenedioxy, alkylthio, haloalkylthio, thio, hydroxy, cyano, nitro, carboxyl derivatives, amido, acylamino, amino, alkylamino, dialkylamino, trifluoroalkoxy, trifluoromethylsulfonyl, alkylsulfonyl, sulfonic acid, sulfonamide, aryl, fused aryl, monocyclic heterocycles and fused monocyclic heterocycles; and



wherein R<sup>7</sup> and R<sup>8</sup> are as defined above and provided that taken together with the nitrogen, R<sup>7</sup> and R<sup>8</sup> comprise an amino acid.

5,773,645

## TWO-DIMENSIONAL ELECTROPHORESIS DEVICE

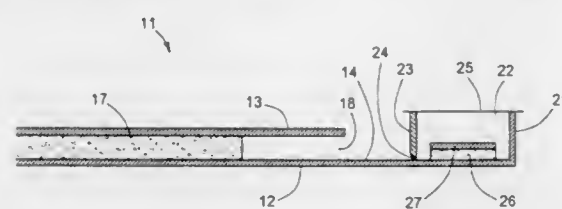
Denis François Hochstrasser, Geneva, Switzerland, assignor to Bio-Rad Laboratories, Inc., Hercules, Calif.

Filed May 5, 1997, Ser. No. 851,829

Int. Cl.<sup>6</sup> G01N 27/26; 27/447

U.S. Cl. 204—456

10 Claims



7. A method for separating a sample into components by two-dimensional electrophoresis, said method comprising:

(a) loading said sample onto a first electrophoretic separation medium of a two-dimensional electrophoresis arrangement comprising first and second electrophoretic separation media, said first electrophoretic separation medium being in the form of an elongate strip and said second electrophoretic separation medium in the form of a slab, said elongate strip and said slab retained on a single support means and isolated from each other by a removable, fluid-impermeable, and electrically insulated barrier;

(b) imposing an electric field across said elongate strip to divide said sample components into zones spaced along said elongate strip;

(c) removing said barrier and placing all zones in said elongate strip in electrical and fluid contact with said slab; and

(d) imposing an electric field across both said elongate strip and said slab in a direction perpendicular to said elongate strip, to effect electrophoretic separation of said zones in said slab in which said elongate strip is encircled by walls forming a liquid-retaining receptacle, one of said walls being said removable, fluid-impermeable, and electrically insulating barrier, and (a) comprises placing said sample inside said liquid-retaining receptacle in fluid contact with said elongate strip.

5,773,646

## META-SUBSTITUTED PHENYLENE DERIVATIVES

Nizal Chandrakumar, Vernon Hills; Barbara B. Chen, Glenview, both of Ill.; Helen Y. Chen, Livingston, N.J.; Michael Clare, Sokie, Ill.; Alan F. Gasielki, Vernon Hills, Ill.; Richard A. Haack, Chicago, Ill.; James W. Malecha, Libertyville, Ill.; Peter G. Ruminski, Ballwin, Mo., and Mark A. Russell, Gurnee, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

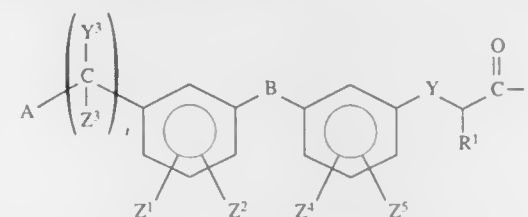
Filed Mar. 27, 1997, Ser. No. 825,086

Int. Cl.<sup>6</sup> C07C 241/00; 321/00; 205/00; 229/00

U.S. Cl. 562—439

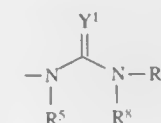
30 Claims

1. A compound of the formula



or a pharmaceutically acceptable salt thereof, wherein

A is



wherein Y<sup>1</sup> is selected from the group consisting of N—R<sup>2</sup>, O, and S;

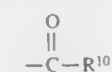
R<sup>2</sup> is selected from the group consisting of H; alkyl; aryl; hydroxy; alkoxy; cyano; nitro; amino; aminocarbonyl; alkenyl; alkynyl; alkyl optionally substituted with one or more substituent selected from lower alkyl, halogen, hydroxyl, haloalkyl, cyano, nitro, carboxyl, amino, alkoxy, aryl or aryl optionally substituted with one or more halogen, haloalkyl, lower alkyl, alkoxy, cyano, alkylsulfonyl, alkylthio, nitro, carboxyl, amino, hydroxyl, sulfonic acid, sulfonamide, aryl, fused aryl, monocyclic heterocycles, or fused monocyclic heterocycles; aryl optionally substituted with one or more substituent selected from halogen, haloalkyl, hydroxy, lower alkyl, alkoxy, methylenedioxy, ethylenedioxy, cyano, nitro, alkylthio, alkylsulfonyl, sulfonic acid, sulfonamide, carboxyl derivatives, amino, aryl, fused aryl, monocyclic heterocycles and fused monocyclic heterocycle; monocyclic heterocycles; and monocyclic heterocycles optionally substituted with one or more substituent selected from halogen, haloalkyl, lower alkyl, alkoxy, amino, nitro, hydroxy, carboxyl derivatives, cyano, alkylthio, alkylsulfonyl, sulfonic acid, sulfonamide, aryl or fused aryl; or

R<sup>2</sup> taken together with R<sup>7</sup> forms a 4-12 membered dinitrogen containing heterocycle optionally substituted with one or more substituent selected from the group consisting of lower alkyl, hydroxy, oxo and phenyl; or

R<sup>2</sup> taken together with R<sup>7</sup> forms a 5 membered heteroaromatic ring; or

R<sup>2</sup> taken together with R<sup>7</sup> forms a 5 membered heteroaromatic ring fused with a phenyl group optionally substituted with one or more substituent selected from the group consisting of alkoxy, carbonyl and alkoxy;

R<sup>7</sup> (when not taken together with R<sup>2</sup>) and R<sup>8</sup> are independently selected from the group consisting of H; alkyl; alkenyl; alkynyl; aralkyl; cycloalkyl; bicycloalkyl; aryl; acyl; benzoyl; alkyl optionally substituted with one or more substituent selected from lower alkyl, halogen, hydroxy, haloalkyl, cyano, nitro, carboxyl derivatives, amino, alkoxy, thio, alkylthio, sulfonyl, aryl, aralkyl, aryl optionally substituted with one or more substituent selected from halogen, haloalkyl, lower alkyl, alkoxy, methylenedioxy, ethylenedioxy, alkylthio, haloalkylthio, thio, hydroxy, cyano, nitro, carboxyl derivatives, aryloxy, amido, acylamino, amino, alkylamino, dialkylamino, trifluoroalkoxy, trifluoromethyl, sulfonyl, alkylsulfonyl, haloalkylsulfonyl, sulfonic acid, sulfonamide, aryl, fused aryl, monocyclic heterocycles, fused monocyclic heterocycles; aryl optionally substituted with one or more substituent selected from halogen, haloalkyl, lower alkyl, alkoxy, methylenedioxy, ethylenedioxy, alkylthio, haloalkylthio, thio, hydroxy, cyano, nitro, carboxyl derivatives, aryloxy, amido, acylamino, amino, alkylamino, dialkylamino, trifluoroalkoxy, trifluoromethylsulfonyl, alkylsulfonyl, sulfonic acid, sulfonamide, aryl, fused aryl, monocyclic heterocycles, or fused monocyclic heterocycles; monocyclic heterocycles; monocyclic heterocycles optionally substituted with one or more substituent selected from halogen, haloalkyl, lower alkyl, alkoxy, aryloxy, amino, nitro, hydroxy, carboxyl derivatives, cyano, alkylthio, alkylsulfonyl, aryl, fused aryl; monocyclic and bicyclic heterocyclicalkyls; —SO<sub>2</sub>R<sup>10</sup> wherein R<sup>10</sup> is selected from the group consisting of alkyl, aryl and monocyclic heterocycles, all optionally substituted with one or more substituent selected from the group consisting of halogen, haloalkyl, alkyl, alkoxy, cyano, nitro, amino, acylamino, trifluoroalkyl, amido, alkylaminosulfonyl, alkylsulfonyl, alkylsulfonylamino, alkylamino, dialkylamino, trifluoromethylthio, trifluoroalkoxy, trifluoromethylsulfonyl, aryl, aryloxy, thio, alkylthio, and monocyclic heterocycles; and

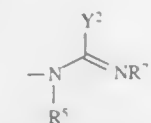


wherein R<sup>10</sup> is defined above; or

R<sup>7</sup> and R<sup>8</sup> taken together form a 4-12 membered mononitrogen containing monocyclic or bicyclic ring optionally substituted with one or more substituent selected from lower alkyl, carboxyl derivatives, aryl or hydroxy and wherein said ring optionally contains a heteroatom selected from the group consisting of O, N and S;

R<sup>5</sup> is selected from the group consisting of H, alkyl, alkenyl, alkynyl, benzyl, and phenethyl; or

A is



wherein Y<sup>2</sup> is selected from the group consisting of hydrogen; alkyl; cycloalkyl; bicycloalkyl; aryl; monocyclic heterocycles; alkyl optionally substituted with aryl which can also be optionally substituted with one or more substituent selected from halo, haloalkyl, alkyl, nitro, hydroxy, alkoxy, aryloxy, aryl, or fused aryl; aryl optionally substituted with one or more substituent selected from halo, haloalkyl, hydroxy, alkoxy, aryloxy, aryl, fused aryl, nitro, methylenedioxy, ethylenedioxy, or alkyl; alkynyl; alkenyl; —S—R<sup>9</sup> and —O—R<sup>9</sup> wherein R<sup>9</sup> is selected from the group consisting of H; alkyl; aralkyl; aryl; alkenyl; and alkynyl; or R<sup>9</sup> taken together with R<sup>7</sup> forms a 4-12 membered mononitrogen containing sulfur or oxygen containing heterocyclic ring; and

R<sup>5</sup> and R<sup>7</sup> are as defined above; or

Y<sup>2</sup> (when Y<sup>2</sup> is carbon) taken together with R<sup>7</sup> forms a 4-12 membered mononitrogen containing ring optionally substituted with alkyl, aryl or hydroxy; or



VOL

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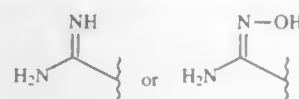
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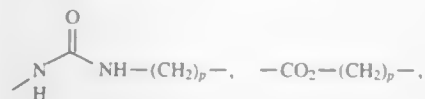
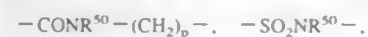
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A is selected from the group consisting of

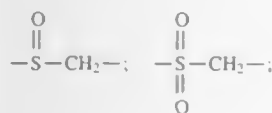


Z<sup>1</sup>, Z<sup>2</sup>, Z<sup>4</sup> and Z<sup>5</sup> are independently selected from the group consisting of H; alkyl; hydroxy; alkoxy; aryloxy; aralkoxy; haloalkyl; haloalkoxy; nitro; amino; aminoalkyl; alkylamino; dialkylamino; cyano; alkylthio; alkylsulfonyl; carboxyl derivatives; acetamide; aryl; fused aryl; cycloalkyl; thio; monocyclic heterocycles; fused monocyclic heterocycles; and A, wherein A is defined above;

B is selected from the group consisting of



optionally substituted by oxo;



wherein p is an integer selected from the group consisting of 0, 1 and 2; wherein n is an integer selected from the group consisting of 0, 1, 2 and 3; R<sup>50</sup> is selected from the group consisting of H and alkyl;

Y is selected from the group consisting of



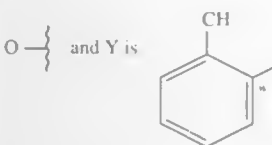
and



wherein q is an integer selected from the group consisting of 0 and 1; R<sup>70</sup> is selected from the group consisting of H, alkyl, aryl and aryl substituted with one or more substituent selected from the group consisting of H; alkyl; hydroxy; alkoxy; aryloxy; aralkoxy; haloalkyl; haloalkoxy; nitro; amino; aminoalkyl; alkylamino; dialkylamino; cyano; alkylthio; alkylsulfonyl; carboxyl derivatives; acetamide; aryl; fused aryl; cycloalkyl; thio; monocyclic heterocycles; fused monocyclic heterocycles;

t is an integer 0, 1 or 2;

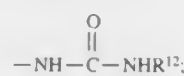
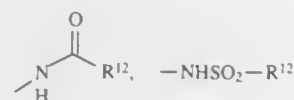
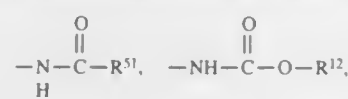
R is X—R<sup>3</sup> wherein X is selected from the group consisting of O, S and NR<sup>4</sup>, wherein R<sup>3</sup> and R<sup>4</sup> are independently selected from the group consisting of hydrogen; alkyl; alkenyl; alkynyl; haloalkyl; aryl; arylalkyl; sugars; steroids and in the case of the free acid, all pharmaceutically acceptable salts thereof; or



wherein the X—R<sup>3</sup> group is attached to the phenyl of the Y group at the para position to form a lactone;

Y<sup>3</sup> and Z<sup>3</sup> are independently selected from the group consisting of H, alkyl, aryl, cycloalkyl and aralkyl;

R<sup>1</sup> is selected from the group consisting of hydrogen; alkyl; aryl;



R<sup>12</sup> is selected from the group consisting of H, alkyl, cycloalkyl, aralkyl and aryl; and  
R<sup>51</sup> is selected from the group consisting of N-substituted piperidinyl, piperidinyl and morpholinyl.

5,773,647

#### COMPOUNDS AND COMPOSITIONS FOR DELIVERING ACTIVE AGENTS

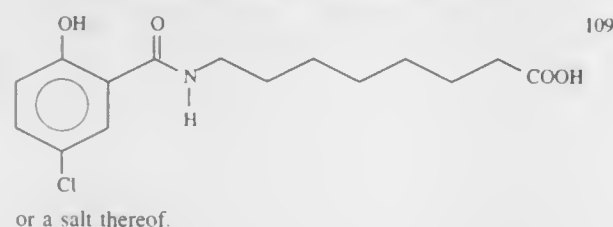
Andrea Leone-Bay, Ridgefield, Conn.; Eric Wang, Yonkers, N.Y.; Donald J. Sarubbi, Bronxville, N.Y., and Harry Leopold, Elmsford, N.Y., assignors to Emisphere Technologies, Inc., Hawthorne, N.Y.

Filed Feb. 7, 1997, Ser. No. 796,337  
Int. Cl.<sup>6</sup> C07C 229/00

U.S. Cl. 562—444

23 Claims

1. A composition comprising:  
(A) at least one active agent; and  
(B) a compound having the following formula



or a salt thereof.

5,773,648

#### PREPARATION OF POLYTETRAHYDROFURAN

Rainer Becker, Bad Dürkheim; Christoph Sigwart, Schriesheim; Michael Hesse, Schifferstadt; Rolf Fischer, Heidelberg; Karsten Eller, Ludwigshafen; Gerd Heilen, Neustadt, and Klaus-Dieter Plitzko, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

PCT No. PCT/EP95/03651, § 371 Date Mar. 10, 1997, § 102(e) Date Mar. 10, 1997, PCT Pub. No. WO96/09335, PCT Pub. Date Mar. 28, 1996

PCT Filed Sep. 21, 1995, Ser. No. 793,987

Claims priority, application Germany, Sep. 21, 1994, 44 33 606.3

Int. Cl.<sup>6</sup> C07C 67/24; 43/18

U.S. Cl. 560—240

10 Claims

1. A process for the preparation of polytetrahydrofuran or polytetrahydrofuran monoesters of C<sub>1</sub>–C<sub>10</sub> monocarboxylic acids by the polymerization of tetrahydrofuran over a heterogeneous catalyst in the presence of one of the telogens water, 1,4-butanediol or polytetrahydrofuran having a molecular weight of from 200 to 700 dalton or a mixture of said telogens, wherein the catalyst used is a supported catalyst which contains a catalytically active amount of an oxygen-containing tungsten or molybdenum compound or a mixture of these compounds on an oxidic support material and which has been calcined at temperatures ranging from 550° to 800° C.

5,773,649

#### DNA MARKERS TO DETECT CANCER CELLS EXPRESSING A MUTATOR PHENOTYPE AND METHOD OF DIAGNOSIS OF CANCER CELLS

Daniel Sinnett, Boucherville; Damian LaBuda, Montréal; Maja Krajcinovic, Montréal, and Chantal Richer, Montréal, all of Canada, assignors to Centre de recherche de l'Hôpital Sainte-Justine, Montréal, Canada

Filed Jun. 10, 1996, Ser. No. 661,168

Int. Cl.<sup>6</sup> C12P 19/34

U.S. Cl. 435—91.2

5 Claims

1. A method of detecting a mutator phenotype of tumor cells in a patient, which comprises the steps of:

- obtaining a genomic DNA sample of said tumor;
- obtaining a genomic DNA sample of a tumor-free tissue of said patient;
- subjecting the DNA samples of steps a) and b) to amplification using primers which are flanking a repeat pattern characteristic of a mutator phenotype or subjecting the DNA samples of steps a) and b) to non-radioactive inter-Alu PCR, wherein the primers employed are specific single sequence primer R12A/267-896 (SEQ ID NO.:3) and a primer selected from the group of Alu primers consisting of R12A/267 (SEQ ID NO.:1) and R14B/264 (SEQ ID NO.:2);
- subjecting the amplified fragments of step c) to electrophoretic fractionation on a polyacrylamide gel followed by hybridization with a probe corresponding to at least one instability prone locus; and
- comparing the hybridization results of said instability prone locus of fractionated tumor DNA and tumor free DNA of step c) to determine the presence of a variation in band profile, thereby detecting genomic instability associated with a mutator phenotype.

5,773,650

Patent Not Issued For This Number

5,773,651

#### PROCESS FOR THE PREPARATION OF FLUORINE-CONTAINING CHEMICAL COMPOUNDS

Ralf Pfirrmann, Griesheim, and Friedrich Seitz, Eschborn, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Nov. 27, 1996, Ser. No. 753,714

Claims priority, application Germany, Dec. 1, 1995, 195 44 871.5

Int. Cl.<sup>6</sup> C07C 62/06; 205/00

U.S. Cl. 562—466

15 Claims

1. A process for preparing or working up fluorine containing compounds in an apparatus constructed and arranged to prevent fluorine induced corrosion, the fluorine containing compounds including fluorinated aromatic carboxylic acids or fluorinated phenols, the process comprising reacting or working-up a reaction mixture in the apparatus, wherein the reaction mixture includes organic compounds selected from the group consisting of nitriles, amides, anhydrides, esters, carboxylic chlorides, imides, and benzotrihalides such that at least one of the organic compounds contains a fluorine atom, and wherein the apparatus comprises a container and a stirrer, the stirrer comprising a carbon material selected from the group of corrosion-resistant materials consisting of corrosion-resistant electrographite, carbon fiber-reinforced plastic, and carbon fiber-reinforced carbon.

5,773,652

#### METHOD FOR ISOLATION AND PURIFICATION OF S-(1,2-DICARBOXYETHYL) GLUTATHIONE

Kazumi Ogata, Toyonaka, and Hideki Tsuruoka, Kawanishi, both of Japan, assignors to Senju Pharmaceutical Co., Ltd., Osaka, Japan

Filed Sep. 3, 1997, Ser. No. 922,464

Claims priority, application Japan, Sep. 4, 1996, 8-233755

Int. Cl.<sup>6</sup> C07C 227/00

U.S. Cl. 562—554

2 Claims

1. A method for isolating and purifying S-(1, 2-dicarboxyethyl)glutathione or a pharmacologically acceptable salt thereof from a reaction mixture available upon reacting glutathione or a salt thereof with either fumaric acid or a salt thereof or maleic acid or a salt thereof, which comprises

- a first step of converting the S-(1, 2-dicarboxyethyl)glutathione or salt thereof in said reaction mixture to the corresponding copper salt, dissolving the copper salt in an aqueous solution of acetic acid, formic acid or propionic acid, and removing the contaminant glutathione, oxidized glutathione and fumaric acid copper salts with the aid of activated carbon and
- a second step of dissolving or suspending the isolated S-(1, 2-dicarboxyethyl)glutathione copper salt in water and blowing hydrogen sulfide gas through the resulting aqueous solution or suspension to remove copper.

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5,773,654

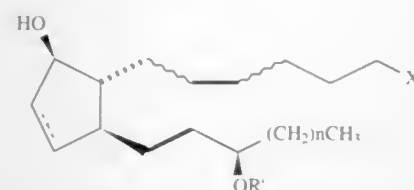
7-(5-SUBSTITUTED CYCLOPENTYL) AND  
(5-SUBSTITUTED CYCLOPENTENYL) HEPTYL  
ALCOHOLS, HEPTYLAMINES AND HEPTANOIC ACID  
AMIDES, AND METHOD OF LOWERING  
INTRAOCULAR PRESSURE IN THE EYE OF A  
MAMMAL BY ADMINISTRATION OF THESE  
COMPOUNDS

Michael E. Garst, Newport Beach, and Robert M. Burk, Irvine, both of Calif., assignors to Allergan, Irvine, Calif.  
Division of Ser. No. 572,437, Dec. 14, 1995, Pat. No. 5,674,910, which is a division of Ser. No. 355,463, Dec. 14, 1994, Pat. No. 5,552,434, which is a division of Ser. No. 964,223, Oct. 21, 1992, Pat. No. 5,385,945. This application  
Jul. 24, 1997, Ser. No. 899,972  
Int. Cl.<sup>6</sup> C07C 403/00

U.S. Cl. 564—189

8 Claims

1. A compound of the formula



where the dotted line represents absence of a bond, the wavy lines represent bonds which are in trans configuration;  
R<sub>1</sub> represents H or CO—R<sub>2</sub> where R<sub>2</sub> is lower alkyl of 1 to 6 carbons, carbocyclic aryl or heterocyclic aryl; or carbocyclic aryl or heteroaryl substituted lower alkyl group;  
X represents CO—NR<sub>3</sub>R<sub>4</sub>, where R<sub>3</sub> and R<sub>4</sub> independently are H or lower alkyl, and  
n is an integer between 0 and 8.

5,773,655

PROCESS FOR THE PURIFICATION OF AN AQUEOUS  
SOLUTION OF A TERTIARY AMINE-OXIDE

Eduard Müllleder, Linz; Bruno Mangeng, Seewalchen; Franz Schwenninger, Königsdorf, and Johann Männer, Weyregg, all of Austria, assignors to Lenzing Aktiengesellschaft, Lenzing, Austria

PCT No. PCT/AT96/00148, § 371 Date Apr. 15, 1997, § 102(e)  
Date Apr. 15, 1997, PCT Pub. No. WO97/07268, PCT Pub.  
Date Feb. 27, 1997

PCT Filed Aug. 16, 1996, Ser. No. 817,818

Claims priority, application Austria, Aug. 18, 1995, 1400/95

Int. Cl.<sup>6</sup> C07C 291/04; D01F 13/02

U.S. Cl. 564—298

14 Claims

1. A process for the purification of an aqueous solution of a tertiary amine-oxide containing impurities partially present in a dissolved and partially in a non-dissolved, colloidal state, characterized by a combination of the steps of

- (A) removing from said aqueous solution substantially all of said impurities present in a non-dissolved, colloidal state and  
(B) contacting said aqueous solution obtained in step (A) with an ion exchanger.

5,773,656

PROCESS FOR THE PREPARATION OF OPTICALLY  
ACTIVE 1-ARYL-ALKYLAMINES

Uwe Stelzer, Burscheid, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 9, 1996, Ser. No. 694,893

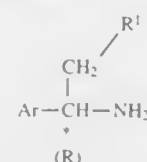
Claims priority, application Germany, Aug. 17, 1995, 195 30 204.4

Int. Cl.<sup>6</sup> C07C 209/00; 69/74; 69/96; A01N 61/00

U.S. Cl. 564—396

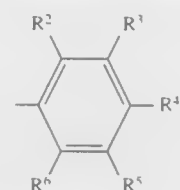
9 Claims

1. A process for the preparation of an (R)-1-aryl-alkylamine of the formula



in which

R<sup>1</sup> represents hydrogen or straight-chain or branched alkyl having 1 to 4 carbon atoms, and  
Ar represents a phenyl radical of the formula



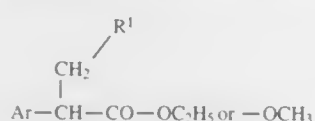
in which

R<sup>2</sup> and R<sup>6</sup> represent hydrogen or fluorine, at least one of these two substituents representing hydrogen, and  
R<sup>3</sup>, R<sup>4</sup> and R<sup>5</sup> independently of one another represent hydrogen, fluorine, chlorine, bromine, straight-chain or branched alkyl having 1 to 4 carbon atoms, straight-chain or branched alkoxy having 1 to 4 carbon atoms, halogenoalkyl having 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, halogenoalkoxy having 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, cyano, dialkylamino having 1 to 4 carbon atoms in each alkyl group, nitro, phenyl, phenoxy or benzyl.

or

Ar represents naphthyl or represents mono- to trisubstituted naphthyl, the substituents being identical or different and being selected from the group consisting of fluorine, chlorine, bromine, straight-chain or branched alkyl having 1 to 4 carbon atoms, halogenoalkyl having 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, alkoxy having 1 to 4 carbon atoms and/or halogenoalkoxy having 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms, but where the ortho positions to the carbon atom via which the naphthyl radical is bonded are not substituted, which process comprises

- a) reacting a racemate of an ethyl or methyl 2-aryl-alkanoate of the formula



in which

- R<sup>1</sup> and Ar have the meanings indicated above, with ammonia in the presence of a lipase which is suitable for the cleavage of esters, in the presence of a diluent,  
b) separating off from the reaction mixture the resulting (R)-2-aryl-alkanamide of the formula

5,773,659

PROCESS FOR PRODUCING DIMETHYLAMINE

Michio Fukatsu, Tokyo-to; Katsumasa Nishijima, Kanagawa-ken; Takeshi Narita, Kanagawa-ken; Toshio Nakamura, Kanagawa-ken, and Kiyonobu Niwa, Tokyo-to, all of Japan, assignors to Nitto Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

PCT No. PCT/JP95/02480, § 371 Date Jul. 24, 1996, § 102(e)  
Date Jul. 24, 1996, PCT Pub. No. WO96/17820, PCT Pub.  
Date Jun. 13, 1996

PCT Filed Dec. 5, 1995, Ser. No. 682,588

Claims priority, application Japan, Dec. 7, 1994, 6-330360; Nov. 21, 1995, 7-325284

Int. Cl.<sup>6</sup> C07C 209/16

U.S. Cl. 564—479

9 Claims

1. In a process for producing dimethylamine by the reaction of methanol with ammonia, of methanol and a methylamine mixture with ammonia, or of a methylamine mixture with ammonia in the gaseous phase in the presence of a catalyst, the improvement which comprises the use as the catalyst of a modified zeolite prepared by treating a zeolite with a solution containing a chelating agent, wherein the chelating agent is an aminopolycarboxylic acid or salt thereof.

5,773,660

PREPARATION OF AMINES FROM OLEFINS OVER  
HEXAGONAL FAUJASITES

Karsten Eller, Ludwigshafen; Rudolf Kummer, Frankenthal, and Eugen Gehrler, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Jan. 21, 1997, Ser. No. 784,548

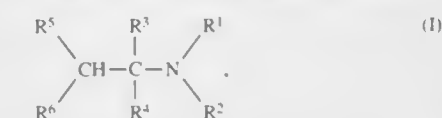
Claims priority, application Germany, Jan. 26, 1996, 196 02 709.8

Int. Cl.<sup>6</sup> C07C 209/02

U.S. Cl. 564—485

12 Claims

1. A process for preparing amines of the general formula I



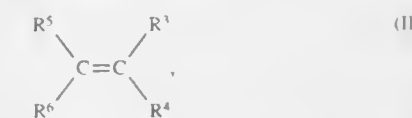
where

R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup> and R<sup>6</sup> are each hydrogen, C<sub>1</sub>—C<sub>20</sub>-alkyl, C<sub>2</sub>—C<sub>20</sub>-alkenyl, C<sub>2</sub>—C<sub>20</sub>-alkynyl, C<sub>3</sub>—C<sub>20</sub>-cycloalkyl, C<sub>4</sub>—C<sub>20</sub>-alkylcycloalkyl, C<sub>4</sub>—C<sub>20</sub>-cycloalkylalkyl, aryl, C<sub>7</sub>—C<sub>20</sub>-alkylaryl or C<sub>7</sub>—C<sub>20</sub>-aralkyl.

R<sup>1</sup> and R<sup>2</sup> together form a saturated or unsaturated C<sub>3</sub>—C<sub>9</sub>-alkylene dichain, or

R<sup>3</sup> or R<sup>5</sup> is C<sub>21</sub>—C<sub>200</sub>-alkyl or C<sub>21</sub>—C<sub>200</sub>-alkenyl or together form a C<sub>3</sub>—C<sub>12</sub>-alkylene dichain,

by reacting olefins of the general formula II



where R<sup>1</sup>, R<sup>4</sup>, R<sup>5</sup> and R<sup>6</sup> are each as defined above, with ammonia or primary or secondary amines of the general formula III



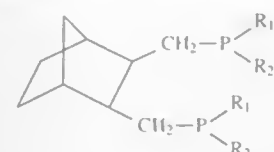
where R<sup>1</sup> and R<sup>2</sup> are each as defined above, at temperatures from 200° to 350° C. and pressures from 100° to 300 bar in the presence of a heterogeneous catalyst, which comprises using a heterogeneous catalyst comprising hexagonal faujasite.



5,773,661  
SYNTHESIS OF AND HYDROFORMYLATION WITH  
FLUORO-SUBSTITUTED BIDENTATE PHOSPHINE  
LIGANDS

Jerry D. Unruh; Brigitte E. Segmuller; Gabriel R. Chapa, all of Corpus Christi, and Kent E. Pryor, Houston, all of Tex., assignors to Celanese International Corporation, Dallas, Tex. Division of Ser. No. 630,146, Apr. 10, 1996, Pat. No. 5,710,337, which is a division of Ser. No. 453,283, May 30, 1995, Pat. No. 5,567,856. This application Sep. 2, 1997, Ser. No. 922,162 Int. Cl.<sup>6</sup> C07F 9/52

U.S. Cl. 568—16 20 Claims  
1. A method of forming a bis(phosphinomethyl)norbornane ligand of the formula:



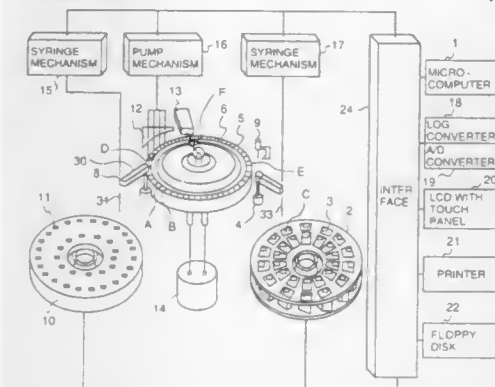
wherein R<sub>1</sub> and R<sub>2</sub> are organic radicals selected from aromatic groups of which at least one is substituted and wherein the methylene groups are present at the trans-2,3 positions on the norbornane moiety comprising: reacting an alkali metal phosphide of the formula R<sub>1</sub>R<sub>2</sub>PM wherein M represents alkali metal with a disulfonic acid ester of trans-2,3 norbornanedimethanol in a reaction mixture further including an inert solvent and at reaction temperature of less than -20 ° C. for sufficient time to form the ligand.

5,773,662  
AUTOMATIC ANALYZING METHOD USING A  
PLURALITY OF REAGENTS AND APPARATUS  
THEREFOR

Kyoko Imai; Isao Shindo, both of Hitachinaka, and Kahei Shiraishi, Hitachioota, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 30, 1996, Ser. No. 705,733  
Claims priority, application Japan, Sep. 5, 1995, 7-227980  
Int. Cl.<sup>6</sup> G01N 35/02

U.S. Cl. 436—50 7 Claims



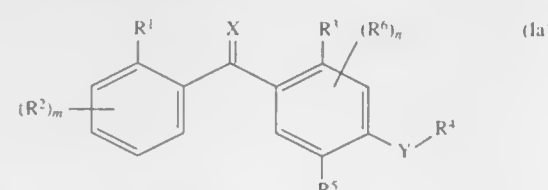
1. An analyzing method in which a row of reaction containers is cyclically transferred on a reaction line formed in a loop so as to have a unit transferring cycle that is defined between stoppages for successive sample additions, wherein the reaction containers are transferred so as to pass across a light beam of a photometer during the unit transferring cycle, and wherein the reaction line includes a sample adding position and a single reagent delivering position, the analyzing method comprising the steps of:  
causing the row of reaction containers to make at least one intermediate pause during which no samples are delivered in the course of the unit transferring cycle, between said successive sample additions;  
delivering a first reagent at the single reagent delivering position to a first reaction container containing a first sample during the at least one intermediate pause; and

adding a second sample to a new reaction container at the sample adding position when the first reaction container containing the first sample and first reagent pauses at the single reagent delivering position to receive a final reagent for the first reaction container at the stoppage that ends the unit transferring cycle.

5,773,663  
FUNGICIDAL METHODS, COMPOUNDS AND  
COMPOSITIONS CONTAINING BENZOPHENONES  
Jurgen Curtze, Geisenheim; Christine Helene Gertrud Rudolph, Nierstein; Ludwig Schroder, Ingelheim; Guido Albert, Hackensheim; Annerose Edith Elise Rehnig, Ingelheim, and Ewald Gerhard Sieverding, Johann, all of Germany, assignors to American Cyanamid Company, Parsippany, N.J.

Filed May 1, 1996, Ser. No. 641,592  
Int. Cl.<sup>6</sup> C07C 49/24; A61K 31/12

U.S. Cl. 568—333 2 Claims  
1. A compound of formula Ia



wherein  
R<sup>1</sup> represents an alkyl group;  
m is an integer of 1, 2, or 4;  
R<sup>2</sup> independently represents a halogen atom or an alkyl or alkoxy group;  
R<sup>3</sup> represents an alkyl or alkenyl group;  
R<sup>4</sup> represents an alkyl group;  
R<sup>5</sup> represents an alkoxy, alkenyloxy, alkynyloxy, alkylthio or cycloalkyloxy group;  
n is an integer of 1 or 2;  
R<sup>6</sup> independently represents an alkoxy group being optionally substituted by phenyl or phenyl being substituted by one or more substituents selected from the group comprising halogen, alkyl, alkoxy and cyano;  
X and Y each represent an oxygen atom.

5,773,664  
PROCESS FOR THE RECOVERY OF  
4-HYDROXYBENZALDEHYDE FROM REACTION  
MIXTURES CONTAINING SAME

Albert Schnatterer; Helmut Fiege, both of Leverkusen; Frank Jelitto, Bergisch Gladbach; Peter Skornia, Bonn, and Karl-Heinz Theisen, Köln, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 26, 1996, Ser. No. 592,162  
Claims priority, application Germany, Feb. 1, 1995, 195 03 163.6

Int. Cl.<sup>6</sup> C07C 45/78; 45/81  
U.S. Cl. 568—438 11 Claims

1. In a process for the production of 4-hydroxybenzaldehyde from methanolic reaction mixture, wherein p-cresol is oxidized with oxygen or an oxygen containing gas in methanol as solvent and in the presence of sodium hydroxide or potassium hydroxide to form a reaction product comprising 4-hydroxybenzaldehyde and by-products, the improvement which comprises recovering the 4-hydroxybenzaldehyde from said reaction product by the steps of  
1. neutralizing excess sodium or potassium hydroxide to an extent sufficient to form a salt precipitate from the methanolic reaction mixture consisting essentially of a member of the group consisting of sodium chloride, sodium sulphate, sodium phosphate, sodium nitrate, sodium carbonate, sodium acetate,

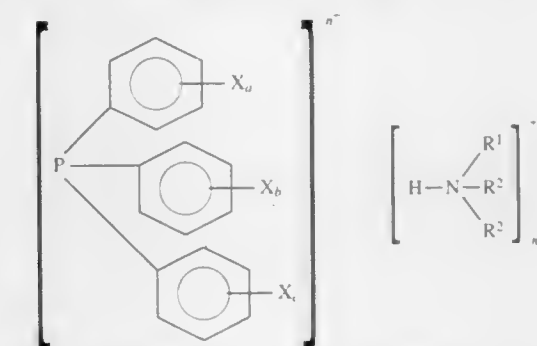
5,773,667  
PROCESS FOR PREPARING ALDEHYDES

Helmut Bahrmann, Hamminkeln; Thomas Muller, Dinslaken, and Rainer Lukas, Essen, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed May 14, 1997, Ser. No. 856,212  
Claims priority, application Germany, May 15, 1996, 196 19 527.6; Aug. 13, 1996, 196 32 600.1  
Int. Cl.<sup>6</sup> C07C 45/50

U.S. Cl. 568—454 25 Claims

1. A process for preparing aldehydes comprising hydroformylation of olefinically unsaturated compounds with hydrogen and carbon monoxide in a homogeneous phase in the presence of a catalyst system comprising rhodium complex compounds and aromatic phosphines in a molar excess and separating off the catalyst system from the hydroformylation reaction mixture by pressure filtration on a semipermeable membrane of an aromatic polyamide, the hydroformylation being effected at a pH of 2.5 to 4.3 using a molar ratio of phosphine:rhodium of at least 60 and at a rhodium concentration of at least 10 ppm by weight, based on the olefinically unsaturated compound used, and using, as aromatic phosphines, alkylammonium and/or arylammonium salts of sulfonated or carboxylated triarylphosphines of the formula



wherein X is sulfonate (SO<sub>3</sub><sup>-</sup>) or carboxylate (COO<sup>-</sup>), a, b and c are individually 0 or 1, wherein at least one of a, b, or c must be equal to 1, n is equal to 1, 2 or 3, R<sup>1</sup> and R<sup>2</sup> are individually selected from the group consisting of alkyl of 8 to 13 carbon atoms, C<sub>6</sub>-C<sub>10</sub>-aryl of 6 to 10 carbon atoms, cycloalkyl of 6 to 10 carbon atoms, and R<sup>1</sup> can also be hydrogen, and the total of the carbon atoms in R<sup>1</sup> and R<sup>2</sup> must be at least 30.

5,773,668  
METHOD OF MAKING  
TRICHLOROMETHOXYBENZENE

Lawrence Fertel, Williamsville; Michael Fifolt; Mary Cocoman, both of Grand Island; Walter Opalinski, Tonawanda, and William Derwin, Buffalo, all of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Feb. 24, 1997, Ser. No. 805,393  
Int. Cl.<sup>6</sup> C07C 85/14

U.S. Cl. 568—655 21 Claims

1. A method of making trichloromethoxybenzene comprising  
(A) preparing a mixture of anisole and a source of chlorine free radicals in a solvent selected from the group consisting of benzotrifluoride, orthochlorobenzotrifluoride, metachlorobenzotrifluoride, parachlorobenzotrifluoride, and dichlorobenzotrifluoride;  
(B) heating said mixture to the reflux temperature of said solvent; and  
(C) generating said chlorine free radicals in said mixture.

5,773,665  
HYDROFORMYLATION PROCESS WITH SEPARATION  
AND RECYCLE OF ACTIVE RHODIUM CATALYST  
Gary Stephen Silverman, Chaddsford, and Paul Mercado, Pennsburg, both of Pa., assignors to ELF Atochem North America, Inc., Philadelphia, Pa.  
Continuation-in-part of Ser. No. 673,983, Jul. 1, 1996. This application Jul. 15, 1996, Ser. No. 683,593  
Int. Cl.<sup>6</sup> C07C 45/50

U.S. Cl. 568—451 18 Claims

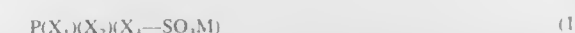
1. A method for purifying and separating active rhodium catalyst from inactive rhodium catalyst contained in a hydroformylation process stream comprising:  
contacting at least a portion of said process stream with an acidic ion-exchange resin to bind impurities and active rhodium catalyst complex to said resin and produce a purified hydroformylation process stream containing inactive rhodium catalyst.

5,773,666  
HYDROFORMYLATION PROCESS  
Toshihiro Omatsu, Hasaki-machi; Jin Tokuyasu; Masahiro Muranaka, both of Kamisu-machi, and Takashi Onishi, Hasaki-machi, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan  
PCT No. PCT/JP96/02771, § 371 Date May 27, 1997, § 102(e)  
Date May 27, 1997, PCT Pub. No. WO97/11931, PCT Pub. Date Apr. 3, 1997

PCT Filed Sep. 26, 1996, Ser. No. 836,880  
Claims priority, application Japan, Sep. 26, 1995, 7-271948  
Int. Cl.<sup>6</sup> C07C 45/50

U.S. Cl. 568—454 6 Claims

1. A process for the hydroformylation of an olefinic compound, which comprises, upon the reaction of the olefinic compound with hydrogen and carbon monoxide, carrying out the reaction in the presence of:  
a) a rhodium compound  
b) a tertiary organic phosphorous compound represented by the following formula (1):



wherein X<sub>1</sub> and X<sub>2</sub> each independently represents a monovalent hydrocarbon group having 1-15 carbon atoms, X<sub>3</sub> represents a divalent hydrocarbon group having 1-15 carbon atoms and M represents an alkali metal, and

c) a polar organic compound; separating the rhodium compound, the tertiary organic phosphorous compound represented by the formula (1) and the polar organic compound from the resulting reaction mixture by extraction with water; subjecting the extracted water layer to removal of water and addition of at least one acidic substance selected from sulfonic acids in an amount to adjust the pH of the extracted water layer to at least about neutral to prepare a concentrate containing the rhodium compound, the tertiary organic phosphorous compound represented by the formula (1) and the polar organic compound; and recycling the resulting concentrate to a reactor for reuse.

5,773,669

**PROCESS FOR PRODUCTION OF VINYL ETHER**  
Yuuji Shimasaki, Otsu, and Akira Kurusu, Kyoto, both of Japan, assignors to Nippon Shokubai Co., Ltd., Osaka, Japan

Filed Mar. 11, 1997, Ser. No. 816,026

Claims priority, application Japan, Mar. 12, 1996, 8-054515

Int. Cl.<sup>6</sup> C07C 41/00

U.S. Cl. 568—687

7 Claims

1. A process for producing a vinyl ether, which comprises subjecting a 2-hydroxyalkoxy compound having, in the molecule, at least one 2-hydroxyalkoxy group and at least one functional group selected from the group consisting of a hydroxyl group and an amino group, to an intramolecular dehydration reaction in a gas phase in the presence of an oxide catalyst containing an alkali metal element and/or an alkaline earth metal element and silicon, to convert the 2-hydroxyalkoxy group partially or completely to a vinyl ether group to obtain a corresponding vinyl ether.

5,773,670

**HYDROGENATION OF UNSATURATED CYCLIC COMPOUNDS**

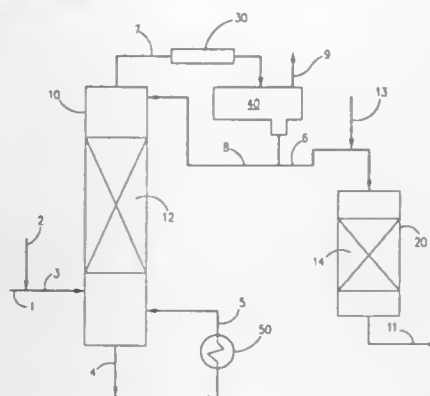
Gary R. Gildert, Dennis Hearn, and Hugh M. Putman, all of 10100 Bay Area Blvd., Pasadena, Tex. 77507

Filed Mar. 6, 1995, Ser. No. 398,690

Int. Cl.<sup>6</sup> C07C 5/10

U.S. Cl. 585—266

18 Claims



1. A process for the hydrogenation of unsaturated cyclic compounds comprising the steps of:

- feeding a first stream containing unsaturated cyclic compounds and a second stream containing hydrogen to a distillation column reactor at a mole ratio of hydrogen to unsaturated cyclic compound between 1.5:1 and 41:1;
- contacting the unsaturated cyclic compounds and hydrogen at a temperature in the range of 100° to 374° F., a hydrogen partial pressure of less than 50 psia, and an overhead pressure in the range of 0 to 120 psig in the presence of a bed of hydrogenation catalyst prepared in the form of a catalytic distillation structure thereby reacting a portion of the unsaturated cyclic compounds with a portion of the hydrogen to form a reaction mixture containing saturated cyclic compounds, unreacted hydrogen and unreacted unsaturated cyclic compounds;
- maintaining the pressure in the distillation column reactor (i) to contain a vapor phase and some liquid phase and provide a continual reflux such that the reaction mixture is at its boiling point and boiling in the bed of catalyst and (ii) condensing a portion of the vapors in the reaction system whereby a portion of the aromatics and other unsaturated cyclic and polycyclic compounds is always condensing on the catalyst structure;
- removing gaseous unsaturated cyclic compounds, gaseous saturated cyclic compounds and hydrogen as overheads from the distillation column reactor;
- condensing substantially all of the unsaturated cyclic compounds and saturated cyclic compounds removed as overheads from the distillation column reactor;

- returning a portion of the condensed unsaturated cyclic compounds and saturated cyclic compounds to the distillation column reactor as reflux; and
- withdrawing an overheads liquid product containing saturated cyclic compounds and unreacted unsaturated cyclic compounds from the distillation column.

5,773,671

**PROCESS FOR PURIFYING 1,1-DICHLORO-2,2,2-TRIFLUOROETHANE AND 1-CHLORO-1,2,2,2-TETRAFLUOROETHANE**

Hsueh Sung Tung, Getzville, N.Y., assignor to Allied Signal, Morristown, N.J.

Continuation of Ser. No. 144,264, Oct. 28, 1993, abandoned.

This application Dec. 17, 1996, Ser. No. 768,338

Int. Cl.<sup>6</sup> C07C 17/38

U.S. Cl. 570—177

26 Claims

1. A process for purifying HCFC-123 and HCFC-124 comprising:

reacting a fluorination reaction product comprising HCFC-123 and HCFC-123a and/or HCFC-124 and HCFC-124a wherein at least one of said HCFC-123a or HCFC-124a is present in an amount of not less than 5 weight percent relative to HCFC-123 or HCFC-124 respectively in the product with anhydrous HF in the presence of a fluorination catalyst under conditions such that the amount of HCFC-123a and/or HCFC-124a relative to HCFC-123 and/or HCFC-124 respectively in the product is reduced to less than 5 weight percent wherein the reaction product and HF are reacted in an HF:reaction product mole ratio of from about 12:1–1:1.

5,773,672

**PRODUCTION OF 1-BROMOPROPANE**

William B. Harrod, Minden; Alireza M. Dadgar, and Phillip R. Beaver, both of Baton Rouge, all of La., assignors to Albemarle Corporation, Richmond, Va.

Filed Jun. 20, 1997, Ser. No. 867,144

Int. Cl.<sup>6</sup> C07C 17/00

U.S. Cl. 570—249

24 Claims

1. A process of producing 1-bromopropane which comprises forming a mixture from hydrogen bromide, propene and a catalytically effective amount of a preformed ozonide catalyst formed from one or more olefins that have at least 5 carbon atoms per molecule, and subjecting the mixture to or maintaining the mixture under reaction conditions effective to produce 1-bromopropane, such that 1-bromopropane is produced as at least the principal product of the reaction.

5,773,673

**METHOD OF MAKING CHLORINATED HYDROCARBONS**

Pravin M. Khandare, Amherst, and Edward A. Rowe, Grand Island, both of N.Y., assignors to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Jul. 1, 1997, Ser. No. 886,427

Int. Cl.<sup>6</sup> C07C 17/10

U.S. Cl. 570—252

20 Claims

1. A method of making chlorinated hydrocarbons comprising
- preparing a mixture which comprises
    - hydrocarbon or partially chlorinated hydrocarbon from C<sub>18</sub> to C<sub>30</sub>; and
    - a solvent selected from the group consisting of benzotrifluoride and perchlorobenzotrifluoride in an amount sufficient to liquefy said mixture, at a temperature of about 50° to about 100° C.;
  - heating said mixture to a temperature of about 50° to about 100° C.;

- adding chlorine gas to said mixture in an amount sufficient to produce a composition containing a chlorinated hydrocarbon that is about 60 to about 80 wt. % chlorine;
- converting said chlorine into chlorine free radicals;
- adding said composition to at least two parts by weight of a C<sub>1</sub> to C<sub>6</sub> monohydric alcohol per part by weight of said composition, whereby said chlorinated hydrocarbon precipitates; and
- collecting said precipitated chlorinated hydrocarbon.

5,773,674

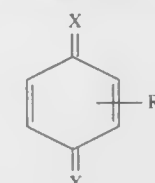
**COMPOSITIONS AND METHODS FOR INHIBITING VINYL AROMATIC MONOMER POLYMERIZATION**  
Graciela B. Arhancet, Katy, and Inge K. Henrici, Spring, both of Tex., assignors to BetzDearborn Inc., Trevose, Pa.  
Division of Ser. No. 489,904, Jun. 12, 1995, Pat. No. 5,648,573. This application Dec. 31, 1996, Ser. No. 775,555

Int. Cl.<sup>6</sup> C07C 7/20

U.S. Cl. 585—5

5 Claims

1. A vinyl aromatic monomer polymerization inhibiting composition comprising a benzoquinone derivative having the formula:



wherein X is N-R or O; R is hydrogen, phenyl, or a C<sub>1</sub> to C<sub>7</sub> alkyl and R<sub>1</sub> is a C<sub>1</sub> to C<sub>7</sub> alkyl and a hydroxylamine compound is a weight ratio of about 1:9 to 9:1.

5,773,675

**METHOD FOR ELIMINATING CARBON OXIDES IN THE HYDROGEN FEED TO A BUTANE ISOMERIZATION PROCESS**

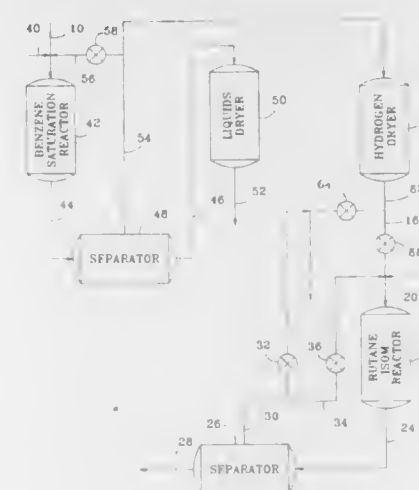
Andrew P. Voss, Cerritos, and Michael J. Pedersen, Irvine, both of Calif., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 15, 1996, Ser. No. 732,828

Int. Cl.<sup>6</sup> C07C 1/00; 5/10; 5/13

U.S. Cl. 585—304

11 Claims



1. A method for isomerizing at least a portion of a butane stream using a hydrogen stream containing at least one carbon oxide selected from the group consisting of carbon monoxide and carbon dioxide, the method comprising:

- charging the hydrogen stream to an aromatics saturation reactor to remove carbon oxides from the hydrogen stream to produce a reduced carbon oxide content hydrogen stream;
- recovering at least a portion of the reduced carbon oxide content hydrogen stream;
- drying at least a portion of the reduced carbon oxide content hydrogen stream;
- charging the reduced carbon oxide hydrogen stream and a butane stream to an isomerization zone; and
- isomerizing at least a portion of the butane stream in the isomerization zone at a temperature from about 250° to about 600° F. and a pressure from about 100 to about 600 psig in the presence of an isomerization catalyst to produce an isobutane stream.

5,773,676

**PROCESS FOR PRODUCING OLEFINS AND AROMATICS FROM NON-AROMATICS**

Charles A. Drake, Nowata; Edward L. Sughrue, II, and James B. Kimble, both of Bartlesville, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 6, 1996, Ser. No. 692,218

Int. Cl.<sup>6</sup> C07C 15/00; C10G 51/02

U.S. Cl. 585—322

8 Claims

1. A process for producing and controlling the purity of a high purity aromatic stream from a hydrocarbon feedstock, wherein the concentration of paraffins in said hydrocarbon feedstock exceeds the combined content of olefins, naphthenes and aromatics in said hydrocarbon feedstock, said process comprises the steps of:

- contacting said hydrocarbon feedstock containing at least one non-aromatic hydrocarbon containing 5–16 carbon atoms per molecule selected from the group consisting of alkanes, alkenes and cycloalkanes with a first zeolite catalyst in a first reaction zone under reaction conditions such that the weight hourly space velocity of said hydrocarbon feedstock exceeds about 5 hour<sup>-1</sup> so as to produce a first reaction product;
- separating said first reaction product into a first tower boiling fraction containing hydrogen gas, lower alkanes, and lower alkenes and a first higher-boiling fraction containing aromatic hydrocarbons;
- contacting said first higher-boiling fraction with a second zeolite catalyst in a second reaction zone under reaction conditions such that the weight hourly space velocity of said first higher-boiling fraction is less than about 10 hour<sup>-1</sup> so as to produce a second reaction product;
- separating said second reaction product into a second lower-boiling fraction containing hydrogen gas, lower alkanes, and lower alkenes and a second higher-boiling fraction containing aromatic hydrocarbons selected from the group consisting of benzene, toluene, xylene, ethylbenzene and mixtures of two or more thereof; and
- adjusting the reaction conditions of said first reaction zone and said second reaction zone such that the WHSV in said second reaction zone is at least about 2 hour<sup>-1</sup> below the WHSV in said first reaction zone and such that the pressure of said second reaction zone is maintained at 10 psi higher than the pressure of said first reaction zone, thereby providing for the production of said second higher boiling fraction having a concentration of aromatic hydrocarbons of at least about 80 weight percent.



5,773,677

**PROCESS FOR THE HYDROGENOLYSIS OF C-O AND C=O BONDS IN ORGANIC SUBSTANCES**

Hans Lansink-Rotgerink, Glatbach; Mario Scholz, Gruendau; Andreas Freund, Kleinostheim, and Guenther Kunz, Bruchkoebel, all of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sep. 19, 1996, Ser. No. 715,775

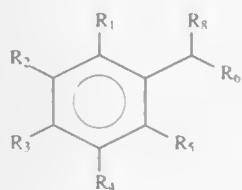
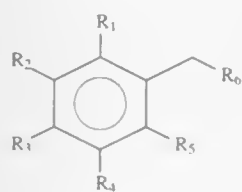
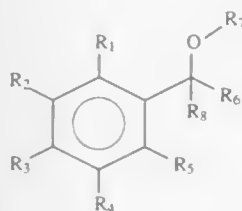
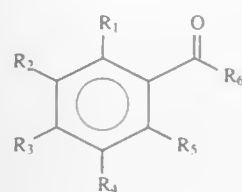
Claims priority, application Germany, Sep. 23, 1995, 195 35 395.1

Int. Cl.<sup>6</sup> C07C 1/20

U.S. Cl. 585—469

16 Claims

I. A process for the hydrogenolysis of a compound represented by the structural formula I or II to give a compound represented by the structural formula III or IV



comprising reacting I or II with hydrogen in the presence of a catalyst system that is a solid catalyst which contains at least one metal from Group VIII and/or Group IB of the Periodic System of Elements on a support consisting of at least one solid acid with an acid activity index of at least 90%, wherein the substituents R<sub>1</sub> to R<sub>9</sub> are the same or different, and are each a member selected from the group consisting of hydrogen, alkyl, substituted or non-substituted aryl, hydroxyl, alkoxy, substituted or non-substituted aryloxy, halogen, carboxyl, a carboxylic acid derivative group, acyloxy, nitro, a sulphonic acid, mercapto, amino, alkyl-substituted amino and substituted or non-substituted aryl-substituted amino.

5,773,678

**USE OF AN OMEGA ZEOLITE BASED CATALYST COMPRISING AT LEAST ONE METAL FROM GROUPS IIA, IVB, IIB OR IVA FOR THE DISMUTATION AND/OR TRANSALKYLATION OF ALKYLAROMATIC HYDROCARBONS**

Eric Benazzi, Montesson, and Fabio Alario, Neuilly sur Seine, both of France, assignors to Institut Francais du Petrole, France

Filed Feb. 7, 1997, Ser. No. 796,188

Claims priority, application France, Feb. 9, 1996, 96 01605

Int. Cl.<sup>6</sup> C07C 5/00

U.S. Cl. 585—470

12 Claims

I. A process for the production of xylene from a feed consisting essentially of at least one of toluene and an alkylaromatic compound having at least 9 carbon atoms per molecule, said process comprising subjecting said feed to dismutation and/or transalkylation reactions, said production being conducted in the presence of a catalyst comprising at least one zeolite having a mazzite structure, the catalyst comprising, on the external surface of crystals of said zeolite, at least one metal selected from the group consisting of metals from groups IIA, IVB, IIB and IVA of the periodic classification of the elements, said catalyst also comprising at least one matrix and, optionally at least one element selected from the group consisting of groups IB and VIII of the periodic classification of the elements.

5,773,679

**PERFORMANCE ENHANCEMENT OF ZEOLITE CATALYSTS WITH WATER COFEED**

Jeffrey S. Beck, Princeton, and David L. Stern, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, Fairfax, Va.

Filed Dec. 26, 1995, Ser. No. 578,346

Int. Cl.<sup>6</sup> C07C 5/52

U.S. Cl. 585—475

20 Claims

I. A shape-selective hydrocarbon conversion process which comprises: contacting a reaction stream including an alkyl aromatic compound to be converted to a dialkyl aromatic compound and a water co-feed in an amount sufficient to increase shape-selectivity for the para-isomer of said dialkyl aromatic compound, under conversion conditions with a zeolite catalyst; and subsequently omitting said water co-feed from said reaction stream after an effective amount of time to increase and maintain the shape-selectivity for said para-isomer at a level above pre-water co-feed shape-selectivity.

5,773,680

**HYBRID WILD RICE PRODUCTION UTILIZING CYTOPLASMIC-GENETIC MALE STERILITY SYSTEM**

Ken Foster, 1216 Rosario St., Davis, Calif. 95616

Filed Apr. 28, 1995, Ser. No. 430,915

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. 800—200

11 Claims

I. A hybrid *Zizania* seed produced by crossing inbred lines using a cytoplasmic-genetic male sterility system.

5. A hybrid *Zizania* plant, produced by growing the seed of claim 1, having a yield heterosis value of greater than 30% above the highest yielding parental line.

5,773,681

**METHOD OF PRODUCING ELECTROLYTE-ENRICHED PLANT EMBRYOS**

Norbert Fuchs, A-5571, Mariapfarr No. 135, Austria

Filed Nov. 29, 1995, Ser. No. 567,208

Int. Cl.<sup>6</sup> A01C 1/00; A01H 3/04

U.S. Cl. 800—200

13 Claims

I. A method of producing electrolyte-enriched plant embryos comprising introducing germinative seeds comprising plant embryos into an electrolyte solution, and incubating said plant embryos in said electrolyte solution at a suitable temperature and for a period of time sufficient to attain an electrolyte enrichment within said plant embryos, wherein said electrolyte solution comprises:

- at least one of zinc, iron, potassium, and magnesium ions;
- at least one of copper, manganese, strontium and lithium ions; and
- at least one of selenium, molybdenum, chromium, arsenic, vanadium and cobalt ions.

5,773,682

**HYBRID MAIZE PLANT & SEED (3568)**

Theron Eugene Roundy, North Platte, Nebr., assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Mar. 14, 1996, Ser. No. 618,458

Int. Cl.<sup>6</sup> A01H 5/00; 4/00; 1/00; C12N 5/04

U.S. Cl. 800—200

7 Claims

I. Hybrid maize seed designated 3568, representative seed of said hybrid 3568 having been deposited under ATCC accession number 209334.

5,773,683

**INBRED CORN LINE LH283**

Terry J. Foley, Williamsburg, Iowa, assignor to Holden's Foundation Seeds, Inc., Williamsburg, Iowa

Filed Dec. 6, 1996, Ser. No. 761,673

Int. Cl.<sup>6</sup> A01H 5/00; 4/00; 1/00; C12N 5/04

U.S. Cl. 800—200

10 Claims

I. Inbred corn seed designated LH283, having ATCC accession No. 97820.

5,773,684

**HYBRID MAIZE PLANT AND SEED (39B42)**

Thierry Loisel, Betton, France, assignor to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Jan. 29, 1997, Ser. No. 790,175

Int. Cl.<sup>6</sup> A01H 15/00; 4/00; 1/00; C12N 5/04

U.S. Cl. 800—200

7 Claims

I. Hybrid maize seed designated 39B42, representative seed of said hybrid 39B42 having been deposited under ATCC accession number 209514.

5,773,685

Patent Not Issued For This Number

5,773,686

Patent Not Issued For This Number

5,773,687

**SOYBEAN CULTIVAR 15733MM**

William H. Eby, Adel, and Elmer F. Schechinger, Harlan, both of Iowa, assignors to Midwest Oilseeds, Inc., Adel, Iowa

Filed Jun. 9, 1997, Ser. No. 871,066

Int. Cl.<sup>6</sup> A01H 5/00; 5/10; C12N 5/04

U.S. Cl. 800—200

10 Claims

I. A soybean seed designated 1 5733MM, deposited as ATCC Accession Number 209633.

2. A plant or plants of the soybean cultivar designated 15733MM produced by growing the seed of claim 1.

5,773,688

**GENE EXPRESSION VECTOR USING THE GENE EXPRESSION REGULATING REGION OF THE ADP RIBOSYLATION FACTOR**

Hisao Kuroda; Naohiko Hirota, and Kazutoshi Ito, all of Gunma-ken, Japan, assignors to Sapporo Breweries Limited, Tokyo, Japan

Filed Apr. 7, 1995, Ser. No. 418,444

Claims priority, application Japan, Apr. 8, 1994, 6-071048

Int. Cl.<sup>6</sup> C12N 15/82; 15/63; C07H 21/04; A01H 5/00

U.S. Cl. 800—205

7 Claims

I. A DNA fragment having a base sequence 1 to 3027 of SEQ ID NO:1.

5,773,689

**METHOD OF INCREASING EXPRESSION OF FOREIGN GENES IN PLANT CELLS**

William F. Thompson; Steven L. Spiker; George C. Allen, all of Raleigh; Gerald E. Hall, Jr., Garner, and Lisa C. Childs, Raleigh, all of N.C., assignors to North Carolina State University, Raleigh, N.C.

Continuation of Ser. No. 956,420, Oct. 5, 1992, abandoned.

This application Apr. 19, 1995, Ser. No. 424,229

Int. Cl.<sup>6</sup> C12N 5/00; 15/00; A01H 1/04

U.S. Cl. 800—205

33 Claims

17. A recombinant plant comprising transformed plant cells, said transformed plant cells containing a heterologous DNA construct comprising, in the 5' to 3' direction, a transcription initiation region functional in plant cells, a structural gene positioned downstream from said transcription initiation region and operatively associated therewith, and a scaffold attachment region positioned either 5' to said transcription initiation region or 3' to said structural gene, said DNA construct subject to the proviso that T-DNA borders are excluded therefrom.

5,773,690

Patent Not Issued For This Number

5,773,691

**CHIMERIC GENES AND METHODS FOR INCREASING THE LYSINE AND THREONINE CONTENT OF THE SEEDS OF PLANTS**

Saverio Carl Falco, Arden; Sharon Jo Keeler, Newark, and Janet Ann Rice, Wilmington, all of Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 178,212, Jan. 6, 1994, abandoned, which is a continuation-in-part of Ser. No. 855,414, Mar. 19, 1992, abandoned. This application Jun. 7, 1995, Ser. No. 474,633

Int. Cl.<sup>6</sup> A01H 5/00; 5/10; C12N 15/82

U.S. Cl. 800—205

12 Claims

I. A chimeric gene wherein a nucleic acid fragment encoding dihydroadipic acid synthase which is insensitive to inhibition

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by lysine is operably linked to a plant chloroplast transit sequence and to a plant seed-specific regulatory sequence.

5. A transformed plant comprising in its genome the chimeric gene of claim 1, 2, 3 or 4.

5,773,692

#### ANTI-SENSE RNA FOR CAB TRANSCRIPT TO REDUCE CHLOROPHYLL CONTENT IN PLANTS

Anne M. Johnson-Flanagan, Edmonton; Jas Singh, Nepean; Laurian S. Robert, Gatineau, and Janice Carol Politeski Morissette, Wainwright, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by Agriculture and Agri-Food Canada, Ontario, Canada

Filed Dec. 12, 1995, Ser. No. 570,929

Int. Cl.<sup>6</sup> C12N 15/29; 15/82; A01H 4/00; 5/00

U.S. Cl. 800—205

15 Claims

1. A nucleic acid construct comprising:

(a) an anti-sense gene of a sense gene encoding a chlorophyll a/b binding protein, or a portion of said anti-sense gene, wherein said sense gene is at least 90% similar to the nucleic acid sequence of SEQ ID NO: 1, and wherein said portion of said anti-sense gene is of a size capable of disrupting transcription of said chlorophyll a/b binding protein;

(b) a seed specific promoter and a polyadenylation signal sequence both operatively linked to said anti-sense gene or portion thereof;

wherein said construct is useful for reducing the level of chlorophyll a/b binding protein in seed tissue.

5,773,693

#### PEA ADP-GLUCOSE PYROPHOSPHORYLASE SUBUNIT GENES AND THEIR USES

Diane G. Burgess, Berkeley, and Hugo K. Dooner, Walnut Creek, both of Calif., assignors to DNAP Plant Technology Corporation, Oakland, Calif.

Continuation of Ser. No. 97,829, Jul. 23, 1993, Pat. No.

5,498,831. This application Dec. 22, 1995, Ser. No. 577,403

Int. Cl.<sup>6</sup> A01H 5/00; C12N 15/29; 15/54; 15/82

U.S. Cl. 800—205

12 Claims

7. A method for producing a plant of genus *Pisum* having increased sucrose content in at least one part of the plant, comprising the steps:

transforming plant cells of genus *Pisum* with a polynucleotide derived from an ADPG-PPase gene, wherein said polynucleotide has at least 90% sequence identity to a sequence selected from the group consisting of Seq. I.D. No. 1, Seq. I.D. No. 3, Seq. I.D. No. 5, Seq. I.D. No. 7, Seq. I.D. No. 8, and Seq. I.D. No. 9, wherein the polynucleotide is operably linked to a promoter, and wherein transformed plant cells are produced;

growing plants from the transformed plant cells, wherein transformed plants are produced; and,

selecting a transformed plant having increased sucrose content in at least one plant part, when compared to similar untransformed plants.

12. A plant produced according to the method of claim 7.

5,773,694

#### ANTIMICROBIAL PROTEINS FROM ALLIUM

Willem Frans Broekaert, Dilbeek; Bruno Philippe Angelo Cammue, Alsemberg, both of Belgium, and Sarah Bronwen Rees, Bracknell, England, assignors to Zeneca Limited, England

PCT No. PCT/GB94/01636, § 371 Date Jan. 25, 1996, § 102(c) Date Jan. 25, 1996, PCT Pub. No. WO95/04754, PCT Pub. Date Feb. 16, 1995

PCT Filed Jul. 29, 1994, Ser. No. 591,498

Claims priority, application United Kingdom, Aug. 4, 1993, 9316158; Aug. 27, 1993, 9317816

Int. Cl.<sup>6</sup> A01H 5/00; A01N 65/00; C07H 21/00; C07K 14/415

U.S. Cl. 800—205

11 Claims

1. An antimicrobial protein comprising the amino acid sequence of SEQ. ID. NO: 1.

2. The antimicrobial protein of claim 1 consisting of the amino acid sequence of SEQ. ID. NO: 16.

6. An isolated nucleic acid encoding the antimicrobial protein of either claim 1 or 2.

8. A biological system transformed with the isolated nucleic acid of claim 6.

10. The transformed biological system of claim 8 which is a plant.

5,773,695

#### PLANT NUCLEAR SCAFFOLD ATTACHMENT REGION AND METHOD FOR INCREASING GENE EXPRESSION IN TRANSGENIC CELLS

William F. Thompson, Raleigh, N.C.; Gerald Hall, Jr., Madison, Wis.; Steven Spiker, and George C. Allen, both of Raleigh, N.C., assignors to North Carolina State University, Raleigh, N.C.

Filed Jan. 26, 1996, Ser. No. 592,658

Int. Cl.<sup>6</sup> A01H 1/04

U.S. Cl. 800—205

28 Claims

1. An isolated DNA molecule having a nucleotide sequence of SEQ ID NO:1.

5,773,696

#### ANTIFUNGAL POLYPEPTIDE AND METHODS FOR CONTROLLING PLANT PATHOGENIC FUNGI

Jihong Liang; Dilip Maganlal Shah; Yonnie Shun Wu, all of Chesterfield, and Cindy Annette Rosenberger, Ballwin, all of Mo., assignors to Monsanto Company, Mo.

Filed Mar. 29, 1996, Ser. No. 627,706

Int. Cl.<sup>6</sup> A01H 5/00; 5/10; C12N 5/14; 5/29; 15/82

U.S. Cl. 800—205

19 Claims

9. A method of controlling fungal damage to a plant, comprising the steps of:

a) inserting into the genome of plant cells a recombinant, double-stranded DNA molecule comprising the following sequences operatively linked in the 5' to 3' direction:

(i) a promoter sequence that functions in plant cells to cause the transcription of an adjacent coding sequence;

(ii) a coding sequence that encodes a polypeptide having the amino acid sequence of SEQ ID NO:2; and

(iii) a 3' non-translated sequence that functions in plant cells to cause transcriptional termination and the addition of polyadenylation nucleotides to the 3' end of the transcribed RNA sequence;

b) obtaining transformed plant cells; and

c) regenerating from said transformed plant cells a genetically transformed plant, cells of which express an antifungal effective amount of the polypeptide.

5,773,697

#### GENETIC CONSTRUCTS AND METHODS FOR PRODUCING FRUITS WITH VERY LITTLE OR DIMINISHED SEED

Dwight T. Tones, Cumming, Iowa; Bin Huang, Toronto, Canada, and Paul D. Miller, Granger, Iowa, assignors to Pioneer Hi-Bred International, Inc., Des Moines, Iowa

Filed Apr. 23, 1996, Ser. No. 636,283

Int. Cl.<sup>6</sup> C12N 15/29; 15/82; A01H 4/00; 5/00

U.S. Cl. 800—205

27 Claims

1. An expression construct for production of transgenic plants that will produce fruit with seed of a diminished size or very little number of seed comprising:

a recombinant gene or combination of genes which encode upon expression a cytotoxic protein; and

a seed specific promoter operably linked to said gene or genes.

10. A nucleic acid vector comprising the expression constructs of claim 1, 8 or 9.

17. A transgenic plant comprising a plant cell or ancestor thereof which has been transformed with the vector of claim 10.

5,773,698

#### CHIMERIC NITRILASE-ENCODING GENE FOR HERBICIDAL RESISTANCE

Bernard Leroux, Lozanne; Bernard Pellissier, and Michel Lebun, both of Lyons, all of France, assignors to Rhone-Poulenc Agrochimie, Lyons, France

Division of Ser. No. 375,566, Jan. 13, 1995, Pat. No. 5,559,024, which is a continuation of Ser. No. 141,699, Oct. 26, 1993,

abandoned, which is a continuation of Ser. No. 2,682, Jan. 8, 1993, abandoned, which is a continuation of Ser. No. 711,400,

Jun. 6, 1991, abandoned, which is a continuation of Ser. No. 326,003, Mar. 20, 1989, abandoned. This application Jun. 3,

1996, Ser. No. 657,175

Claims priority, application France, Mar. 23, 1988, 88 04130

Int. Cl.<sup>6</sup> A01H 5/00; C12N 5/04; 15/31; 15/82

U.S. Cl. 800—205

5 Claims

1. A plant cell containing a chimeric gene which confers resistance to a herbicide based on 3,5-dihalo-4-hydroxybenzonitrile, comprising at least one gene encoding nitrilase derived from bacteria, operably linked to a foreign promoter and a polyadenylation signal region, wherein the promoter originates from a gene which is naturally expressed in plant cells and is selected from the group consisting of the promoter of the 35S RNA gene of cauliflower mosaic virus (CaMV 35S) the promoter of the small subunit (SSU) gene of sunflower (*Helianthus annuus*) ribulose-1,5-biphosphate carboxylase/oxygenase (RubisCO), and a combination of the promoter of the 35S RNA gene of cauliflower mosaic virus (CaMV 35S) and the promoter of the small subunit (SSU) gene of sunflower (*Helianthus annuus*) ribulose-1,5-biphosphate carboxylase/oxygenase (RubisCO).

2. A transformed plant or part thereof, which is obtained by regeneration of plant cells according to claim 1.

5,773,699

#### NUCLEOTIDE SEQUENCES OF GALACTINOL SYNTHASE FROM ZUCCHINI AND SOYBEAN

Phillip S. Kerr; Richard W. Pearlstein, both of Newark; Bruce J. Schweiger, Wilmington, all of Del.; Mary F. Becker-Manley, Beacon, N.Y., and John W. Pierce, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 182,060, Aug. 23, 1994, Pat. No. 5,648,210, which is a continuation of Ser. No. 735,066, Jul. 24, 1991, abandoned. This application Sep. 12, 1996, Ser. No. 712,702

Int. Cl.<sup>6</sup> A01H 1/04; C12N 15/29; C12Q 1/68

U.S. Cl. 800—205

16 Claims

1. A chimeric gene capable of being expressed in transformed plants comprising an isolated nucleic acid fragment

consisting of a nucleotide sequence that encodes the polypeptide sequence set forth in SEQ ID NO: 5 or SEQ ID NO: 6, said polypeptide sequence encoding a plant galactinol synthase, operably linked to a suitable regulatory sequence.

5,773,700

#### CONSTRUCTS CONTAINING IMPATIENS NECROTIC SPOT TSPOVIRUS RNA AND METHODS OF USE THEREOF

Martinus Quirinus Joseph Marie Van Grinsven; Petrus Theodorus De Haan; Johannes Jacobus Ludgerus Gielen, all of Enkhuizen; Dirk Peters, and Robert Willem Goldbach, both of Wageningen, all of Netherlands, assignors to Ando Ltd, Basel, Switzerland

Continuation of Ser. No. 214,064, Mar. 15, 1994, abandoned, which is a continuation of Ser. No. 32,235, Mar. 17, 1993,

abandoned. This application Dec. 6, 1996, Ser. No. 764,100

Claims priority, application United Kingdom, Mar. 19, 1992,

9206016

Int. Cl.<sup>6</sup> A01H 5/00; C12N 15/82; 15/33

U.S. Cl. 800—205

17 Claims

1. Recombinant Impatiens Necrotic Spot Virus DNA constructs comprising a DNA sequence under expression control of a promoter and a terminator capable of functioning in plants, said DNA sequence encodes an RNA sequence selected from the group consisting of the following sequences:

i) the S RNA nucleotide sequence from position 1 to position 3001 of SEQ. ID No. 1;

ii) the S RNA nucleotide sequence from position 1 to position 2993 of SEQ. ID No. 2;

iii) the S RNA nucleotide sequence from position 1 to position 789 of SEQ. ID No.4;

iv) the S RNA nucleotide sequence of SEQ ID No. 9 from position 1 to position 3000;

v) the S RNA nucleotide sequence of SEQ ID No. 10 from position 1 to position 2993;

vi) the S RNA nucleotide sequence of SEQ ID No. 11 from position 1 to position 789;

vii) the M RNA nucleotide sequence of SEQ ID No. 14 from position 1 to position 4970;

viii) the M RNA nucleotide sequence of SEQ ID No. 15 from position 1 to position 912;

ix) the M RNA nucleotide sequence of SEQ ID No. 20 from position 1 to position 4970;

x) the M RNA nucleotide sequence of SEQ ID No. 22 from position 1 to position 912; and

xi) an RNA sequence wherein the codons of said RNA sequence have been replaced by one or more codons which encode the same amino acid as an RNA sequence of i) thru x)

xii) an RNA sequence complementary to an RNA sequence.

4. A plant comprising in its genome a DNA construct according to claim 1.

5,773,701

#### PLANTS RESISTANT TO INFECTION BY PVX

Carl Joseph Braun, III, Creve Coeur; Cynthia Lou Hemenway, St. Louis, and Nilgun Erenk Tumer, Chesterfield, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 804,862, Dec. 6, 1991, abandoned, which is a continuation-in-part of Ser. No. 771,912, Oct. 4,

1991, abandoned. This application Feb. 21, 1997, Ser. No. 803,973

Int. Cl.<sup>6</sup> C12N 5/10; 15/63; 15/82; A01H 5/00

U.S. Cl. 800—205

10 Claims

1. A double stranded DNA molecule comprising: a promoter that functions in plant cells to cause the production of an RNA sequence; which is operably linked to a DNA sequence encoding shown as SEQ ID NO: 1 a full length PVX replicase protein; which is operably linked to a 3'



non-translated DNA sequence that functions in plants to cause the addition of polyadenylated ribonucleotides to the 3' end of the transcribed mRNA sequence.

5,773,702

**IMIDAZOLINONE HERBICIDE RESISTANT SUGAR BEET PLANTS**

Donald Penner, Williamston, and Terry R. Wright, Lansing, both of Mich., assignors to Board of Trustees operating Michigan State University, East Lansing, Mich.

Filed Jul. 17, 1996, Ser. No. 682,303

Int. Cl.<sup>6</sup> C12N 15/01; 15/05; A01H 3/00; 4/00

U.S. Cl. 800—230

14 Claims

1. A sugar beet plant material consisting of mutated cells with a mutated acetolactate synthase gene encoding the synthase wherein a nucleotide is modified from guanine to adenine at position 337, wherein the mutated cells have a resistance to an imidazolinone herbicide and wherein the resistance is transmittable by conventional cross-breeding of plants produced from the cells and the cells are regenerable to a plant.

5,773,703

**HERBICIDE RESISTANT RICE**

Timothy P. Croughan, Crowley, La., assignor to Board of Supervisors of Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La.

Continuation of Ser. No. 345,213, Nov. 28, 1994, Pat. No. 5,545,822, which is a continuation of Ser. No. 171,210, Dec. 21, 1993, abandoned, which is a continuation of Ser. No. 934,878, Aug. 21, 1992, abandoned. This application Apr. 4, 1996, Ser. No. 628,031

Int. Cl.<sup>6</sup> A01H 5/00

U.S. Cl. 800—235

18 Claims

1. A process for controlling weeds in the vicinity of a rice plant, said process comprising applying a herbicide to the weeds and to the rice plant, wherein:

- (a) the growth of the rice plant is resistant to inhibition by one or more of the following herbicides, at levels of herbicide which would normally inhibit the growth of a rice plant: imazethapyr, imazaquin, primisulfuron, nicosulfuron, or a derivative of any of these herbicides; and
- (b) the rice plant is the plant with ATCC accession number 75295; or is a mutant, recombinant, or genetically engineered derivative of the plant with ATCC accession number 75295 or of any progeny of the plant with ATCC accession number 75295; or is a plant which is the progeny of any of these plants;
- (c) the rice plant has the herbicide resistance characteristics of the plant with ATCC accession number 75295; and
- (d) the herbicide comprises imazethapyr, imazaquin, primisulfuron, nicosulfuron, or a derivative of any of these herbicides.

11. A process for controlling weeds in the vicinity of a rice plant, said process comprising applying a herbicide to the weeds and to the rice plant, wherein:

- (a) the growth of the rice plant is resistant to inhibition by one or more of the following herbicides, at levels of herbicide which would normally inhibit the growth of a rice plant: sulfometuron, imazapyr, imazameth, or a derivative of any of these herbicides; and

- (b) the rice plant is the plant with ATCC accession number 75295; or is a mutant, recombinant, or genetically engineered derivative of the plant with ATCC accession number 75295 or of any progeny of the plant with ATCC accession number 75295; or is a plant which is the progeny of any of these plants;
- (c) the rice plant has the herbicide resistance characteristics of the plant with ATCC accession number 75295;
- (d) the herbicide comprises sulfometuron, imazapyr, imazameth, or a derivative of any of these herbicides.

5,773,704

**HERBICIDE RESISTANT RICE**

Timothy P. Croughan, Crowley, La., assignor to Board of Supervisors of Louisiana State University and Agricultural and Mechanical College, Baton Rouge, La.

Filed Apr. 29, 1996, Ser. No. 639,793

Int. Cl.<sup>6</sup> A01H 5/00; 4/00; A01G 13/00; 16/00

U.S. Cl. 800—235

18 Claims

1. A rice plant wherein:

- (a) the growth of said plant is resistant to inhibition by one or more of the following herbicides, at levels of herbicide that would normally inhibit the growth of a rice plant: imazethapyr, imazaquin, primisulfuron, nicosulfuron, sulfometuron, imazapyr, imazameth, imazamox, or a derivative of any of these herbicides; and
- (b) said plant is a derivative of the plants with ATCC accession numbers 75295 and 97523; and
- (c) said plant has the herbicide resistance characteristics of the plants with ATCC accession numbers 75295 and 97523.

5,773,705

**UBIQUITIN FUSION PROTEIN SYSTEM FOR PROTEIN PRODUCTION IN PLANTS**

Richard David Vierstra; David Hondred, both of Madison, Wis., and Judy Callis, Davis, Calif., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

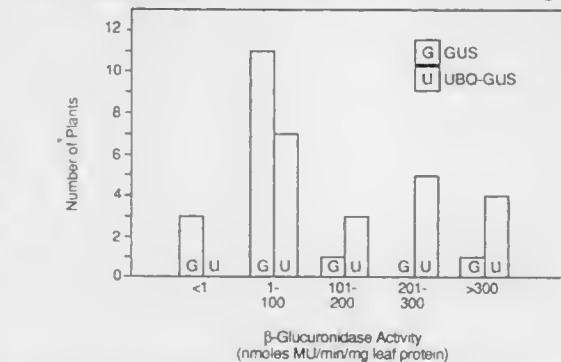
Continuation of Ser. No. 999,709, Dec. 31, 1992, abandoned.

This application May 25, 1995, Ser. No. 450,834

Int. Cl.<sup>6</sup> A01H 1/04; C12N 5/00; 15/00

U.S. Cl. 800—250

8 Claims



1. A vector to express a desired protein in plants, the vector comprising, 5' to 3':

- a promoter effective in plant cells;
- a protein coding sequence including a first sequence encoding a UBQ11 ubiquitin repeat domain and a second sequence encoding the desired protein, the desired protein not being ubiquitin, the first and second sequence arranged to encode a ubiquitin-protein fusion; and
- a transcriptional terminator effective in plants.

## ELECTRICAL

5,773,706

**GELLED ORGANIC LIQUIDS**

John N. Wesley, Edison; Amjad Farooq, Somerset; Ammanuel Mehreteab, Piscataway, and Francis T. Barbato, Mildford, all of N.J., assignors to Candle Corporation of America, Greenwich, Conn.

Continuation of Ser. No. 293,360, Aug. 19, 1994, abandoned, which is a continuation-in-part of Ser. No. 916,457, Jul. 20, 1992, abandoned. This application Jan. 28, 1997, Ser. No. 788,487

The portion of the term of this patent subsequent to Oct. 15, 2014, has been disclaimed.

Int. Cl.<sup>6</sup> B01J 13/00; C10L 7/02; 7/04

U.S. Cl. 44—266

19 Claims

11. A polymeric gelled fuel composition having an increased viscosity provided by an auxiliary rheological additive comprising approximately by weight:

- (a) 0.1 to 3 percent by weight of an anionic polymer at least partially neutralized through the addition of at least one organic base to neutralize said anionic polymer and to form a gel;
- (b) 0.01 to 4 percent by weight of an amphoteric oxide auxiliary rheological additive; and
- (c) the balance being primarily a fuel;
- wherein the polymeric gel is viscoelastic and has a G' value of at least 80 dynes/sq. cm at a frequency of 10 radians/second, a G'' value of at least 10 dynes/sq. cm. at a frequency of 10 radians/second, a ratio of G'/G'' of less than 1, G' being substantially constant over a torque range of 1 to 100 micro N.m. with the viscosity of the polymeric gel being increased by said auxiliary rheological additive such that the content of the anionic polymer in the polymeric gel can be decreased by 10 percent to 75 percent by weight and the polymeric gel has essentially an equivalent viscosity due to the presence of said auxiliary rheological additive.

5,773,707

**CALIBRATION METHOD FOR MULTISAMPLE DYNAMIC HEADSPACE SAMPLER**

Karl H. Scheppers, Scotts Valley, and Gregory I. Rudd, Aptos, both of Calif., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

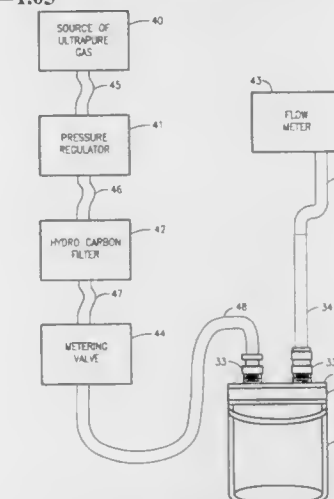
Division of Ser. No. 527,292, Sep. 12, 1995, Pat. No. 5,646,334.

This application Jan. 9, 1997, Ser. No. 780,885

Int. Cl.<sup>6</sup> G01N 1/00

U.S. Cl. 73—1.03

3 Claims



1. A calibration method for apparatus for sampling off-gassed organic compounds from a plurality of specimens, said apparatus having a plurality of sampling chambers wherein a plurality of specimens may be simultaneously heated and outgassed organic compounds simultaneously collected from said plurality of specimens under test for subsequent analysis by an analysis instrument capable of identifying organic compounds, one of said plurality of sampling chambers being reserved for a compound used as a spike,

said calibration method employing calibration curves defining a plot of amount of organic compound in units of mass versus magnitude of response of said analysis instrument in deflection units, said calibration method comprising the following steps:

- preparing a calibration curve on said analysis instrument for each organic compound expected to be outgassed by said specimens under test;
- using said analysis instrument for determining a recovery factor for each compound used as a spike;
- using said calibration curves and recovery factor to quantify the amount of specific organic compounds outgassed from said specimens under test; and
- using measured values obtained from said spike to assess the accuracy and precision of the measurement technique.

5,773,708

Patent Not Issued For This Number

5,773,709

**METHOD AND APPARATUS FOR THERMALLY INDUCING CIRCULATION OF FLUID BETWEEN THE INTERIOR OF A SYSTEM AND A FLUID POCKET ATTACHED THERETO**

Jean-Pierre Gibeault, Dollard-des-Ormeaux, and Claude Beauchemin, Valleyfield, both of Canada, assignors to Syprotec Inc., Pointe-Claire, Canada

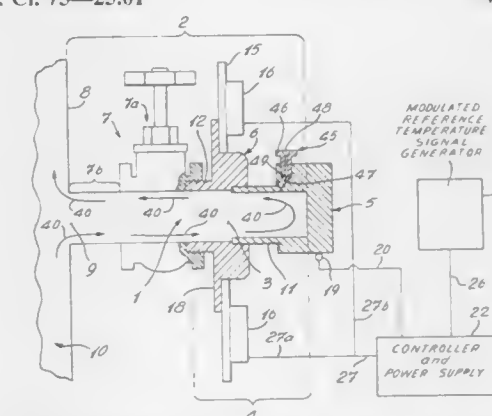
Filed Jul. 1, 1996, Ser. No. 674,006

Claims priority, application Canada, Jun. 28, 1996, 2180233

Int. Cl.<sup>6</sup> G01N 25/06; 25/56

U.S. Cl. 73—25.01

42 Claims



1. In an apparatus for monitoring a substance in a dielectric fluid, said fluid being in an interior of an electrical system, the apparatus comprising:

- a) attachment means for attaching the apparatus to said electrical system so as to define a housing, said housing defining a fluid pocket, said fluid pocket being in fluid communication with a dielectric fluid access opening of the electrical system for fluid communication between the fluid pocket and said interior of the electrical system, and
- b) means for monitoring said substance in dielectric fluid in said fluid pocket.

the improvement wherein said apparatus comprises heat transfer means comprising a heat transfer element configured for thermal communication with dielectric fluid in said pocket, said heat transfer means comprising temperature modulation means for modulating the temperature of the heat transfer element between a first temperature and a second temperature.

5,773,710

## CELLULAR MATERIAL DETECTION APPARATUS AND METHOD

David James Squirrell, Porton Down, Great Britain, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, United Kingdom

PCT No. PCT/GB95/00544, § 371 Date Feb. 5, 1997, § 102(e) Date Feb. 5, 1997, PCT Pub. No. WO95/25811, PCT Pub. Date Sep. 28, 1995

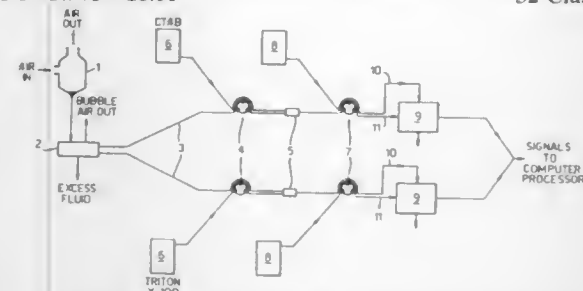
PCT Filed Mar. 18, 1995, Ser. No. 793,011

Claims priority, application United Kingdom, Mar. 18, 1994, 9405392

Int. Cl.<sup>6</sup> C12Q 1/06; 1/24; G01N 33/52

U.S. Cl. 73—28.01

32 Claims



1. A method for determining the presence and/or amount of cellular material present in a gaseous environment comprising:
  - (a) continuously collecting a particulate fraction from that environment over a period of time;
  - (b) continuously transferring the particulate fraction to a processing fluid;
  - (c) continuously releasing intracellular contents including ATP from microorganisms, cells or spores present in the processing fluid containing the particulate fraction using a lytic agent;
  - (d) continuously adding luminescent reagents which cause the processing fluid to luminesce in the presence of ATP;
  - (e) measuring light emitted from the processing fluid produced in (d) in a luminometer wherein a signal indicative of this light is produced by the luminometer and the presence and magnitude of the signal is equated to presence and/or amount of cellular material present in the gas.

5,773,711

## CAN INTERNAL PRESSURE INSPECTION APPARATUS

Hideo Itoh; Mithuo Yokoyama; Saburo Itoh, and Fumihiko Usui, all of Sunto-gun, Japan, assignors to Mitsubishi Materials Corporation, Tokyo, Japan

Filed Jan. 9, 1997, Ser. No. 781,037

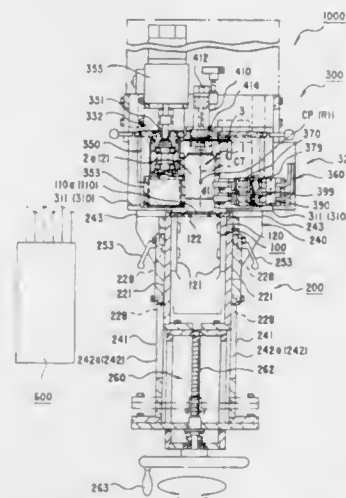
Claims priority, application Japan, Jan. 9, 1996, 8-001835; Jan. 9, 1996, 8-001836; Jan. 9, 1996, 8-001840

Int. Cl.<sup>6</sup> G01M 3/36; 3/26; G01B 5/16

U.S. Cl. 73—52

6 Claims

1. A can internal pressure inspection apparatus comprising:
  - a) an apparatus body located in relation to a can carrying path, said apparatus body including a body frame, and a can barrel pressure detection section and a can barrel guide section which are disposed to be in opposed relation to each other with said can carrying path interposed therebetween, said can barrel pressure detection section having a can barrel pressure detector for pressing against a barrel portion of a can; and
  - b) a separation change mechanism for changing a separation distance between said can barrel pressure detection section and said can barrel guide section including
    - i) a first movable frame for supporting said can barrel guide section; and
    - ii) a second movable frame for supporting said can barrel pressure detection section;
  - c) a width variable gauge rotatable attached to said body frame and disposed between said first and second movable frames to be brought into contact therewith, said width variable



gauge having a variable width in accordance with a rotation of the width variable gauge, said first and second movable frames being movably supported by said body frame so that said can barrel pressure detection section and said can barrel guide section can approach each other and separate from each other in accordance with the amount of said rotation applied to said width variable gauge.

5,773,712

## METHOD FOR MEASURING VISCOSITY AND VISCOSIMETER

Thomas Arvidsson, Hamneda, and Pierre Ståhl, Lammhult, both of Sweden, assignors to Glasforskningsinstitutet, Växjö, Sweden

PCT No. PCT/SE95/01024, § 371 Date Apr. 28, 1997, § 102(e) Date Apr. 28, 1997, PCT Pub. No. WO96/08709, PCT Pub. Date Mar. 21, 1996

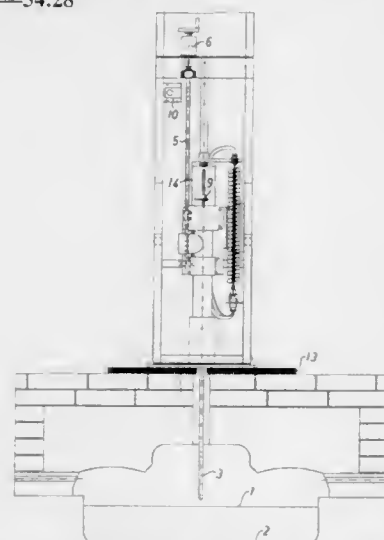
PCT Filed Sep. 12, 1995, Ser. No. 809,109

Claims priority, application Sweden, Sep. 13, 1994, 9403039

Int. Cl.<sup>6</sup> G01N 11/14

U.S. Cl. 73—54.28

7 Claims



1. A method for measuring the viscosity of a liquid, wherein a rotary measuring head is introduced into the liquid, and the torque (M) exerted on the measuring head is sensed, characterized in that the measuring head is rotated at a substantially constant speed, that the torque (M) is sensed at two depths of introduction ( $h_1$ ,  $h_2$ ) of the measuring head into the liquid, and that the viscosity ( $\eta$ ) of the liquid is calculated based on the formula:

$$M = C \int_0^h \eta(h) dh + \delta h \cdot \eta(h)$$

wherein M is the torque exerted on the measuring head.

C is a constant containing a rotational speed and diameter of the measuring head.

h is the current depth of introduction.

n is the viscosity of the liquid, and

$\delta h$  is the change in the depth of introduction.

5,773,713

## ENVIRONMENTAL MONITORING OF ORGANIC COMPOUNDS

Christopher Barber, Darlington; Bradley Mark Patterson, Sorrento; Gregory Bruce Davis, Floreat, and Terence Robert Power, Mullaloo, all of Australia, assignors to CRC For Waste Management & Pollution Control Limited, Australia

PCT No. PCT/AU95/00456, § 371 Date Feb. 10, 1997, § 102(e) Date Feb. 10, 1997, PCT Pub. No. WO96/03633, PCT Pub. Date Feb. 8, 1996

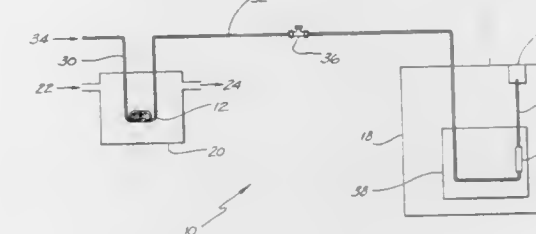
PCT Filed Jul. 26, 1995, Ser. No. 619,537

Claims priority, application Australia, Jul. 26, 1994, PM7074

Int. Cl.<sup>6</sup> G01N 13/05; 1/00; B01D 15/08

U.S. Cl. 73—61.41

19 Claims



1. A method of environmental monitoring of low concentration levels of organic compounds in an environmental medium, the method comprising the steps of:

locating a diffusion cell in the environmental medium for in situ monitoring of the organic compounds, the diffusion cell including a polymeric membrane into which and through which the organic compounds diffuse, providing equilibrium partitioning between the environmental medium, the polymeric membrane and a zone for a carrier fluid.

providing flow of the carrier fluid through the zone of the diffusion cell at a relatively low flow rate, the carrier fluid and its flow rate being chosen for the carrier fluid to acquire, before discharge from the zone, a concentration of the organic compounds substantially in equilibrium with the concentration of the organic compounds in the environmental medium and in the polymeric membrane whereby, in use, low concentration levels of the organic compounds in the environmental medium can be detected in a manner which has a relatively high degree of sensitivity.

monitoring the organic compounds in the carrier fluid, and providing an output signal representative of the organic compounds in the environmental medium.

5,773,714

## SCANNER BEAM DYNAMIC DEFLECTION MEASUREMENT SYSTEM AND METHOD

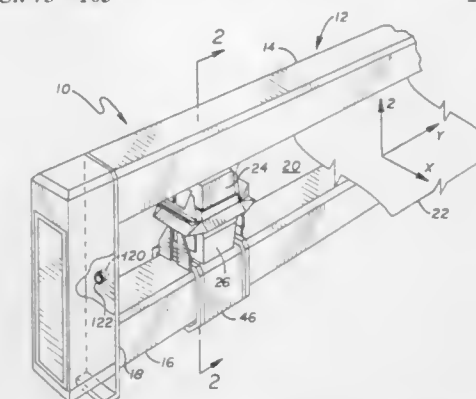
Raymond P. Shead, Berkshire, England, assignor to Honeywell-Mesurex Corporation, Cupertino, Calif.

Filed Feb. 19, 1997, Ser. No. 804,029

Int. Cl.<sup>6</sup> G01N 21/86; 37/00

U.S. Cl. 73—105

23 Claims



1. A process for measuring the values of a parameter of a sheet of material by a sensor system including first and second head members movably mounted by a support structure on opposite sides of the sheet of material and for correcting the measured values of the parameter to account for variability of the separation of the first and second head members, comprising the steps of:
  - a) measuring the values of the parameter with the sensor system without correction for variability of the separation of the first and second head members from one another to provide uncorrected, measured values;
  - b) determining variability of the separation of the first and second head members by measuring a temperature differential between at least two different locations in the support structure; and
  - c) correcting the uncorrected measured values according to the determined variability of the separation of the first and second head members.

5,773,715

Patent Not Issued For This Number

5,773,716

## METHOD AND UNIT FOR DIAGNOSING LEAKAGE OF AN INTERNAL COMBUSTION ENGINE HIGH-PRESSURE INJECTION SYSTEM

Pierpaolo Antonioli, Piosasco; Francesco De Cristofaro, Bruino; Roberto Imarisio, Giaveno; Carlo Andrea Malvicino, Torino, and Riccardo Buratti, Genova, all of Italy, assignors to C.R.F. Societa Consortile Per Azioni, Strada Torino, Italy

Filed Jan. 21, 1997, Ser. No. 786,438

Claims priority, application Italy, Jan. 19, 1996, TO96A0029; Jul. 9, 1996, TO96A0585

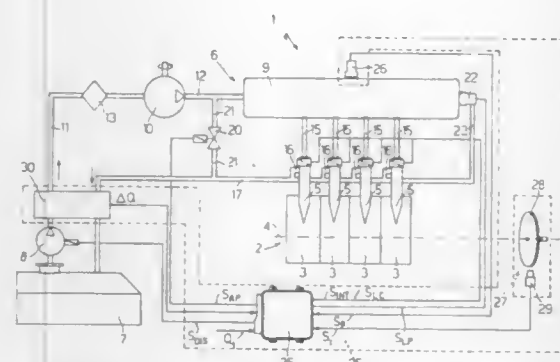
Int. Cl.<sup>6</sup> G01M 15/00

U.S. Cl. 73—119 A

30 Claims

1. A method of diagnosing leakage of a high-pressure injection system (1) of an internal combustion engine (2) comprising a number of cylinders (3) and a number of injectors (5), each supplying fuel to a respective cylinder (3); characterized by comprising the steps of:





- a) generating an operating signal ( $S_p$ ;  $\Delta Q$ ) related to a physical quantity of said injection system (1);
- b) comparing said operating signal ( $S_p$ ;  $\Delta Q$ ) with a reference operating value ( $P_0$ ;  $\Delta Q_{H1}$ );
- c) determining a fuel leakage condition in the event of a predetermined operating relationship between said operating signal ( $S_p$ ;  $\Delta Q$ ) and said reference operating value ( $P_0$ ;  $\Delta Q_{H1}$ );
- d) reducing the quantity of fuel injected into said cylinders (3) in the presence of said leakage condition;
- e) calculating a work torque value ( $C_L$ ) of said engine (2);
- f) comparing said calculated work torque value ( $C_L$ ) with a reference work torque value ( $C_T$ ); and
- g) determining a type of leakage on the basis of said comparison.

5,773,717

**APPARATUS AND RELATED METHODS FOR DETERMINING LATERAL TIRE TREAD STIFFNESS**

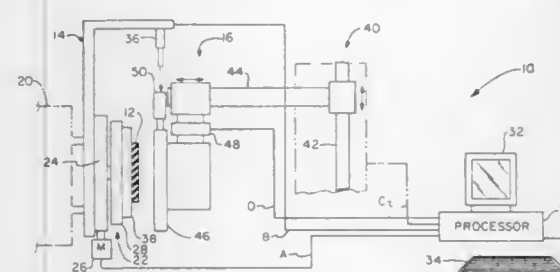
Andrew K. Reinhardt, Akron; Stephen M. Vossberg, Uniontown; David O. Stalnaker, Hartsville, and John L. Turner, Akron, all of Ohio, assignors to Bridgestone/Firestone, Inc., Akron, Ohio

Filed Oct. 17, 1996, Ser. No. 733,374

Int. Cl.<sup>6</sup> G01M 17/02; G01N 3/24

U.S. Cl. 73—146

14 Claims



1. An apparatus for measuring tread stiffness, comprising:
  - a table for carrying a tread specimen;
  - a loading plate coupled to the tread specimen, said loading plate movable in at least two directions;
  - means for determining an amount of force applied by said loading plate;
  - means for measuring an amount of displacement to the tread specimen when said loading plate is moved; and
  - means for processing said amount of force and said amount of displacement to determine the stiffness of the tread specimen, said processing means controlling the movement of said loading plate.

**5,773,718  
DEVICE FOR MEASURING LIQUID VOLUME OF THE CYLINDRICAL PISTON METER TYPE**  
Reiner Bielenberg, Neustr. 60, D 50374 Ertstadt-Gymnich, Germany

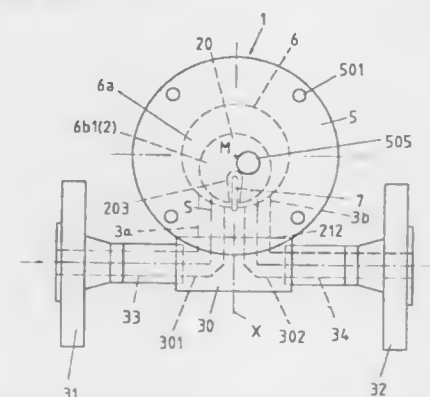
Filed Apr. 16, 1996, Ser. No. 632,999

Claims priority, application European Pat. Off., Mar. 4, 1996, 96103328

Int. Cl.<sup>6</sup> C01F 3/08

U.S. Cl. 73—252

12 Claims



1. A device for measuring liquid volume, comprising a multipartite housing defining a cylindrical measuring chamber with a lengthwise cylinder axis (M) and including a dividing wall projecting radially into the cylindrical measuring chamber, and two connecting channels for allowing liquids to be measured to flow into and out of the cylindrical measuring chamber, said connecting channels comprising straight bores passing through the housing into the cylindrical measuring chamber perpendicular to the lengthwise cylinder axis (M) of the cylindrical measuring chamber, the connecting channels having inlet openings to the cylindrical measuring chamber divided from one another by the dividing wall projecting into the cylindrical measuring chamber, said inlet openings being arranged mirrorwise relative to the dividing wall; a cylindrical piston located eccentrically in the cylindrical measuring chamber with respect to the lengthwise cylinder axis (M) so as to perform a wobbling movement, said cylindrical piston having an H-shaped cross section forming a jacket having an outer jacket surface and a piston middle wall, thereby forming an upper and a lower annular chamber with inside jacket surfaces, the cylindrical piston having a through opening for engagement of the dividing wall projecting into the measuring chamber and dividing the measuring chamber into an outer filling chamber extending between the multipartite housing that delimits the cylindrical measuring chamber and the outer jacket surface of the cylindrical piston, and two inner filling chambers, the two inner filling chambers comprising the upper and lower annular chambers of the cylindrical piston and being delimited from the cylindrical measuring chamber, the jacket having recesses therein extending symmetrically from the piston middle wall and symmetrically from the through opening of the cylindrical piston to expose the upper and lower annular chambers; and a magnet movably mounted inside the cylindrical measuring chamber for generating a measured value of liquid volume, wherein said recesses are associated to the inlet openings of the connecting channels and have such a size that an incoming volume of liquid flowing through the connecting channels and inlet openings into the measuring chamber strikes the outer jacket surface of the cylindrical piston and the said recesses exposing the upper and lower annular chambers, thereby dividing the incoming volume of liquid into a part flowing in the outer chamber and into two parts flowing into the inner filling chambers comprising the upper and annular chambers of the cylindrical piston, whereby the outer jacket surface of the cylindrical piston and inside jacket surfaces of the cylindrical piston relative to one another can be impacted uniformly or symmetrically by the incoming volume of liquid, and the pressure differential between the pressure produced in the two inner filling chambers in the vicinity of the upper and lower annular chambers of the cylindrical piston with respect to the pressure produced by the incoming volume of liquid in the outer

filling chamber of the cylindrical measuring chamber tends toward zero, wherein the recesses are made so large that with the incoming volume of liquid in one of the connecting channels, a uniform degree of filling of the outer filling chamber relative to the sum of the two inner filling chambers can be achieved in the area of the cylindrical piston.

5,773,719

**FIXTURE FOR LOCKING MOTORCYCLE WHEELS ONTO A BALANCING MACHINE SHAFT**

Gino Ferrari, and Franco Maioli, both of Correggio, Italy; assignors to Femas, S.R.L., Correggio, Italy

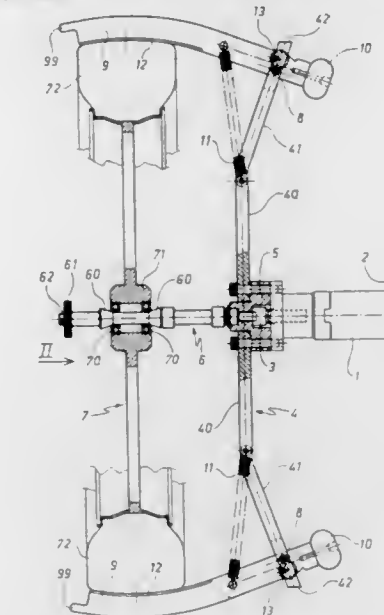
Filed Oct. 25, 1996, Ser. No. 738,284

Claims priority, application Italy, Nov. 7, 1995, RE95 0055 U

Int. Cl.<sup>6</sup> G01M 1/00

U.S. Cl. 73—487

8 Claims



1. A fixture for locking motorcycle wheels onto the shaft of balancing machines having a spindle coaxial to the shaft and provided for supporting the wheel to be balanced, and means for making said shaft and said wheel rotationally rigid, comprising:
  - a diametrical entrainment arm to be fixed to the end of the shaft; and
  - wheel clamping members each comprising a body in the manner of a rocker element pivotally attached to each of the ends of the entrainment arm, said body having clamping means at one end, and at its opposite end a counter-weight such that, under the action of centrifugal force, the body increases its clamping action on the wheel.

5,773,720

**IMPACT SENSOR AND MANUFACTURING METHOD THEREFOR**

Toshio Miyata, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jan. 28, 1997, Ser. No. 790,283

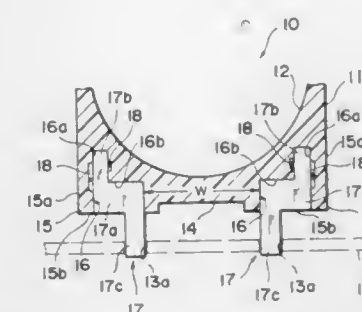
Claims priority, application Japan, Apr. 5, 1996, 8-083860

Int. Cl.<sup>6</sup> G01L 7/08

U.S. Cl. 73—493

19 Claims

1. An impact sensor comprising:
  - a housing body having a bottom face and having a hollow space defined in the housing body for accommodating a sensor mechanism for detecting an impact; and
  - mounting means for fixing the housing body to a wiring board, the mounting means comprising a generally H-shaped mounting pin which includes a first pin portion extending along the bottom face of the housing body, a pair of second pin portions



- extending from the first pin portion in a direction at right angles with the longitudinal direction of the first pin portion, and a pair of third pin portions extending from the first pin portion in the opposite direction from the extending direction of the second pin portions, wherein the housing body has a press-fit recess and the first pin portion and the second pin portions are press-fitted into the recess, the first and second pin portions contacting tightly with surface portions of the recess, and wherein the housing body is fixed to the wiring board by portions of the third pin portions of the mounting means which extend from the housing body.

5,773,721

**LASER BEAM AIMING APPARATUS FOR ULTRASONIC INSPECTION**

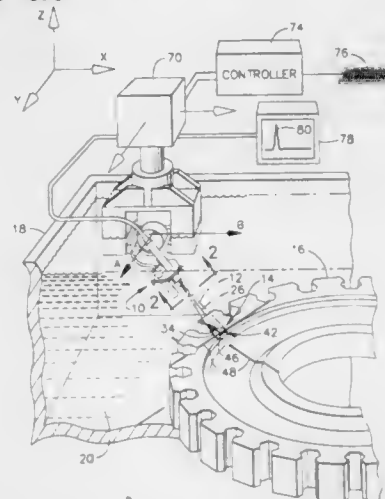
Manohar Bashyam, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jul. 31, 1996, Ser. No. 690,654

Int. Cl.<sup>6</sup> G01D 5/32

U.S. Cl. 73—596

21 Claims



1. An apparatus for aiming an ultrasonic beam to nondestructively test an object, comprising:
  - an ultrasonic transducer means for generating the ultrasonic beam and impinging the ultrasonic beam upon the object; said ultrasonic beam having a beam axis;
  - a laser aiming means for directing at least one laser beam having a laser sight line substantially coaxial with said ultrasonic beam axis.

5,773,722

**TORQUE ACTUATED TENSILE TESTER**

James F. Helder, 414 S. Maple St., Graham, N.C. 27253

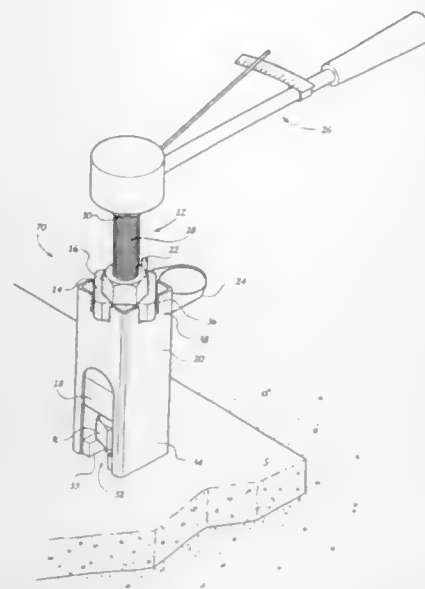
Filed Jan. 3, 1995, Ser. No. 367,947

Int. Cl.<sup>6</sup> G01N 3/08

U.S. Cl. 73—826

22 Claims

1. A device for proof loading an anchor fixed in a structure, comprising:



an actuator having at least one threaded portion and a portion engageable by a torque applying member;  
a support member that is positionable to be rigid with respect to the structure in which the anchor to be proof loaded is affixed; means on said support member for supporting said actuator for rotation in alignment with the anchor to be proof loaded; and means for engaging the anchor to be proof loaded, said engaging means being movable with respect to said support member and connected to said actuator for rotation of said actuator with respect to the anchor to be proof loaded, said engaging means locatable at a spacing from said supporting means, at least one of said at least one threaded portion of said actuator threadedly engaging at least one of said supporting means and said engaging means for movement of said engaging means toward said supporting means upon rotation of said actuator in one direction by application of a torque to said engageable portion of said actuator by a torque applying member;  
whereby, upon engagement of the anchor to be proof loaded by said engaging means and application of a predetermined torque to said engageable portion of said actuator by a torque applying member, a predetermined proof load is applied to the anchor.

5,773,723

## FLOW TUBE LINER

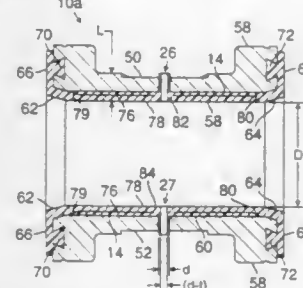
Peter B. Lewis, 966 Longview Dr., North Attleboro, Mass. 02760; Richard A. Bertone, 251 Irondequoit Rd., Franklin, Mass. 02038; Richard W. Kalinoski, 64 Francis La., Little Compton, R.I. 02837, and Michael R. Sheridan, 20 Hoffman Ave., Morgan, N.J. 08879

Filed Sep. 29, 1995, Ser. No. 535,986

Int. Cl.<sup>6</sup> G01F 1/58

U.S. Cl. 73—861.12

28 Claims



10. An electromagnetic flowmeter, comprising a tube for carrying fluid along a longitudinal axis.

an aperture in a surface of the tube for allowing an electrode to be inserted into the tube in a direction transverse to the longitudinal axis of the tube,  
a liner disposed on an inner surface of the tube, the liner comprising  
a plastic layer and  
a metal grid embedded in the plastic layer, the plastic layer and the metal grid having holes aligned with the aperture in the tube, the hole in the grid being larger than the hole in the plastic layer so that a portion of the liner near the aperture has no embedded grid, wherein the grid comprises a metal perforated cylinder having a spiral welding seam,  
a button electrode inserted through the aperture and holes in the metal grid and plastic layer, the button electrode holding the portion of the liner against the tube.

5,773,724

## METHOD OF MANUFACTURING SADDLE COILS HAVING DIFFERENT DIMENSIONS

Roland Unterseh, Saint Louis, France, assignor to Endress & Hauser Flowtec AG, Reinach, Switzerland

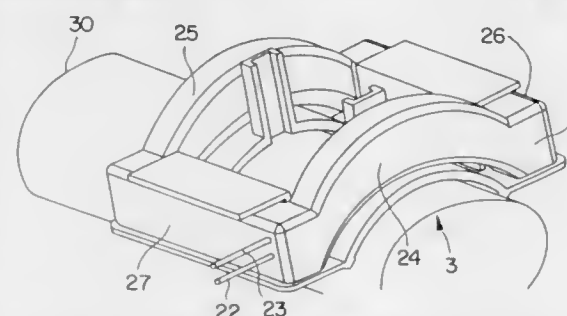
Filed Mar. 22, 1996, Ser. No. 621,832

Claims priority, application European Pat. Off., Oct. 13, 1995, 95 11 6189.2

Int. Cl.<sup>6</sup> G01F 1/58

U.S. Cl. 73—861.12

4 Claims



1. A method of manufacturing differently dimensioned saddle coils which each fit one of differently dimensioned curved surfaces and which have a number of turns, wherein  
a prefabricated wire is used for the saddle coil,  
said wire having a first insulating-varnish coating directly thereon and a second insulating-varnish coating applied to the first insulating-varnish coating, said second insulating-varnish coating having a baking temperature lower than the softening point of the first insulating-varnish coating;  
the wire is first wound into a flat coil on a coil form which was prefabricated from a flexible plastic which is dimensionally stable with respect to the individual parts of the coil form at the baking temperature;  
the flat coil, together with the coil form, is fitted to the curved surface or a corresponding dummy to form a still dimensionally unstable saddle coil.  
through the latter, a current of such a strength that the baking temperature is at least reached is sent until the second insulating-varnish coatings of the turns are bonded, particularly baked or fused, at least to each other;  
after the current has been switched off, the second insulating-varnish coating is allowed to solidify; and  
the now dimensionally stable saddle coil, together with the coil form, is put to an intended use.

5,773,725

Patent Not Issued For This Number

5,773,726

## FLOW METER PITOT TUBE WITH TEMPERATURE SENSOR

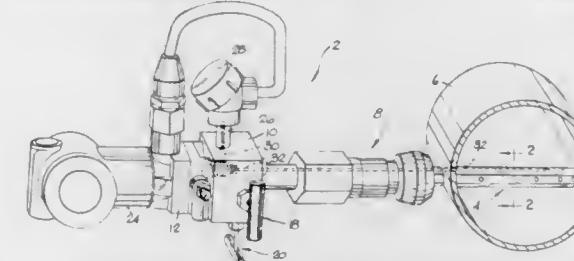
Ralene S. Mahoney, Boulder; Donald R. Verhaagen, Golden, and John Everett Garnett, Boulder, all of Colo., assignors to Dieterich Technology Holding Corp., Boulder, Colo.

Filed Jun. 4, 1996, Ser. No. 658,147

Int. Cl.<sup>6</sup> G01F 1/46

U.S. Cl. 73—861.65

9 Claims



1. A sensing probe assembly for a flow measurement system comprising:  
a tubular body, a portion of which is adapted for insertion into the fluid flowing in a confined conduit, and having within said body separated plenums, means exposing the respective plenums to the high and low fluid pressures in the flow, respectively;  
manifold means attached to that portion of the tubular body which is disposed outside of the fluid flow, and having, valved passages for conveying the said high and low fluid pressures through the manifold,  
terminal means carried by said manifold for interconnecting electrical components,  
a duct for carrying electrical conductors, and  
electrically responsive temperature sensing means disposed within the tubular body and having connecting means which are directed through the manifold's duct for connection with the terminal means.

5,773,727

## MASS FLOW METER

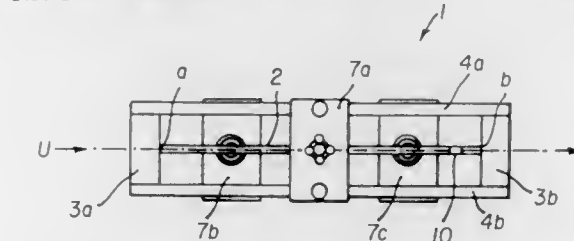
Masami Kishiro; Keita Ohkawa; Hironobu Yao, and Iwao Matsumoto, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Japan

Filed Oct. 17, 1995, Ser. No. 544,367

Int. Cl.<sup>6</sup> G01F 1/78

U.S. Cl. 73—861.355

5 Claims



1. A mass flow meter for measuring a mass flow rate of a fluid based on a reactive force generated by accelerating the fluid as it flows through a straight measuring tube, the mass flow meter comprising:

- a sensing means for detecting a state of the measuring tube, wherein said state comprises at least one of a strain and a temperature of the measuring tube; and
- a correcting means for correcting an as measured value of the mass flow rate based on the output of the sensing means, wherein the correcting means comprises:
  - a mass flow rate correcting means for correcting a part of the as measured value of the mass flow rate corresponding to a substantial mass flow rate of the fluid; and
  - a zero point correcting means for correcting a part of the as measured value corresponding to a zero point offset remaining when the fluid is not flowing;

wherein the zero point offset (Qzc) is calculated by using a known relationship between the zero-point offset and the state of the measuring tube based on the output of the sensing means;  
wherein the substantial mass flow rate value (Qs) is obtained by subtracting the zero-point offset value (Qzc) from the as measured value of the mass flow rate (Qm); and  
wherein a substantial mass flow rate after correction (Qmc) is obtained as a result of correcting the substantial mass flow rate value (Qs) based on the output of the sensing means.

5,773,728

## FORCE TRANSDUCER AND METHOD OF FABRICATION THEREOF

Kouji Tsukada, Seto; Takeshi Morikawa, Kasugai; Yutaka Nonomura, Nagoya; Sanae Tokumitsu; Masaharu Takeuchi, both of Owariasahi, and Kazuyoshi Kawaguchi, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Aichi-ken, Japan

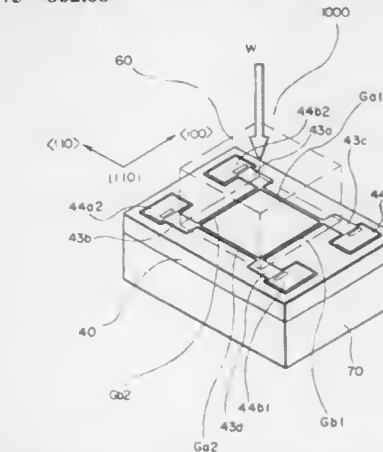
Filed Mar. 29, 1996, Ser. No. 625,528

Claims priority, application Japan, Mar. 31, 1995, 7-099683

Int. Cl.<sup>6</sup> G01L 1/16

U.S. Cl. 73—862.68

23 Claims



1. A force transducer comprising:  
a silicon single crystal substrate having a {110} crystal face to which a compression force is applied;  
a pressure transfer block for transferring said compression force to said silicon single crystal substrate; and  
strain gages provided on said silicon single crystal substrate; wherein said strain gages are formed so as to protrude from said {110} crystal face of said silicon single crystal and constituted as a bridge circuit composed of two pairs of opposing strain gages, electrical resistance of said strain gages being changed by said compression force transferred by said pressure transfer block.  
wherein said pressure transfer block is fixed over said strain gages; and the longitudinal direction of one pair of said opposing strain gages is aligned in a <110> crystal direction and the longitudinal direction of another pair of said opposing strain gages is aligned in a <100> crystal direction; whereby a current flows through input electrodes of said bridge circuit and a voltage output proportional to said compression force is obtained from output electrodes of said bridge circuit.

5,773,729

## OVERLOAD PROTECTED LOADCELL

Rathindra Nahar, Duluth, Ga., assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 17, 1996, Ser. No. 718,621

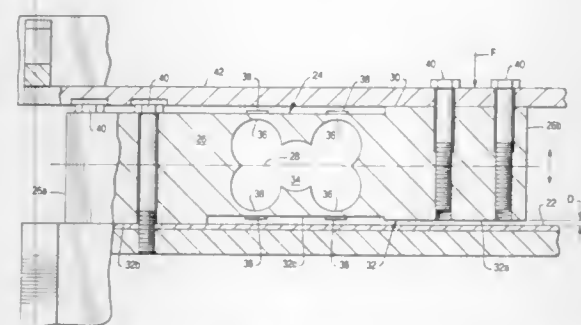
Int. Cl.<sup>6</sup> G01L 1/00

U.S. Cl. 73—862.382

9 Claims

1. A loadcell for a weighing scale comprising:  
an elongate beam including:





mounting and free ends spaced apart along a longitudinal centerline beam axis to define a cantilever; an upper surface spaced above said beam axis; a lower surface spaced below said beam axis; a central aperture extending laterally through said beam to define a plurality of spaced apart necks; and said beam lower surface at said free end being spaced closer to said beam axis than at said mounting end to define a step, therebetween; and

a plurality of strain gauges mounted to said beam adjacent to respective ones of said necks for measuring strain thereat; and wherein said beam lower surface at said mounting end defines a mounting land, and said step has a depth measured inwardly therefrom, and said step depth is sized so that cantilever deflection of said beam free end relative to said mounting end over said depth does not exceed about two percent yield stress of said beam.

5,773,730

**METHOD AND APPARATUS FOR SAMPLING ROOM-AIR CONDITIONS FOR HVAC CONTROL**

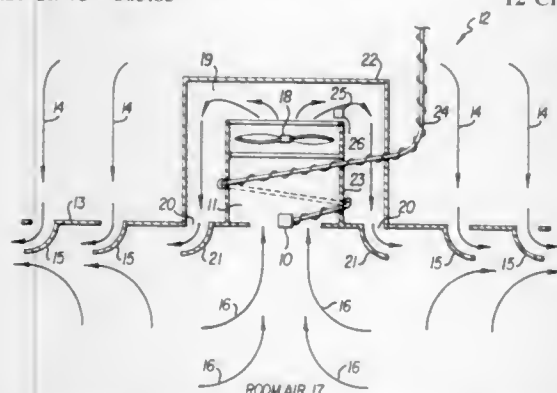
Douglas Carl McConnell, Hialeah, and Winfield LeRoy Kelley, Miami, both of Fla., assignors to Warren Technology Inc., Hialeah, Fla.

Continuation of Ser. No. 572,643, Dec. 14, 1995, abandoned. This application Feb. 13, 1997, Ser. No. 782,101

Int. Cl.<sup>6</sup> F24F 7/00

U.S. Cl. 73—863.83

12 Claims



1. Apparatus for sampling air conditions in a room comprising a first sensor for determining room air conditions, means forming a sensor well into which said sensor is placed, said sensor well having an inlet opening and a separate discharge opening, means within said sensor well for drawing room air past said sensor positioned in said sensor well to determine a said room air condition, means forming a discharge plenum outside of said sensor well for receiving only sensed room air discharged from said discharge opening of said sensor well, discharge means for discharging from said discharge plenum only said received sensed room air in directions away from said room air sensor well, and an air supply plenum including means to diffuse supply air into said room, said sensed room air discharged from said discharge plenum forming a boundary layer of air between said room air to be sensed at said sensor well and said supply air diffused into said room.

**5,773,731  
METHOD AND APPARATUS FOR DETECTING  
RESIDUAL GRINDING AMOUNT**

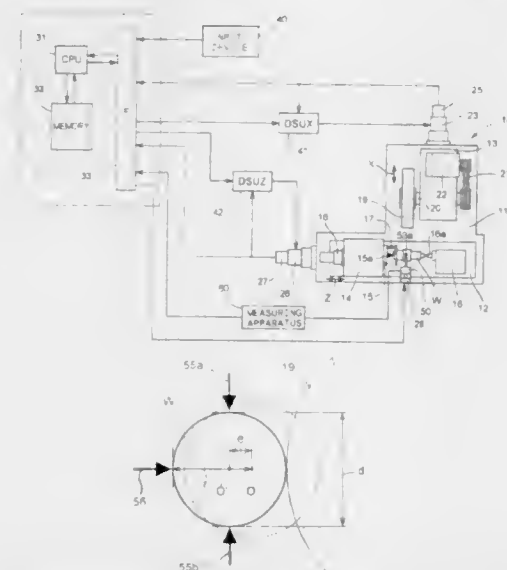
Moriaki Sakakura; Takayuki Hotta, both of Nagoya, and Satoshi Abeta, Okazaki, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed May 22, 1996, Ser. No. 652,273

Claims priority, application Japan, May 23, 1995, 7-123632 Int. Cl.<sup>6</sup> B24B 49/00

U.S. Cl. 73—865.8

8 Claims



1. A method for detecting a residual grinding amount produced due to a grinding resistance between a workpiece and a grinding wheel during a grinding operation, said method comprising the steps of:

measuring an outer diameter of a workpiece in a direction perpendicular to a direction of deflection of the workpiece; measuring a position of a peripheral surface of the workpiece in the direction of deflection of the workpiece; and calculating a residual grinding amount based on the measured outer diameter of the workpiece and the measured position of the peripheral surface of the workpiece.

**5,773,732  
MEASURING INSTRUMENT AND ASSEMBLING  
METHOD**

Gerard Rutten, Murten, and Walter Hofmann, Sutz, both of Switzerland, assignors to Synton A.G., Lyss, Switzerland

Continuation of Ser. No. 264,326, Jun. 23, 1994, abandoned.

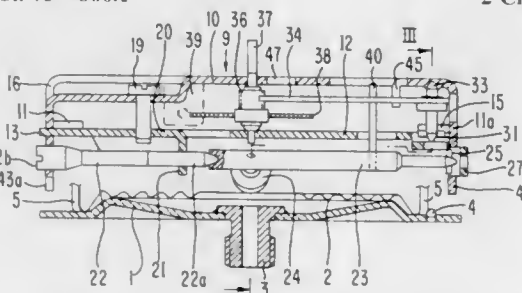
This application Apr. 22, 1996, Ser. No. 635,791

Claims priority, application Switzerland, Jul. 9, 1993, 02 074/93-1

Int. Cl.<sup>6</sup> G01D 7/00

U.S. Cl. 73—866.1

2 Claims



1. A measuring instrument comprising a measuring element and an instrument framework, a mechanism being lodged within said framework for transmitting a position of said measuring element to a display element, said framework consisting of shaped pieces which are connected to each other at least in part by elastic forces

wherein said shaped pieces comprise bridges which are elastically snapped or latched into a single, common base, said elastic forces elastically holding and assembling the bridges;

a rotatable transmission axle whose rotational movement is transmitted by a radial pin, one end of said axle being journaled within an axially resilient bearing and another end of said axle being journaled in an axially adjustable bearing, the axially adjustable bearing being lodged within a radially resilient and adjustable tongue of a first one of said bridges, wherein a locking screw acts between a second one of said bridges and the adjustable tongue of the first one of said bridges simultaneously fastens said bridges.

5,773,733

**ALUMINA-ALUMINUM NITRIDE-NICKEL COMPOSITES**  
Wei-Hsing Tuan, Taipei; Wen-Bing Chou, Taipei Hsien, and Shun-Tai Chang, Taipei, all of Taiwan, assignors to National Science Council, Taiwan

Filed Apr. 12, 1996, Ser. No. 631,369

Int. Cl.<sup>6</sup> B22F 3/10; C22C 1/05; 1/10; 19/03

U.S. Cl. 75—235

18 Claims

1. An alumina-aluminum nitride-nickel composite, comprising alumina ( $Al_2O_3$ ), aluminum nitride (AlN) and nickel (Ni).

5,773,734

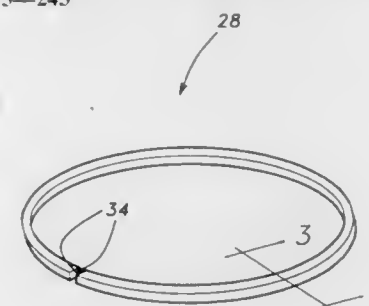
**NITRIDED POWDERED METAL PISTON RING**  
William B. Young, Hagerstown, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 21, 1995, Ser. No. 576,428

Int. Cl.<sup>6</sup> B22F 3/12; 5/02; C22C 33/02

U.S. Cl. 75—243

20 Claims



1. A powdered metal piston ring comprising: a structure of predominantly pearlite with a dispersion of separate and discrete metallic particles including at least one element with a high affinity to nitrogen;

a nitrided hard surface layer formed at an outer periphery of said ring, said surface layer including a first iron nitrided region and an adjacent region having greater hardness formed by a reaction between said metallic particles and nitrogen.

9. A method of forming a powdered metal piston ring comprising the steps of:

blending a powder of between approximately 0 and 1.5 percent carbon, between approximately 0 and 0.5 percent of one of copper and nickel, between 1 and 50 percent of a metallic powder having a high affinity for nitrogen, and a balance of predominantly iron;

pressing said blended powder into a general shape of said ring; sintering said blended powder after said pressing step and forming a structure including a dispersion of separate and discrete metallic particles consisting of said metallic powder;

machining said ring into a final shape; nitriding an outer periphery of said ring to create a hard surface layer having a first region of iron nitride and an adjacent region of greater hardness because of a reaction between said metallic particles and nitrogen.

**5,773,735  
DENSE FINE GRAINED MONOTUNGSTEN CARBIDE-  
TRANSITION METAL CEMENTED CARBIDE BODY AND  
PREPARATION THEREOF**

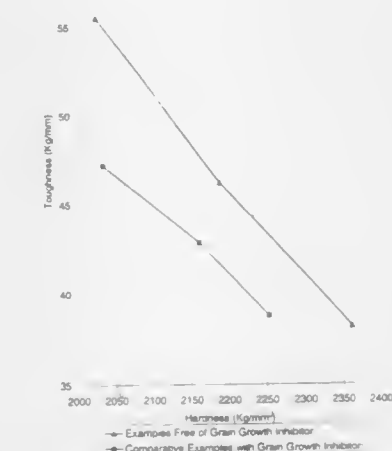
Ellen M. Dubensky, and Robert T. Nilsson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 20, 1996, Ser. No. 752,513

Int. Cl.<sup>6</sup> C22C 29/00

U.S. Cl. 75—240

22 Claims



1. A cemented carbide body comprising: (1) a transition metal binder phase, the transition metal of the transition metal binder phase being selected from the group consisting of iron, nickel, cobalt and mixture thereof, and (2) WC grains dispersed within the metal binder phase, the WC grains having an average WC grain size of at most about 0.5 micrometer in diameter wherein 99 percent by number of the WC grains have a diameter of at most about 0.8 micron and at least about 50 percent by volume of the WC grains are angular grains and the body: (1) contains an amount of the transition metal ranging from about 3 percent to about 18 percent by weight of the body, (2) is essentially free of grain growth inhibitors and (3) is essentially pore free.

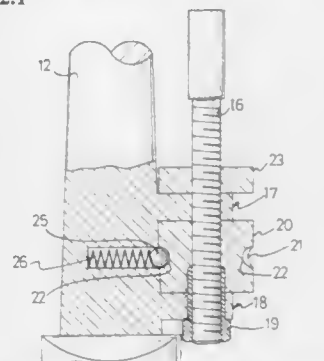
**5,773,736  
ADJUSTING DEVICE FOR A DRUMSTICK FRAME**  
Wu-Hong Hsieh, No. 46, Lane 59, Chungcheng Rd., Luchou Hsiang, Taipei Hsien, Taiwan

Filed Jul. 28, 1997, Ser. No. 901,046

Int. Cl.<sup>6</sup> G10D 13/02

U.S. Cl. 84—422.1

2 Claims



1. An improved adjusting device for a drumstick frame, said drumstick frame having two side rods, a pivot disposed between the two side rods, a pedestal mounted on the pivot to connect a drum pedal with a drumstick, said adjusting device being mounted on one of the side rods and connected with said pivot for adjusting the operation of the drumstick, said adjusting device comprising: a spring connected to the pivot;

a screw rod connected with the spring;  
a rating nut and a fixing nut received on the screw rod, said rating nut defining a circumferential recess therein, said circumferential recess further defining at least one cavity therein for receiving a steel ball;  
an elastic element disposed in said side rod; and  
the steel ball retained between the elastic element and the circumferential recess of the rating nut.

5,773,737

## VISUAL DISPLAY FOR DIGITAL AURAL MUSICAL INSTRUMENT TUNING

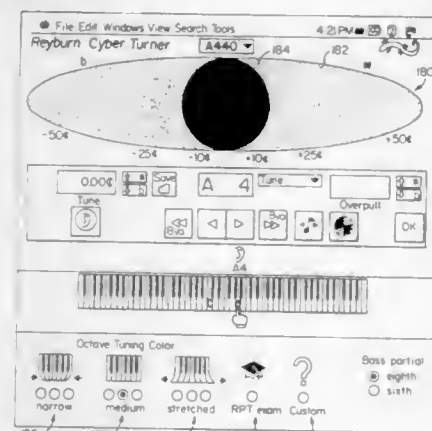
Dean Laurence Reyburn, Cedar Springs, Mich., assignor to Reyburn Piano Service, Inc., Cedar Springs, Mich.

Division of Ser. No. 663,653, Jun. 14, 1996, Pat. No. 5,719,343. This application Jun. 10, 1997, Ser. No. 872,022

Int. Cl.<sup>6</sup> G10G 7/02

U.S. Cl. 84—454

28 Claims



1. A method for graphically and dynamically displaying a pitch difference of an unknown pitch relative to a desired pitch, said method comprising the steps of:

- determining an unknown pitch;
- comparing said unknown pitch to a desired pitch to determine a pitch difference;
- displaying a spinner at a center of a display if said pitch difference is within a first defined pitch window relative to said desired pitch;
- maintaining said spinner stationary if said pitch difference is equal to zero;
- rotating said spinner clockwise if said pitch difference is greater than zero but less than an upper boundary of said first defined pitch window;
- rotating said spinner counterclockwise if said pitch difference is less than zero but greater than a lower boundary of said first defined pitch window;
- setting the rate of rotation in proportion to the extent said unknown pitch is different than zero;
- moving said spinner in a first direction off of said center if said pitch difference exceeds said upper boundary of said first defined pitch window;
- moving said spinner in a second direction off said center if said pitch difference exceeds said lower boundary of said first defined pitch window; and
- setting the amount of movement of said spinner proportional to the extent said unknown pitch exceeds said upper and lower boundaries of said first defined pitch window.

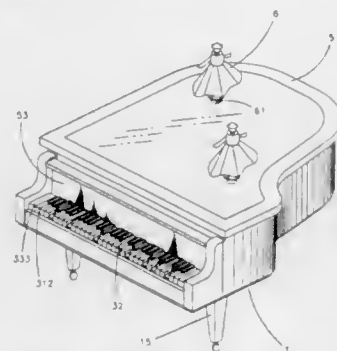
5,773,738  
PIANO TOY HAVING AUTOMATIC PLAYING KEYS  
Jin-Long Chou, 10F, No.218, Sec.3, Da-Tung Road, Hsi-Chih Chen, Taipei Hsien, Taiwan

Filed Jun. 24, 1997, Ser. No. 881,199

Int. Cl.<sup>6</sup> G10C 3/00; 3/12

U.S. Cl. 84—600

2 Claims



1. A piano toy having automatic playing keys, comprising a bracket having an identical shape of a real piano and the peripheral of said bracket being provided with a fixing flange, said bracket being provided with a plurality of positioning posts which are equal to the gears of a gear set, said bracket being provided with a plurality of U-shape mounting sockets for rotationally mounting a linkage and connecting shaft thereon, said bracket being provided with a plurality of fixing columns, a plurality of supporting legs being provided thereunder for supporting said bracket;

a gearbox being configured by a mounting plate, a motor, a gear set, and a linkage set, said gear set and said linkage set being disposed between said mounting plate and said bracket and which are releasably connected by fixing posts, said gear set being configured by a plurality of gears to configure a reduced transmission ratio, the first terminal gear being connected with said linkage set and which in turn drives a connecting shaft of said keyboard;

a keyboard assembly being configured by a keyboard having a plurality of keys and each of said keys being extended with a shaft which is in turn received respectively within a receiving groove of a lower fixing board, the overall length of said keys being equal to the span between the end tabs disposed at both ends of said lower fixing board, each of said keys being provided with a cam which has semi-circular shape, an upper fixing board and said lower fixing board being fixedly connected by means of screws which are locked together and are jointly fixed to said bracket, a connecting shaft including a plurality of sectors, the left and right sides being a shaft and a driving gear, each of said driving gear being aligned with a corresponding key and which is provided with a recess, each of said recess being disposed in different position;

a controlling circuitry being configured by a printed circuit board, a battery set, a microswitch and a speaker, said printed circuit board being fixedly disposed onto said bracket and being electrically connected with said battery set, said microswitch, the speaker and a motor; and

an upper cover being tightly enclosed onto inner portion of said peripheral flange of said bracket, said upper cover including a front recess having a pair of shaft holes thereof, a pivoting shaft of a fallboard being pivotally received within said shaft holes of said front recess, said pivotal shaft of said fallboard being extended with a pressing tab which is projected over the external portion of said front recess, said upper cover further including a rear recess having a plurality of positioning posts thereof and which can be releasably engaged with said fixing columns of said bracket;

wherein by the combination of those described components, when said microswitch is triggered and a power is supplied to said controlling circuitry, wherein said motor is rotated and which in turn will drive said gear set and said connecting rod such that said connecting shaft is rotated, by the corporation of said recess of said driving gear and said cam disposed

under said key, said key can be moved upward during the rotation of said driving gear, meanwhile, said speaker is also broadcasting music.

5,773,739

## TONE GENERATING METHOD AND DEVICE BASED ON SOFTWARE

Motoichi Tamura, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

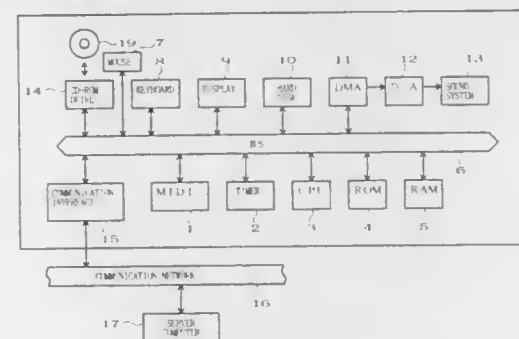
Filed Nov. 20, 1996, Ser. No. 752,924

Claims priority, application Japan, Nov. 22, 1995, 7-328428; Jan. 17, 1996, 8-024747

Int. Cl.<sup>6</sup> G10H 7/00

U.S. Cl. 84—603

19 Claims



1. A tone generating device comprising:  
a supply unit for supplying performance information;  
a storage unit for storing therein a plurality of programs including a tone generating program; and  
a general-purpose arithmetic processing unit capable of concurrently executing the programs stored in said storage unit in a parallel manner, said arithmetic processing unit causing a plurality of internal interrupt signals to be generated within a predetermined time period and activating the tone generating program to generate tone data based on the performance information that is supplied by said supply unit in response to the internal interrupt signals.

wherein the tone generating program activated by said arithmetic processing unit includes an adjusting mechanism for variably adjusting an amount of a tone waveform to be generated, in such a manner that a predetermined number of samples of tone data can be cumulatively formed within the predetermined time period by tone data forming operations being effected only when the tone generating program is actually activated by said arithmetic processing unit.

5,773,740

## COMPUTERIZED MUSIC APPARATUS PROCESSING WAVEFORM TO CREATE SOUND EFFECT, A METHOD OF OPERATING SUCH AN APPARATUS, AND A MACHINE-READABLE MEDIA

Hirofumi Mukaino, and Takeshi Mori, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Sep. 18, 1996, Ser. No. 716,552

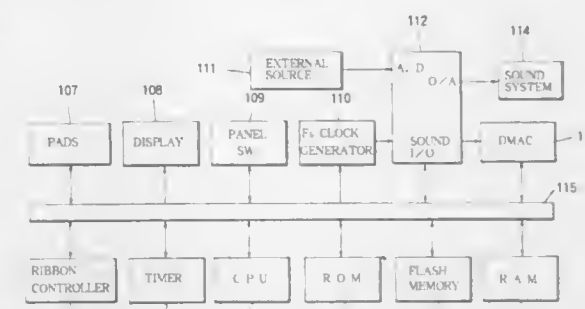
Claims priority, application Japan, Sep. 20, 1995, 7-266252; Sep. 20, 1995, 7-266253

Int. Cl.<sup>6</sup> G10H 7/00

U.S. Cl. 84—605

56 Claims

1. A computerized music apparatus installed with a program which is executed to perform reproduction of a musical tone by reading out a corresponding waveform, the apparatus comprising:  
storage means for storing a plurality of waveforms corresponding to different musical tones, each waveform being stored in the form of a sequence of amplitude value data arranged at a given sampling period;



designating means for designating at least one of the stored waveforms to command reproduction of a corresponding one of the musical tones;

switching means operable by a user for switching the reproduction of the musical tone between a normal mode and an optional mode; and

reproducing means allotted with relatively high performance under the normal mode for concurrently reading out a number of the designated waveforms from the storage means according to the program so as to concurrently reproduce the number of the corresponding musical tones, otherwise the reproducing means being allotted with relatively low performance under the optional mode such that the number of the musical tones concurrently reproduced under the optional mode is reduced as compared to that under the normal mode while the reproducing means is allotted with additional performance under the optional mode for digitally processing the designated waveform to impart a specific sound effect to the reproduced musical tone according to the program.

5,773,741

## METHOD AND APPARATUS FOR NONSEQUENTIAL STORAGE OF AND ACCESS TO DIGITAL MUSICAL SCORE AND PERFORMANCE INFORMATION

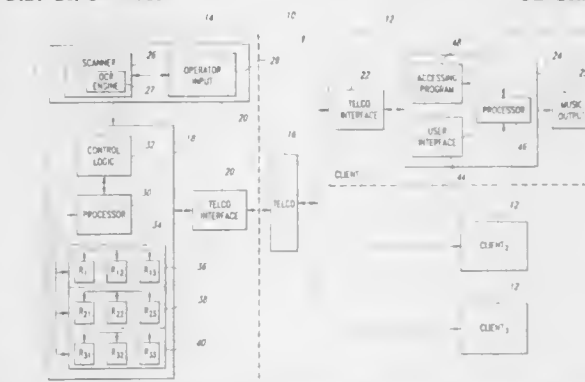
Marlin J. Eller, and Brent R. Mills, both of Seattle, Wash., assignors to Sunhawk Corporation, Inc., Seattle, Wash.

Filed Sep. 19, 1996, Ser. No. 715,978

Int. Cl.<sup>6</sup> A63H 5/00; G04B 13/00; G10H 7/00

U.S. Cl. 84—609

32 Claims



1. A method for use in processing a musical score in a computer system, comprising the steps of:

- identifying a plurality of types of information for use in collectively defining particular elements of said musical score, said elements being sequentially related with respect to said musical score, wherein each of said plurality of types of information is common to more than one of said elements of said musical score;
- establishing a first record in said computer system, said first record including first information of a first of said types regarding a first of said elements;
- establishing a second record in said computer system, said second record including second information of a second of said types regarding said first element; and





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5,773,747

## TWO-PIECE AMMUNITION FLICK RAM

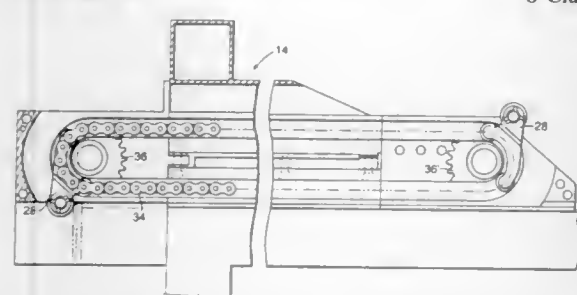
Robert Michael Tellander; Kenneth W. Hummel, both of Coon Rapids, and Jeffrey F. Kezar, St. Paul, all of Minn., assignors to United Defense, LP, Arlington, Va.

Continuation of Ser. No. 646,206, May 8, 1996, abandoned.

This application Oct. 21, 1997, Ser. No. 954,809

Int. Cl.<sup>6</sup> F41A 9/43

U.S. Cl. 89—47



8 Claims

1. A rammer mechanism implemented in a gun system to cooperatively operate with a loading and conveying system for ammunition to be conveyed to a gun tube, the rammer mechanism comprising:

- means for transferring ammunition into a gun recoil slide;
- a motor to initiate the rammer mechanism;
- means for sensing pawls on the rammer mechanism;
- means for positively locating positions of said pawls; and
- means for uniformly accelerating the ammunition to enable uniform acceleration at various angles of inclination of the gun tube; and said means for transfer, said motor to initiate, said means for sensing; said means for positively locating and said means for uniformly accelerating having mechanical cooperation such that said pawls which are attached to a chain on the rammer are mobilized to push ammunition forward into the gun tube and further that an electric sensor senses and locates said positions of the pawls.

5,773,748

## LIMITED-LIFE CARTRIDGE PRIMERS

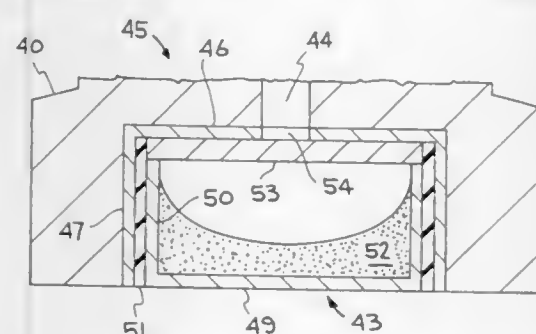
Daniel M. Makowiecki, Livermore, and Robert S. Rosen, San Ramon, both of Calif., assignors to Regents of the University of California, Oakland, Calif.

Filed Jun. 14, 1995, Ser. No. 490,407

Int. Cl.<sup>6</sup> B41F 1/40

U.S. Cl. 102—205

22 Claims



1. An improved cartridge primer having a casing containing at least a quantity of inorganic reactive multilayer material, said inorganic reactive multilayer material having time-dependent interdiffusion of elements occurring at interfaces of the multilayer material which reduces stored energy and reactivity thereby producing a limited-life of the cartridge primer.

5,773,749

## FREQUENCY AND VOLTAGE DEPENDENT MULTIPLE PAYLOAD DISPENSER

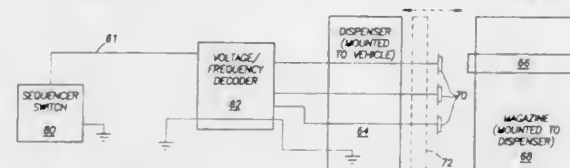
Beryl W. Cotton, III, Lexington, and David Wallace, Austin, both of Tex., assignors to Tracor, Inc., Austin, Tex.

Filed Jun. 7, 1995, Ser. No. 486,241

Int. Cl.<sup>6</sup> F42C 11/00; B64D 1/00

U.S. Cl. 102—217

18 Claims



7. An adapter for coupling a voltage/frequency source to a payload dispenser unit with a plurality of dispenser holes, the adapter comprising:

- (a) an input for receiving an input signal from the voltage/frequency source;
- (b) a plurality of outputs for providing a plurality of signals to the plurality of dispenser holes; and
- (c) a plurality of filters providing the plurality of outputs, the plurality of filters all coupled to the input and passing selective signals based on the input signal.

5,773,750

## ROCK FRAGMENTATION SYSTEM USING GOLD SCHMIDT METHOD

Hwan-Young Jae, Seoul; Chwi-Hwa Park, Namdong-gu; Hak-Won Kim, Kyunggi-do; Byung-Ro Song, Seoul; Woo-Sik Kim, Seoul, and Dae-Seung Kim, Seoul, all of Rep. of Korea, assignors to Soosan Special Purpose Vehicle Co., Ltd., Chungnam, Rep. of Korea

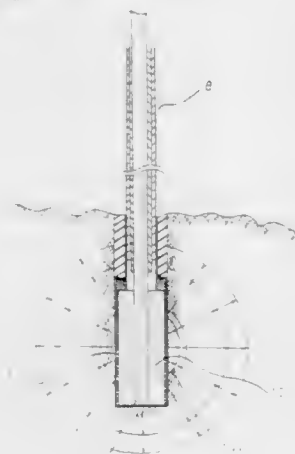
Filed Oct. 22, 1996, Ser. No. 735,112

Claims priority, application Rep. of Korea, Oct. 30, 1995, 1995-38020

Int. Cl.<sup>6</sup> F42B 3/00

U.S. Cl. 102—302

5 Claims



1. A rock fragmentation system employing a thermite reaction of aluminum and a metal oxide, wherein said system comprises:

- a capacitor bank connected to a switch;
- a first and second charge dump connected to said capacitor bank;
- a high voltage electric power supply for generating a high voltage to charge said capacitor bank;
- an electrode assembly connected to said switch whereby high current is fed to said electrode assembly when said high voltage is discharged from said capacitor bank and wherein said electrode assembly includes at least two electrodes at a lower end of said assembly wherein said at least two electrodes have positioned between said at least two electrodes a composition comprising a mixture of aluminum (Al) and CuO

in a ratio of Al: CuO sufficient to provide a blasting force upon rapid introduction of electrical energy of the Al/CuO mixture.

mer; and said alkylsilicone defoaming agent comprises methylsilicone as said defoaming agent; and  
(d) projecting said projectile of step against said desired location for producing impact indicia on said desired location.

5,773,751

## SHELL FOR GUN WITH SMOOTH-BORE BARREL

Lennart Fredriksson, Lindesberg, and Arne Wikström, Skellefteå, both of Sweden, assignors to Bofors Liab AB, Lindesberg, Sweden

PCT No. PCT/SE95/00364, § 371 Date Nov. 8, 1996, § 102(e) Date Nov. 8, 1996, PCT Pub. No. WO95/30875, PCT Pub. Date Nov. 16, 1995

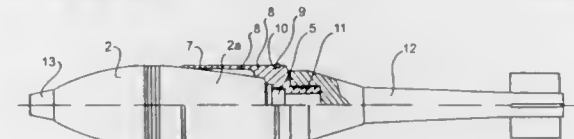
PCT Filed Apr. 5, 1995, Ser. No. 737,290

Claims priority, application Sweden, May 10, 1994, 9401625

Int. Cl.<sup>6</sup> F42B 12/20; 14/06

U.S. Cl. 102—473

17 Claims



1. A method for converting mortar shells into shells for use in smooth-bore gun barrels having an interior surface, the mortar shells including a warhead having a front end, a rear end, a tail fin, and a propellant charge, said method comprising the steps of:

- attaching a guide casing to at least the rear end of the warhead, said guide casing including an outside surface, said guide casing supporting at least the rear end of the warhead and being adapted for use with the smooth-bore gun barrel that the converted shells are to be fired from; and
- attaching a bourrelet to said outside surface of said guide casing for sealing between the converted shells and the interior surface of the smooth-bore gun barrel that the converted shells are to be fired from.

5,773,752

## COATING COMPOSITIONS WITH IMPACT MARKING CAPABILITY AND METHOD

Kevin L. Blume, 12707 W. 43rd St., Nickerson, Kans. 67561, and Bo Inge Hakan Gimvang, St. Augustine, Fla., assignors to Kevin L. Blume, Nickerson, Kans.

Filed Feb. 2, 1996, Ser. No. 595,752

Int. Cl.<sup>6</sup> F42B 12/40

U.S. Cl. 102—513

4 Claims

1. A method for producing impact indicia on a desired location comprising the steps of:

- (a) providing a desired location;
- (b) providing a projectile;
- (c) disposing on said projectile of step (b) a composition for producing impact indicia; said composition for producing impact indicia comprises a dispersing agent; a thickening agent; a defoaming agent; a coloring pigment; and an emulsifying agent; said dispersing agent is an acid; said thickening agent is a cellulose polymer; said defoaming agent is a silicone defoaming agent; said coloring pigment is a coloring powder selected from the group consisting of an inorganic coloring powder, an organic coloring powder, and mixtures thereof; and said emulsifying agent includes a wax emulsifying agent; said acid is selected from the group consisting of polyacrylic acid, polymethylacrylic acid, and mixtures thereof; said cellulose polymer comprises an alkylcellulose polymer wherein the alkyl in said alkylcellulose polymer includes from 1 to 10 carbon atoms; said silicone defoaming agent comprises an alkylsilicone agent wherein the alkyl in said alkylsilicone agent includes from 1 to 10 carbon atoms; said inorganic coloring powder comprises iron oxide; and said wax emulsifying agent comprises polytetrafluoroethylene; and said alkylcellulose polymer comprises methylcellulose poly-

5,773,753

Patent Not Issued For This Number

5,773,754

## GAS GENERATING AGENT WITH TRIHYDRAZINO TRIAZINE FUEL

Yo Yamato, Hyogo, Japan, assignor to Daicel Chemical Industries, Ltd., Osaka, Japan

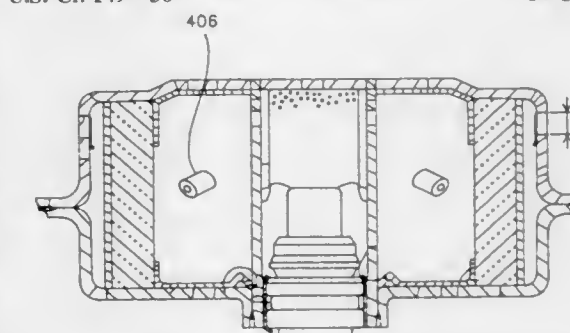
Filed Jun. 3, 1997, Ser. No. 867,740

Claims priority, application Japan, Jun. 3, 1996, 8-139964

Int. Cl.<sup>6</sup> C06B 43/00

U.S. Cl. 149—36

14 Claims



1. A composition of a gas generating agent for an air bag, said composition comprising: trihydrazinotriazine as a fuel, and an oxyacid salt, a metal oxide, a metal dioxide (a metal double oxide) or a mixture thereof as an oxidizing agent.

5,773,755

## PROTECTIVE CASING STRUCTURE FOR ELECTRONIC APPARATUS

Misao Iwatare, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

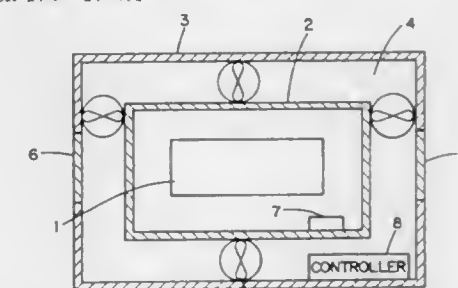
Filed May 31, 1996, Ser. No. 656,074

Claims priority, application Japan, Jun. 1, 1995, 7-134903

Int. Cl.<sup>6</sup> H05K 7/20

U.S. Cl. 174—17 VA

6 Claims



1. A double wall casing structure for electronic apparatus having heat generating elements radiating heat through said casing structure, comprising:

- an inner casing for housing said apparatus;
- an outer casing surrounding said inner casing in spaced relationship so as to define an air layer extending all about and between said inner casing and said outer casing, said air layer being defined by an inner surface of a wall of said outer



casing and an outer surface of a wall of said inner casing and being normally insulated from an external ambient air;  
at least one fan provided in said air layer, said at least one fan being selectively operative responsive to first predetermined sensed temperature conditions for steering and circulating air in said air layer; and  
at least one, selectively openable valve which is controlled in response to second predetermined sensed temperature conditions provided in said wall of said outer casing, said second predetermined sensed temperature conditions being set higher than said first predetermined sensed temperature conditions whereby upon sensed temperature in said outer casing wall reaching said second predetermined temperature conditions said valve opens so as to communicate said air layer with said external ambient air.

5,773,756

# **LIGHTWEIGHT AND DURABLE UTILITY PULL BOX FOR PROTECTING SPLICES AND JUNCTIONS OF UNDERGROUND COAXIAL CABLES, ELECTRICAL WIRES AND OPTICAL FIBERS**

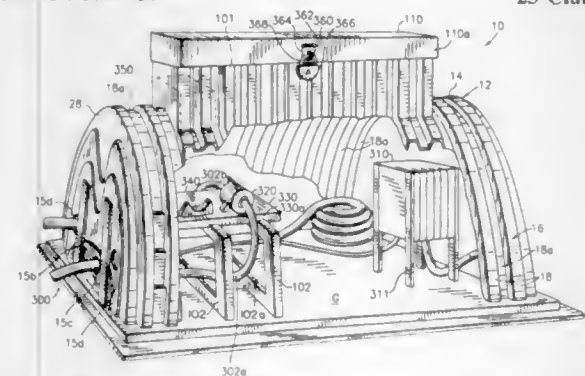
Robert J. DiTullio, Brookfield, Conn., assignor to Cultec, Inc., Brookfield, Conn.

Continuation-in-part of Ser. No. 236,409, May 2, 1994, Pat. No. 5,419,838. This application May 25, 1995, Ser. No. 450,613

Int. Cl.<sup>6</sup> H02G 9/00

U.S. Cl. 174—37

23 Claims



1. A gallery for storing splices or junctions for electrical, telephone, coaxial cable or optical fiber cable, comprising:  
an elongated main body portion made of durable and lightweight plastic material for providing chemical resistance and structural integrity, having an arch-shaped configuration defining an enlarged inner enclosure for storing communication equipment such as a splice or junction for electrical, telephone, coaxial cable or optical fiber cable, having side walls formed with stiffening ribs and groove corrugations forming upstanding outer laterally extending strengthening ribs alternating with inwardly protruding grooves, and having end walls enclosing an end of the enclosure in the elongated main body portion; and means for forming at least one inlet opening in the elongated main body portion for receiving the electrical, telephone, coaxial cable or optical fiber cable for splicing or joining together and storing inside the enlarged inner enclosure of the elongated main body portion;

wherein said gallery further comprises a raised top wall having four sides defining a raised top manhole portal to accommodate a person's body for accessing the communication equipment or connection in the enlarged inner enclosure, the raised top wall having stiffening ribs and groove corrugations forming columnar upstanding outer laterally extending strengthening ribs alternating with inwardly protruding grooves, and wherein said gallery also further comprises a removable cover dimensioned to close the raised top manhole portal and lockable in place to close securely the raised top manhole portal.

## **5,773,757 RETRACTABLE ELECTRICAL POWER CORD APPARATUS**

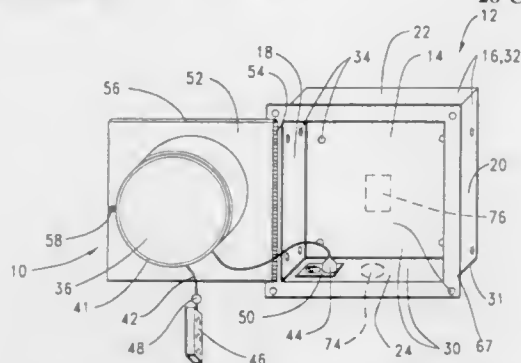
John A. Kenney, Oklahoma City, and Harold F. Rehman, Kingfisher, both of Okla., assignors to Pembroke Properties, Inc., Oklahoma City, Okla.

Filed Aug. 12, 1996, Ser. No. 695,581

Int. Cl.<sup>6</sup> H01H 9/02

U.S. Cl. 174—53

28 Claims



1. A retractable electric power cord apparatus comprising:  
a frame adapted to be mounted substantially flush to a wall;  
a door pivotally connected to said frame;  
an electrical power cord sized to fit within said frame and behind said door; and  
a spool for extending and retracting said electrical power cord, said spool sized to be positioned within said frame and attached to an inside of said door such that an axis of rotation of said spool is substantially perpendicular to said door and remains substantially perpendicular to said door when said door is pivoted relative said frame wherein said axis of rotation of said spool varies with respect to said frame.

5,773,758

## **DEVICE FOR FITTING AND GRIPPING OF A FLEXIBLE CABLE IN A CYLINDRICAL ORIFICE AND HIGH-VOLTAGE TRANSFORMER EQUIPPED WITH THIS DEVICE**

Thierry Coutureau, Dole, and Marguerite Tharradin, Velesmes, both of France, assignors to Thomson Multimedia S.A., Courbevoie, France

PCT No. PCT/FR95/01428, § 371 Date Nov. 12, 1996, § 102(e) Date Nov. 12, 1996, PCT Pub. No. WO96/14646, PCT Pub. Date May 17, 1996

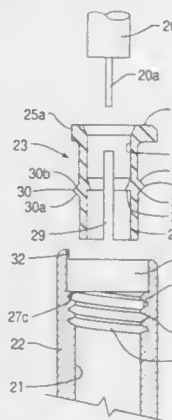
PCT Filed Oct. 27, 1995, Ser. No. 666,487

Claims priority, application France, Nov. 7, 1994, 94 13331

Int. Cl.<sup>6</sup> H02G 3/18

U.S. Cl. 174—65 R

8 Claims



1. Device for the mechanical assembly of a flexible cable in a cylindrical orifice comprising:  
a cable grip member to hold the cable in the cylindrical orifice and prevent its being pulled out axially.

said cable grip member having a first helical thread for engaging a second helical thread in said cylindrical orifice, enabling the cable grip member to be clicked axially into the cylindrical orifice before insertion of the flexible cable, but enabling axial extraction of the flexible cable only by unscrewing the cable grip member from the orifice.

wherein said cable grip member comprises a head and a tubular part with two diametrically opposite axial slots running from a free end of the tubular part to near the head, this tubular part carrying said first helical thread whose diameter is slightly larger than the diameter of the cylindrical orifice, such that insertion of said cable grip member without said flexible cable into said cylindrical orifice requires an elastic radial deformation of the tubular part, this deformation being made possible by the presence of the axial slots and being facilitated by respective slopes of said first helical thread on the tubular part and of said second helical thread in said cylindrical orifice, and wherein extraction of said cable grip member once said flexible cable is inserted therein requires unscrewing said cable grip member from said cylindrical orifice.

5,773,759

## **SCREW-TYPE CONDUIT FITTING FOR A SHIELDED CABLE**

Richard Hahlützel, Birmensdorf, Switzerland, assignor to Agro AG, Hunzenschwil, Switzerland

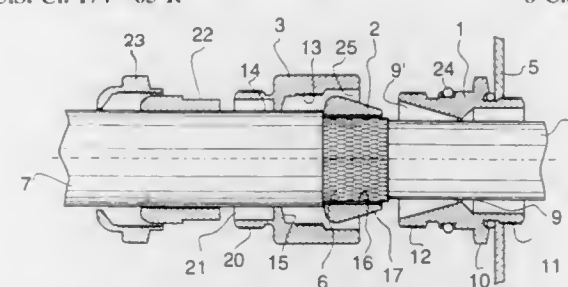
Filed Dec. 9, 1996, Ser. No. 762,363

Claims priority, application Switzerland, Dec. 7, 1995, 3460/95

Int. Cl.<sup>6</sup> H02G 3/18

U.S. Cl. 174—65 R

8 Claims



1. A conduit fitting for a shielded cable, the fitting comprising: a first part having a hole through which the cable can pass, said hole having a conically expanding shape, said first part having means for electrically connecting to a housing;

a second part having a hole with a cylindrical inner surface through which said cable can pass and formed as an annular sleeve of the cable, said second part being formed of electrically conductive material;

a third part having a hole through which said cable can pass, said third part being connectable to said first part and having a first fastening means for being axially tensioned with said first part, said second part being positionable to fit between said first and third part, said second part having a sheathing surface conically tapering and positionable against said conically expanding shape of said hole of said first part, said second part also being formed in a zig-zag shape for reducing a cross section of said hole of said second part when said first and third part are increasingly axially tensioned.

5,773,760

## **UNIVERSAL ELECTRICAL COVER**

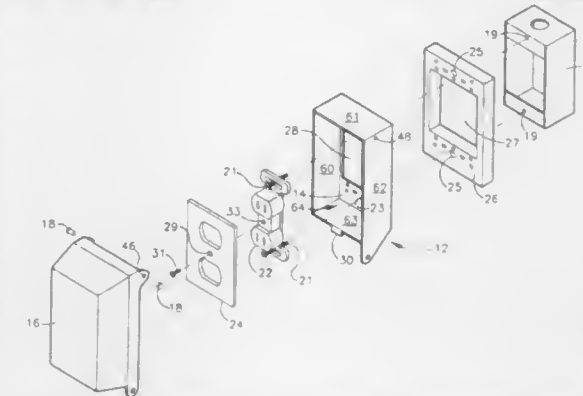
Thomas S. Stark, Coral Springs, Fla., and Thomas J. Gretz, Clarks Summit, Pa., assignors to Arlington Industries, Inc., Scranton, Pa.

Filed Jun. 6, 1995, Ser. No. 468,017

Int. Cl.<sup>6</sup> H02G 3/14

U.S. Cl. 174—66

6 Claims



1. A universal electrical box cover for a pre-existing electrical outlet box which pre-existing electrical outlet box has a front face with screw receiving holes therein comprising:

an open front enclosure having four side walls surrounding a chamber and having a back plate that has an opening surrounded by a solid periphery, said opening allowing passage of wiring from the pre-existing box to said enclosure chamber, said periphery having a front surface and a rear surface adapted to having a pre-existing electrical device mounted on said front surface of said periphery which attaches said enclosure and said periphery and said electrical device to said pre-existing electrical outlet box and further adapted to having a pre-existing receptacle plate mounted thereon by being attached to said electrical device;

a gasket of a size to overlay a substantial portion of said rear surface of said periphery of said back plate; and

a front cover member mounted on said enclosure to cover said electrical device, said cover having at least one cord outlet for allowing closure of said cover while one or more cords are installed.

5,773,761

## **METHOD FOR PRODUCING AN ELECTRIC CABLE AND AN ELECTRIC CABLE**

Jukka Hartikainen, Eero Kaakko, both of Kirkkonummi; Pertti Korhonen, Espoo; Torsten Hagelberg, Pikkala; Pekka Luoma, Kirkkonummi; Hannu Mäkinen, Espoo; Seppo Saarinen, Siuntio, and Eero Tanner, Masala, all of Finland, assignors to Nokia Kaapeli OY, Helsinki, Finland

PCT No. PCT/FI94/00139, § 371 Date Nov. 29, 1995, § 102(e) Date Nov. 29, 1995, PCT Pub. No. WO94/24679, PCT Pub. Date Oct. 27, 1994

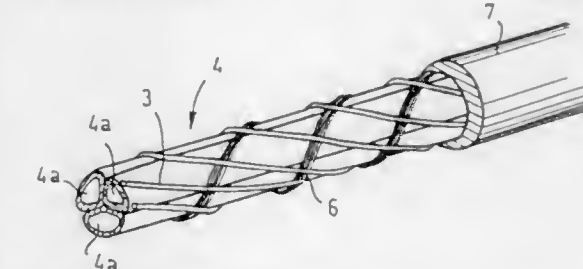
PCT Filed Apr. 13, 1994, Ser. No. 532,711

Claims priority, application Finland, Apr. 14, 1993, 931671

Int. Cl.<sup>6</sup> H01B 7/32

U.S. Cl. 174—113 R

9 Claims



6. An electric power cable comprising:  
at least one insulated, longitudinally extending conductor.

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a protective coating surrounding said at least one insulated conductor, and

a short-circuiting layer interposed between said at least one insulated conductor and said protective coating,

said short-circuiting layer comprising a plurality of individual short-circuiting wires extending substantially parallel to one another, in spaced relation along said at least one insulated conductor and a contact member positioned substantially transversely with respect to said short-circuiting wires and connecting said short-circuiting wires electrically, said contact member being constituted as a bundle of a plurality of individual further wires helically wound relative to said short-circuiting wires and in contact with said short circuiting wires at separate and distinct contact regions along the cable, said short circuiting wires being electrically isolated from one another except at said contact regions with said further wires.

5,773,762

## CABLE WITH VARYING CELL ARRANGEMENTS

Lawrence William Orr, Jr., Simpsonville; Sharon Ledbetter Adams, Greenville, and Kathryn R. Hammett, Piedmont, all of S.C., assignors to Woven Electronics Corporation, Mauldin, S.C.

Filed Apr. 4, 1996, Ser. No. 628,035

Int. Cl.<sup>6</sup> H01B 7/04

U.S. Cl. 174-117 M

24 Claims



1. An insulating fabricated wire harness assembly for use in restricted areas of varying sizes, which includes a fabricated cable carrying a plurality of insulated conductors having exposed first and second ends:

said cable being comprised of interengaged yarns forming a trunk portion comprising at least first and second sections and a tube portion, opposed ends of each of said portions terminating with a break out area, said at least first and second sections of said trunk portion having a plurality of cells with said second section of said trunk portion having a greater number of said cells than said first section and said tube portion having a single cell,

said plurality of insulated conductors being arranged to extend through said cells and continuously along the length of said cable, with said first exposed ends extending outwardly from said break out area of said tube portion and said second exposed ends extending outwardly from said break out area of said trunk portion,

said yarns forming said cable being disposed relative to each other to provide at least 90% cover whereby said cable provides mechanical and thermal insulation for said insulated conductors.

5,773,763  
MOUNTING DEVICE FOR COMMUNICATION RJ  
ELEMENTS (PATCH PANEL) WHICH HAS A REAR  
CABLE GUIDE STRIP AND A FRONT CABLE GUIDE  
RING

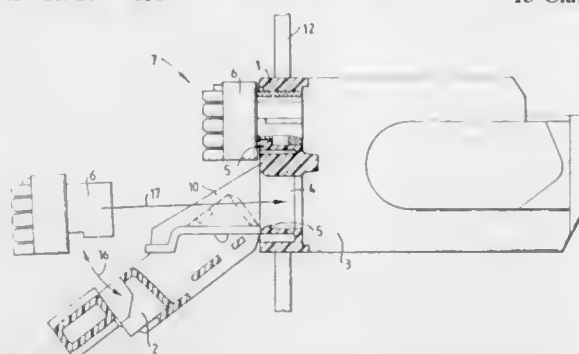
Peter Stachulla, Cheltenham, Great Britain, assignor to Krone Aktiengesellschaft, Berlin-Zehlendorf, Germany  
Filed Sep. 28, 1995, Ser. No. 535,775

Claims priority, application Germany, Nov. 3, 1994, 44 40 455.7

Int. Cl.<sup>6</sup> H01B 7/00

U.S. Cl. 174-135

13 Claims



10. A mounting device for voice/data communication RJ connection elements, comprising:

a mounting panel having a front side and a rear side and having receiving portions adjacent to recesses defined in said mounting panel, said recesses defining a space for the RJ connection elements;

a rear-side cable guiding portion removably connected to said rear side of said mounting panel at a location corresponding to said receiving portions, said mounting panel including latch lug means and said rear side cable guiding portion including latch lug receiving means, said latch lug means and said latch lug receiving means cooperating for supporting said rear side cable guiding portion in a first position, connected to said mounting panel and supporting said rear side cable guiding portion in a swung out position, from said first position, connected to said mounting panel; and

front-side cable guiding means connected to said front side for guiding cables at the front side of said mounting panel, said front-side cable guiding means comprising a lateral cable guiding ring removably connected to said front side of said mounting panel.

5,773,764

## PRINTED CIRCUIT BOARD PANEL

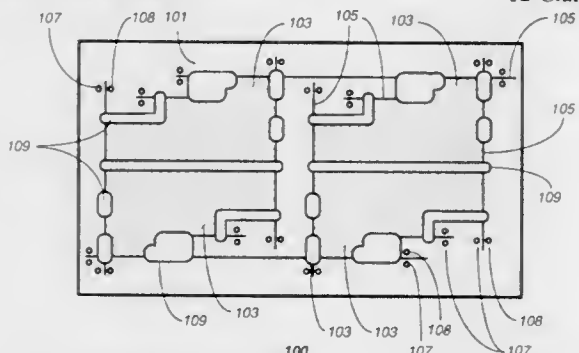
Richard P. von Vajna, Fort Worth, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 28, 1996, Ser. No. 697,664

Int. Cl.<sup>6</sup> H05K 1/00

U.S. Cl. 174-250

12 Claims



1. A circuit board panel having first and second sides comprising: at least first and second circuit board portions;

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the circuit board panel having a score-line formed in one of its sides defining a boundary between the first and second circuit board portions;

a pair of electrical test pads, disposed on the circuit board panel; and

an electrical runner electrically connected to the pair of electrical test pads, the electrical runner being interrupted by the score-line.

5,773,765

ATTACHMENT MECHANISM FOR A VIBRATORY  
ARTICLE TRANSPORTING APPARATUS

Takashi Sashiki, and Yoshio Iwamoto, both of Shiga, Japan, assignors to Ishida Co., Ltd., Kyoto, Japan

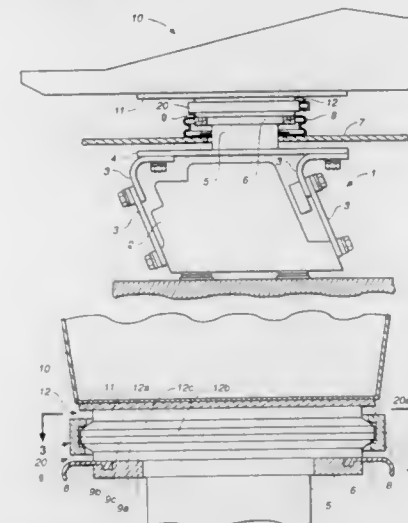
Filed Apr. 10, 1995, Ser. No. 419,125

Claims priority, application Japan, Apr. 15, 1994, 6-102195

Int. Cl.<sup>6</sup> G01G 13/00; 13/16

U.S. Cl. 177-25.12

12 Claims



1. A mechanism for attaching a feeder to a vibrator, said mechanism comprising:

a lower engaging member attached to said vibrator;

an upper engaging member attached to said feeder and being placed on and engageable with said lower engaging member, said lower and upper engaging members each having a peripheral part;

an annular clamp which has an inner surface and is wrapped around and engageable with said peripheral parts of said lower and upper engaging members together, at least one selected from the peripheral part of said lower engaging part and the peripheral part of said upper engaging member being tapered with respect to said inner surface of said annular clamp; and

a diameter controlling device attached to said clamp for reducing a diameter of said clamp and thereby causing said lower and upper engaging members to be pressed against each other.

5,773,766

## AXLE LOAD SCALE

Hidetoshi Kinoshita, Yokohama, and Tadayori Makino, Tokyo, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 20, 1997, Ser. No. 803,102

Claims priority, application Japan, Mar. 6, 1996, 8-048494

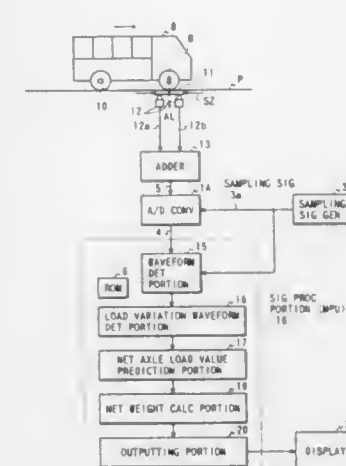
Int. Cl.<sup>6</sup> G01G 19/22; 19/52; 19/02

U.S. Cl. 177-25.13

6 Claims

1. An axle load scale comprising:

load signal generation means having a platform receiving an axle load of a vehicle running for generating a load signal in accordance with the received axle load, the platform having a



predetermined size in a running direction of the vehicle and the axle load showing a sinusoidal variation with running of the vehicle, thereby the load signal showing a pulse waveform including a top slope reflecting a portion of a waveform of the sinusoidal variation and a net weight of the axle load;

sinusoidal variation prediction means for predicting the sinusoidal variation from the load signal; and

net axle load prediction means comprising minimal and maximal value detection means for detecting maximal and minimal values of the predicted sinusoidal variation and averaging means for averaging the detected maximal and minimal values to provide an average value as the predicted net axle load value.

5,773,767

## SCALE WITH RESET EXTENDER BAR

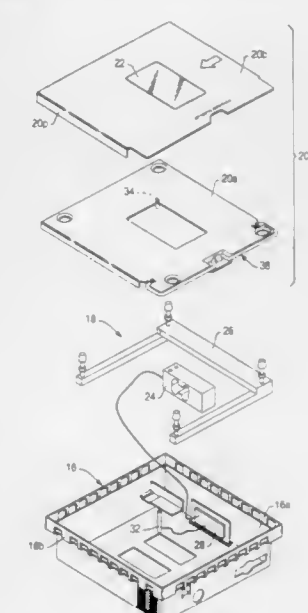
Donald A. Collins, Jr., Lawrenceville, and Rex A. Aleshire, Buford, both of Ga., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 27, 1996, Ser. No. 703,831

Int. Cl.<sup>6</sup> G01G 21/28; 21/00; 19/56

U.S. Cl. 177-126

18 Claims



1. A weighing scale comprising:

a housing having a top opening defined by a vertically extending top flange;

weighing means mounted inside said housing for measuring weight;

a scale platform disposed inside said top opening and resting by gravity atop said weighing means;



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a proximity sensor mounted inside said housing adjacent to said platform for detecting proximity of said platform adjacent thereto, and operatively joined to said weighing means; and an elongate lift bar pivotally mounted atop said platform for movement between a stowed position in said platform and an upright deployed position for extending size of said platform and for permitting manual lifting of said platform away from said proximity switch and return adjacent thereto for resetting said weighing means.

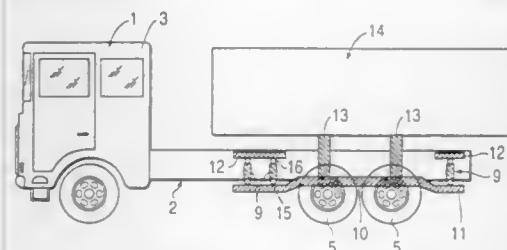
5,773,768  
TRANSPORT AND ON-BOARD WEIGHING DEVICE  
WITH A STABILIZER THEREOF

Henry Nuyts, Retie, Belgium, assignor to NV Nuyts Orb, Oud-Turnhout, Belgium  
Continuation-in-part of Ser. No. 169,664, Dec. 20, 1993, Pat. No. 5,578,798. This application Nov. 25, 1996, Ser. No. 756,015

Claims priority, application Belgium, Dec. 22, 1992, 09201128; Sep. 24, 1993, 09300998  
Int. Cl.<sup>6</sup> G01G 19/08

U.S. Cl. 177—136

16 Claims



1. A weighing device for weighing a load carried by a vehicle, which device is adapted to be mounted to a vehicle, comprising:
  - at least two weighing frames for supporting a load to be weighed, wherein the weighing frames are adapted to be suspended from a chassis of the vehicle;
  - a plurality of connecting elements, each having an upper connecting joint and a lower connecting joint, wherein one of the upper and lower joints of each of the connecting elements is adapted to be operatively connected to the chassis and the other of the upper and lower joints is connected to one of the weighing frames to thereby suspend the weighing frames from the chassis, each of the connecting elements carrying a load cell for measuring the force exerted thereto by the weighing frame; and
  - a stabilizer adapted to be operatively connected to the chassis and the weighing frames for selectively immobilizing the weighing frames relative to the chassis.

5,773,769  
TWIN LEVER KEY WITH HORIZONTAL FINGER PADS  
FOR CODE TRANSMISSION

Christopher W. Raymond, 619 Cherry Valley Rd., Princeton, N.J. 08540

Filed Nov. 23, 1994, Ser. No. 344,128

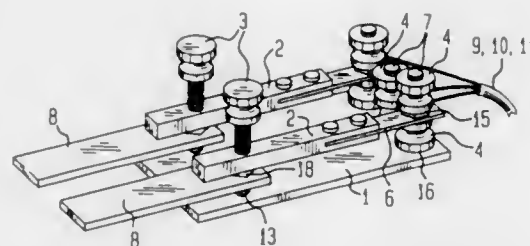
Int. Cl.<sup>6</sup> H01H 21/86

U.S. Cl. 178—104

9 Claims

1. A twin lever mechanical key unit with horizontal finger pads for code transmission when used with an electronic iambic keyer, comprising:

- a ground base pad,
- an electrically grounded threaded post with thumb nut attached to said base pad,
- two key arms, each having physical and electrical contacts and an insulated finger key pad,



said key unit operable by downward finger pressure on said insulated finger key pads to close the physical and electrical circuit, opening of the circuit being effected by release of said pressure, in single or in combination of both key arms, thereby generating a predetermined continuous wave code sequence.

5,773,770  
CROSS FLOW PATH EXHAUST MUFFLER

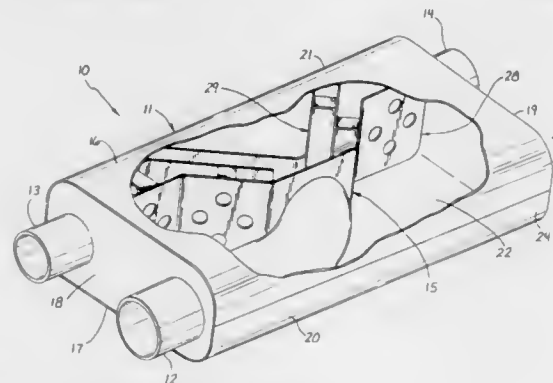
Mack L. Jones, M.A.C. Products, Inc., 43214 Black Deer Loop, Unit 113, Temecula, Calif. 92590-3473

Filed Jun. 11, 1997, Ser. No. 872,814

Int. Cl.<sup>6</sup> F01N 1/08

U.S. Cl. 181—268

2 Claims



1. An exhaust muffler, comprising:
  - a housing, the housing having opposite top and bottom walls, opposite first and second side walls, and opposite forward and rearward end walls that enclose a hollow interior of the housing;
  - means in the form of an inlet tube for conveying exhaust gases into the housing;
  - means in the form of first and second outlet tubes for conveying exhaust gases out of the housing; and
  - means in the form of a baffle assembly within the housing for defining multiple paths for exhaust gases to follow and multiple Helmholtz chambers for the exhaust gases to encounter as the exhaust gases flow through the housing from the inlet tube to the first and second outlet tubes;
- wherein the inlet tube extends through the first side wall to an inner end of the inlet tube that is disposed at a central region of the interior in a position facing away from the forward end wall toward the rearward end wall, the first outlet tube extends through the first side wall, and the second outlet tube extends through the second side wall;
- wherein the baffle assembly includes first and second partitions extending between the top and bottom walls of the housing that define first and second Helmholtz chambers, a first passageway from the inner end of the inlet tube to the first outlet tube, and a second passageway from the inner end of the inlet tube to the second outlet tube; and
- wherein the baffle assembly includes means for splitting the flow of exhaust gases in the first and second passageways, including a first plate extending along the first passageway intermediate the inner end of the inlet tube and the first outlet tube

and a second plate extending along the second passageway, intermediate the inner end of the inlet tube and the second outlet tube.

5,773,771  
APPARATUS FOR PREVENTING UNINTENDED  
MOVEMENT OF ELEVATOR CAR

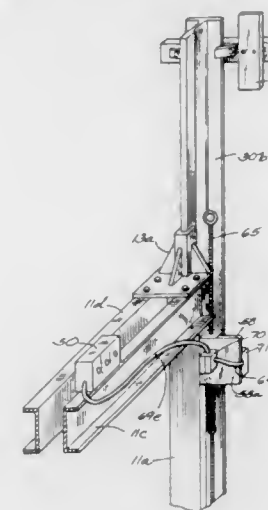
Charles Chatham, 429 N. 97 St., Wauwatosa, Wis. 53226

Filed Jul. 30, 1996, Ser. No. 692,808

Int. Cl.<sup>6</sup> B66B 1/36; 1/00; 1/34

U.S. Cl. 187—282

13 Claims



8. Apparatus for preventing unintended movement of an elevator car positioned for vertical movement between first and second guide rails, and provided with an electric control circuit operable to vertically move the car, said apparatus comprising:

- first and second elongated members extendible outward from opposing ends of said car to engage corresponding complementary support members, respectively joined to said first and second guide rails;
- first and second drive mechanisms attached to said first and second elongated members, respectively, and positioned on opposite sides of said car;
- a rotatable member joined to said first and second drive mechanisms and rotatable in a first direction to operate said drive mechanisms to simultaneously extend said first and second elongated members, and rotatable in the opposite direction to operate said drive mechanisms to simultaneously retract said first and second elongated members;
- switching means coupled to said control circuit and actuatable to enable said control circuit to move said elevator only within a specified zone of displacement above said level; and
- means for actuating said rotatable member and said switching means together, when said car is in said specified zone.

5,773,772  
TRANSFERRING ELEVATOR CABS BETWEEN NON-  
CONTIGUOUS HOISTWAYS

Richard C. McCarthy, Simsbury; Joseph Bittar, Avon; Frederick H. Barker, Bristol; Bruce A. Powell, Canton; Samuel C. Wan, Simsbury; Paul Bennett, Waterbury; Anthony Cooney, Unionville, and John K. Salmon, deceased, late of South Windsor, all of Conn., by Lucy Mary Salmon, legal representative, assignors to Otis Elevator Company, Farmington, Conn.

Filed Jun. 19, 1996, Ser. No. 666,162

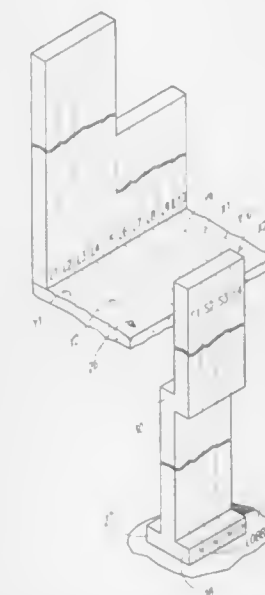
Int. Cl.<sup>6</sup> B66B 9/00; 1/06

U.S. Cl. 187—289

29 Claims

23. An elevator system, comprising:

- a first elevator hoistway;



- a group of second elevator hoistways;
- a plurality of intersecting paths, including a plurality of first, mutually parallel paths, one for each of said first and second hoistways, each extending outwardly from a corresponding one of said hoistways, and a second path extending perpendicularly to said first paths and intersecting each of said first paths;
- a carrier moveable along said paths and adapted to receive an elevator cab from an elevator car frame in a hoistway, and adapted to deliver a cab to an elevator car frame in a hoistway; and
- a LIM for moving said carrier along said paths, said LIM having a primary portion and a secondary portion, one of said portions extending along said paths and the other of said portions being disposed in the shape of an orthogonal cross on said carrier in proximity with said one portion.

5,773,773  
JOYSTICK WITH DETENT MECHANISM FOR TACTILE  
FEEDBACK CENTERING

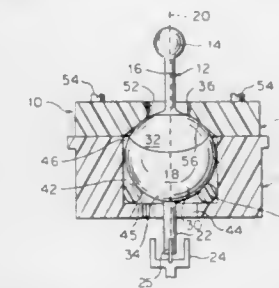
Gilbert L. McCauley, Southfield; James E. Van Hout, Auburn Hills, and Lee M. Dziekan, East Pointe, all of Mich., assignors to Chrysler Corporation, Auburn Hills, Mich.

Filed Nov. 22, 1993, Ser. No. 155,564

Int. Cl.<sup>6</sup> H01H 25/04

U.S. Cl. 200—6 A

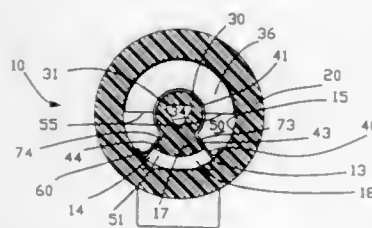
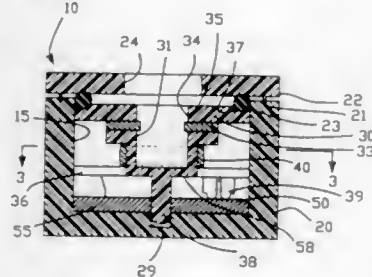
5 Claims



1. A joystick control comprising:
  - a ball having an axis on which a contact stem and joystick stem are aligned, the ball having a spherical portion from which the contact stem extends and a frustoconical portion unitary with and axially aligned with the spherical portion from which the joystick extends;
  - a housing having a socket therein for receiving the ball;
  - a frustoconical surface in the housing complementing the frustoconical surface of the ball and being positioned against the frustoconical surface of the ball; and

a resilient member in the form of O-ring positioned with the socket for engaging the spherical portion and for urging the frustoconical surface of the ball into engagement with the frustoconical surface in the housing whereby the ball is urged to a centered position.

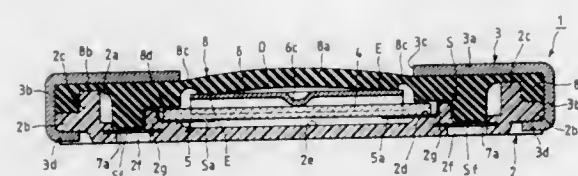
5,773,774  
ELECTRICAL SWITCH WITH OMEGA SHAPED  
RETURN SPRING  
Rajkumar Ramamurthy, Keokuk, Iowa, assignor to Methode  
Electronics, Inc., Chicago, Ill.  
Filed May 2, 1996, Ser. No. 643,017  
Int. Cl.<sup>6</sup> H01H 21/44; F16F 1/18; H01C 10/36  
U.S. Cl. 200—11 K 18 Claims



1. An electrical switch comprising:  
a housing having an aperture and a base, the base including a plurality of electrical circuit elements associated therewith;  
a rotor mounted within the aperture having a brace member protruding from the rotor wherein the rotor is in a centered position when the brace is adjacent a stop abutment;  
a first and a second contact protruding from the rotor and interacting with the plurality of circuit elements, thereby forming alternate circuit paths among the plurality of circuit elements as the rotor is rotated relative to the base;  
a stop abutment attached to the housing protruding into the aperture; and  
an Omega-shaped spring member formed of a flat unitary resilient material mounted on the rotor having a first arm and second arm for abutting against the stop abutment of the housing and the brace member in order to provide a spring force to return the rotor back to the centered position.

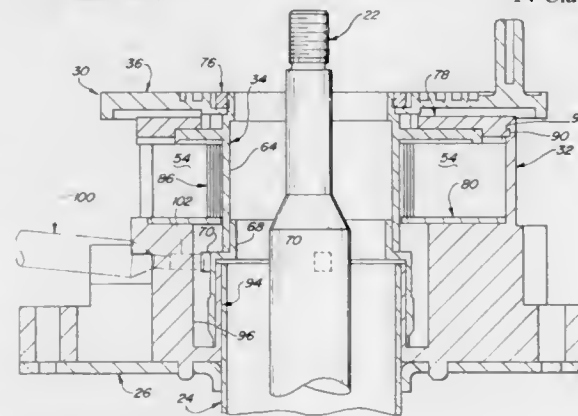
5,773,775  
PRESSURE ACTUATED CIRCUIT BREAKER WITH  
FRANGIBLE PRINTED CIRCUIT BOARD  
Tadamitsu Azema, Miyagi-ken, Japan, assignor to Alps Electric  
Co., Ltd., Tokyo, Japan  
Filed May 8, 1996, Ser. No. 646,655  
Claims priority, application Japan, May 31, 1995, 7-158632;  
May 17, 1995, 7-118658; Jun. 7, 1995, 7-140774; Jul. 31, 1995,  
7-194887  
Int. Cl.<sup>6</sup> H01H 85/00; H01M 2/34; H02H 7/18  
U.S. Cl. 200—61.08 11 Claims

1. A pressure actuated breaker comprising:  
a box formed of an insulating material and defining an opening;  
a pressure receiving member disposed to cover the opening of  
said box, the pressure receiving member being formed from a



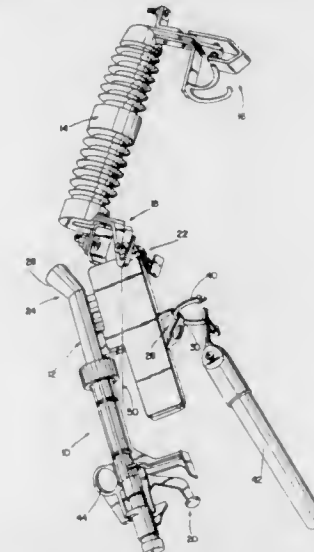
flexible material such that the pressure receiving member is deformed inwardly into the box by external pressure;  
an operating member having a higher rigidity than said pressure receiving member and being located inside of the box adjacent the pressure receiving member such that the operating member is pressed away from the opening by said deformation of said pressure receiving member; and  
a breakable member contained in said box, said breakable member including a substrate and a conductive path formed on the substrate, said substrate being formed from a breakable material and being supported in said box such that when the breakable member is pressed by said operating member with a force exceeding a predetermined value, the substrate is cracked, thereby breaking said conductive path.

5,773,776  
STEERING WHEEL ASSEMBLY  
Michael A. Uleski, Roseville, and Thomas J. Allard, Walled  
Lake, both of Mich., assignors to UT Automotive Dearborn,  
Inc., Dearborn, Mich.  
Filed Oct. 21, 1996, Ser. No. 733,948  
Int. Cl.<sup>6</sup> H01H 3/16; H01R 39/00; B60Q 1/42  
U.S. Cl. 200—61.27 14 Claims



1. A steering wheel assembly comprising:  
a steering wheel mounted on an outer end of a steering shaft on a vehicle;  
a clockspring housing mounted on said vehicle, said steering shaft extending at least partially into said clockspring housing;  
a rotor rotatably mounted in said clockspring housing, said rotor having at least one cancel cam on an outer surface of said rotor, said rotor being driven rotatably by said steering wheel;  
a wire ribbon electrically connecting said steering wheel to said vehicle, said ribbon being coiled about said rotor;  
a turn signal switch mounted on said clockspring housing, said turn signal switch having a cancel member extending generally toward said rotor, said turn signal switch having an activated position and a deactivated position, wherein rotation of said steering wheel causes said cancel cam on said rotor to contact said cancel member on said turn signal switch, thereby returning said turn signal switch from said activated position to said deactivated position.

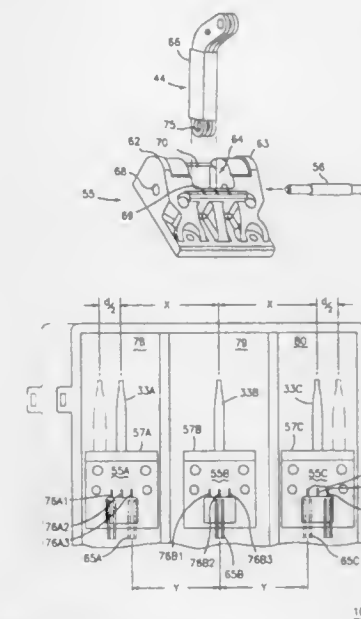
5,773,777  
CIRCUIT-INTERREPTING DEVICE WITH HANDLING  
FEATURES  
Henry W. Scherer, Gurnee, Ill., assignor to S&C Electric Com-  
pany, Chicago, Ill.  
Filed Sep. 13, 1996, Ser. No. 713,937  
Int. Cl.<sup>6</sup> H01H 71/10; 85/04  
U.S. Cl. 218—1 10 Claims



1. A circuit-interrupting device for use in an electrical mounting having spaced apart upper and lower terminals and mounting arrangements, the circuit-interrupting device comprising:  
a housing;  
supporting means carried by said housing for supporting said housing within and for providing electrical connection to the spaced apart upper and lower terminals and mounting arrangements of the electrical mounting, said supporting means further comprising upper support means and lower support means, said lower support means comprising means for pivotally supporting said circuit-interrupting device with respect to the lower terminal and mounting arrangement of the electrical mounting; and  
handling means for permitting handling of said circuit-interrupting device to assist in the insertion and removal of said circuit-interrupting device with respect to said electrical mounting, said handling means comprising being located with respect to said circuit-interrupting device such that lifting of said circuit-interrupting device via said handling means initially results in pivoting of said circuit-interrupting device with respect to said lower terminal and mounting arrangement before continued lifting results in the lifting of said circuit-interrupting device out of said lower mounting arrangement.

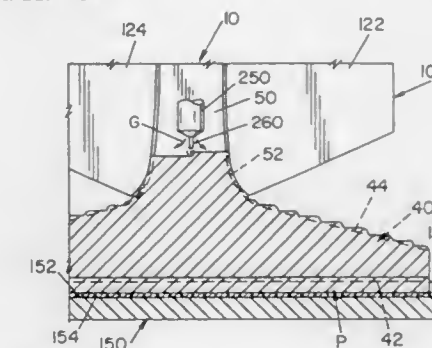
5,773,778  
MODULAR ISOLATION BLOCK FOR CIRCUIT  
BREAKER CONTACT ARMS  
David Arnold, Chester, Conn., assignor to General Electric  
Company, New York, N.Y.  
Filed Apr. 24, 1996, Ser. No. 637,020  
Int. Cl.<sup>6</sup> H01H 33/42; 3/00  
U.S. Cl. 218—153 10 Claims

7. A circuit breaker having an adjustable contact arm block assembly comprising:  
an electrically-insulative circuit breaker enclosure;  
a pair of contacts within said enclosure for separation upon occurrence of an overload condition within an associated electric circuit, one of said contacts being attached to a contact arm assembly;  
an operating mechanism arranged for separating one of said contacts to interrupt said electric circuit;  
a contact arm isolation block comprising:



- a molded plastic support;  
means on a bottom of said support for connecting with said contact arm assembly;  
a pair of opposing side pieces integral with said support and upstanding from said bottom, said side pieces defining a first recess therebetween for supporting a first circuit breaker link connect or associated with a first circuit breaker having a first ampere rating and a second recess between said side pieces for supporting a second circuit breaker link connect or associated with a second circuit breaker having a second ampere rating, said first ampere rating being greater than said second ampere rating.  
8. The circuit breaker of claim 7 wherein said first circuit breaker link connector and said second circuit breaker link connector are attached to a circuit breaker operating mechanism.

5,773,779  
METHOD AND SYSTEM FOR WELDING RAILROAD  
RAILS  
Michael J. Morlock, Cleveland Heights, Ohio, assignor to The  
Lincoln Electric Company, Cleveland, Ohio  
Continuation-in-part of Ser. No. 802,935, Feb. 21, 1997. This  
application Oct. 15, 1997, Ser. No. 950,408  
Int. Cl.<sup>6</sup> B23K 9/09  
U.S. Cl. 219—54 55 Claims



1. A method of gas shielded arc welding steel railroad rails each having a lower base, a vertically extending web and an upper head, said rails having laterally extending end faces longitudinally spaced apart to provide a base gap, a web gap and a head gap to be filled with steel to join said rails, said method comprising the steps of filling said base gap, said web gap and said head gap with a molten steel from a filler metal electrode by a gas shielded electric arc process, said filling said head gap comprising continuously sequentially moving said electrode in laterally opposite directions



in said head gap along paths having starting and ending ends in the corresponding one of said opposite directions for laying beads of filler metal along said paths, and delaying movement of said electrode from the starting end of each said path for a preselected period of time.

5,773,780

**METHOD OF SEVERING BOND WIRES AND FORMING BALLS AT THEIR ENDS**

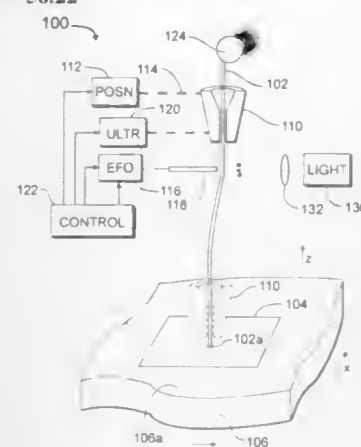
Benjamin N. Eldridge, Danville, and Gaetan L. Mathieu, Dublin, both of Calif., assignors to FormFactor, Inc., Livermore, Calif.

Continuation of Ser. No. 573,945, Dec. 18, 1995, Pat. No. 5,601,740, which is a continuation-in-part of Ser. No. 452,255, May 26, 1995, which is a continuation-in-part of Ser. No. 340,144, Nov. 15, 1994, which is a continuation-in-part of Ser. No. 152,812, Nov. 16, 1993, Pat. No. 5,476,211. This application Feb. 7, 1996, Ser. No. 797,023

Int. Cl.<sup>6</sup> B23K 20/00

U.S. Cl. 219—56.22

20 Claims



1. Method of severing and forming balls at the end of bond wires, comprising:

bonding a bond wire to a terminal of an electronic component with a capillary of a wire bonder;

with an electrode disposed at or beyond an end of the capillary, causing a first electrical discharge to sever the bond wire so that a first portion of the bond wire is bonded to the electronic component and an end of a second portion of the bond wire extends from the end of the capillary of the wire bonder; and after causing the first electrical discharge, causing a second electrical discharge to form a ball at the end of the second portion of the wire.

5,773,781

**PROFILING ELECTRICAL DISCHARGE MACHINING APPARATUS**

Kiyoshi Sawada, Sunto-gun; Shun'ichi Odaka, and Knuji Yamaguchi, both of Oshino-mura, all of Japan, assignors to Fanuc, Ltd., Yamanashi, Japan

Continuation-in-part of Ser. No. 307,778, Oct. 7, 1994, abandoned. This application Apr. 28, 1997, Ser. No. 846,499

Claims priority, application Japan, Feb. 10, 1993, 5-045750

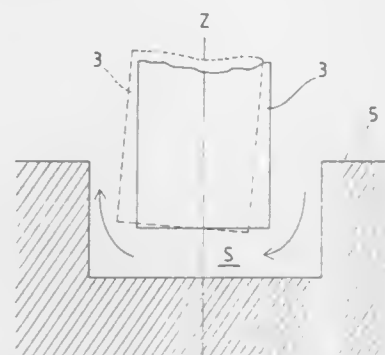
Int. Cl.<sup>6</sup> B23H 1/00; 7/26

U.S. Cl. 219—69.2

5 Claims

1. A profiling electrical discharge machining apparatus which generates an electrical discharge between a tool electrode and a workpiece during a machining operation on the workpiece, comprising:

an oscillating device including an oscillating element generating a short-period oscillation with a minute displacement, attached to the tool electrode, to alternately incline said tool electrode between at least two different inclination positions,



to thereby reciprocally shift a distal end portion of said tool electrode between a first direction and a second direction by a displacement amount smaller than a size of a gap between the tool electrode and the workpiece during the machining operation.

5,773,782

**METHOD AND APPARATUS FOR THE MACHINING OF METAL BY SPARK EROSION**

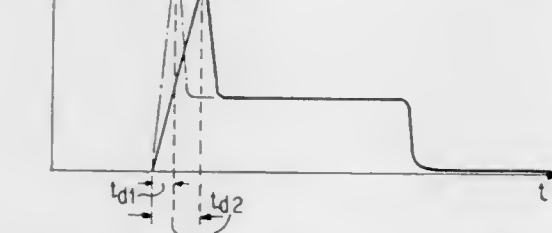
Manfred Storr, and Wilhelm Rehbein, both of Stuttgart, Germany, assignors to Oel-Held GmbH, Stuttgart, Germany

Division of Ser. No. 167,078, Dec. 15, 1993, abandoned. This application Mar. 19, 1997, Ser. No. 820,040

Int. Cl.<sup>6</sup> B23H 1/00; H01B 3/22

U.S. Cl. 219—69.14

4 Claims



1. In a method for the machining of metal by spark erosion which comprises providing a dielectric fluid between an electrode and a metal workpiece and causing a spark discharge between said electrode and said workpiece, the improvement comprising providing as said dielectric fluid a composition consisting essentially of saturated aliphatic hydrocarbons and Solvent Green 5, said saturated aliphatic hydrocarbons containing no more than 1% by weight of aromatic hydrocarbons, said Solvent Green 5 being present in an amount of no more than 1% by weight, whereby the metal erosion rate is improved and wear of a work piece electrode is reduced.

5,773,783

**DOUBLE SKIN COMPOSITE STRUCTURES AND METHODS OF PRODUCING SUCH STRUCTURES**

Hugh Gordon Bowerman, Woking, England, assignor to British Steel plc, Woking, England

PCT No. PCT/GB95/00755, § 371 Date Feb. 14, 1997, § 102(e) Date Feb. 14, 1997, PCT Pub. No. WO95/26854, PCT Pub. Date Oct. 12, 1995

PCT Filed Mar. 31, 1995, Ser. No. 716,333

Claims priority, application United Kingdom, Mar. 31, 1994, 9406439.1

Int. Cl.<sup>6</sup> B23K 11/00

U.S. Cl. 219—117.1

18 Claims

1. A method of sequentially welding a plurality of metallic cross-members in spaced rows to facing plates of a double skin composite panel with the longitudinal axis of each cross-member aligned substantially normal to the facing plates, the method

5,773,785

**PLASMA CUTTING APPARATUS FOR CONCRETE STRUCTURES**

Yuukou Takeuchi, Nagoya; Hitoshi Hayakawa, Tokai; Taku Murakami, Kawasaki; Tooru Fukuda, Kawasaki, and Aki-fumi Hoshino, Kawasaki, all of Japan, assignors to Komatsu Ltd., Tokyo, and Daido Tokushuko Kabushiki Kaisha, Nagoya, both of Japan

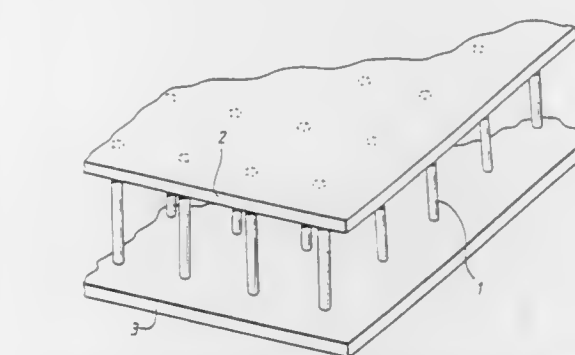
Filed Jun. 7, 1996, Ser. No. 659,988

Claims priority, application Japan, Jun. 7, 1995, 7-140629; Nov. 24, 1995, 7-306296

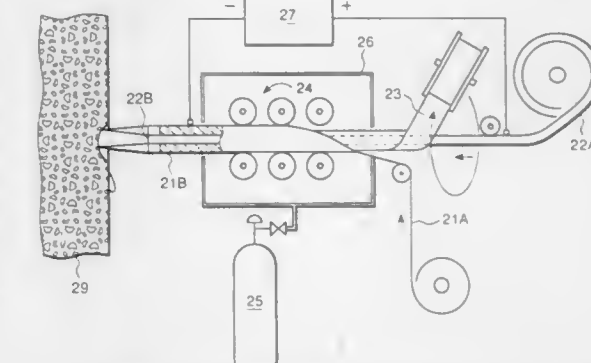
Int. Cl.<sup>6</sup> B23K 10/00

U.S. Cl. 219—121.44

2 Claims



including the steps of causing the facing plates to separate, positioning each cross-member in turn between the facing plates, applying a controlled clamping force to the inner and outer surfaces of each facing plate thereby to hold each facing plate substantially normal to the longitudinal axis of each cross-member and to place the inner surface of each facing plate in intimate contact with the respective end of a cross-member to be welded thereto, subjecting the interfaces between the ends of the cross-member and the facing plates to a welding operation, and controlling the force applied through the facing plates to each end of the cross-member during the course of the welding operation.



1. A plasma cutting apparatus for cutting a concrete structure comprising:

a consumable electrode assembly including a first consumable electrode formed of a metallic hollow rod, a second consumable electrode which is in metallic rod or tube form and is inserted through a hollow portion of the first electrode, an insulator located between the first and second electrodes, and a gas-flowing passage located between the first and second electrodes;

a plasma gas feeder mechanism which is connected to one end of the first electrode for feeding plasma gas into said passage; a plasma power source for applying voltage between the first and second electrodes; and

said insulator is a consumable flux comprising at least one ingredient which is adapted to lower the melting point of the concrete structure for facilitating said cutting.

5,773,786

**METHOD AND DEVICE FOR REDUCING OVERPENETRATION AT THE START OF PLASMA ARC WELDS**

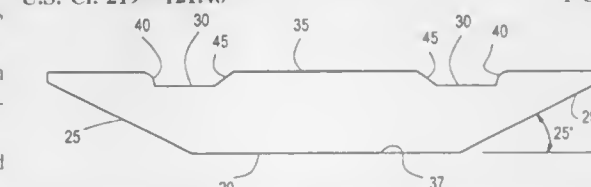
John M. Sanders, Jackson Township, Stark Cty., Ohio; John M. Lehmann, Bedford Cty., Va., and Patrick M. Ryan, Washington Township, Stark Cty., Ohio, assignors to McDermott Technology, Inc., New Orleans, La.

Filed Sep. 17, 1997, Ser. No. 932,596

Int. Cl.<sup>6</sup> B23K 10/00

U.S. Cl. 219—121.46

1 Claim



1. A method of plasma arc welding two workpieces together while reducing weld overpenetration, comprising:

providing two workpieces to be welded together in close proximity to each other;

providing a shim comprising a shim body having top and bottom edges, the body having a generally rectangular shape with opposite ends which taper away from the body and a pair of notches in the top edge of the shim body, one notch located

5,773,784

**ELECTRON BEAM PROCESSING APPARATUS**

Yo Noguchi, and Masashi Yamakawa, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

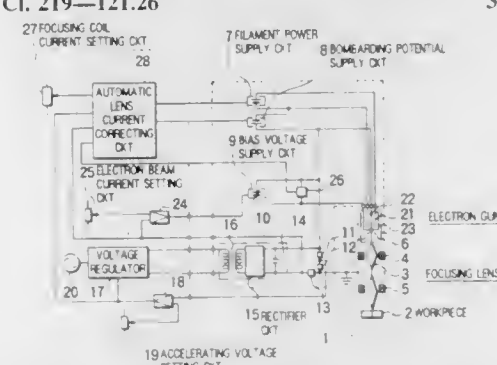
Filed Sep. 26, 1995, Ser. No. 534,237

Claims priority, application Japan, Sep. 30, 1994, 6-237859

Int. Cl.<sup>6</sup> B23K 15/02

U.S. Cl. 219—121.26

3 Claims



over each corner formed between the bottom edge of the shim body and each tapered end, the shim positioned between the workpieces;

starting a plasma arc weld keyhole adjacent to one of the tapered ends of the shim with a plasma arc welder to form a weld between the workpieces;

moving the plasma arc welder longitudinally along the shim from the plasma arc weld keyhole toward the opposite tapered end of the shim;

raising a welding heat input of the plasma arc welder while moving the plasma arc welder longitudinally so that the plasma arc welder is at full weld thickness parameters when the welder has moved past the notch adjacent the tapered end where the weld keyhole was started; and

ending the plasma arc weld at the opposite tapered end of the shim.

5,773,787

## PLASMA-GUN VOLTAGE GENERATOR

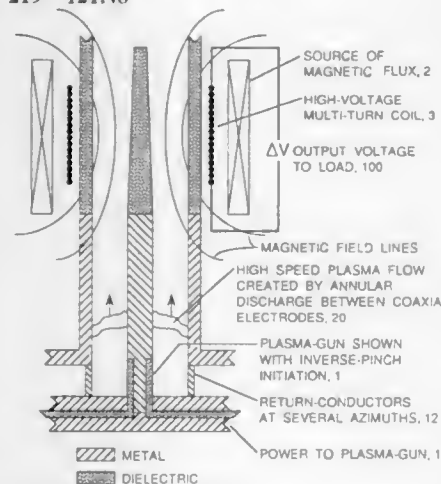
Peter J. Turchi, Worthington, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 28, 1996, Ser. No. 704,044

Int. Cl.<sup>6</sup> B23K 10/00

U.S. Cl. 219—121.48

11 Claims



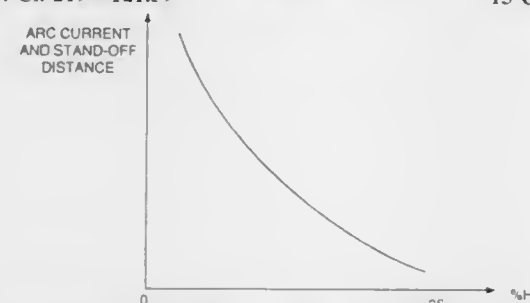
1. A voltage generator comprising:
- a means for providing magnetic flux, having lines of magnetic field oriented along an axis;
- a means for generating a high speed plasma flow along said axis towards said magnetic flux to create a displaced magnetic flux wherein said generating means comprises:
- a housing containing a supply of gas; a plasma gun with coaxial electrode elements that generate an annular, axisymmetric discharge to ionize said gas in said housing and to generate the high speed plasma flow; and a means for supplying power to said plasma gun, wherein said supplying means is a power supply unit that outputs between 10 and 50 kV of electricity level to said plasma gun, said electricity level being selected to cause said plasma flow to have a velocity of between 50 and 100 km/second; and
- a multi-turn coil which is enveloped in said displaced magnetic flux to undergo induction that causes said multi-turn coil to output a voltage signal.

5,773,788  
GAS MIXTURES FOR PLASMA ARC TORCH CUTTING AND MARKING SYSTEMS

Zhipeng Lu, Hanover, and Elizabeth B. Hackett, Lebanon, both of N.H., assignors to Hypertherm, Inc., Hanover, N.H.  
Filed Sep. 3, 1996, Ser. No. 707,247  
Int. Cl.<sup>6</sup> B23K 10/00

U.S. Cl. 219—121.59

13 Claims



1. A method of operating a plasma arc torch for marking a metallic workpiece spaced a distance therefrom, the torch having a body, an electrode and a nozzle mounted in the body so as to define a plasma chamber, a plasma gas flow through the body that forms a pilot arc in the plasma chamber and a transferred arc between the electrode and the workpiece, the nozzle having a central passage and an exit orifice through which the transferred arc passes to the workpiece, the method comprising:
- selecting an amount of hydrogen which is between 0% and 35% of the plasma gas flow and an amount of inert gas which is between 100% and 65% of the plasma gas flow;
- forming the plasma gas flow of a selected mixture of hydrogen and inert gas; and
- selecting at least one of (i) a distance between the torch and the workpiece and (ii) an operating current of the torch based on the amount of hydrogen selected wherein the distance and the operating current are inversely proportional to the amount of hydrogen in the plasma gas flow.

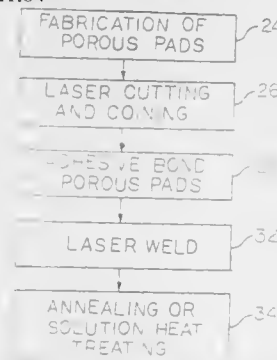
5,773,789

## METHOD OF MAKING AN ORTHOPAEDIC IMPLANT HAVING A POROUS METAL PAD

Deva Devanathan, Warsaw; Steve Krehs; Steve T. Lin, both of Fort Wayne; Clarence M. Panchison, Warsaw, all of Ind., and James J. Morr, Panama City Beach, Fla., assignors to Bristol-Myers Squibb Company, New York, N.Y.  
Continuation-in-part of Ser. No. 609,210, Mar. 1, 1996, Pat. No. 5,672,284, which is a continuation of Ser. No. 228,774, Apr. 18, 1994, Pat. No. 5,504,300. This application May 23, 1996, Ser. No. 652,193  
Int. Cl.<sup>6</sup> B23K 26/00

U.S. Cl. 219—121.64

24 Claims



1. A method of making an orthopaedic implant, comprising the steps of:
- forming an orthopaedic implant body, said body including a supporting surface;
- placing a porous metal pad against said supporting surface of said body; and coupling a laser beam between said porous

metal pad and said body to form a coalescence of metal between said porous metal pad and said body.

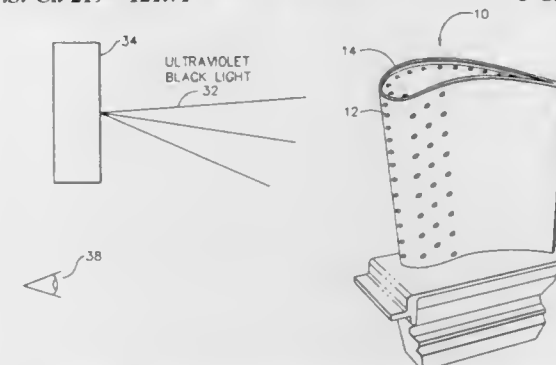
5,773,790

## BEAM BLOCKING MATERIAL AND METHOD FOR BEAM DRILLING AND INSPECTING COOLING HOLES

James R. Moore, and Gary E. Wheat, both of Madisonville, Ky., assignors to General Electric Company, Cincinnati, Ohio  
Continuation of Ser. No. 786,132, Jan. 21, 1997, abandoned.  
This application Sep. 9, 1997, Ser. No. 925,906  
Int. Cl.<sup>6</sup> B23K 26/00

U.S. Cl. 219—121.71

5 Claims



1. A method of forming and inspecting beam drilled holes in a wall of an article with a hollow interior, said method comprising:
- (a) filling the hollow interior with a beam blocking material having fluorescent material,
- (b) beam drilling the holes in the wall through to the hollow interior,
- (c) illuminating a plurality of the holes simultaneously under an ultraviolet black light, and
- (d) inspecting the holes under the ultraviolet black light.

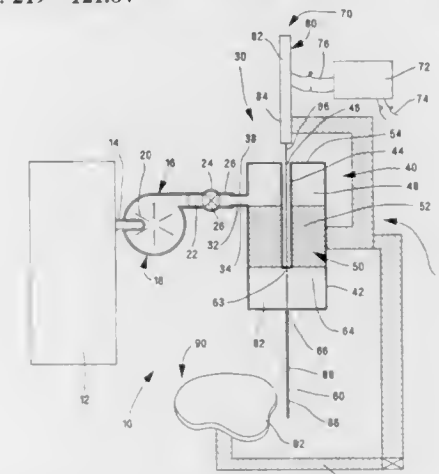
5,773,791

## WATER LASER MACHINE TOOL

Robert Kuykendal, Water Works Inc. 1136 Washington Suite 600, St. Louis, Mo. 63101  
Filed Sep. 3, 1996, Ser. No. 706,787  
Int. Cl.<sup>6</sup> B23K 26/14

U.S. Cl. 219—121.84

10 Claims



1. Apparatus for cutting, shaping, or machining comprising:
- first conduit means for receiving fluid material from a source or reservoir of fluid materials;
- means for pumping said fluid material into a second conduit means containing

means for regulating and controlling the pressure of said fluid material;

third conduit means for transferring said fluid material from said pressure regulating control means to an outlet orifice assembly;

said outlet orifice assembly comprising an inlet valve and a first outer wall and a laterally spaced inner wall inwardly from said first outer wall;

a fluid chamber defined between said inner wall and said first outer wall;

diffuser means located within said fluid chamber to dampen major currents of fluid velocity;

a longitudinally extending opening defined by said inner wall;

means for generating electrical power sufficient for generating a laser beam located adjacent said first outer wall;

said laser beam generating means located adjacent said electrical power supply and adjacent said first outer wall;

alignment means for directing said laser beam into said opening within said inner wall;

means for passing said laser beam through said inner wall and into said lower chamber;

means for directing said laser beam through said orifice means whereby said laser beam is imbedded by a laminar fluid stream of said fluid as it exits from said outlet orifice; and

means for directing said laser beam and said laminar fluid stream to a work piece for machining, cutting, or shaping.

5,773,792

## ARC WELDING MACHINE AND PLASMA CUTTING MACHINE

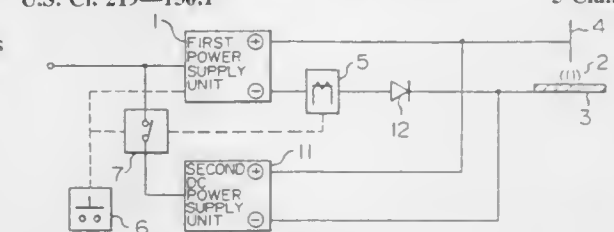
Seigo Hagiwara, Kawanishi, and Kazuo Kimoto, Habikino, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan  
Continuation of Ser. No. 391,095, Feb. 21, 1995, Pat. No. 5,582,751, which is a continuation of Ser. No. 104,892, Aug. 12, 1993, abandoned. This application Apr. 12, 1996, Ser. No. 631,087

Claims priority, application Japan, Aug. 25, 1992, 04-225418; Dec. 22, 1992, 04-340854

Int. Cl.<sup>6</sup> B23K 9/06

U.S. Cl. 219—130.1

5 Claims



1. A power supply apparatus for powering an electrode and a base metal in one of an arc welding machine and a plasma cutting machine, said power supply apparatus comprising:
- first power supply means, connected to said electrode and said base metal, for supplying power between said electrode and said base metal;
- second power supply means, having a descending characteristic and connected to an output of said first power supply means, for applying a high voltage between said electrode and said base metal; and
- applying means for applying the high voltage from said second power supply means between said electrode and said base metal during start of arc, and after generation of arc, for stopping said second power supply means from applying the high voltage and starting said first power supply means to supply the power between said electrode and said base metal.



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5,773,793

IMAGE FIXING ROLLER AND IMAGE FIXING  
APPARATUS CONTAINING THE SAME

Minoru Matsuo, Sagami-hara, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 14, 1996, Ser. No. 645,703

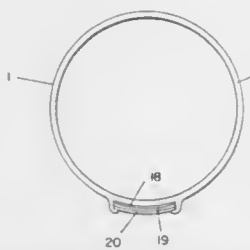
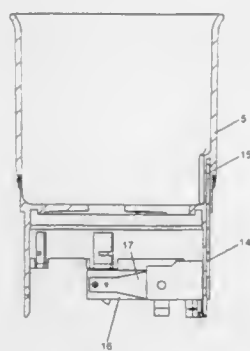
Claims priority, application Japan, May 18, 1995, 7-144127; Feb. 27, 1996, 8-065504

Int. Cl.<sup>6</sup> G03G 15/20

U.S. Cl. 219—216

11 Claims

1. A fixing roller comprising:
- 1) a core,
  - 2) a heating member, and
  - 3) an exothermic phase transition layer which performs phase transitions repeatedly from an amorphous state to a crystalline state, comprising:
    - i) an exothermic phase transition material which has a melting point temperature which is higher than that of a toner fixing temperature; and
    - ii) a protection layer comprising a protective material which is provided on an exterior of said exothermic phase transition layer,wherein at least one of said exothermic phase transition material and said protective layer further comprises a thermally conductive material having a thermal conductivity which is higher than a thermal conductivity of said exothermic phase transition material in a crystalline state when in said exothermic phase transition material and which is higher than a thermal conductivity of said protective material when in said protective layer.



a heat-conducting member arranged laterally on said cup wall and connected to said thermostat switch.

5,773,796

## HEATED ROLLER ASSEMBLY

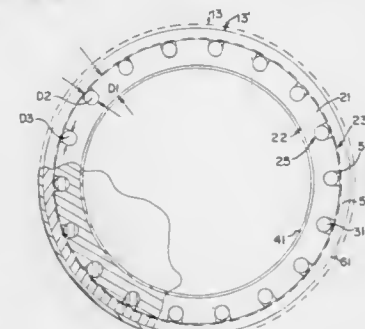
Karl Singer, Barrington Hills; Robert Allen Crimmins, Algonquin, and Lawrence B. LeStange, Elgin, all of Ill., assignors to D&amp;K Custom Machine Design, Inc., Elk Grove Village, Ill.

Filed Feb. 13, 1997, Ser. No. 799,875

Int. Cl.<sup>6</sup> G03G 15/20

U.S. Cl. 219—470

22 Claims



1. A heated roller assembly comprising:
- a cylindrical shell having a plurality of annularly spaced apart parallel longitudinal channels formed in an outer surface of the shell, the channels each having a channel depth;
  - an elongated heat pipe secured in at least some of the channels, each pipe having a pipe diameter equal to or less than the channel depth;
  - a heater means attached to the shell;
  - an electrical connection means for supplying electricity to the heater means.

5,773,797

## INDUCTION HEATED STEAM GENERATING SYSTEM

Motoaki Uemura, Osaka, Japan, assignor to Daihan Co., Ltd., Kita-Ku, Japan

Filed Oct. 18, 1996, Ser. No. 733,868

Int. Cl.<sup>6</sup> H05B 6/10

U.S. Cl. 219—628

10 Claims

1. A steam generating system comprising:

5,773,794

METHOD FOR MAKING PERMANENT DENTAL  
ACRYLIC PARTS WITHOUT THE USE OF A DENTAL  
FLASK

Lilian Zimet-Sternberg, and Alberto Sternberg, both of AV, Garibaldi 1969/603, Montevideo, Uruguay, 11800

Continuation-in-part of Ser. No. 457,463, Jun. 1, 1995, Pat. No. 5,545,875, which is a division of Ser. No. 960,860, Oct. 14, 1992, Pat. No. 5,444,218. This application Dec. 11, 1995, Ser. No. 570,694

Claims priority, application Uruguay, Oct. 23, 1991, U-2974; Oct. 23, 1991, 23305; Dec. 13, 1994, 23869

Int. Cl.<sup>6</sup> A61C 13/14; F27D 7/02

U.S. Cl. 219—440

21 Claims

1. A method for preparing a permanent dental acrylic part for a tooth restoration comprising using a temporary tooth made in wax finishing to obtain an impression of the tooth in rock plaster, filling the impression with heat-curable acrylic, and heat curing the acrylic all without the use of a dental flask.

5,773,795

## ELECTRICALLY HEATABLE WARMING DEVICE

Robert Messmer, Kandel, Germany, assignor to David &amp; Baader—DBK Spezialfabrik Elektrischer Apparate u. Heizwiderstände GmbH, Kandel/Pfalz, Germany

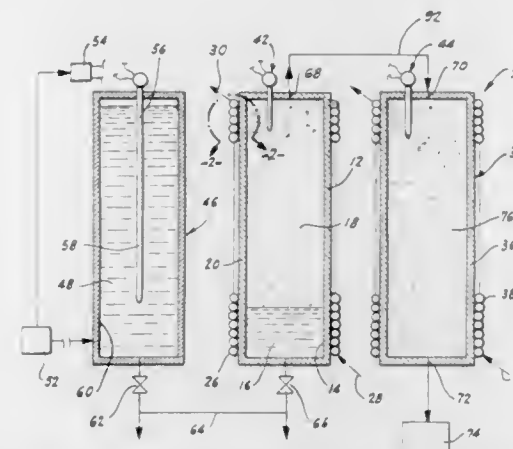
Filed Oct. 13, 1995, Ser. No. 542,637

Int. Cl.<sup>6</sup> F27D 11/02; A47J 27/21

U.S. Cl. 219—441

11 Claims

1. An electrically heatable warming device for warming up substances contained in a receptacle, comprising:
- a cup which serves as a water bath and into which the receptacle can be introduced, the bottom of said cup being a metallic heating plate;
  - an electric heating element of at least one PTC element arranged directly below said heating plate;
  - a thermostat switch at a location close to said heating element to be directly influenced by said heating element; and



- a first container, said first container including a chamber for a liquid said first chamber including an inlet and an outlet, said first container further including wall portion, said wall portion comprising a tank surrounded by a mask of material heated by an induction eddy current, said wall portion further including a layer of insulation surrounding said tank and mask of material;
- a first coil at least partially surrounding said first container;
- first electric means for generating a field in said first coil and an eddy current at said first container wall to produce steam in said first container chamber;
- a second container, said second container including a chamber, said second container including an inlet and an outlet, said second container further including a wall portion, said wall portion comprising a tank surrounded by a mask of material heated by an induction eddy current, said wall portion further including a layer of insulation surrounding said tank and mask of material;
- a second coil at least partially surrounding said second container;
- conduit means for transporting steam from said first container chamber outlet to said second chamber inlet; and
- second electric means for generating a field in said second coil and an eddy current at said second container wall portion to produce super heated steam.

5,773,798

## METHOD OF HEATING FLUID WITH MAGNETS

Mamoru Fukumura, 275, Kubo 6-chome, Kanazawa-shi, Ishikawa 921, Japan

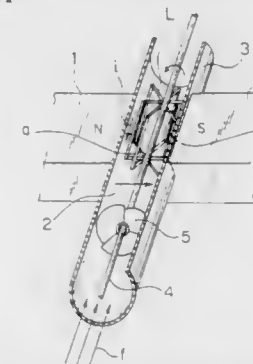
Filed Apr. 15, 1997, Ser. No. 839,247

Claims priority, application Japan, Apr. 17, 1996, 8-120885

Int. Cl.<sup>6</sup> H05B 6/10

U.S. Cl. 219—631

1 Claim



1. A method for heating a fluid flowing through an interior of a pipe having a wall with an inner and outer peripheral surface, said method comprising the steps of:
- locating N and S poles of a magnet adjacent the outer peripheral surface of said pipe on opposite sides, respectively, thereof;

placing heating line means as a conductor in the interior of said pipe between the N and S poles of said magnet and fixing said heating line means to a central shaft extending in the interior of said pipe longitudinally and coaxially with said pipe, said heating line means having portions orthogonally intersecting with a magnetic line of force defined between said N and S poles; and

placing an impeller in the interior of said pipe so as to be rotated by the flow of the fluid flowing through the interior of said pipe, and securing the impeller to said central shaft so that those portions of said heating line means orthogonally intersecting with said magnetic line of force around the inner peripheral surface of said pipe are caused to rotate in unison with said central shaft in a direction perpendicular to the magnetic line of force, whereby said heating line means produces a heat due to induced current generated therein to heat the fluid flowing through the interior of said pipe.

5,773,799

HIGH-FREQUENCY INDUCTION HEATING POWER  
SUPPLY

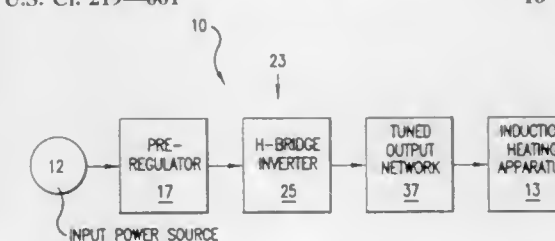
Mark Maxfield, Los Gatos, and Frank A. Doljack, Pleasanton, both of Calif., assignors to Gas Research Institute, Chicago, Ill.

Filed Apr. 1, 1996, Ser. No. 626,068

Int. Cl.<sup>6</sup> H05B 6/06

U.S. Cl. 219—661

16 Claims



1. A method for delivering a high-frequency constant output current to an inductive heating apparatus, the method comprising the steps of:
- converting a variable input voltage to a regulated output voltage with a pre-regulator;
  - inverting the regulated output voltage to generate a high-frequency constant output voltage with an H-bridge inverter;
  - amplifying the constant output voltage with a tuned output network;
  - converting the amplified constant output voltage to the high-frequency constant output current; and
  - delivering the high-frequency constant output current to the inductive heating apparatus.

5,773,800

APPARATUS AND METHOD FOR PERCEIVING OR  
ABSENCE OF A COVER FOR A CONTAINER AND FOR  
DETERMINING A QUALITY OF FOOD IN THE  
CONTAINER IN A MICROWAVE OVEN

Lee-jon Choy, Pusan, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Filed Dec. 12, 1996, Ser. No. 764,124

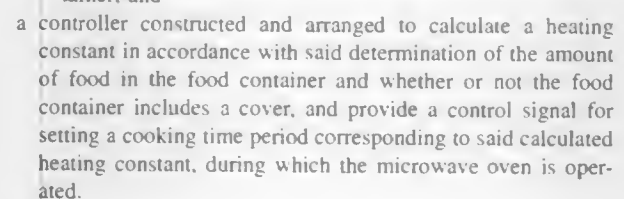
Claims priority, application Rep. of Korea, Mar. 26, 1996, 1996-8414

Int. Cl.<sup>6</sup> H05B 6/68

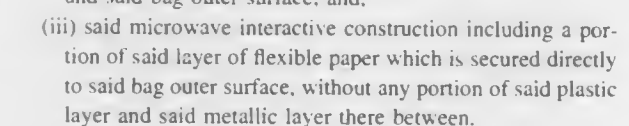
U.S. Cl. 219—707

5 Claims

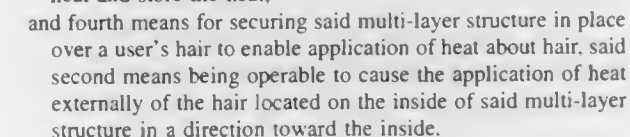
1. In a microwave oven having a cooking space, an apparatus for detecting a cover for a container of food in the cooking space and



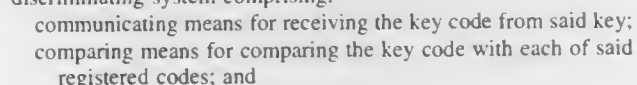
## 12 Claims



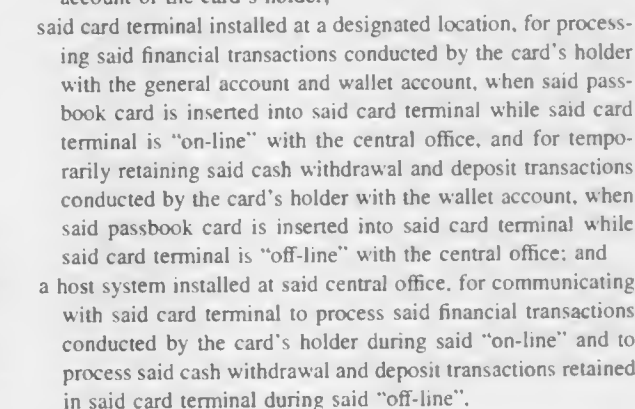
## 55 Claims



### 15 Claims



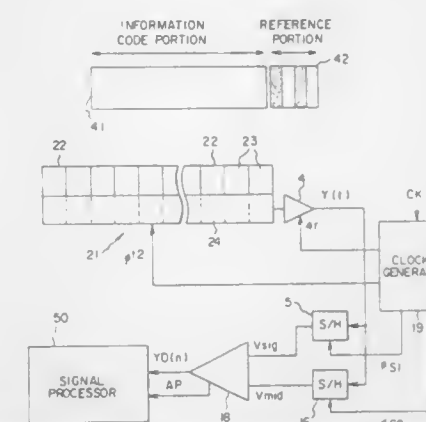
## 20 Claims





# UMI

1. An apparatus for optically reading a combined code pattern including an information code pattern and a reference pattern, each



D) a binarizing circuit, coupled to said first and second sample and hold circuits, for comparing one of said first and second voltages with said intermediate voltage and for outputting a binary code data signal.





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an integrator stage coupled to said photodetector which converts said current into voltage and integrates said voltage over an integration period to provide an output signal; and  
a window comparator which receives said output signal from said integrator stage and compares said output signal to a first threshold and a second threshold to provide a measurement signal defining a pulse having a width which corresponds to the time interval over which said output signal increases from said first threshold to said second threshold, wherein said second threshold is greater than said first threshold.

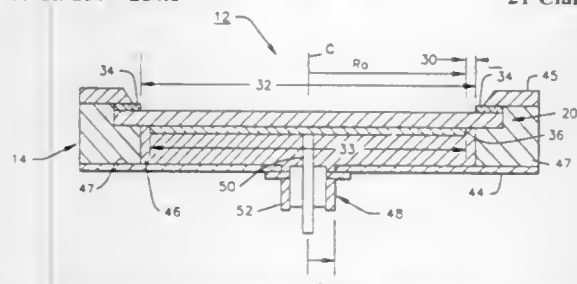
5,773,817

**ULTRAFAST, HIGH VOLTAGE PULSER USING CIRCUMFERENTIALLY ILLUMINATED, LASER-SWITCHED RADIAL TRANSMISSION LINE**  
Lawrence E. Kingsley, Shrewsbury; Maurice Weiner, Ocean; Hardev Singh, Robbinsville, all of N.J., and William R. Donaldson, Pittsford, N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sep. 12, 1996, Ser. No. 712,786  
Int. Cl.<sup>6</sup> H01J 40/14

U.S. Cl. 250—214.1

21 Claims



1. A pulse signal generator apparatus comprising:  
transformer means for storing electrical energy, said transformer means having a circular plate structure which can be coupled to a voltage source; and  
light activated switching means which becomes conductive upon the application thereto of a predetermined type of light energy, said light activated switching means disposed along a surface surrounding said circular plate structure for switching an input electrical pulse of a predetermined peak voltage, injected at a circumferential edge of said circular plate structure onto a peripheral surface of said circular plate structure to produce an output electrical pulse having a substantially higher peak voltage than said predetermined peak voltage of said input electrical pulse, at a center of said circular plate structure of said transformer means.

5,773,818

**DIGITAL SCANNING SYSTEM HAVING DROP-OUT CAPABILITIES AND A COLOR DROP-OUT FILTER THEREFOR**

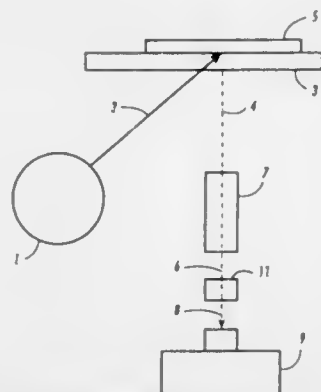
Robert P. Herloski, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 31, 1997, Ser. No. 829,633  
Int. Cl.<sup>6</sup> G01J 3/50

U.S. Cl. 250—226

14 Claims

1. A digital scanning system, comprising:  
an illumination system;  
a document staging system;  
an optical lens system;  
a photosensing system to convert light to electrical signals; and  
a color drop-out filter;  
said illumination system illuminating an original image to be scanned positioned in said document staging system;  
said optical lens system directing light reflected from the original image to be scanned onto said photosensing system;



said color drop-out filter being located in an optical path between the original image to be scanned and said photosensing system;  
said color drop-out filter allowing a predetermined range of wavelengths associated with a visible spectrum of light to pass therethrough and a range of wavelengths associated with infrared radiation to pass therethrough.

5,773,819

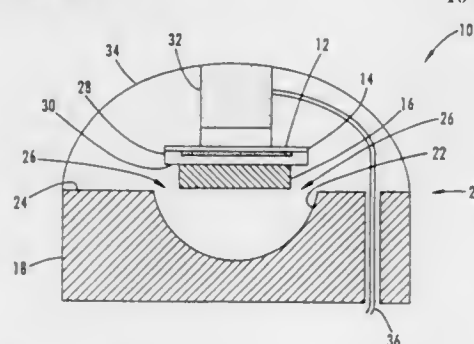
**SINGLE ELEMENT LIGHT DETECTOR**

David P. Ramer, Dayton, Ohio, and Jack C. Rains, Jr., Herndon, Va., assignors to Advanced Optical Technologies, LLC, Chevy Chase, Md.

Filed Jan. 23, 1996, Ser. No. 589,105  
Int. Cl.<sup>6</sup> G01J 1/04

U.S. Cl. 250—228

10 Claims



1. A light detector that provides a response signal based on the intensity of light incident from any direction within a predetermined sector, comprising:

- a base having a surface formed of a diffusely reflective material that defines a reflective region that faces the predetermined sector;
  - a mask spaced a predetermined distance from the reflective region and located between the base and the predetermined sector such that, when light is incident at an angle normal to the base's surface, the mask occludes a portion of the reflective region;
  - a sensor, responsive to incident light, that generates the response signal based on the intensity of light that it receives and that is located to intercept light reflections from the base surface, wherein the base, mask and sensor are configured such that the light detector is substantially uniformly responsive to light from any direction within the predetermined sector,
- wherein the reflective region further includes a hemispherical cavity and the reflective region is defined by the cavity's aperture and a shoulder surrounding the cavity's aperture.

5,773,820

**ROTARY POSITION SENSOR WITH REFERENCE AND GREY SCALES**

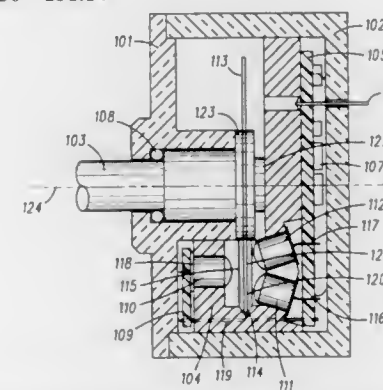
Marc Osajda, and Arnaud Delpoux, both of Toulouse, France, assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 29, 1996, Ser. No. 656,997

Claims priority, application France, Jun. 12, 1995, 95 06902  
Int. Cl.<sup>6</sup> G01D 5/34

U.S. Cl. 250—231.14

8 Claims



1. An optoelectronic sensor compensation system for an optoelectronic sensor having an optical emitter and first and second optical detectors, a first of which detects the amount of light transmitted through a modulating path and the second of which detects the amount of light transmitted through a reference path, the compensation system comprising a reference channel including an input for receiving the output signal of the second detector, a controllable chopping switch for chopping the signal at the input according to an adjustable duty cycle, and a filter for averaging the chopped signal to provide an output of the reference channel, a modulation channel including an input for receiving the output signal of the first detector to provide an output of the modulation channel, a comparator for comparing the outputs of the modulation and reference channels and providing an output indicating whether the outputs of the modulation and reference channels are the same or not, the output of the comparator being used to control the chopping switch so as to try to equalize the outputs of the modulation and reference channels, and a filter for averaging the output of the comparator thereby providing an indication of the ratio between the output signals of the two detectors.

5,773,821

**RADIOLOGICAL SURVEYING AS A METHOD FOR MAPPING FOSSILIZED BONE SITES**

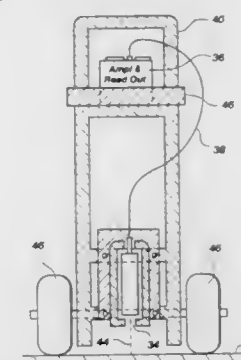
Ramal D. Jones, Sandy, Utah, assignor to University of Utah Research Foundation, Salt Lake City, Utah

Filed Oct. 15, 1996, Ser. No. 731,325

Int. Cl.<sup>6</sup> G01V 5/00

U.S. Cl. 250—253

18 Claims



1. A radiological surveying method, comprising:  
providing a gamma ray detector within a shielded housing having a collimating window, all structured and arranged to provide a shielded line of sight for said detector;

associating said shielded housing with a movable support, structured and arranged to hold said window at a selected orientation and elevation with respect to the surface of the earth when said support is positioned atop said surface;  
positioning said support sequentially at a plurality of measurement positions atop said surface within a survey site, with said line of sight transverse said surface;  
operating said detector at each said measurement position to determine the level of radioactivity at each said measurement position;  
determining the background radioactivity characteristic of said survey site; and  
determining those measurement positions within said survey site characterized by above-background radiological activity.

5,773,822

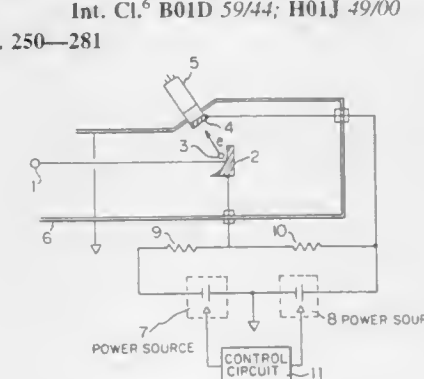
**ION DETECTOR AND HIGH-VOLTAGE POWER SUPPLY**  
Satoshi Kitamura, and Tatsuji Sato, both of Tokyo, Japan, assignors to Jeol Ltd., Tokyo, Japan

Filed Nov. 29, 1996, Ser. No. 757,662

Claims priority, application Japan, Nov. 30, 1995, 7-311960  
Int. Cl.<sup>6</sup> B01D 59/44; H01J 49/00

U.S. Cl. 250—281

4 Claims



1. An ion detector comprising:

- a conversion dynode;
- an ion-accelerating means for accelerating ions toward said conversion dynode such that said ions strike said conversion dynode to release secondary electrons;
- a secondary electrons-accelerating means for accelerating said secondary electrons toward an electron detector;
- said electron detector being equipped with an electron-light transducer for detecting said accelerated secondary electrons;
- a power supply consisting of two dc power sources connected in series at a junction grounded, each of said dc power sources delivering an output voltage capable of being switched between 0 V and a given nonzero voltage, said power supply having a positive-voltage output terminal connected with said electron-light transducer and a negative-voltage output terminal;
- a voltage-dividing means connected between said positive-voltage output terminal and said negative-voltage output terminal of said power supply, said voltage-dividing means having a tapping connected with said conversion dynode; and
- a control means for complementarily operating said two dc power sources in such a way that when one dc power source delivers said given voltage, the other delivers 0 V and vice versa.

VOL

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5,773,823

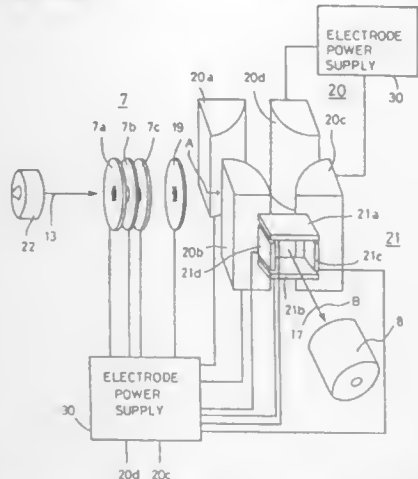
## PLASMA ION SOURCE MASS SPECTROMETER

Tetsumasa Ito, and Yoshitomo Nakagawa, both of Chiba, Japan, assignors to Seiko Instruments Inc., Japan  
Continuation-in-part of Ser. No. 302,503, Sep. 8, 1994, Pat. No. 5,559,337. This application Jan. 16, 1996, Ser. No. 585,953  
Claims priority, application Japan, Sep. 10, 1993, 5-226098; Sep. 29, 1995, 7-254136

Int. Cl.<sup>6</sup> B01D 59/44; H01J 49/00

U.S. Cl. 250—288

35 Claims



1. A plasma ion source mass spectrometer comprising: a plasma ion source for ionizing a sample in a plasma; a vacuum vessel; a sampling interface for introducing the ionized sample into the vacuum vessel; an ion lens disposed in the vacuum vessel for focusing the ionized sample and producing an ion beam; a mass filter disposed in the vacuum vessel for separating ions in the ion beam by mass; a deflector disposed in the vacuum vessel for deflecting the ion beam by a predetermined angle for preventing an interruptive ray from the plasma ion source from entering the mass filter; a scanning electrode disposed in the vacuum vessel for scanning the ion beam; a detector disposed in the vacuum vessel for detecting when an ion has passed through the mass filter and producing an output signal in response thereto; an electrode power supply for applying a scanning signal to the scanning electrode, and applying predetermined voltage signals to the ion lens and the deflector; and a data processing unit for counting output signals from the detector in synchronism with the scanning signal applied by the electrode power supply to the scanning electrode so as to enable the setting of optimum voltage signals to be applied to the ion lens and the deflector and an optimum scanning signal to be applied to the scanning electrode.

5,773,824

## METHOD FOR IMPROVING MEASUREMENT ACCURACY USING ACTIVE LATERAL SCANNING CONTROL OF A PROBE

Edwin Flecha; Martin Allen Klos; Kenneth G. Roessler, all of Boca Raton, Fla., and Robert Marshall Stowell, West Linn, Oreg., assignors to International Business Machines Corporation, Armonk, N.Y.

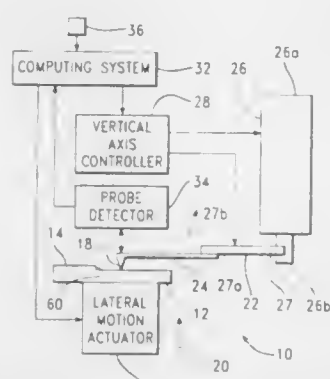
Filed Apr. 23, 1997, Ser. No. 841,538

Int. Cl.<sup>6</sup> H01J 37/28

U.S. Cl. 250—306

19 Claims

1. Apparatus for determining topographical characteristics of a sample surface, wherein said apparatus comprises:  
a probe having a sharp tip movable into engagement with said sample surface in an engagement direction perpendicular to said sample surface;  
a probe detector measuring a physical parameter at said probe, wherein said physical parameter is indicative of contact conditions between said probe and said sample surface;  
first drive means moving said probe in said engagement direction and opposite thereto, in response to an output from said



probe detector, to maintain contact conditions between said probe and said sample surface within a first predetermined range;

second drive means moving said probe in said engagement direction and opposite thereto, in response to movement of said first drive means beyond a second predetermined range of movement thereof as determined by examining an input signal applied to said first drive means, wherein said first and second drive means are coupled to each other and to said probe so that motion of said probe occurs according to a sum of motion of said first and second drive means; and  
lateral movement means for generating relative movement between said sample surface and said sharp tip in a scanning direction parallel to said sample surface, wherein said lateral movement means generates said relative movement only when said first drive means is within said second predetermined range of movement thereof.

5,773,825

## BI-LAYER ATTENUATED TOTAL REFLECTANCE DEVICE PROVIDING OPTIMIZED ABSORBANCE LINEARITY

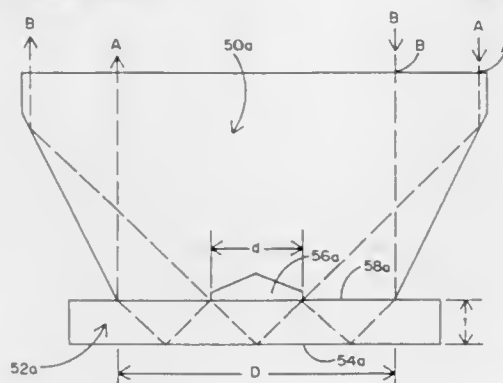
Walter M. Doyle, Laguna Beach, Calif., assignor to Axiom Analytical, Inc., Irvine, Calif.

Continuation-in-part of Ser. No. 532,164, Sep. 22, 1995, abandoned. This application Aug. 23, 1996, Ser. No. 697,439

Int. Cl.<sup>6</sup> G01N 21/01

U.S. Cl. 250—339.11

20 Claims



1. A sensing apparatus for spectral analysis which is adapted to cause reflection of infrared rays by a sample, comprising:  
supporting structure through which entering and exiting rays pass;  
radiation-path-determining structure carried by the supporting structure which determines the path of each light ray into reflection at the sample;  
said path-determining structure including (a) a sample-contacting element which is infrared transparent and which is resistant to corrosion and (b) a supporting element for the sample-contacting element which is infrared transparent and which presses against the inner surface of the sample-contacting element; and

said path-determining structure including a first surface which is a sample-contacting surface, and a second surface, parallel to the first surface, which is a reflecting surface, the dimensions of the second surface being so related to the separation dimension between the first and second surfaces that substantially all rays which are reflected from both the first and second surface at a specified angle have the same number of reflections.

5,773,826

## FLAME DETECTOR AND PROTECTIVE COVER WITH WIDE SPECTRUM CHARACTERISTICS

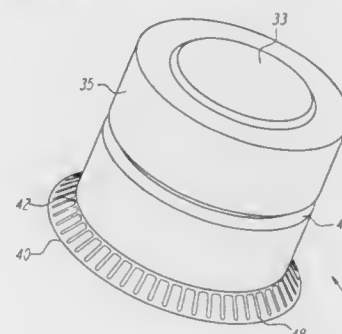
David A. Castleman, Claremont, and Chris A. Selstad, Fullerton, both of Calif., assignors to Fire Sentry Systems Inc., Cleveland, Ohio

Filed Mar. 1, 1996, Ser. No. 609,740

Int. Cl.<sup>6</sup> G01J 5/02

U.S. Cl. 250—339.15

16 Claims



1. A protective cover for use with a flame detector disposed within a housing having a viewing window, said flame detector with sensitivity for a visible band, near band infrared, and a wide infrared spectrum, said protective cover for preventing accumulation of paint, grime or the like on the viewing window, comprising:  
a one-piece configuration shaped to completely surround said viewing window, said one-piece configuration having wide spectrum transmittance characteristics that transmit radiant energy in said visible band, said near band, and said wide infrared spectrum to which said flame detector is sensitive.

5,773,827

## XEROGRAPHIC INFRARED REFLECTANCE DENSITOMETER (IRD) SENSOR

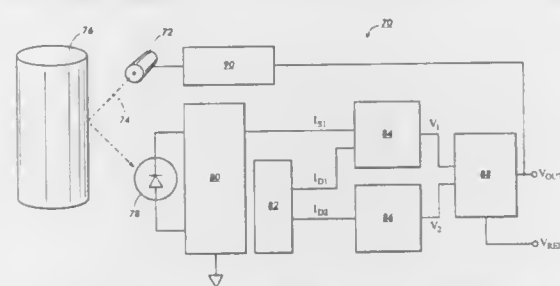
Mostafa R. Yazdy, Los Angeles; Mehrdad Zomorrod, West Hills; Harry J. McIntyre, Los Angeles, all of Calif., and Alan J. Werner, Jr., Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 16, 1996, Ser. No. 764,888

Int. Cl.<sup>6</sup> G03G 21/00; G01N 21/47

U.S. Cl. 250—341.8

1 Claim



1. In a xerographic system which has an infrared reflectance densitometer sensor for sensing light reflected off toner on a photoconductor comprising:

a circuit for generating a reference curve to determine the density of toner on the photoconductor;  
a first current generator having a photodiode responsive to a reflected light from said toner on the photoconductor;  
a second current generator;  
a first voltage generator for generating a first voltage;  
a second voltage generator for generating a second voltage;  
said first current generator being electrically connected to said first voltage generator;  
said second current generator being electrically connected to said first and said second voltage generators;  
said first voltage generator having a first current and a second current;  
said second voltage generator having a third current;  
said first current generator having a current sink to limit said first current of said first voltage generator to a first given value;  
said second current generator having a first current sink to limit said second current to a second given value and a second current sink to limit said third current to said second given value;  
said first voltage generator being responsive to said first current and said second current to generate said first voltage;  
said second voltage generator being responsive to said third current to generate said second voltage;  
an output voltage generator;  
said first voltage generator being electrically connected to said output voltage generator for supplying said first voltage to said output voltage generator;  
said second voltage generator being electrically connected to said output voltage generator for supplying said second voltage to said output voltage generator;  
means for supplying a reference voltage;  
said reference voltage supplying means being electrically connected to said output voltage generator; and  
said output voltage generator being responsive to said first voltage generator, said second voltage generator and said reference voltage supplying means to generate an output voltage by adding said reference voltage and said second voltage and subtracting said first voltage;  
said output voltage being equal to:

$$V_{OUT} = V_{REF} + K[(I_{S1} + I_{D1})^2 - (I_{D2})^2]$$

wherein:

 $I_{S1}$  = said first current, $I_{D1}$  = said second current, $I_{D2}$  = said third current; and $V_{OUT}$  = reference curve.

5,773,828

## GAS ANALYZER

Shigeyuki Akiyama; Masahiko Fujiwara; Takuji Oida; Naohito Shimizu; Aritoshi Yoneda, and Toshikazu Ohnishi, all of Miyahigashi-machi, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Feb. 23, 1996, Ser. No. 606,071

Claims priority, application Japan, Mar. 4, 1995, 7-070593

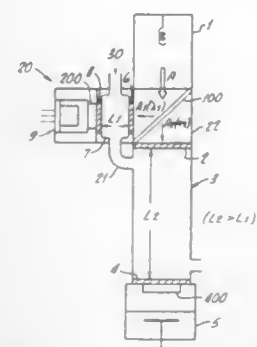
Int. Cl.<sup>6</sup> G01N 21/35

U.S. Cl. 250—345

16 Claims

1. A gas analyzer comprising:  
a light source;  
at least one infrared penetration/reflection means provided immediately adjacent to the light source and having an infrared penetration side and an infrared reflection side;  
a plurality of measuring cells communicating sequentially with each other to form a single gas path; and





a plurality of infrared-ray detectors;  
at least one set of one of the measuring cells and one of the infrared-ray detectors being provided immediately adjacent to the infrared penetration side of the infrared penetration/reflection means, and at least one set of one of the measuring cells and one of the infrared-ray detectors being provided immediately adjacent to the infrared reflection side of the infrared penetration/reflection means.

5,773,829

## RADIATION IMAGING DETECTOR

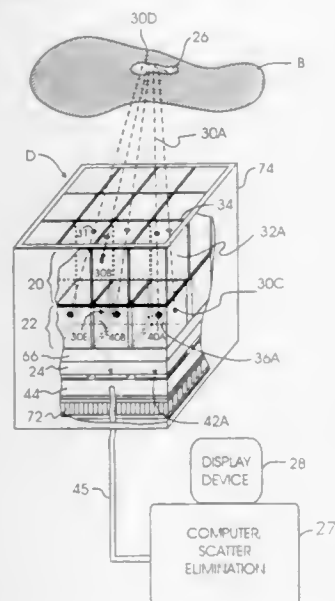
Jan S. Iwanczyk, 3066 Corda Dr., Los Angeles, Calif. 90049, and Bradley E. Patt, 5416 Katherine Ave., Sherman Oaks, Calif. 91401

Filed Nov. 5, 1996, Ser. No. 743,320

Int. Cl.<sup>6</sup> G01T 1/20

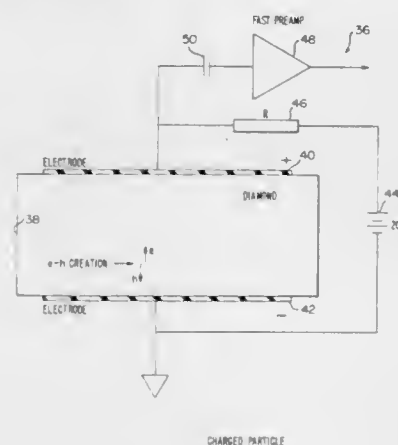
U.S. Cl. 250—367

32 Claims



1. An imaging detector for collimating and detecting individual x-ray or gamma-ray photons, comprising:  
a collimator including a plurality of chambers, each chamber having an end defining an exit aperture cross section;  
a scintillator including a plurality of segments, each segment having a first end defining a first aperture cross section substantially matching one of said exit aperture cross sections and having a second end defining a second aperture cross section;  
a photodetector array including a plurality of elements, each element having a cross section substantially matching one of said second aperture cross sections; and  
an array of readout electronics channels for amplification and processing of electrical signals produced by said photodetector array, each channel being coupled for communication with a respective one of said photodetector array elements.

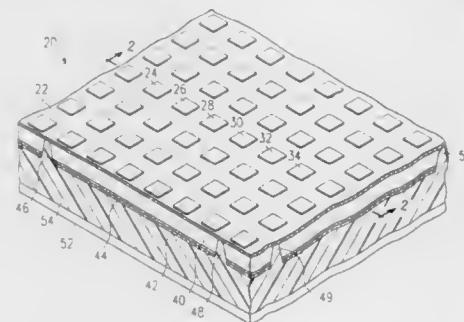
5,773,830  
CVD DIAMOND RADIATION DETECTOR  
Grant Lu, Shrewsbury, Mass., and Gordon L. Cann, Laguna Beach, Calif., assignors to Saint-Gobain/Norton Industrial Ceramics Corp., Worcester, Mass.  
Division of Ser. No. 94,826, Jul. 20, 1993, abandoned. This application May 23, 1995, Ser. No. 447,390  
Int. Cl.<sup>6</sup> G01T 1/24  
U.S. Cl. 250—370.01  
6 Claims



1. A polycrystalline CVD diamond particle detector device, comprising:  
a wafer of chemically vapor deposited diamond exhibiting a collection distance of at least 25 microns and  
electrode means in electrical contact with the wafer and adapted to generate an electric field in the wafer when provided with a biasing voltage.

5,773,831

PATCH COUPLED INFRARED PHOTODETECTOR  
Austin John Brouns, Dallas, Tex., assignor to Lockheed Martin Vought Systems Corporation, Grand Prairie, Tex.  
Filed Mar. 19, 1997, Ser. No. 820,976  
Int. Cl.<sup>6</sup> H01L 27/14; 29/15; G01J 5/20  
U.S. Cl. 250—370.08  
40 Claims



1. An infrared radiation detector comprising:  
a planar, infrared radiation sensitive structure for producing carriers in response to infrared radiation, said infrared radiation sensitive structure having first and second surfaces,  
a first electrically conductive layer proximate said infrared sensitive structure first surface and electrically connected thereto, said first electrically conductive layer transparent to said infrared radiation,  
a planar patch conductive for said infrared radiation positioned on the surface of said first conductive layer opposite said infrared sensitive structure, said patch having a width equal to approximately one half of a wavelength of said infrared radiation in said infrared sensitive structure.

an electrically conductive, planar infrared radiation reflective layer positioned proximate said second surface of said infrared sensitive structure and electrically connected thereto, and wherein a resonant cavity is formed between said conductive patch and said reflective layer, said resonant cavity having a thickness not greater than approximately one eighth of the wavelength of said infrared radiation in said infrared sensitive structure.

5,773,832

## ADVANCED CCD-BASED X-RAY IMAGE SENSOR SYSTEM

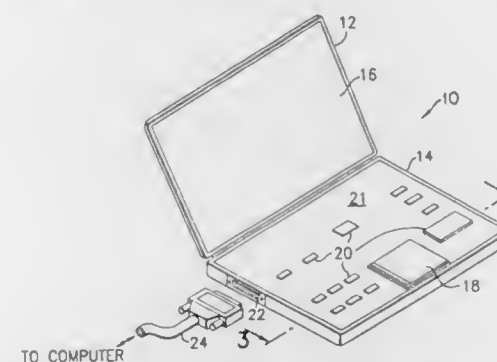
Alaa A. Sayed, Concord, and Daniel P. Laxson, Mountain View, both of Calif., assignors to Loral Fairchild Corporation, Syosset, N.Y.

Division of Ser. No. 561,436, Nov. 21, 1995, Pat. No. 5,693,948. This application Mar. 19, 1997, Ser. No. 820,606

Int. Cl.<sup>6</sup> H05G 1/44

U.S. Cl. 250—370.09

19 Claims



1. A method for operating an x-ray system, comprising the steps of:  
providing a solid state x-ray image sensor system within an enclosure, the sensor system comprising a CCD-based radiation detector comprised of a plurality of radiation responsive pixels, the sensor system being electrically coupled to a controller;  
operating an x-ray source to provide a first x-ray dose that is significantly less than a normal dose, the first x-ray dose being applied to an object to be x-rayed;  
binning together a plurality of the pixels so as to develop an output signal that is indicative of an amount of x-ray flux reaching the pixels due to the first x-ray dose, wherein the output signal is comprised of a summation of charge packets from the binned-together plurality of the pixels; and  
calculating, with the controller, a magnitude of a second dose in accordance with the output signal, the magnitude of the second dose being calculated to obtain an optimum x-ray exposure time for the object.

5,773,833

## PHOTO-IONIZATION DETECTOR FOR VOLATILE GAS MEASUREMENT

Peter C. Ili, Fremont, Calif., assignor to RAE Systems, Inc., Sunnyvale, Calif.

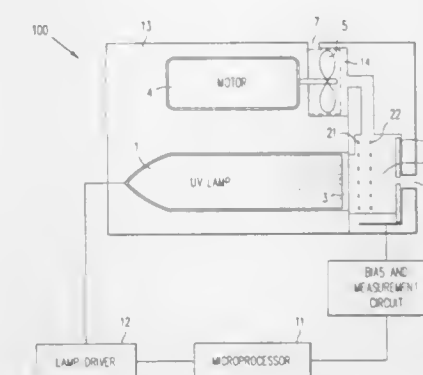
Filed Mar. 22, 1996, Ser. No. 620,635

Int. Cl.<sup>6</sup> G01N 27/66

U.S. Cl. 250—382

25 Claims

1. A photo-ionization detector comprising:  
a detector housing having an ionization chamber formed therein, the detector housing including a block that forms a wall of the ionization chamber;  
a pump disposed within the block to create a flow of gases from a surrounding environment through the ionization chamber;  
an ultraviolet lamp disposed within the block and positioned to transmit ultraviolet light into the ionization chamber; and



an ion detector at least partially disposed inside the ionization chamber.

5,773,834

## METHOD OF FORMING CARBON NANOTUBES ON A CARBONACEOUS BODY, COMPOSITE MATERIAL OBTAINED THEREBY AND ELECTRON BEAM SOURCE ELEMENT USING SAME

Kazuhiro Yamamoto, Kashiwa; Yoshinori Koga, Abiko, and Shuzo Fujiwara, Tsukuba, all of Japan, assignors to Director-General of Agency of Industrial Science and Technology, Japan

Filed Feb. 12, 1997, Ser. No. 799,767

Claims priority, application Japan, Feb. 13, 1996, 8-025037

Int. Cl.<sup>6</sup> H01J 27/02

U.S. Cl. 250—423 F

12 Claims



1. A method of producing a composite material, comprising the step of irradiating a surface of a shaped body of a carbonaceous material with an ion beam, in a vacuum, to form a layer of carbon nanotubes as a deposit on said surface by sputtering.

5,773,835

## FIBER OPTIC SPECTROSCOPY

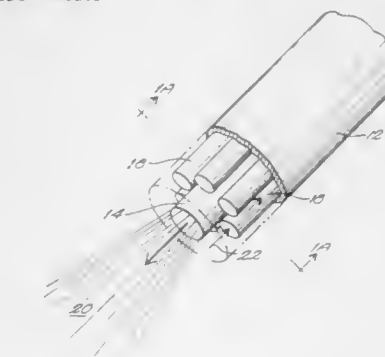
Edward L. Sinofsky, Dennis, Mass., assignor to Rare Earth Medical, Inc., West Yarmouth, Mass.

Filed Jun. 7, 1996, Ser. No. 660,271

Int. Cl.<sup>6</sup> G01T 21/64

U.S. Cl. 250—462.1

19 Claims



1. An apparatus for spectral analysis comprising excitation means for irradiating a target region of a biological material with excitation radiation;

collection means for collecting fluorescent radiation from the target region that is emitted in response to said excitation radiation; and  
a casing surrounding at least a portion of the collection means, the casing comprising a fluoropolymer material that exhibits low auto fluorescence and is substantially transparent to fluorescent radiation emitted by the target region.

5,773,836

**METHOD FOR CORRECTING PLACEMENT ERRORS IN A LITHOGRAPHY SYSTEM**

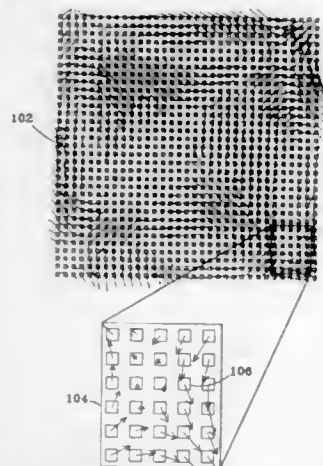
John George Hartley, Fishkill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 28, 1996, Ser. No. 739,137

Int. Cl.<sup>6</sup> H01J 37/304

U.S. Cl. 250—491.1

11 Claims



1. A method for correcting placement errors in a lithography system comprising the steps of:

- obtaining metrology data from at least one substrate selected from (i) a lithographic substrate produced by a first lithography system and (ii) a lithographic substrate produced by a second lithography system using a substrate produced by said first lithography system, said data being of sufficient density to smoothly map an error to be corrected;
- deriving a metrology data grid coordinate system from said metrology data;
- aligning the metrology data grid coordinate system to the coordinate system of said first lithography system to remove rigid body errors; and
- for each of a plurality of first lithography system substrate fields,
  - determining a smoothness radius about the center of said field and the total number of metrology sites lying within an area defined by said smoothness radius about the center of said field;
  - identifying from said total number of metrology sites in step (d)(i) a number N of metrology sites about the center of the field, wherein N is not less than the number of degrees of freedom to be corrected, and wherein none of the N sites is collinear with any other two of the sites;
  - establishing a reference grid coordinate system wherein the origin of said reference grid coordinate system coincides with center of said field; and
  - fitting the metrology data for the identified N metrology sites to the reference grid coordinate system to determine at least one correction factor which minimizes residual errors; and
- applying at least one correction factor for at least one field to said first lithography system to correct a placement error.

5,773,837

**APPARATUS FOR IMAGE TRANSFER WITH CHARGED PARTICLE BEAM, AND DEFLECTOR AND MASK USED WITH SUCH APPARATUS**

Mamoru Nakasuji, Kanagawa-ken, Japan, assignor to Nikon Corporation, Tokyo, Japan

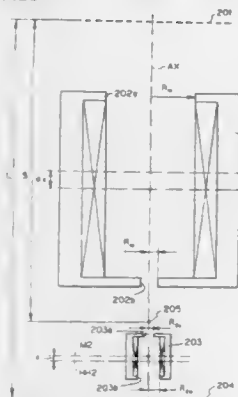
Division of Ser. No. 548,616, Oct. 26, 1995, Pat. No. 5,689,117. This application Jun. 10, 1997, Ser. No. 871,939

Claims priority, application Japan, Nov. 22, 1994, 7-288057; Dec. 15, 1994, 7-311975; Dec. 28, 1994, 7-329094; Dec. 28, 1994, 7-329095

Int. Cl.<sup>6</sup> H01J 37/30

U.S. Cl. 250—412.23

1 Claim



1. A reduction-transferring apparatus using a charged particle beam for reduction-transferring a pattern of a mask onto a target by directing a charged particle beam passed through said mask to first and second projection lenses providing a cross-over, wherein:

the bore radii of said first and second projection lenses on the side of said cross-over are set to be smaller than 1/4 of the bore radii of the projection lenses on the other side.

5,773,838

**APPARATUS FOR IMAGE TRANSFER WITH CHARGED PARTICLE BEAM, AND DEFLECTOR AND MASK USED WITH SUCH APPARATUS**

Mamoru Nakasuji, Kanagawa-ken, Japan, assignor to Nikon Corporation, Tokyo, Japan

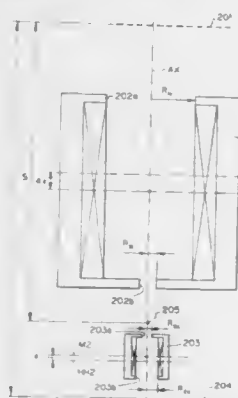
Division of Ser. No. 548,616, Oct. 26, 1995, Pat. No. 5,689,117. This application Jun. 10, 1997, Ser. No. 871,971

Claims priority, application Japan, Nov. 22, 1994, 6-288057; Dec. 15, 1994, 6-311975; Dec. 28, 1994, 6-329094; Dec. 28, 1994, 6-329095

Int. Cl.<sup>6</sup> H01J 37/30

U.S. Cl. 250—492.23

2 Claims



1. A reduction-transferring apparatus using a charged particle beam for reduction-transferring a pattern of a mask onto a target by

directing a charged particle beam passed through said mask to first and second projection lenses of a charged particle beam optical system having an optical axis, wherein:

when a distance between said mask and said target is L, reduction ratio of pattern from said mask to said target is 1/n, a positive constant number is  $\epsilon$  and a point spaced apart from said mask toward said target by an amount of  $L-n(n+1)$  is set as cross-over of said charged particle beam optical system, a central position of said first projection lens along the optical axis is displaced toward said cross-over by an amount of  $n\epsilon$  with respect to the position bisecting the distance between said mask and said cross-over, and a central position of said second projection lens along the optical axis is displaced toward said cross-over by an amount of  $\epsilon$  with respect to the position bisecting the distance between said cross-over and said target.

5,773,839

**CASSETTE FOR USE IN AN ELECTRONIC RADIOGRAPHIC IMAGING SYSTEM**

Kenneth J. Krepel, North St. Paul; Joseph A. Hoffman, Minneapolis; Anthony B. Ferguson, Lake Elmo, all of Minn.; Daniel J. Severson, St. Croix, Wis.; Keith K. McLaughlin, Eagan, Minn.; Walter S. Federation, Maplewood, Minn.; Wayne M. Wirth, North St. Paul, Minn.; Owen L. Nelson, St. Paul, Minn.; John E. Potts, and James E. Steffen, both of Woodbury, Minn., assignors to Imation Corp., Oakdale, Minn.

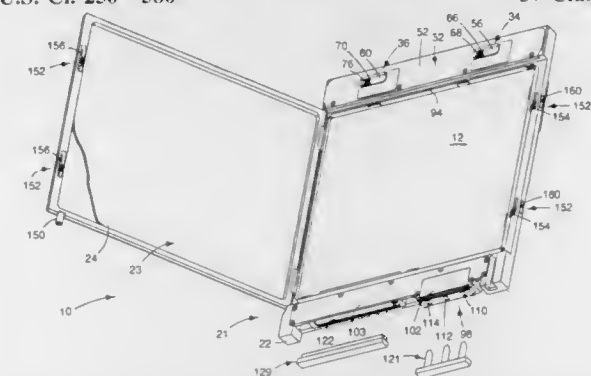
Continuation of Ser. No. 220,899, Mar. 31, 1994, abandoned.

This application Aug. 18, 1995, Ser. No. 512,596

Int. Cl.<sup>6</sup> G01N 23/04

U.S. Cl. 250—580

39 Claims



1. A cassette adapted for use in an electronic radiographic imaging system having electronic components, comprising:

- a photoreceptive medium;
- a frame for supporting the photoreceptive medium and for protecting the photoreceptive medium from ambient actinic radiation;
- at least one power storage device housed and supported within the frame, the at least one power storage device being electrically connectable to the photoreceptive medium, wherein the at least one power storage device applies a voltage across the photoreceptive medium when connected to the photoreceptive medium enabling the photoreceptive medium to capture a radiographic image; and
- an electronic interface structure for electronically connecting the photoreceptive medium to the electronic components external of the cassette to enable the electronic components to acquire image information corresponding to the radiographic image from the photoreceptive medium.

5,773,840

**METHOD & APPARATUS FOR ELECTRO OPTICALLY DETERMINING THE DIMENSION, LOCATION & ATTITUDE OF OBJECTS**

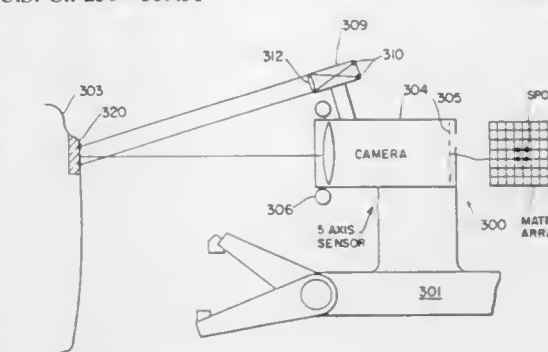
Timothy R. Pryor; Bernard Hockley; Nick Liptay-Wagner; Omer L. Hageniers, and W. J. Pastorius, all of Windsor, Canada, assignors to Sensor Adaptive Machines Inc., Windsor, Canada

Division of Ser. No. 334,350, Nov. 2, 1994, Pat. No. 5,510,625, which is a division of Ser. No. 124,605, Sep. 21, 1993, Pat. No. 5,362,970, which is a division of Ser. No. 836,508, Feb. 8, 1992, Pat. No. 5,280,179, which is a division of Ser. No. 711,397, Jun. 6, 1991, Pat. No. 5,164,579, which is a continuation of Ser. No. 511,967, Apr. 17, 1990, abandoned, which is a continuation of Ser. No. 381,031, Jul. 19, 1989, abandoned, which is a continuation of Ser. No. 262,131, Oct. 25, 1988, abandoned, which is a continuation of Ser. No. 59,632, Jun. 8, 1987, abandoned, which is a continuation of Ser. No. 757,208, Jul. 22, 1985, Pat. No. 4,674,869, which is a continuation of Ser. No. 697,683, Feb. 1, 1985, abandoned, which is a continuation of Ser. No. 634,191, Jul. 27, 1984, abandoned, which is a continuation of Ser. No. 378,808, May 17, 1982, abandoned, which is a division of Ser. No. 34,278, Apr. 30, 1979, Pat. No. 4,373,804. This application Jun. 5, 1995, Ser. No. 463,083

Int. Cl.<sup>6</sup> G01C 3/08

U.S. Cl. 250—559.31

35 Claims



1. Apparatus for measuring an object comprising: sensor means comprising a solid state TV camera for viewing at least a portion of an object to be measured and for providing an output thereof;

a non-contact range sensing means for sensing data relating to the range between at least one point on said object and said sensor means and for providing an output thereof; means for moving said sensor means and said range sensing means in at least 3 cartesian axes relative to said object; and processing means for determining information concerning said object from said output of said sensor means and said range sensing means.

5,773,841

**SELF ALIGNING VACUUM SEAL ASSEMBLY**

Derek Aqul, San Jose, Calif., assignor to High Yield Technology, Inc., Sunnyvale, Calif.

Filed Jan. 13, 1995, Ser. No. 372,257

Int. Cl.<sup>6</sup> G01N 21/49

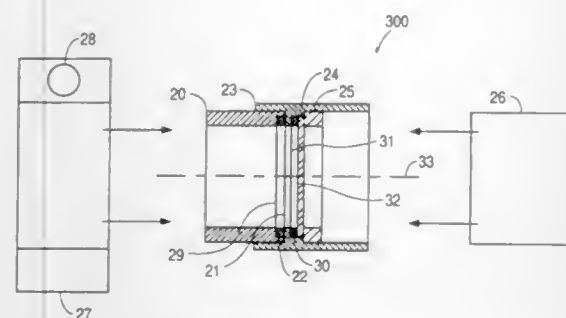
U.S. Cl. 250—573

9 Claims

1. A system for providing a vacuum sealed installation of an optical device for use with a process chamber, said system comprising:

- a nipple connected to said process chamber, said nipple having a longitudinal axis, an internal mating surface extending perpendicular to said longitudinal axis, and a threaded external surface;
- an annular coupling having a longitudinal axis, first and second internal mating surfaces extending perpendicular to said longitudinal axis, a threaded internal surface, and a portion for accommodating an optical device wherein said threaded exter-





- nal surface is threadably engaged with said threaded internal surface such that said first internal mating surface faces said internal mating surface of said nipple, and said second internal mating surface faces away from said mating surface of said nipple, with said first internal mating surface located longitudinally between said second internal mating surface and said internal mating surface of said nipple;
- a window, positioned inside said internally threaded coupling, having a mating surface facing said second internal mating surface, with said second internal mating surface located longitudinally between said first internal mating surface and said window;
- a first vacuum seal provided between said first mating surface and said mating surface of said nipple; and
- a second vacuum seal provided between said second mating surface and said mating surface of said window.

#### 5,773,842 RESONANT-TUNNELLING HOT ELECTRON TRANSISTOR

Gyung-Ok Kim, and Ho-Hyung Suh, both of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon-shi, Rep. of Korea

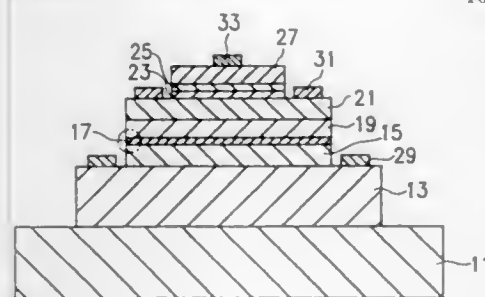
Filed Dec. 5, 1995, Ser. No. 567,579

Claims priority, application Rep. of Korea, Dec. 19, 1994, 94-35155

Int. Cl.<sup>6</sup> H01L 29/06

U.S. Cl. 257—25

10 Claims



1. A resonant-tunnelling hot electron transistor comprising:
- a compound semiconductor substrate;
- a conductive collector layer formed on said compound semiconductor substrate;
- a first buffer layer undoped with impurities, formed on said conductive collector layer;
- a collector potential barrier layer, having Quantum well structure, formed on said first buffer layer;
- a second buffer layer undoped with impurities, formed on said collector potential barrier layer;
- a conductive base layer, having the same conductivity type with said collector, formed on said second buffer layer;
- an emitter barrier layer undoped with impurities, formed above said base layer;
- an emitter layer, having the same conductivity type with said base layer, formed on said emitter barrier layer; and
- a spacer layer between said base layer and the emitter layer.

#### 5,773,843 METAL ELECTRODE FOR SUPERCONDUCTING CURRENT PATH FORMED OF OXIDE SUPERCONDUCTOR MATERIAL AND SUPERCONDUCTING DEVICE UTILIZING THEREOF

Takao Nakamura, and Michitomo Iiyama, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Inc., Osaka, Japan

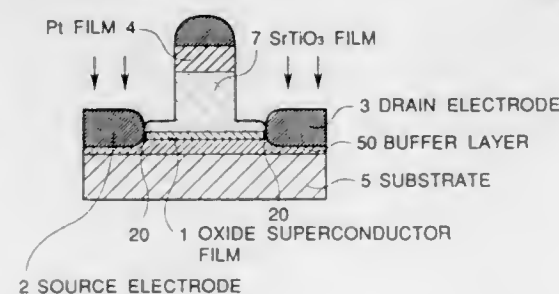
Filed Feb. 20, 1996, Ser. No. 605,554

Claims priority, application Japan, Feb. 20, 1995, 7-055102

Int. Cl.<sup>6</sup> H01L 29/06

U.S. Cl. 257—30

7 Claims



1. A superconducting field effect transistor type device comprising:
- a substrate having a principal surface;
- a thin superconducting channel formed of an oxide superconductor over the principal surface of the substrate;
- a metal source electrode disposed at a first end of the superconducting channel and a metal drain electrode disposed at a second end of the superconducting channel said source electrode and said drain electrode being electrically coupled to the superconducting channel, so that superconducting current can flow through the superconducting channel between the source electrode and the drain electrode; and
- a gate electrode on a gate insulator disposed on the superconducting channel for controlling the superconducting current flowing through the superconducting channel by a signal voltage applied to the gate electrode;
- wherein at least a portion of each of the source electrode and the drain electrode is in electrical contact with a side surface of the superconducting channel which is perpendicular to the principal surface of the substrate and wherein layers of a ohmic alloy, comprising a metal of the same type as used for said source electrode and said drain electrode and an oxide superconductor of the same type as used for said superconducting channel, are disposed between the source electrode and the superconducting channel and between the drain electrode and the superconducting channel.

#### 5,773,844 METHOD OF FORMING A POLYCRYSTALLINE SILICON LAYER, A THIN FILM TRANSISTOR HAVING THE POLYCRYSTALLINE SILICON LAYER, METHOD OF MANUFACTURING THE SAME, AND A LIQUID CRYSTAL DISPLAY DEVICE HAVING THE THIN FILM TRANSISTOR

Shinichi Kawamura; Kaichi Fukuda, both of Yokohama; Takeshi Kashi, Kawasaki, and Shigetaka Toriyama, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 2, 1996, Ser. No. 691,609

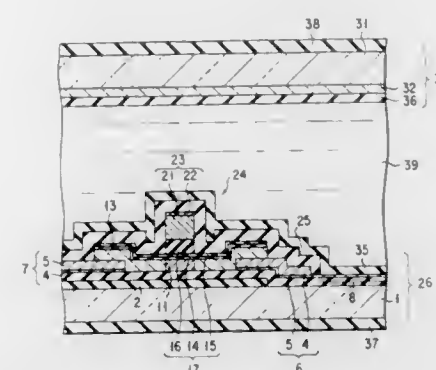
Claims priority, application Japan, Sep. 25, 1995, 7-246500; Sep. 26, 1995, 7-248094

Int. Cl.<sup>6</sup> H01L 29/04

U.S. Cl. 257—57

7 Claims

1. A thin film transistor comprising:
- an insulating substrate;
- a non-single crystal silicon layer formed on said insulating substrate;
- a gate insulator formed on said non-single crystal silicon layer;



- a gate electrode formed on said gate insulator;
- source and drain contact regions of polycrystalline silicon formed in said non-single crystal silicon layer on both sides of said gate electrode; and
- source and drain electrodes formed respectively in contact with said source and drain contact regions;
- wherein:
- said gate insulator includes a first insulating film and a second insulating film formed on said first insulating film,
- said first insulating film covers at least said source and drain contact regions, and
- said second insulating film has an etching rate different from that of said first insulating film and is located at a position corresponding to said gate electrode between said source and drain contact regions.

#### 5,773,845 LIQUID CRYSTAL DISPLAY DEVICE WITH DECREASED LINE WIDTH AND METHOD OF FORMING THE SAME

Soo Manh Kim, Kyungki-do, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

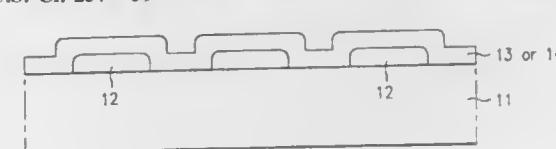
Filed Mar. 4, 1996, Ser. No. 610,755

Claims priority, application Rep. of Korea, Nov. 9, 1995, 1995 40526; Dec. 14, 1995, 1995 49777

Int. Cl.<sup>6</sup> H01L 29/40; 29/80; 31/112; 31/20

U.S. Cl. 257—59

26 Claims



1. A liquid crystal display device for displaying an imaging signal, comprising:
- a plurality of redundancy lines; and
- a signal line covering the plurality of redundancy lines thereby increasing an effective width of the signal line, wherein the plurality of redundancy lines do not contact each other.

#### 5,773,846 TRANSISTOR AND PROCESS FOR FABRICATING THE SAME

Hongyong Zhang; Toru Takayama, and Yasuhiko Takemura, all of Kanagawa, Japan, assignors to Semiconductor Energy Laboratory Co., Ltd., Kanagawa-ken, Japan

Division of Ser. No. 207,182, Mar. 8, 1994, abandoned. This application May 24, 1995, Ser. No. 449,669

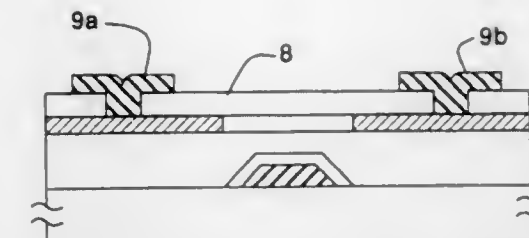
Claims priority, application Japan, Mar. 12, 1993, 5-078997; Mar. 12, 1993, 5-078998

Int. Cl.<sup>6</sup> H01L 29/76; 27/01

U.S. Cl. 257—66

19 Claims

1. A thin film transistor comprising:



- a channel semiconductor region comprising intrinsic silicon formed on an insulating surface; and
- source and drain semiconductor regions comprising one conductivity type silicon doped with one conductivity type impurity, wherein said channel semiconductor region extends between said source and drain semiconductor regions;
- wherein said source and drain semiconductor regions contain a catalyst element for promoting a crystallization of silicon, and wherein a concentration of said catalyst element in said channel semiconductor region is lower than that in said source and drain semiconductor regions.

#### 5,773,847 SEMICONDUCTOR DEVICE HAVING AN ACTIVE LAYER WITH SEPARATE LAYERS WHERE ONE OF THE LAYERS ACTS AS CRYSTAL NUCLEI FOR THE OTHER

Masahiko Hayakawa, Kanagawa, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 452,705, May 30, 1995, abandoned.

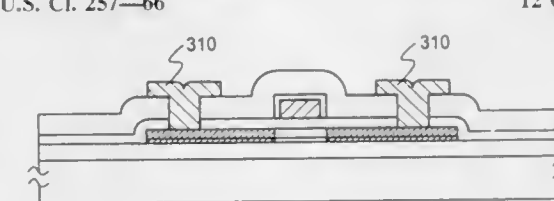
This application Sep. 3, 1997, Ser. No. 922,381

Claims priority, application Japan, Jun. 7, 1994, 6-148560

Int. Cl.<sup>6</sup> H01L 29/76; 31/036; 31/112

U.S. Cl. 257—66

12 Claims



1. A semiconductor device comprising:
- source and drain regions formed on an insulating surface, said source and drain regions having first crystalline semiconductor layer being formed on said insulating surface and second crystalline semiconductor layer being formed on said first semiconductor layer;
- a channel region formed between said source and drain regions, said channel region having said first semiconductor layer being formed on said insulating surface and said second semiconductor layer being formed on said first semiconductor layer;
- wherein said first semiconductor layer comprises a catalyst element for crystallizing said semiconductor at first concentration while said second semiconductor layer is free from said catalyst element or comprises said catalyst element at a second concentration lower than said first concentration.

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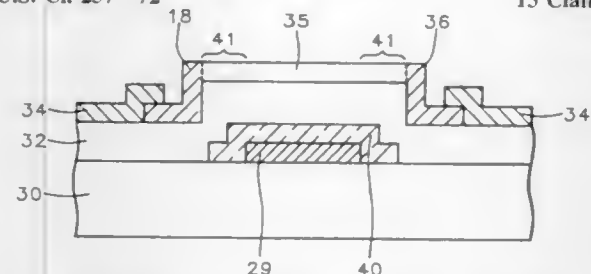
**5,773,848**  
**THIN FILM TRANSISTOR WITH LIGHT**  
**ANTIREFLECTION LAYER**

Meng-Yueh Wu, and Tzung-Szu Weng, both of Taipei, Taiwan, assignors to Industrial Technology Research Institute, Hsin-Chu, Taiwan

Division of Ser. No. 551,727, Nov. 1, 1995, Pat. No. 5,612,235. This application Dec. 27, 1996, Ser. No. 775,071

Int. Cl.<sup>6</sup> H01L 27/01

U.S. Cl. 257—72 13 Claims



1. A self-aligned polysilicon thin film transistor, comprising: an insulating substrate; a gate electrode formed on said insulating substrate; a protective light-antireflection layer over said gate electrode and over said insulating substrate; a gate dielectric layer over said protective light-antireflection layer and over said insulating substrate; a polysilicon layer over said gate dielectric layer, comprising an undoped region aligned with said gate electrode, and doped regions adjacent to said undoped region; source and drain electrodes of electrically conductive material in contact with said doped regions.

**5,773,849**  
**FIELD OF THE INVENTION**

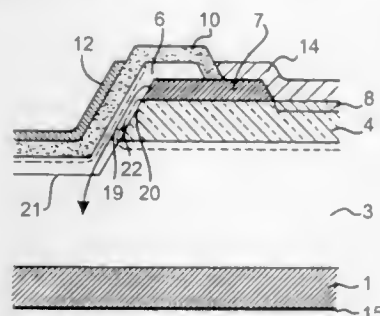
Christopher Harris, Sollentuna; Mietek Bakowski, Skultuna; Ulf Gustafsson, Linköping, and Mats Andersson, Stenungsund, all of Sweden, assignors to ABB Research Ltd., Zurich, Switzerland

Filed Apr. 24, 1996, Ser. No. 636,940

Int. Cl.<sup>6</sup> H01L 31/0312

U.S. Cl. 257—77

14 Claims



1. A field controlled semiconductor device of SiC comprising superimposed thereon at least a drain, a highly doped substrate layer and a low doped n-type drift layer, said device further comprising a highly doped n-type source region layer and a source connected thereto, a vertical trench extending into said drift layer, a low doped n-type channel region layer extending vertically along a wall of said trench and connecting said source region layer to said drift layer and through which a current is intended to flow when the device is in an on-state, and a gate electrode arranged in said trench at least along said wall and to, upon applying a voltage thereto, influence the charge carrier distribution of said channel region layer and thus the conductivity thereof, and a p-type base layer arranged laterally next to said channel region layer at the opposite side thereof with respect to the gate electrode for forming a vertical conducting channel in said channel region layer at a distance from said trench wall.

**5,773,850**  
**SEMICONDUCTOR DEVICE HAVING A ZNCDSE**  
**BUFFER LAYER WITH A II-VI COMPOUND**  
**SEMICONDUCTOR LAYER CONTAINING TE GROWN**  
**THEREON**

Koichi Naniwae, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

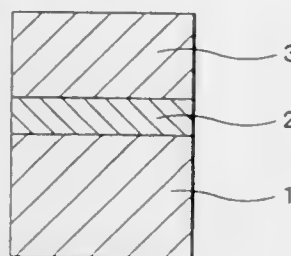
Filed May 7, 1997, Ser. No. 852,283

Claims priority, application Japan, May 10, 1996, 8-116836

Int. Cl.<sup>6</sup> H01L 29/267

U.S. Cl. 257—78

3 Claims



1. A semiconductor device comprising: an InP substrate; a ZnCdSe buffer layer formed on said InP substrate; and a II-VI compound semiconductor layer containing Te and formed on said ZnCdSe buffer layer.

**5,773,851**  
**SEMICONDUCTOR DEVICE AND MANUFACTURING**  
**METHOD THEREOF**

Hideki Nakamura, and Tadaharu Minato, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

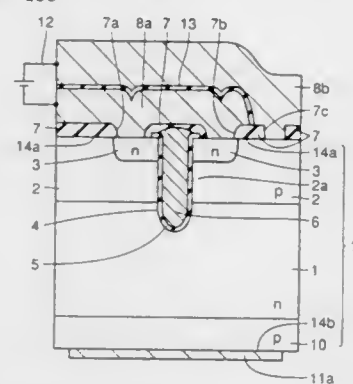
Filed Jun. 11, 1997, Ser. No. 873,029

Claims priority, application Japan, Jun. 11, 1996, 8-149261

Int. Cl.<sup>6</sup> H01L 29/74; 31/111

U.S. Cl. 257—133

16 Claims



1. A semiconductor device having first and second major surfaces opposite to each other, and controlling conduction/cut-off of a current flowing between said first and second major surfaces, comprising: a semiconductor substrate having said first and second major surfaces; a first impurity region of a first conductivity type formed extending from said first major surface into said semiconductor substrate; a second impurity region of a second conductivity type selectively formed in said first impurity region; a third impurity region of the first conductivity type selectively formed in said second impurity region; a trench extending from said first major surface into said semiconductor substrate, contacting both said second and third impurity regions, and having its bottom surface in said first impurity region;

- a gate electrode formed in said trench with an insulated gate layer interposed; forward bias means for applying forward bias to a pn junction between said second and third impurity regions during conduction; and a fourth impurity region of the second conductivity type formed extending from said second major surface into said semiconductor substrate.

**5,773,852**  
**SHORTED ANODE LATERAL INSULATED GATE**  
**BIPOLAR TRANSISTOR**

Min-Koo Han; Byeong-Hoon Lee; Moo-Sup Lim; Yearn-Ik Choi, all of Seoul; Jung-Eon Park, and Won-Oh Lee, both of Kyong Buk, all of Rep. of Korea, assignors to Korea Electronics Co., Ltd., Kumi, Rep. of Korea

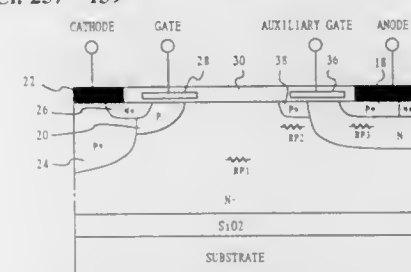
Filed Jul. 15, 1996, Ser. No. 679,564

Claims priority, application Rep. of Korea, Mar. 20, 1996, 96-7510

Int. Cl.<sup>6</sup> H01L 29/74; 31/111

U.S. Cl. 257—139

8 Claims



1. A shorted anode lateral insulated gate bipolar transistor comprising: a) a semiconductor layer of a first conductivity type having a surface; b) a first current electrode formed on the surface of the semiconductor layer; c) a second current electrode formed on the surface of the semiconductor layer and spaced apart from the first current electrode; d) a first insulation layer formed on the surface of the semiconductor layer and disposed between the first current electrode and the second current electrode; e) a first gate electrode formed within the first insulation layer in the vicinity of the first current electrode; f) a second gate electrode formed within the first insulation layer in the vicinity of the second current electrode; g) a first high concentration impurity region of a second conductivity type formed in the vicinity of the surface of the semiconductor layer below the first current electrode and extending to a first depth; h) a low concentration impurity region of the second conductivity type formed in the vicinity of the surface of the semiconductor layer below the first insulation layer between the first gate electrode and the first current electrode and below the first gate electrode to be adjacent the first high concentration impurity region of the second conductivity type and extending to a second depth which is less than the first depth; i) a first high concentration impurity region of the first conductivity type formed in the vicinity of the surface of the semiconductor layer extending from the first gate electrode to a part of the first current electrode and extending to a third depth which is less than the second depth; j) an intermediate concentration impurity region of the first conductivity type formed in the vicinity of the surface of the semiconductor layer disposed below the second gate electrode, below the first insulation layer between the second gate electrode and the second current electrode, and below the second current electrode and extending to a fourth depth;

- k) a second high concentration impurity region of the second conductivity type formed in the vicinity of the surface of the semiconductor layer adjacent to the intermediate concentration impurity region of the first conductivity type and extending to a fifth depth; l) a third high concentration impurity region of the second conductivity type formed in the vicinity of the surface of the semiconductor layer extending from the second gate electrode to a part of the second current electrode and extending to the fifth depth; and m) a second high concentration impurity region of the first conductivity type formed to be adjacent with the third high concentration impurity region of a second conductivity type below the second current electrode and extending to the third depth.

**5,773,853**  
**COMPOUND SEMICONDUCTOR DEVICE**

Junji Saito, Yamanashi, Japan, assignor to Fujitsu Ltd., Kanagawa, and Fujitsu Quantum Devices Ltd., Yamanashi, both of Japan

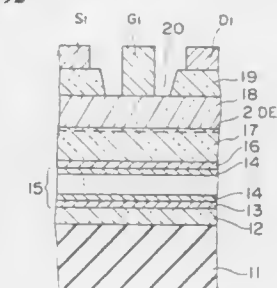
Continuation of Ser. No. 320,379, Oct. 11, 1994, abandoned, which is a continuation of Ser. No. 109,512, Aug. 20, 1993, abandoned. This application Aug. 22, 1996, Ser. No. 701,666

Claims priority, application Japan, Feb. 26, 1993, 5-038794

Int. Cl.<sup>6</sup> H01L 29/06; 31/0328; 31/0336

U.S. Cl. 257—192

10 Claims



1. A compound semiconductor device comprising: a compound semiconductor substrate; and a first buffer layer formed above the compound semiconductor substrate, said first buffer layer having a high resistance layer of a superlattice structure obtained by alternately and repeatedly depositing a first multi-element compound semiconductor layer and a GaAs layer including arsenic excessively deviating from a stoichiometric ratio above the compound semiconductor substrate, and said first buffer layer having an active layer formed above said high resistance layer, said active layer having a channel region in a vicinity of an upper surface thereof; wherein a mixed crystal ratio of said first multi-element compound semiconductor layer is made to change in a step form every time the number of layers are increased.

**5,773,854**  
**METHOD OF FABRICATING A LINEARLY**  
**CONTINUOUS INTEGRATED CIRCUIT GATE ARRAY**  
Nicholas F. Pasch, Pacifica, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Continuation of Ser. No. 473,543, Jun. 7, 1995, Pat. No. 5,659,189. This application Jul. 15, 1997, Ser. No. 892,827

Int. Cl.<sup>6</sup> H01L 27/10

U.S. Cl. 257—202

21 Claims

1. An integrated circuit, comprising: a substrate of semiconductor material having an upper surface area;



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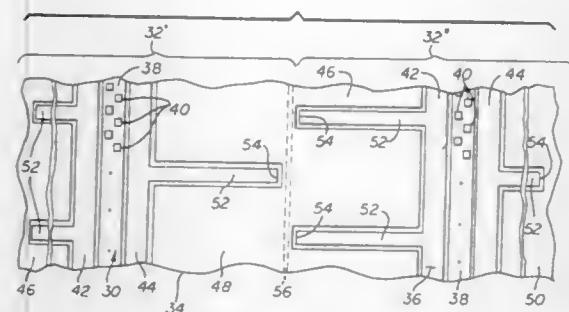
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at least one pair of spaced apart elongated vertically extending columnar gate array fields defined on said upper surface area extending between two opposed boundary edges of said substrate;

said gate array fields for the formation of individual logic gates therein;

at least one pair of spaced apart elongated vertically extending columnar input/output device fields defined on said upper surface area sandwiched between said pair of gate array fields and extending between the opposed boundary edges;

said input/output device fields for the formation of individual input/output circuits therein;

an elongated vertically extending columnar connector pad field defined on said upper surface area sandwiched between said pair of input/output device fields and extending between the opposed boundary edges;

said connector pad field having a plurality of electrical connector pads formed therein; and

said logic gates, said input/output circuits and said electrical connector pads being arranged for electrical interconnection to accomplish a desired application functionality.

5,773,855

#### MICROELECTRONIC CIRCUIT INCLUDING SILICIDED FIELD-EFFECT TRANSISTOR ELEMENTS THAT BIFUNCTION AS INTERCONNECTS

Michael Colwell, Livermore; Gary Cheung, Fremont, both of Calif., and Paul Torgerson, Inver Grove Heights, Minn., assignors to LSI Logic Corporation, Milpitas, Calif.

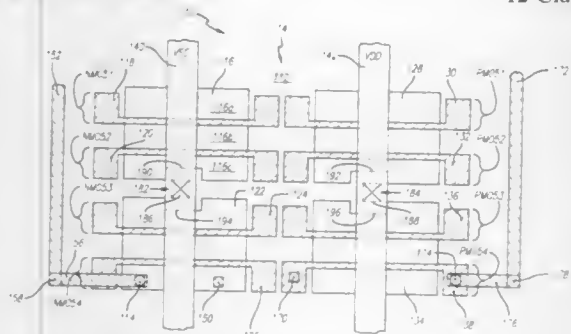
Continuation of Ser. No. 342,534, Nov. 21, 1994, abandoned.

This application Jan. 31, 1997, Ser. No. 792,479

Int. Cl.<sup>6</sup> H01L 29/72

U.S. Cl. 257—206

12 Claims



1. A microelectronic circuit, comprising:  
a substrate;

a first field effect transistor that is formed on the substrate and includes a diffusion region constituting a source or drain, said diffusion region having a first surface that is silicided, said first silicided surface comprising a first region and a second region; and

a first electrical contact within said first region, such that said silicided surface provides an electrical interconnection between said first contact and said second region thereby

facilitating collection of electrical current across the first and second regions within the diffusion region to the electrical contact.

5,773,856

#### STRUCTURE FOR CONNECTING TO INTEGRATED CIRCUITRY

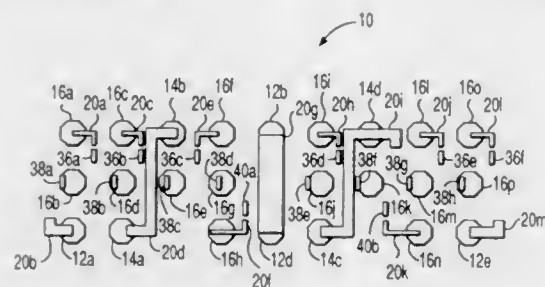
David Ray Bearden, Austin, and Mark David Bolliger, Round Rock, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y., and Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 720,263, Sep. 26, 1996, abandoned, which is a continuation of Ser. No. 558,859, Nov. 15, 1995, abandoned, which is a continuation of Ser. No. 323,202, Oct. 14, 1994, abandoned. This application Jun. 18, 1997, Ser. No. 878,452

Int. Cl.<sup>6</sup> H01L 27/118

U.S. Cl. 257—207

6 Claims



1. A structure for connecting to integrated circuitry, comprising:  
first, second and third terminal pads formed within a central region of the integrated circuitry to provide connections to integrated circuit package pins, said second terminal pad being positioned between said first and third terminal pads;

a group of input/output receiver/drivers ("IORDs") of the integrated circuitry, each said IORD having a specific position in said group relative to other ones of said IORDs in said group, said group being positioned within an area delineated by said first and third terminal pads and including at least first, second and third IORDs of the integrated circuitry; and

connecting means, including first, second and third metal patterns at a single metallization layer of the integrated circuitry, for connecting one of said first, second or third IORDs of the integrated circuitry through said first metal pattern to said first terminal pad, through said second metal pattern to said second terminal pad, and through said third metal pattern to said third terminal pad.

5,773,857

#### SEMICONDUCTOR DEVICE HAVING DUMMY WIRING CONDUCTORS FOR SUPPRESSING HEAT-TREATMENT-INDUCED SHIFTING

Kenji Ura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 15, 1996, Ser. No. 749,855

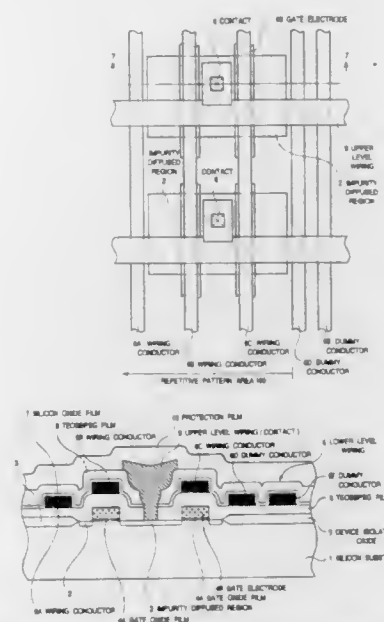
Claims priority, application Japan, Nov. 15, 1995, 7-296552

Int. Cl.<sup>6</sup> H01L 27/10

U.S. Cl. 257—211

18 Claims

1. A semiconductor device, comprising:  
a first impurity diffused region and a second impurity diffused region arranged in a repetitive pattern area;  
a plurality of wiring patterns formed in said repetitive pattern area and extending over a distance from said first impurity diffused region to said second impurity diffused region; and  
a dummy wiring conductor formed in an area adjacent to an edge zone of said repetitive pattern area, said dummy wiring



conductor extending parallel to said plurality of wiring patterns over said distance.

5,773,858

#### POWER DIODE

Heinrich Schlagenotto, Neu-Isenburg; Karl-Heinz Sommer, and Franz Kaussen, both of Warstein, all of Germany, assignors to Eupec Europäische Gesellschaft fuer Leistungshalbleiter mbH & Co. KG., Warstein-Belecke, Germany

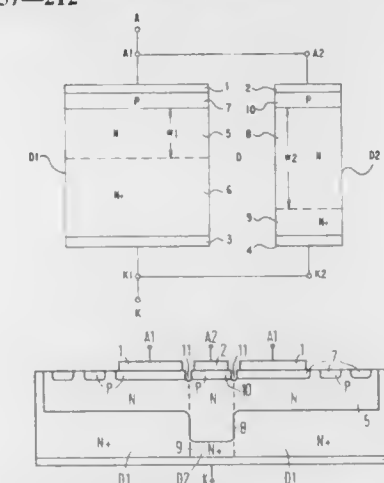
Filed Jan. 19, 1993, Ser. No. 5,760

Claims priority, application Germany, Jan. 17, 1992, 42 01 183.3

Int. Cl.<sup>6</sup> H01L 23/58

U.S. Cl. 257—212

14 Claims



1. A power diode, comprising:

at least one semiconductor body having a base zone of a first conductivity type and a given doping level, a cathode zone of the first conductivity type and a doping level higher than the given doping level, and an anode zone of a second conductivity type opposite the first conductivity type and a doping level higher than the given doping level;

said base zone having at least a first region with a first predetermined thickness and being dimensioned for a given blocking voltage and a second region with a second thickness being greater than the first predetermined thickness by at least a factor of 1.4;

the first region forming a base zone of a first diode and the second region forming a base zone of a second diode, said first diode having a first area and a first minority carrier

lifetime, the second diode having a second area and a second minority carrier lifetime, said areas being dimensioned such that a forward current flowing through said first diode is greater than a forward current flowing through said second diode by at least a factor of 2.

5,773,859

#### SOLID-STATE IMAGE TRANSISTOR HAVING A SHIELDING FILM

Takahisa Ueno, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 313,367, Sep. 27, 1994, abandoned.

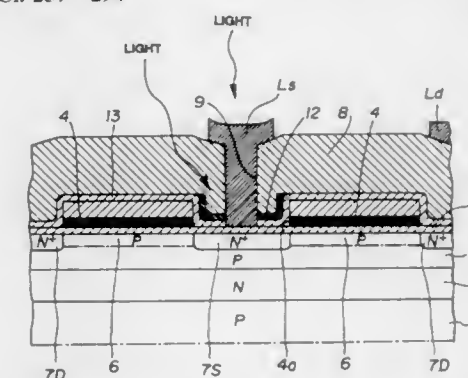
This application Nov. 22, 1996, Ser. No. 755,244

Claims priority, application Japan, Sep. 28, 1993, 5-241183

Int. Cl.<sup>6</sup> H01L 31/062; 31/113

U.S. Cl. 257—294

12 Claims



5. A solid state imaging device comprising:

a plurality of transistors for converting light into an electrical signal;

the transistors comprising a source region and a drain region formed on a semiconductor substrate, the source region and the drain region being spaced apart to define a channel region; a gate electrode formed above the channel region;

a thin insulating layer formed above the gate electrode and the source and drain regions;

a light-shielding film formed on the thin insulating layer in a location which is not over the gate electrode; and  
an interlayer insulating film formed over the light-shielding film and the thin insulating layer.

5,773,860

#### SEMICONDUCTOR DEVICE INCLUDING MOS CAPACITANCE

Masaki Kijima, and Akinobu Manabe, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

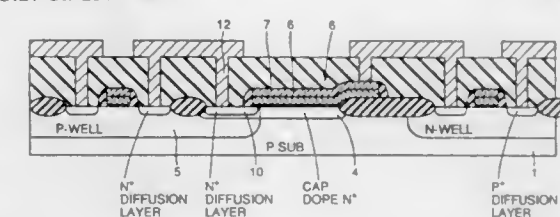
Filed Feb. 5, 1997, Ser. No. 795,216

Claims priority, application Japan, Sep. 13, 1996, 8-243523

Int. Cl.<sup>6</sup> H01L 27/108; 29/76; 29/94; 31/119

U.S. Cl. 257—306

2 Claims



1. A semiconductor device including an MOS capacitance, comprising:

a semiconductor substrate of a first conductivity type, having a main surface;

a well of the first conductivity type, formed at the main surface of said semiconductor substrate;

VOL

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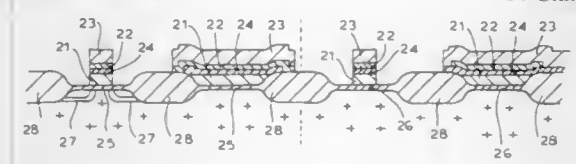
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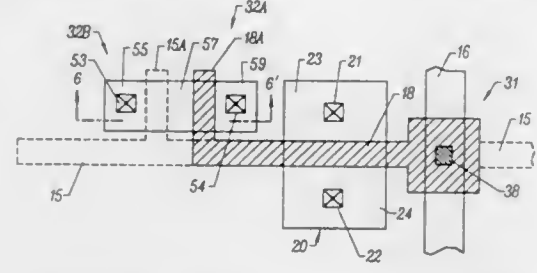
a capacitance dope layer of a second conductivity type, provided at a surface of said well of the first conductivity type;  
a first electrode provided on said semiconductor substrate on said capacitance dope layer with an insulating film interposed;  
a high concentration impurity diffusion layer of the second conductivity type provided at the main surface electrically connected to said capacitance dope layer, said high concentration impurity diffusion layer having higher concentration than said capacitance dope layer; and  
a second electrode formed on said semiconductor substrate in contact with said high concentration impurity diffusion layer; wherein  
said well does not extend under the entire capacitance dope layer, and the first conductivity type impurity concentration in the semiconductor substrate is less than that in the well, and said well does not extend under said high concentration impurity diffusion layer.

5,773,861  
SINGLE TRANSISTOR EPROM MEMORY DEVICE  
James T. Chen, Cupertino, Calif., and Atsuo Yagi, Shiobara-machi, Japan, assignors to Nippon Precision Circuits, Inc., Tokyo, Japan, by said Atsuo Yagi  
Continuation of Ser. No. 237,761, May 4, 1994, abandoned.  
This application Nov. 17, 1995, Ser. No. 559,800  
Int. Cl.<sup>6</sup> H01L 29/68; 29/34; 29/04  
U.S. Cl. 257—316 14 Claims



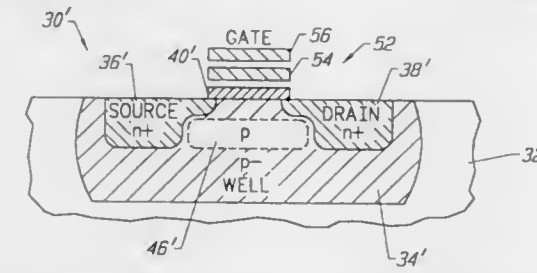
1. A semiconductor device comprising:  
a semiconductor substrate of a first conductivity type;  
a source region of a second conductivity type formed in said substrate;  
a drain region of second conductivity type formed in said substrate, whereby said source and said drain regions are separated by a channel region of said first conductivity semiconductor;  
two adjacent field insulating regions grown on those surfaces of said substrate adjacent said source region, channel region and drain region, each said field insulating region having an edge extending above and below the surface of said substrate;  
a first dielectric layer of uniform thickness formed on the surfaces of said source region, channel region and drain region between said field insulating regions;  
a floating gate of nonuniform thickness, the thickness of a portion of said floating gate which extends over the edges of said field insulating regions being less than the thickness of an area of said floating gate above said first dielectric layer;  
said floating gate comprising:  
a first semiconductor region positioned above said first dielectric layer between the edges of said adjacent field insulating regions; and  
a second semiconductor region positioned above and connected to said first semiconductor region, said second semiconductor region partially extending over the edges of said field insulating regions, a portion of said second semiconductor region positioned over the edge of said field insulating region having a flatter surface than that of the edge of said field insulating regions;  
a second dielectric layer formed over said floating gate and over exposed portions of said field insulating regions; and  
a control gate comprising a semiconductor layer of uniform thickness formed over said second dielectric layer.

5,773,862  
FLOATING GATE FGPA CELL WITH SEPARATED SELECT DEVICE  
Jack Zehong Peng, San Jose; Robert M. Salter, III, Saratoga, and Robert J. Lipp, Los Gatos, all of Calif., assignors to Zycad Corporation, Fremont, Calif.  
Filed Aug. 27, 1996, Ser. No. 704,853  
Int. Cl.<sup>6</sup> H01L 29/788  
U.S. Cl. 257—316 10 Claims



1. A programming portion of an FPGA cell in a substrate of an integrated circuit, comprising  
a first-type dopant region in said substrate and extending to a principal surface of said substrate;  
first, second and third second-type dopant regions in said first-type dopant region and extending to said principal surface;  
a floating gate electrode over a first channel region at said principal surface, said first channel region separating first and second second-type dopant regions;  
a control gate electrode over said floating gate; and  
a select transistor gate electrode over a second channel region at said principal surface, said second channel region separating said second and third second-type dopant regions, said select transistor gate electrode connected to said control gate electrode, wherein said second second-type region is substantially defined by an edge of said floating gate electrode and an edge of said control gate electrode.

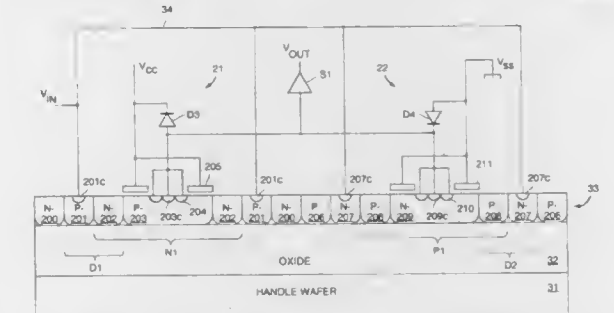
5,773,863  
LOW POWER, HIGH PERFORMANCE JUNCTION TRANSISTOR  
James B. Burr, Foster City, and Michael P. Brassington, Sunnyvale, both of Calif., assignors to Sun Microsystems, Inc., Mt. View, Calif.  
Filed Aug. 18, 1994, Ser. No. 292,513  
Int. Cl.<sup>6</sup> H01L 29/76; 29/788; 29/94  
U.S. Cl. 257—344 12 Claims



1. An improved junction transistor formed on a semiconductor substrate, the junction transistor switching when a threshold gate voltage is applied, the transistor comprising:  
a well region having an average dopant concentration of a first conductivity type extending from a top surface of the semiconductor substrate downward into the substrate;  
a source region of a second conductivity type positioned within said well region;  
a drain region of the second conductivity type positioned within said well region;  
a channel region within said well region and separating the source and drain regions, wherein said channel region has a

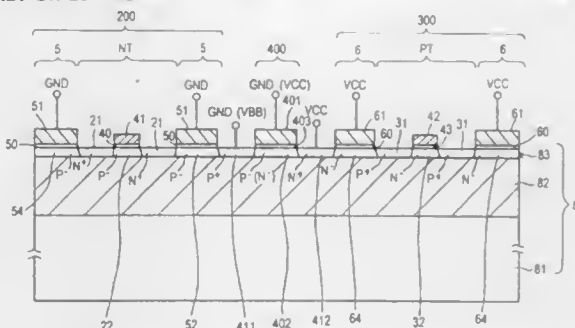
width of about 2 microns or less and a dopant concentration in the channel region is between about  $1 \times 10^{14}$  and  $1 \times 10^{16}$  atoms/cm<sup>3</sup>;  
a gate positioned over the top surface of the substrate and over the channel region, said gate having an electrically tunable threshold voltage and having a threshold voltage magnitude of at most about 150 mV at room temperature; and  
a buried region of the first conductivity type within the well region and disposed beneath of the channel region and spanning the length of the channel region, said buried region having a dopant concentration of the first conductivity type that is between about 10 and 100 times greater than the average dopant concentration in the well region, wherein the buried region dopant concentration is between about  $1 \times 10^{17}$  and  $1 \times 10^{18}$  atoms/cm<sup>3</sup>; and  
a contact connected to the source region and an ohmic contact connected to the well region such that the potential difference between the source and well regions can be adjusted to tune the gate threshold voltage by back biasing.

5,773,864  
CMOS INTERFACE CIRCUIT FORMED IN SILICON-ON-INSULATOR SUBSTRATE  
Richard Billings Merrill, Daly City, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.  
Filed Apr. 28, 1995, Ser. No. 430,997  
Int. Cl.<sup>6</sup> H01L 27/01 7 Claims



1. A CMOS device formed in a silicon-on-insulator (SOI) substrate, said CMOS device comprising:  
an N-channel MOSFET comprising a first N well, a first P well and a relatively shallow N diffusion within said first P well, a portion of said first P well adjacent a surface of said SOI substrate forming a channel of said N-channel MOSFET, said first N well and said first P well extending to a surface of an insulating layer within said SOI substrate, a first gate being formed over said channel of said N-channel MOSFET, said first gate being connected to a first voltage;  
a P-channel MOSFET comprising a second P well, a second N well and a relatively shallow P diffusion within said second N well, a portion of said second N well adjacent a surface of said SOI substrate forming a channel of said P-channel MOSFET, said second P well and said second N well extending to said surface of said insulating layer, a second gate being formed over said channel of said P-channel MOSFET, said second gate being connected to a second voltage;  
a third P well formed in said SOI substrate adjacent said first N well, a junction between said first N well and said third P well forming a first diode; and  
a third N well formed in said SOI substrate adjacent said second P well, a junction between said second P well and said third N well forming a second diode.

5,773,865  
SEMICONDUCTOR MEMORY AND SEMICONDUCTOR DEVICE HAVING SOI STRUCTURE  
Hidetoshi Hidaka, and Takahiro Tsuruda, both of Iiyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
Division of Ser. No. 463,795, Jun. 5, 1995, Pat. No. 5,635,744.  
This application Apr. 2, 1997, Ser. No. 832,351  
Claims priority, application Japan, Sep. 8, 1994, 6-214805; Dec. 19, 1994, 6-314987  
Int. Cl.<sup>6</sup> H01L 27/01; 27/12; 29/76  
U.S. Cl. 257—349 4 Claims



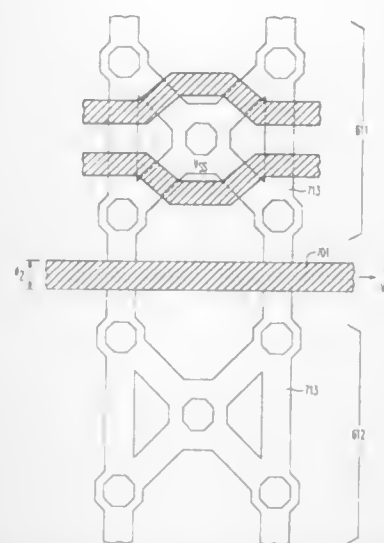
1. A semiconductor memory formed on an SOI substrate, comprising:  
a plurality of N-channel transistor regions each having an N-channel MOS transistor formed therein;  
a plurality of P-channel transistor regions each having a P-channel MOS transistor formed therein;  
a first field shield region for isolating said N-channel transistor regions from one another;  
a second field shield region for isolating said P-channel transistor regions from one another; and  
an oxide isolation region formed between said N-channel transistor regions on one hand, and said P-channel transistor regions on the other hand, the two types of the transistor regions being disposed adjacent to each other, said oxide isolation region isolating said two types of the transistor regions from each other.

5,773,866  
Patent Not Issued For This Number

5,773,867  
PROGRAMMABLE HEX-ROM WITH ISOLATION TRANSISTOR STRUCTURE  
Sairesh Chittipeddi, Emmaus, Pa.; William Thomas Cochran, Clermont, Fla., and Kang Woo Lee, Allentown, Pa., assignors to Lucent Technologies, Inc., Murray Hill, N.J.  
Continuation of Ser. No. 428,264, Apr. 25, 1995, abandoned.  
This application Mar. 26, 1997, Ser. No. 827,352  
Int. Cl.<sup>6</sup> H01L 29/78; G11C 17/00  
U.S. Cl. 257—390 1 Claim

1. A programmable Hex-ROM, comprising:  
a plurality of groups of four transistors, each of the groups of four transistors having a first plurality of junction points and a second plurality of junction points, the first junction points of each of the groups being connected to a common voltage relative to a substrate of the Hex-ROM;  
a plurality of via holes, the via holes corresponding to a portion of the second junction points; and  
a plurality of isolation transistors, each of the isolation transistors being disposed between a pair of adjacent transistors of the groups of four transistors, a plurality of gates of the isolation transistors being set to a voltage relative to the substrate of the Hex-ROM so that the adjacent transistors are isolated from each other, wherein the Hex-ROM is pro-





grammed by selecting ones of the second junction points to be included in the portion of the second junction points.

5,773,868

**SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME**

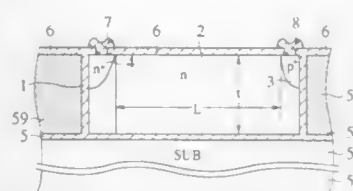
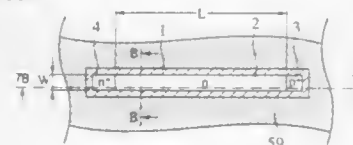
Koichi Endo, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 26, 1996, Ser. No. 622,587

Claims priority, application Japan, Mar. 30, 1995, 7-073344  
Int. Cl.<sup>6</sup> H01L 29/861; 29/06

U.S. Cl. 257—514

19 Claims



1. A semiconductor power device comprising:

- (a) a substrate;
- (b) a bottom insulating film formed on said substrate;
- (c) a first semiconductor layer of a first conductivity type having a top, a bottom and at least four side surfaces, formed on said bottom insulating film at a partial area thereof;
- (d) an element isolation region facing to said side surfaces and surrounding said first semiconductor layer, said element isolation region having a substantially vertical side wall;
- (e) an element isolation insulating film formed on said side surfaces at an interface between said element isolation region and said first semiconductor layer;
- (f) a first main electrode region of the first conductivity type having a higher impurity concentration than that of the first semiconductor layer, formed in said first semiconductor layer at a partial area thereof; and
- (g) a second main electrode region of a second conductivity type formed in said first semiconductor layer at a partial area thereof, said second main electrode region being spaced apart from said first main electrode region,

wherein a thickness  $t$  of said first semiconductor layer is  $5\text{ }\mu\text{m}$  or thicker, a width  $W$  of said first semiconductor layer sandwiched by said element isolation insulating film between said first and second main electrode regions is  $5\text{ }\mu\text{m}$  or narrower, and  $t > W$ .

5,773,869

**DOUBLE DENSITY FUSE BANK FOR THE LASER BREAK-LINK PROGRAMMING OF AN INTEGRATED CIRCUIT**

Karl-Heinz Froehner, Hopewell Junction, N.Y., assignor to Siemens Aktiengesellschaft, Munich, Germany

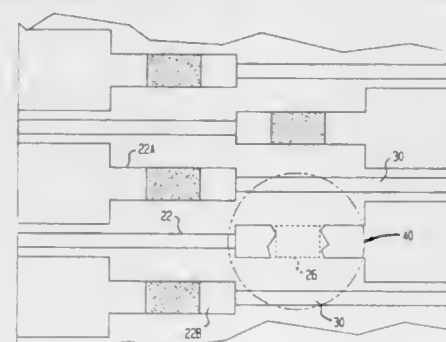
Continuation of Ser. No. 365,641, Dec. 29, 1994, abandoned.

This application Jan. 8, 1997, Ser. No. 780,242

Int. Cl.<sup>6</sup> H01L 29/00

U.S. Cl. 257—529

20 Claims



1. A fuse bank for use in the laser programming of an integrated circuit, comprising:

- a plurality of adjacent fuse elements forming a single column, each having a first end and a second end opposite said first end, wherein each fuse element includes a first region, proximate said first end, configured to be severed by a predetermined exposure of laser radiation and a second region, proximate said second end, configured to be unsevered by said predetermined exposure to laser radiation;

wherein said fuse elements are alternately aligned in substantially parallel rows so that the first end of each element is juxtaposed with the second end of an immediately adjacent fuse element, a distance between first regions of two immediately adjacent fuse elements of said plurality of said adjacent fuse elements being dimensioned to prevent said first regions of said two immediately adjacent fuse elements to be severed from a single pulse of laser.

5,773,870

**MEMBRANE TYPE INTEGRATED INDUCTOR AND THE PROCESS THEREOF**

Shyang Su, Jeng Tzong Sheu, both of Hsinchu, and Kuen Joung Chuang, Peng Hu, all of Taiwan, assignors to National Science Council, Taipei, Taiwan

Filed Sep. 10, 1996, Ser. No. 709,827

Int. Cl.<sup>6</sup> H01L 29/00

U.S. Cl. 257—531

5 Claims

- 1. A membrane type integrated inductor comprising:
  - a substrate having a top surface,
  - a membrane dielectric layer fabricated on the entire top surface of the substrate, and
  - an integrated inductor formed on the membrane dielectric layer;

5,773,872

**SEMICONDUCTOR DEVICE HAVING AN INTEGRATED DIFFERENTIAL CIRCUIT WITH AN IMPROVED COMMON-MODE REJECTION RATIO (CMRR)**

Hiroyuki Kobatake, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

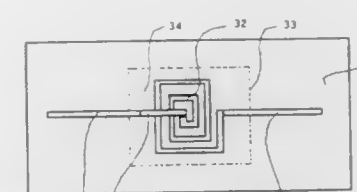
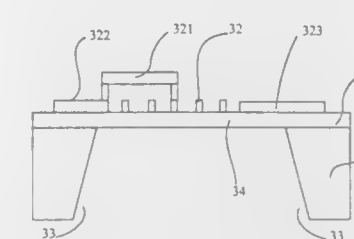
Filed Oct. 23, 1996, Ser. No. 735,550

Claims priority, application Japan, Oct. 25, 1995, 7-277318

Int. Cl.<sup>6</sup> H01L 29/92

U.S. Cl. 257—532

8 Claims



wherein the substrate below the membrane where the integrated inductor is formed is etched away using the membrane dielectric layer as an etching stop.

5,773,871

**INTEGRATED CIRCUIT STRUCTURE AND METHOD OF FABRICATION THEREOF**

John M. Boyd, Woodlawn; Joseph P. Ellul, and Sing P. Tay, both of Nepean, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Continuation of Ser. No. 289,365, Aug. 11, 1994, abandoned,

which is a continuation-in-part of Ser. No. 80,544, Jun. 24,

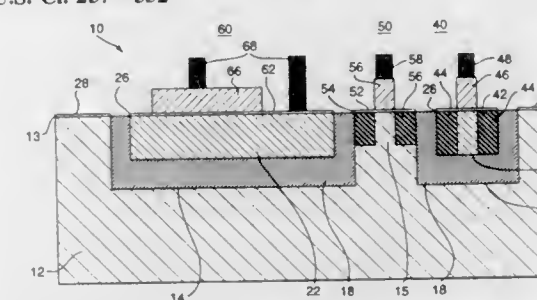
1993, Pat. No. 5,362,669. This application Apr. 25, 1996, Ser.

No. 638,084

Int. Cl.<sup>6</sup> H01L 29/00

U.S. Cl. 257—532

3 Claims



- 1. An integrated circuit including a capacitor comprising:
  - a semiconductor substrate having a planar surface and a trench region defined therein comprising a steep sided trench filled with a layer of semiconductor material comprising one of polysilicon and amorphous silicon, the semiconductor material being heavily doped to form a conductive layer and being isolated from the substrate by a layer of dielectric lining the trench,

- surfaces of the dielectric and the semiconductor material filling the trench being fully planarized to provide an isolated trench region of the semiconductor material having a smooth polished surface coplanar with the surface of the substrate, the semiconductor material thereby forming a bottom electrode of the capacitor;
- a layer of capacitor dielectric provided on the smooth polished surface of the bottom electrode of the capacitor;
- and another conductive layer formed on the capacitor dielectric providing a top capacitor electrode of the capacitor.

5,773,873

**SEMICONDUCTOR DEVICE HAVING MULTI-EMITTER STRUCTURE**

Yasuhiko Kuriyama, Kanagawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Mar. 12, 1996, Ser. No. 614,254

Claims priority, application Japan, Mar. 15, 1995, 7-055795

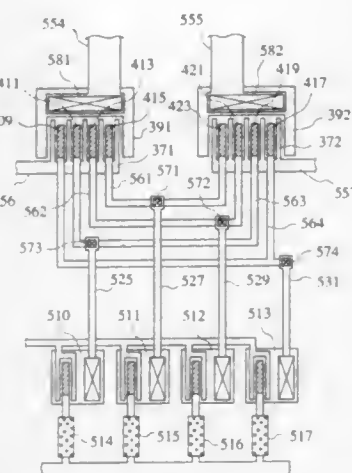
Int. Cl.<sup>6</sup> H01L 29/00; 27/082

U.S. Cl. 257—563

19 Claims

1. A semiconductor device having a differential amplifier with a first and a second input terminal, the differential amplifier comprising:

- (a) a first multi-emitter bipolar transistor, comprising a first emitter electrode, a second emitter electrode electrically independent from said first emitter electrode, a third emitter electrode electrically independent from said first and second emitter electrodes, a first collector electrode common to said first, second and third emitter electrodes, and a first base electrode common to said first, second and third emitter electrodes, said first base electrode being the first input terminal;



- (b) a second multi-emitter bipolar transistor, comprising a fourth emitter electrode, a fifth emitter electrode electrically independent from said fourth emitter electrode, a sixth emitter electrode electrically independent from said fourth and fifth emitter electrodes, a second collector electrode common to said fourth, fifth and sixth emitter electrodes, and a second base electrode common to said fourth, fifth and sixth emitter electrodes, said second base electrode being the second input terminal;
- (c) a first emitter terminal interconnecting said first and fourth emitter electrodes;
- (d) a second emitter terminal interconnecting said second and fifth emitter electrodes;
- (e) a third emitter terminal interconnecting said second and fifth emitter electrodes;
- (f) a first constant current source connected to said first emitter terminal;
- (g) a second constant current source connected to said second emitter terminal; and
- (h) a third constant current source connected to said third emitter terminal.

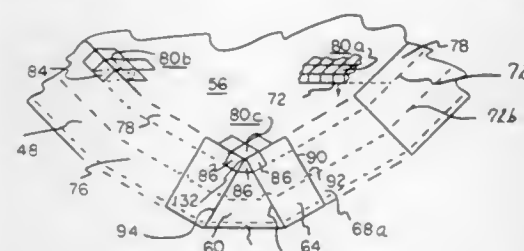
5,773,874

**SEMICONDUCTOR DEVICE HAVING A MESA STRUCTURE FOR SURFACE VOLTAGE BREAKDOWN**  
Willem Gerard Einthoven, Belle Mead, N.J., assignor to General Instrument Corporation, Hatboro, Pa.  
Continuation of Ser. No. 406,515, Mar. 17, 1995, abandoned, which is a continuation-in-part of Ser. No. 23,299, Apr. 20, 1994, Pat. No. 5,399,901. This application May 12, 1997, Ser. No. 854,475

Int. Cl.<sup>6</sup> H01L 29/06; 29/74

U.S. Cl. 257—623

6 Claims



1. A semiconductor device comprising a monocrystalline silicon wafer having a major surface lying in the {100} crystal plane, a generally rectangular mesa structure extending upwardly from said surface, said mesa structure having spaced apart top and bottom surfaces interconnected by four side walls meeting at corner walls, horizontal edges of said side walls being disposed at an angle of at least about 12 degrees to <110> directions on said major surface, each of said corner walls comprising a triangular facet lying in a {111} crystal plane, and a plurality of planar second facets extend-

ing between one side of said triangular facet and one of said side walls, the planes of adjoining second facets being angularly off-set from one another, and the slopes of said second facets, with respect to said mesa structure bottom surface, being about 45 degrees.

5,773,875

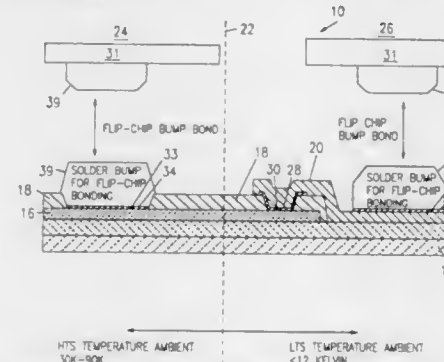
**HIGH PERFORMANCE, LOW THERMAL LOSS, BI-TEMPERATURE SUPERCONDUCTIVE DEVICE**  
Hugo Wai-Kung Chan, Rancho Palos Verdes, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Feb. 23, 1996, Ser. No. 606,177

Int. Cl.<sup>6</sup> H01L 39/00; 23/34; H04B 1/00

U.S. Cl. 257—661

38 Claims



1. A superconductive electrical device operable simultaneously at a relatively higher temperature and at a relatively lower temperature differing by at least 20° K, the device comprising:

- (a) a non-superconducting substrate having a first relatively higher temperature region and a second relatively lower temperature region;
- (b) a first superconductive layer on the first region and on a portion of the second region of the substrate, the first layer being superconductive at the relatively higher temperature;
- (c) a dielectric layer on the first superconductive layer; and
- (d) a second superconductive layer on the second region of the substrate and on a portion of the dielectric layer, the second layer being superconductive at the relatively lower temperature but not at the relatively higher temperature.

5,773,876

**LEAD FRAME WITH ELECTROSTATIC DISCHARGE PROTECTION**

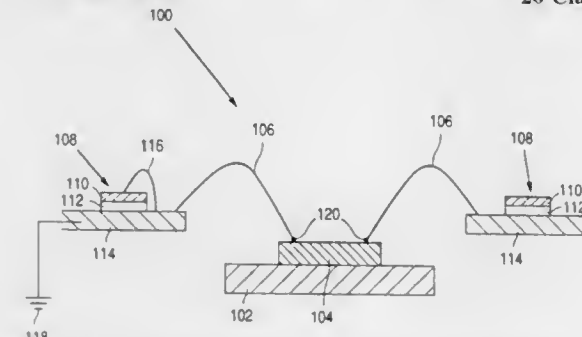
Boonmi Mekdhanasarn, Sunnyvale, and Randy Hsiao-Yu Lo, Campbell, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 6, 1996, Ser. No. 744,681

Int. Cl.<sup>6</sup> H01L 23/48

U.S. Cl. 257—665

20 Claims



1. A lead frame having protection against electrostatic discharge, comprising:
- a multiplicity of leads; and
- an electrostatic discharge protection device including a conductive layer and a protection layer formed from an electrostatic

discharge protection material, the protection layer being arranged to contact the multiplicity of leads, wherein the electrostatic discharge protection material insulates the leads from the conductive layer at voltages below a predefined threshold voltage and establishes an electrical connection between the leads and the conductive layer at voltages above the threshold voltage.

5,773,877

**PLASTIC ENCAPSULATED IC PACKAGE AND METHOD OF DESIGNING SAME**

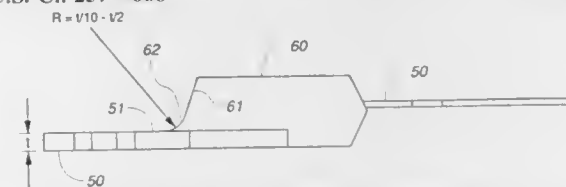
Jun Min Hu, Canton, and Yi-Hsi Pao, Livonia, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 7, 1997, Ser. No. 796,991

Int. Cl.<sup>6</sup> H01L 23/495

U.S. Cl. 257—666

3 Claims



1. An IC package having a plastic encapsulated portion and a lead frame portion that are bonded together at a bonding interface, the IC package comprising:

- a design material combination selected by selecting material candidates for the plastic encapsulated portion, selecting material candidates for the lead frame portion, and determining a peeling stress and shear stress at the bonding interface for a plurality of combinations of material candidates; and
- a circular fillet feature having a radius at a singularity point, the singularity point determined by determining a point at the bonding interface of the design material combination having the highest stress, and wherein the radius determined from a range of possible radii.

5,773,878

**IC PACKAGING LEAD FRAME FOR REDUCING CHIP STRESS AND DEFORMATION**

Thiam Beng Lim, Toh Crescent, and Sarvatham M. Bhandarkar, Telok Kurau, both of Singapore, assignors to Institute of Microelectronics National University of Singapore, Singapore, Singapore

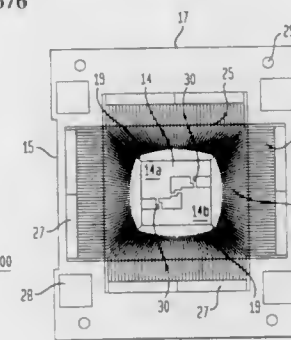
Filed Jan. 4, 1996, Ser. No. 582,643

Claims priority, application Singapore, Oct. 28, 1995, 9501670-5

Int. Cl.<sup>6</sup> H01L 23/495

U.S. Cl. 257—676

14 Claims



1. A lead frame for a semiconductor die having a unitary construction, comprising:

- a die pad configured to receive the semiconductor die;
- a frame surrounding said die pad and connected to said die pad by at least one die pad suspension strap; and
- a plurality of leads connected to the semiconductor die; said leads being formed integrally with said frame;

wherein said die pad is divided into a plurality of sections, adjacent ones of the sections being connected by at least one flexible expansion joint.

5,773,879

**CU/MO/CU CLAD MOUNTING FOR HIGH FREQUENCY DEVICES**

Toshiro Fusayasu, Kenji Kagata, Hirotugu Yamada, Isao Kitamura, Masanobu Kohara, and Mitsuyuki Takada, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

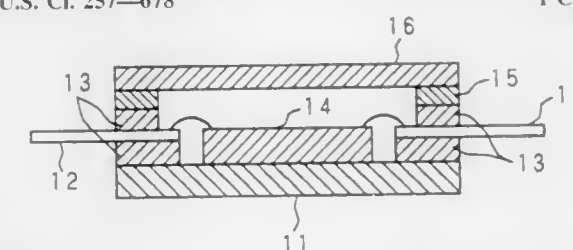
Filed Feb. 9, 1993, Ser. No. 15,007

Claims priority, application Japan, Feb. 13, 1992, 4-026368; Jan. 22, 1993, 5-009106

Int. Cl.<sup>6</sup> H01L 23/02; 23/12; 23/10; 23/06

U.S. Cl. 257—678

1 Claim



1. A semiconductor package comprising:
- a base plate formed of a three layer Cu/Mo/Cu clad material, having a thickness ratio from 1:3:1 to 1:5:1, for attaching to a semiconductor chip;
- a leadframe for receiving at least one lead, said leadframe being bonded by an adhesive to said base plate;
- a window frame surrounding the semiconductor chip and bonded by said adhesive to said leadframe, and a cap bonded to said window frame,
- wherein said adhesive has the dielectric constant of not more than 1.4 and a thickness of not less than 0.6 mm.

5,773,880

**NON-CONTACT IC CARD HAVING INSULATED EXPOSED LEADS**

Hisashi Ohno, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

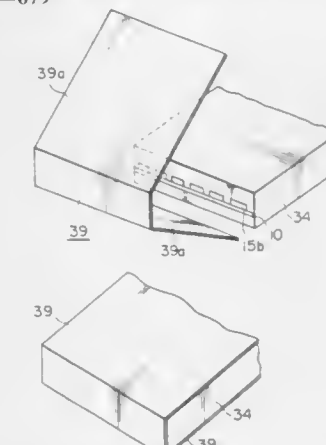
Filed Jul. 28, 1993, Ser. No. 97,904

Claims priority, application Japan, Jul. 30, 1992, 4-203724

Int. Cl.<sup>6</sup> H01L 23/02

U.S. Cl. 257—679

4 Claims



1. A non-contact IC card comprising:
- a circuit board having opposed first and second surfaces;
- an electronic circuit mounted on the first surface of said circuit board and having a plurality of functions;



a resin package disposed on the first and second surfaces of said circuit board, covering said electronic circuit, and having an end surface transverse to and exposing an edge of said circuit board;

a plurality of testing wire conductors disposed on the first surface of said circuit board, each testing wire conductor being connected at a first end to said electronic circuit and being flush with and exposed at the end surface of said resin package; and

insulating means for electrically insulating said second ends of said testing wire conductors.

5,773,881

## ACCELERATION SENSOR DEVICE

Hajime Kato, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

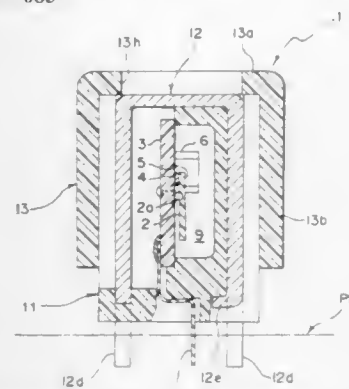
Filed Nov. 18, 1996, Ser. No. 751,699

Claims priority, application Japan, May 28, 1996, 8-133760

Int. Cl.<sup>6</sup> H01L 23/02; 23/48

U.S. Cl. 257—685

5 Claims



1. An acceleration sensor device comprising:
  - a semiconductor sensor element which can sense acceleration in a direction perpendicular to a specified plane;
  - a base member which supports said sensor element;
  - a package member which supports said base member and encloses said base member and said semiconductor sensor element;
  - a frame member fixed on said package member, said frame member having a plurality of leg sections protruding from a bottom plane of said package member; and
  - a cap-shaped resin cover member fixed to said package member, said cover member having a roof section opposite to an upper surface of said package member or said frame member and covering said package member from above, said cover member enclosing only part of said package member so that said plurality of leg sections protruding from a bottom plane of said package member are exposed, wherein
  - a side wall section of said cover member extends at least to a position corresponding to a place where said sensor element is arranged.

5,773,882

## SEMINCONDUCTOR PACKAGE

Hiroshi Iwasaki, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 427,958, Apr. 26, 1995, abandoned.

This application Feb. 21, 1997, Ser. No. 802,947

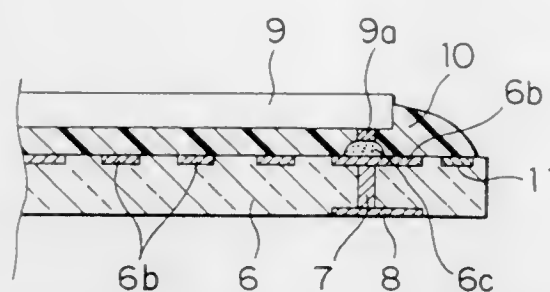
Claims priority, application Japan, Apr. 28, 1994, 6-092379

Int. Cl.<sup>6</sup> H01L 23/48; 23/52

U.S. Cl. 257—692

4 Claims

1. A semiconductor package comprising:
  - a single layer board having oppositely facing first and second main surfaces;
  - a plurality of connection pads and a corresponding plurality of circuit wires on the first main surface, each of the circuit wires



extending from a connection pad to a connection end, the circuit wires being disposed in a region of the first main surface;

- a semiconductor chip mounted on the first main surface and having input/output terminals aligned with and connected to the connection pads, the semiconductor chip being located over the circuit wires in the region of the first main surface;
- a plurality of flat external connector terminals exposed on the second main surface of said board, said external connector terminals being arrayed at constant pitch in a rectangular grid; and
- a filled via hole connection extending vertically from each of said external connector terminals and electrically connected to the connection end of each of said circuit wires, respectively, whereby each of said input/output terminals is connected by one of said circuit wires to one of said external connector terminals.

5,773,883

## SEMICONDUCTOR DEVICE AND SEMICONDUCTOR MODULE

Gourab Majumdar; Satoshi Mori; Sukechisa Noda; Tooru Iwagami; Yoshio Takagi, and Hisashi Kawafuji, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

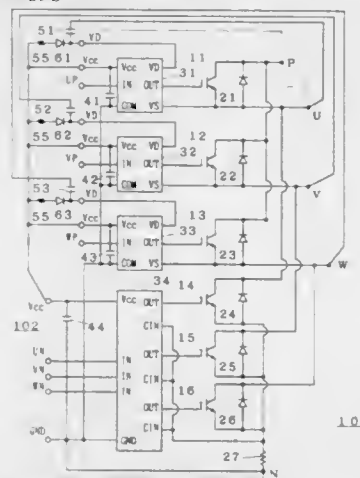
Filed Jun. 13, 1996, Ser. No. 663,407

Claims priority, application Japan, Jan. 9, 1996, 8-001581

Int. Cl.<sup>6</sup> H01L 23/48; 23/34

U.S. Cl. 257—698

10 Claims



1. A semiconductor device comprising:
  - first and second series connected switching semiconductor elements;
  - first and second driving circuits for independently and respectively driving said first and second switching semiconductor elements, each of said first and second driving circuits having a pair of source electrodes, a first one of said pair of source electrodes of said first driving circuit being connected to a connecting part for said first and second switching semiconductor elements;
  - a plurality of terminals for connecting to an external device, said plurality of terminals including a first terminal connected to a second one of said pair of source electrodes of said first driving circuit.

driving circuit and a second terminal connected to said connecting part, with no terminal of said plurality of terminals connected to said first one of said source electrodes of said first driving circuit except for said second terminal; an electrically conductive lead frame, being in the form of a plate having a pattern shape, having said first and second switching semiconductor elements and said first and second driving circuits being fixed thereto and including said plurality of terminals in a peripheral portion thereof; and a sealing body sealing said first and second switching semiconductor elements and said first and second driving circuits along with said lead frame to expose said plurality of terminals.

5,773,884

## ELECTRONIC PACKAGE WITH THERMALLY CONDUCTIVE SUPPORT MEMBER HAVING A THIN CIRCUITIZED SUBSTRATE AND SEMICONDUCTOR DEVICE BONDED THERETO

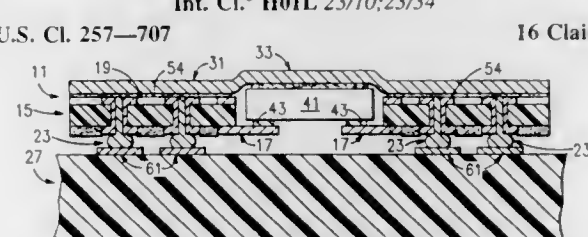
Frank Edward Andros, Binghamton; James Russell Bupp, Endwell; Michael DiPietro, Vestal, and Richard Benjamin Hammer, Apalachin, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 671,426, Jun. 27, 1996, Pat. No. 5,633,533. This application Mar. 3, 1997, Ser. No. 811,070

Int. Cl.<sup>6</sup> H01L 23/10; 23/34

U.S. Cl. 257—707

16 Claims



1. An electronic package comprising:
  - a substantially rigid, thermally conductive support member;
  - a thin, flexible circuitized substrate including a dielectric member having a first layer of circuitry positioned on a first surface thereof, said thin, flexible circuitized substrate including a plurality of conductive through-holes located within said dielectric member and electrically connected to said first layer of circuitry, said thin circuitized substrate being directly bonded to said support member in an electrically insulative manner, including along the portion of said dielectric member having said plurality of conductive through-holes therein;
  - a semiconductor device bonded to said support member in a thermally conductive manner at a location relative to said first layer of circuitry of said circuitized substrate, said semiconductor device including a surface having a plurality of electrical contact sites thereon for being electrically coupled to said first layer of said circuitry of said circuitized substrate; and
  - a plurality of solder elements each positioned on selected ones of said conductive through-holes and electrically connected thereto, each of said solder elements including a first portion thereof extending within a respective one of said selected ones of said conductive through-holes and a rounded second portion projecting from said conductive through-hole and adapted for being electrically coupled to an external circuitized substrate.

5,773,885

## THERMALLY RESPONSIVE COMPRESSIVE DIODE ASSEMBLY

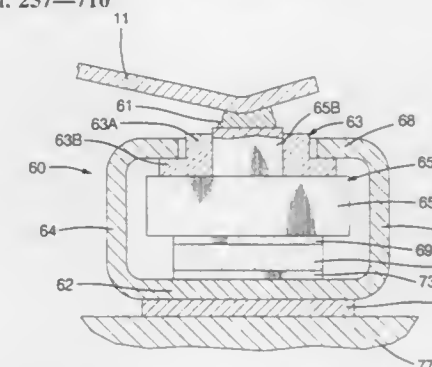
Roy Burton Steele, Richmond, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 6, 1996, Ser. No. 656,956

Int. Cl.<sup>6</sup> H01L 23/10

U.S. Cl. 257—710

8 Claims



1. A power rectifier assembly comprising:
  - a rectifier blank having opposite anodic and cathodic surfaces;
  - first contact means coupled to one of the anodic and cathodic surfaces;
  - second contact means coupled to the other one of the anodic and cathodic surfaces; and
  - thermally responsive clamping means effective to progressively compressively load the rectifier blank between the first and second contact means as assembly temperature increases, said means including substantially unyieldable means through which the loading is transmitted.

5,773,886

## SYSTEM HAVING STACKABLE HEAT SINK STRUCTURES

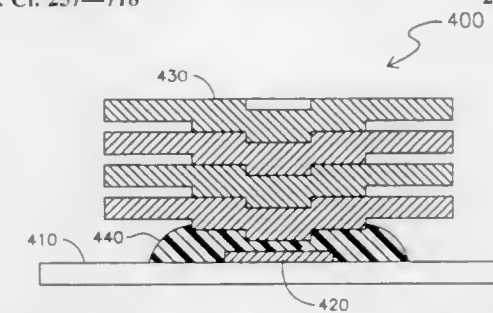
Michael D. Rostoker, Boulder Creek; Mark R. Schneider, and Joseph H. Jorowski, both of San Jose, all of Calif., assignors to LSI Logic Corporation, Milpitas, Calif.

Continuation-in-part of Ser. No. 93,292, Jul. 15, 1993, abandoned. This application Apr. 12, 1996, Ser. No. 634,336

Int. Cl.<sup>6</sup> H01L 23/34; 23/28

U.S. Cl. 257—718

27 Claims



# UMI

1. A semiconductor memory device, comprising:
  - a semiconductor substrate;
  - a plurality of memory cells formed in said semiconductor substrate;
  - a first complementary pair of bit lines coupled to said memory cells, formed in a first interconnecting layer parallel to said semiconductor substrate, and mutually separated by a first distance; and
  - a second complementary pair of bit lines coupled to said memory cells, formed in a second interconnecting layer parallel to said first interconnecting layer, and mutually separated by a second distance differing from said first distance.

Patent Not Issued For This Number



5,773,894

**INSULATION LAYER SYSTEM FOR THE ELECTRICAL ISOLATION CIRCUITS**

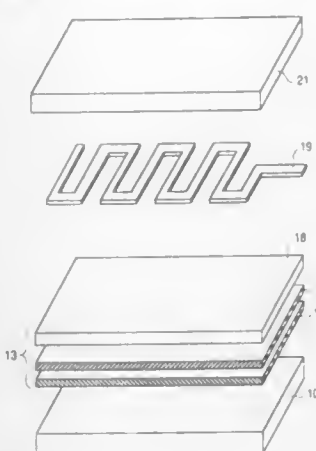
Karl-Hermann Friese, Leonberg; Heinz Geier, Stuttgart; Werner Gruenwald, Gerlingen, and Claudio De La Prieta, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Continuation of Ser. No. 495,488, Jul. 25, 1995, abandoned.

This application Dec. 18, 1996, Ser. No. 769,182

Claims priority, application Germany, Dec. 9, 1993, 43 42 033.8; Dec. 8, 1994, 44 39 883.2

Int. Cl.<sup>6</sup> G01N 27/406; 27/407; H01B 3/12; C04B 35/48  
U.S. Cl. 257—760 13 Claims



1. An insulation layer system for the electrical isolation of electric circuits, having an electrically conductive solid-electrolyte layer, an electrically conductive layer and at least one electrically insulating, ceramic layer between the solid-electrolyte layer and the electrically conductive layer, and wherein: the at least one insulating layer disposed adjacent to the solid-electrolyte layer is formed of an electrically insulating ceramic material, with said insulating ceramic material additionally containing pentavalent metal oxides of niobium or tantalum as an additive in a quantitative ratio of up to 10% by volume with reference to the volume of the at least one insulating layer; and the solid-electrolyte layer has a diffused region doped with pentavalent cations of niobium or tantalum adjacent to an insulating layer, caused by the diffusion of the pentavalent cations from the at least one insulating layer during sintering.

5,773,895

**ANCHOR PROVISIONS TO PREVENT MOLD DELAMINATION IN AN OVERMOLDED PLASTIC ARRAY PACKAGE**

Altaf Hassan, Chandler, and Bidyut K. Bhattacharyya, Phoenix, both of Ariz., assignors to Intel Corporation, Santa Clara, Calif.

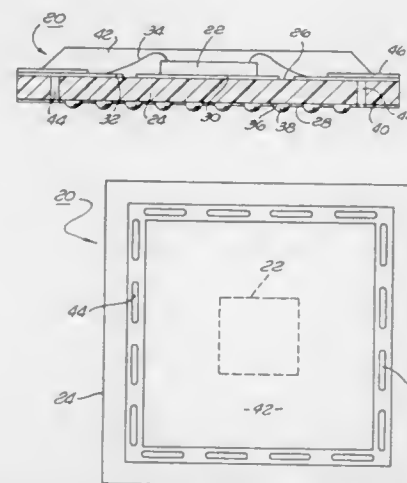
Filed Apr. 3, 1996, Ser. No. 627,058

Int. Cl.<sup>6</sup> H01L 23/48; 23/52

U.S. Cl. 257—774

13 Claims

1. An electronic package, comprising:  
a substrate which has a first surface and an opposite second surface, said substrate having a slot in said first surface and an outer raised layer on said first surface, wherein said outer raised layer has a top surface;  
a contact that extends from said second surface of said substrate;  
an integrated circuit mounted to said first surface; and,



a plastic mold compound that encapsulates said integrated circuit, wherein a portion of said plastic mold compound extends into said slot and onto said top surface of said outer raised layer of said substrate.

5,773,896

**SEMICONDUCTOR DEVICE HAVING OFFSETCHIPS**

Hiroaki Fujimoto; Shinitsu Takehashi, and Takashi Ohtsuka, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

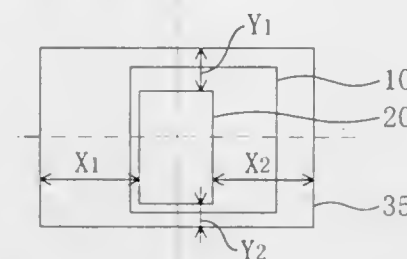
Filed Feb. 18, 1997, Ser. No. 802,025

Claims priority, application Japan, Feb. 19, 1996, 8-030301; May 13, 1996, 8-117588

Int. Cl.<sup>6</sup> H01L 23/48; 23/34

U.S. Cl. 257—777

2 Claims



1. A semiconductor device comprising:  
a first semiconductor chip having a first LSI;  
a second semiconductor chip having a second LSI, said second semiconductor chip being smaller in size than said first semiconductor chip and connected to said first semiconductor chip by face down bonding; and  
a package for packaging said first and second semiconductor chips, wherein  
the center of said first semiconductor chip is offset from the center of said second semiconductor chip in a first direction in which a first one of two contiguous edges of said second semiconductor chip extends, said first edge being as long as or shorter than the other one of the two contiguous edges, while the center of said second semiconductor chip is substantially coincident with the center of said package.

5,773,897

**FLIP CHIP MONOLITHIC MICROWAVE INTEGRATED CIRCUIT WITH MUSHROOM-SHAPED, SOLDER-CAPPED, PLATED METAL BUMPS**

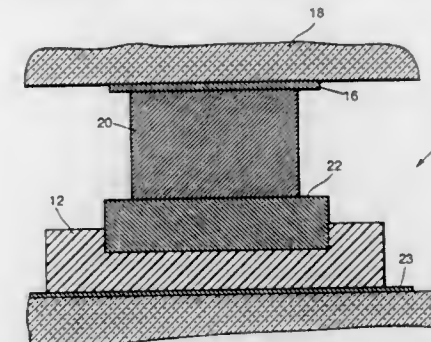
Cheng P. Wen, Mission Viejo, and Wah S. Wong, Montebello, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Feb. 21, 1997, Ser. No. 803,656

Int. Cl.<sup>6</sup> H05K 1/09; H01L 29/46

U.S. Cl. 257—778

3 Claims



1. A flip chip structure comprising a monolithic microwave integrated circuit formed on a module substrate and mounted on an assembly substrate, said module substrate further including a plurality of solder bumps for securement of said module substrate to said assembly substrate, said solder bumps comprising electroplated silver pillars having a first diameter and being capped with electroplated solder having a second diameter, where said second diameter is larger than said first diameter.

5,773,898

**HYBRID INTEGRATED CIRCUIT WITH A SPACER BETWEEN THE RADIATOR PLATE AND LOADING PORTION OF THE IC**

Eiji Kobayashi, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

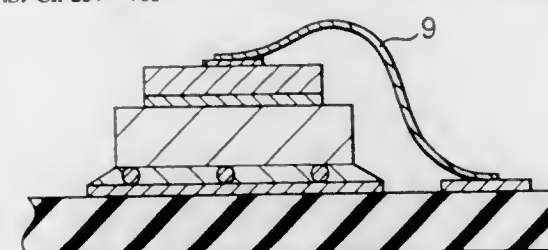
Filed Nov. 26, 1996, Ser. No. 756,649

Claims priority, application Japan, May 27, 1996, 8-131995

Int. Cl.<sup>6</sup> H01L 23/34; H05K 7/20

U.S. Cl. 257—783

13 Claims



1. A hybrid integrated circuit comprising:  
a substrate;  
a loading portion affixed to an upper surface of said substrate;  
a radiator plate attached to said loading portion;  
a first solder layer positioned between said loading portion and said radiator plate;  
a transistor attached to an upper surface of said radiator plate; and  
a spacer layer for maintaining a predetermined gap between said radiator plate and said loading portion, said spacer layer including one of (1) a plurality of globular metal particles distributed within said first solder layer, (2) a high melting point solder layer positioned between said first solder layer and said radiator plate, and (3) a dummy layer formed of a plurality of stacked elements within said first solder layer.

5,773,899

**BONDING PAD FOR A SEMICONDUCTOR CHIP**

Raffaele Zambrano, San Giovanni La Punta, Italy, assignor to Consorzio per la Ricerca sulla Microelettronica nel Mezzogiorno, Catania, Italy

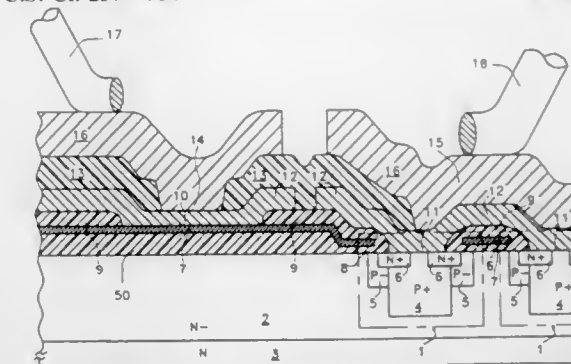
Continuation of Ser. No. 462,180, Jun. 5, 1995, abandoned, which is a division of Ser. No. 306,455, Sep. 15, 1994, abandoned. This application Aug. 29, 1996, Ser. No. 705,921

Claims priority, application European Pat. Off., Sep. 30, 1993, 93830396

Int. Cl.<sup>6</sup> H01L 23/48; 29/43; 29/784

U.S. Cl. 257—784

6 Claims



1. A bonding pad for a semiconductor device having active regions interconnected by a metal pattern, the bonding pad comprising:

a metal region disposed over the metal pattern, the metal region defining a bonding pad area over the active regions, the metal region being in direct contact with the metal pattern for substantially the whole bonding pad area, a thickness of the metal region preventing perforation of the metal region by a bonding wire during a bonding process of bonding the bonding wire to the metal region so that a mechanical stress caused by the bonding wire during the bonding process is substantially entirely sustained by the metal region; and  
a passivating material layer disposed between the metal pattern and the metal region except for under said bonding pad area defined by the metal region.

5,773,900

**DEVICE FOR SUPPRESSING SIGNAL INTERFERENCE**

Hartmut Schumacher, Freiberg; Klaus Oswald, Baltmannsweiler; Norbert Crispin, Ludwigsburg, and Martin Daiber, Ostfildern-Ruit, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

PCT No. PCT/DE95/01082, § 371 Date May 20, 1997, § 102(e) Date May 20, 1997, PCT Pub. No. WO96/07872, PCT Pub. Date Mar. 14, 1996

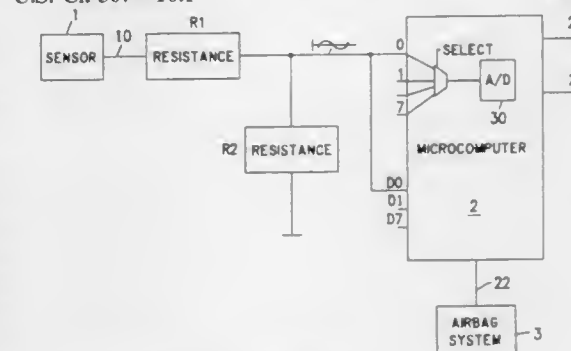
PCT Filed Aug. 17, 1995, Ser. No. 793,285

Claims priority, application Germany, Sep. 10, 1994, 44 32 229.1

Int. Cl.<sup>6</sup> B60L 3/00

U.S. Cl. 307—10.1

4 Claims



1. An electronic device comprising:

a sensor generating a first analog output signal on a sensor output line; and

a microcomputer including a plurality of A/D input lines, the sensor output line coupled to a first one of the plurality of A/D input lines, the microcomputer evaluating the first analog output signal and evaluating a second analog signal on a second one of the plurality of A/D input lines, the microcomputer further including an A/D converter converting the first analog output signal into a first digital signal and converting the second analog signal into a second digital signal, the first one of the plurality of A/D input lines having a first measurement interval, the second one of the plurality of A/D input lines having a second measurement interval, the second measurement interval being outside of the first measurement interval,

wherein the first one of the plurality of A/D input lines is coupled to a first potential during the first measurement interval, and

wherein the second one of the plurality of A/D input lines is coupled to a second potential during the second measurement interval.

5,773,901

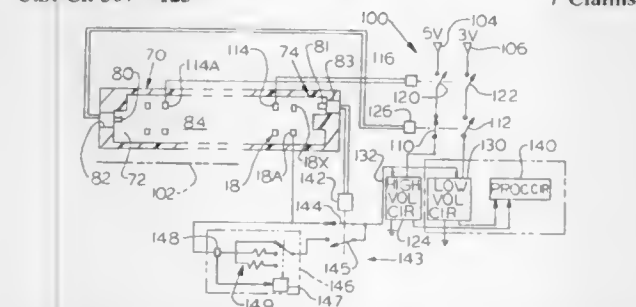
## UNIVERSAL PC CARD HOST

Edward A. Kantner, 5332 Caber Rd., Raleigh, N.C. 27613  
Continuation-in-part of Ser. No. 505,609, Jul. 21, 1995, Pat. No. 5,627,416. This application Mar. 27, 1997, Ser. No. 826,119

Int. Cl.<sup>6</sup> H01H 47/00

U.S. Cl. 307—125

7 Claims



1. A PC card-receiving host that has a card-receiving slot with first and second sides, wherein said slot can receive any one of four types of PC cards comprising low-voltage-low current cards, low voltage-high current cards, high voltage-low current cards, and high voltage-high current cards, where each of said four types of cards is designed to operate at a different combination of first or second voltages and first or second current ranges, and wherein said cards each have first and second sides that indicate the particular type of card, wherein each low voltage card has a voltage discrimination key at the first side of the card but each high voltage card does not, and each low current card has a current discrimination key at its second side but each high current card does not, characterized by:

voltage and current sensing switches mounted on said host;

said voltage sensing switch is located at said card host first side and has an actuator positioned to be operated by the voltage discrimination key of a low voltage card;

said current sensing switch is located at said card host second side and has an actuator positioned to be operated by the current discrimination key of a low current card;

circuitry that can be switched, connected to said voltage and current switches.

5,773,902

Patent Not Issued For This Number

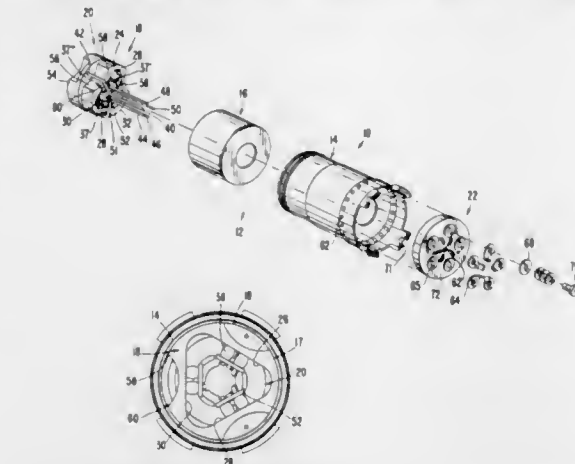
5,773,903  
ROTATING RECTIFIER ASSEMBLY  
Jack L. McCabria, Eudora, Kans., and Richard J. Nisonger, Belle Center, Ohio, assignors to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 20, 1996, Ser. No. 770,919

Int. Cl.<sup>6</sup> H09K 11/00; H09B 1/00; H02M 1/00

U.S. Cl. 310—68 D

23 Claims



1. A rectifier assembly comprising:

a rotor shaft assembly having an inner non-conductive annulus;

a first conductive diode carrier having an inner annulus and an outer periphery, the inner annulus including first, second, and third diode receiving surfaces disposed at spaced apart locations on the inner annulus of the first conductive diode carrier, the outer periphery engaging the inner annulus of the rotor shaft assembly;

a second conductive diode carrier, electrically isolated from the first conductive diode carrier, having an inner annulus and an outer periphery, the inner annulus including first, second, and third diode receiving surfaces disposed at spaced apart locations on the inner annulus of the second conductive diode carrier, the outer periphery engaging the inner annulus of the rotor shaft assembly;

a first electrical conductor connected to the first conductive diode carrier and extending to one end of the rectifier assembly to provide a first DC output;

a second electrical conductor connected to the second conductive diode carrier and extending to the one end of the rectifier assembly to provide a second DC output;

a first diode group comprising at least two diodes and a third electrical conductor for connection to a first electrical phase extending to the one end of the rectifier assembly and electrically connected to an anode of at least one diode of the first diode group and to a cathode of at least one other diode of the first diode group with a cathode of each diode of the at least one diode of the first diode group being electrically connected to the first diode receiving surface of the first conductive diode carrier and with an anode of each diode of the at least one other diode of the first diode group being electrically connected to the first diode receiving surface of the second conductive diode carrier;

a second diode group comprising at least two diodes and a fourth electrical conductor for connection to a second electrical phase extending to the one end of the rectifier assembly and electrically connected to an anode of at least one diode of the second diode group and to a cathode of at least one other diode of the second diode group with a cathode of each diode of the at least one diode of the second diode group being electrically connected to the second diode receiving surface of the first conductive diode carrier and with an anode of each diode of the at least one other diode being electrically connected to the second diode receiving surface of the second conductive diode carrier; and

a third diode group comprising at least two diodes and a fifth electrical conductor for connection to a third electrical phase extending to the one end of the rectifier assembly and electrically connected to an anode of at least one diode of the third diode group and to a cathode of at least one other diode of the third diode group with a cathode of each diode of the at least one diode of the third diode group being electrically connected to the third diode receiving surface of the first conductive diode carrier and with an anode of each diode of the at least one other diode being electrically connected to the third diode receiving surface of the second conductive diode carrier.

ally connected to an anode of at least one diode of the third diode group and to a cathode of at least one other diode of the third diode group with a cathode of each diode of the at least one diode of the third diode group being electrically connected to the third diode receiving surface of the first conductive diode carrier and with an anode of each diode of the at least one other diode of the third diode group being electrically connected to the second diode receiving surface of the second conductive diode carrier.

5,773,904

## ELECTRIC MACHINE HAVING AT LEAST ONE CLUTCH

Stefan Schiebold, Schweinfurt, and Wolfgang Thierler, Harsfurt, both of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Germany

PCT No. PCT/DE94/00006, § 371 Date Oct. 2, 1995, § 102(e) Date Oct. 2, 1995, PCT Pub. No. WO94/19856, PCT Pub. Date Sep. 1, 1994

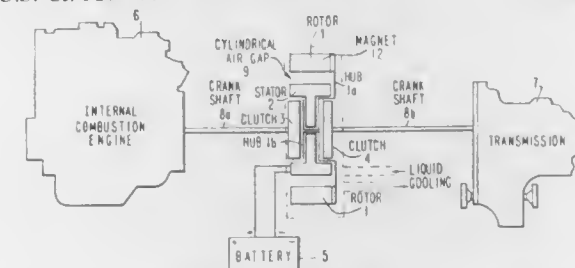
PCT Filed Jan. 3, 1994, Ser. No. 505,340

Claims priority, application Germany, Feb. 19, 1993, 43 05 533.8; May 25, 1993, 43 18 949.0

Int. Cl.<sup>6</sup> B60K 9/04

U.S. Cl. 310—92

8 Claims



1. An electric external-rotor machine for a motor vehicle, comprising:

a stator (2) having a pot-shaped housing with an open side; a substantially cylindrical rotor (1) positioned about and separated from said stator (2) forming an air gap (9) between said rotor (1) and said stator (2), said rotor including an axis extending therethrough; an internal combustion engine having a crank shaft; at least one integrated switchable clutch (3, 4) positioned between said rotor and crank shaft within said stator (2) for transmitting torque to the rotor (1); a second clutch positioned within said stator, each of said at least one clutch and said second clutch including a face side and being positioned along said axis of said rotor (1) in opposing end regions of said stator (2), said face sides of said at least one clutch and said second clutch opposing each other; and, a first hub provided with a plurality of recesses therethrough, said first hub being connected to the rotor so as to extend across said rotor and said stator on said open side of the stator housing to seal the air gap.

5,773,905

## MULTIPHASE ELECTRIC MACHINE WITH PREFABRICATED CO-AXIAL SLOT BARS CONNECTED BY PREFABRICATED CONNECTING CONDUCTORS

Wolfgang Hill, Ortenbergstrasse 3, D-76135 Karlsruhe, Germany

Filed Apr. 6, 1995, Ser. No. 430,847

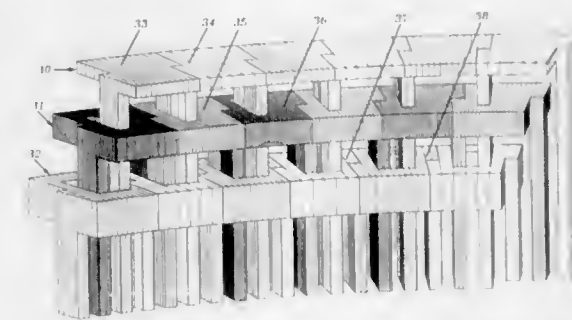
Claims priority, application Germany, Oct. 9, 1992, 42 34 175.2; Oct. 9, 1992, 42 34 129.9

Int. Cl.<sup>6</sup> H02K 3/04

U.S. Cl. 310—201

11 Claims

1. A multiphase electric machine comprising: co-axial slot bars having straight ends and connecting conductors, wherein said co-axial slot bars and said connecting conductors form conductor lanes;



said multiphase electric machine further comprising: a soft magnetic body having a face side and in front of said face side a head region, in which said connecting conductors connect the ends of said co-axial slot bars;

said connecting conductors and said co-axial slot bars consist of prefabricated conductor parts;

said conductor lanes have a variable cross section and form outside the magnetic body head regions;

wherein on at least one side of said multiphase electric machine said co-axial slot bars are joined to each other by attaching said connecting conductors to said straight ends of said co-axial slot bars, wherein said head regions of said conductor lanes lie axially in front of said face side of said soft magnetic body;

wherein said connecting conductors are separated from each other in tangential and axial directions by only a thin layer of adhesive and/or a thin insulating layer and wherein said connecting conductors abut each other and are connected to said straight ends of said co-axial slot bars;

wherein said connecting conductors, when assembled together, form a number of planes of links in the head region;

wherein all of said connecting conductors in a given one of said planes of links belong to the same electric phase;

wherein said number of the planes of links corresponds to the number of slots in each pole pitch;

and wherein at least two of said coaxial slot bars, of differing electric phase are arranged in each pole pitch.

5,773,906

## BRUSH AND SLIP RING ARRANGEMENT OF AN AC GENERATOR

Takuzou Mukai, Handa, and Kenzo Mitani, Obu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

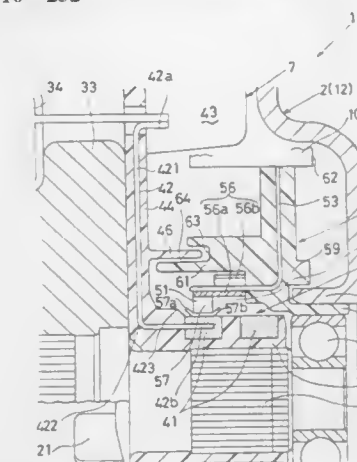
Filed Sep. 25, 1996, Ser. No. 719,213

Claims priority, application Japan, Sep. 27, 1995, 7-248927

Int. Cl.<sup>6</sup> H02K 13/00

U.S. Cl. 310—232

18 Claims



1. A brush and slip ring arrangement of an AC generator which includes a housing, a stator having a stator coil, a rotor having a shaft, a field coil and a rotor core for rotating relative to said stator, wherein said arrangement comprises:



a slip ring unit carried by said shaft and having a cylindrical insulating member and a pair of carbonaceous slip rings held in said cylindrical insulating member, each of said carbonaceous slip rings being composed of a conductive body structure impregnated with carbon power;

a pair of brush members made of springy copper alloy disposed to slide on said carbonaceous slip rings;

a brush holder unit fixed to said housing for holding said brush members; and

a pair of connection bars electrically connecting said field coil and said carbonaceous slip rings, each of said connection bars having an insert member at one end thereof insert-molded with said conductive body structure of one of said carbonaceous slip rings, thereby ensuring both mechanical and electrical connection.

5,773,907

**BRUSH HOLDER ASSEMBLIES HAVING NOVEL BRUSH HOLDERS**

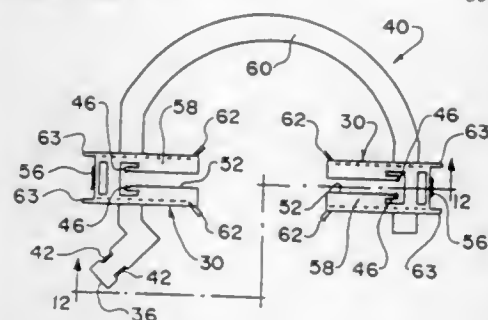
Ilya Rubinchik, London, Canada, assignor to Siemens Canada Ltd., Mississauga, Canada

Continuation-in-part of Ser. No. 234,737, Apr. 28, 1994. This application Jun. 28, 1995, Ser. No. 495,135

Int. Cl.<sup>6</sup> H02U 13/00

U.S. Cl. 310—248

55 Claims



1. An electrical machine comprising a stationary portion and a rotating portion, the latter portion comprising an armature having a commutator, a brush holder assembly disposed on said stationary portion and comprising a non-electrically conductive card having a central aperture through which a portion of said armature passes, a plurality of brush holders disposed on said card and spaced circumferentially around said aperture, electrically conductive brushes guided by said brush holders for motion radially of said aperture, spring means for urging each of said brushes radially inward toward said aperture and into forceful electrical contact with said armature, each said brush holder comprising sides that are disposed along respective sides of the respective brushes and that extend in the direction of brush travel, each said brush holder comprising a respective spring locator that extends integrally laterally outward from a radially inner end of each respective side of the brush holder and terminates as a free end edge that is transverse to said card, said spring locators providing for containment of said spring means for the respective brush, said spring means comprising a spring strip that has respective spring coils at opposite lengthwise ends thereof and a spring segment extending between said spring coils, said spring coils being respectively disposed laterally outward of the respective sides of each holder and behind the respective spring locators, and the respective spring segment extending from a respective spring coil of the respective spring strip around the end edge of the respective spring locator prior to entry of the spring segment into operative association with the respective brush, said spring strip passing along a respective side of the respective brush, thence laterally across a surface of the respective brush, thence along the other side of the respective brush, thence around the end edge of the other spring locator of the respective brush holder, and thence to the other spring coil disposed behind said other spring locator of the respective brush holder.

5,773,908

**SINGLE PHASE MOTOR WITH POSITIVE TORQUE PARKING POSITIONS**

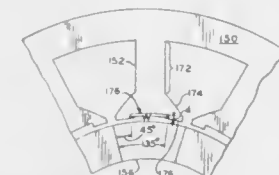
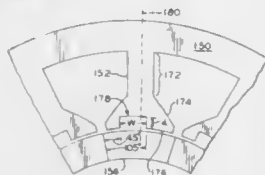
Charles M. Stephens, Pattersonville, and Wen Liang Soong, Schenectady, both of N.Y., assignors to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 678,524, Jul. 9, 1996, which is a continuation of Ser. No. 352,393, Dec. 8, 1994, abandoned, which is a continuation of Ser. No. 23,790, Feb. 22, 1993, abandoned. This application Dec. 5, 1996, Ser. No. 760,755

Int. Cl.<sup>6</sup> H02K 1/12

U.S. Cl. 310—254

30 Claims



1. A motor comprising:

a rotor rotatable about an axis of rotation;

a stator in magnetic coupling relation with the rotor, said stator including a plurality of teeth each having a radially extending pole body and an axially extending face, said pole bodies of the stator teeth each having a generally uniform thickness throughout its radial extent, said faces of the stator teeth defining an aperture for receiving the rotor, said faces of the stator teeth and said rotor defining an air gap therebetween, each stator tooth having a notch in its face which is approximately at least as wide as the thickness of the pole body of the respective stator tooth, said notch defining a modified air gap reluctivity between the stator and the rotor for parking the rotor in a rest position corresponding to a positive torque starting position;

a winding on the pole bodies of the stator teeth; and

a control circuit for controlling current in the winding whereby an electromagnetic field is produced for rotating the rotor at a desired speed or torque during operation of the motor.

5,773,909

**X-RAY TUBE TARGET DRIVE ROTOR**

Steven D. Hansen, Port Washington, and James A. Blake, Franklin, both of Wis., assignors to General Electric Company, Milwaukee, Wis.

Continuation of Ser. No. 366,178, Dec. 29, 1994, abandoned. This application Oct. 16, 1996, Ser. No. 730,778

Int. Cl.<sup>6</sup> H02K 19/00

U.S. Cl. 310—261

3 Claims

1. In an x-ray tube induction motor having plural stator pole pieces with arcuate faces which define a central aperture, an improved high torque shaft mounted cylindrical rotor assembly fitting concentrically in said aperture for concentric rotation therein, said rotor comprising in combination,

(a) a separate discrete and self-supporting thick wall electrically insulating cylinder on said shaft to electrically insulate said shaft from said rotor assembly where said shaft may be exposed to an electrical potential of about 90.0 KV with said stator being at around potential and with said electrical insulator exposed to a temperature of about 500° C.,

(b) a thinner wall iron, Fe, cylinder fitting concentrically on said thick wall insulating cylinder to be positioned thereby in

5,773,911

**SURFACE ACOUSTIC WAVE DEVICE**

Mitsuhiro Tanaka, Chita-Gun; Masao Takeuchi, Natori; Kazuhiko Yamanouchi, and Hiroyuki Odagawa, both of Sendai, all of Japan, assignors to NGK Insulators, Ltd., Japan

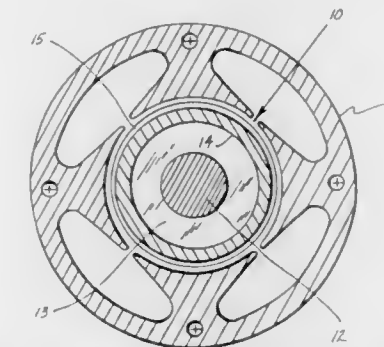
Continuation of Ser. No. 524,061, Sep. 6, 1995, abandoned. This application Jul. 29, 1997, Ser. No. 901,277

Claims priority, application Japan, Sep. 28, 1994, 6-233550; Oct. 25, 1994, 6-260488; Jan. 23, 1995, 7-008048

Int. Cl.<sup>6</sup> H03H 9/145

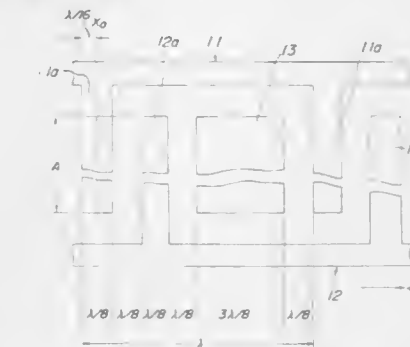
U.S. Cl. 310—313 B

21 Claims



closely adjacent operating relationship to said stator pole pieces for maximum torque.

(c) a thin wall good electrically conductive copper Cu, cylinder fitted on said iron, Fe, cylinder to serve as the electrical conductor for said induction motor rotor.



1. A surface acoustic wave device comprising:

a piezoelectric substrate having such cut angles that the substrate reveals a natural single-phase unidirectional transducer behavior; and

a directionality reversed electrode structure formed on a surface of said piezoelectric substrate and having a basic structure in which positive and negative electrode fingers each having a width of about  $\lambda/8$ ,  $\lambda$  being a wavelength of a surface acoustic wave, are arranged successively with an edge distance of about  $\lambda/8$  and floating electrode fingers each having a width of about  $3\lambda/8$  are arranged with an edge distance of about  $\lambda/8$  with respect to positive electrode fingers, wherein  $\lambda$  is a wavelength of a surface acoustic wave and said positive and negative electrode fingers are connectable to two terminals of a signal source or a load having 180° phase difference.

5,773,910

**TRANSVERSE FLUX MACHINE**

Andreas Lange, Heidenheim, Germany, assignor to Voith Turbo GmbH & Co., Heidenheim, Germany

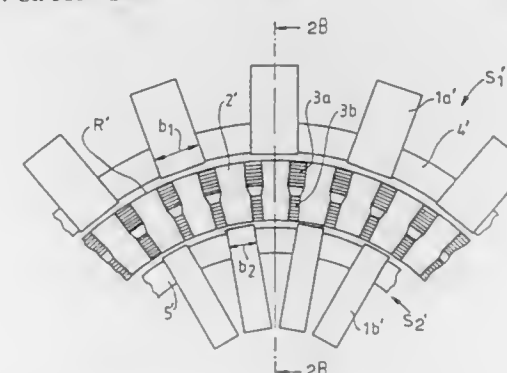
Filed Nov. 8, 1995, Ser. No. 555,127

Claims priority, application Germany, Nov. 10, 1994, 44 40 166.3

Int. Cl.<sup>6</sup> H02K 21/14

U.S. Cl. 310—266

2 Claims

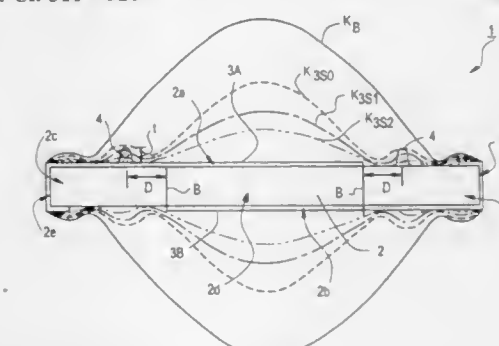


1. A transverse flux machine comprising:

(a) an outer stator having a plurality of soft iron outer stator elements and an outer ring winding;

(b) an inner stator having a plurality of soft iron inner stator elements and an inner ring winding; and

(c) a rotor having a plurality of soft iron rotor elements and a plurality of rotor magnets, said rotor elements alternating with said rotor magnets when viewed with respect to a plane perpendicular to an axis of the transverse flux machine, said rotor magnets, said inner stator elements, and said outer stator elements each having a width when viewed with respect to said plane, the width of the rotor magnets narrowing step-wise in a direction toward the inner stator to an extent such that a flux density in a radial inner air gap and a flux density in a radial outer air gap are substantially equalized, the width of the inner stator elements being smaller than the width of the outer stator elements.



1. A piezoelectric resonator comprising:

a piezoelectric substrate having opposite major surfaces; oscillating electrodes disposed on said opposite major surfaces of said piezoelectric substrate, said oscillating electrodes being arranged so as to extend from respective opposed ends of said piezoelectric substrate to a central portion of said piezoelectric substrate so that said oscillating electrodes over-

lap each other at the central portion of said piezoelectric substrate with said piezoelectric substrate sandwiched between said oscillating electrodes; and  
an oscillation buffer material disposed on a portion of at least one of said opposite major surfaces of said piezoelectric substrate, which portion is displaced by a third harmonic oscillation having a frequency substantially equal to about three times a resonance frequency of said piezoelectric substrate, the oscillation buffer material having a natural resonant frequency which is substantially the same as the frequency of said third harmonic oscillation such that the oscillation buffer material prevents generation of said third harmonic oscillation.

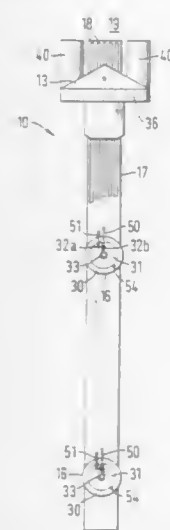
5,773,913

PIEZOELECTRIC SENSORS

Ian Casselden, Bexhill-On-Sea, United Kingdom, assignor to Sensor Systems (Jersey) Limited, St. Helier, United Kingdom  
PCT No. PCT/GB95/00939, § 371 Date Oct. 25, 1996, § 102(e) Date Oct. 25, 1996, PCT Pub. No. WO95/29389, PCT Pub. Date Nov. 2, 1995

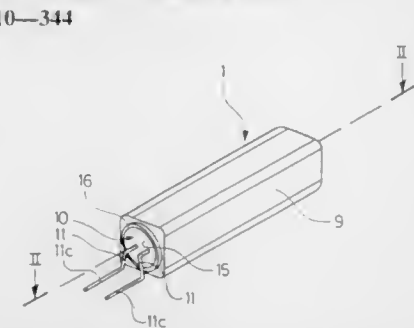
PCT Filed Apr. 25, 1995, Ser. No. 732,362  
Claims priority, application United Kingdom, Apr. 25, 1994, 9408189

Int. Cl.<sup>6</sup> H01L 41/04; G01F 2/328  
U.S. Cl. 310—338



1. A piezoelectric sensor probe (10) comprising an elongate, insulative, support member (17) that supports a plurality of piezoelectric sensing elements (16, 116) spaced from each other along a length of the member, the support member (17) has respective pairs of conductors (18, 117, 118, 119) that extend from one end of the member separately to each of the sensing elements for conducting electrical signals separately to and from each sensing element, each sensing element (16, 116) is supported by the support member (17) and suspended from a surface of said support member such that the sensing element (16, 116) is free to expand and contract substantially independently of the support member (17) when an electrical signal is applied to the sensing element along a respective conductor.

5,773,914  
PIEZOELECTRIC RESONATOR  
Hans-Rudolf Gottier, Safnern, Switzerland, assignor to Eta SA Fabriques d'Ebauches, Grenchen, Switzerland  
Filed Dec. 11, 1996, Ser. No. 763,957  
Claims priority, application France, Dec. 28, 1995, 95 15636  
Int. Cl.<sup>6</sup> H01L 41/04; 41/053  
U.S. Cl. 310—344



1. A piezoelectric resonator comprising a vibrating element provided with electrodes and a tight sealed housing of elongated shape, containing said vibrating element and comprising a metal cap, a base on which said cap is fixed and coupling conductors passing through said base and having internal ends electrically connected to said electrodes of the vibrating element, said metal cap being formed by a part in the shape of a rectangular parallelepiped which has in its lengthways direction a cylindrical axial blind hole.

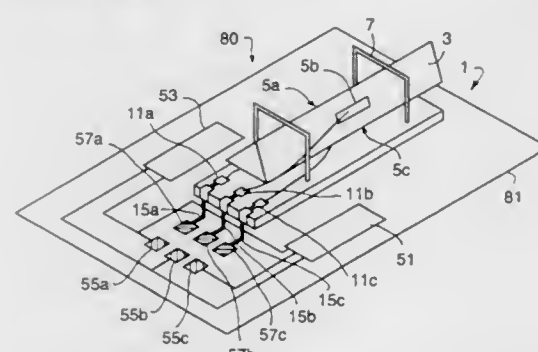
5,773,915

VIBRATING GYROSCOPE

Shigeto Yamamoto, Shiga-ken, Japan, assignor to Murata Manufacturing Co., Ltd., Japan  
Filed Aug. 6, 1996, Ser. No. 692,772

Claims priority, application Japan, Aug. 8, 1995, 7-20249; Jul. 24, 1996, 8-194911

Int. Cl.<sup>6</sup> H01L 41/08  
U.S. Cl. 310—348



1. A vibrating gyroscope comprising a column-like vibratable body having a plurality of side surfaces, a plurality of piezoelectric elements each formed on a respective side surface of the vibratable body and having the same vibration characteristics, supporting members attached to the vibratable body in the vicinity of nodal points of the vibrating body to support the vibratable body, and a detection circuit having two input terminals connected to two detecting piezoelectric elements to detect the difference between output signals from the two detecting piezoelectric elements, the two detecting piezoelectric elements being the two of the plurality of piezoelectric elements which provide the smallest difference between their outputs with respect to a change in ambient atmosphere temperature.

5,773,916

PIEZOELECTRIC VIBRATOR AND ACCELERATION SENSOR USING THE SAME

Takeshi Nakamura, and Takayuki Kaneko, both of Nagaoka-kyo, Japan, assignors to Murata Manufacturing Co. Ltd., Kyoto, Japan

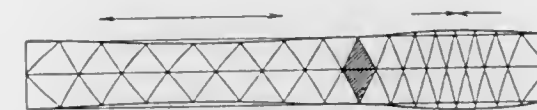
Continuation of Ser. No. 521,422, Aug. 30, 1995, abandoned, which is a division of Ser. No. 202,017, Feb. 25, 1994, abandoned. This application Feb. 6, 1997, Ser. No. 796,496

Claims priority, application Japan, Mar. 1, 1993, 5-066231; Mar. 1, 1993, 5-066233; Mar. 19, 1993, 5-085712; Apr. 26, 1993, 5-123421; Apr. 26, 1993, 5-123422; Apr. 28, 1993, 5-125485  
Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 310—357

10 Claims

12



1. A piezoelectric vibrator comprising:  
a vibrating body made of piezoelectric material which is polarized in one direction between opposite surfaces of said vibrating body; and  
a first pair of electrodes formed on the opposite surfaces of said vibrating body at a first position and a second pair of electrodes formed on the opposite surfaces of said vibrating body at a second position, said first pair of electrodes having driving signals applied thereto which have inverse phase to driving signals applied to said second pair of electrodes, wherein said vibrating body vibrates by using a piezoelectric effect of said vibrating body, and said vibrating body vibrates in such a manner that said first position of said vibrating body expands while said second position of said vibrating body contracts.

5,773,917

SURFACE ACOUSTIC WAVE DEVICE AND PRODUCTION PROCESS THEREOF

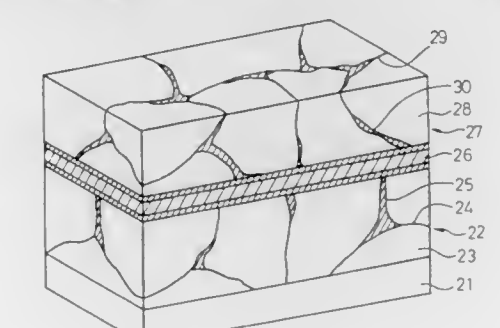
Yoshio Satoh; Osamu Ikata; Hidema Uchishiba; Takashi Matsuda; Tokihiro Nishihara; Mitsuo Takanatsu, and Hajime Taniguchi, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 297,914, Aug. 31, 1994, abandoned. This application May 23, 1997, Ser. No. 863,026

Claims priority, application Japan, Oct. 27, 1993, 5-268542  
Int. Cl.<sup>6</sup> H01L 41/08

U.S. Cl. 310—364

5 Claims



1. A surface acoustic wave device comprising:  
a piezoelectric substrate; and  
an electrode formed on said substrate by alternately laminating an aluminum copper alloy film and a copper film such that said electrode has a three-layered laminate structure with two aluminum-copper alloy films sandwiching one copper film.

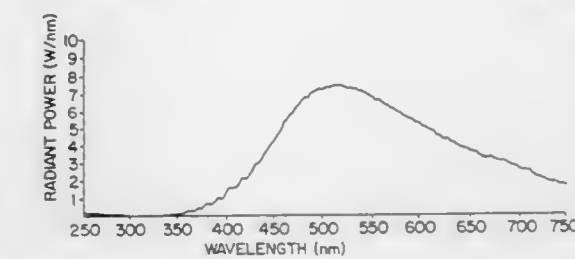
5,773,918

LAMP WITH LIGHT REFLECTION BACK INTO BULB

James T. Dolan, Frederick, and Michael G. Ury, Bethesda, both of Md., assignors to Fusion Lighting, Inc., Rockville, Md.  
Division of Ser. No. 149,818, Nov. 10, 1993, which is a continuation of Ser. No. 60,553, May 13, 1993, abandoned, which is a continuation-in-part of Ser. No. 867,551, Apr. 13, 1992, abandoned, Ser. No. 875,769, Apr. 29, 1992, abandoned, and Ser. No. 882,409, May 13, 1992, abandoned, which is a continuation-in-part of Ser. No. 779,718, Oct. 23, 1991, abandoned, which is a continuation-in-part of Ser. No. 604,487, Oct. 25, 1990, abandoned. This application Jun. 7, 1995, Ser. No. 488,279

Int. Cl.<sup>6</sup> H01J 17/20; 61/12; 61/18  
U.S. Cl. 313—113

16 Claims



1. A discharge lamp comprising:  
a bulb comprised of an envelope and a fill in the envelope which includes sulfur when excited,  
a source of excitation power,  
means for coupling sufficient excitation power from said source to said fill to cause said sulfur to emit radiation which is principally in the visible part of the spectrum and is in the form of molecular radiation, and  
reflector means for reflecting radiation which is emitted by the fill back into the fill, while allowing some radiation to exit the lamp, causing the radiation which exits the lamp to have proportionately more spectral power in the red region of the spectrum than if said radiation were not reflected back into the fill.

5,773,919

ELECTRON SPIRAL TOROID

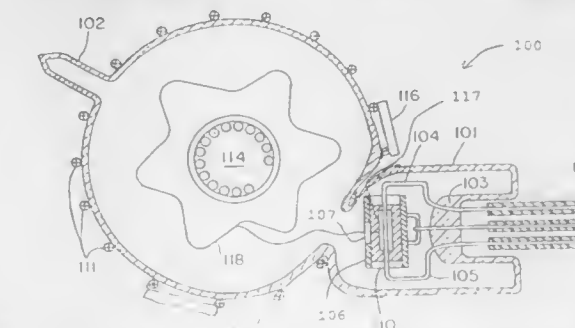
D. Clint Seward, Acton, Mass., assignor to Electron Power Systems, Acton, Mass.

Continuation-in-part of Ser. No. 996,752, Dec. 24, 1992, which is a continuation-in-part of Ser. No. 841,308, Feb. 24, 1992, Pat. No. 5,175,466, which is a continuation of Ser. No.

529,783, May 25, 1990, abandoned, which is a continuation of Ser. No. 214,904, Jun. 28, 1988, abandoned, which is a continuation of Ser. No. 914,629, Oct. 2, 1986, abandoned. This application May 31, 1995, Ser. No. 455,221

Int. Cl.<sup>6</sup> H01J 17/26; 61/28; H05H 13/00; 11/00  
U.S. Cl. 313—231.31

43 Claims



1. A manufacture comprising a plurality of electrons circulating along a path having a hollow symmetrical shape defined by a



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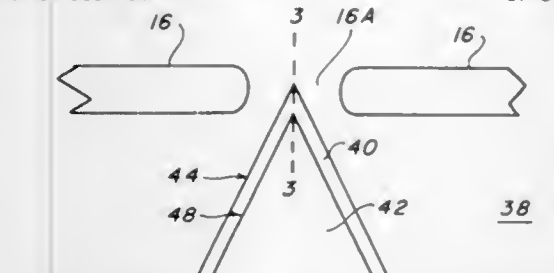
UMI

surface of a toroid, the hollow symmetrical shape surrounding a hollow interior having a circular axis extending around a central axis of the toroid.

has cylindrical molecules formed at least in part as single-shell or multiple-shell carbon nano-cylinders.

5,773,920  
GRADED ELECTRON AFFINITY SEMICONDUCTOR  
FIELD EMITTER  
Jonathan L. Shaw, Springfield, Va.; Kevin Jensen, Kensington, Md., and Henry F. Gray, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.  
Filed Jul. 3, 1995, Ser. No. 498,266  
Int. Cl.<sup>6</sup> H01L 31/00

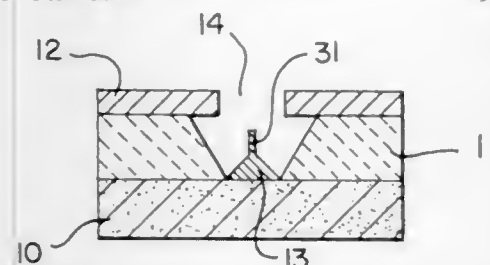
U.S. Cl. 313—309 17 Claims



1. A field emitter comprising:  
(a) a substrate of a material whose composition is selected to provide a first value of electron affinity; and  
(b) a layer of material having a selected thickness and on the surface of said substrate, said layer having a graded structure being of a composition selected to establish an electron affinity profile from the substrate interface to its surface, said profile being defined by the variation of said electron affinity from said substrate interface to said surface  
wherein said graded affinity structure promotes the attraction of electrons from the substrate to the surface via the bending of the conduction band of the graded affinity structure downward.

5,773,921  
FIELD EMISSION CATHODE HAVING AN  
ELECTRICALLY CONDUCTING MATERIAL SHAPED OF  
A NARROW ROD OR KNIFE EDGE  
Till Keesmann, Bahnhofstrasse 53a, Heilidelberg, Germany, D-69115, and Hubert Grosse-Wilde, Staffelbergstrasse 4, Neunkirchen a.Br., Germany, D-91077  
PCT No. PCT/DE95/00221, § 371 Date Aug. 23, 1996, § 102(e)  
Date Aug. 23, 1996, PCT Pub. No. WO95/23424, PCT Pub. Date Aug. 31, 1996  
PCT Filed Feb. 22, 1995, Ser. No. 702,684  
Claims priority, application Germany, Feb. 23, 1994, 44 05 768.7

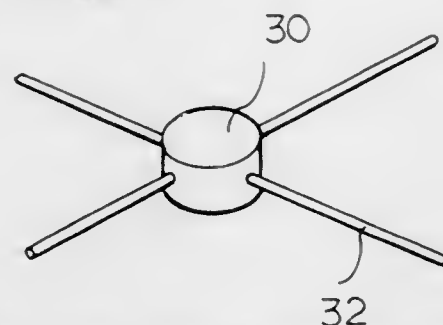
Int. Cl.<sup>6</sup> H01J 1/05  
U.S. Cl. 313—309 9 Claims



1. A field emission cathode which consists of an electrically conducting material having the shape of a narrow rod or a knife edge to achieve high magnification of the electric field strength, such that the electron-emitting part of the field emission cathode

5,773,922  
DIRECT HEATING CATHODE AND PROCESS FOR  
PRODUCING SUCH  
Kwang-Min Lee, Kyu-Nam Joo, Jong-Seo Choi, Geun-Bae Kim, and Kwi-Seuk Choi, all of Suwon, Rep. of Korea, assignors to Samsung Display Devices, Co., Ltd., Kyungki-do, Rep. of Korea  
Filed Nov. 30, 1995, Ser. No. 565,545  
Claims priority, application Rep. of Korea, Dec. 28, 1994, 94 38126

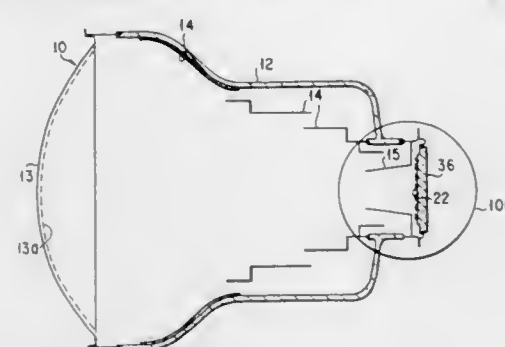
Int. Cl.<sup>6</sup> H01J 1/18; 9/04  
U.S. Cl. 313—346 R 6 Claims



6. A direct heating cathode for electron tubes produced by a process comprising the steps of:  
mixing 85–95 wt % of a powdered basic ingredient comprising Ir, Pt or Au with 5–15 wt % of a powdered subsidiary ingredient comprising Ce, La or Pr at a given mixing ratio into a powdered metal mixture;  
applying a mechanical impact to said powdered metal mixture through high energy ball milling, thereby mechanically alloying the powdered metal mixture into alloy powder;  
compressing said alloy powder with a given pressure, thereby forming an alloy pellet;  
removing residual gases from said pellet; and  
testing an electron emitting performance of said pellet.

5,773,923  
X-RAY IMAGE INTENSIFIER TUBE  
Fumiyasu Tamagawa, Otawara, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan  
Filed Oct. 25, 1996, Ser. No. 738,285  
Claims priority, application Japan, Oct. 27, 1995, 7-280277; Oct. 15, 1996, 8-272312

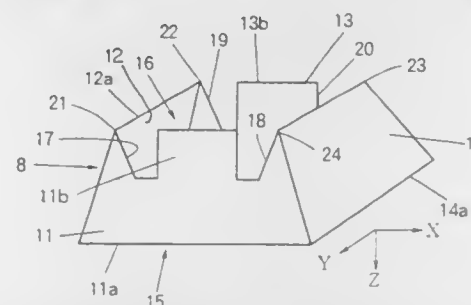
Int. Cl.<sup>6</sup> H01J 31/00  
U.S. Cl. 313—371 8 Claims



8. An X-ray image intensifier tube, comprising:  
a vacuum envelope;  
an input screen arranged on an X-ray incident side of said vacuum envelope for converting an X-ray image into an electron beam image;

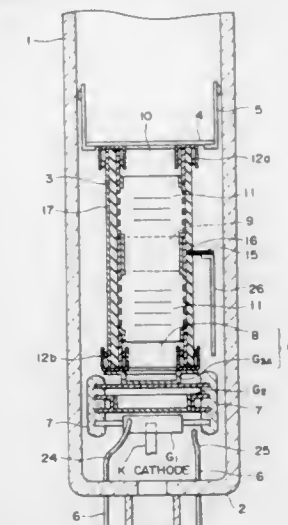
at least one electrode arranged within the vacuum envelope for accelerating and focusing the electron beam image;  
a glass substrate hermetically bonded to the vacuum envelope with a sealing metal ring; and  
an output screen including a phosphor layer formed on the inner surface of said glass substrate,  
wherein said glass substrate is formed of a borosilicate glass containing 0.1 to 5% by weight of cerium oxide,  
wherein said glass substrate is at least partially fused or melted to achieve said hermetic bonding with said sealing metal ring, wherein each of said sealing metal ring and said glass substrate exhibits a thermal expansion coefficient within a range of between  $45 \times 10^{-7}^{\circ}\text{C.}$  and  $62 \times 10^{-7}^{\circ}\text{C.}$ , and  
wherein said phosphor layer contains mainly a zinc sulfide phosphor co-activated by aluminum and copper and also contains cadmium in an amount of 0 to 1000 ppm by weight.

5,773,924  
COLOR CATHODE RAY TUBE WITH AN INTERNAL  
MAGNETIC SHIELD  
Kouji Nakamura, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
Filed Aug. 2, 1996, Ser. No. 691,560  
Claims priority, application Japan, Nov. 27, 1995, 7-307134  
Int. Cl.<sup>6</sup> H01J 29/06  
U.S. Cl. 313—402 10 Claims



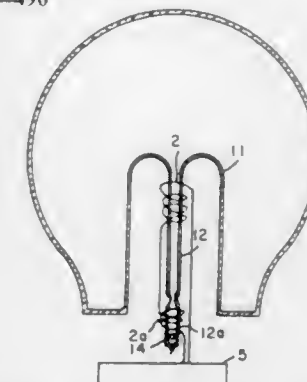
1. A color cathode ray tube comprising:  
an envelope having a front panel and a funnel joined to the periphery of said front panel;  
a phosphor screen disposed on an inner surface of said front panel;  
a shadow mask disposed to face said phosphor screen and having a plurality of apertures for passing electron beams;  
an electron gun disposed in a neck of said funnel and emitting said electron beams toward said shadow mask; and  
a magnetic shield disposed within said envelope and surrounding a path along which said electron beams travel;  
wherein said magnetic shield has a first side plate, a third side plate facing said first side plate, a second side plate, a fourth side plate facing said second side plate, a first opening on the side of said shadow mask, and a second opening on the side of said electron gun, thereby forming almost a hollow frustum of a quadrangular pyramid, only each of said first and third side plates having notches in the vicinity of both ends of an edge thereof on the side of said second opening, the edge of the first side plate between the notches on the side of the second opening having a straight portion parallel to another edge of the first side plate on the side of the first opening, and the edge of the third side plate between the notches on the side of the second opening having a straight portion parallel to another edge of the third side plate on the side of the first opening.

5,773,925  
ELECTRON GUN FOR A CATHODE RAY TUBE  
Shingo Kimura, and Shigenori Tagami, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan  
Filed Oct. 23, 1995, Ser. No. 546,944  
Claims priority, application Japan, Oct. 24, 1994, 6-258586; Oct. 25, 1994, 6-260658  
Int. Cl.<sup>6</sup> H01J 29/62  
U.S. Cl. 313—414 9 Claims



1. An electron gun comprising:  
at least one cathode for emitting electrons;  
a cylindrical device;  
a pre-focusing lens formed of first and second grids;  
a first electrode layer provided on the cathode side of inner surface of the cylindrical device;  
a second electrode layer provided on a panel side of inner surface of the cylindrical device; and  
a third electrode layer provided between the first electrode layer and the second electrode layer;  
wherein the first, second and third electrode layers form a main lens and a ratio of a gap between the second electrode layer and the third electrode layer to a gap between the first electrode layer and the third electrode layer is more than 1.

5,773,926  
ELECTRODELESS FLUORESCENT LAMP WITH COLD  
SPOT CONTROL  
Jakob Maya, Brookline, and Oleg Popov, Needham, both of Mass., assignors to Matsushita Electric Works Research and Development Laboratory Inc., Woburn, Mass.  
Filed Nov. 16, 1995, Ser. No. 559,557  
Int. Cl.<sup>6</sup> H01J 61/28  
U.S. Cl. 313—490 7 Claims



1. An electrodeless fluorescent RF lamp comprising:  
a bulbous lamp envelope having a top and a bottom and a fill of rare gas and vaporizable amalgam in said envelope;

a reentrant cavity disposed adjacent the bottom of said envelope and entering into said envelope;  
a tubulation extending from said envelope, the interior of said tubulation being in communication with the interior of said envelope, at least the major portion of said vaporizable amalgam being disposed within said tubulation;  
an induction coil for the generation of a plasma to produce radiation, said coil being situated outside said envelope and fitted within said cavity;  
a heating coil electrically connected to the induction coil, said heating coil being thermally connected to said tubulation adjacent to said amalgam whereby to maintain said amalgam at a temperature between about 60° and 140° C. during operation of said lamp.

5,773,927

**FIELD EMISSION DISPLAY DEVICE WITH FOCUSING ELECTRODES AT THE ANODE AND METHOD FOR CONSTRUCTING SAME**

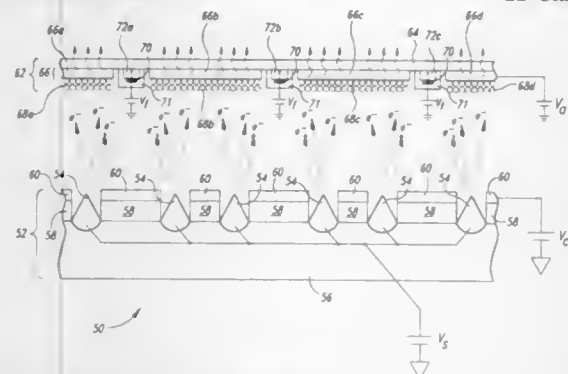
David A. Zimlich, Boise, Id., assignor to Micron Display Technology, Inc., Boise, Id.

Filed Aug. 30, 1995, Ser. No. 520,886

Int. Cl.<sup>6</sup> H01J 1/62

U.S. Cl. 313—495

22 Claims

**1. A display device comprising:****a baseplate comprising:****a supporting substrate;****an insulating layer positioned on the surface of the supporting substrate and having a plurality of apertures therein;****a plurality of field-induced electron emitters each carried by the supporting substrate and disposed within a respective aperture in the insulating layer; and****a conductive layer positioned on the insulating layer peripherally about the apertures therein such that a conductive voltage applied to the conductive layer and a source voltage applied to the emitters will cause electron emission to occur from each of the emitters; and****a faceplate comprising:****a substantially transparent, non-conductive viewing layer positioned in a substantially parallel spaced-apart relationship with the baseplate and having a substantially planar surface facing the baseplate;****a plurality of localized, spaced apart layers of conductive transparent material positioned on the substantially planar surface of the viewing layer opposite the emitters to form a plurality of anodes such that an anode voltage applied to each anode will direct the electron emissions from the emitters toward the anode;****a respective luminescent layer positioned on each anode opposite the emitters such that at least some of the electron emissions directed toward the anode will bombard a localized portion of the luminescent layer and cause it to emit light and to thereby provide a respective display;****a plurality of respective focusing electrodes surrounding the periphery of at least some of the anodes, each focusing electrode comprising a conductive strip positioned on the substantially planar surface of the viewing layer around the periphery of the localized portion of the luminescent layer**

substantially opposite the emitters such that a focusing electrode voltage applied to the focusing electrode which is less than the anode voltage will focus the electron emissions directed toward the anode on the localized portion of the luminescent layer; and  
an electrically insulating material coating at least some of the focusing electrodes.

5,773,928

Patent Not Issued For This Number

5,773,929

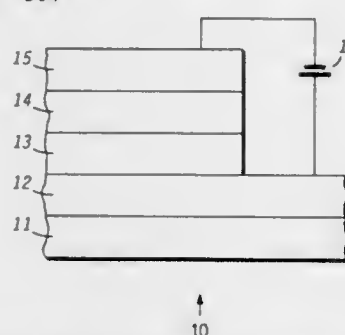
**ORGANIC EL DEVICE WITH DUAL DOPING LAYERS**  
Song Q. Shi, Phoenix, Ariz.; Hsing-Chung Lee, Calabasas, Calif., and Franky So, Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 24, 1996, Ser. No. 669,206

Int. Cl.<sup>6</sup> H01B 33/14

U.S. Cl. 313—504

9 Claims

**1. An organic light emitting device comprising:****a first conductive layer having a first type of conductivity;****a layer of first carrier transporting material with fluorescent dye molecules as fluorescent centers supported on the first conductive layer;****a layer of second carrier transporting material with fluorescent dye molecules as fluorescent centers positioned on the first carrier transporting material; and****a second conductive layer having a second type of conductivity supported on the layer of second carrier transporting material.**

5,773,930

**DISPLAY DEVICE FOR CONTROLLING LIGHT INTENSITY**

Se-Jin Ahn, Kwangmyung, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

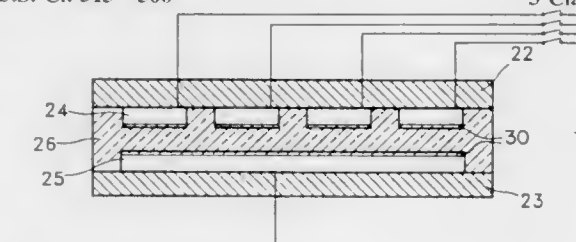
Filed Apr. 3, 1996, Ser. No. 626,928

Claims priority, application Rep. of Korea, Dec. 15, 1995, 1995-50701

Int. Cl.<sup>6</sup> H01J 1/70

U.S. Cl. 313—506

3 Claims

**2. A display device for controlling light intensity, comprising:****a pair of glass substrates disposed in parallel so as to face each other, said glass substrates each having an inner surface;**

5,773,932

**METAL HALIDE LAMP WITH REDUCED COLOR SHADOWING**

Masachika Ooyama; Mitsuo Narita, and Yoshio Okazaki, all of Iimeji, Japan, assignors to Ushiodenki Kabushiki Kaisha, Tokyo, Japan

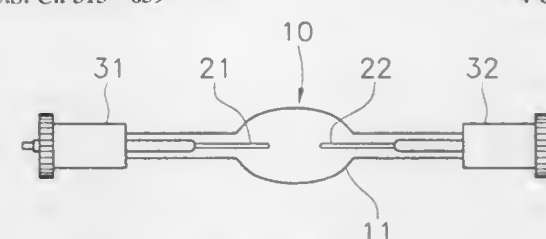
Filed Aug. 23, 1996, Ser. No. 703,602

Claims priority, application Japan, Sep. 6, 1995, 7-252026

Int. Cl.<sup>6</sup> H01J 61/20

U.S. Cl. 313—639

4 Claims

**1. A metal halide lamp, comprising:****lutetium halide and at least one metal halide selected from each groups A, B and C are encapsulated in an arc tube together with a mercury halide, where Group A consists of dysprosium halide, holmium halide, erbium halide, and thulium halide; Group B consists of cerium halide, praseodymium halide, and neodymium halide; and Group C consists of cesium halide.**

5,773,931

**ORGANIC ELECTROLUMINESCENT DEVICE AND METHOD OF MAKING SAME**

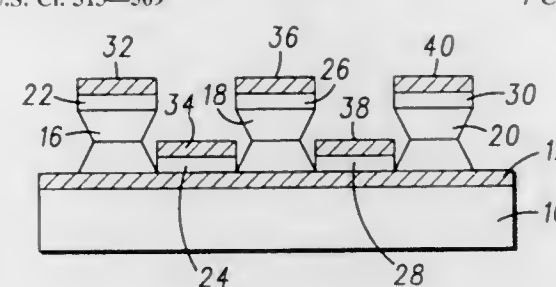
Song Shi, Phoenix; Franky So, Tempe, both of Ariz., and Hsing Chuy Lee, Calabasas, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 6, 1996, Ser. No. 708,338

Int. Cl.<sup>6</sup> H05B 33/12

U.S. Cl. 313—509

7 Claims

**1. A light emitting display device, comprising:****a transparent substrate having disposed on one surface thereof a layer of first electrically conductive material;****a plurality of spaced apart electrically insulating walls with each wall being defined by a pair of side surfaces and an adjoining upper surface, the walls being positioned on the layer of first electrically conductive material so as to define exposed areas of the layer of first electrically conductive material between opposed side surfaces of adjacent walls;****a blanket composite layer of organic material, including at least one layer of electroluminescent organic material, disposed on the exposed areas of the layer of first electrically conductive material and the upper surface of the spaced apart electrically insulating walls; and****a blanket layer of second electrically conductive material disposed on the blanket composite layer of organic material with first portions overlying the exposed areas of the layer of first electrically conductive material and second portions overlying the upper surface of the spaced apart electrically insulating walls, the side surfaces of the spaced apart electrically insulating walls being formed to prevent electrical contact between the first and second portions of the blanket layer of second electrically conductive material, and the side surfaces of the spaced apart electrically insulating walls being further formed to prevent electrical contact between the first portions of the blanket layer of second electrically conductive material and the layer of first electrically conductive material.**

5,773,933

**BROADBAND TRAVELING WAVE AMPLIFIER WITH AN INPUT STRIPLINE CATHODE AND AN OUTPUT STRIPLINE ANODE**

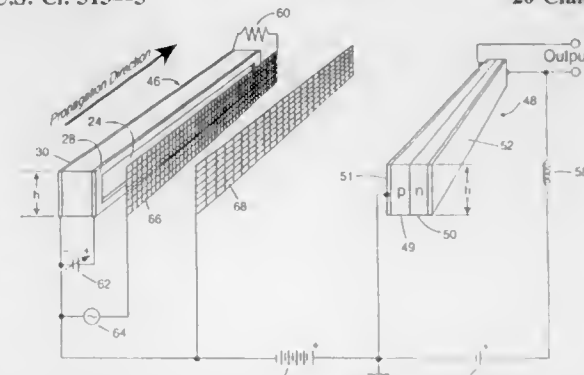
Max N. Yoder, Falls Church, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 29, 1996, Ser. No. 623,757

Int. Cl.<sup>6</sup> H03F 5/00

U.S. Cl. 315—3

20 Claims

**1. A broadband traveling wave amplifier which comprises a target anode and electron gun means for bombarding said anode with an electron beam having an amplitude proportional to the amplitude of an input signal to be amplified, characterized in that:****the electron gun means comprises a cold cathode which includes semiconductor material exhibiting negative electron affinity (NEA) and which is configured as an input strip transmission line, or input stripline, having an electron emitting surface, and a modulation structure for modulating the density of the electrons emitted from said electron emitting surface with said input signal to generate said electron beam; and****said anode is configured as an output strip transmission line spaced from and extending parallel to the input stripline cathode, said output stripline anode having an electron bombarded surface facing the electron emitting surface of the input stripline cathode and said output stripline anode exhibiting a phase velocity equal to the phase velocity of the input stripline cold cathode.**





5,773,940

## POWER DRIVE DEVICE

Nobuo Matsukawa, Tokyo, Japan, assignor to Nikon Corporation, Tokyo, Japan

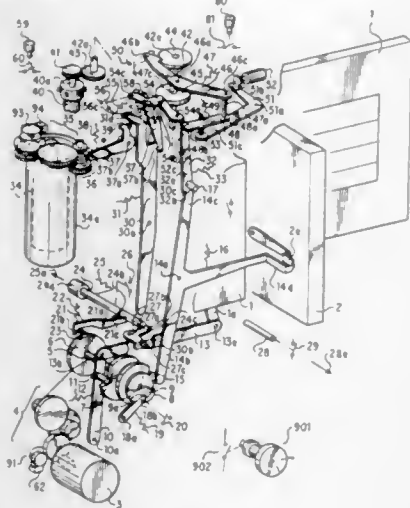
Filed Nov. 3, 1995, Ser. No. 552,780

Claims priority, application Japan, Nov. 11, 1994, 6-303003

Int. Cl.<sup>6</sup> G03B 1/00; H02P 1/54; G05B 11/32

U.S. Cl. 318—59

20 Claims



1. A power drive device, comprising:  
a motor;  
a control device coupled to the motor;  
a rotatable reference axle member rotatably interlocked with the rotation of the motor;  
a movable reference member in selective engagement with the reference axle member, the restriction member being movable to a first position to prevent rotation of the reference axle member and to a second position to permit rotation of the reference axle member;  
a movable reverse rotation prevention member in selective engagement with the reference axle member, the reverse rotation member being movable to a first position to prevent reverse rotation of the reference axle member and to a second position to permit reverse rotation of the reference axle member;  
a first detection member that detects a first phase and a third phase of rotation of the reference axle member, the first phase corresponding to a rotation starting position of the reference axle member and the third phase corresponding to a near completion position of the reference axle member; and  
a second detection member that detects a second phase and a fourth phase of rotation of the reference axle member, the fourth phase of rotation corresponding to a rotation completion position of the reference axle member, wherein the control device drives the motor in accordance with the detected phases of the first and second detection members, the first detection member is interlockable with the restriction member, and the second detection member is interlockable with the reverse rotation prevention member.

5,773,941

## TWO-WIRE BRUSHLESS DC MOTOR CONTROL SYSTEM

Frederick G. Moritz, Hauppauge, and Roger Mosciatti, Coram, both of N.Y., assignors to MFM Technology, Inc., Ronkonkoma, N.Y.

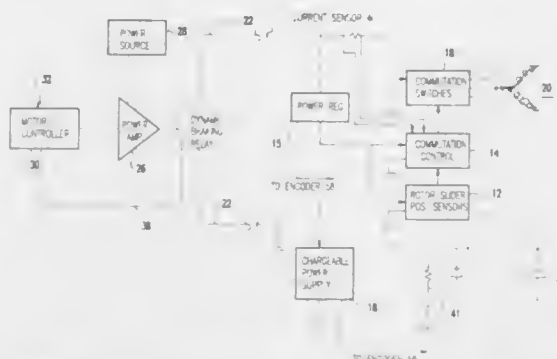
Filed Oct. 31, 1996, Ser. No. 742,821

Int. Cl.<sup>6</sup> H02P 6/02; H02K 29/08

U.S. Cl. 318—254

6 Claims

1. A two-wire control system to be mounted on or in proximity of a brushless, d.c. motor, comprising in combination:  
commutating switch means;



- commutating control logic means coupled to said commutating switch means for controlling the sequence of opening and closing of individual switches that comprise said commutating switch means;  
rotor/slider commutating position sensing means coupled to said commutating control logic means for inputting rotor/slider commutation position data to said commutating control logic means;  
rechargeable power supply means, and means for coupling said rechargeable power supply means to said commutating control logic means; and said rotor/slider commutating position sensing means;  
two-wire power input means for coupling power to said two-wire control system from a power amplifier; and  
means for coupling said two wire power input means to said rechargeable power supply means, said commutating switch means, said commutating control logic means, and said rotor/slider commutating position sensing means.

5,773,942

## POWER WINDOW MOTOR DRIVING APPARATUS

Yoshiyuki Takahara, and Tomohiro Iida, both of Shizuoka, Japan, assignors to Yazaki Corporation, Minato-ku, Japan

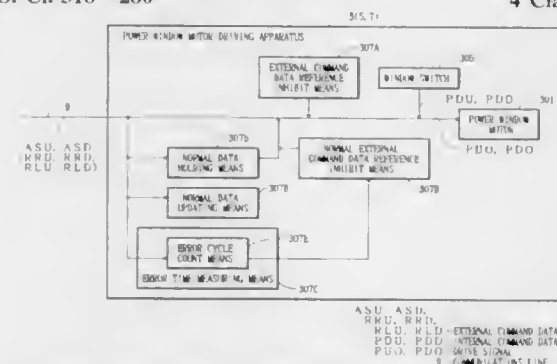
Filed May 22, 1996, Ser. No. 651,762

Claims priority, application Japan, May 24, 1995, 7-124861; Jul. 6, 1995, 7-171046

Int. Cl.<sup>6</sup> H02P 1/00

U.S. Cl. 318—280

4 Claims



1. A power window motor driving apparatus for use in a vehicle, which is related to an open-close controlling operation of the windows at passenger seats other than a driver's seat, and generates a drive signal for a power window motor based on internal command data internally generated by the operation of a window switch at each of the passenger seats and on external command data received from the driver's seat through a communications line, and which, whenever any data error occurs in the external command data, limits the generation of the drive signal, said power window motor driving apparatus comprising:  
an external command data reference inhibit means which, whenever any data error occurs in the external command data, inhibits the generation of the drive signal based only on the erroneous external command data received from the driver's

seat while permitting generation of a drive signal based on the external command data for each window switch of each of the passenger seats.

5,773,943

## DRIVE DEVICE FOR A REVOLVING DOOR

Henrik Andersen, Værløse, Denmark, assignor to Dorma GmbH &amp; Co. KG, Ennepetal, Germany

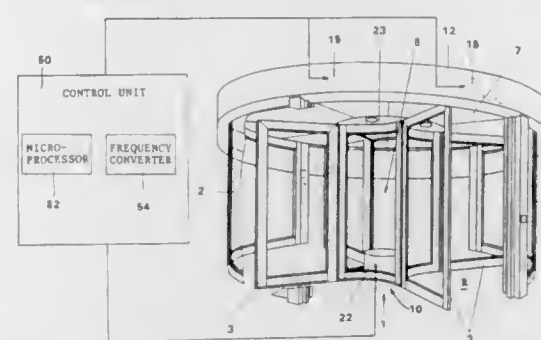
Filed Apr. 25, 1996, Ser. No. 638,086

Claims priority, application Germany, Aug. 25, 1994, 44 29 893.5

Int. Cl.<sup>6</sup> E05D 15/02; H02P 7/00

U.S. Cl. 318—432

4 Claims



1. A revolving door, said revolving door being for installation in a portion of a building having a building floor surface and a building ceiling surface, said revolving door comprising:  
a rotary door portion comprising a plurality of door panels rotatable about an axis of rotation; and  
a drive device for driving said rotary door portion, said drive device comprising:  
motor means to supply a rotary torque; and  
worm gearing means to receive said rotary torque from said motor means and to transfer said rotary torque to said rotary door portion to thereby drivably rotate said rotary door portion about said axis of rotation;  
said worm gearing means being positioned laterally with respect to said motor means;  
said revolving door additionally comprising:  
control means to control the rotary torque supplied by said motor means;  
said control means comprising a microprocessor and a frequency converter; and  
at least two of said drive devices, a first of said at least two drive devices being positioned substantially adjacent to the building floor surface, and a second of said at least two drive devices being positioned substantially adjacent to the revolving door ceiling surface.

5,773,944

## ELECTRIC MACHINE CONTROL SYSTEM INCLUDING A TORQUE SMOOTHING DEVICE

Jacques Courault, Veneux Les Sablons, France, assignor to Cegelec, Levallois Perret, France

Filed Dec. 12, 1996, Ser. No. 766,463

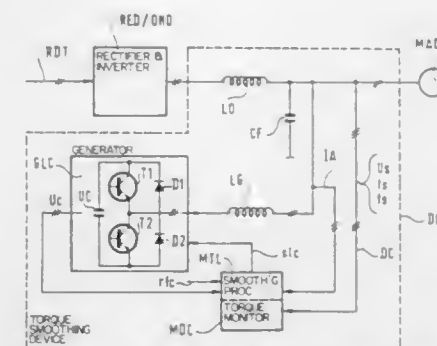
Claims priority, application France, Dec. 14, 1995, 95 14 865

Int. Cl.<sup>6</sup> H02P 7/00

U.S. Cl. 318—432

17 Claims

1. An electric machine control system comprising:  
an electric machine, an electrical power supply input connected to said machine, a torque smoothing device including torque monitoring means connected to said machine for supplying torque signals of said machine, a smoothing processor means connected to said torque monitoring means and receiving said torque signals of said machine, said smoothing processor means receiving at least one torque reference signal corresponding to a desired torque output of said electric machine,



- and a smoothing generator connected to said machine, receiving said smoothing signals and supplying a smoothing power input to said machine to conform the machine torque to said torque reference signal.

5,773,945

## TIME-COMPENSATED OVERCURRENT DETECTION CIRCUIT FOR DC MOTOR

Yong-Ho Kim, Seoul, and Hyun-Min Jo, Bucheon, both of Rep. of Korea, assignors to Samsung Electronics, Co. Ltd., Suwon, Rep. of Korea

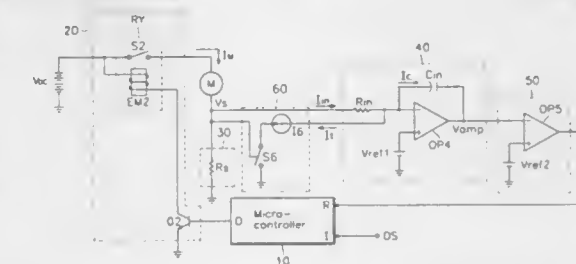
Filed Jul. 2, 1996, Ser. No. 677,346

Claims priority, application Rep. of Korea, Jul. 3, 1995, 1995-19295

Int. Cl.<sup>6</sup> H02H 7/08

U.S. Cl. 318—434

15 Claims



1. A time-compensated overcurrent detection circuit for a DC motor, comprising:  
a control circuit coupled to the motor for starting and stopping the motor;  
a converter coupled to the motor for generating a voltage signal proportional to a drive current in the motor;  
an overcurrent detector having an input coupled to the converter and an output coupled to the control circuit, the overcurrent detector generating a motor reset signal for a motor overcurrent condition; and  
a compensator circuit coupled to the motor and the overcurrent detector, the compensator circuit establishing a given time period before generating the motor reset signal during the motor overcurrent condition, the compensator establishing the given time period by reducing the voltage signal supplied from the converter to the overcurrent detector when the voltage signal rises above a predetermined value.

5,773,946

## APPARATUS FOR AND METHOD OF AUTOMATICALLY CONTROLLING OPERATION AND SPEED OF WINDSHIELD WIPERS

Fabián Montero, C/Lirio, 23 - Cobeña, 28863 Madrid, Spain

Filed Mar. 14, 1996, Ser. No. 615,878

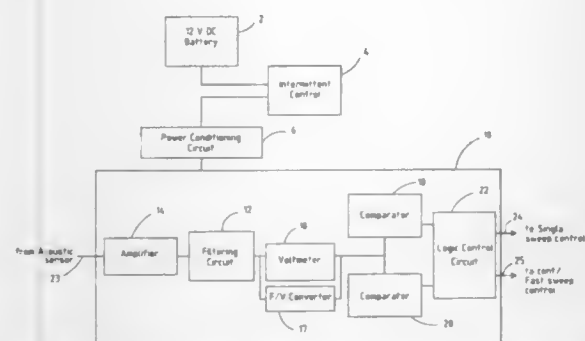
Int. Cl.<sup>6</sup> G05B 5/00

U.S. Cl. 318—460

25 Claims

1. A windshield wiper control apparatus for detecting impacts of water on a vehicle and controlling operation of a windshield wiper comprising:





- a. means for generating a signal representative of an amount of water contacting a vehicle by monitoring sound from impacts on a surface of the vehicle; and  
b. means for operating the windshield wiper in response to a level of the signal.

5,773,947

**POSITION DETECTOR AND POSITION CONTROL METHOD FOR A MOVING BODY**

Katsuhiko Torii, Hamana-gun; Kengo Yamamura, Inasa-gun; Masafumi Yamaura, Nishio; Makihiro Ishikawa, Okazaki, and Yoshihisa Sato, Nagoya, all of Japan, assignors to ASMO Co., Ltd., Kosai, and Nippondenso Co., Ltd., Kariya, both of Japan

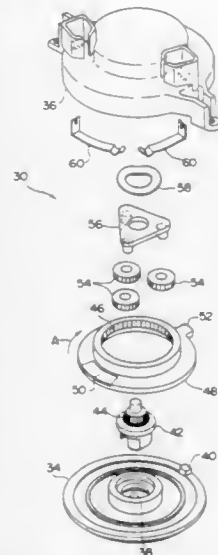
Filed May 9, 1995, Ser. No. 437,876

Claims priority, application Japan, May 11, 1994, 6-097420; Jul. 27, 1994, 6-175873

Int. Cl.<sup>6</sup> B60J 7/04

U.S. Cl. 318—466

21 Claims



1. A position detector for a moving body for detecting a specified move position of the moving body moving in forward and reverse directions to drive an object, said detector comprising:  
a switch section for detecting a specified move position of a moving body through operation of contacts that turn ON and OFF;  
an actuation mechanism operatively linked with said moving body to move with said moving body through a moving force transmitted from said moving body and to actuate said switch section when said moving body moves to said specified move position; and  
a clutch mechanism operatively coupled with said actuation mechanism to transmit the moving force of said moving body to said actuation mechanism until said switch section is actuated and, after said switch section is actuated, to shut off transmission of the moving force in a forward direction from said moving body to said actuation mechanism while maintaining an actuated state of said switch section to allow further

movement of the moving body, said moving body having an output shaft which has a gear at one end to drive the object, and a driving mechanism at another end of the output shaft to drive said actuation mechanism; and  
said switch section, said actuation mechanism and said clutch mechanism being disposed on substantially the same plane as said driving mechanism that is disposed at said another end of said output shaft.

5,773,948

**SERVO CONTROL GAIN CORRECTION METHOD OF DISK RECORDING SYSTEM**

Joon-Bae Kim, and Sung-Yeoul Park, both of Seoul, Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Suwon, Rep. of Korea

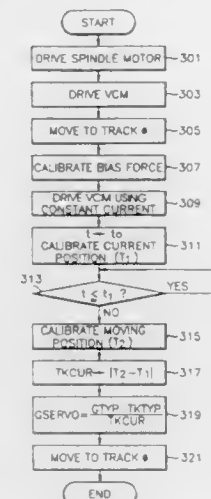
Filed Nov. 17, 1995, Ser. No. 560,178

Claims priority, application Rep. of Korea, Nov. 17, 1994, 1994-30263

Int. Cl.<sup>6</sup> G11B 5/596

U.S. Cl. 318—561

12 Claims



1. A servo control gain correction method of a disk recording system driving an actuator supporting a head to read and write information on a recording medium, said method comprising the steps of:

driving said actuator to move the head to a target track on said recording medium designated to begin reading and writing information on said recording medium while said recording medium is being rotated at a constant speed;  
determining a current moving distance value of said actuator on said recording medium while said the head moves to the target track on said recording medium during a reference time period, indicating the number of tracks over which the head traverses during said reference time period;  
obtaining a servo control correction gain based upon a reference direct current gain set for said disk recording system and a ratio of a reference moving distance value set by a manufacturer and said current moving distance value; and  
calibrating a bias force applied to said actuator in accordance with said servo control correction gain to settle the head onto a data line of said target track to begin reading and writing data information on and from said recording medium.

5,773,949

**CUTTER FRACTURE DETECTING SYSTEM**

Takashi Nagatomi, and Miwako Sakaguchi, both of Minamitsuru-gun, Japan, assignors to Fanuc, Ltd., Yamana-nashi, Japan

PCT No. PCT/JP95/02154, § 371 Date Jul. 26, 1996, § 102(e) Date Jul. 26, 1996, PCT Pub. No. WO96/19316, PCT Pub. Date Jun. 27, 1996

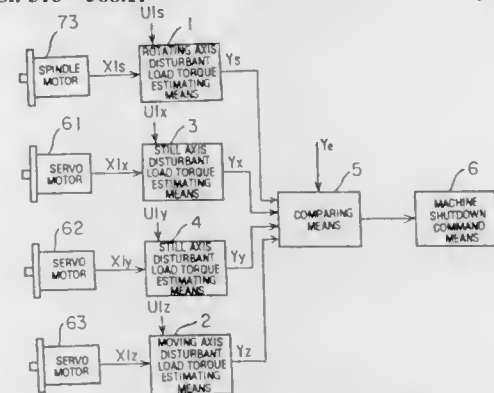
PCT Filed Oct. 19, 1995, Ser. No. 682,729

Claims priority, application Japan, Dec. 21, 1994, 6-318036

Int. Cl.<sup>6</sup> B25J 9/18

U.S. Cl. 318—568.11

9 Claims



1. A cutter fracture detecting system for a numerically controlled machine tool in which a workpiece and a cutter move relatively to each other, the cutter fracture detecting system comprising:

still axis disturbing load torque estimating means for estimating a disturbing load torque acting on at least one axis on which the workpiece and the cutter do not move relatively to each other;  
comparing means for comparing the disturbing load torque estimated by said still axis disturbing load torque estimating means with a predetermined reference torque; and  
machine shutdown command means for outputting a command signal to stop the numerically controlled machine tool depending on a result of the comparison performed by said comparing means.

5,773,950

**PROGRAM CREATING METHOD FOR UNIFORM-SHAPE MACHINING**

Tomoyuki Yamamoto, Oshino-mura, Japan, assignor to Fanuc Ltd., Yamana-nashi, Japan

PCT No. PCT/JP94/00062, § 371 Date Sep. 22, 1994, § 102(e) Date Sep. 22, 1994, PCT Pub. No. WO94/17460, PCT Pub. Date Aug. 4, 1994

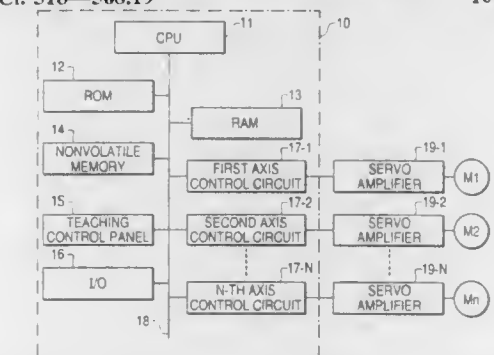
PCT Filed Jan. 18, 1994, Ser. No. 307,662

Claims priority, application Japan, Jan. 29, 1993, 5-032406

Int. Cl.<sup>6</sup> G06F 15/00; G05B 19/403

U.S. Cl. 318—568.19

10 Claims



1. A method for creating machining programs controlling uniform-shape machining of a machining shape in at least two machining positions on a circumference of one circle on a work-piece, said method comprising the steps of:

creating the machining programs for controlling the machining for the machining shape in specific machining positions on the workpiece;

specifying a rotational shift angle, rotation center position and rotation plane enabling points representing the machining shape in said specific machining position to coincide with corresponding points representing the machining shape on said workpiece in another machining position, and determination of a three-dimensional coordinate system based on a specified rotational center positions and rotation plane;

obtaining transform matrices individually for cases in which the points representing the machining shapes in said specific machining positions defined by said obtained coordinate system are shifted individually to the points representing the machining shapes in the other machining positions; and  
creating the machining programs for the individual machining positions by converting machining data of the machining programs for said specific machining positions into machining data of other machining positions by said obtained transform matrix.

5,773,951

**WAFER PROBER HAVING SUB-MICRON ALIGNMENT ACCURACY**

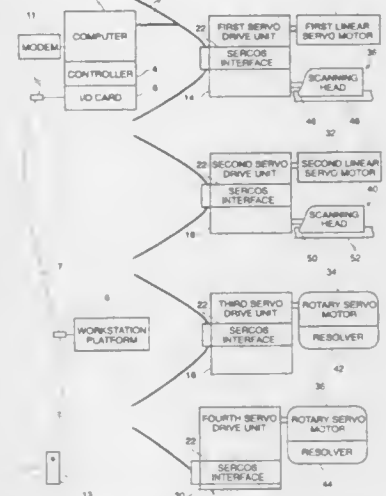
Paul S. Markowski, and Theodore J. Cosby, both of San Jose, Calif., assignors to Digital Test Corporation, San Jose, Calif.

Filed Mar. 25, 1996, Ser. No. 621,494

Int. Cl.<sup>6</sup> G05B 11/32

U.S. Cl. 318—625

26 Claims



1. An apparatus for positioning a semiconductor wafer for prober testing, said apparatus comprising:  
a base having first way disposed along a first axis;  
a first stage having a first runner block movably attached to said first way said base, and having a second way disposed along a second axis on a first side of said first stage;  
a second stage having a second runner block movably attached to said second way, said first axis and said second axis not being parallel;  
a first linear servo motor having a first linear motor element and a second linear motor element, said first linear motor element disposed parallel to said first axis on said base, said second linear motor element disposed parallel to said first axis on a second side of said first stage, said first linear motor element and said second linear motor element facing one another and engaged to position said first stage along said first axis;  
a second linear servo motor having a third linear motor element and a fourth linear motor element, said third linear motor element disposed parallel to said second axis on said first side of said first stage, said fourth linear motor element disposed parallel to said second axis on a first side of said second stage, said third linear motor element and said fourth linear motor

U.S. Cl. 320—116 6 Claims

1. A charge control system for a cell set including a serial connection or a series-parallel connection of a plurality of cells, each respectively composed of a secondary battery or a plurality of



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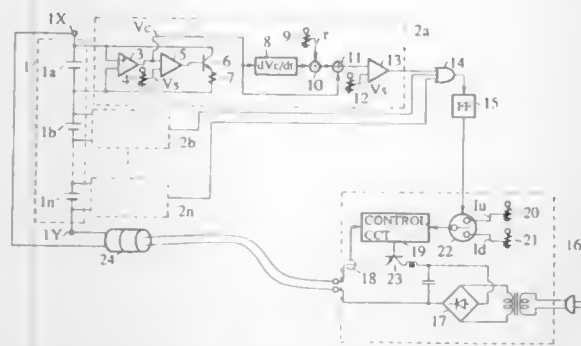
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modules each respectively consisting of a plurality of cells each respectively composed of a secondary battery, the charge control system comprising:

- a charging means for outputting a charge current to charge the cell set, the charging means being controllable for a reduction of the charge current within a response period of time;
- a plurality of bypass circuits each respectively controllable for a current conduction therethrough and connected in parallel to a corresponding one of the plurality of cells or a corresponding one of the plurality of modules; and
- a control means for controlling the charging means and a respective one of the plurality of bypass circuits to control a charge quantity of the corresponding cell or the corresponding module so that a voltage of the corresponding cell or the corresponding module is predicted with respect to a time point after a lapse of the response time, and the reduction of the charge current is started when the predicted voltage has reached an upper limit voltage set therefor.

5,773,958

**APPARATUS FOR DETECTING CELL REVERSAL IN RECHARGEABLE BATTERIES**

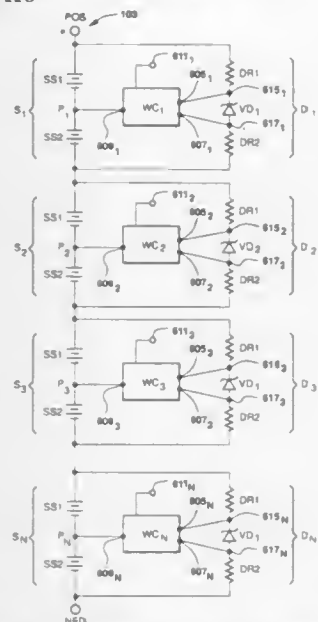
Philippe H. Gow, Birmingham; Robert A. Rogers, Macomb Township, Macomb County, and Andrea L. Lijoi, Shelby Township, Macomb County, all of Mich., assignors to Ovonic Battery Company, Inc., Troy, Mich.

Filed Jan. 3, 1997, Ser. No. 778,486

Int. Cl.<sup>6</sup> H01M 10/48

U.S. Cl. 320—118

17 Claims



1. An apparatus for monitoring a battery pack having two or more serially connected rechargeable batteries, said battery pack divided into N serially connected battery segments ( $S_1 \dots S_N$ ) where N is an integer greater than or equal to one, each of said battery segments ( $S_1 \dots S_N$ ) having two or more of said serially connected rechargeable batteries, said apparatus comprising:

a detection means for detecting cell reversal in said battery pack, said detection means comprising:

N divider networks ( $D_1 \dots D_N$ ), each including a first divider resistor serially connected to a second divider resistor at a resistor junction, each of said divider networks ( $D_1 \dots D_N$ ) connected across the respective of said battery segments ( $S_1 \dots S_N$ );

N test points ( $P_1 \dots P_N$ ) each located at a junction between two of said rechargeable batteries within the respective of said battery segments ( $S_1 \dots S_N$ );

a voltage comparison means for comparing voltage at each of said test points ( $P_1 \dots P_N$ ) to voltage at said resistor junction of the respective of said divider networks ( $D_1 \dots D_N$ ); and

N voltage drop devices ( $VD_1 \dots VD_N$ ), each serially connected between said first divider resistor and said second divider resistor of the respective of said divider networks ( $D_1 \dots D_N$ ), wherein said voltage comparison means compares voltage at each of said test points ( $P_1 \dots P_N$ ) to a voltage window defined by voltage at opposite terminals of the respective of said voltage drop devices ( $VD_1 \dots VD_N$ ), said voltage comparison means providing a detection signal when voltage at any one of said test points ( $P_1 \dots P_N$ ) is outside said voltage window of the respective of said voltage drop devices ( $VD_1 \dots VD_N$ ).

5,773,959

**LITHIUM POLYMER BATTERY CHARGER METHODS AND APPARATUS**

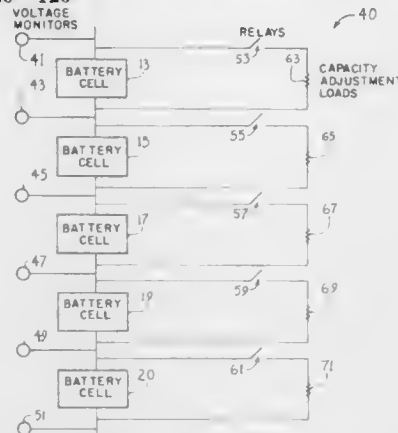
Lauren V. Merritt, Sunnyvale; Vincent L. Teofilo, Los Gatos; Roger Paul Hollandsworth, Boulder Creek; Zaid B. Rodriguez, Sunnyvale, and Jack G. Lovgren, Milpitas, all of Calif., assignors to Lockheed Martin Corporation, Sunnyvale, Calif.

Filed Jan. 11, 1996, Ser. No. 582,527

Int. Cl.<sup>6</sup> H02M 10/44

U.S. Cl. 320—120

8 Claims



SAMPLE ALGORITHM:  
CALCULATE  $\frac{E_{OCV}}{2}$  FOR EACH CELL  
FIND CELL WITH HIGHEST CALCULATED VALUE  
IF HIGHEST CELL ALSO HAS LOWEST EOCV, DO NOTHING  
ELSE, APPLY LOAD TO HIGHEST CELL FOR 15 MINUTES DURING NEXT CHARGE PERIOD

1. A method of charging a plurality of equal charge point lithium polymer battery cells, said method comprising:  
connecting the cells in a series stack,  
connecting a power supply to the series stack,  
applying a charge current to the series stack from the power supply,  
monitoring the state of charge of each cell in the stack,  
detecting when the state of charge in any cell is approaching full charge, and  
controlling the charge current to each cell in response to said detecting to prevent overcharging of any cell, and wherein the controlling of the charge current includes reducing the charge

current to a trickle charge to the series stack when any one cell reaches full charge.

5,773,960

**ELECTRONIC EQUIPMENT DETECTING BATTERY VOLTAGE TO CONTROL POWER SUPPLY**

Toshiyuki Ueda, Ikoma, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

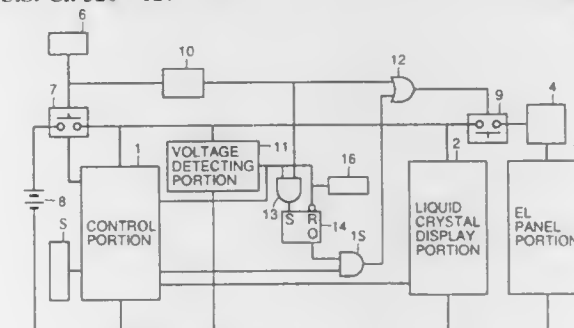
Filed Nov. 14, 1996, Ser. No. 749,052

Claims priority, application Japan, Nov. 17, 1995, 7-299805

Int. Cl.<sup>6</sup> H02J 7/00

U.S. Cl. 320—127

7 Claims



1. An electronic equipment driven by a battery, comprising:  
detecting means for detecting battery voltage;  
first switching means for controlling supply of power to a high load device;  
controlling means for controlling said first switching means to supply power to said high load device immediately after turning-on of a power switch, and for controlling said first switching means to stop the supply of power to said high load device when voltage detected by said detecting means is not higher than a prescribed voltage; and  
backup means for holding data even when the power switch is off,  
wherein said controlling means controls said first switching means to stop supply of power to said high load device and to set a flag at said backup means when voltage detected by said detecting means is not higher than said prescribed voltage, and controls said first switching means to refrain from supplying power to said high load device when said flag is set at said backup means at the time of turning-on of the power switch.

5,773,961

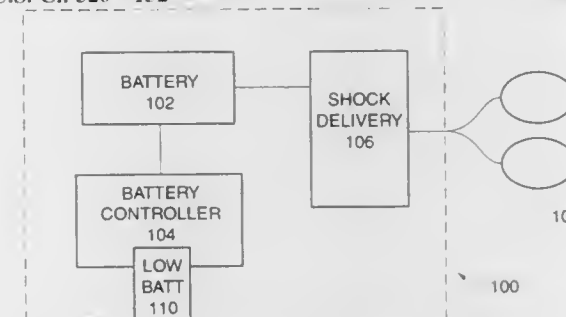
**DYNAMIC LOAD CONTROLLER FOR A BATTERY**  
David B. Cameron, Seattle; Daniel J. Powers, Issaquah, and Douglas H. Roberts, Bellevue, all of Wash., assignors to Heartstream, Inc., Seattle, Wash.

Filed Jun. 6, 1996, Ser. No. 659,503

Int. Cl.<sup>6</sup> H01M 10/48

U.S. Cl. 320—132

92 Claims



1. A dynamic load controller for a battery, comprising:  
detection circuitry for measuring at least one condition related to battery capacity; and

optimization circuitry for optimizing power delivery from the battery at an optimum power based upon the at least one condition.

67. A method of providing a battery capacity indication in an electrotherapy device powered by a battery, the method comprising the following steps:

- operating the electrotherapy device to treat a patient;
- monitoring a battery parameter during the operating step;
- providing a low battery capacity indication based on a value of the battery parameter, the providing step being performed while the electrotherapy device can provide at least three therapeutic electrical shocks to the patient before the battery is depleted.

5,773,962

**BATTERY ENERGY MONITORING CIRCUITS**

Jiri K. Nor, Oakville, Canada, assignor to Norvik Traction Inc., Mississauga, Canada

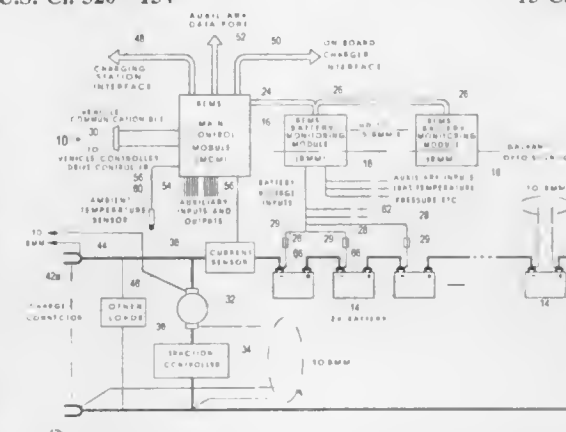
Division of Ser. No. 372,936, Jan. 17, 1995, Pat. No. 5,670,861.

This application Apr. 22, 1997, Ser. No. 841,455

Int. Cl.<sup>6</sup> H02J 7/00

U.S. Cl. 320—134

15 Claims



1. A monitoring and control apparatus for a battery which comprises a long chain of series connected cells or battery modules, said monitoring and control apparatus being a circuit comprising:

a main control module having a plurality of input and output ports;

at least one battery monitoring module associated with a respective plurality of cells or battery modules, and having input and output communications with said main control module; and  
a current sensor means in series with said long chain battery, and having a sensed current input to said main control module;

wherein said main control module includes current control means, current flow interruption means for controlling external means or circuits used for periodically interrupting or changing the current flow in said long chain battery, voltage reading means for receiving and storing voltage information from each of said battery monitoring modules when said current flow has been periodically interrupted or changed, timing means, microprocessor means, annunciator means, battery monitoring module control means, temperature monitoring means, and serial communications bus means;

wherein each of said battery monitoring modules includes serial communications bus means, and data acquisition circuitry which comprises cell or battery voltage monitoring means for each cell or battery module with which it is associated, and control means for controlling switches that are within or series connected with each of said cells or battery modules; wherein said main control module and said battery monitoring modules are in communication with one another over said serial communications bus means; and

wherein said data acquisition circuitry in each of said battery monitoring modules is galvanically connected with the

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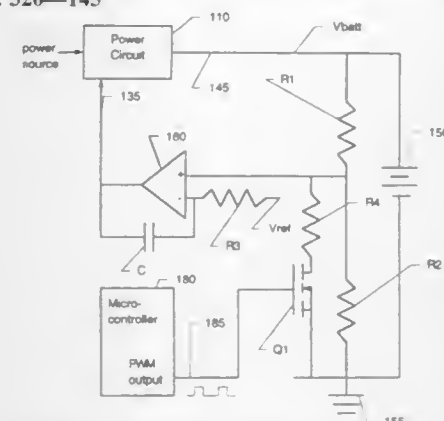
respective cells or battery modules with which it is associated, and galvanically isolated from said serial communications bus means.

5,773,963  
METHOD AND APPARATUS FOR PROGRAMMABLY  
ADJUSTING OUTPUT VOLTAGE OF A BATTERY  
CHARGER

James J. Blanc, San Mateo, and Mark C. Gurries, San Jose, both of Calif., assignors to Apple Computer Inc., Cupertino, Calif.

Filed Aug. 29, 1996, Ser. No. 705,357  
Int. Cl.<sup>6</sup> H02J 7/04; 7/16

U.S. Cl. 320—145



1. A constant-voltage battery charger for charging at least one battery, the battery charger comprising:

- a voltage divider network including at least two resistive elements in series and said two resistive elements being disposed in electrical parallel to the at least one battery;
- a power circuit for generating an output voltage of the battery charger from an incoming power source and an incoming error signal; said power circuit being adapted for applying the output voltage to the at least one battery and the voltage divider network;
- a control circuit including a control resistor serially connected to a MOSFET, said control resistor and said MOSFET being disposed in electrical parallel to one of the at least two resistive elements of the voltage divider network, said control circuit having one end connected to an electrical ground;
- a controller being connected to the MOSFET and adapted for switching the MOSFET ON and OFF, said MOSFET being responsive to a pulse width modulated output signal having a programmable duty cycle operating at a pre-determined frequency from the controller; and
- a comparison circuit including an operational amplifier for generating the error signal by comparing between a pre-determined voltage reference and the voltage across the control circuit, said comparison circuit being configured to roll off at a frequency much lower than the pre-determined frequency of the pulse width modulated output signal.

5,773,964  
OUTPUT AND TORQUE CONTROL OF AN  
AUTOMOTIVE ALTERNATOR

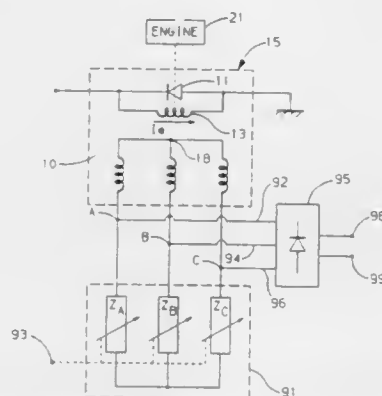
David Allan Peter, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 357,908, Dec. 16, 1994. This application Apr. 22, 1996, Ser. No. 636,195  
Int. Cl.<sup>6</sup> H02P 9/00

U.S. Cl. 322—20

5 Claims

1. In an automotive electrical system having an alternator drivingly connected to a vehicle engine, said alternator having a polyphase output winding producing a polyphase output compris-



11 Claims

ing a polyphase alternating voltage and corresponding polyphase alternating current, an apparatus for varying the output and torque of the alternator comprising:

- a controlled bridge rectifier coupled to said polyphase output winding and having a pair of direct voltage output terminals, said controlled bridge rectifier comprising a plurality of controlled rectifier elements each controllable in accordance with a respective conduction signal applied thereto;
  - a conduction signal generator for generating a plurality of conduction signals corresponding in frequency and phase separation to said polyphase alternating voltage, said conduction signals being applied to said controlled rectifier elements for controlling the conduction thereof;
  - a phase controller for establishing and maintaining a desired phase relationship between said alternating current and said alternating voltage by controlling a conduction timing of said conduction signals,
- whereby output and torque increase when conduction timing is advanced and output and torque decrease when conduction timing is retarded.

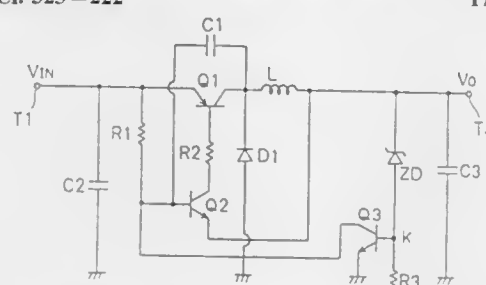
5,773,965  
SWITCHING POWER SUPPLY APPARATUS FOR  
CONVERTING A HIGH DC VOLTAGE INTO A LOW DC  
VOLTAGE

Hiroshi Hayashi, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Oct. 23, 1996, Ser. No. 736,072  
Claims priority, application Japan, Oct. 24, 1995, 7-275971  
Int. Cl.<sup>6</sup> G05F 1/10; 1/40

U.S. Cl. 323—222

17 Claims



1. A power supply apparatus comprising:
- an input terminal;
  - an output terminal;
  - a switching means and an inductance means that are connected in series between the input terminal and the output terminal;
  - a monitoring circuit connected between the output terminal and a reference potential node, for monitoring a voltage at the output terminal;
  - a drive circuit for putting the switching means into either a conducting state or a nonconducting state according to a monitoring result of the monitoring circuit; and
  - a path means for forming a path for a current resulting from a back electromotive force that is developed in the inductance means when the switching means is put into a non-conducting

state, said path means including a capacitor connected between an output of said switching means and an input of said drive circuit.

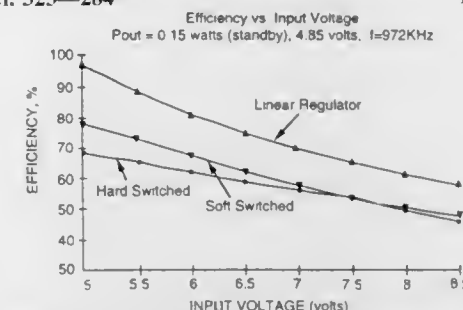
5,773,966  
DUAL-MODE, HIGH-EFFICIENCY DC-DC CONVERTER  
USEFUL FOR PORTABLE BATTERY-OPERATED  
EQUIPMENT

Robert Louis Steigerwald, Burnt Hills, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 6, 1995, Ser. No. 554,174  
Int. Cl.<sup>6</sup> G06F 1/56

U.S. Cl. 323—284

12 Claims



1. A dual-mode dc—dc converter system, comprising:
- a dc—dc converter for converting an input dc voltage to an output dc voltage, said dc—dc converter comprising at least one power switching device;
  - gate driver circuitry for providing gating signals for driving said at least one power switching device;
  - a strobe signal generator responsive to load current outputted by said dc—dc converter for providing a strobe signal to said gate driver circuitry for commanding operation of said converter in a switching regulation mode or a linear regulation mode, said strobe signal commanding operation in a switching regulation mode for values of said load current above a threshold and in a linear regulation mode for values of said load current below said threshold.

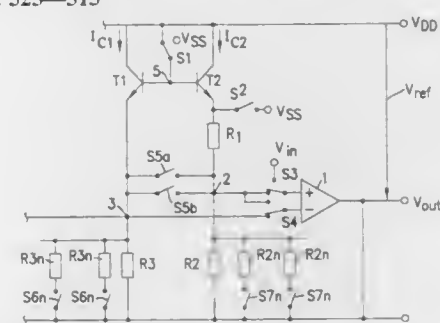
5,773,967  
VOLTAGE REFERENCE WITH TESTING AND SELF-  
CALIBRATION

Wilfried Tenten, Gammertingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany  
PCT No. PCT/DE95/01409, § 371 Date May 2, 1997, § 102(e)  
Date May 2, 1997, PCT Pub. No. WO96/14613, PCT Pub. Date May 17, 1996

PCT Filed Oct. 13, 1995, Ser. No. 836,447  
Claims priority, application Germany, Nov. 5, 1994, 44 39 707.0

Int. Cl.<sup>6</sup> G05F 3/16; G11C 16/04  
U.S. Cl. 323—313

10 Claims



1. A voltage reference circuit providing a voltage and having a temperature coefficient comprising:
- at least one input resistor;
  - at least one feedback resistor;

at least one operations amplifier having an inverting input terminal and a non-inverting input terminal, the at least one operations amplifier being switched to function as a non-inverting amplifier using the at least one input resistor and the at least one feedback resistor; and

a plurality of switches performing at least one of a self-test and a self-calibration of the voltage reference circuit to compensate for the temperature coefficient of the voltage reference circuit during a service life of the voltage reference circuit, the plurality of switches including:

- a first switch having a first end connected to the non-inverting input terminal,
- a second switch having a first end connected to the inverting input terminal, and
- a third switch connected in parallel with a fourth switch, the third and fourth switches switching at least one calibration resistor in parallel to the at least one feedback resistor, wherein one of the third and fourth switches is activated before the other one of the third and fourth switches.

5,773,968  
INTERNAL VOLTAGE CONVERSION CIRCUIT

Hideaki Kondo, Kyoto, and Akinori Shibayama, Hirakata, both of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Sep. 11, 1996, Ser. No. 716,786  
Claims priority, application Japan, Sep. 21, 1995, 7-242743  
Int. Cl.<sup>6</sup> G05F 3/16

U.S. Cl. 323—316

10 Claims



1. An internal voltage conversion circuit which is contained in a semiconductor integrated circuit and which feeds to internal elements of said semiconductor integrated circuit an internally converted voltage which is lower than an external power supply voltage,
- said internal voltage conversion circuit comprising:
- a reference voltage generation circuit which generates a first reference voltage and a second reference voltage which is higher than said first reference voltage by a predetermined voltage;
  - an output circuit which outputs said internally converted voltage on the basis of said first reference voltage output from said reference voltage generation circuit; and
  - an output control circuit which reduces, when said internally converted voltage increases in excess of said second reference voltage generated by said reference voltage generation circuit, said excess internally converted voltage.



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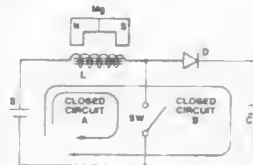
DC-DC CONVERTER CIRCUIT AND INDUCTIVE LOAD DRIVE DEVICE USING DC-DC CONVERTER CIRCUIT  
Tetsuya Nakayama, Masakazu Moritoki, Masao Hagiwara, Kenichiro Maeda, and Daisuke Yoshida, all of Hiratusuka, Japan, assignors to Komatsu Ltd., Japan

Filed Feb. 27, 1996, Ser. No. 564,339

Claims priority, application Japan, May 12, 1993, 5-110776  
Int. Cl.<sup>6</sup> G05F 5/00

U.S. Cl. 323—330

30 Claims



1. A DC-DC converter circuit provided with a power source, a coil that is connected to the power source, switching means for opening and closing a closed circuit including the power source and the coil, a capacitor that is connected in parallel to the switching means and a diode provided between the coil and the switch means in such a manner as to prevent a current to flow through the switch means from the capacitor when the switch means is closed, wherein the switching means is closed so that a power source voltage will be applied to the coil, which results in energy being stored in the coil, and the switching means is opened at an arbitrarily determined timing, which results in the energy stored in the coil being stored in the capacitor and output through the diode, characterized in that:

an electromagnetic energy stored in the coil is increased by the application of a magnetic bias to a magnetic core of the coil in a direction opposite to a direction of a magnetic flux induced by a current supplied from the power source.

5,773,970

TAP CHANGER WITH TICKLER COIL FOR ARCLESS TAP CHANGING

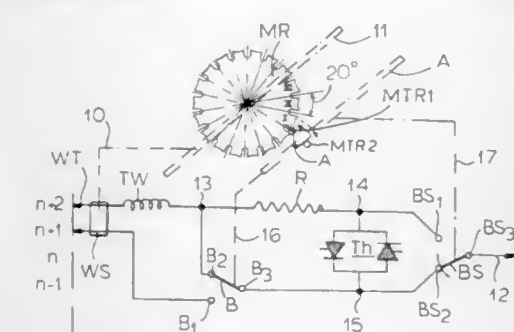
Dieter Dohnal, Lappersdorf, and Hans-Henning Lessmann-Mieske, Neutraubling, both of Germany, assignors to Maschinenfabrik Reinhausen GmbH, Regensburg, Germany  
Filed May 10, 1996, Ser. No. 644,124

Claims priority, application Germany, May 18, 1995, 195 18 272.3

Int. Cl.<sup>6</sup> G05F 1/147

U.S. Cl. 323—341

9 Claims



1. A tap changer comprising:  
an array of fixed contacts each corresponding to a connectable tap;

a first and a second movable tap selector contact displaceable along said array;

a tickler coil and a switchover resistor in series with a first of said tap selector contacts and forming a series network therewith;

a bypass switch having a pair of selectable bypass contacts and a bypass selector contact connectable to a load, a first of said selectable bypass contacts being connected to said series network;

a switchover switch having a pair of selectable switchover contacts and a switchover selector contact, a first of said selectable switchover contacts being connected to said second tap selector contact, a second of said selectable switchover contacts being connected to said network between said tickler coil and said switchover resistor, said switchover selector contact being connected to a second of said selectable bypass contacts;

a thyristor pair of oppositely poled parallel thyristors connected across a first point between said switchover resistor and said first of said selectable bypass contacts and a second point between said switchover selector contact and said second selectable bypass contact; and

a rotary intermittent drive connected to said tap selector contacts and to said selector contacts of said bypass switch and said switchover switch for actuating same.

5,773,971

THREE ELECTRODE AC DETECTION

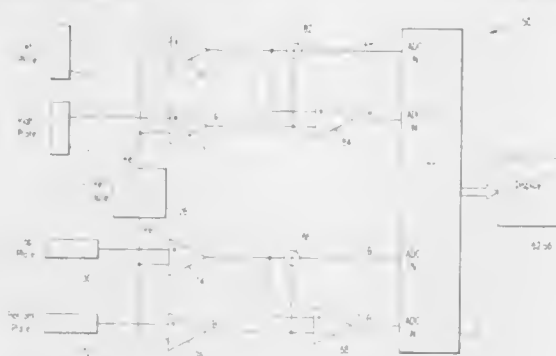
Russell E. Tavernetti, San Carlos, Calif., assignor to Zircon Corporation, Campbell, Calif.

Filed Aug. 8, 1996, Ser. No. 689,427

Int. Cl.<sup>6</sup> G01R 19/145; G01V 3/08; 3/165

U.S. Cl. 324—67

9 Claims



1. Apparatus for sensing an alternating electric voltage in a conductor, comprising:

a reference electrode, a first sensor electrode, and a second sensor electrode, all spaced apart, the electrodes responsive to the alternating electric voltage in the conductor;

a first differential amplifier connected to receive signals from the first sensor electrode and the reference electrode, and provide a first output signal indicative of a difference between the signals from the first sensor electrode and the reference electrode;

a second differential amplifier connected to receive signals from the second sensor electrode and the reference electrode, and provide a second output signal indicative of a difference between the signals from the second sensor electrode and the reference electrode;

a third differential amplifier for receiving the output signals from the first and second differential amplifiers and providing a third output signal indicative of a difference between the output signals from the first and second differential amplifiers;

a processor coupled to receive the third output signal to process the third output signal for display; and

a display driven by the processor to show presence of the alternating electric voltage in the conductor.

5,773,972

TRANSITION DETECTION CIRCUIT FOR DETECTING TRANSITIONS IN THE STATE OF AN OBJECT OF DETECTION

Koichi Futsuhara, and Toshihito Shirai, both of Saitama-ken, Japan, assignors to The Nippon Signal Co., Ltd., Tokyo, Japan

PCT No. PCT/JP96/00585, § 371 Date Dec. 6, 1996, § 102(e)  
Date Dec. 6, 1996, PCT Pub. No. WO96/31755, PCT Pub. Date Oct. 10, 1996

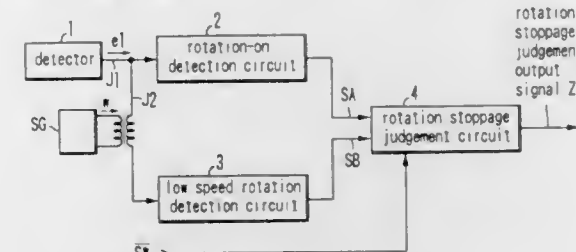
PCT Filed Mar. 8, 1996, Ser. No. 750,144

Claims priority, application Japan, Apr. 6, 1995, PCT/JP95/00675

Int. Cl.<sup>6</sup> G01P 13/00; 3/00; G01R 31/00; G08B 19/00

U.S. Cl. 324—161

25 Claims



1. A transition detection circuit comprising:

a detector outputting a signal corresponding to operation characteristics of an object of detection, said operation characteristics including a shift from a first state to a second state;

a first state detection circuit generating a first output signal at different levels which include a high level and a low level corresponding to said first state based upon a signal provided by said detector;

a second state detection circuit generating a second output signal at different levels which include a high level and a low level corresponding to said second state based upon said signal provided by said detector, said first output signal and said second output signal having a period of time during which said first output signal is at the high level and said second output signal is at the high level while said object of detection shifts from said first state to said second state in a normal manner; and

a state judgement circuit generating a state judgement output signal on condition that said first output signal and said second output signal have had a period of time during which said first output signal is at the high level and said second output signal is at the high level.

5,773,973

METHOD OF MAGNETO OPTIC IMAGE FEATURE EXTRACTION

Michael Horn, South Setauket, N.Y., assignor to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Mar. 26, 1996, Ser. No. 622,128

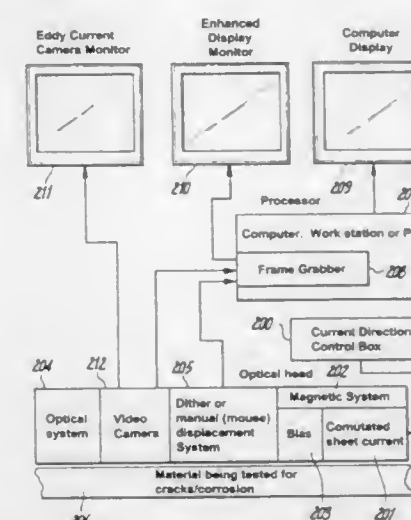
Int. Cl.<sup>6</sup> G01N 27/82; 21/21; G01R 33/032

U.S. Cl. 324—235

11 Claims

1. A method of magneto optic imaging to locate the presence of a crack around a circular hole wherein the circular hole, because of its sharp corners, locally disturbs the magnetic field used to form the image and obscures the presence of a crack therearound, comprising:

a. forming a magneto optic image of a circular hole under test, wherein a crack near the circular hole perturbs the circularity of the hole image by driving the magnetic field away from the circumference of the circular hole to cause the image of the hole to appear out of round and eccentric; and



b. applying a pattern recognition analysis to the image to check the image for a circular shape, wherein the circular shape image is correlated with a circle of similar diameter to check the circularity of the image, and an eccentricity of the circular image shape is indicative of a crack around the circular hole.

5,773,974

PORTABLE ELECTRO-MAGNETIC FIELD DETECTION AND MEASUREMENT APPARATUS FOR NEAR-FIELD TEST AND MEASUREMENTS

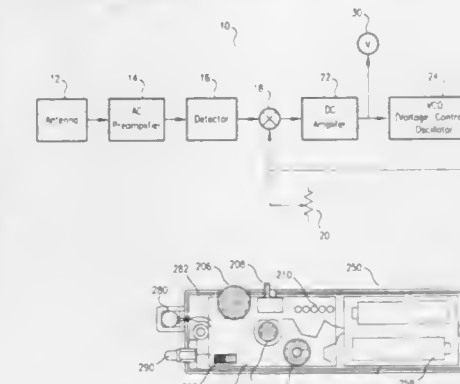
Vladimir Kraz, Santa Cruz, Calif., assignor to Credence Technologies, Inc., Santa Cruz, Calif.

Filed Apr. 13, 1995, Ser. No. 421,802

Int. Cl.<sup>6</sup> G01R 33/02; 29/08; 13/00

U.S. Cl. 324—258

11 Claims



1. Hand-held apparatus for detecting and measuring the near-field strength of an electromagnetic field, said apparatus comprising:

receiving means for detecting and converting broad-band electromagnetic field radiation into alternating-current signals representing said broad-band electromagnetic field radiation;

signal conversion means, coupled to the receiving means, for converting said alternating-current signals into direct-current signals; and

signal strength indicating means, coupled to the signal conversion means, for indicating the magnitude of the strength of said electromagnetic field radiation in response to said direct-current signals;

said signal strength indicating means including a voltage-controlled oscillator, having a reference voltage, for converting said direct-current signals having a magnitude greater than the reference voltage into an alternating-current signal having a frequency directly proportional to the magnitude of said broad-band electromagnetic field radiation.

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5,773,975

**METHOD OF AND DEVICE FOR MEASURING THE VELOCITY OF MOVING MATTER BY MEANS OF MAGNETIC RESONANCE**

Jan F. L. De Becker; Thomas L. M. Hoogenboom, and Miha Fuderer, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

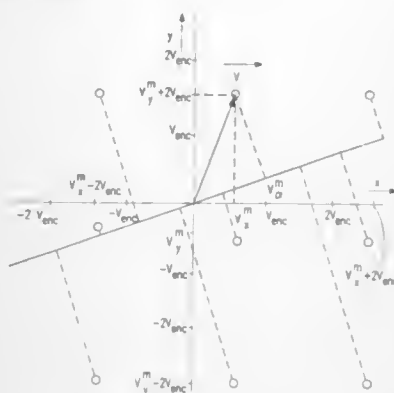
Filed Sep. 24, 1996, Ser. No. 718,807

Claims priority, application European Pat. Off., Sep. 25, 1995, 95202580

Int. Cl.<sup>6</sup> G01V 3/00

U.S. Cl. 324—306

15 Claims



1. A method of determining a velocity of moving matter by means of magnetic resonance (MR), comprising:

- a) applying a motion-encoding magnetic gradient field in at least one measuring direction and determining, from the phase of a received MR signal, a velocity component in the measuring direction but for any applicable multiple of twice an encoding velocity in the measuring direction, said encoding velocity in the measuring direction being associated with the motion-encoding magnetic gradient field applied in that direction and being chosen to be less than a maximum absolute value of said component;
- b) applying a motion-encoding magnetic gradient field in an additional direction, referred to herein as the dewrap direction, and determining, from the phase of a received MR signal, a velocity component in the dewrap direction but for any applicable multiple of twice an encoding velocity in the dewrap direction, said encoding velocity in the dewrap direction being associated with the motion-encoding magnetic gradient field applied in the dewrap direction; and
- c) determining an actual velocity component in the measuring direction, including any applicable multiple of twice the encoding velocity in the measuring direction, from the determinations in steps a) and b).

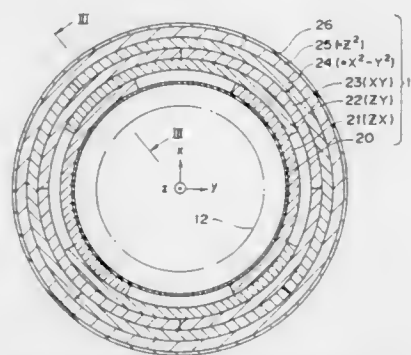
5,773,976

**SHIMMING IN MAGNETIC RESONANCE IMAGING**  
Yoshitomo Sakakura, Nishinasuno-Machi; Hiromi Kawamoto, Yaita, and Masafumi Kondo, Sagami-hara, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan  
Filed Jan. 19, 1996, Ser. No. 588,058Claims priority, application Japan, Jan. 20, 1995, 7-007267  
Int. Cl.<sup>6</sup> G01R 33/20; A61B 5/00

U.S. Cl. 324—318

20 Claims

1. A magnetic resonance imaging system comprising:
- a) a magnet generating a static magnetic field;
- a) a gradient coil unit, formed into a substantially cylindrical shape having an outer circumferential surface, generating a gradient magnetic field superposed on the static magnetic field and shielding the gradient magnetic field from leaking out into a radially outer space of the gradient coil unit; and
- a) a shim coil unit, mounted on the outer circumferential surface of the gradient coil unit in common serving as a bobbin for the shim coil unit, comprising a plurality of channels of shim coils for generating a correcting magnetic field of higher-



order shimming more than primary shimming by conducting electric current through the shim coils, said correcting magnetic field homogenizing the static magnetic field.

5,773,977

**METHOD OF TESTING AN ELECTRIC STORAGE BATTERY BY DETERMINING A BOUNCE-BACK VOLTAGE AFTER A LOAD HAS BEEN REMOVED**

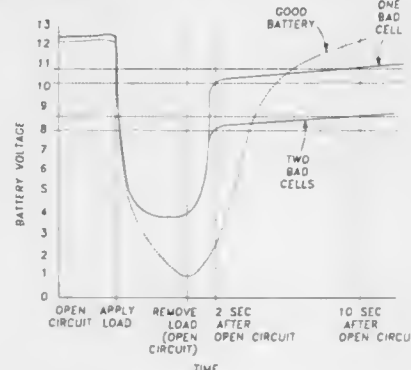
Thomas J. Dougherty, Waukesha, Wis., assignor to Johnson Controls Technology Company, Plymouth, Mich.

Filed Apr. 18, 1996, Ser. No. 634,650

Int. Cl.<sup>6</sup> G01N 27/416

U.S. Cl. 324—429

26 Claims



1. A method of testing a battery to determine if one or more individual cells of the battery are bad by connecting the battery to a control circuit including a predetermined load and a switching means for controlling the connection of said load to the battery, said method comprising the steps of:

- connecting said predetermined load to the battery for a first predetermined period of time;
- disconnecting said predetermined load from the battery after said first predetermined period of time;
- monitoring the voltage of the battery after said load has been removed; and
- determining if one or more cells of the battery are bad based on said monitored battery voltage, wherein the step of determining if one or more cells of the battery are bad includes determining the battery voltage level a second predetermined period of time after the predetermined load is disconnected from the battery and comparing the determined battery voltage level to a predetermined battery voltage level so that if the determined battery voltage level is below the predetermined battery voltage level, then at least one of the cells is bad.

5,773,978

**BATTERY IMPEDANCE MONITOR**

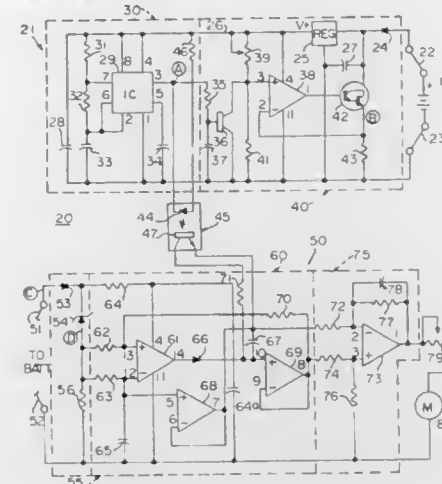
Thomas P. Becker, Kenosha, Wis., assignor to Snap-on Technologies, Inc., Lincolnshire, Ill.

Filed Oct. 25, 1996, Ser. No. 736,992

Int. Cl.<sup>6</sup> G01R 31/36

U.S. Cl. 324—430

17 Claims



1. An impedance monitor for a battery having positive and negative output terminals across which a DC output voltage is provided, said monitor comprising:

- an oscillatory loading circuit adapted to be coupled across the battery terminals for periodically loading the battery to produce at the output terminals a time-varying voltage component having a peak-to-peak amplitude superimposed on the DC output voltage; and
- a measuring circuit adapted to be connected across the battery output terminals for sensing the time-varying voltage component to determine the internal impedance of the battery, said measuring circuit including an impedance portion connected in series with the battery when said detector circuit is connected across the battery terminals and having a finite DC impedance and a substantially zero AC impedance for shifting the level of the DC output voltage without affecting the peak-to-peak amplitude of the time-varying component, said measuring circuit including a peak detector for generating, in response to the output of said impedance portion, an indicating voltage level proportional to the peak-to-peak amplitude of the time-varying voltage component.

5,773,979

Patent Not Issued For This Number

5,773,980

**ONE-TERMINAL FAULT LOCATION SYSTEM THAT CORRECTS FOR FAULT RESISTANCE EFFECTS**

Lifeng Yang, Coral Springs, Fla., assignor to ABB Power T &amp; D Company, Inc., Raleigh, N.C.

Filed Jan. 30, 1997, Ser. No. 791,816

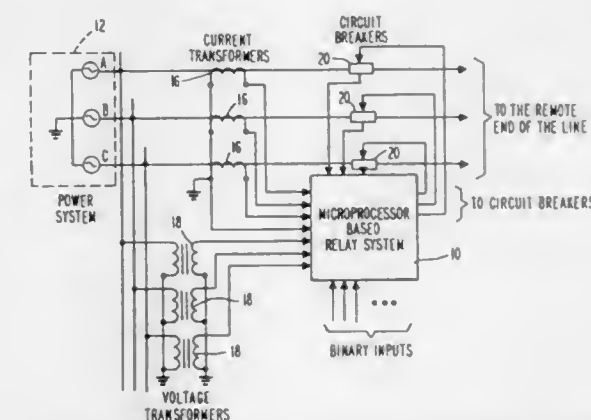
Int. Cl.<sup>6</sup> G01R 31/08

U.S. Cl. 324—525

12 Claims

1. A system for locating a fault associated with one or more conductors of a multiple phase electric power transmission or distribution system, said fault being one of the following group of fault types: phase-to-ground, phase-to-phase-to-ground, phase-to-phase, and phase-to-phase-to-phase, comprising:

- measuring means for measuring at least one voltage phasor and at least one current phasor, each said voltage phasor being indicative of an amplitude and phase associated with a voltage waveform at a first prescribed location and each said current



phasor being indicative of an amplitude and phase associated with a current waveform at said first prescribed location; processing means coupled to said measuring means for computing a fault location parameter m indicative of the location of the fault, wherein m is computed as:

$$m = \frac{X_1 + R_1 \tan(\arg(I_1') - \arg(I_m))}{X_{11} + R_{11} \tan(\arg(I_1') - \arg(I_m))}$$

where:

- $X_1$ =an imaginary portion of a faulted circuit impedance;
- $R_1$ =a real portion of a faulted circuit impedance;
- $X_{11}$ =a positive sequence line reactance;
- $R_{11}$ =a positive sequence line resistance;
- $I_1'$ =said current phasor compensated for cross coupling effects in a single-phase to ground fault and a difference between current phasors in a multiple-phase fault; and
- $I_m$ =a negative sequence current of said current phasor in a single-phase-to-ground fault and a difference between pre-fault load currents and said current phasors in a multiple-phase fault.

5,773,981

**METHOD OF DETECTING LINEAR SOLENOID INTER-TERMINAL SHORT OF ELECTRONIC CONTROL TYPE AUTOMATIC TRANSMISSION**

Masayuki Sugiura, Göteborg, Sweden; Shinichi Matsui, Nagoya, Japan; Tatsuyuki Yoneda, and Kenji Suzuki, both of Okazaki, Japan, assignors to Aisin AW Co., Ltd., Japan

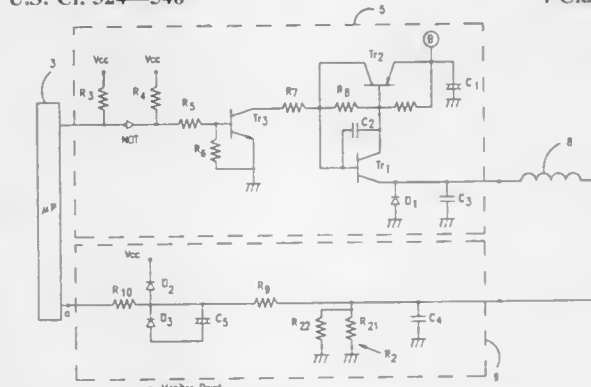
Filed Sep. 6, 1996, Ser. No. 708,194

Claims priority, application Japan, Sep. 8, 1995, 7-023157

Int. Cl.<sup>6</sup> G01R 31/02

U.S. Cl. 324—546

4 Claims



1. A method of detecting a short between terminals of a linear solenoid of an automatic transmission operated by an electronic control wherein the linear solenoid is driven by pulse width modulation at a duty ratio set by a feedback control to maintain electrical current through the terminals of the linear solenoid at a target value, comprising:





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- a) one or more long test probes;
- b) a plurality of substantially parallel guide plates having at least a top guide plate and a bottom guide plate, said plurality of substantially parallel guide plates having through holes in predetermined locations, such that each of said one or more long test probes extend through said through holes in said guide plates and line up with a corresponding one of said one or more test targets;
- c) one or more spring probes mounted in said top guide plate such that said each of said one or more spring probes lines up with a corresponding one of said one or more standard access test targets;
- d) a probe-mounting plate between said plurality of guide plates and said interface probes of said tester when said hybrid test fixture is mounted on said tester;
- e) a plurality of personality pins having wirewrap posts mounted in said probemounting plate, each of said personality pins being electrically connected to at least one of said one or more long test probes and at least one of said one or more spring probes; and
- f) an alignment plate, said wirewrap posts of said personality pins extending through said alignment plate in such a manner that each of said wirewrap posts lines up with a corresponding interface pin of said tester when said hybrid test fixture is mounted on said tester.

5,773,989

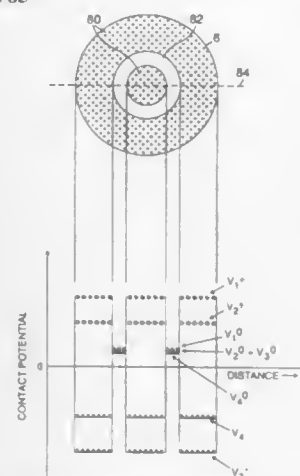
**MEASUREMENT OF THE MOBILE ION CONCENTRATION IN THE OXIDE LAYER OF A SEMICONDUCTOR WAFER**

Piotr Edelman; Andrew M. Hoff; Lubek Jastrzebski, and Jacek Lagowski, all of Tampa, Fla., assignors to University of South Florida, and Semiconductor Diagnostics, Inc., both of Tampa, Fla.

Filed Jul. 14, 1995, Ser. No. 502,660  
Int. Cl.<sup>6</sup> G01R 31/00

U.S. Cl. 324-765

24 Claims



1. A method for determining the mobile ion concentration within an oxide layer disposed on a surface of a semiconductor wafer, comprising:

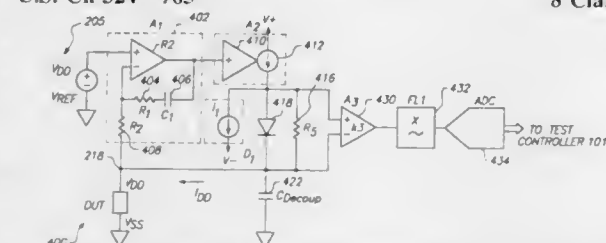
- a) depositing charge on at least a portion of the surface of the oxide layer at a low temperature at which said mobile ions do not substantially move;
- b) measuring the contact potential on the surface of the oxide layer at said low temperature;
- c) heating the semiconductor wafer and oxide layer to a temperature sufficient to activate the drift of said mobile ions;
- d) measuring the shift in contact potential after said heating; and
- e) determining the mobile ion concentration within the oxide layer on the basis of the shift.

5,773,990  
**INTEGRATED CIRCUIT TEST POWER SUPPLY**  
Jan B. Wilstrup, Mounds View, and Stanley Peter Mros, Roseville, both of Minn., assignors to Megatest Corporation, San Jose, Calif.

Filed Sep. 29, 1995, Ser. No. 536,206  
Int. Cl.<sup>6</sup> G01R 15/12

U.S. Cl. 324-765

8 Claims



1. A power supply for testing an integrated circuit, comprising:
- a source voltage input terminal;
- an operational amplifier coupled to said input terminal and configured to produce current in response to a feedback signal;
- a shunt resistor coupled to said operational amplifier;
- a diode coupled in parallel with said shunt resistor;
- a current sensor coupled in series with said shunt resistor; and
- an output terminal coupled to said resistor, diode and current sensor, said output terminal configured to connect to a device under test.

5,773,991

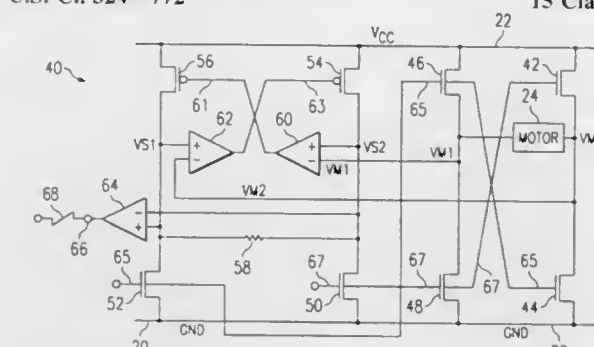
**MOTOR CURRENT SENSE CIRCUIT USING H BRIDGE CIRCUITS**

Ching-Siang Chen, Laguna Niguel, Calif., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 433,236, May 2, 1995, abandoned.  
This application Feb. 18, 1997, Ser. No. 801,441  
Int. Cl.<sup>6</sup> G01R 23/00

U.S. Cl. 324-772

15 Claims



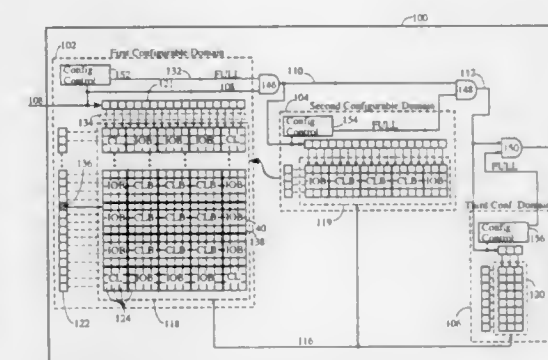
12. A circuit for sensing current in a motor, said circuit comprising:

- a first stage, said first stage supplying power to said motor, said power causing a motor current to flow through said motor;
- a second stage supplying power to a sensing resistor, said second stage mirroring a current proportional to said motor current into said sensing resistor; and
- a circuit for measuring a voltage across said sensing resistor, wherein said voltage across said sensing resistor is proportional to said motor current;
- said first stage comprising a first current path including a first transistor coupled to a power supply in series with said motor and in series with a second transistor coupled to ground, wherein during a first state of operation of said circuit current flows from said power supply to ground through said first current path;
- said first-stage further comprising a second current path including a third transistor coupled to said power supply in series with said motor and in series with a fourth transistor coupled to ground, wherein during a second state of operation of said

circuit current flows from said power supply to ground through said second current path;

said second stage comprising a first current path including a fifth transistor coupled to said power supply in series with said sensing resistor and in series with a sixth transistor coupled to ground, wherein during said first state of operation of said circuit, a current substantially equal to said motor current is forced through said sensing resistor;

wherein a positive terminal of a differential amplifier is coupled to a drain of said sixth transistor, and a negative terminal of said differential amplifier is coupled to a drain of said second transistor, said differential amplifier causing a voltage of said drain of said sixth transistor to be substantially equal to a voltage of said drain of said second transistor.



tion configurable device being configurable by a first bitstream, the configurable electronic device comprising:

- a first configurable domain which is integrated in the configurable device and configurable by the first bitstream;
- a second configurable domain which is integrated in the configurable device and optionally configurable by an optional second bitstream concatenated to the first bitstream; and
- configuration means for loading the first bitstream into said first configurable domain and for loading said second configurable domain with the optional second bitstream; and
- signal means coupled to said configuration means for indicating when the first bitstream has been loaded into said first configurable domain.

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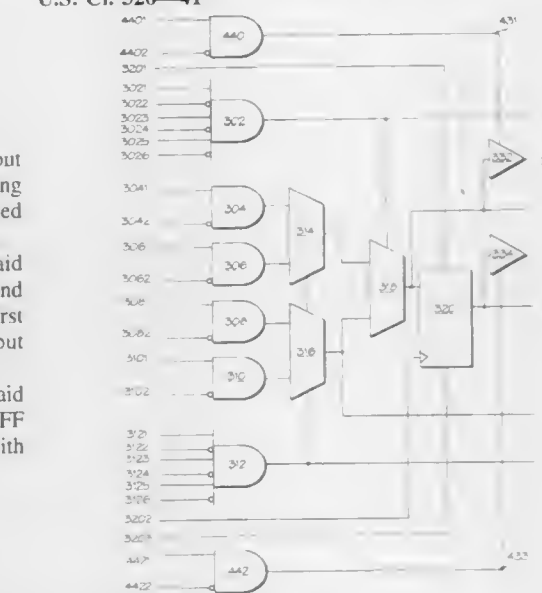
**METHOD AND APPARATUS FOR IMPLEMENTING AN INTERNAL TRI-STATE BUS WITHIN A PROGRAMMABLE LOGIC CIRCUIT**

Christopher W. Jones, Pleasanton, Calif., assignor to Cypress Semiconductor Corp., San Jose, Calif.

Filed Dec. 15, 1995, Ser. No. 573,237  
Int. Cl.<sup>6</sup> H03K 19/177

U.S. Cl. 326-41

26 Claims



1. A programmable circuit comprising:
- an input/output interface for receiving data input to said programmable circuit and for generating output data from said programmable circuit;
- a plurality of interconnect elements coupled to said input/output interface; and
- a plurality of logic cells coupled to said plurality of interconnect elements, at least one of said plurality of logic cells comprising:
- a plurality of logic elements for performing digital functions on a plurality of input signals received by said logic cell

5,773,993

**CONFIGURABLE ELECTRONIC DEVICE WHICH IS COMPATIBLE WITH A CONFIGURATION BITSTREAM OF A PRIOR GENERATION CONFIGURABLE ELECTRONIC DEVICE**

Stephen M. Trimberger, San Jose, Calif., assignor to Xilinx, Inc., San Jose, Calif.

Filed Sep. 26, 1996, Ser. No. 721,387  
Int. Cl.<sup>6</sup> H03K 19/177

U.S. Cl. 326-38

16 Claims

1. A configurable electronic device which is compatible with a prior generation configurable electronic device, the prior genera-



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from said plurality of interconnect elements and for generating a plurality of output signals, said plurality of logic elements comprising:

a plurality of AND gates for receiving signals from said plurality of interconnect elements, said plurality of AND gates generating a first subset of said plurality of output signals;

a plurality of first stage multiplexers coupled to said plurality of AND gates, said plurality of first stage multiplexers outputting a second subset of said plurality of output signals;

at least one second stage multiplexer coupled to said plurality of first stage multiplexers, said at least one second stage multiplexer outputting a third subset of said plurality of output signals; and

a register element coupled to said at least one second stage multiplexer and said interconnect elements, said register element outputting a fourth subset of said plurality of output signals;

a first tri-state buffer coupled to said third subset of said plurality of output signals and outputting a fifth subset of said plurality of output signals; and

a second tri-state buffer coupled to said fourth subset of said plurality of output signals and outputting a sixth subset of said plurality of output signals.

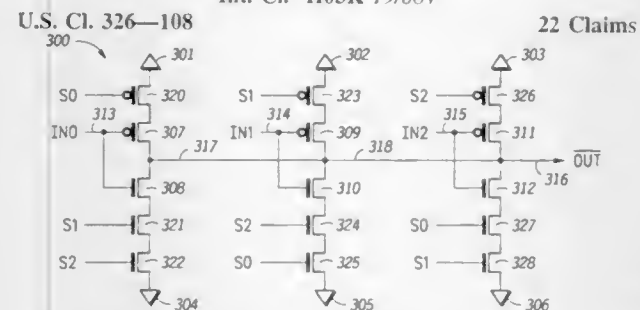
5,773,995

## DIGITAL MULTIPLEXER CIRCUIT

Paul R. Crocker, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 22, 1996, Ser. No. 636,084

Int. Cl.<sup>6</sup> H03K 19/084



1. A digital multiplexer circuit comprising: circuitry operable for receiving N data signals; circuitry operable for generating N selection signals for selecting one of said N data signals to be output from said digital multiplexer circuit;

an encoder operable for encoding said N selection signals into a plurality of encoded signals, wherein there are N of said plurality of encoded signals and N selection signals; and circuitry operable for selecting said one of said N data signals for output from said digital multiplexer circuit in response to receipt of said plurality of encoded signals, wherein N is at least one and fewer than N of said plurality of encoded signals are used by said selecting circuitry to output said one of said N data signals.

5,773,996

## MULTIPLE-VALUED LOGIC CIRCUIT

Waho Takao, Kanagawa, Japan, assignor to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed May 22, 1996, Ser. No. 650,251

Claims priority, application Japan, May 22, 1995, 7-122889 Int. Cl.<sup>6</sup> H03K 17/70

U.S. Cl. 326—135 26 Claims

1. A multiple-valued logic circuit comprising: a first device;



a second device connected in series with said first device; a signal source for supplying an oscillating voltage across a series circuit consisting of said first device and said second device; and

a signal output terminal, wherein said first device is constituted by at least one unit device having first and second main terminals and exhibiting voltage-current characteristics including negative differential resistance characteristics for obtaining a peak current between said first and second main terminals.

said second device is constituted by at least two series-connected unit devices each having first and second main terminals and exhibiting voltage-current characteristics including variable negative differential resistance characteristics for obtaining a peak current changing between said first and second main terminals, and

said signal output terminal is connected to at least one of the contacts between said unit devices constituting said series circuit.

5,773,997

## REFERENCE CIRCUIT FOR SENSE AMPLIFIER

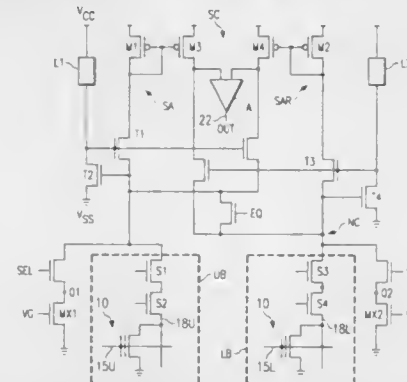
Harvey J. Stiegler, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 308,022, Sep. 16, 1994, abandoned.

This application Oct. 4, 1996, Ser. No. 727,842

Int. Cl.<sup>6</sup> G11C 7/06; H03K 5/24

U.S. Cl. 327—53 8 Claims



1. Reference circuitry for providing a reference signal to either of two inputs of multiple differential amplifiers, said reference circuitry comprising:

at least one reference memory cell in a circuit configured to provide a reference current;

a first mirror circuit having an input and an output, said input of said first mirror circuit coupled to said reference current; and a second mirror circuit having an input and an output, said input of said second mirror circuit coupled to said output of said

first mirror circuit, and said output of said second mirror circuit coupled to a switching means for switchably coupling said output of said second mirror circuit to either of said inputs of at least one of said multiple differential amplifiers.

5,773,998

## SWITCHED CURRENT CIRCUITS

John B. Hughes, Hove, and Kenneth W. Moulding, Horley, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

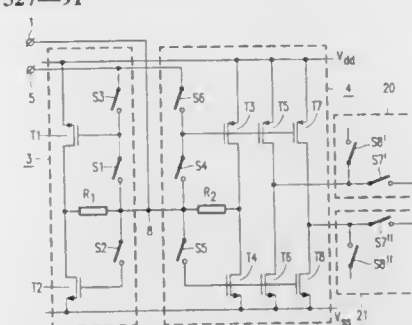
Filed Aug. 27, 1996, Ser. No. 708,160

Claims priority, application United Kingdom, Aug. 31, 1995, 9517790

Int. Cl.<sup>6</sup> G11C 27/02

U.S. Cl. 327—91

8 Claims



1. A circuit arrangement for processing sampled analog currents comprising: an input for receiving said sampled analog currents, first and second current memories each having an input coupled to the input of the circuit arrangement and an output coupled to the input of the other current memory, the second current memory having at least one further output coupled to an output of the circuit arrangement, wherein the first and second current memories each comprise a first, coarse, current memory cell and a second, fine, current memory cell, and a switching arrangement couples the further output to said output of the circuit arrangement, characterized in that a resistor is connected between the input and first output of the second current memory, said resistor having a resistance substantially equal to the 'on' resistance of said switching arrangement multiplied by the scale factor relating to the relative magnitudes of the first and further output currents.

5,773,999

## OUTPUT BUFFER FOR MEMORY CIRCUIT

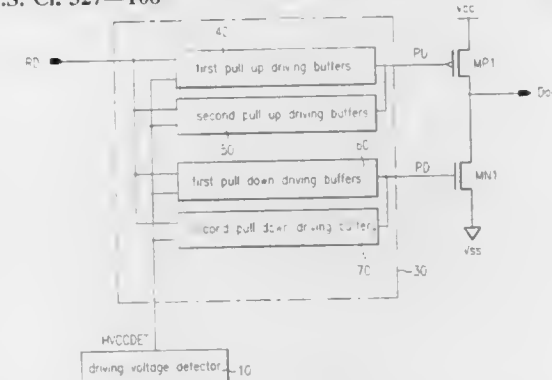
Jong Hoon Park, Kyungki-do, and Tae Hyung Jung, Seoul, both of Rep. of Korea, assignors to LG Semicon Co., Ltd., Chungcheongbuk-Do, Rep. of Korea

Filed Sep. 28, 1995, Ser. No. 534,974

Int. Cl.<sup>6</sup> H03K 3/00; 17/16

U.S. Cl. 327—108

11 Claims



1. An output buffer circuit comprising: a pull-up transistor; a pull-down transistor coupled to the pull-up transistor;

a driving voltage detector for comparing a driving voltage with a reference voltage and producing a signal accordingly;

first and second pull-up driving buffers, the first and second pull-up driving buffers being activated according to the signal from the driving voltage detector, the pull-up transistor being driven by only one of the first and second pull-up driving buffers at any given time; and

first and second pull-down driving buffers, the first and second pull-down driving buffers being activated according to the signal from the driving voltage detector, and the pull-down transistor being driven by only one of the first and second pull-down driving buffers at any given time;

wherein the first pull-up driving buffer comprises p channel transistors and n channel transistors which are connected in series between the driving voltage and a ground voltage, and wherein the p channel and n channel transistors are turned on and off according to the signal produced by the driving voltage detector and an input signal to drive the pull-up transistor.

5,774,000

## DC SEMICONDUCTOR SWITCH

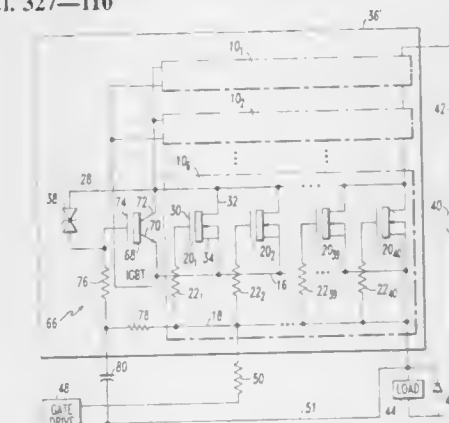
Leonard C. Vercellotti, Pawleys Island, S.C., and Stephen A. Lane, Cockeysville, Md., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

Filed Nov. 8, 1996, Ser. No. 745,981

Int. Cl.<sup>6</sup> H03B 1/00

U.S. Cl. 327—110

20 Claims



1. A semiconductor power type switch coupled between a current source having an inductive type source impedance and a load, comprising:

at least one switch circuit including a plurality of semiconductor devices connected in parallel between the current source and the load and being located on a common support structure; a drive circuit for commonly controlling the conductive and non conductive states of said plurality of semiconductor devices of said switch circuit so as to share load current substantially equally when rendered conductive and thus close the switch; and

an active snubber circuit and a voltage regulator type of device connected in parallel with said plurality of semiconductor devices of said switch circuit for carrying substantially all of the load current when said semiconductor devices are rendered non-conductive and thus open the switch in order to protect said semiconductor devices from a potentially harmful transient current surge due the inductance type source impedance.

**UMI**

1. A flip-flop comprising:
  - a clock input, for receiving a clock input signal;
  - a data input, for receiving data;
  - a flip-flop output;
  - a delay block, coupled to said clock input, providing a delayed clock output signal at a delayed clock output;
  - a NAND gate comprising a first input, a second input, a third input, and a NAND output, wherein said first input is coupled to said clock input, said second input is coupled to said data input, and said third input is coupled to said delayed clock output;
  - a first transistor, coupled between a first supply and said flip-flop output, wherein a gate of said first transistor coupled to said NAND output; and
  - a stack of at least three transistors in series, coupled between said flip-flop output and a second supply, wherein said second supply is at a voltage below said first supply, wherein a second transistor in said stack is coupled to said clock input, a third transistor in said stack is coupled to said NAND output, and a fourth transistor in said stack is coupled to said delayed clock output.



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5,774,006  
CLOCK GENERATOR AND METHOD FOR  
GENERATING A CLOCK SIGNAL

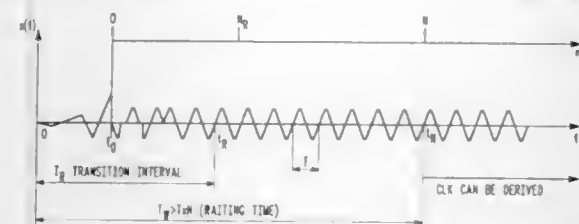
Udi Barel, Rishon Le Zion; Micha Stern, Neve Ilan, Yavne; Ido Reuveny, Rishon Le Zion, and Yoram Yeivin, Hod-Hasharon, all of Israel, assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 24, 1997, Ser. No. 803,788

Int. Cl.<sup>6</sup> H03K 13/02

U.S. Cl. 327—291

18 Claims



1. A clock generator for generating a clock signal comprising:
- a) an oscillator providing an oscillator signal;
  - a) first trigger receiving said oscillator signal, said first trigger having first and second thresholds Y1, Y2 with a first interval  $I1=Y1-Y2$ , said first trigger providing a first trigger signal;
  - a) second trigger receiving said oscillator signal, said second trigger having first and second thresholds Z1, Z2 with a second interval  $I2=Z1-Z2>I1$ , said second trigger providing a second trigger signal;
  - a) detector for determining the number of times n' that said oscillator signal swings to or beyond either of said thresholds Z1, Z2 and generating an enable signal when  $n'>3$ ; and
  - a) control circuit for receiving said enable signal and deriving said clock signal from said first trigger signal.

5,774,007  
CLOCK DISTRIBUTING APPARATUS HAVING V/I AND  
I/V CONVERTERS

Mitsuo Soneda, Kanagawa, Japan, assignor to Sony Corporation, Japan

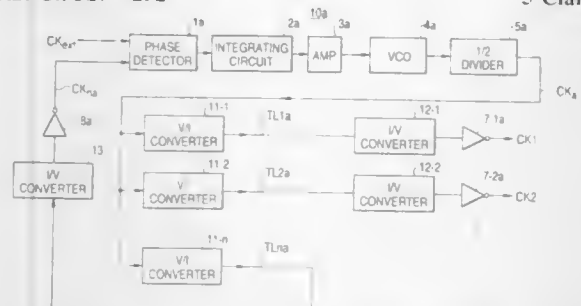
Filed Oct. 16, 1996, Ser. No. 730,933

Claims priority, application Japan, Oct. 17, 1995, 7-268590

Int. Cl.<sup>6</sup> H03L 7/07

U.S. Cl. 327—292

5 Claims



1. A clock distributing apparatus having a plurality of circuit blocks supplied with clock signals and a plurality of clock transmission lines supplying said clock signals to said plurality of circuit blocks, comprising:
- a) a plurality of voltage/current converters which convert the clock signals of a voltage level to current signals and send the current signals to the sending side of the clock transmission lines; and
  - a) a plurality of current/voltage converters which convert the current signals to clock voltage signals at the receiving side of the clock transmission lines.

5,774,008  
COMPUTATIONAL CIRCUIT

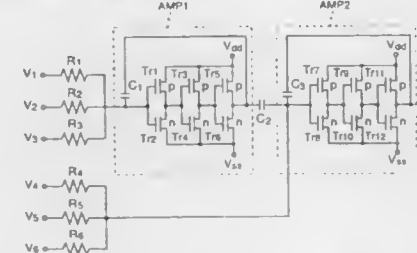
Guoliang Shou; Sunao Takatori, and Makoto Yamamoto, all of Tokyo, Japan, assignors to Yozen Inc, Tokyo, and Sharp Corporation, Osaka, both of Japan

Continuation of Ser. No. 262,059, Jun. 17, 1994, Pat. No. 5,666,080. This application Dec. 13, 1996, Ser. No. 766,875. Claims priority, application Japan, Apr. 1, 1993, 6-087720; Jun. 17, 1993, 5-171041; Jun. 18, 1993, 5-172551; Jun. 18, 1993, 5-172552; Jun. 22, 1993, 5-174713; Jun. 24, 1993, 5-177362; Jun. 30, 1993, 5-187215; Sep. 20, 1993, 5-256355; Sep. 20, 1993, 5-256359; Sep. 20, 1993, 5-256367; Sep. 20, 1993, 5-256518; Sep. 20, 1993, 5-256557; Sep. 20, 1993, 5-256558

Int. Cl.<sup>6</sup> G06G 7/14; 7/42; H03K 17/62

U.S. Cl. 327—361

1 Claim



1. A computational circuit comprising:
- a) first resistance coupling receiving a first plurality of analog input voltages, the first resistance coupling having a plurality of resistors, each of the resistors receiving one of the first plurality of analog input voltages, the first resistance coupling having a common output terminal for outputting therefrom a weighted addition result of the first plurality of analog input voltages;
  - a) first inverting amplifier circuit comprising an odd number of CMOS inverters serially connected from a first stage to a last stage and a feedback capacitance connecting an output of the CMOS inverter of the last stage to an input of the CMOS inverter of the first stage, the input of the CMOS inverter of the first stage operatively connected to the common output of the first resistance coupling;
  - a) second resistance coupling receiving a second plurality of analog input voltages, the second resistance coupling having a plurality of resistors, each of the resistors receiving one of the second plurality of analog input voltages, the second resistance coupling having a common output terminal for outputting therefrom a weighted addition result of the second plurality of analog input voltages;
  - a) second inverting amplifier circuit comprising an odd number of CMOS inverters serially connected from a first stage to a last stage and a feedback capacitance connecting an output of the CMOS inverter of the last stage to an input of the CMOS inverter of the first stage, the input of the CMOS inverter of the first stage operatively connected to the common output of the second resistance coupling; and
  - a) capacitance connected between the output of the CMOS inverter of the last stage of the first inverting amplifier and the input of the CMOS inverter of the first stage of the second inverting amplifier,
- whereby the weighted addition of the second resistance coupling is subtracted from the weighted addition of the first resistance coupling.

5,774,009  
RTC OSCILLATOR AMPLIFIER CIRCUIT WITH  
IMPROVED NOISE IMMUNITY

Jay D. Popper, Jamaica, N.Y., assignor to Standard Microsystems Corporation, Hauppauge, N.Y.

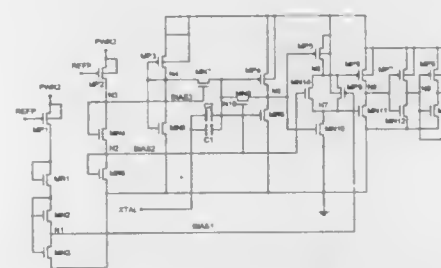
Filed Feb. 14, 1997, Ser. No. 799,253

Int. Cl.<sup>6</sup> H03K 17/16

U.S. Cl. 327—379

1 Claim

1. A clock generator circuit comprising an input for receiving an input signal and an output at which a clock signal is produced



during specified levels of said input signal, said circuit including a first inverter-amplifier coupled to said input, a second inverter-amplifier coupled to said output, and a third amplifier-inverter coupled intermediate said first and second inverter-amplifiers, said third inverter-amplifier including first and second nodes respectively coupled to first and second complementary MOS switching devices in said second inverter-amplifier and means coupled to said first and second nodes for delaying the transition of the signal at one of said first and second nodes with respect to the signal at the other of said first and second nodes in response to said input signal, said delaying means comprising third and fourth complementary MOS switching devices coupled in parallel with one another and in series between said first and second nodes, and means for applying a first and a second bias voltage to the gates of said third and fourth MOS devices, respectively, for biasing said third and fourth MOS devices in the subthreshold region, thereby to establish a relatively high impedance at said third and fourth MOS devices.

5,774,010  
MOS FOUR-QUADRANT MULTIPLIER INCLUDING THE  
VOLTAGE-CONTROLLED-THREE-TRANSISTOR V-I  
CONVERTERS

Katsuji Kimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Continuation of Ser. No. 488,412, Jun. 7, 1995, abandoned.

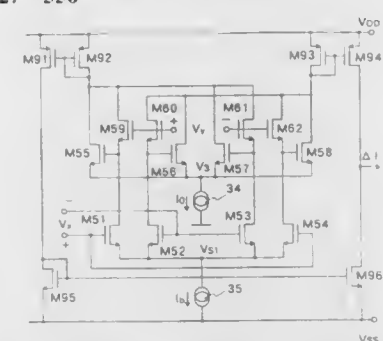
This application Feb. 11, 1997, Ser. No. 798,637

Claims priority, application Japan, Jun. 13, 1994, 6-130469; Jun. 13, 1994, 6-130470; Jun. 13, 1994, 6-130471; Dec. 6, 1994, 6-301991

Int. Cl.<sup>6</sup> G06G 7/16

U.S. Cl. 327—526

6 Claims



1. A MOS four-quadrant multiplier for outputting a combined differential output current corresponding to a product of first and second differential input voltages, comprising:
- a) multiplier core comprising a tail current first and first and second pairs of transistors having sources connected in common to each other and to said tail current source, wherein a first transistor of said first pair and a second transistor of said second pair each have a respective drain directly connected in common at a first node,
  - wherein a second transistor of said second pair and a first transistor of said second pair each have a respective drain directly connected in common at a second node,
  - wherein a first differential output current is defined by a current difference between said first and second nodes; and
  - an input circuit for generating gate input voltages to be applied to gates of said first and second pairs of transistors

said input circuit having third, fourth, fifth and sixth pairs of transistors, wherein said third, fourth, fifth and sixth pairs of transistors are connected such that

- a) a first transistor of said third pair shares a common current path with a first transistor of said fifth pair,
- a) a second transistor of said third pair shares a common current path with a second transistor of said fifth pair,
- a) a first transistor of said fourth pair shares a common drain current with a first transistor of said sixth pair, the drain of said first transistor of said sixth pair being connected with the drain of said second transistor of said fifth pair at a third node,
- a) a second transistor of said fourth pair shares a common drain current with a second transistor of said sixth pair, the drain of said second transistor of said sixth pair, the drain of said second transistor of said sixth pair being connected with said first transistor of said fifth pair at a fourth node;

wherein said third and fourth nodes are not directly connected and a second differential output current is defined by a current difference between said third and fourth nodes, said first and second pairs of transistors including transistors whose drains are each directly connected to a respective drain of a transistor of said fifth pair of transistors and a respective drain of a transistor of said sixth pairs of transistors; and

means providing the combined differential output current, responsive to the first differential output current from said first and second nodes and a second differential output current from said third and fourth nodes.

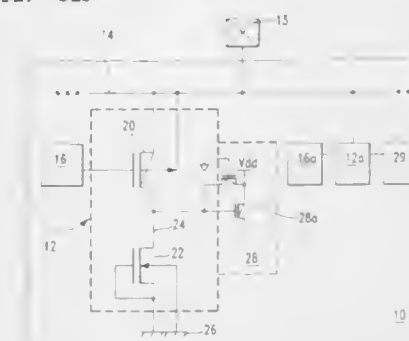
5,774,011  
ANTIFUSE CIRCUIT USING STANDARD MOSFET  
DEVICES

Wai-Ming William Au, Albuquerque, N. Mex.; Edward Joseph Nowak, and Ming Ho Tong, both of Essex, Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 576,026, Dec. 21, 1995, Pat. No. 5,672,994. This application May 28, 1997, Ser. No. 864,254

Int. Cl.<sup>6</sup> H01H 1/37/76

11 Claims



1. An integrated circuit having an antifuse circuit for enabling a discretionary circuit, comprising:
- a) a first node having a programmable high voltage applied thereto;
  - b) a PFET having:
    - a) a gate,
    - a source coupled to the first node, and
    - a drain coupled to a second node and the discretionary circuit;
  - c) a programmable circuit, coupled to the gate of the PFET, for pulling the PFET gate voltage high and low; and
  - d) an NFET having a drain electrode coupled to the second node, the NFET gate having a channel region with a predetermined width and length that is shorted upon application of the programmable high voltage.

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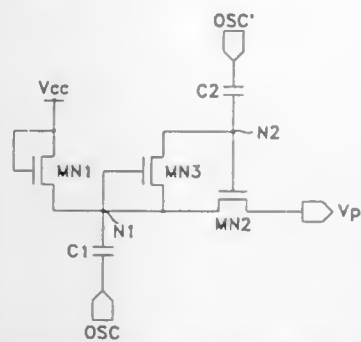
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**5,774,012**  
**CHARGE-PUMPING CIRCUIT FOR SEMICONDUCTOR MEMORY DEVICE**Heung-Soo Im, Seoul, Rep. of Korea, assignor to Samsung Electronics, Co., Ltd., Kyungki-Do, Rep. of Korea  
Filed Sep. 13, 1996, Ser. No. 713,634

Claims priority, application Rep. of Korea, Sep. 14, 1995, 30105/1995

U.S. Cl. 327—536  
Int. Cl.<sup>6</sup> G05F 1/10

9 Claims



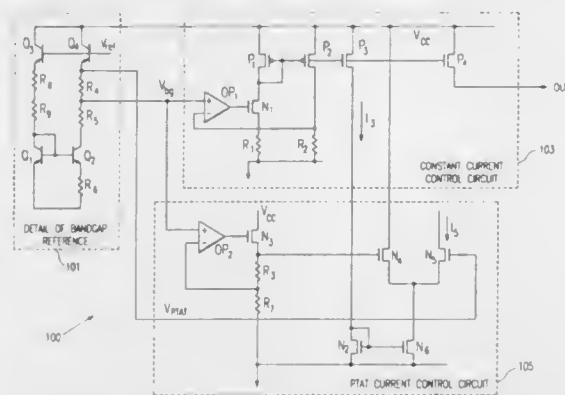
1. A circuit for generating a voltage at an output terminal that is higher than an applied supply voltage, comprising:  
a voltage switching transistor having a conductive path which is interposed between an output terminal and a first capacitive node and having a control electrode;  
a first oscillating signal source for providing a first oscillating signal;  
a first capacitor coupled in series between the first capacitive node and the first oscillating signal source;  
a second oscillating signal source for providing a second oscillating signal having the same period as the first oscillating signal source and having a pulse width less than that of the first oscillating signal source;  
a second capacitor coupled in series between the second oscillating signal source and the control electrode of the switching transistor, wherein said second capacitor has a capacitance which is less than a capacitance of said first capacitor;  
input means for receiving a supply voltage and coupled to the first capacitive node for establishing an initial voltage at said first capacitive node while preventing charge from flowing backward from the said node to the power supply; and  
means coupled to the first capacitive node for establishing an initial voltage at the second capacitor while preventing charge from flowing backward from the second capacitor toward the first capacitive node.

**5,774,013**  
**DUAL SOURCE FOR CONSTANT AND PTAT CURRENT**  
John B. Groe, Poway, Calif., assignor to Rockwell Semiconductor Systems, Inc., Newport Beach, Calif.Filed Nov. 30, 1995, Ser. No. 565,424  
Int. Cl.<sup>6</sup> G05F 1/10

U.S. Cl. 327—543

9 Claims

1. A proportional to absolute temperature (PTAT) current source including:  
(a) a reference voltage circuit having a temperature independent voltage output and a temperature dependent voltage output;  
(b) a temperature independent current source, coupled to the temperature independent voltage output, having a temperature independent current output; and  
(c) a temperature dependent current control circuit including:  
(1) a current mirror having at least two legs, the first leg being coupled to the output from the temperature independent current source, such that each leg of the current mirror carries the same amount of current as is output from the temperature independent current source;  
(2) a differential amplifier coupled to the second leg of the current mirror such that the second leg of the current mirror



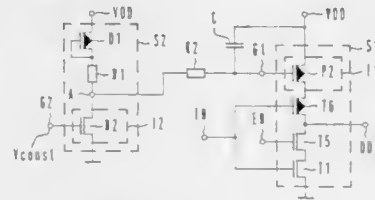
sinks the tail current from the differential amplifier, a first of the differential inputs being coupled to the temperature dependent voltage output and a second of the differential inputs being coupled to the temperature independent voltage output;  
wherein the differential amplifier provides a current sink which is proportional to the temperature dependent voltage output and which is set by the temperature independent voltage output.

**5,774,014**  
**INTEGRATED BUFFER CIRCUIT WHICH FUNCTIONS INDEPENDENTLY OF FLUCTUATIONS ON THE SUPPLY VOLTAGE**

Johannes Stecker, Klaus Luther, both of Munich; Kurt Hoffmann, Taufkirchen, and Oskar Kowarik, Neubiberg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 4, 1996, Ser. No. 627,568  
Claims priority, application European Pat. Off., Apr. 5, 1995, 95105126U.S. Cl. 327—546  
Int. Cl.<sup>6</sup> G05F 1/10

5 Claims



1. An integrated buffer circuit, comprising:  
a first series circuit connected between a first supply potential and a second supply potential, said first series circuit including:  
at least one voltage-controlled first constant current source,  
a first field effect transistor having a gate forming an input of the buffer circuit,  
a circuit node between said at least one voltage-controlled first constant current source and said first field effect transistor, said circuit node forming an output of the buffer circuit,  
a first control input for controlling said at least one voltage-controlled first constant current source with a reference potential having a constant potential difference relative to the first supply potential, and  
said at least one voltage-controlled first constant current source having a second field effect transistor of a first channel type with a gate receiving the first control input; and

a second series circuit connected between the first supply potential and the second supply potential, said second series circuit including:  
at least one first resistor,  
a voltage-controlled second constant current source furnishing a current being independent of the first supply potential,

a circuit node between said first resistor and said second constant current source, said circuit node establishing the reference potential and being connected to said first control input of said at least one voltage-controlled first constant current source,  
a second control input for controlling said voltage-controlled second constant current source being a control voltage,  
a voltage generating circuit for supplying said control voltage independently of said first supply potential, said control voltage having a constant potential difference relative to the second supply potential,  
said second voltage-controlled constant current source having a second field effect transistor of a second channel type with a gate receiving said second control input, and  
said voltage generating circuit including:  
a third field effect transistor of the first channel type and a third field effect transistor of the second channel type, being connected in series between the first supply potential and the second supply potential,  
said fourth field effect transistor of the first channel type having a gate and a drain being connected to one another, said third field effect transistor of the second channel type having a gate and a drain being connected to one another, said third field effect transistor of the first channel type having a gate connected to the gate of said fourth field effect transistor of the first channel type, and  
said fourth field effect transistor of the second channel type having a gate being connected to the gate of said third field effect transistor of the second channel type and to said second control input of said second constant current source.

3. A method of providing audio signals through an amplifier system having a plurality of input terminals and a plurality of amplifier channels, comprising the steps of:  
prioritizing the connection of each of the plurality of input terminals to each of the plurality of amplifier channels;  
controlling the connection of each of the plurality of input terminals to each of the plurality of amplifier channels in accordance with the priority from the previous step, so that for each amplifier channel, the active input terminal with the highest priority is connected to the amplifier channel.

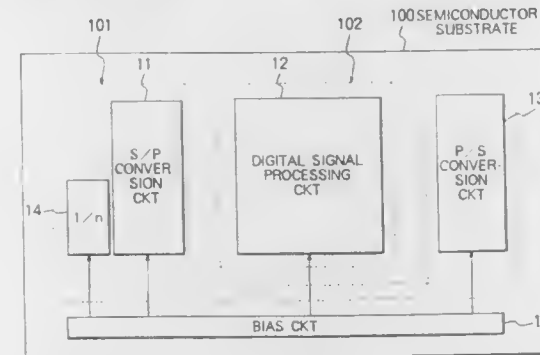
**5,774,015**  
**COMPACT SEMICONDUCTOR INTEGRATED CIRCUIT CAPABLE OF REDUCING ELECTROMAGNETIC EMISSION**

Kouichi Murakami, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 14, 1995, Ser. No. 572,019  
Claims priority, application Japan, Dec. 15, 1994, 6-332919  
Int. Cl.<sup>6</sup> H01L 27/04

U.S. Cl. 327—565

9 Claims



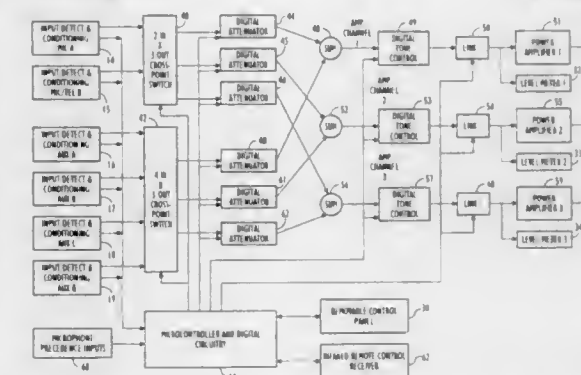
1. A semiconductor integrated circuit comprising:  
a fast operation circuit which is operable at a primary operation speed and which is composed of a semiconductor element operable with a first rising time and a first trailing time;  
a slow operation circuit which is operable at a secondary operation speed smaller than said primary operation speed and

which is composed of a semiconductor element operable with a second rising time and a second trailing time; and  
said second rising time and said second trailing time being longer than said first rising time and said first trailing time.

**5,774,016**  
**AMPLIFIER SYSTEM HAVING PRIORITIZED CONNECTIONS BETWEEN INPUTS AND OUTPUTS**  
Ernest R. Ketterer, Lincoln Park, N.J., assignor to Bogen Corporation, Ramsey, N.J.Filed Apr. 9, 1996, Ser. No. 633,837  
Int. Cl.<sup>6</sup> H03F 3/68

U.S. Cl. 330—51

8 Claims

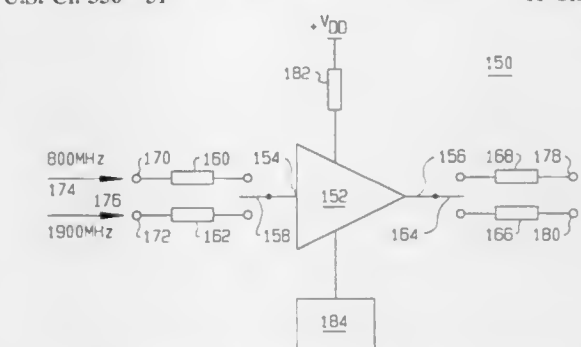


3. A method of providing audio signals through an amplifier system having a plurality of input terminals and a plurality of amplifier channels, comprising the steps of:  
prioritizing the connection of each of the plurality of input terminals to each of the plurality of amplifier channels;  
controlling the connection of each of the plurality of input terminals to each of the plurality of amplifier channels in accordance with the priority from the previous step, so that for each amplifier channel, the active input terminal with the highest priority is connected to the amplifier channel.

**5,774,017**  
**MULTIPLE-BAND AMPLIFIER**  
Aharon Adar, Berkeley Heights, N.J., assignor to Anadigics, Inc., Warren, N.J.Filed Jun. 3, 1996, Ser. No. 664,972  
Int. Cl.<sup>6</sup> H03F 1/14

U.S. Cl. 330—51

11 Claims



1. Amplifying apparatus for amplifying a signal having a frequency of one of a plurality of predetermined frequencies comprising:  
at least one amplifying stage for amplifying such signal;  
input impedance means for providing, in accordance with the frequency of such signal, predetermined input impedance at the frequency of such signal; and  
output impedance means for providing, in accordance with the frequency of such signal, predetermined output impedance at the frequency of such signal, the output impedance means



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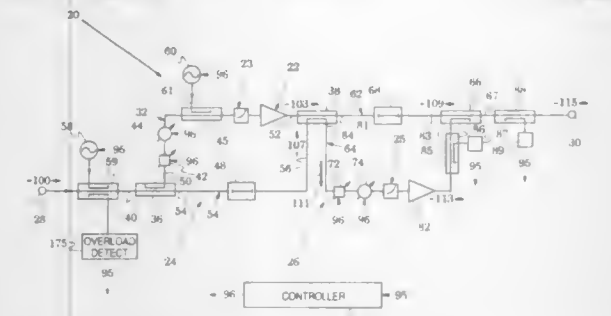
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comprising means for selectively coupling, in accordance with the frequency of such signal, a selected one of a plurality of output impedance networks to the output of the amplifying stage.

**5,774,018**  
**LINEAR AMPLIFIER SYSTEM AND METHOD**  
Paul A. Gianfortune, Redondo Beach, and Thomas M. Straus, Los Angeles, both of Calif., assignors to Hughes Electronics Corporation, Los Angeles, Calif.

Filed Sep. 18, 1996, Ser. No. 715,530  
Int. Cl.<sup>6</sup> H03F 3/66; 1/26  
U.S. Cl. 330—52 19 Claims

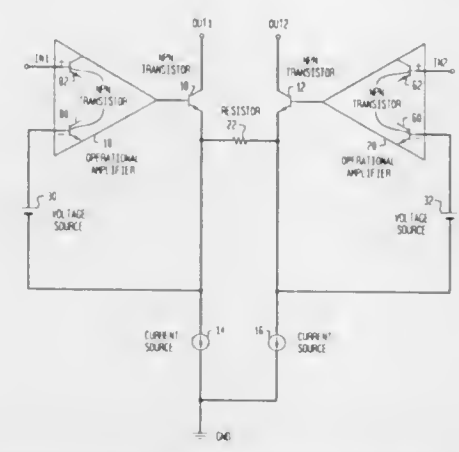


1. A linearized amplifier system, comprising:  
an input port for receiving an input signal;  
a signal amplifier for amplifying said input signal into an amplified signal, said signal amplifier having an input and an output and a signal amplifier transfer characteristic between said input and said output;  
a signal predistorter arranged in series with said signal amplifier to couple said input port with said signal amplifier input, said signal predistorter configured to have a signal predistorter transfer characteristic which provides a signal transfer characteristic for the series combination of said signal predistorter and said signal amplifier that is more linear than said signal amplifier transfer characteristic;  
an output port for receiving said amplified signal;  
a first delay element coupled between said input port and said signal amplifier output;  
a second delay element connecting said signal amplifier output and said output port; and  
an error amplifier arranged in parallel with said second delay element to couple said signal amplifier output with said output port;  
said signal predistorter, said signal amplifier and said first delay element forming an error sensor loop for comparing a sample of said amplified signal with a sample of said input signal to generate an error signal representative of errors in said amplified signal caused by nonlinearities in said signal transfer characteristic; and  
said second delay element and said error amplifier forming an error correction loop for coupling said error signal into said output port for cancellation of at least a portion of said errors.

**5,774,019**  
**LOW DISTORTION DIFFERENTIAL AMPLIFIER CIRCUIT**  
Mikio Koyama, Tokyo, and Hiroyuki Kimura, Kanagawa, both of Japan, assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Apr. 23, 1996, Ser. No. 636,484  
Claims priority, application Japan, Feb. 10, 1995, 7-045047  
Int. Cl.<sup>6</sup> H03F 3/45 4 Claims

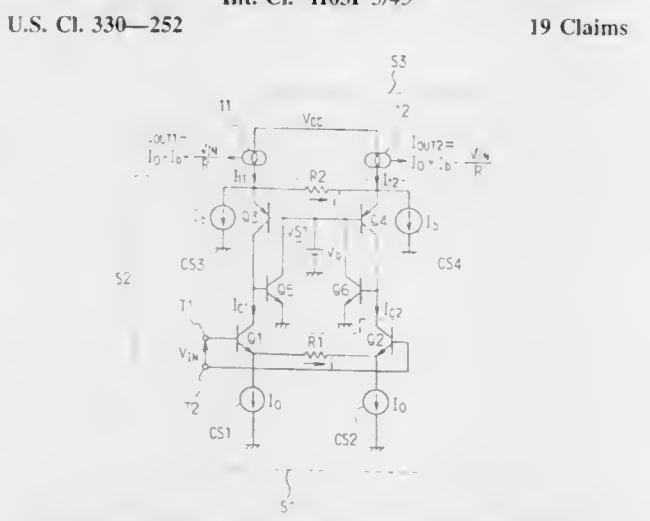
1. A low distortion differential amplifier comprising:  
a pair of bipolar transistors, each transistor having a respective output terminal;



- a pair of current sources, each current source being connected in series between a respective emitter of one of said bipolar transistors and ground;
- a pair of operational amplifiers, each of said operational amplifiers having a positive and a negative input, the output of each operational amplifier being connected to a respective base of one of said bipolar transistors;
- a resistor connected between the emitters of said pair of bipolar transistors;
- a pair of voltage sources, each of said voltage sources coupled between the negative input of one of said pair of operational amplifiers and the emitter of the associated bipolar transistor.

**5,774,020**  
**OPERATIONAL TRANSCONDUCTANCE AMPLIFIER AND MULTIPLIER**  
Katsuji Kimura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 15, 1996, Ser. No. 731,467  
Claims priority, application Japan, Oct. 13, 1995, 7-291955  
Int. Cl.<sup>6</sup> H03F 3/45 19 Claims

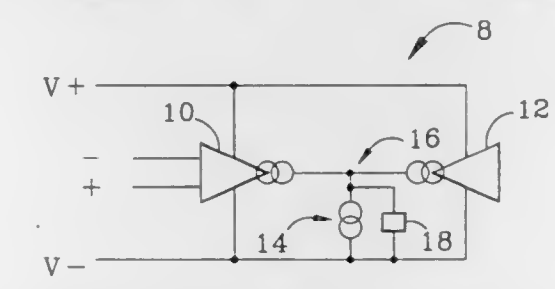


1. An operational transconductance amplifier comprising:  
a first differential pair of first and second transistors respectively driven by first and second current sources or sinks, said first differential pair constituting an input transistor pair;  
a first resistor connected to a first signal terminal of said first transistor and a first signal terminal of said second transistor;  
a differential input signal being applied across a control terminal of said first transistor and a control terminal of said second transistor;  
a first current flowing through said first transistor and a second current flowing through said second transistor;  
a second differential pair of third and fourth transistors, said second differential pair constituting an output transistor pair;

- a second resistor connected to a first signal terminal of said third transistor and a first signal terminal of said fourth transistor;
- a third current flowing through said third transistor and a fourth current flowing through said fourth transistor;
- said third current having a first relationship with said first current to contain a component proportional to said input signal, and said fourth current having a second relationship with said second current to contain a component proportional to said input signal;
- a fifth current flowing through said first resistor in response to said applied differential input signal; and
- a current path connected to said first signal terminals of said third and fourth transistors, thereby allowing a sixth current to flow through said second resistor;
- a bias voltage being applied to a control terminal of said third transistor and a control terminal of said fourth transistor; and
- an output signal being derived from said first signal terminal of said third transistor and said first signal terminal of said fourth transistor.

**5,774,021**  
**MERGED TRANSCONDUCTANCE AMPLIFIER**  
Thomas S. Szepesi, Saratoga; Joseph C. Buxton, Palo Alto; Zoltan Zansky, San Carlos, and Derek F. Bowers, Sunnyvale, all of Calif., assignors to Analog Devices, Inc., Norwood, Mass.

Filed Oct. 3, 1996, Ser. No. 725,557  
Int. Cl.<sup>6</sup> H03F 3/45; H02J 7/00; G05F 3/26  
U.S. Cl. 330—257 24 Claims

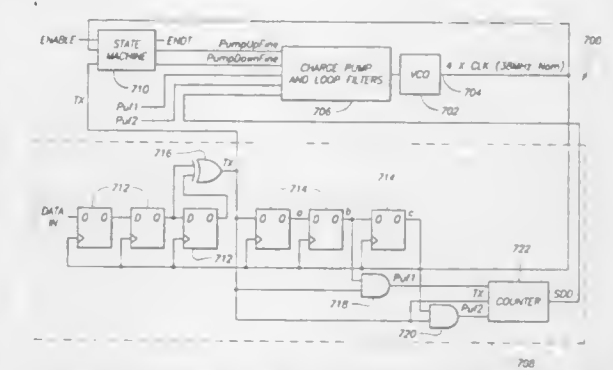


1. Merged amplifiers, comprising:  
a plurality of operational transconductance amplifiers, each having differential inputs and current outputs, the outputs of said amplifiers connected to share an output stage, and  
a current source having a high impedance node coupled to said output stage to thereby be modulated in voltage at said high impedance node by said output stage, thereby producing a voltage output.

**5,774,022**  
**DIGITAL CLOCK RECOVERY LOOP**  
Dan M. Griffin, Bountiful, Utah; George E. Pax, and James E. O'Toole, both of Boise, Id., assignors to Micron Communications, Inc., Boise, Id., and Lockheed Martin Corporation, Bethesda, Md.

Filed Aug. 29, 1996, Ser. No. 707,220  
Int. Cl.<sup>6</sup> H03L 7/089; 7/10 18 Claims

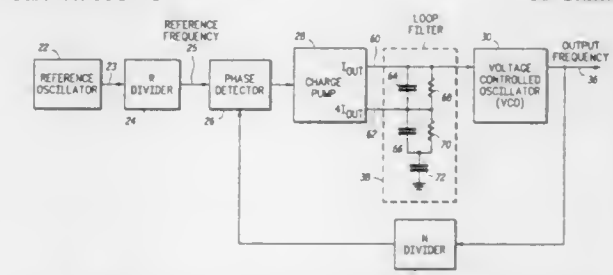
1. A communications system including a clock recovery circuit that extracts a clock signal from incoming digital data, the clock recovery circuit comprising:  
a voltage controlled oscillator having a control node and having an output producing an output wave having a frequency that varies in response to a voltage applied to the control node;  
charge pump and loop filter circuitry that controls the rate of change of the voltage on the control node of the voltage controlled oscillator;



- a start-up circuit that performs frequency discrimination and, in conjunction with the charge pump and loop filter circuitry, adjusts the voltage on the control node of the voltage controlled oscillator; and
- a state machine that performs phase control and adjusts the voltage on the control node of the voltage controlled oscillator.

**5,774,023**  
**ADAPTIVE PHASE LOCKED LOOP SYSTEM WITH CHARGE PUMP HAVING DUAL CURRENT OUTPUT**  
James Stuart Irwin, Paige, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 30, 1997, Ser. No. 846,695  
Int. Cl.<sup>6</sup> H03L 1/02; 7/089; 7/093; 7/18 16 Claims



1. A phase lock loop system receiving a reference frequency signal and generating an output frequency signal comprising:  
a charge pump with a high current output and a low current output, wherein the charge pump will generate an output current on either the high current output or the low current output when the charge pump is active;
- a loop filter responsively coupled to the charge pump and providing a loop filter output coupled to the low current output, said loop filter comprising:  
a first pole filter comprising:  
a low current first pole filter capacitor coupled between the high current output and the low current output,  
a low current first pole damping resistor coupled in parallel to the low current first pole filter capacitor,  
a high current first pole filter capacitor,  
a high current first pole damping resistor coupled in parallel to the high current first pole filter capacitor, and  
a first pole filter capacitor coupled in a series with the high current first pole filter capacitor, wherein:  
the series is coupled between the high current output and a ground;
- a voltage controlled oscillator responsively coupled to the low current output and generating the output frequency signal;
- an N frequency divider responsively coupled to the output frequency signal;
- an R frequency divider responsive to the reference frequency signal; and
- a phase detector responsively coupled to the N frequency divider and the R frequency divider, wherein:  
the charge pump is responsively coupled to the phase detector.

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5,774,024

**MICROWAVE NON-RECIPROCAL CIRCUIT ELEMENT**  
Hiroshi Marusawa; Takehiro Konoike; Kunisaburo Tomono; Takashi Kawanami, and Takashi Hasegawa, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Continuation of Ser. No. 500,888, Aug. 1, 1995, abandoned.

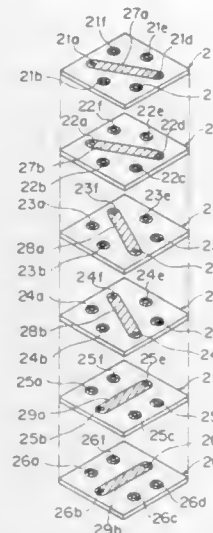
This application Sep. 25, 1996, Ser. No. 755,148

Claims priority, application Japan, Apr. 2, 1993, 5-076977; Apr. 28, 1994, 6-091011

Int. Cl.<sup>6</sup> H01P 1/383

U.S. Cl. 333—1.1

8 Claims



1. A microwave non-reciprocal circuit element comprising:  
a plurality of center electrodes being arranged to intersect with each other in a state being electrically insulated from each other and one end of each being connected to a ground potential; and  
one material selected from the group consisting of a microwave magnetic and a dielectric body on which a plurality of center electrodes are arranged,  
each center electrode being formed by a plurality of conductors being stacked in parallel with and overlapping each other through one of the microwave magnetic and dielectric body wherein the plurality of conductors forming said each center electrode are embedded in the microwave magnetic or dielectric body, the respective center electrodes being successively arranged in the direction of thickness in said microwave magnetic or dielectric body.

5,774,025

**PLANAR PHASE SHIFTERS USING LOW COERCIVE FORCE AND FAST SWITCHING, MULTILAYERABLE FERRITE**

John D. Adam, Murrysville, Pa.; Steven N. Stitzer, Ellicott City, Md.; Carol J. Painter, Library, Pa.; Michael R. Daniel, Monroeville, Pa.; Deborah P. Partlow, Export, Pa., and Andrew J. Piloto, Columbia, Md., assignors to Northrop Grumman Corporation, Los Angeles, Calif.

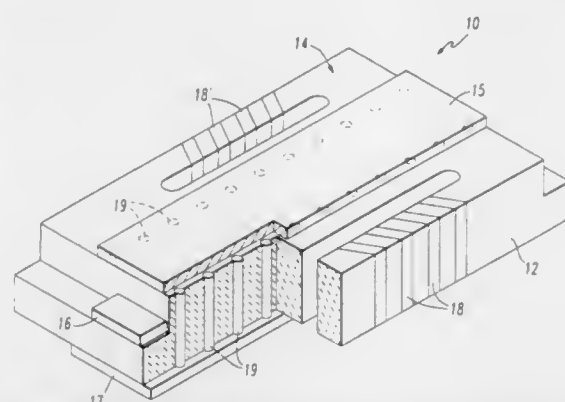
Filed Aug. 7, 1995, Ser. No. 511,927

Int. Cl.<sup>6</sup> H01P 1/215

U.S. Cl. 333—24.1

17 Claims

1. A planar phase shifter comprised of multiple layers of a glass-free magnetic dielectric wherein selected layers of said magnetic dielectric collectively have a phase shifter conductor pattern



provided thereon, said magnetic dielectric being sinterable at a temperature below the melting temperature of said conductor and wherein the multiple layers of magnetic dielectric and conductor are cofired.

5,774,026

**HIGH FREQUENCY IMPEDANCE TRANSFORMER**

Bernard Cunin, Strasbourg; Paul Geist, Schiltigheim; Alphonse Martz, Kilstett, and Joseph-Albert Mieh, Strasbourg, all of France, assignors to Communauté Européenne, Luxembourg, Luxembourg

PCT No. PCT/FR95/00836, § 371 Date Jan. 7, 1997, § 102(e) Date Jan. 7, 1997, PCT Pub. No. WO96/02073, PCT Pub. Date Jan. 25, 1996

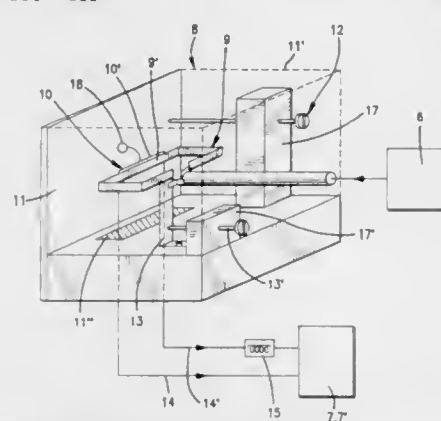
PCT Filed Jun. 22, 1995, Ser. No. 765,183

Claims priority, application France, Jul. 7, 1994, 94 08598

Int. Cl.<sup>6</sup> H01P 5/04

U.S. Cl. 333—111

10 Claims



1. A coupling and matching circuit for the transmission of high frequency and hyperfrequency signals, the circuit connecting a relatively low output impedance device with a relatively high input impedance device, the circuit comprising:

primary and secondary line sections (9, 10) having portions (9', 10') disposed in parallel and weakly coupled with each other; a ground plane (11) disposed parallel to the secondary line section (10) and adapted to form a portion of a shielding envelope (11') surrounding the coupling and matching circuit; means (12) for relative displacement of the secondary line section (10) with respect to the ground plane (11), the primary line section (9), forming a short circuit, being connected to the relatively low output impedance device and the secondary line section (10) being connected to the relatively high input impedance device and having a midpoint connected to said around plane.

5,774,027

**BAND-PASS FILTER WITH TRAP CIRCUITS HAVING DIFFERENT Q FACTORS**

Ryuji Yamamoto, Daitou, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

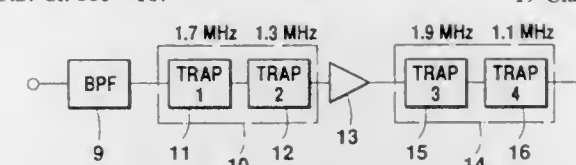
Filed Aug. 22, 1996, Ser. No. 701,462

Claims priority, application Japan, Aug. 25, 1995, 7-217789; Aug. 25, 1995, 7-217790

Int. Cl.<sup>6</sup> H03H 7/01

U.S. Cl. 333—167

19 Claims



1. A band-pass filter device to which a signal belonging to a predetermined passing frequency band and a signal belonging to a frequency band other than the passing frequency band are supplied as an input signal, and which selectively permits a portion of the input signal which belongs to the passing frequency band to pass, comprising:

a BPF having a characteristic permitting all frequency components in a frequency band, to which a signal to be passed belongs, to sufficiently pass;  
a first trap circuit having a Q factor sufficiently higher than that of the BPF, and used for attenuating a signal belonging to a frequency band higher than the passing frequency band;  
a second trap circuit having a Q factor sufficiently higher than that of the BPF, and used for attenuating a signal belonging to a frequency band lower than the passing frequency band;  
a third trap circuit having a Q factor lower than that of the first trap circuit, and used for attenuating an unnecessary component generated in the first trap circuit; and  
a fourth trap circuit having a Q factor lower than that of the second trap circuit, and used for attenuating an unnecessary component generated in the second trap circuit.

5,774,028

**SURFACE MOUNT LINE FILTER WITH SOLDER GAS DISCHARGE PATHS IN THE CORE**

Chang Sik Kim, Kyongki-do, Rep. of Korea, assignor to Samsung Electro-Mechanics, Kyongki-do, Rep. of Korea

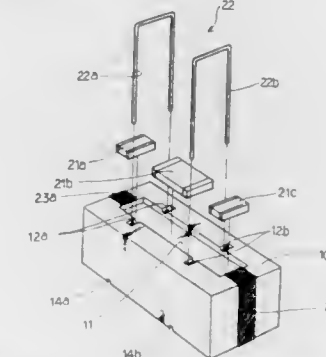
Filed Jun. 3, 1996, Ser. No. 657,260

Claims priority, application Rep. of Korea, Jun. 7, 1995, 1995-14961

Int. Cl.<sup>6</sup> H03H 7/09

U.S. Cl. 333—181

9 Claims



1. A line filter for a surface mounting device, comprising:  
a ferrite core having a top side and a bottom side and having a capacitor mounting portion formed in a top surface thereof, and having a plurality of pairs of lead wire openings extending through from said top side to said bottom side, said ferrite core having a plurality of gas discharge paths extending from a surface of said ferrite core to each of said pairs of openings;

a multiplicity of capacitor elements each mounted in said mounting portion of the ferrite core and each spaced a distance apart;

pairs of lead wires each having a pair of legs and a connecting portion connecting said pair of legs said pair of legs extending through a corresponding said pair of openings in said ferrite core, each of said connecting portions being mounted between two of said multiplicity of capacitor elements;  
a soldering portion fixing the capacitors and the pairs of lead wires; and  
an epoxy coating portion coating a surface of said soldering portion.

5,774,029

Patent Not Issued For This Number

5,774,030

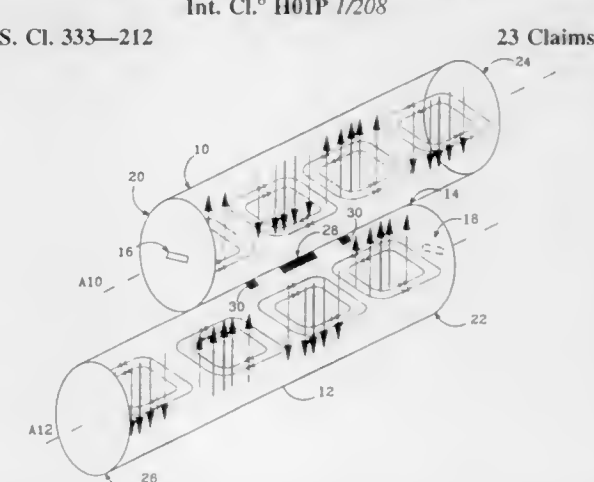
**PARALLEL AXIS CYLINDRICAL MICROWAVE FILTER**  
Devon J. Gray, Torrance, Calif., assignor to Hughes Electronics Corporation, Los Angeles, Calif.

Filed Mar. 31, 1997, Ser. No. 829,634

Int. Cl.<sup>6</sup> H01P 1/208

U.S. Cl. 333—212

23 Claims



1. A cylindrical multi-cavity microwave filter comprising:  
a first right-cylindrical resonator for supporting primary and secondary TE<sub>11X</sub> mode electromagnetic resonances, where X is an integer greater than or equal to 3, said resonator having endwalls at either end and an input aperture formed in one end wall;  
a second right-cylindrical resonator for supporting primary and secondary TE<sub>11X</sub> mode electromagnetic resonances, said second resonator having endwalls at either end and an output aperture formed one endwall, said resonators formed such that they are non-coaxial, their longitudinal axes are parallel and they share a common wall along the longitudinal direction;  
a mainline aperture formed in said shared wall to couple energy from the magnetic field of a secondary resonance mode of the first resonator to the magnetic field of a primary resonance mode of the second resonator, and  
at least one bridge aperture formed in said shared wall to couple energy between the magnetic field of the secondary resonance mode of the second resonator and the magnetic field of the primary resonance mode of the first resonator.



5,774,031

LOW-VOLTAGE POWER SWITCH WITH RELATIVE  
AUXILIARY SWITCH

Uwe Linzenich, Simmerath; Andreas Baldewein; Bernd Howald, both of Bonn, and Volker Helms, Meckenheim, all of Germany, assignors to Klöckner-Moeller GmbH, Bonn, Germany

PCT No. PCT/DE95/00032, § 371 Date Aug. 8, 1996, § 102(e) Date Aug. 8, 1996, PCT Pub. No. WO95/22161, PCT Pub. Date Aug. 17, 1995

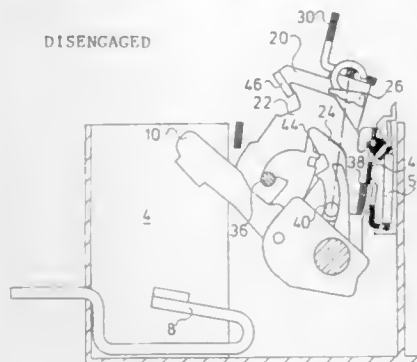
PCT Filed Jan. 13, 1995, Ser. No. 687,581

Claims priority, application Germany, Feb. 9, 1994, 44 04 073.3

Int. Cl.<sup>6</sup> H01N 9/00

U.S. Cl. 335—172

20 Claims



1. Low voltage power breaker with relative auxiliary control switch, comprising a molded housing, in or on which the relative auxiliary control switch is mounted or attached, interacting stationary and moving contacts for each pole, as well as an actuating shaft which carries the moving contacts, said low voltage power breaker comprising:

a breaker mechanism which on one hand comprises a rocker arm or similar actuation means, and on the other hand is linked during opening and closing with the moving contacts, the breaker mechanism comprises a latching mechanism with a trip lever being engagable with a latch spring and can be tripped by tripping means, whereby the opening angle of the moving contacts and of the actuating shaft in the tripped state is greater than in the de-energized state;

a roller lever mounted in the molded housing, which is linked to a pre-loaded actuating tappet of the relative auxiliary control switch; and

a radial extension which is located on the actuating shaft, so that this extension applies pressure to the pivoting lever exclusively in the tripped state.

5,774,032

COOLING ARRANGEMENT FOR A  
SUPERCONDUCTING COIL

Kenneth Gordon Herd, Niskayuna, and Evangelos Trifon Laskaris, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 23, 1996, Ser. No. 702,879

Int. Cl.<sup>6</sup> H02K 55/00; 9/00; H01F 7/00

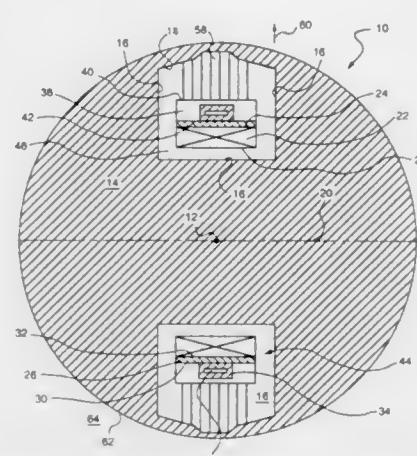
U.S. Cl. 335—216

11 Claims

1. A superconducting device comprising:

a) a vacuum enclosure having an interior wall surrounding a generally-annular cavity, wherein said cavity has a generally longitudinal axis, and wherein said cavity contains a vacuum having a pressure not exceeding generally one-thousandth of a torr;

b) a superconductive coil disposed within said cavity, generally coaxially aligned with said longitudinal axis, generally spaced-apart from said interior wall, having a circumferential outward-facing surface, and having a circumferential inward-facing surface;



c) a generally-annularly-arranged sheet of thermally conductive material having a coefficient of thermal conductivity at least equal to that of copper at a temperature of generally 50 Kelvin, disposed within said cavity, generally coaxially aligned with said longitudinal axis, generally spaced-apart from said interior wall, having a circumferential outward-facing surface, and having a circumferential inward-facing surface, wherein the inward-facing surface of said sheet contacts generally the entire outward-facing surface of said superconductive coil;

d) a generally-annularly-arranged coolant tube containing a cryogenic fluid having a cryogenic temperature, disposed within said cavity, generally coaxially aligned with said longitudinal axis, and generally spaced-apart from said interior wall, wherein said coolant tube contacts a generally-circumferential portion of the outward-facing surface of said sheet; and

e) a generally-annularly-arranged coil overwrap of thermally insulative material having a coefficient of thermal conductivity no greater than that of fiberglass at a temperature of generally 50 Kelvin, disposed within said cavity, generally coaxially aligned with said longitudinal axis, generally spaced-apart from said interior wall, having a circumferential outward-facing surface, and having a circumferential inward-facing surface, wherein said coil overwrap generally circumferentially surrounds the outward-facing surface of said sheet, wherein said coolant tube and the inward-facing surface of said coil overwrap together contact generally the entire outward-facing surface of said sheet, and wherein said superconductive coil, said sheet, and said coil overwrap are disposed completely outside said coolant tube.

5,774,033

SOLENOID APPARATUS HAVING A PLUNGER WITH AN  
INTERNAL PASSAGE AND A VACUUM SOURCE FOR  
GENERATING NEGATIVE PRESSURE

Nicholas Antonelli, Harrison, N.Y., assignor to Pitney Bowes Inc., Stamford, Conn.

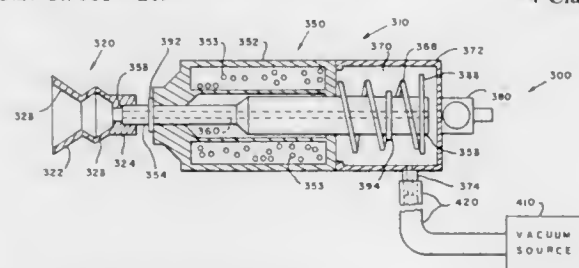
Division of Ser. No. 498,007, Jul. 3, 1995, Pat. No. 5,581,972.

This application Aug. 29, 1996, Ser. No. 705,506

Int. Cl.<sup>6</sup> H01F 1/00

U.S. Cl. 335—219

4 Claims



1. A solenoid apparatus comprising:  
a substantially cylindrical casing.

5,774,035

## CURRENT TRANSFORMER FOR LOAD SWITCH

Seok Won Lee, Chungcheongbuk-do, Rep. of Korea, assignor to LG Industrial Systems Co., Ltd., Seoul, Rep. of Korea

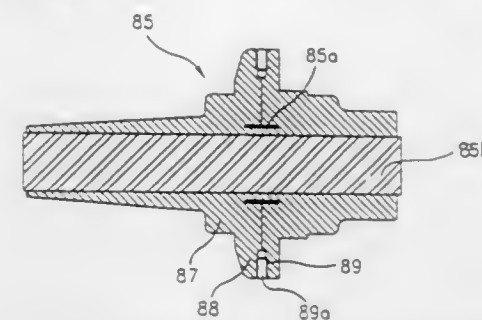
Filed Jun. 26, 1997, Ser. No. 883,430

Claims priority, application Rep. of Korea, Jun. 27, 1996, 1996-17930

Int. Cl.<sup>6</sup> H01F 38/20; 27/28, H02G 15/28; H01B 17/26

U.S. Cl. 336—173

4 Claims



1. A current transformer assembly for detecting the current in an alternating current electrical transmission cable for a load switch having a switching mechanism, comprising:

a bushing including a base unit having a conductive socket electrically connected to a conductive plate for detecting a cable voltage, a jaw unit having a smaller outer diameter than the base unit, and a cone shaped unit extending from the jaw unit and having a smaller outer diameter than the jaw unit; and

a current transformer including a ring shaped core, a coil winding the core, a rubber coating member having a lower coating part for tightly covering the base unit of the bushing and an upper coating part for tightly covering the jaw unit of the bushing as well as the coil and the core, and coil terminals connected with respective ends of the coil.

5,774,034

## MAGNET ASSEMBLY IN MRI INSTRUMENT

Yuhito Yoneda; Koji Miyata; Ken Ohashi, and Dai Higuchi, all of Fukui-ken, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1996, Ser. No. 706,349

Claims priority, application Japan, Sep. 19, 1995, 7-239530

Int. Cl.<sup>6</sup> G01V 3/00

U.S. Cl. 335—301

3 Claims



1. A magnet field control assembly for use in a magnetic resonance imaging instrument, comprising:

first and second permanent magnets disposed opposite one another to form therebetween a magnetic gap space;

a first pole piece mounted on said first permanent magnet;

a first magnetic modulating coil mounted on said first pole piece;

a first magnetic field compensation member mounted on said first magnetic modulating coil, having a thickness in a range from 0.005 mm to 0.5 mm and formed of a magnetically soft ferromagnetic material;

a second pole piece mounted on said second permanent magnet;

a second magnetic modulating coil mounted on said second pole piece;

a second magnetic field compensation member mounted on said second magnetic modulating coil, having a thickness in a range from 0.005 mm to 0.5 mm and formed of a magnetically soft ferromagnetic material;

said first magnetic modulating coil being located between said first magnetic field compensation member and said first pole piece;

said second magnetic modulating coil being located between said second magnetic field compensation member and said second pole piece;

wherein said first and second permanent magnets are operative to generate a static magnetic field in said magnetic gap space; wherein said magnetic modulating coils are operative to generate a gradient magnetic field relative to the static magnetic field; and

wherein said magnetic field compensation members are operative to counteract a residual magnetization of said pole pieces.

5,774,036

BOBBIN-MOUNTED SOLENOID COIL AND METHOD OF  
MAKING

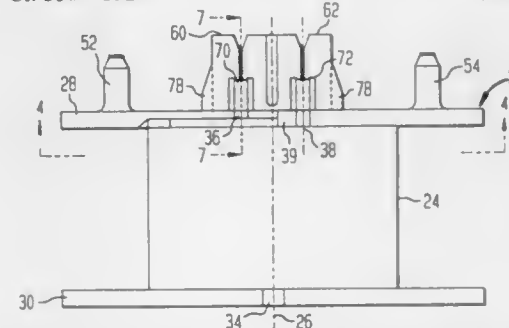
Bernard J. Hrytzak, and Victor Derbowka, both of Chatham, Canada, assignors to Siemens Electric Limited, Ontario, Canada

Filed Jun. 30, 1995, Ser. No. 497,679

Int. Cl.<sup>6</sup> H01F 27/29; 27/30

U.S. Cl. 336—192

32 Claims



10. An electromagnetic device comprising a length of insulated electric wire, and structure on which an intermediate segment of the length of wire is disposed as electromagnetic coil that terminates in end segments of the length of wire, the structure comprising a wall defining a socket having an open axial end for accepting an electric terminal that is to make electric contact with one of the end segments of the wire, wire guides mutually aligned across the socket for locating the one end segment of the wire to transversely span the socket, and a wire securement which is disposed on the structure in spaced relation to the socket wall and to which the one wire end segment is secured, wherein the one wire end segment

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extends along a straight line in tension across the socket and continues along a straight line in tension from a wire guide to the wire securement.

5,774,037

**CIRCUIT PROTECTOR AND METHOD FOR MAKING A CIRCUIT PROTECTOR**

Leon Gurevich, Grover, Mo., assignor to Cooper Industries, Inc., Houston, Tex.

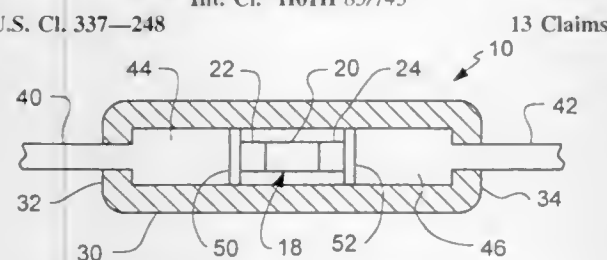
Continuation of Ser. No. 227,399, Apr. 13, 1994, abandoned.

This application Oct. 7, 1996, Ser. No. 726,606

Int. Cl.<sup>6</sup> H01H 85/143

U.S. Cl. 337—248

13 Claims



1. A subminiature circuit protector comprising:
- a substrate carrying a metal film fuse element and having electrical contacts at opposing end portions;
  - a lead at each end portion of the substrate electrically disposed in contact with the electrical contacts;
  - a glass sleeve enclosing the substrate and at least the end portion of each lead electrically connected with the electrical contacts, wherein ends of the glass sleeve are sealed to the leads by heating the assembly to a temperature sufficient to soften the glass sleeve and providing a pressure sufficient to cause the ends of the softened glass sleeve to form a seal around the leads, wherein the glass sleeve retains the leads in contact with the electrical contacts and the glass sleeve is collapsed on the surface of the substrate to cover closely the fuse element.

5,774,038

**SAFETY MONITOR**

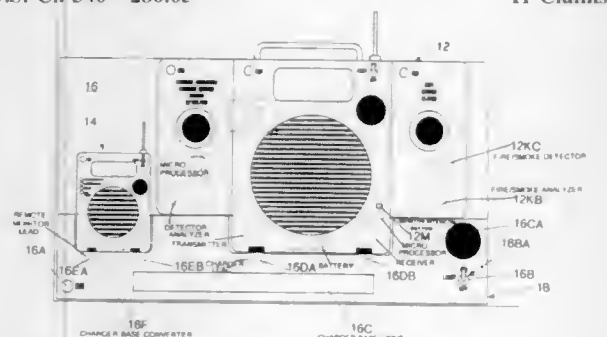
Dana L. Welch; Mark A. Welch, and Shirley A. McCoy, all of 4600 Maple Ridge Rd., Sterling, Mich. 48659

Filed Jul. 1, 1996, Ser. No. 674,257

Int. Cl.<sup>6</sup> G08B 23/00

U.S. Cl. 340—286.05

11 Claims



1. An improved safety monitor (10) comprising:
- A) a main monitor (12) which comprises:
- 1) a main monitor microprocessor (12F) electronically connected to a power means, a main monitor indicator light (12A) is electronically connected to the main monitor microprocessor (12F), a main monitor switch (12B) having main monitor switch indicia (12BA) is electronically connected between the main monitor microprocessor (12F) and the main power means comprising monitor battery (12I), a main monitor light (12C) is electronically connected to the main monitor microprocessor (12F), a main monitor light photocell (12CA) is electronically connected to the main

monitor microprocessor (12F), a main monitor antenna (12D) is electronically connected to the main monitor microprocessor (12F), a main monitor speaker/microphone (12E) is electronically connected to the main monitor microprocessor (12F), a main monitor transmitter (12G) is electronically connected to the main monitor microprocessor (12F), a main monitor receiver (12H) is electronically connected to the main monitor microprocessor (12F), a main monitor detector (12J) is electronically connected to the main monitor microprocessor (12F), a main monitor fire/smoke alarm (12K) is electronically connected to the main monitor microprocessor (12F), a main monitor intercom button (12M) is electronically connected to the main monitor microprocessor (12F); and

B) a remote monitor (14) which is in communication with the main monitor (12), the remote monitor (14) comprises:

- 1) a remote monitor microprocessor (14F) electronically connected to a power means, a remote monitor indicator light (14A) is electronically connected to the remote monitor microprocessor (14F), a remote monitor switch (14B) having remote monitor switch indicia (14BA) is electronically connected between the remote monitor microprocessor (14F) and the power means, a remote monitor light (14C) having a remote monitor light photocell (14CA) is electronically connected to the remote monitor microprocessor (14F), a remote monitor antenna (14D) is electronically connected to the remote monitor microprocessor (14F), a voice activated remote monitor speaker/microphone (14E) is electronically connected to the remote monitor microprocessor (14F), a remote monitor transmitter (14G) is electronically connected to the remote monitor microprocessor (14F), a remote monitor receiver (14H) is electronically connected to the remote monitor microprocessor (14F), a remote monitor detector indicator (14J) is selected from a group consisting of a remote monitor carbon monoxide detector indicator (14JA), a remote monitor radon detector indicator (14JC), and a remote monitor fire/smoke detector indicator (14JD), a remote monitor intercom button (14K) is electronically connected to the remote monitor microprocessor (14F), a remote user can override the voice activated remote monitor speaker/microphone (14E) by depressing the remote monitor intercom button (14K) and speaking a remote user message into the remote monitor speaker/microphone (14E) which sends an electronic signal to the remote monitor microprocessor (14F) which sends an electronic signal to the remote monitor transmitter (14G) which sends a radio signal via the remote monitor antenna (14D) which is received by the main monitor antenna (12D) which sends the radio signal to the main monitor receiver (12H) which sends an electronic signal to the main monitor microprocessor (12F) which sends an electronic signal to the main monitor speaker/microphone (12E) from which a main user can hear the remote user message, a main user can depress the main monitor intercom button (12M) and speak a main user message into the main monitor speaker/microphone (12E) which sends an electronic signal to the main monitor microprocessor (12F) which sends an electronic signal to the main monitor transmitter (12G) which sends a radio signal via the main monitor antenna (12D) which is received by the remote monitor antenna (14D) which sends the radio signal to the remote monitor receiver (14H) which sends an electronic signal to the remote monitor microprocessor (14F) which sends an electronic signal to the remote monitor speaker/microphone (14E) from which a remote user can hear the main user message, in an event that a main monitor detector (12J) senses an adverse substance, the main monitor detector (12J) sends an electronic signal to the main monitor microprocessor (12P) which sends an electronic signal to the main monitor transmitter (12G) which concurrently sends an alarm sound to the main monitor speaker/microphone (12E) and sends a radio signal via the main monitor antenna (12D) which is

received by the remote monitor antenna (14D) which sends the radio signal to the remote monitor receiver (14H) which sends an electronic signal to the remote monitor microprocessor (14F) which sends an electronic signal to the remote monitor speaker/microphone (14E) from which a remote user can hear an alarm sound through the remote monitor speaker/microphone (14E).

5,774,039

**PROGRAMMABLE DOORBELL CONTROL**

Todd B. Housley, 7605 Mabray Dr., Plano, Tex. 75025

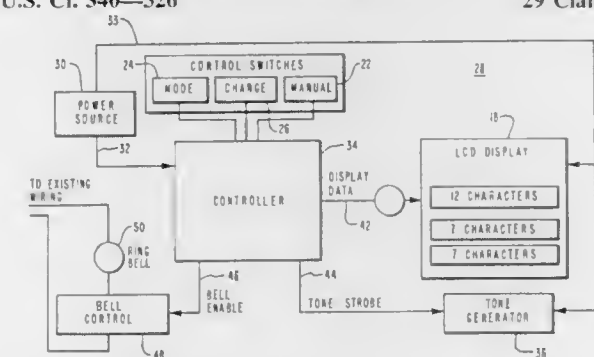
Continuation-in-part of Ser. No. 62,615, May 11, 1993, abandoned, which is a continuation of Ser. No. 735,096, Jul. 23, 1991, Pat. No. 5,210,520, which is a continuation of Ser. No. 408,613, Sep. 18, 1989, abandoned, which is a continuation-in-part of Ser. No. 73,456, Jul. 15, 1987, Pat. No. 4,868,540.

This application Apr. 22, 1994, Ser. No. 231,615

Int. Cl.<sup>6</sup> G08B 27/00

U.S. Cl. 340—326

29 Claims



1. A programmable doorbell system for controlling a doorbell which is connected to, and activated by a doorbell actuation means, said system comprising:

- means for communicating a message comprising a display means and audio record and playback circuitry;
- means for generating time-of-day signals;
- means responsive to a first one of said time-of-day signals for disconnecting said doorbell from said doorbell actuation means and for enabling said communication means to communicate said message; and
- means responsive to a second one of said time-of-day signals for connecting said doorbell to said doorbell actuation means and for disabling said communication means.

5,774,040

**FIRE SOUND SIMULATOR**

Dominic H. Lastoria, 13652 108th Avenue, Surrey, Canada, V3T 2K5

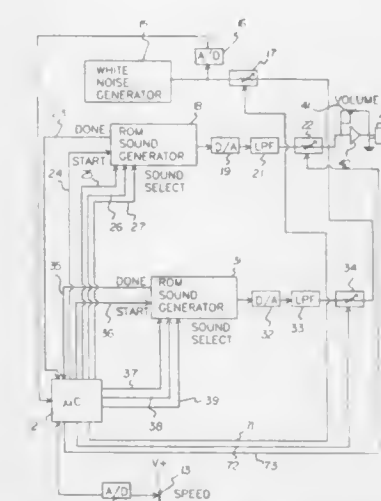
Filed Aug. 11, 1997, Ser. No. 909,188

Int. Cl.<sup>6</sup> G08B 3/10

U.S. Cl. 340—384.3

9 Claims

1. A Fire Sound Simulator powered by a direct current power source comprising:
- a white noise generator for generating a white noise signal representative of a hissing sound;
  - a means for generating a popping signal representative of a popping sound;
  - a means for generating a crackling signal representative of a crackling sound;
  - a microcontroller operably coupled to the means for generating the popping signal and the means for generating the crackling signal, the microcontroller generating a first start signal for activating the means for generating the popping signal and a second start signal for activating the means for generating the crackling signal;



a mixing means for mixing the white noise signal, the popping signal and the crackling signal, and for generating an amplifier input signal, the mixing means being operably coupled to the microcontroller;

an audio amplifier for amplifying the amplifier input signal and for generating an amplifier output signal; and

a sound speaker connected to receive the amplifier output signal.

5,774,041

**DESIGNER CHIME COVER**

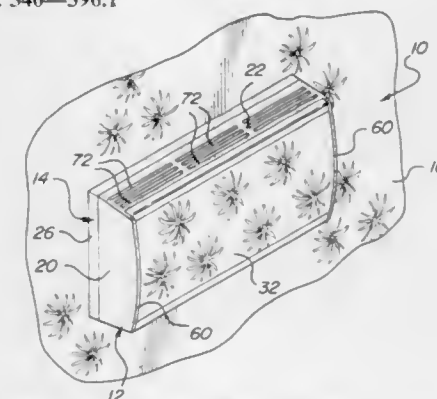
Thomas Xydis, Ann Arbor; Bob Demick, Eastpoint; Robert Clarke, Madison Heights, and Paul Angott, Bloomfield Hills, all of Mich., assignors to Dimango Products Corporation, Brighton, Mich.

Filed Jul. 18, 1996, Ser. No. 684,291

Int. Cl.<sup>6</sup> G08B 3/00

U.S. Cl. 340—396.1

33 Claims



1. A chime cover assembly (10) comprising:
- a box-like housing for supporting the electrical components of a door chime;
  - said housing having an integral plastic cover (12) presenting a front wall (18) with a periphery and an independent integral plastic base (14) for mounting to a wall (16), said cover (12) having integral end walls (20) and top (22) and bottom (24) walls extending between said end walls (20) to define an open periphery about said walls (20, 22, 24), said walls (20, 22, 24) extending about said periphery of said front wall (18) and filling the area between said walls (20, 22, 24), said base (14) extending over said open periphery about said end walls (20) and said top (20) and bottom walls (22);
  - said assembly characterized by a decorative plate (30) for being covered (32) and disposed over the exterior of said front wall (18) to cover said front wall (18) and to present a decorative appearance overlying said front wall (18).



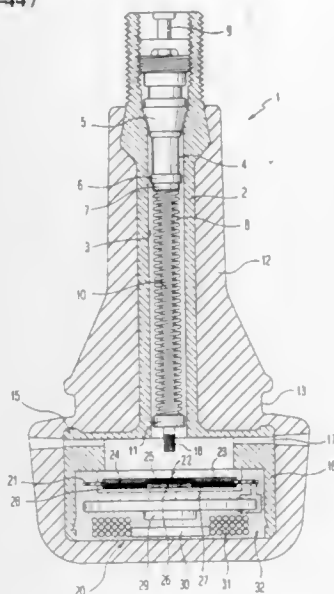


5,774,048

VALVE HAVING MEANS FOR GENERATING A WIRELESS TRANSMITTABLE INDICATING SIGNAL IN CASE OF A PRESSURE DROP WITHIN VEHICLE TIRES  
Rainer Achterholt, Durach/Weidach, Germany, assignor to Alpha-Beta Electronics AG, Ellighausen, Switzerland  
PCT No. PCT/EP94/00341, § 371 Date Dec. 19, 1994, § 102(e) Date Dec. 19, 1994, PCT Pub. No. WO94/18018, PCT Pub. Date Aug. 18, 1994

PCT Filed Feb. 7, 1994, Ser. No. 307,776  
Claims priority, application Germany, Feb. 8, 1993, 43 03 583.3

Int. Cl. B60C 23/00  
U.S. Cl. 340—447



15 Claims

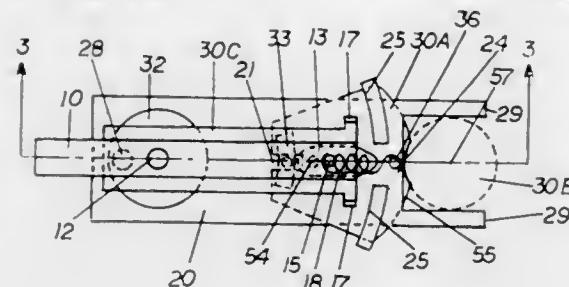
1. A valve having signal generating means for generating a wireless transmittable indicating signal in response to a pressure drop within a vehicle tire, wherein the valve comprises a valve spud and a valve stem extending from said valve spud which provides a valve means which opens and closes during pressurization of said tire, said signal generating means mounted adjacent said valve spud comprising at least:

an absolute-pressure sensor being coupled to the pressure within the tire and generating an electric pressure signal in accordance with the pressure within the tire;  
an electronic storage means;  
a transmitter means for telemetric transmission of an indicating signal in case of a pressure drop;  
a microprocessor including an arithmetic-logic unit; and  
an activating means coupled to said valve means for enabling the absolute-pressure sensor to generate an electric pressure signal corresponding to the actually prevailing tire pressure in response to operation of said valve means;  
said electric pressure signal being stored into the electronic storage means after each operation of said valve means and is available as a reference pressure signal;  
and wherein the arithmetic-logic unit:  
compares an electric pressure signal generated by said absolute-pressure means with said stored reference pressure signal and generates a compare signal;  
refers said compare signal to a given threshold value; and  
activates said transmitter means at least then, whenever a given ratio between the threshold value and the compare signal is outside upper and lower limits.

5,774,049

VEHICLE TURN SIGNAL MECHANISM  
Louis W. Schreiner, 2067 W. 29th Ave., Eugene, Oreg. 97405  
Continuation-in-part of Ser. No. 291,278, Aug. 16, 1994, abandoned. This application Aug. 11, 1995, Ser. No. 514,309  
Int. Cl. B60Q 1/40  
U.S. Cl. 340—476

12 Claims



1. A vehicle turn signal mechanism for automatically returning a turn lever to a neutral position by means of frictional coupling to a cylindrical steering shaft rotated in response to the vehicle direction change comprising:

a base plate mounted adjacent to one side of a steering shaft of a vehicle;  
a turn lever pivotally mounted to a first pivot point, disposed on an axis of said base plate, said turn lever being movable about said pivot point, from a center neutral position to a right turn angular position or to a left turn angular position, at the discretion of a vehicle driver, to indicate a turn;  
a detent wheel, being disposed on said axis of said base plate, remote from said pivot point, said detent wheel being rotatable and movable along said axis of said base plate;  
an index plate secured to an end of said turn lever, remote from said pivot point, by a coupling means causing said index plate to follow said angular motion of said turn lever and allowing linear action of said index plate along an axis of said turn lever, said index plate being urged away from said pivot point by a spring means, said index plate including a truncated end remote from said pivot point, said end being approximately straight, disposed at an angle of approximately 90° with said axis of said base plate, said end being bisected by a notch disposed symmetrically about said axis, said spring means urging said index plate toward said detent wheel causing said notch to embrace said wheel inducing a detent action which secures said turn lever in said center position, whereby, moving said turn lever to either of said left turn or right turn angular positions, to signal a turn, causes the index plate notch to leave said steering shaft, forcing said index plate against said spring means, causing said index plate to apply a linear force, parallel with said axis of the base plate against said detent wheel, forcing said detent wheel against said steering shaft, thereby, causing frictional coupling between said detent wheel and said steering shaft and causing frictional coupling between said detent wheel and said index plate, said frictional coupling inducing rotation to said detent wheel in unison with said steering shaft, said rotation of said detent wheel applying a tangential force to said index plate, by means of said frictional coupling, said force being transferred to said turn lever, thus forcing said turn lever back to said center position when the steering shaft is rotated in the direction to cancel the turn.

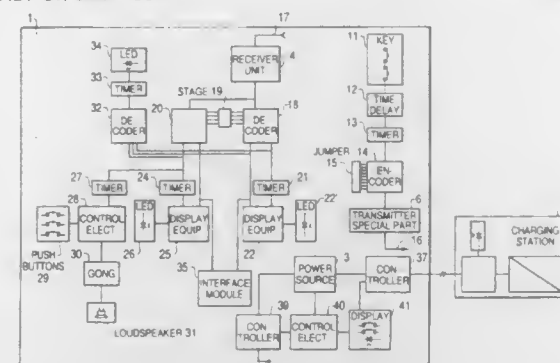
5,774,050

RADIO ALARM SECURITY SYSTEM  
René Kägi, Stäfa, Switzerland, assignor to Baumer Holding AG, Frauenfeld, Switzerland  
Filed Mar. 9, 1995, Ser. No. 401,620  
Claims priority, application Switzerland, Mar. 24, 1994, 00881/94

Int. Cl. G08B 1/08

U.S. Cl. 340—539

5 Claims



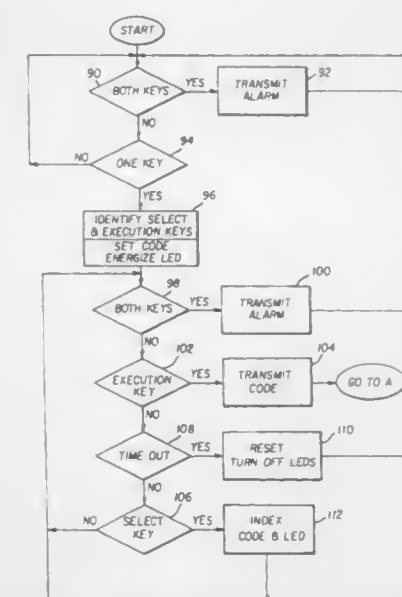
1. A radio alarm security system, comprising:  
a portable central alarm unit, including:  
a separate, rechargeable power source temporarily connectable to at least one charging station for charging the power source;  
a receiving assembly, including:  
a receiver unit for receiving radio signals generated from alarm indicators indicating an alarm condition; and  
optical and acoustic display means connected with said receiver unit and being activatable as a result of the radio signals for alerting a user of the alarm condition; and  
a transmitting assembly, including:  
a hand-activatable initiating means for initiating additional radio signals; and  
a transmitter unit connected with said initiating means for transmitting the additional radio signals to activate an alarm generator.

5,774,051

SECURITY SYSTEM WITH MULTI-FUNCTION TRANSMITTER  
Karl Henry Kostusiak, Pittsford, N.Y., assignor to Detection Systems, Inc., Fairport, N.Y.  
Filed Nov. 27, 1995, Ser. No. 562,975  
Int. Cl. G08B 1/08  
U.S. Cl. 340—539

22 Claims

1. A hand portable communicator for controlling a security system having alternative modes of operation, said communicator including a wireless transmitter and two keys actuatable to operate said transmitter and control said system; said communicator comprising:  
means for assigning functions to said respective keys based on an order in which said keys are actuated, said means: a) assigning to a first actuated one of said keys a mode selecting



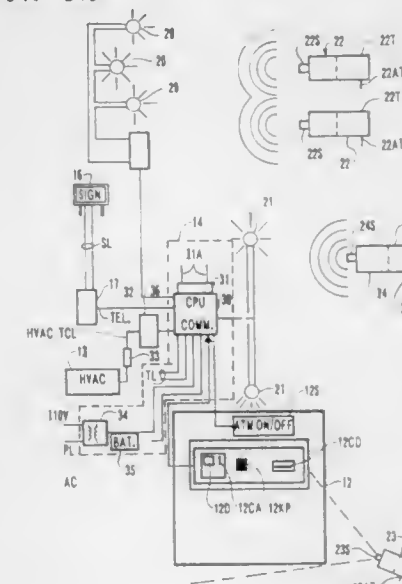
function selecting between said alternative operating modes; and, b) assigning to the other one of said keys a transmission execution function transmitting said selection of said first actuated one of said keys.

5,774,052

MONITORING AND ALERTING SYSTEM FOR BUILDINGS  
Dennis Hamm, and David P. Kimmich, both of Pasadena, Calif., assignors to Pacific Bank Technology, Inc., Pasadena, Calif.

Filed Feb. 8, 1996, Ser. No. 598,338  
Int. Cl. G08B 21/00  
U.S. Cl. 340—540

15 Claims

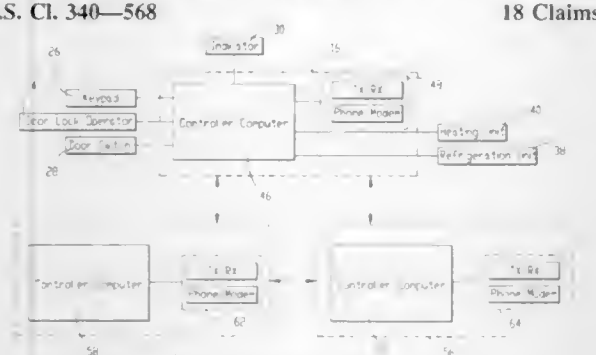


10. A system for monitoring and responding to variations in light levels from predetermined levels of the surroundings adjacent an automatic teller machine to insure adequate consumer light level protection comprising:  
light sensing means for sensing at least two levels of lighting values in the area of said machine including wireless transmitting means for transmitting signals only in response to sensed lighting levels below either of said lighting values;  
a central data processing unit including a clock, wireless signal receiving means for receiving said transmitted signals, means responsive to said clock for controlling operating hours of the system, a communications channel responding to reception of



said transmitted signals for communicating reception of said signals to a manned location, and means responsive to reception of said transmitted signals for disabling said machine; and  
a lightable sign illuminated in response to disabling of said machine and operative in response to a resumption of lighting above said lighting values for terminating the illumination of said sign and for re-enabling said machine.

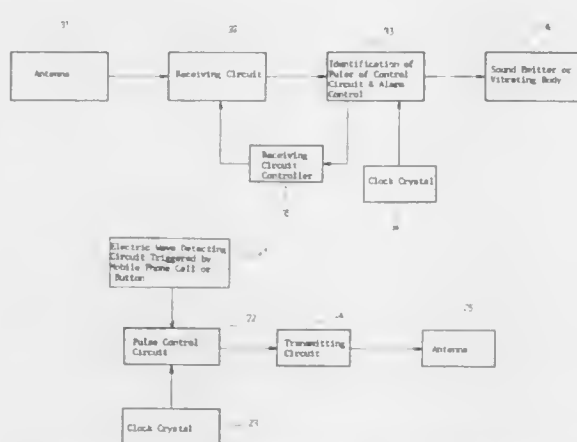
**5,774,053**  
**STORAGE DEVICE FOR THE DELIVERY AND PICKUP OF GOODS**  
David Porter, 442 W. 62nd Ter., Kansas City, Mo. 64113  
Filed May 2, 1996, Ser. No. 643,038  
Int. Cl.<sup>6</sup> G08B 13/14  
U.S. Cl. 340—568 18 Claims



1. A storage device for the delivery and pick-up of goods, the storage device comprising:  
an enclosure for enclosing the goods, the enclosure including a door, a lock for locking the door, and a lock operator for unlocking the lock, the lock operator including a keypad for permitting entry of an alphanumeric key code; and  
a communication apparatus operably coupled with the enclosure for controlling entry to the enclosure and for providing a notification that goods have been delivered to or picked-up from the enclosure, the communication apparatus including a controller coupled with the keypad, the controller including memory for storing a plurality of vendor codes each associated with a separate vendor, comparing means for comparing the key code to the vendor codes to determine if the key code matches one of the vendor codes, and activating means for activating the lock operator for unlocking the lock if the key code matches one of the vendor codes.

**5,774,054**  
**SYNCHRONOUS RECEIVING/TRANSMITTING DEPARTURE ALARM**  
Stephen Chen, Changhua, Taiwan, assignor to E Lead Electronic Co., Ltd., Changhua, Taiwan  
Filed Nov. 4, 1996, Ser. No. 743,079  
Int. Cl.<sup>6</sup> G08B 13/14  
U.S. Cl. 340—572 4 Claims

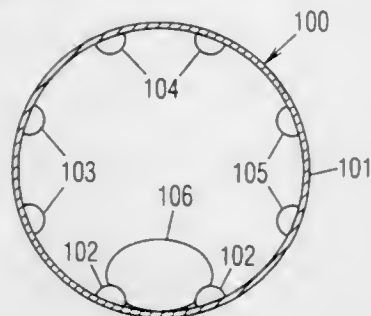
1. A synchronous receiving/transmitting departure alarm comprising at least one transmitter unit and a receiver unit, wherein:  
the transmitter unit includes a pulse control circuit, a clock crystal, a transmitting circuit and an antenna which form a means for transmitting pulse signals at fixed time intervals; and  
the receiver unit includes an antenna, a receiving circuit, a control circuit, a clock crystal, a receiving circuit controller, and a sound emitter or vibrating body which form a means for receiving said pulse signals and synchronizing said receiver and transmitter so that during the intervals between said pulse signals, the receiving circuit of the receiver unit is synchro-



nously deactivated and before a next transmitted pulse signal is to be received the receiving circuit is again activated for receiving the next pulse signal from the transmitter unit, and whereby when the receiving circuit fails to receive the transmitted pulse signal once or continuously several times, the receiver unit by way of sound or vibration warns a holder of the receiver unit of the failure to receive the transmitted pulse signal, and

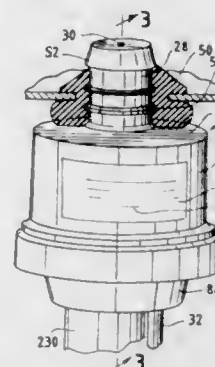
wherein the transmitter unit further includes an electromagnetic wave detecting circuit responsive to detection of an electromagnetic wave for changing or stopping transmission of said pulse signals to thereby cause said receiving unit to warn the holder by sound or vibration that an electro-magnetic wave has been detected.

**5,774,055**  
**INFANT MONITORING DEVICE**  
David Pomerantz, 251 174th St., Apt. 504, Miami Beach, Fla. 33160  
Filed Jun. 9, 1997, Ser. No. 871,832  
Int. Cl.<sup>6</sup> G08B 23/00  
U.S. Cl. 340—573 10 Claims

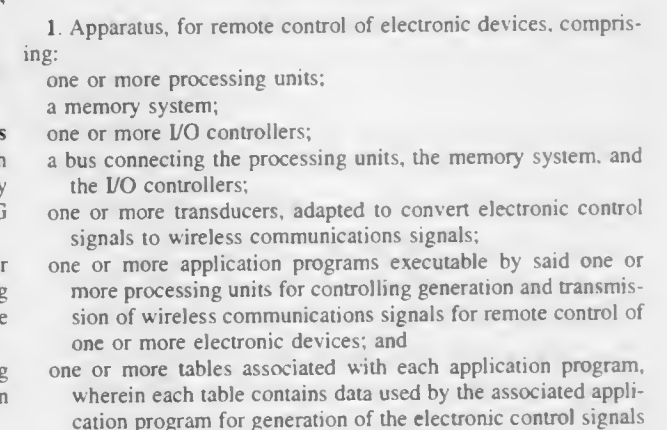


1. A body position monitoring device, comprising:  
a sensor for attaching to a person for detecting a predetermined body position, said sensor comprising a hollow housing with a circular interior surface, an electrode means attached to said circular interior surface, and a connecting means positioned on said circular interior surface and freely movable completely around a circumference thereof, said connecting means generally remaining in a single radial position regardless of a radial orientation of said housing, said connecting means making contact with said electrode means only when said housing is rotated such that said electrode means is generally in said single radial position, said single radial position corresponding to said predetermined body position, said connecting means disengaging from said electrode means when said housing is rotated to other positions; and  
an alarm connected to said sensor for producing an alert when said predetermined body position is detected.

**5,774,056**  
**GAUGE FOR MONITORING AIR FILTERS**  
Charles Henry Berry, III, Cedar Falls; Jerry Lee Manross, Waverly; Thomas Alan Stoll, Waterloo; Gregory Matthew Ferris, Cedar Falls, and James Nathan Forry, Waterloo, all of Iowa, assignors to Engineered Products Co., Waterloo, Iowa  
Filed May 30, 1996, Ser. No. 655,396  
Int. Cl.<sup>6</sup> G08B 21/00  
U.S. Cl. 340—607 12 Claims



# UMI





which are converted by the one or more transducers to wireless communications signals.

8. A method of generating wireless communications signals, comprising the steps of:

setting a command pointer to a starting command in a table, wherein said table is comprised of one or more commands;

programming a timer interrupt to a remote carrier frequency; and

passing control to a timer interrupt routine at specified time intervals, wherein the timer interrupt routine performs the steps of:

reading a command from the table;

determining, based on the command, if a state of a transmission signal should be changed; and

changing the state of the transmission signal if it is determined during said determining step that the state of the transmission signal should be changed.

5,774,064

## REMOTE CONTROL SYSTEM FOR DOOR LOCKS

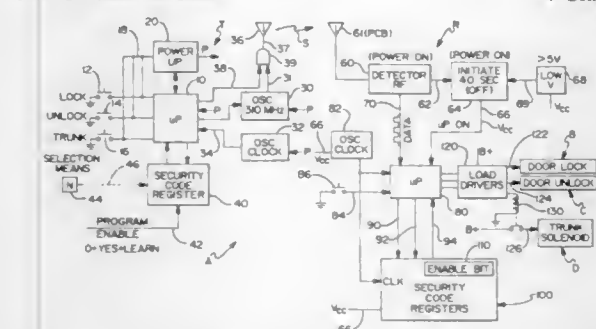
George Lambropoulos, Grosse Pointe Woods; Robert A. Hair, Pontiac, and Kenneth R. Pitera, Warren, all of Mich., assignors to TRW Inc., Lyndhurst, Ohio

Continuation of Ser. No. 419,447, Apr. 10, 1995, Pat. No. 5,619,191, which is a continuation of Ser. No. 133,744, Oct. 7, 1993, Pat. No. 5,406,274, which is a continuation of Ser. No. 767,034, Sep. 26, 1991, Pat. No. 5,252,966, which is a continuation of Ser. No. 336,841, Apr. 12, 1989, Pat. No. 5,109,221, which is a division of Ser. No. 262,206, Oct. 19, 1988, Pat. No. 4,881,148, which is a continuation of Ser. No. 52,469, May 21, 1987, abandoned. This application Nov. 18, 1996, Ser. No. 751,588

Int. Cl.<sup>6</sup> H04Q 7/00

U.S. Cl. 340—825.69

4 Claims



1. Apparatus operative to control access to a vehicle, said apparatus adapted to be mounted on said vehicle and to respond to remote hand-held portable transmitters, each transmitter of which transmits coded signals distinctive from the coded signals transmitted by other said transmitters, and wherein the apparatus is programmable in the field to recognize the coded signals transmitted from authorized said transmitters and not from unauthorized said transmitters so as to permit access to said vehicle in response to receipt of coded signals from said authorized transmitters, said apparatus comprising:

- receiver means for receiving coded signals transmitted by said transmitters;
- memory means for storing information for identifying the distinctive coded signals received from said authorized transmitters, said memory means being capable of storing at any time information sufficient to identify the coded signals transmitted from at least two different said transmitters;
- means manually operable in the field for initiating programming periods; and
- computer means responsive to said receiver means and said memory means (a) for causing said information stored in said memory means to represent only those said transmitters that transmitted coded signals to said apparatus during the most recent said programming period, and (b) for evaluating coded signals received during non-programming periods in accordance

with said stored information and allowing control of access to said vehicle in response to said coded signals only if the transmitter that generated said coded signal also transmitted a coded signal to said apparatus in the most recent said programming period;

whereby programming of said apparatus with an unauthorized said transmitter during the most recent said programming period will be apparent to the vehicle operator because said authorized transmitters that were programmed during a programming period prior to the most recent said programming period will not be capable of controlling access to said vehicle after said most recent said programming period.

5,774,065

## REMOTE CONTROL SYSTEM AND METHOD USING VARIABLE ID CODE

Tomoji Mabuchi, Kariya, and Hisataka Hotta, Gifu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

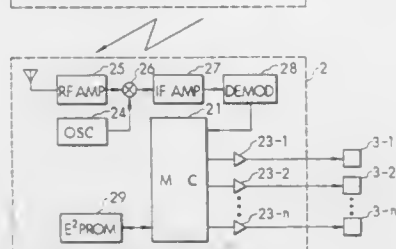
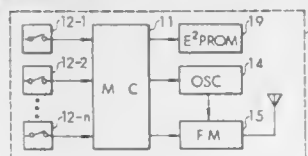
Filed Aug. 2, 1995, Ser. No. 510,469

Claims priority, application Japan, Aug. 5, 1994, 6-184849; Jul. 3, 1995, 7-167434

Int. Cl.<sup>6</sup> G08C 19/00; G06F 7/04; H04K 1/00

U.S. Cl. 340—825.72

17 Claims



1. A remote control system comprising:
- a transmitter for transmitting a transmission code including an ID code prepared by encoding specific identifying information, the transmitter comprising:
  - rolling code varying means for, each time the transmitter transmits the transmission code, varying a rolling code comprising a prescribed number of bits,
  - operation processing means for performing an operation process with respect to each bit of the rolling code and each corresponding bit of the ID code, to vary each bit of the ID code in correspondence with the rolling code and thereby set a variable ID code,
  - bit-data rearranging means for rearranging a position of each bit of the variable ID code and a position of each bit of the rolling code according to a prescribed bit-data rearranging order setting to set a rearranged code, and
  - transmission code producing means for producing a transmission code from the rearranged code having a position of each bit rearranged by the bit-data rearranging means; and
  - a receiver for receiving the transmission code transmitted from the transmitter, decoding the ID code and, when the ID code obtained by decoding thereof coincides with a preset ID code, outputting an instruction causing operation of a control object, the receiver comprising:
  - bit-data rearranging and restoring means for, when receiving the transmission code from the transmitter, extracting the rearranged code and rearranging each bit according to the prescribed bit-data rearranging order setting to thereby set a restored variable ID code and a restored rolling code,
  - operation processing and restoring means for performing an operation inverse to the operation process performed by the transmitter, with respect to the restored variable ID code and the restored rolling code, and restoring, in correspon-

5,774,067

## FLASH-FLOODING MULTI-STAGE INTERCONNECTION NETWORK WITH PARALLEL PATH SEEKING SWITCHING ELEMENTS

Howard Thomas Olnowich, Endwell, N.Y.; Jehoshua Bruck, La Canada, Calif.; Michael Hans Fisher, Rochester, Minn.; Joel Mark Gould, Winchester, Mass.; John David Jabusch, Cary, N.C., and Arthur Robert Williams, Croton-On-Hudson, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

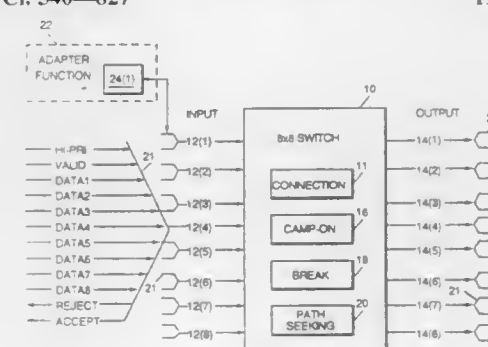
Continuation of Ser. No. 481,854, Jun. 7, 1995, abandoned.

This application Oct. 16, 1997, Ser. No. 950,104

Int. Cl.<sup>6</sup> H04Q 1/00

U.S. Cl. 340—827

19 Claims



5,774,066

## PROGRAMMABLY OPERABLE SYSTEM FOR THE DELAYED LOCKING/UNLOCKING OF A SECURITY INSTALLATION

Pierre Pellaton, Le Locle, and Michel Richner, Neuchâtel, both of Switzerland, assignors to Rethor S.A., La Chaux-de-Fonds, Switzerland

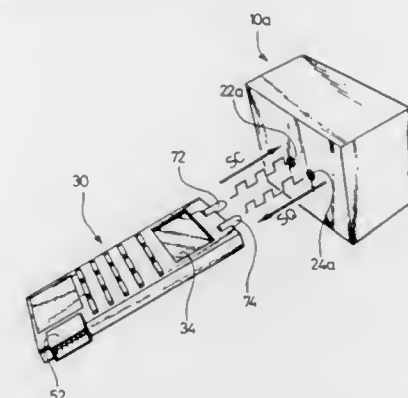
Filed Apr. 26, 1996, Ser. No. 639,227

Claims priority, application Switzerland, Apr. 28, 1995, 1231/95

Int. Cl.<sup>6</sup> G06F 7/00

U.S. Cl. 340—825.22

10 Claims



1. Programmable activation system for the timed locking/unlocking of a security installation, the activation system including:
- at least one activation module for unlocking an opening element of the installation, and
  - means for controlling the activation module to program a time value corresponding to the precise moment where the activation module will cause the unlocking of said element,
- characterized in that the control means include at least one remote control element constituting a mobile detachable or detached part with respect to said activation module whereas said activation module may constitute a fixed part of the installation, both parts including communicating interfaces for the transmission of information, at least one of the two parts which is referred to as the emitting part including at least one own exclusive and unique identification code being transmitted through said communicating interfaces to the other part which forms a receiving part, said code being written, for each programming operation of said time value, into memorisation means of said receiving part to constitute a label identifying in a non-equivocal manner said emitting part as source of the programming, said memorisation means which are provided to record said code within the receiving part being arranged for supplying a listing in the form of events of each programming operation, systematically in association with said identification code constituting said label.

# UMI

wherein said oral instruction addition means adds a second additional oral instruction instead of said first additional oral instruction when the distance between said first next guide intersection and said second next guide intersection is less than a fourth standard distance which is less than said third standard distance, and said second additional oral instruction indicating an urgency of a vehicle maneuver required at said second next guide intersection, which urgency is not indicated by said first additional oral instruction.

## 6 Claims

wherein the decoder of said auxiliary unit has a set of signal output terminals corresponding to a coded radio signal transmitted by the encoder and the transmitting circuit of the main unit so that when one signal output terminal of the encoder of said auxiliary unit is triggered by said coded radio signal transmitted by the encoder and the transmitting circuit of said main unit, the decoder of said auxiliary unit gives a signal to said looking circuit, causing it to turn on a respective indicator lamp; when one of said calling control buttons is depressed after the corresponding indicator lamp is turned on, said AND gate IC in driven to give a signal to the encoder of



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UMI

said auxiliary unit, causing it to transmit a radio calling signal to the receiver unit of said main unit through the transmitting circuit of said auxiliary unit.

5,774,073

## NAVIGATION SYSTEM FOR A VEHICLE

Kazuteru Maekawa, Aichi-ken; Toyoji Hiyokawa, Toyota, and Hiroyuki Kanemitsu, Susono, all of Japan, assignors to Aisin AW Co., Ltd., Japan

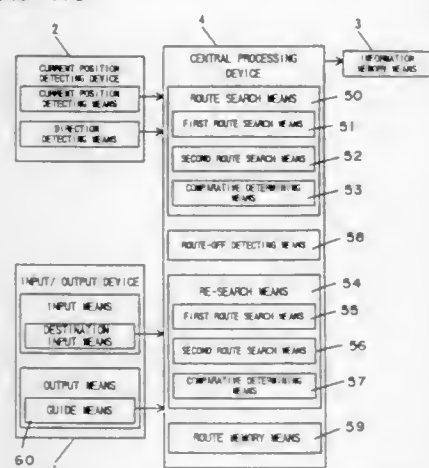
Filed Jun. 6, 1995, Ser. No. 466,191

Claims priority, application Japan, Sep. 22, 1994, 6-254847

Int. Cl.<sup>6</sup> G08G 1/123

U.S. Cl. 340—995

7 Claims



1. A navigation system for providing route guidance to a destination in accordance with a preset route, comprising: memory means for storing map information and guidance information; current position detecting means for detecting current position of a vehicle and traveling direction thereof; route search means for searching to determine a route from the detected current position to a destination on the basis of information stored in said memory means and for storing the determined route as the preset route; route-off detecting means for determining whether the vehicle is off of the preset route on the basis of the result of the detecting of current position by said current position detecting means and information in said memory means; re-search means for re-searching for a new route, from the detected current position to the destination, on the basis of information in said memory means responsive to a determination by said route-off detecting means that the vehicle is off the preset route, said re-search means including: first route search means for searching for a first re-search route forward, in the detected traveling direction, from the detected current position of the vehicle; second route search means for searching for a second re-search route without giving priority to the forward traveling direction of the vehicle; and comparative determining means for determining a difference in distance between the first and second re-search routes and for selecting said second re-search route when the difference in distance between said first and second re-search routes is greater than a predetermined value, and for selecting said first re-search route when the difference is less than the predetermined value; and guide means for providing guidance by reading guidance information from said memory means based on one of said preset and new routes.

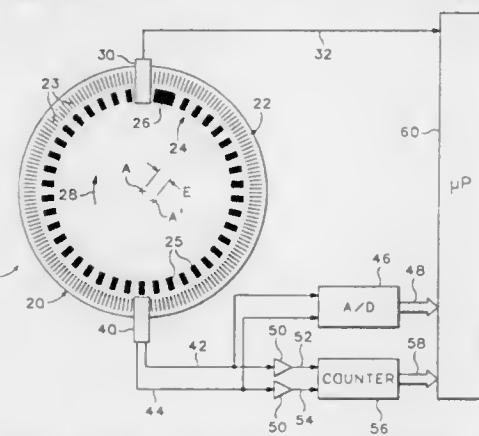
5,774,074  
MULTI-TRACK POSITION ENCODER SYSTEM  
Eugene A. Cooper, Ridgefield, Wash., and Steven B. Elgee, Portland, Oreg., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jan. 21, 1997, Ser. No. 784,641

Int. Cl.<sup>6</sup> H03M 1/22

U.S. Cl. 341—11

16 Claims



1. A position encoder system for use in determining relative angular position of an object rotating about a first axis, the position encoder system comprising: a disc mounted for rotation about the first axis with the object, said disc having a first track with incremental markings of a first resolution, and a second track with incremental markings of a second resolution greater than said first resolution; a first sensor configured to identify incremental markings along said first track of said disc as the disc rotates; a second sensor spaced from said first sensor, said second sensor being configured to identify incremental markings along said second track of said disc as the disc rotates; a counter operatively connected to said second sensor to quantify incremental markings identified by said second sensor, said counter thereby being configured to track relative angular position of the disc; and a processor operatively connected to said counter and said first sensor for use in identifying a correlation between a predetermined portion of said first track and a quantity of incremental markings of said second track, said correlation being indicative of disc accuracy.

5,774,075

## DIGITAL SWITCH WITH ANALOG FEEL

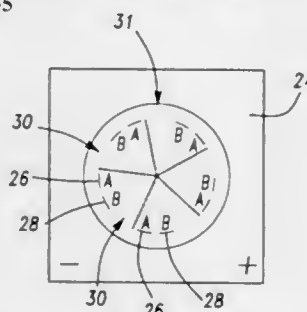
Silviu Palalau, Birmingham, and Daniel Toffolo, Dearborn, both of Mich., assignors to UT Automobile Dearborn, Inc., Dearborn, Mich.

Filed Aug. 30, 1996, Ser. No. 706,170

Int. Cl.<sup>6</sup> H03K 17/94; H03M 11/00

U.S. Cl. 341—35

18 Claims



1. A switch assembly for generating digital electrical signals, comprising: a base; a control knob movably supported for movement relative to said base;

a plurality of electrical conducting portions supported on one of said control knob or said base, said conducting portions being arranged such that a first distance between one of said conducting portions and a first adjacent conducting portion on one side of said one conducting portion is greater than a second distance between said one conducting portion and a second adjacent conducting portion on another side of said one conducting portion opposite from said first adjacent conducting portion; and an electrical contact portion supported on the other of said control knob or said base and having an operative dimension that is smaller than said first distance and greater than said second distance, said electrical contact contacting one or more of said electrical conducting portions as said control knob moves relative to said base to thereby generate digital electrical signals indicative of movement of said control knob.

5,774,076

Patent Not Issued For This Number

5,774,077

ENCODING ARRANGEMENT AND METHOD FOR ENCODING (N-1)-BIT INFORMATION WORDS INTO N-BIT CHANNEL WORDS AND DECODING THE CHANNEL WORDS INTO INFORMATION WORDS  
Kornelis A. Schoubamer Immink, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

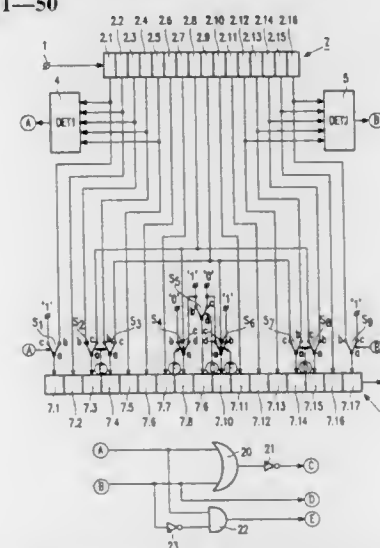
Filed Feb. 2, 1996, Ser. No. 595,534

Claims priority, application European Pat. Off., Feb. 8, 1995, 95200305

Int. Cl.<sup>6</sup> H03M 7/46

U.S. Cl. 341—50

45 Claims



1. Encoding arrangement for encoding (n-1)-bit information words into n-bit channel words so as to obtain a channel signal of concatenated channel words, the channel signal being a bit sequence having the virtue that at most k 'zeros' between 'ones' occur, the encoding arrangement comprising: input means for receiving the (n-1)-bit information words; converting means for converting the (n-1)-bit information words into n-bit channel words; and output means for supplying the channel signal of concatenated n-bit channel words, wherein the converting means comprises: inserting means for inserting one bit of a first or a second binary value in between a specified first and a second neighbouring

bit position in each (n-1)-bit information word to form an n-bit channel word, a 'zero' bit being inserted in between said specified first and second neighbouring position of any particular (n-1)-bit information word if the number of leading 'zeros' at the leading end of said any particular information word exceeds a specified first integer number, or the number of trailing 'zeros' at the trailing end of said any particular information word exceeds a specified second integer number; and

setting means for setting a logical value in a specified third bit position into a 'one' value if the number of leading 'zeros' exceeds said specified first number, and for setting a logical value in a specified fourth bit position into a 'one' value if the number of trailing 'zeros' exceeds said specified second number, the specified third bit position being one of a specified fourth number of trailing bit positions of said any particular information word, the specified fourth bit position being equal to the specified first number plus one, the specified fourth number being equal to the specified second number plus one, n and k being integer values and the specified first and second numbers having a relationship with k, the inserting means inserting a 'zero' bit in between said specified first and second neighbouring position if a group of more than k consecutive bit positions in the any particular information word comprise all 'zeros', said group of more than k consecutive bit positions not comprising both the specified first and second bit positions.

5,774,078

## SINGLE MERGING BIT DC-SUPPRESSED RUN LENGTH LIMITED CODING

Shin-ichi Tanaka, Kyoto; Toshiyuki Shimada, Kobe; Koichi Hirayama, and Hisashi Yamada, both of Yokohama, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, and Kabushiki Kaisha Toshiba, Kanagawa, both of Japan

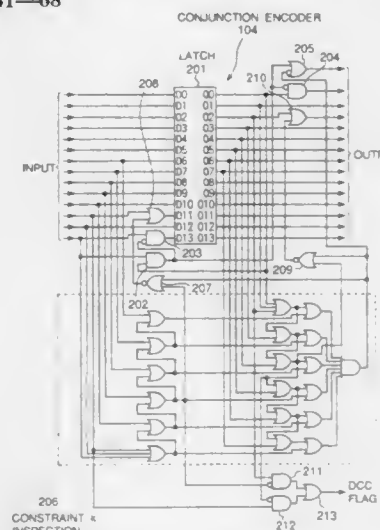
Filed Apr. 5, 1996, Ser. No. 628,167

Claims priority, application Japan, Apr. 14, 1995, 7-089728

Int. Cl.<sup>6</sup> H03M 5/06

U.S. Cl. 341—68

18 Claims



1. An article of manufacture, comprising: a reproducer usable medium having a reproducer readable code word embodied therein, the reproducer readable code word in the article of manufacture comprising: pits and pit-intervals between the pits, each pit having a length greater than 2 bits and equal to  $T_{max}$  bits or less, each

# UMI

a logic circuit connected to generate at least one control bit to select said sine and cosine outputs according to said octant identifier bits that represent the octant number of said input angle word.

- (i) a converting circuit responsive to said input digital signal value to generate a uncorrected analogue signal;
- (ii) a reference signal circuit for generating a reference signal of a predetermined duty cycle, said converting circuit and said reference signal circuit being formed in single integrated circuit such that changes in a shared integrated circuit supply voltage and shared environmental conditions produce matching changes in said uncorrected analogue signal and said reference signal;
- (iii) a reference signal low pass filter for generating a reference voltage from said reference signal; and
- (iv) a correcting circuit responsive to said uncorrected analogue circuit and said reference voltage to generate said output analogue signal.



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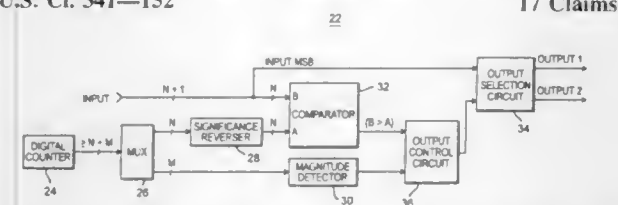
30

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5,774,084  
METHOD AND APPARATUS FOR TRANSLATING  
DIGITAL DATA INTO AN ANALOG SIGNAL  
Eric Martin Brombaugh, Mesa; John Michael Liebetreu, and  
Ronald Duane McCallister, both of Scottsdale, all of Ariz.,  
assignors to SICOM, Inc., Scottsdale, Ariz.  
Filed Apr. 3, 1996, Ser. No. 627,930  
Int. Cl.<sup>6</sup> H03M 1/66

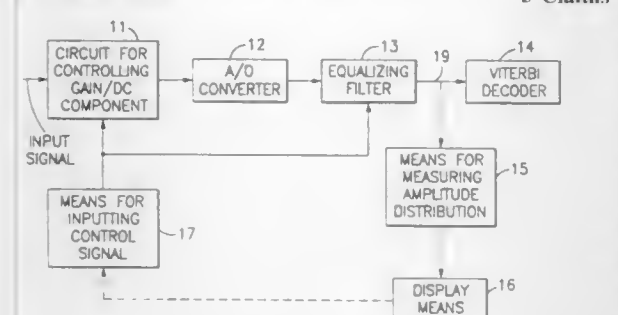
U.S. Cl. 341—152 17 Claims



1. A pulse width modulation method for translating digital data into an analog signal, said method comprising the steps of:
- obtaining a digital input word and a digital count word, said digital count word having at least a first bit and a second bit, said first bit being of higher significance relative to said second bit;
  - separating each of said digital count word bits into a first word and a second word, wherein said first word has at least two bits;
  - reversing the relative order of significance of said first and second bits of said first word to produce a reversed order count word;
  - generating a first analog value for an output when the magnitude of said digital input word is greater than the magnitude of said reversed order count word;
  - generating a second analog value for said output when the magnitude of said digital input word is not greater than the magnitude of said reversed order count word;
  - providing said output when the magnitude of said second word equals a predetermined value; and
  - withholding said output when the magnitude of said second word differs from said predetermined value.

5,774,085  
APPARATUS AND METHOD FOR OBTAINING PROPER  
OUTPUT SIGNAL IN WHICH GAIN AND DC  
COMPONENT ARE REGULATED BASED UPON ON  
MEASURED AMPLITUDE DISTRIBUTION  
Yoshiyuki Yanagimoto, and Mitsuhiro Nakamura, both of  
Hyogo, Japan, assignors to Hewlett-Packard Company, Palo  
Alto, Calif.  
Continuation of Ser. No. 527,327, Sep. 12, 1995, abandoned.  
This application Aug. 18, 1997, Ser. No. 916,718  
Claims priority, application Japan, Sep. 14, 1994, 6-247194  
Int. Cl.<sup>6</sup> H03G 3/00

U.S. Cl. 341—155 5 Claims



1. A method comprising the steps of:
- controlling a gain and direct-current component control circuit means to adjust amplitude and direct-current offset levels of an input signal;

performing A/D conversion on an output of said gain and direct-current component control circuit means to produce digital signals;

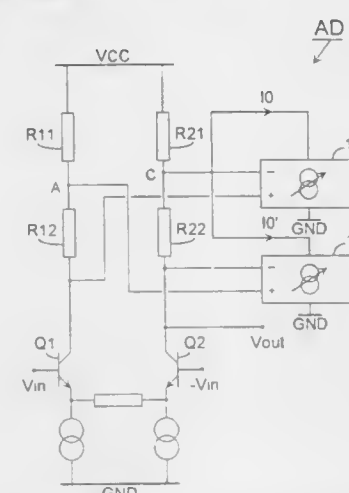
equalization filtering said digital signals to produce filtered digital signals;

measuring an amplitude distribution of said filtered digital signals by determining a measure of each digital signal, sorting into groups each said digital signal in accord with said measure thereof and determining a number of digital signals which fall into each group; and

controlling said gain and direct-current component control circuit means in dependence upon results of said measuring step to assure that said filtered digital signals exhibit a suitable signal characteristic which matches requirements of a connected signal processing means.

5,774,086  
VOLTAGE AMPLIFIER HAVING A LARGE RANGE OF  
VARIATIONS, AND A/D CONVERTER COMPRISING  
SUCH AN AMPLIFIER  
Benoît Guyot, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.  
Filed Nov. 25, 1996, Ser. No. 755,667  
Claims priority, application France, Nov. 29, 1995, 95 14131  
Int. Cl.<sup>6</sup> H03M 1/36

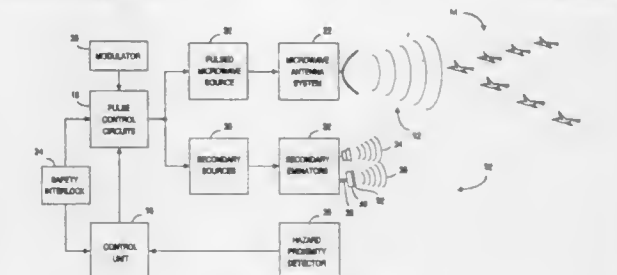
U.S. Cl. 341—159 20 Claims



1. A voltage amplifier intended to receive an input voltage and to supply an output voltage, which voltage amplifier comprises an amplifier stage including a first and a second transistor arranged as a differential pair, the base of the first transistor being intended to receive the input voltage, the base of the second transistor being intended to receive a voltage opposed to said input voltage, the collector of the first transistor being connected to a positive power supply terminal by means of a first branch comprising a resistive load, the collector of the second transistor, intended to supply the output voltage, being connected to the positive power supply terminal by means of a second branch comprising a resistive load, characterized in that the first branch is constituted by at least two series-arranged resistive elements featuring at least a first intermediate node between the positive power supply terminal and the collector of the first transistor, in that the second branch is constituted by at least two series-arranged resistive elements featuring at least a second intermediate node between the positive power supply terminal and the collector of the second transistor, in that the voltage amplifier is provided with means for comparing the potential of the second intermediate node with that of the collector of the first transistor, on the one hand, and the potential of the first intermediate node with that of the collector of the second transistor, on the other hand, and for adding, to the current supplied in a portion of the resistive load of the second branch, a first current

5,774,088  
METHOD AND SYSTEM FOR WARNING BIRDS OF  
HAZARDS  
Melvin L. Kreithen, Pittsburgh, Pa., assignor to The University  
of Pittsburgh, Pittsburgh, Pa.  
Continuation of Ser. No. 598,093, Feb. 7, 1996, abandoned,  
which is a continuation of Ser. No. 280,287, Jul. 26, 1994,  
abandoned. This application May 8, 1997, Ser. No. 852,915  
Int. Cl.<sup>6</sup> G01S 13/93

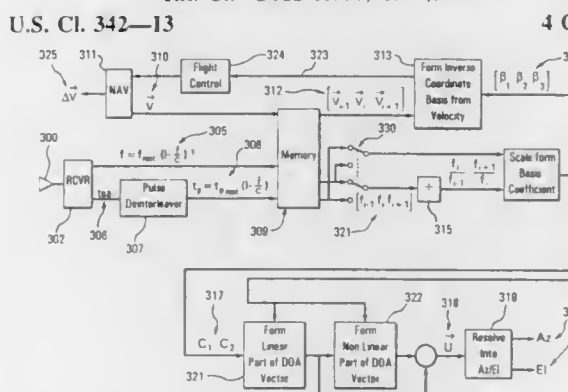
U.S. Cl. 342—22 1 Claim



1. A method for benignly communicating the presence of an object to a flying vertebrate, the method comprising the following steps:
- propagating a region at least partially surrounding said object with pulses of microwave energy having an average power level of about 1 mw/cm<sup>2</sup>, wherein said pulses of microwave energy are selected to elicit a warning signal within said flying vertebrate's auditory system without physically harming said flying vertebrate.

5,774,087  
APPARATUS FOR MEASURING MOVING EMITTER  
ELEVATION AND AZIMUTH DIRECTION FROM  
DOPPLER CHANGE MEASUREMENTS  
Conrad M. Rose, Dahlgren, Va., assignor to Litton Systems  
Inc., Woodland Hills, Calif.  
Filed Feb. 20, 1997, Ser. No. 800,561  
Int. Cl.<sup>6</sup> G01S 13/06; 13/72; 3/04

U.S. Cl. 342—13 4 Claims



1. Apparatus for measuring, from a moving observer, direction of arrival (DOA), including azimuth and elevation, of a continuous wave radar signal from a moving emitter using Doppler shift, comprising:

an antenna for sensing the emitter radar signal,

receiver means for measuring emitter carrier frequency over a predetermined dwell period,

navigation signal means for measuring observer velocity, i.e., speed and heading during a dwell and providing corresponding output signals,

observer control means for changing observer heading, speed or both between dwells or observer altitude during a dwell for establishing at least two linearly independent velocity vector differences,

memory means for receiving outputs from said receiver means and said navigation signal means for storing three contiguous velocities measured during three contiguous dwells and the respective three measured emitter carrier frequencies,

first computation means for taking the difference of the velocities and forming inverse coordinate basis vectors corresponding to these two unique velocity differences,

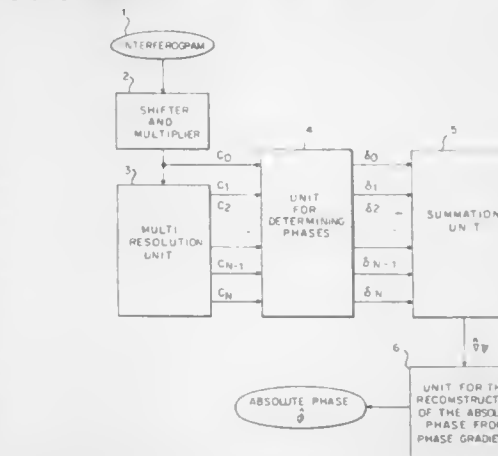
first processor means for forming corresponding ratios of the carrier frequency measurements and forming basis set coefficients for two of said basis vectors,

second processor means for deriving a normalizing coefficient for a third inverse coordinate basis vector so that the DOA unit vector is measured by equation 4 and

second computation means for resolving the DOA unit vector in the system coordinates in which the emitter azimuth and elevation angles are defined and to compute the azimuth and elevation angle from the coefficients of the unit vector in those coordinates.

5,774,089  
METHOD TO RESOLVE AMBIGUITIES IN A PHASE  
MEASUREMENT  
Richard Bamler, Gilching, Germany, and Gordon Davidson,  
Vancouver, Canada, assignors to Deutsche Forschungsan-  
stalt für Luft- und Raumfahrt e.V., Köln, Germany  
Filed Mar. 13, 1997, Ser. No. 816,639  
Claims priority, application Germany, Mar. 15, 1996, 196 10  
096.8; Feb. 3, 1997, 197 063 922.7  
Int. Cl.<sup>6</sup> G01S 13/90

U.S. Cl. 342—25 8 Claims



1. A method for resolving ambiguities in a phase measurement in radar interferometry, comprising the steps of:
- providing radar data of a two-dimensional image matrix including pixels indexed by  $i$  and  $k$ ;
  - forming an interferogram  $z(i,k)$  from the radar data;
  - providing a shifter and an adder;
  - forming from the interferogram in the shifter and the adder a first product

$$C_0(i,k) = z(i+1,k) \cdot z^*(i,k)$$

and a second product

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$$C_0^*(i,k)=z(i,k+1)z^*(i,k),$$

- wherein  $z^*$  denotes a complex conjugate of  $z$ ;
- (e) providing a multi-resolution unit (3);
- (f) subsequently reducing resolution of the first product and the second product by  $N$  increments in the multi-resolution unit, the step of reducing resolution including at least one of a step of averaging adjacent pixels and a step of adding adjacent pixels;
- (g) providing a phase determination unit (4);
- (h) forming differential phases, between pairs of adjacent resolution levels in the phase determination unit, sequentially according to

$$\delta_{N-1}^{i,k} = \arg \{ C_N^{i,k} C_{N-1}^{i,k*} \},$$

$$\delta_{N-1}^{i,k} = \arg \{ C_{N-1}^{i,k} C_{N-2}^{i,k*} \},$$

and in general

$$\delta_n^{i,k} = \arg \{ C_n^{i,k} C_{n-1}^{i,k*} \},$$

wherein superscript letters  $i, k$  indicate that an equation applies to both indices  $i, k$ ,

$C_n$  is a function produced by an  $n$ th step of the resolution reduction, and

$\delta_n^{i,k}$  is a differential phase of the function  $C_n$  to  $C_{n-1}$ , where  $n=1, 2, 3 \dots N$ ;

- (i) providing a summation unit (5);
- (j) determining estimated gradient values  $\nabla \psi(i,k)$

of a phase gradient field by adding the differential phases in the summation unit from a lowest resolution level  $N$  to a predetermined resolution level  $n_{min}$ ;

- (k) providing a reconstruction unit (6); and finally
- (l) reconstructing, in the reconstruction unit, an absolute phase  $\phi$  from the estimated gradient values of the phase gradient field, whereby the ambiguities are resolved.

5,774,090

#### METHOD AND DEVICE TO BROADEN THE RADIATION PATTERN OF AN ACTIVE ANTENNA

Jean-Pierre Marcy, Bourg la Reine, and Joseph Roger, Bures S/Yvette, both of France, assignors to Thomson-CSF, Paris, France

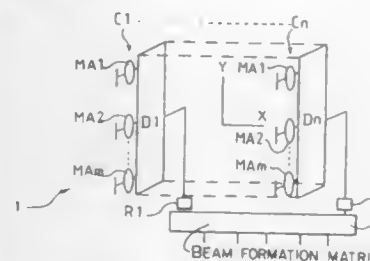
Filed Sep. 18, 1995, Ser. No. 529,612

Claims priority, application France, Sep. 23, 1994, 94 11377

Int. Cl.<sup>6</sup> H01Q 3/22; 3/24; 3/26

U.S. Cl. 342—372

3 Claims





VOL

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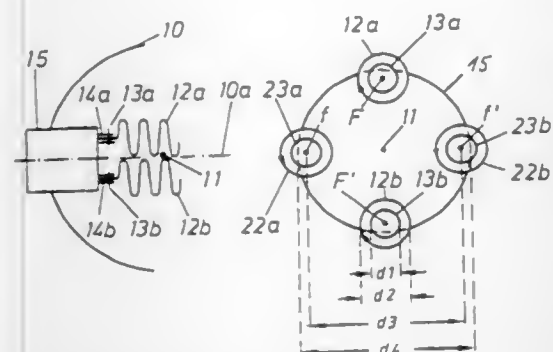
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a plurality of circuit boards are provided and said circuit boards are positioned orthogonal to each other.

5,774,096

## HEAD MOUNTED DISPLAY

Yoshinao Usuki; Masaki Matsuno; Futoshi Ito, and Kenji Tosaki, all of Tokyo, Japan, assignors to Kabushiki Kaisha Sega Enterprises, Tokyo, Japan

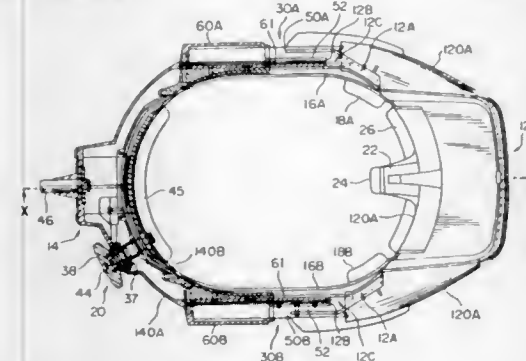
Filed Apr. 20, 1995, Ser. No. 426,168

Claims priority, application Japan, Apr. 21, 1994, 6-105070; Apr. 21, 1994, 6-107796; Jul. 8, 1994, 6-157587; Jul. 15, 1994, 6-164199

Int. Cl.<sup>6</sup> G09G 5/00

U.S. Cl. 345—8

11 Claims



1. A head mounted display, comprising:  
a front frame which covers a forehead and further comprises a display device mounted on the front side of said front frame;  
a back frame which covers the back portion of a head;  
connecting means including rails and sliders provided on one of the front and back frames, for connecting the front frame and the back frame, wherein the rails and sliders engage in a manner which permits the front and back frames to move freely toward the back and front of the head;  
belts which are placed on the inside surfaces of the front frame, the back frame, and around the inside surfaces facing the temporal regions of the head;  
a fastening means mounted on the rear frame, for fastening the belts; and  
a loosening means mounted on the rear frame, for loosening the fastened belts.

5,774,097

Patent Not Issued For This Number

5,774,098  
INDICATOR

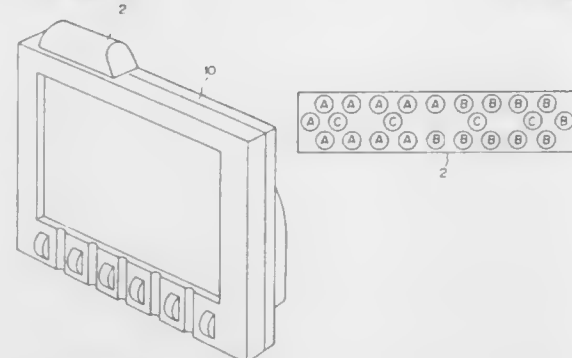
Toshiyuki Kawashima, Kanagawa; Minoru Tanaka; Hiroshi Houjo, both of Tokyo, and Masaru Fujii, Kanagawa, all of Japan, assignors to Sony Corporation, Japan

Filed May 17, 1993, Ser. No. 61,557

Claims priority, application Japan, May 22, 1992, 4-155998 Int. Cl.<sup>6</sup> G09G 3/32

U.S. Cl. 345—83

18 Claims



1. An indicator comprising:  
an indicator lamp having a lamp case which is light-transmissive to light emitted by at least one light-emitting element on one side of the lamp case, said lamp case being made from a material through which a light indication of said at least one light-emitting element is easily visible without being impaired by the reflection of ambient light from a surface on another side of the lamp case;  
a signal lamp comprising said at least one light-emitting element located within said lamp case; and  
a display unit mutually integrated with said signal lamp for displaying information related to light emitted by said signal lamp.

5,774,099

## LIQUID CRYSTAL DEVICE WITH WIDE VIEWING ANGLE CHARACTERISTICS

Shinichi Iwasaki; Hiroshi Kurihara; Yasuyuki Mishima, and Masayuki Ohta, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, and Hitachi Device Engineering Co., Ltd., Chiba-ken, both of Japan

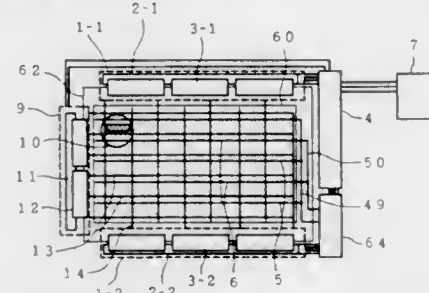
Filed Apr. 10, 1996, Ser. No. 630,619

Claims priority, application Japan, Apr. 25, 1995, 7-101240; Jul. 5, 1995, 7-169840

Int. Cl.<sup>6</sup> G02F 1/135

U.S. Cl. 345—87

11 Claims



1. A liquid crystal device comprising: a liquid crystal sealed in between a pair of two substrates, at least one of which is transparent; pixels arranged in a matrix shape on one of said substrates and having thin film transistor elements, pixel electrodes connected with the source electrodes of said thin film transistors, and common electrodes; gate lines connected with the gate electrodes of the thin film transistors adjoining in each row; drain lines connected with the drain electrodes of the thin film transistors adjoining in each column; odd row common electrodes lines connected with said common electrodes in the individual odd rows; even row common electrode lines connected with said common electrodes in

the individual even rows; an odd row common bus line connected with said odd row common electrode lines; an even row common bus line connected with said even row common electrode lines; and drive voltage applying means for applying voltage signal waveforms between said pixel electrodes and said common electrodes, wherein said pixel electrodes and said common electrodes are so arranged as to apply electric fields having components parallel with the substrate plane between said pixel electrodes and said common electrodes by said drive voltage applying means, wherein said parallel electric field components are generated to drive the liquid crystal between said pixel electrodes and said common electrodes by applying voltage waveforms varying with video data to said pixel electrodes and pulse waveforms having binary amplitude levels to said common electrodes, wherein the waveforms applied to said odd row common electrode lines and said even row common electrode lines by said drive voltage applying means have inverted phases to each other, and wherein the pulse waveforms to be applied to said odd row common electrode lines and said even row common electrode lines have periods longer than two times of the horizontal interval.

5,774,100

## ARRAY SUBSTRATE OF LIQUID CRYSTAL DISPLAY DEVICE

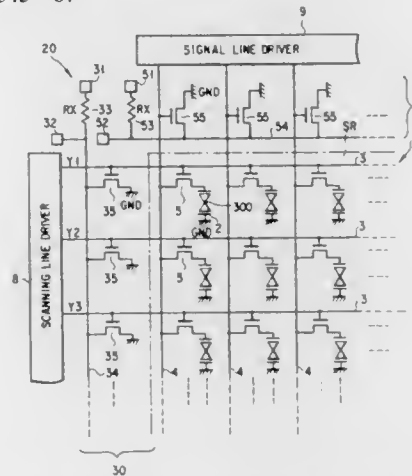
Yoshiro Aoki, and Youichi Masuda, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 26, 1996, Ser. No. 721,620

Claims priority, application Japan, Sep. 26, 1995, 7-248069 Int. Cl.<sup>6</sup> G09G 3/36

U.S. Cl. 345—87

6 Claims



1. An array substrate for a liquid crystal display device, comprising:  
an insulating substrate;  
a plurality of pixel electrodes arrayed in a matrix having rows and columns on the insulating substrate;  
a set of first pixel wiring lines formed along rows of said pixel electrodes on the insulating substrate;  
a set of second pixel wiring lines formed along columns of said pixel electrodes on the insulating substrate;  
a plurality of switching elements, formed on the insulating substrate at positions adjacent to intersections of the first and second pixel wiring lines, each for supplying a video signal from a corresponding one of the second pixel wiring lines to a corresponding one of the pixel electrodes in response to a scanning signal from a corresponding one of the first pixel wiring lines; and  
a test supporting circuit for sensing potentials of at least one set of said first and second pixel wiring lines,  
wherein said test supporting circuit includes a first test section having a plurality of testing thin film transistors whose gates are respectively connected to the pixel wiring lines of one set, and a test wiring section connected to source-drain paths of the testing thin film transistors and used when detecting

operation states of the testing thin film transistors corresponding to the gate potentials thereof; and  
said test wiring section includes first and second potential pads for receiving a test voltage applied thereto, a resistive element connected in series with a parallel circuit of the source-drain paths of the testing thin film transistors between said first and second potential pads to divide the test voltage according to a resistance ratio between the resistive element and the testing thin film transistors, and a monitor pad connected to a node between said resistive element and the source-drain path of each testing thin film transistor.

5,774,101

## MULTIPLE LINE SIMULTANEOUS SELECTION METHOD FOR A SIMPLE MATRIX LCD WHICH USES TEMPORAL AND SPATIAL MODULATION TO PRODUCE GRAY SCALE WITH REDUCED CROSSTALK AND FLICKER

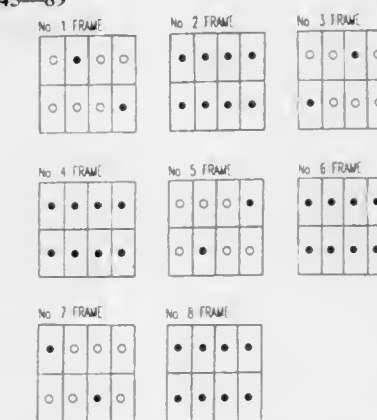
Yoshinori Hirai; Makoto Nagai; Akira Nakazawa; Kazuyoshi Kawaguchi, and Takeshi Kuwata, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Dec. 14, 1995, Ser. No. 572,046

Claims priority, application Japan, Dec. 16, 1994, 6-313791 Int. Cl.<sup>6</sup> G09G 3/36; 5/10

U.S. Cl. 345—89

14 Claims

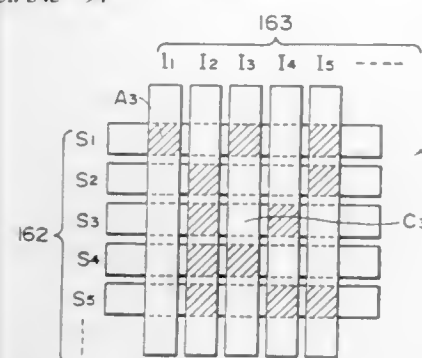


**5,774,102**  
**DRIVING METHOD FOR OPTICAL MODULATION DEVICE**

Junichiro Kanbe, and Kazuharu Katagiri, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan Division of Ser. No. 206,211, Mar. 3, 1994, Pat. No. 5,559,616, which is a division of Ser. No. 79,215, Jun. 21, 1993, Pat. No. 5,296,953, which is a continuation of Ser. No. 919,381, Jul. 29, 1992, abandoned, which is a continuation of Ser. No. 760,504, Sep. 16, 1991, abandoned, which is a division of Ser. No. 390,922, Aug. 8, 1989, Pat. No. 5,092,665, which is a division of Ser. No. 320,798, Mar. 9, 1989, abandoned, which is a continuation of Ser. No. 135,535, Dec. 17, 1987, abandoned, which is a continuation of Ser. No. 691,761, Jan. 15, 1985, abandoned. This application May 25, 1995, Ser. No. 450,017 Claims priority, application Japan, Jan. 23, 1984, 10503/1984; Jan. 23, 1984, 10504/1984; Dec. 13, 1984, 263662/1984; Dec. 24, 1984, 272357/1984

Int. Cl.<sup>6</sup> G09G 3/36  
U.S. Cl. 345—94

16 Claims



1. A display apparatus, comprising:

a liquid crystal device comprising a plurality of scanning electrodes, a plurality of signal electrodes disposed to intersect the scanning electrodes, and a chiral smectic liquid crystal disposed so as to form a matrix of picture elements defining a display area, each picture element being formed at an intersection of the scanning electrodes and the signal electrodes; and driving means for:

(a) sequentially and periodically applying a scanning selection signal to the scanning electrodes to periodically select a particular scanning electrode, the scanning selection signal comprising a first voltage signal, a second voltage signal and a third voltage signal having mutually different waveforms;

(b) applying data signals to the signal electrodes, each data signal comprising an information signal for selecting a display state of a picture element on the particular scanning electrode and an auxiliary signal having a waveform different from that of the information signal,

wherein the picture elements on each periodically selected particular scanning electrode supplied with the first voltage signal are non-selectively erased into one display state,

wherein a selected picture element on the particular scanning electrode supplied with the second voltage signal is changed into the other display state depending on the selected information signal,

wherein the picture elements on the particular scanning electrode supplied with the third voltage signal are allowed to retain their previous display states, and

wherein a non-selected picture element on the particular scanning electrode supplied with the second voltage signal is held in said one display state, thereby providing a periodically refreshed display picture in the display area; and

(c) when a certain region of the display area is desired to be rewritten during a period of sequential and periodic application of the scanning selection signal to the scanning electrodes, designating a certain number of scanning electrodes corresponding to the certain region to be rewritten, applying the scanning selection signal to the designated scanning electrodes, and applying to the signal electrodes

data signals carrying information for the partial rewriting in synchronism with the scanning selection signal, thereby providing a display picture including a partially rewritten region.

5,774,103

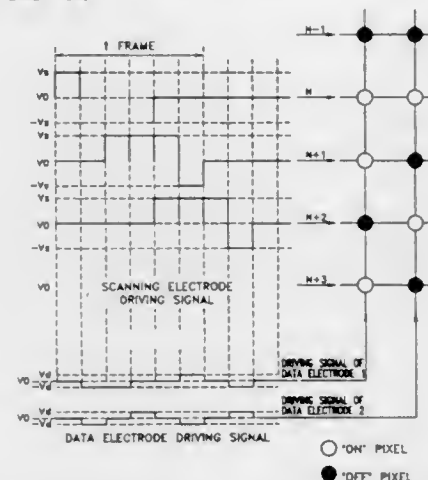
**METHOD FOR DRIVING A LIQUID CRYSTAL DISPLAY**  
Sun-jung Choi; Cheol-woo Park, both of Suwon, and Choon-yul Oh, Anyang, all of Rep. of Korea, assignors to Samsung Display Devices Co., Ltd., Kyungki-do, Rep. of Korea  
Filed Nov. 2, 1995, Ser. No. 552,367

Claims priority, application Rep. of Korea, Sep. 5, 1995, 95-289 53

Int. Cl.<sup>6</sup> G09G 3/20; 3/36

U.S. Cl. 345—94

10 Claims



1. A matrix LCD driving method comprising the steps of: driving a plurality of scanning electrodes by:

sequentially applying an orthogonal function scanning electrode driving signal to each of the scanning electrodes, each orthogonal function scanning electrode driving signal including a combination of a selection pulse and a compensation pulse, the compensation pulse having a width narrower than that of the selection pulse by a predetermined amount, the compensation pulse having an opposite polarity from the selection pulse, and

overlapping selection pulses of orthogonal function scanning electrode driving signals applied to adjacent scanning electrodes by an overlap interval; and

driving a plurality of data electrodes by:

applying data electrode driving signals to the data electrodes, the data electrode driving signals including pulses having the same voltage level and the opposite polarity to each other wherein the data electrode driving signals are applied to the data electrodes during a selection pulse interval of each of the orthogonal function scanning electrode driving signals applied to adjacent scanning electrodes and,

when transitioning the data electrode driving signals from a first voltage level to a second voltage level, maintaining the data electrode driving signals at a third voltage level intermediate the first and second voltage levels during the overlap interval of the orthogonal function scanning electrode driving signals applied to adjacent scanning electrodes.

**5,774,104**  
**CO-ORDINATE ADDRESSING OF LIQUID CRYSTAL CELLS**

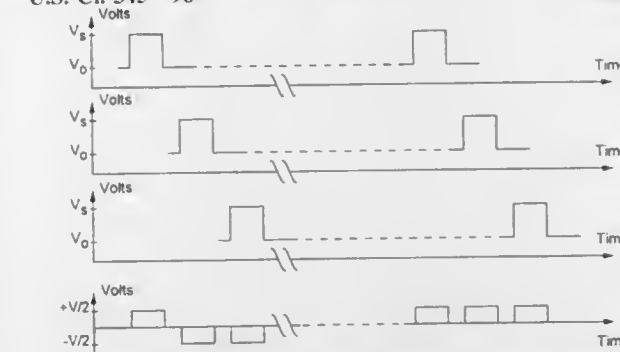
William Alden Crossland, Harlow, and Martin John Birch, Teddington, both of United Kingdom, assignors to Northern Telecom Limited, Montreal, Canada

Continuation of Ser. No. 363,573, Dec. 22, 1994, abandoned, which is a continuation of Ser. No. 984,426, Mar. 24, 1993, abandoned. This application Oct. 30, 1996, Ser. No. 739,811 Claims priority, application United Kingdom, Sep. 11, 1990, 9019883; Sep. 11, 1991, 911536

Int. Cl.<sup>6</sup> G09G 3/36

U.S. Cl. 345—96

5 Claims



1. A method of addressing a liquid crystal cell whose response to an electrical stimulus is sensitive to the polarity of that stimulus, which cell has a co-ordinate array of pixels, wherein data for refreshing the cell is applied at each refreshing in two sequential states in one of which all said pixels are individually set to their required optical appearance states and in the other of which all said pixels are set to the inverse of their required states, wherein said first sequential stage provides net transfer of charge across individual pixels, which net transfer of charge is substantially cancelled pixel by pixel by net transfer of charge across individual pixels provided in said second sequential stage.

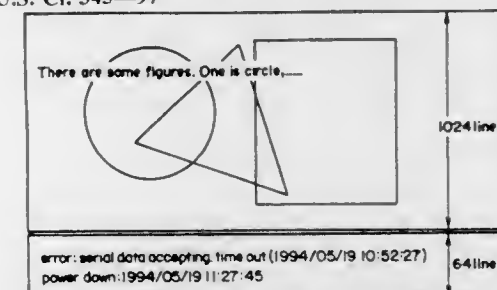
5,774,105

**DISPLAY APPARATUS WITH MEMORY CHARACTERISTIC FOR STORING SYSTEM DATA**  
Takashi Yamamoto, Yamato, and Tomoyuki Ohno, Atsugi, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Oct. 6, 1995, Ser. No. 540,137  
Claims priority, application Japan, Oct. 7, 1994, 6-270642

Int. Cl.<sup>6</sup> G09G 3/36

U.S. Cl. 345—97

43 Claims



1. A display apparatus, comprising:

display means for providing a display based on image data including a display region having a memory characteristic, and drive means for driving the display means so as to:

(a) generate system data in response to an event comprising at least one of switching-off of a power supply, occurrence of an error and transition to a low power consumption mode,  
(b) store system data in the display region by utilizing the memory characteristic of the display region,  
(c) keep the storage of the system data even in case of interruption of the power supply to the display means, and

(d) drive the display means to provide a display based on the image data supplied from a host system independent of means for generating the system data.

5,774,106

**LIQUID CRYSTAL DRIVER AND LIQUID CRYSTAL DISPLAY DEVICE USING THE SAME**

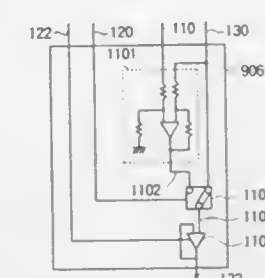
Hiroyuki Nitta, Fujisawa; Hiroyuki Mano, Chigasaki; Tsutomu Furuhashi, Yokohama; Isao Takita, Fujisawa; Satoru Tsunekawa, Higashimurayama; Toshio Futami, Mobarra, and Makiko Ikeda, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed Jun. 5, 1995, Ser. No. 464,133

Claims priority, application Japan, Jun. 21, 1994, 6-138499; Jul. 22, 1994, 6-170696

Int. Cl.<sup>6</sup> G09G 3/36

U.S. Cl. 345—98

16 Claims



1. A liquid crystal driver comprising:

a plurality of output terminals for outputting display voltages to be applied to a liquid crystal display device;  
an input terminal for receiving display data corresponding to said plurality of output terminals; and  
output means for converting said input display data into said output display voltages;  
wherein said output means selects a display voltage level corresponding to one input display data and simultaneously generates two different display voltages from the selected display voltage level so that either one of said two different display voltages can be selected as an output display voltage for each of said output terminals.



said spacer of said touch panel superposing an area other than said pixels of said liquid crystal display when said touch panel overlies said liquid crystal display such that all pixels of the liquid crystal display and spacers of said touch panel are substantially out of alignment with one another.

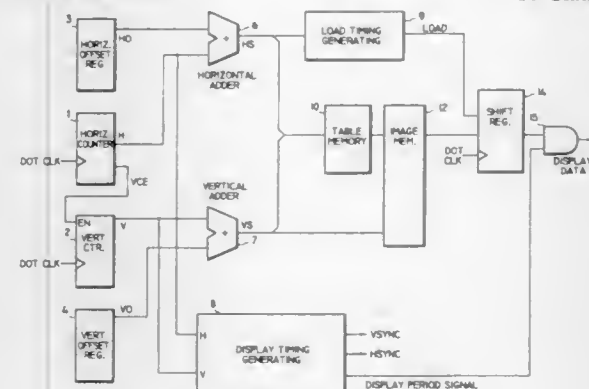
5,774,108  
PROCESSING SYSTEM WITH DISPLAY SCREEN  
SCROLLING

Takashi Michiyoshi, Toyonaka, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 20, 1996, Ser. No. 668,252  
Int. Cl.<sup>6</sup> G09G 5/34

U.S. Cl. 345—123

16 Claims



1. An image display apparatus for displaying on a display screen a plurality of characters each of which is composed of a predetermined number of dots, said image display apparatus comprising: a first storage unit configured to store display order data representing at least one character display order;

a second storage unit configured to store image data for forming an image of a character, and to output the image data when addressed by display order data output by said first storage unit;

a third storage unit configured to store the image data transmitted by said second storage unit and to sequentially transmit the image data at a dot display rate;

a fourth storage unit configured to store at least data indicating a quantity of horizontal offset of the display order data stored in said first storage unit;

timing circuitry configured to count at least horizontal positions of dots represented by the image data to be displayed, and to load image data output by said second storage unit into said third storage unit;

an address generating circuit configured to generate an address for input into said first storage unit, said address being derived at least in part by said quantity of offset stored in said fourth storage unit and said value counted by said counter; and

a switching circuit configured to selectively transmit image data output from said third storage unit for subsequent display on a display screen.

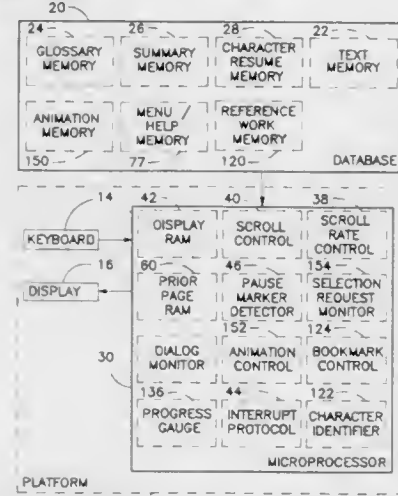
5,774,109  
ELECTRONIC SCROLLING BOOK WITH TEMPORARY  
INTERRUPTIONS

Gregory J. Winksy, Medford; Morton Edward David, Montclair, both of N.J., and James H. Simons, New York, N.Y., assignors to Franklin Electronic Publishers, Incorporated, Burlington, N.J.

Filed Dec. 29, 1995, Ser. No. 580,874  
Int. Cl.<sup>6</sup> G06F 3/00

U.S. Cl. 345—124

53 Claims



1. A hand held electronic book machine having a platform with a keyboard and a display for displaying text, comprising:

a database mounted to the platform, said database having a first memory portion storing text of a prose work and a second memory portion storing predetermined information relevant to said prose work;

scrolling means operatively connected to said first memory portion of said database and to the display for scrolling said text on the display;

an operator actuated selection means operatively connected to said second memory portion of said database and to the display for permitting operator selection of portions of said predetermined information to be displayed on the display; and

delay means operatively connected to said scrolling means and to said operator actuated selection means for temporarily interrupting the scrolling of said text during display of a selected portion of said predetermined information.

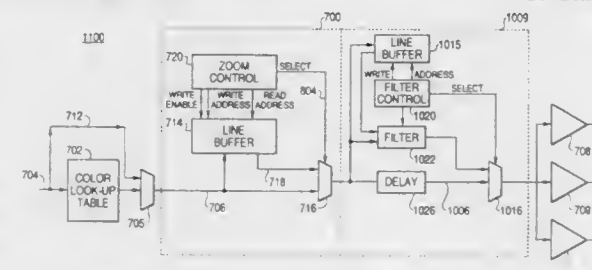
5,774,110  
FILTER RAMDAC WITH HARDWARE 1½-D ZOOM  
FUNCTION

Steven D. Edelson, 7 Sears Rd., Wayland, Mass. 01778-2101  
Continuation of Ser. No. 177,569, Jan. 4, 1994, abandoned.  
This application Jun. 17, 1996, Ser. No. 664,797

Int. Cl.<sup>6</sup> G09G 5/00

U.S. Cl. 345—131

16 Claims



1. A RAMDAC for converting graphics data into analog display signals, comprising:

a color look-up table for converting incoming image data into corresponding color image data;

a line buffer for storing original image data and for generating a zoomed line of image data;  
means for switching between color data from the color look-up table corresponding to image data that is not within a zoom area and zoomed line data from the line buffer corresponding to image data within a zoom area;  
a plurality of digital to analog converters for converting the color data or zoomed line data to analog video signals; and  
zoom control means for enlarging a portion of image data by generating a write and read address and signals for controlling the line buffer and switching means wherein,  
the zoom control means selectively enables the line buffer to store original image data and to read out original image data from said line buffer to create an enlarged display image.

5,774,111  
METHOD AND APPARATUS FOR PROVIDING A  
DYNAMICALLY ORIENTED COMPASS CURSOR ON  
COMPUTER DISPLAYS

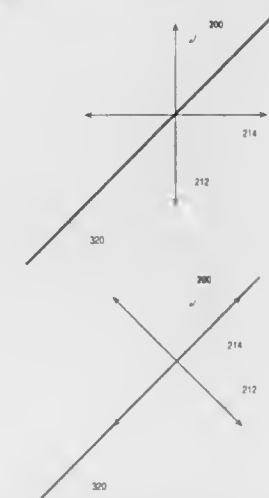
Pascal Lecland, Rueil Malmaison; Antoine Balestriéri, Suresnes; Duy Minh Vu, Puteaux, and André Clément, Palaiseau, all of France, assignors to Dassault Systèmes, Suresnes, France

Filed Feb. 12, 1996, Ser. No. 601,427

Int. Cl.<sup>6</sup> G09G 5/08

U.S. Cl. 345—145

20 Claims



1. In an interactive computer-controlled drawing system, a method for generating and manipulating a dynamic compass cursor, said method comprising the steps of:

generating a compass cursor in a first orientation, said compass cursor being responsive to movement of a cursor control device;

selecting a geometrical element having a second orientation; and  
automatically re-orienting said compass to said second orientation and maintaining said second orientation until a new orientation for said dynamic compass cursor is selected.

5,774,112  
METHOD AND APPARATUS FOR TONE CORRECTION  
OF A DIGITAL COLOR IMAGE WITH PRESERVATION  
OF THE CHROMATICITY OF THE IMAGE

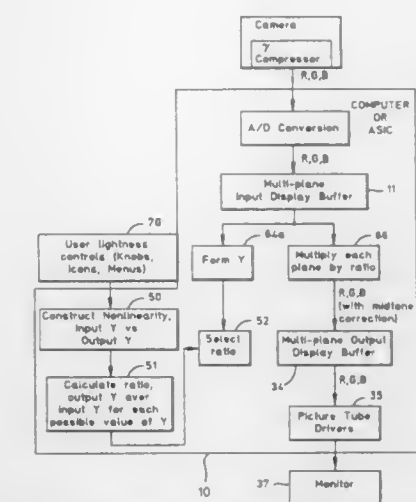
James M. Kasson, Menlo Park, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.  
Continuation of Ser. No. 329,040, Oct. 25, 1994, abandoned.  
This application Dec. 11, 1996, Ser. No. 763,206

Int. Cl.<sup>6</sup> G09G 5/04

U.S. Cl. 345—153

7 Claims

1. An apparatus for modifying colors of pixels in pixel array that represents a color image, comprising:



a source of a pixel array, each pixel in the pixel array including a plurality of color components, each color component representing a respective component of a color space and having a value representing the contribution of the component to a color which the pixel has;

means for providing an adjusted single color attribute value in response to a user-selected selected value.

attribute means coupled to the source for obtaining a single color attribute value for a pixel by combining the values of the pixel's color components;

attribute adjustment means coupled to the attribute means for adjusting the single color attribute value to the adjusted single color attribute value;

color adjustment means coupled to the attribute adjustment means for adjusting the color of the pixel by changing the values of the pixel's color components in response to the adjusted single color attribute value; and

a monitor drive connected to the color adjustment means for producing a monitor drive signal to cause a monitor to display the pixel in response to the pixel's color components.

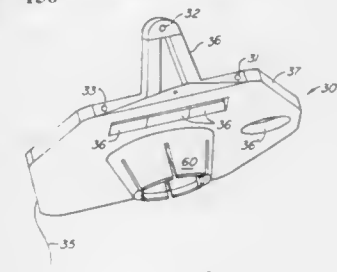
5,774,113  
3-D MOUSE ON A PEDESTAL

James Barnes, Campbell, Calif., assignor to Logitech, Inc., Fremont, Calif.

Continuation of Ser. No. 135,660, Oct. 12, 1993, abandoned, which is a continuation of Ser. No. 801,238, Dec. 3, 1991, abandoned. This application Mar. 6, 1995, Ser. No. 400,625  
Int. Cl.<sup>6</sup> G09G 5/00

U.S. Cl. 345—156

21 Claims



1. An input device for a computer comprising:  
a first, stationary transducer;

a base for supporting said input device on a flat surface;  
a platform for supporting a pointing device;  
a coupling mechanism coupling said platform to said base to allow rotation of said platform about said base;  
a rigid pointer, mounted on said platform to be rotatable in multiple directions relative to said base, said pointer including a plurality of second transducers, each one of said plurality of second transducers being fixed relative to said pointer and to said plurality of second transducers, such that said pointer, platform and plurality of second transducers are a single, rigid unit which rotates about said base;  
means for transmitting signals between said first transducer and said plurality of second transducers;  
control means, coupled to said first and said one of said plurality of second transducers, for providing the computer an attitude of said pointer.

5,774,114

**INPUT APPARATUS FOR CONTROLLING A DISPLAY DEVICE REMOTELY**

Toshio Suzuki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

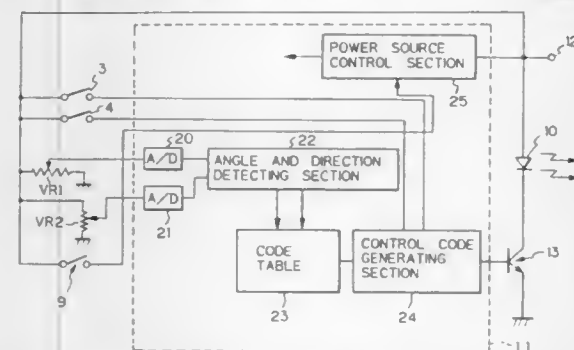
Continuation of Ser. No. 212,998, Mar. 15, 1994, abandoned.

This application Sep. 1, 1995, Ser. No. 522,853

Claims priority, application Japan, Mar. 17, 1993, 5-082810 Int. Cl.<sup>6</sup> G09G 5/08

U.S. Cl. 345—157

5 Claims



1. An input apparatus for controlling a display device by using a screen display of the display device, comprising:  
an operating surface;  
a wireless transmitter;  
cursor moving means for moving a position of a cursor on the screen display of the display device, said cursor moving means having directional input means protruding from said operating surface of said input apparatus and operated by a user for indicating a desired movement of said position of said cursor on the screen display of the display device by a corresponding movement of said directional input means;  
a controller for controlling operation of said input apparatus including:  
an angle and direction detecting circuit responsive to movement of said directional input means,  
memory means for storing a control code table and for receiving an output from said angle and direction detecting circuit for conversion thereof to a corresponding control code from a plurality of control codes arranged in three levels in said control code table based on an angle of inclination and direction of movement of said directional input means relative to said operating surface, said three levels including a first level whereby a moving speed of said cursor on the screen is set to a low speed, a second

level whereby said moving speed of said cursor on the screen is set to a middle speed, and a third level whereby said moving speed of said cursor on the screen is set to a high speed,  
a control code generating circuit for generating a signal representative of the control code output from said control code table, said signal being fed to said wireless transmitter for transmission to the display device, and  
a power supply for supplying power to said controller; and  
switching means coupled with said directional input means of said cursor moving means for switching on said power supply of said controller in accordance with a movement of said directional input means in a predetermined direction relative to said operating surface of said input apparatus.

5,774,115

**CIRCUIT CONTROL PANEL WITH VARIABLE GRAPHICS DISPLAY**

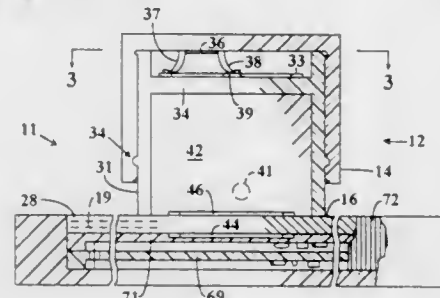
Denny Jaeger, and Kenneth M. Twain, both of Oakland, Calif., assignors to Intertactile Technologies Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 420,438, Apr. 10, 1995, Pat. No. 5,572,239, which is a continuation of Ser. No. 225,782, Apr. 11, 1994, abandoned, which is a continuation-in-part of Ser. No. 147,545, Nov. 5, 1993, abandoned. This application May 10, 1996, Ser. No. 644,795

Int. Cl.<sup>6</sup> G09G 5/00

U.S. Cl. 345—172

22 Claims



1. A control panel for an electrical circuit which control panel has at least one control device that can be manually operated to change an electrical condition in said circuit and which has a power input conductor for receiving electrical energization, said control panel having an electrically controlled flat panel display which displays changeable images that convey information pertinent to operation of the control device, the flat panel display having a transparent cover plate and an image display area thereat, wherein the improvement comprises:  
said control device being attached to said transparent cover plate and being situated at least partially within said image display area, said control panel further including a first coil situated at a location which is behind said cover plate, an electrical power source coupled to said first coil for applying a varying voltage thereto and a second coil situated at a location which is in front of said cover plate and being coupled to said power input conductor of said control device.

5,774,116

**ELECTRIC FUNCTIONAL UNIT AND CATHODE RAY TUBE VISUAL DISPLAY UNIT**

Edmund Pötsch, Königshrunn, Germany, assignor to Siemens Nixdorf Informationssysteme Aktiengesellschaft, Paderborn, Germany

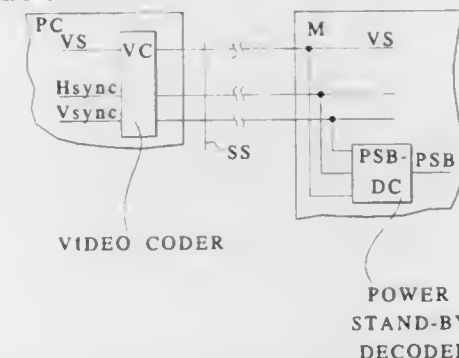
PCT No. PCT/DE93/00056, § 371 Date Jul. 29, 1994, § 102(e) Date Jul. 29, 1994, PCT Pub. No. WO93/15495, PCT Pub. Date Aug. 5, 1993

Continuation of Ser. No. 641,205, Apr. 30, 1996, abandoned, which is a continuation of Ser. No. 256,992, Jul. 29, 1994, abandoned. This PCT application Jan. 25, 1993, Ser. No. 738,731

Claims priority, application Germany, Jan. 31, 1992, 42 02 793.401; Jan. 31, 1992, 42 02 794.2; Jan. 31, 1992, 92 01 166 U Int. Cl.<sup>6</sup> G09G 5/00

U.S. Cl. 345—211

4 Claims



2. In a personal computer and monitor system having a personal computer connected via standard interface to a monitor, said standard interface supplying basic operating signals from said personal computer to said monitor, said monitor being operable at least two energy-saving states, the improvement comprising:  
said standard interface having a personal computer interface side including video coder means for generating and transmitting a coded message via said interface commanding said monitor to enter into a first said at least two energy-saving states at a first point in time and into at least a second of said energy-saving states, different from said first energy-saving state, at a subsequent point in time, said video coder means being serially connected in said personal computer interface side; and  
said standard interface having a monitor interface side including power standby decoder means for receiving and evaluating said coded message and for producing a power standby decoder output for causing, said monitor to assume said first energy-saving state and to assume said second energy-saving state respectively at said first and subsequent points in time, said power standby decoder means being connected in parallel with said monitor interface side.

5,774,117

**METHOD AND APPARATUS FOR EXCHANGING ELECTRONIC BUSINESS CARDS IN A POINT-TO-POINT OR A MULTI-POINT PERSONAL COMPUTER CONFERENCE**

Puneet Kukkal, Hillsboro; Dale Boss, and Sridhar Iyengar, both of Beaverton, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Filed Sep. 29, 1995, Ser. No. 535,628

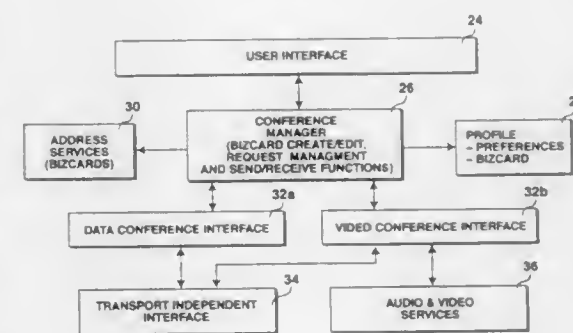
Int. Cl.<sup>6</sup> G06T 11/00

U.S. Cl. 345—330

15 Claims

7. A multi-point personal conferencing system comprising a first, a second and a third PC conferencing system, and a multi-point control unit (MCU), the first, second and third PC conferencing systems being coupled to the MCU and having a first, a second and a third general purpose personal conference (GPPC) application respectively,

wherein each of the GPPC applications includes a conference manager that automatically requests a business card data



structure from a joining conference participant responsive to a join event denoting the joining of one of the other PC conferencing systems to the PC conferencing system in a multi-point computer conference,  
each of the conference managers further includes a first function for managing business card data structure requests from the other PC conferencing systems, and a second function for sending and receiving business card data structures between the PC conferencing system and the other PC conferencing systems in coordination with the first function, and  
the business card data structure includes information commonly found in business cards and, the information are rendered on each of the PC conferencing systems in a format that resembles a business card.

5,774,118

**METHOD AND DEVICE FOR DISPLAYING HELP FOR OPERATIONS AND CONCEPTS MATCHING SKILL LEVEL**

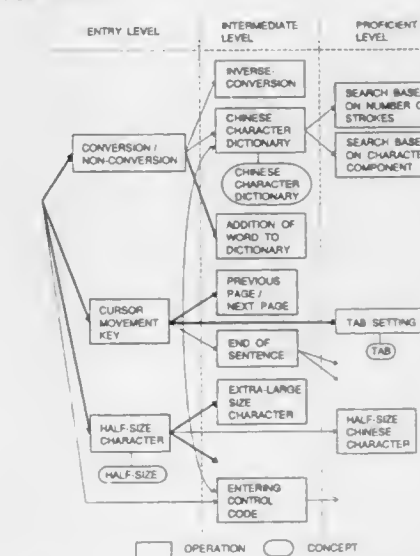
Hiroshi Hatakama, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 22, 1995, Ser. No. 517,684

Claims priority, application Japan, Dec. 13, 1994, 6-308814 Int. Cl.<sup>6</sup> G06F 3/00

U.S. Cl. 345—337

16 Claims



1. A method of displaying help information about operations and concepts used in a device, said method comprising the steps of:  
a) storing skill-development information which shows at least one general pattern of skill development for said operations according to a functional classification of said operations;  
b) storing help documents which describe said operations and said concepts;  
c) storing an operation log which records use of said operations by a user;



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- d) comparing said operation log with said skill-development information so as to determine skill levels of said user according to said functional classification of said operations;
- e) generating from said help documents said help information which matches said skill levels of said user, said help information regarding at least one of said operations and said concepts; and
- f) displaying said help information.

5,774,119

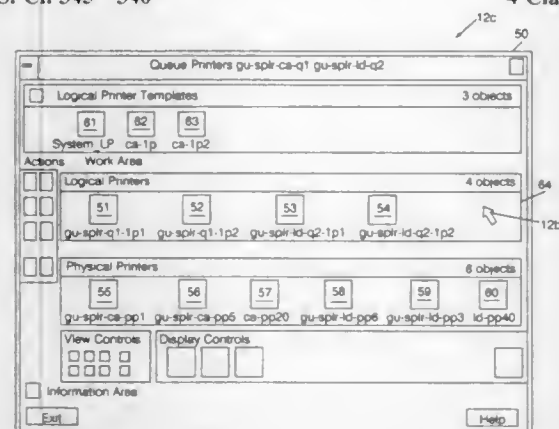
**GRAPHICAL INTERFACE METHOD, APPARATUS AND APPLICATION FOR SELECTION OF TARGET OBJECT**  
Claudia Alimpich; Joan Stagaman Goddard, both of Boulder, and Rachel Youngman Yang, Superior, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 696,750, Aug. 14, 1996, abandoned.  
This application Sep. 18, 1997, Ser. No. 932,507

Int. Cl.<sup>6</sup> G06F 15/00; 3/14

U.S. Cl. 345—340

4 Claims



1. An application for selection of one or more target objects as controlled by a computer system having at least a visual operator interface, an operating system for controlling the operation of program applications within the computer system, and memory for storing a program application therein, said application comprising:

means for selecting an object;

means for ambiguously dragging and dropping the selected object onto a window containing multiple possible target objects, where the selected object is intended to operate on at least one of the possible target objects, but the selected object is not dropped directly onto one or more of the possible target objects and the computer system is not sure which of the possible target objects is intended to be selected;

means for generating a selection window listing all of the possible target objects in response to an ambiguous drop; and

means for selecting in the selection window the one or more possible target objects on which the selected object is to act.

5,774,120

**REFRESH AND SELECT-ALL ACTIONS IN GRAPHICAL USER INTERFACE**

Joan Stagaman Goddard, Boulder, Colo., and Minh Trong Vo, Mountain View, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

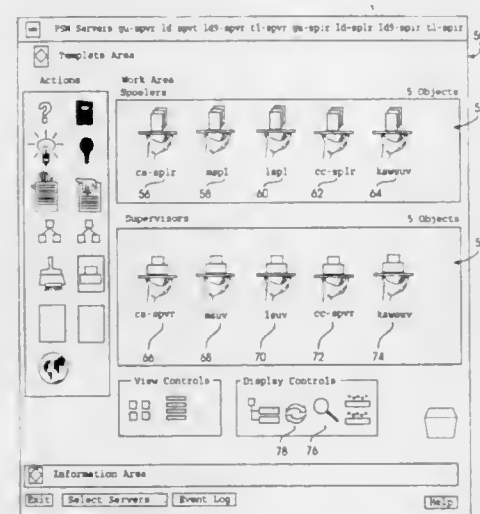
Filed Aug. 14, 1996, Ser. No. 696,751

Int. Cl.<sup>6</sup> G06F 3/00

U.S. Cl. 345—348

4 Claims

1. An application for selecting all objects in a user-selected target as controlled by a computer system having at least a visual operator interface, an operating system for controlling the operation of program applications within the computer system, and memory for storing a program application, the application comprising:



- a Select All function; means for selecting the Select All function;
- means for dragging and dropping the Select All function on a user-selected target;
- if the selected target is one object, means for selecting the object;
- if the selected target is a well, means for selecting all objects in the well;
- if the selected target is a pane, means for selecting all objects in the pane but not selecting objects in wells associated with the pane; and
- if the selected target is an area, means for selecting all objects in the area, but not selecting objects in wells associated with the area.

5,774,121

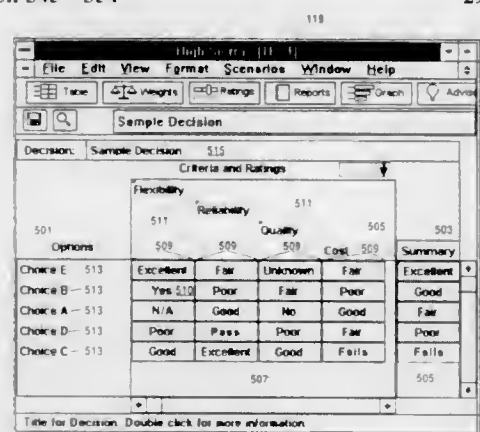
**USER INTERFACE METHOD AND SYSTEM FOR GRAPHICAL DECISION MAKING WITH CATEGORIZATION ACROSS MULTIPLE CRITERIA**  
Marc D. Stiegler, Kingman, Ariz., assignor to Avantis Performance Systems, Inc., Emeryville, Calif.

Filed Sep. 18, 1995, Ser. No. 531,151

Int. Cl.<sup>6</sup> G06F 15/00; 17/00

U.S. Cl. 345—354

29 Claims



1. A computer system providing decision analysis for providing evaluations of a plurality of user defined options with respect to a user defined criterion, comprising:
- a user interface display including an ordered first plurality of category areas distributed along a first axis, and having a plurality of contiguous locations distributed along a second axis, each location along the second axis mapped to a rating within a selected range of numerical ratings, the category areas ordered such that the selected ranges form a numerical sequence, each category area capable of displaying options at

- selected locations along the second axis, the display of an option at a selected location within a category area indicative of a categorical evaluation of the option with respect to the criterion and a selected numeric rating; and
- a pointing device operable by a user to select any option displayed within the user interface display and to position the selected option at a location in a category area to establish a rating corresponding to the displayed location thereto.

5,774,122

**METHOD FOR VISUAL PROGRAMMING WITH AID OF ANIMATION**

Keiji Kojima, Pittsburgh, Pa.; Yoshiki Matsuda, Kokubunji, and Seiji Futatsugi, Inagi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

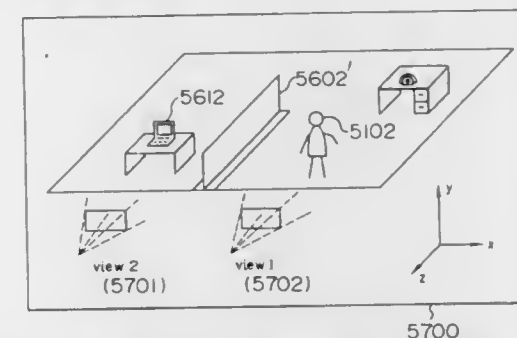
Division of Ser. No. 589,405, Sep. 28, 1990, Pat. No. 5,566,294.  
This application Jun. 7, 1996, Ser. No. 659,805

Claims priority, application Japan, Sep. 29, 1989, 1-251890;  
Apr. 27, 1990, 2-110014

Int. Cl.<sup>6</sup> G06F 3/14; G06T 15/00

U.S. Cl. 345—355

10 Claims



1. An icon displaying method of displaying a plurality of icons selected by an operator on a display device in order to input the icons into a computer as processing targets representing computer resources to be processed by a program, said method comprising the steps of:

projecting onto a plane a plurality of three-dimensional bodies which are arranged in a three-dimensional space and seen from a first view point in order to designate the icons for processing said program; and

displaying each of figures obtained by the processing of said program as one of said plurality of icons.

5,774,123

**APPARATUS AND METHOD FOR ENHANCING NAVIGATION OF AN ON-LINE MULTIPLE-RESOURCE INFORMATION SERVICE**

David J. Matson, San Diego, Calif., assignor to NCR Corporation, Dayton, Ohio

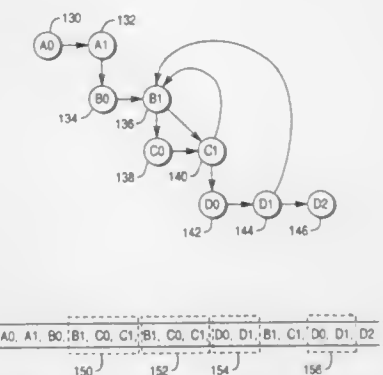
Filed Dec. 15, 1995, Ser. No. 572,980

Int. Cl.<sup>6</sup> G06F 17/30

U.S. Cl. 345—357

19 Claims

1. A method for enhancing computer-implemented navigation of an on-line multiple-resource information service utilizing a navigation agent, comprising the steps of:
- recording navigation information while navigating the information service, wherein the navigation information identifies each location in the on-line resource information service that was traversed while navigating, and wherein the information service is comprised of multiple resources connected to each other and to a computer by one or more networks;
- categorizing the recorded navigation information to associate the recorded navigation information with previously recorded navigation information;



- optimizing the recorded navigation information to remove multiples of the same locations within the navigation information; and
- traversing a navigation path at a pre-established time of day by stepping through the locations recorded in the navigation information.

5,774,124

**FINITE ELEMENT MODELING METHOD AND COMPUTER SYSTEM FOR CONVERTING A TRIANGULAR MESH SURFACE TO A QUADRILATERAL MESH SURFACE**

Takayuki Itoh, Sagami, and Kenji Shimada, Yokohama, both of Japan, assignors to International Business Machines Corporation, Armonk, N.Y.

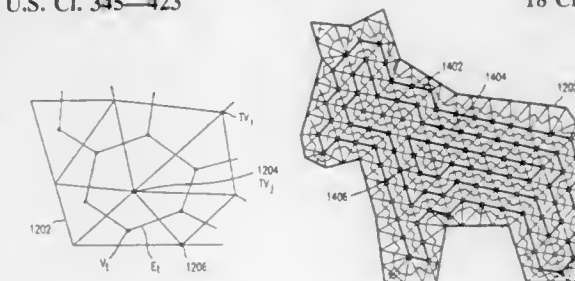
Filed Oct. 27, 1995, Ser. No. 549,361

Claims priority, application Japan, Nov. 7, 1994, 6-271966

Int. Cl.<sup>6</sup> G06T 17/00

U.S. Cl. 345—423

18 Claims



1. A method for converting triangular meshes to quadrilateral meshes in a computer system, the computer system comprising a processor, a means for inputting graphical data, the graphical data comprising at least one surface, the surface being defined by at least one boundary, the surface comprising at least one triangular mesh, the triangular mesh comprising at least one triangle, said triangle having edges and vertices, the method comprising the processor-executed steps of:

(a) for at least one triangle, ascertaining the topological distance from the triangle to the boundary;

(b) dividing the surface into at least one layer, the layer comprising at least one triangle, such that each layer comprises triangles having a topological distance within a predetermined range from the boundary;

(c) for at least one layer, forming at least one group, the group comprising at least one triangle; and

(d) dividing each group into at least three quadrilateral elements.

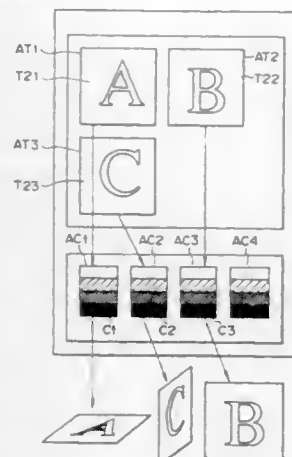
5,774,125

**TEXTURE MAPPING METHOD IN WHICH 3-D IMAGE DATA IS TRANSFORMED INTO 2-D DATA AND MAPPED ONTO A SURFACE OF AN OBJECT FOR DISPLAY**

Masakazu Suzuki, Tokyo, and Makoto Furuhashi, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan  
Continuation-in-part of Ser. No. 154,620, Nov. 18, 1993, Pat. No. 5,537,224. This application Mar. 6, 1996, Ser. No. 611,624  
Int. Cl.<sup>6</sup> G06T 15/00

U.S. Cl. 345—430

14 Claims



1. A real time texture mapping method for producing a two-dimensional image of an object having a surface that has dynamically changing texture by using three-dimensional image data and two-dimensional moving image data, comprising the steps of:

- receiving the three-dimensional image data and the two-dimensional moving image data;
- transforming the three-dimensional image data to respective two-dimensional image data;
- storing the two-dimensional image data in a drawing area of an image memory;
- storing the two-dimensional moving image data frame-by-frame as texture pattern data in a texture area of the image memory; and
- mapping a frame of the moving image data stored in the texture area per vertical display period onto the surface of the object represented by the two-dimensional image data stored in the drawing area of the image memory.

5,774,126

**METHOD AND APPARATUS FOR DYNAMICALLY CHANGING THE COLOR DEPTH OF OBJECTS DISPLAYED IN A COMPUTER SYSTEM**

Amit Chatterjee, Redmond; Stuart T. Laney, Seattle, and Stuart Raymond Patrick, Issaquah, all of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Nov. 27, 1995, Ser. No. 562,801

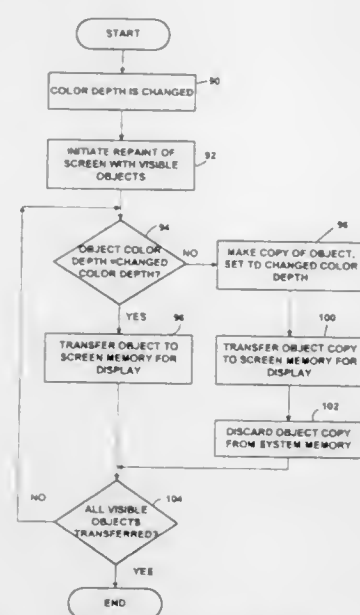
Int. Cl.<sup>6</sup> G06T 11/00

U.S. Cl. 345—431

16 Claims

1. A method for changing the color depth of an object stored as a device dependent bitmap in memory of a computer system in response to a change in the color depth of a display device, the method comprising the following steps:

- determining the changed color depth of the display device;
- finding in system memory an object whose color depth differs from the changed color depth;
- converting the object from a device dependent bitmap to a device independent bitmap, the device independent bitmap having the color depth of the device dependent bitmap;
- changing the color depth of the device independent bitmap to the changed color depth; and



reconverting the device independent bitmap to a device dependent bitmap for the object, the device dependent bitmap having the changed color depth of the device independent bitmap.

5,774,127

Patent Not Issued For This Number

5,774,128

**METHOD OF GRAPHICALLY DISPLAYING AN OBJECT-ORIENTED SCHEMA**

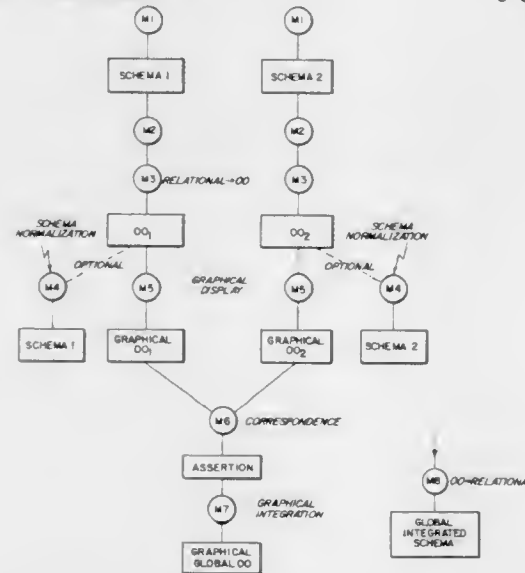
Forouzan Golshani, Paradise Valley; Oris D. Friesen, and Thomas H. Howell, both of Scottsdale, all of Ariz., assignors to Bull HN Information Systems, Inc., Billerica, Mass.

Filed Mar. 26, 1996, Ser. No. 624,725

Int. Cl.<sup>6</sup> G06T 11/00

U.S. Cl. 345—440

3 Claims



1. A method residing in a computer system for graphically displaying a database schema in object-oriented (OO) form; comprising the steps of:

- receiving as an input the textual description of an OO schema;
- parsing the input to identify components of the OO schema;

5,774,130

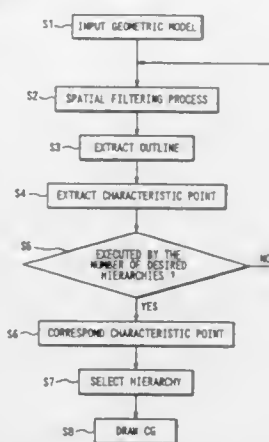
**COMPUTER ANIMATION GENERATOR CREATING HIERARCHIES OF MODELS FOR RAPID DISPLAY**  
Junji Horikawa, Tokyo, and Takashi Totsuka, Chiba, both of Japan, assignors to Sony Corporation, Japan

Filed Aug. 31, 1995, Ser. No. 521,759

Claims priority, application Japan, Sep. 8, 1994, 6-240646  
Int. Cl.<sup>6</sup> G06T 3/40

U.S. Cl. 345—441

21 Claims



1. A drawing method of drawing figure data by selectively using a plurality of drawing models obtained from original figure data by using a hierarchical approximating method, comprising the steps of:

- inputting figure data representing an image of an object;
  - creating a plurality of image data sets representing said object, where each of said data sets is based on said figure data and said image data sets vary as to the degree of detail with which said object is represented;
  - arranging said plurality of image data sets in a hierarchy according to the detail with which said object is represented;
  - selecting an image data set from said plurality of image data sets; and
  - drawing an image of said object on a display using said selected image data set,
- wherein the step of creating a plurality of data sets comprises the steps of:

- executing a spatial filtering process on said input figure data to generate an image data set; and
  - identifying characteristic points from said image data set, and wherein said step of identifying characteristic points for an image data set is performed for each image data set in said plurality of image data sets;
- and said method further comprises matching each characteristic point in each image data set to a corresponding characteristic point in each of the other image data sets of said plurality of image data sets.

5,774,131

**SOUND GENERATION AND DISPLAY CONTROL APPARATUS FOR PERSONAL DIGITAL ASSISTANT**  
Hong Joo Kim, Seoul, Rep. of Korea, assignor to LG Electronics Inc., Seoul, Rep. of Korea

Filed Oct. 24, 1995, Ser. No. 547,226

Claims priority, application Rep. of Korea, Oct. 26, 1994, 27483/1994

Int. Cl.<sup>6</sup> G06F 15/16

U.S. Cl. 345—503

19 Claims

1. A sound generation and display control apparatus for a personal digital assistant, comprising:

- a central processing unit for controlling operations of a system;
- a graphic and sound co-processor for processing graphic and sound data in accordance with a control of said central processing unit;

- creating a connectivity matrix (CM) which provides information as to the number of relationships between any given pair of objects, and partitioning the display screen of a computer into a grid of cells, one of said cells being a center cell, with each cell having the ability to hold an object and the attributes of that object, and placing the object that participates in the maximum number of relationships in the center cell of said grid and placing related objects in adjacent cells; and
- depicting relationships between objects and their attributes by lines, arcs, labels, and arrows, on the computer screen.

5,774,129

**IMAGE ANALYSIS AND SYNTHESIS NETWORKS USING SHAPE AND TEXTURE INFORMATION**

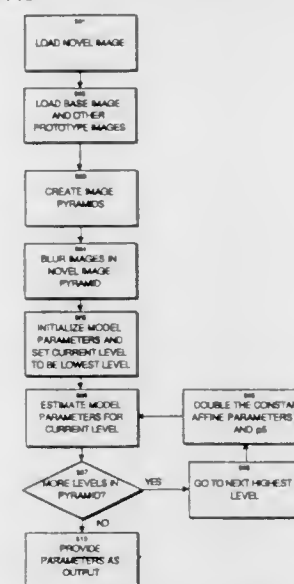
Tomaso Poggio, Wellesley; David Beymer; Michael Jones, both of Cambridge, all of Mass., and Thomas Vetter, Tübingen, Germany, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 7, 1995, Ser. No. 486,637

Int. Cl.<sup>6</sup> G06F 15/00

U.S. Cl. 345—441

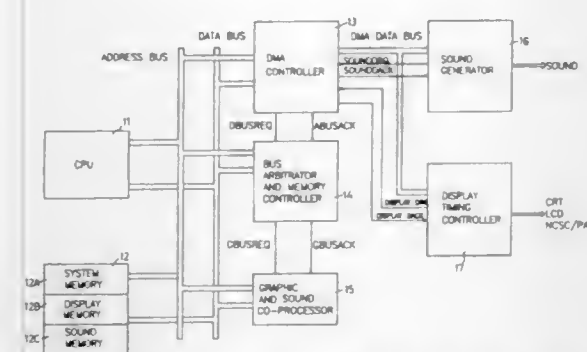
10 Claims



1. A method of synthesizing and operating a network to characterize a new physical image relative to a plurality of prototypes, the prototypes having shapes but no texture, the process comprising:

- synthesizing the network by:
  - determining pointwise prototype correspondences among the plurality of prototypes;
  - creating a model responsive to the pointwise prototype correspondences, the model being a parameterized pointwise weighted linear combination of the shapes of the prototypes;
- operating the network by:
  - filtering and normalizing the new image;
  - determining model parameters to iteratively minimize a pointwise distance metric from the new image to the model, the pointwise distance metric being responsive to shape, thereby establishing new image pointwise correspondences between the new image and each said prototype; and
  - characterizing the new image by the model parameters and the new image pointwise correspondences.





- a memory for storing the graphic and sound data processed by said graphic and sound co-processor and for storing system data;
- a direct memory access (DMA) controller for accessing the graphic data, the sound data and the system data stored in said memory;
- a bus arbitrator and memory controller for arbitrating an allocation of a system bus and for controlling an access to the memory;
- a sound generator for receiving the sound data outputted from the memory through said DMA controller and for generating a sound corresponding to the sound data; and
- a display timing controller for receiving display data from the memory through the DMA controller and for processing the display data so as to display the display data on a display unit, wherein said graphic and sound co-processor includes:
- a graphic engine for generating the graphic data;
  - an arithmetic logic operator for executing an operation so as to generate the graphic data; and
  - a sound engine for generating the sound data, and
- wherein the display timing controller overlays the graphic data of the memory and video data externally input thereto.

5,774,132  
VIDEO CAPTURE COMPUTER SYSTEM USING LOCAL  
MEMORY FOR TEXTURE MAPPING

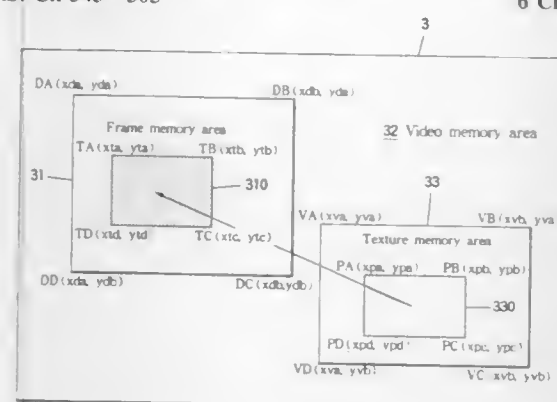
Toshimi Uchiyama, Hamamatsu, Japan, assignor to Yamaha Corporation, Hamamatsu, Japan

Filed Oct. 26, 1995, Ser. No. 547,719

Claims priority, application Japan, Oct. 28, 1994, 6-289065  
Int. Cl.<sup>6</sup> G06F 15/16

U.S. Cl. 345—503

6 Claims



1. A graphic apparatus connected between a host computer and a monitor for admitting video data from a video source to display a picture on the monitor according to commands from the host computer, the graphic apparatus comprising:
- local memory means provided separately from the host computer, and being functionally divided into a video memory area for storing video data including those representing a graphic pattern and a frame memory area for storing video data representing a picture to be displayed;

admitting means operative in response to an admission command from the host computer for admitting video data from the video source and reserving the admitted video data in the video memory area;

driver means operative in response to a drive command from the host computer for transferring the video data from the frame memory area to the monitor so as to display the picture; and

drawing means responsive to a drawing command from the host computer and including first means for setting a first region within the video memory area to cut out a desired graphic pattern representing a desired texture pattern, second means for setting a second region within the frame memory area to define a desired space in the picture, and third means for transferring the video data from the first region to the second region to map the desired texture pattern to the desired space in the picture.

5,774,133  
COMPUTER SYSTEM WITH IMPROVED PIXEL  
PROCESSING CAPABILITIES

John Walter Neave, Los Altos, Calif.; Neil F. Trevett, Kingston-upon-Thames, United Kingdom; Jonathan David Salkild, deceased, late of Worcester Park, United Kingdom, by David Joseph Salkild, heir, and Iain Stuart MacNaughton, Sutton, United Kingdom, assignors to 3Dlabs Ltd., Egham Surrey, United Kingdom

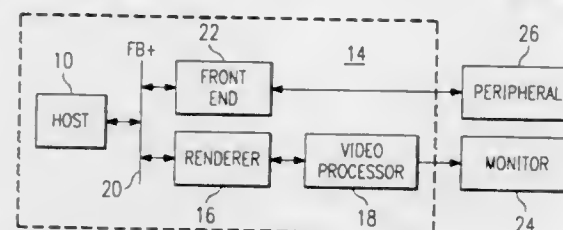
Filed Jul. 7, 1993, Ser. No. 88,725

Claims priority, application United Kingdom, Jan. 9, 1991, 9100357; Jan. 9, 1991, 9100358; Jan. 9, 1991, 9100359; Jan. 9, 1991, 9100360; Jan. 9, 1991, 9100361; Jan. 9, 1991, 9100362

Int. Cl.<sup>6</sup> G06F 15/80

U.S. Cl. 345—505

25 Claims



9. A computer system, comprising:
- a display providing a large number of selectably visible pixels; at least one central processing unit which manipulates graphical objects in an image space containing at least as many pixels as the number of pixels in said display;
  - an image memory, containing at least as many addressable pixel data locations as the number of pixels in said display;
  - a display driver, which can access said pixel data locations in said image memory and drive said display, in accordance therewith, to produce a viewable image corresponding to the data stored in at least some pixel data locations in said image memory; and
  - a pixel processing unit, connected to receive data which defines positions of graphical objects from said central processing unit, and accordingly to write pixel data into said image memory;
- wherein said pixel processing unit is connected for parallel access to said image memory, such that said pixel processing unit normally reads or writes data for a plurality of pixel locations, corresponding to a patch of pixels which are contiguous in said image space, in each single access to said image memory;
- and wherein said central processing unit is operable to command a line to be drawn between two specified endpoints, and in response thereto said pixel processing unit;
- incrementally selects the appropriate pixel patches for manipulation, by a method wherein a cumulative error term is carried forward from one patch to the next;
- accesses locations in said image memory corresponding to successively selected patches of pixels, and performs an interpolation operation to determine which pixels of each respective

patch are part of said line, and selectively writes corresponding data, for the thus-determined pixels of said respective patch, into said image memory;

wherein any two sequentially selected ones of said patches of pixels adjoin, in said image space, along an entire side of each patch;

wherein said display driver produces an image on said display which at least partially includes the pixels rendered by said pixel processing unit; and

wherein said pixel processing unit, prior to accessing data for a first one of said patches of pixels, selects first and second orthogonal directions, in accordance with the slope of said line, such that the positional offset of each said subsequent patch in said second direction cannot be greater than the positional offset thereof in said first direction.

5,774,134  
GRAPHIC DISPLAY DEVICE HAVING FUNCTION OF  
DISPLAYING TRANSFER AREA

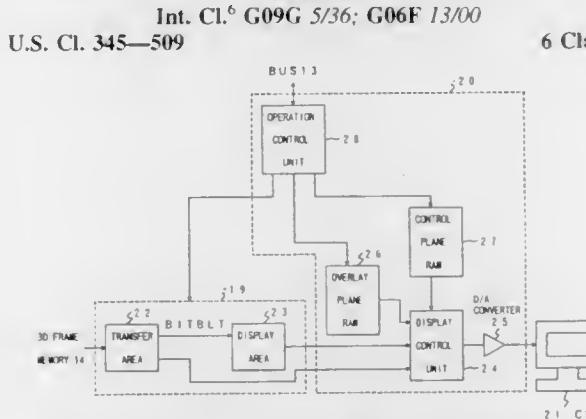
Hideki Saito, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 314,691, Sep. 29, 1994, abandoned, which is a continuation-in-part of Ser. No. 288,723, Aug. 15, 1994, abandoned. This application Jun. 13, 1997, Ser. No. 874,579

Int. Cl.<sup>6</sup> G09G 5/36; G06F 13/00

U.S. Cl. 345—509

6 Claims



1. A graphic display device for displaying image data provided from a memory comprising:
- transfer memory means for storing the image data transferred from said memory;
  - display memory means for storing the image data transferred from said transfer memory means;
  - display means for displaying the image data supplied from an image source, said image source being said display memory means in a first operation mode of said graphic display device so that said display means displays said image data without visible flickers and without interfering with data transfer from said memory to said transfer memory means; and
  - switching means for selecting said image source from said display memory means or said transfer memory means, so that said display means can display said image data stored in said transfer memory means by bypassing said display memory means in a second operation mode of said graphic display device to allow a user to check whether said image data stored in said transfer memory means contains an error.

5,774,135  
NON-CONTIGUOUS MEMORY LOCATION ADDRESSING  
SCHEME

Lawrence Letham, Chandler, Ariz., assignor to VLSI Technology, Inc., San Jose, Calif.

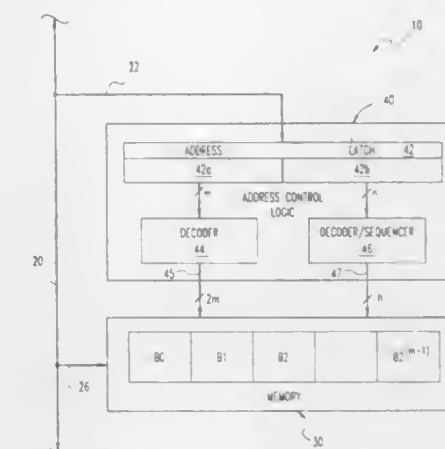
Filed Nov. 5, 1996, Ser. No. 743,992

Int. Cl.<sup>6</sup> G06F 12/06

U.S. Cl. 345—516

19 Claims

1. A method of transferring digital information, comprising:



- (a) generating an address having a first number of bits and a second number of bits;
- (b) transmitting the address to a digital device with a memory, the memory including a number of independently accessible multi-bit storage registers;
- (c) decoding the first number of bits to select a contiguously addressable group of at least 4 of the registers;
- (d) selecting a non-contiguous combination of the registers in the group as a function of the second number of bits, the second number of bits being configured to provide a different bit pattern for each different non-contiguous set of the registers in the group, the patterns each being selectable to provide a correspondingly different set for the combination; and
- (e) writing multi-bit data to each of the registers of the combination.

5,774,136  
ULTRASONIC METHOD FOR MONITORING INKJET  
CARTRIDGE LEVELS

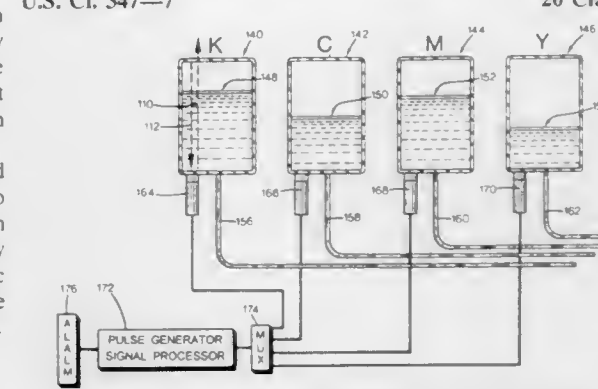
George Barbehenn, Vancouver, Wash., and Martin K. Mason, Andover, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 21, 1995, Ser. No. 561,470

Int. Cl.<sup>6</sup> B41J 2/195; G01F 23/296

U.S. Cl. 347—7

20 Claims



1. A method of monitoring the inklevel in an ink reservoir of a replaceable ink jet cartridge installed in a printing mechanism for reciprocating back and forth across a print media, comprising the steps of:
- (a) sending an ultrasonic signal towards the ink reservoir;
  - (b) receiving a series of reflected ultrasonic signals from the reservoir; and
  - (c) processing the series of received reflected ultrasonic signals in order to determine the ink level in the reservoir.

5,774,137

## INK JET PRINTER

Yasunari Yoshida, Aichi-ken, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

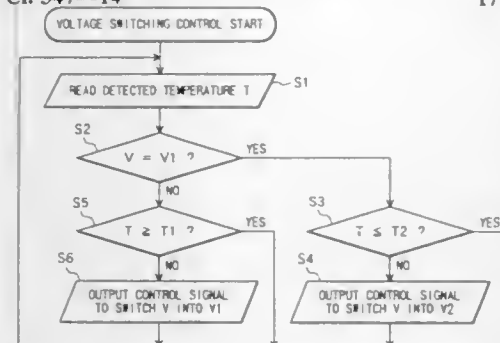
Filed Dec. 9, 1996, Ser. No. 762,146

Claims priority, application Japan, Dec. 9, 1995, 7-345694

Int. Cl.<sup>6</sup> B41J 29/38

U.S. Cl. 347—14

17 Claims



1. An ink jet printer for ejecting ink onto a recording medium, the inkjet printer comprising:

a recording head capable of ejecting ink onto a recording medium;

driving energy supplying means for supplying driving energy to the recording head so as to control the recording head to eject ink;

temperature detection means for detecting data indicative of temperature of the recording head;

driving energy switching means for switching the driving energy in a predetermined plurality of different levels; and

switching control means for receiving the detected data and for controlling the driving energy switching means based on a pair of threshold points determined for every two adjacent levels of the plurality of different levels, the pair of threshold points including a first threshold point and a second threshold point, the first threshold point being determined for switching the driving energy from a lower level toward a higher level of the corresponding two adjacent levels, the second threshold point being determined for switching the driving energy from the higher level toward the lower level.

5,774,138

Patent Not Issued For This Number

5,774,139

## VERTICAL AXIS SERVICE STATION ADJUSTMENT DEVICE AND METHOD

Mark L. Salzer; Bret K. Taylor, and Allan D. Donley, all of Vancouver, Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 667,610, Jul. 3, 1996, which is a continuation-in-part of Ser. No. 509,070, Jul. 31, 1995.

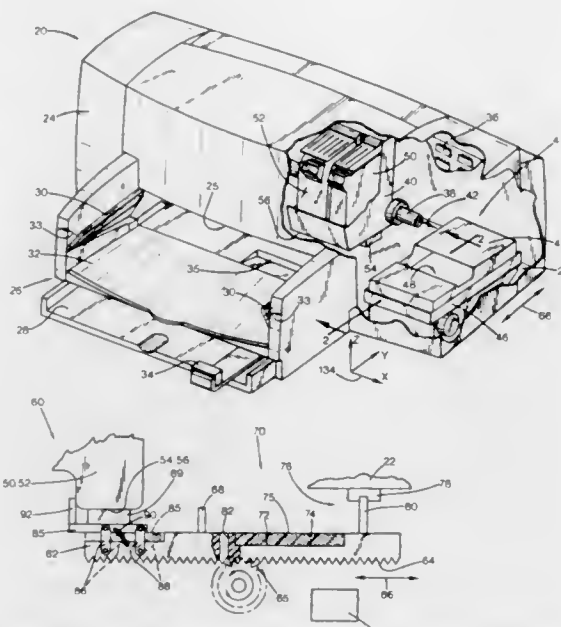
This application Oct. 21, 1996, Ser. No. 734,655

Int. Cl.<sup>6</sup> B41J 2/165

U.S. Cl. 347—32

17 Claims

14. An inkjet printing device, comprising:  
a chassis, the chassis defining a plane;  
a printing mechanism, the printing mechanism including an inkjet printhead that prints an image;



a service station that services the inkjet printhead, the service station being coupled to the chassis; and  
frame means slideably mounted on the chassis and coupled to the service station for moving the service station at an angle to the plane defined by the chassis upon translation of the frame means along the plane defined by the chassis.

5,774,140

## SKIP STROKE WIPING SYSTEM FOR INKJET PRINTHEADS

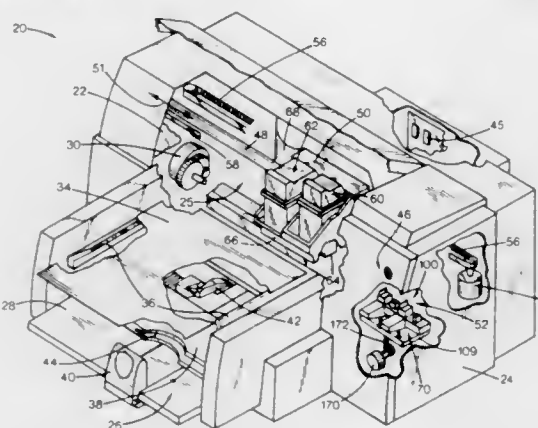
Kris M. English, Portland, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 558,561, Oct. 31, 1995. This application Feb. 29, 1996, Ser. No. 610,104

Int. Cl.<sup>6</sup> B41J 2/165

U.S. Cl. 347—33

25 Claims



1. A method of cleaning an inkjet printhead in an inkjet printing mechanism, with the printhead having an orifice plate, and first and second outboard regions located along two opposing sides of the orifice plate, the method comprising the steps of:

first wiping ink residue from the orifice plate onto the first outboard region without touching the second outboard region; and  
second wiping ink residue from the orifice plate onto the second outboard region without touching the first outboard region.

5,774,141

## CARRIAGE-MOUNTED INKJET AEROSOL REDUCTION SYSTEM

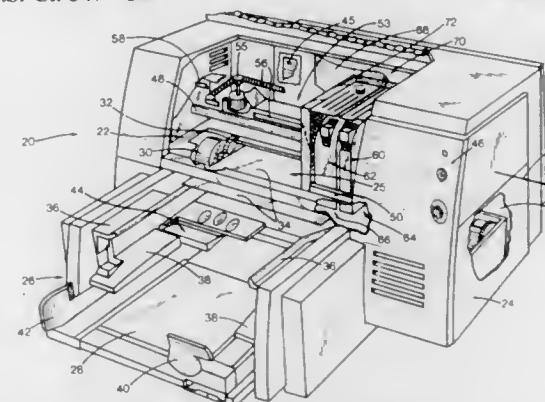
Brently L. Cooper, Brush Prairie; Jeffrey G. Patrick, Vancouver; Donald R. Boyer, Brush Prairie; Larry G. Neubauer, Vancouver, all of Wash., and Robert K. Beretta, Cambridge, Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Oct. 26, 1995, Ser. No. 548,836

Int. Cl.<sup>6</sup> B41J 2/165; 2/175

U.S. Cl. 347—34

24 Claims



1. An inkjet printing mechanism, comprising:  
a stationary enclosure;

an inkjet printhead that selectively ejects ink within the enclosure to print an image on a print media and that concurrently generates airborne ink aerosol within the enclosure, with the airborne ink aerosol failing to contact the print media to print the image;

a carriage that reciprocally moves the printhead through the enclosure to print the image; and

a passive ink aerosol collection system having an electrostatic collection member supported by the carriage for movement through the enclosure to encounter and entrap at least a portion of the airborne ink aerosol floating therein both adjacent to the printhead and remote from the printhead.

5,774,142

## USE OF A SECONDARY SPITTOON FOR WASTED INK CONTAINMENT

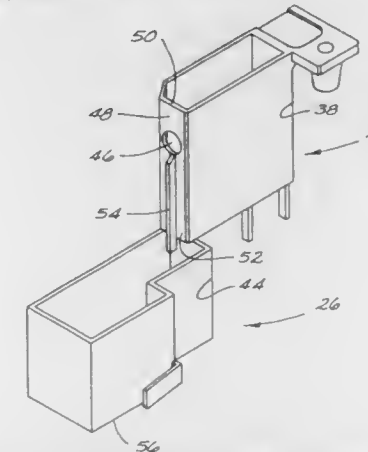
Chan Nguyen, San Diego, Calif., and Alan Shibata, Camas, Wash., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 342,186, Nov. 18, 1994, abandoned. This application Jan. 3, 1997, Ser. No. 774,711

Int. Cl.<sup>6</sup> B41J 2/165

U.S. Cl. 347—35

19 Claims



1. A method of preventing the overflow of ink from a primary spittoon used in a service station of an ink-jet device, into which

ink is jetted from nozzles of an ink-jet printhead in a print cartridge, said method comprising:

- providing a primary spittoon into which waste ink is jetted, said primary spittoon comprising a container having a bottom and side walls, each of said side walls having a top and at least one of said side walls having an opening through which said waste ink issues from said primary spittoon, thereby forming spillover ink, said primary spittoon secured in a fixed position;
- providing a secondary spittoon comprising a container having a bottom and side walls, fixedly secured beneath said primary spittoon;
- providing a passageway on said primary spittoon to route said spillover ink issued from said opening directly to said secondary spittoon such that said spillover ink routed by said passageway issues from said passageway into said secondary spittoon by force of naturally-occurring gravity; and
- collecting said spillover ink issued from said primary spittoon in said secondary spittoon.

5,774,143

## DOT-MATRIX TYPE PRINTING SYSTEM

Masaaki Hori, Tajimi, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

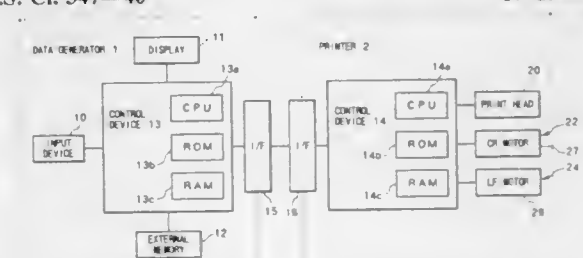
Filed Jun. 7, 1996, Ser. No. 657,904

Claims priority, application Japan, Jun. 7, 1995, 7-140318

Int. Cl.<sup>6</sup> B41J 2/145

U.S. Cl. 347—40

17 Claims



1. A dot matrix printing system for printing dots, the system comprising:

- a print head having a plurality of printing elements arranged at a predetermined pitch in a direction substantially perpendicular to a line printing direction;
- conveying means for conveying one of the print head and a printing medium in the line printing direction relative to the other one of the print head and the printing medium;
- feed means capable of feeding, at a feed pitch different from the predetermined pitch, one of the print head and the printing medium relative to the other one of the print head and the printing medium in a feed direction which is perpendicular to the line printing direction;
- pattern generating means for generating a printing pattern data desired to be printed by the printing elements;
- correspondence change means for changing a correspondence between arrangements of the printing pattern data in the feed direction and of the printing elements; and
- control means for controlling a feed amount desired to be attained by the feed means and for supplying the correspondence change means with information on a desired correspondence between the arrangements of the printing elements and of the printing pattern data in the feed direction, the feed amount and the information being determined based on a position desired to be printed with the printing pattern data.



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5,774,144

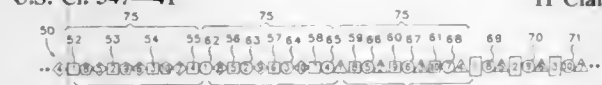
**IMAGE INTERLACING AND JOINING IN A PRINTER**  
Joern B. Eriksen, Oregon City, Oreg., assignor to Tektronix, Inc., Wilsonville, Oreg.

Filed Aug. 1, 1995, Ser. No. 509,843

Int. Cl.<sup>6</sup> B41J 2/145; 2/15; 2/21

U.S. Cl. 347—41

11 Claims



1. A method for printing an interlaced image using a print head having a plurality of nozzles, each pair of adjacent nozzles having a predetermined internozzle spacing of  $N$  pixel widths, the method comprising the steps of:

- printing a plurality of sets of scan lines in a Y-axis direction on a rotating receiving surface, the plurality of sets of scan lines including at least a first set of scan lines and a second set of scan lines; and
- interlacing said plurality of sets of scan lines on the rotating receiving surface in an X-axis direction within a single print band by use of an interlace ratio  $n_1$  that is an integer divisor of the internozzle spacing  $N+2$ .

5,774,145

**INK JET PRINT HEAD AND IMAGE RECORDING APPARATUS**

Naoki Morita; Naoshi Kotake, and Yutaka Mori, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

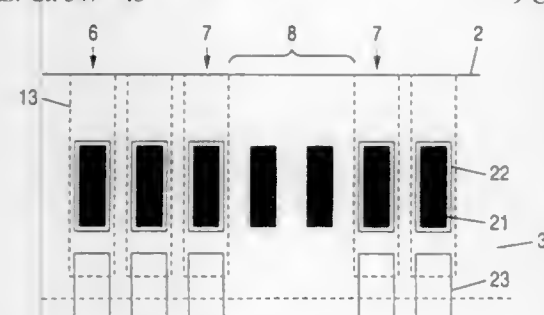
Filed Apr. 22, 1996, Ser. No. 635,628

Claims priority, application Japan, Apr. 27, 1995, 7-103662

Int. Cl.<sup>6</sup> B41J 2/145; 2/14

U.S. Cl. 347—43

9 Claims



1. An ink jet print head comprising: nozzles for jetting ink of a plurality of different colors for performing printing/recording, and at least two dummy nozzles which are not used for performing printing/recording, are provided between said nozzles, wherein

a space which is wide enough to dispose therein two or more nozzles is provided between the at least two dummy nozzles, the space being free from nozzles and dummy nozzles.

5,774,146

**COLOR PRINT OUTPUT APPARATUS ADAPTIVE TO PAPER TYPES**

Norio Mizutani, Aichi-ken, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Aug. 30, 1996, Ser. No. 705,803

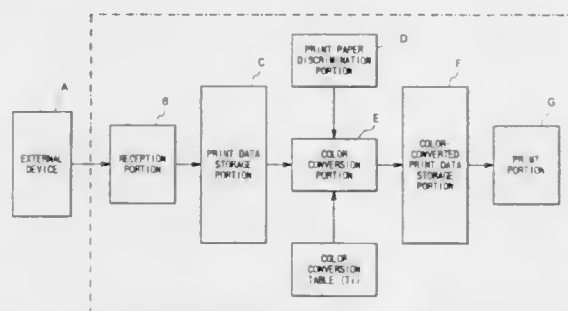
Claims priority, application Japan, Sep. 1, 1995, 7-224967

Int. Cl.<sup>6</sup> B41J 2/21

U.S. Cl. 347—43

19 Claims

1. A print output device for outputting a desired print output, the device comprising:



instruction reception means for receiving print instruction supplied from an external device;

data production means for producing print data based on the received print instruction;

print paper kind discrimination means for discriminating a kind of paper desired to be printed;

color-conversion means for performing a color-conversion on the print data, the color-conversion being dependent on the discriminated kind of paper, the color-conversion means including table storage means for previously storing a plurality of color-conversion tables each defining a color-conversion suited for a corresponding one of a plurality of kinds of paper and table selection means for selecting one color-conversion table corresponding to the discriminated kind of paper, the table selecting means performing, on the print data, a color-conversion defined by the selected color-conversion table to thereby produce color-converted print data suited for the kind of paper desired to be printed; and print means for obtaining a print output on the desired paper with the color-converted print data.

5,774,147

**SUBSTRATE HAVING A COMMON COLLECTOR REGION AND BEING USABLE IN A LIQUID JET RECORDING HEAD**

Asao Saito, Fujisawa; Tsutomu Kato, and Ryoichi Koizumi, both of Atsugi, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

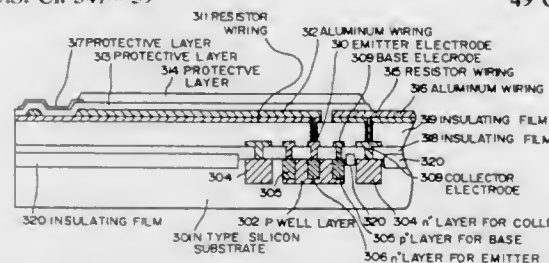
Continuation of Ser. No. 754,188, Aug. 28, 1991, abandoned, which is a continuation of Ser. No. 625,704, Dec. 11, 1990, abandoned, which is a continuation of Ser. No. 385,071, Jul. 25, 1989, abandoned. This application Dec. 21, 1993, Ser. No. 170,633

Claims priority, application Japan, Jul. 26, 1988, 63-184696

Int. Cl.<sup>6</sup> B41J 2/05

U.S. Cl. 347—59

49 Claims



1. In a substrate for a liquid jet recording head: electricity-heat converting elements for generating heat energy for discharging a liquid; and

a plurality of transistors for individually driving said electricity-heat converting elements, each of said plurality of transistors being electrically connected to a corresponding one of said electricity-heat converting elements, wherein each of said plurality of transistors includes a base region, an emitter region and a collector region, each emitter region being electrically connected to a corresponding one of said electricity-

heat converting elements, and wherein the collector region is provided in common to each of said plurality of transistors and surrounds the base region and emitter region of each transistor, the collector regions, the base regions and the emitter regions comprising a semiconductor,

5,774,148

**PRINTHEAD WITH FIELD OXIDE AS THERMAL BARRIER IN CHIP**

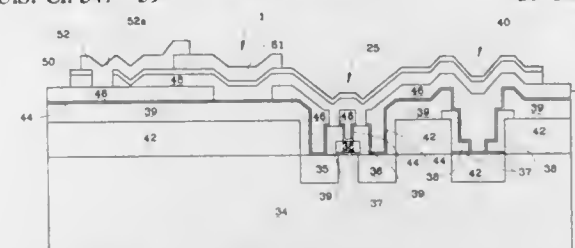
Robert Wilson Cornell, and Lawrence Russell Steward, both of Lexington, Ky., assignors to Lexmark International, Inc., Lexington, Ky.

Filed Oct. 19, 1995, Ser. No. 545,126

Int. Cl.<sup>6</sup> B41J 2/05

U.S. Cl. 347—59

10 Claims



1. A thermal ink jet cartridge to contain ink for ink jet printing by nucleation by heat from heater elements of a silicon semiconductor chip, said chip comprising a plurality of resistors for carrying current to produce said heat to cause nucleation, a plurality of field effect transistors (FET's), a different one of said FET's being connected to each one of said resistors to control said current to said resistor to which said FET is connected, a layer of boron-phosphorus doped silicate glass (BPSG) immediately under said plurality of resistors, and a layer of silicon containing thermal insulator immediately under said layer of BPSG.

5,774,149

**INK JET RECORDING HEAD AND APPARATUS**  
Eiichiro Shimizu, Urawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

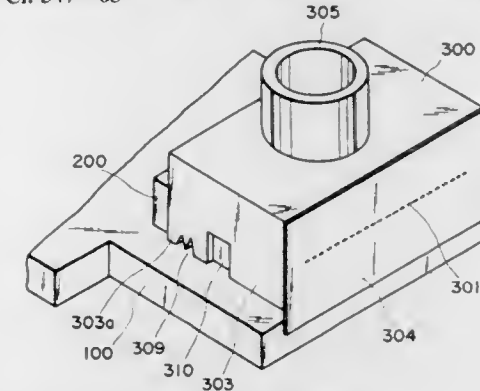
Filed Aug. 22, 1995, Ser. No. 517,682

Claims priority, application Japan, Aug. 24, 1994, 6-199853

Int. Cl.<sup>6</sup> B41J 2/05

U.S. Cl. 347—63

10 Claims



1. An ink jet recording head comprising: a plurality of ejection outlets; a top plate having a plurality of recesses and a plurality of walls defining a common ink chamber therein for containing ink; and a substrate having an edge, said substrate being joined to said top plate along a joint defining a plane having a direction, said substrate and said top plate together forming ink paths con-

nected to said plurality of ejection outlets through which ink is ejected from said common ink chamber, with said recesses facing said common ink chamber with said plurality of ejection outlets at a first one of said walls, said substrate having a thickness direction,

wherein said top plate overhangs from said edge of said substrate in said direction of said plane, said top plate having two overhanging portions extending in the thickness direction of said substrate, said overhanging portions having a cutaway portion, said substrate being disposed between said overhanging portions.

5,774,150

**METHOD FOR MANUFACTURING INK JET HEAD, INK JET HEAD MANUFACTURED BY SUCH A METHOD, AND INK JET APPARATUS PROVIDED WITH SUCH A HEAD**

Junichi Kobayashi, Ayase; Keiichi Mural, Yokohama; Shigeo Toganoh, Tokyo; Toshiaki Sasaki, Abiko, and Hajime Yamamoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 70,258, Jun. 2, 1993, abandoned.

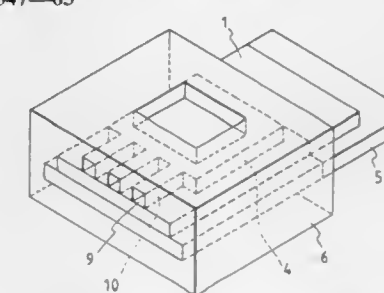
This application Jan. 3, 1997, Ser. No. 778,283

Claims priority, application Japan, Jun. 4, 1992, 4-144503; Jun. 29, 1992, 4-171193; Jun. 29, 1992, 4-171194; Jun. 29, 1992, 4-171195; Jun. 29, 1992, 4-171196; Jun. 29, 1992, 4-171197

Int. Cl.<sup>6</sup> B41J 2/05

U.S. Cl. 347—63

7 Claims



1. A method for manufacturing an ink jet head having a liquid path, comprising the steps of:

preparing a substrate having a first side and a second side, the second side being a backside of the first side, and having disposed on said first side an ink discharge energy generating element for discharging ink;

joining a support member having a high thermal conductivity, a top side and a bottom side to the second side of said substrate, said second side facing said top side of said support member; providing a dissolvable solid layer for forming a liquid path pattern corresponding to said liquid path on said first side of said substrate in correspondence with said discharge energy generating element, said substrate, said support member, and said dissolvable solid layer together forming an assembly;

coating a resin for forming a liquid path wall by transfer molding on the assembly, in which the substrate is joined to a part of the support member, so that both said first side of said substrate and a portion on said bottom side of said support member corresponding to said substrate are coated with said resin, defining a coating area, and a region of said support member projects beyond said coating area; and forming said liquid path by dissolving and removing said dissolvable solid layer.

5,774,151  
LIQUID EJECTING HEAD, LIQUID EJECTING  
APPARATUS AND METHOD OF PRODUCING SAID  
LIQUID EJECTING HEAD

Hiroshi Sugitani, Machida; Masaki Inaba, Kawasaki; Masami Ikeda; Yutaka Koizumi, both of Yokohama; Masami Kasamoto, Ayase; Tsuyoshi Orikasa, Musashimurayama; Makiko Kimura, Sagami; Toshio Kashino, Chigasaki; Seiichiro Karita, Yokohama; Haruhiko Terao, Yokohama, and Akira Goto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

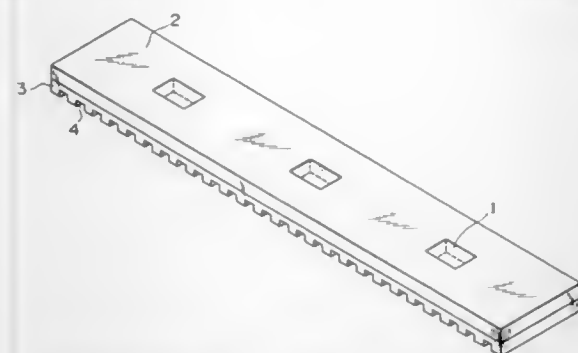
Continuation of Ser. No. 693,541, Aug. 7, 1996, abandoned, which is a continuation of Ser. No. 593,475, Jan. 29, 1996, abandoned, which is a continuation of Ser. No. 175,514, Dec. 30, 1993, abandoned. This application Sep. 11, 1997, Ser. No. 927,636

Claims priority, application Japan, Jan. 1, 1993, 5-014415; Dec. 17, 1993, 5-318737

Int. Cl.<sup>6</sup> B41J 2/05

U.S. Cl. 347-63

42 Claims



1. A liquid ejecting head for ejecting a liquid, comprising:  
a base plate having a plurality of liquid ejecting elements for ejecting the liquid; and  
a grooved member having a plurality of grooves constituting a plurality of liquid paths formed thereon corresponding to said liquid ejecting elements, said grooved member being connected to said base plate and composed of a grooved element made of a material having a thermal expansion coefficient and having said grooves formed thereon and a supporting member for supporting said grooved element thereon, said supporting member comprising a material having a thermal expansion coefficient that is lower than that of the material constituting said grooved element.

5,774,152  
INK JET RECORDING HEAD AND METHOD  
MANUFACTURING THEREOF

Yumiko Namba, and Koji Ikegami, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 12, 1996, Ser. No. 631,091

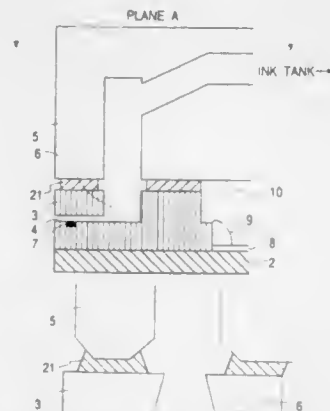
Claims priority, application Japan, Apr. 25, 1995, 7-099326

Int. Cl.<sup>6</sup> B41J 2/05

U.S. Cl. 347-65

8 Claims

1. An ink jet recording head comprising:  
a jetting element member having  
a plurality of nozzles;  
an energy generating body for jetting ink droplets out of said nozzles; and  
an ink chamber communicating with said nozzles;  
an ink flow path member supplying an ink to said ink jetting element member, wherein end portions of the ink flow path member are chamfered and have sloped surfaces; and  
an ink containing member,  
wherein  
an internal pressure within an ink flow path from said ink containing member to said nozzles is held at a value smaller than the atmospheric pressure;



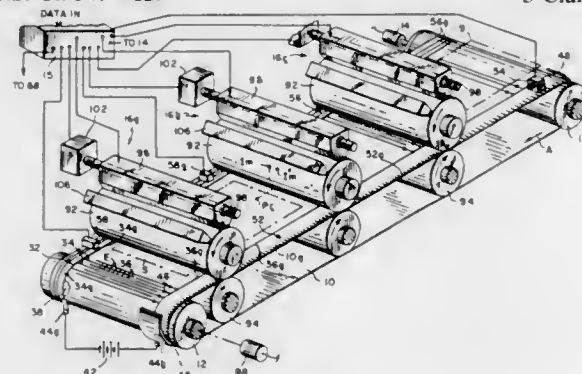
at least part of said ink flow path member and said jetting element member are bonded by an adhesive, wherein said adhesive extends to said end portions having sloped surfaces and forms a part of said ink flow path, and said ink flow path is smoothly shaped at a portion bonded by said adhesive.

5,774,153  
DIGITAL PRECISION POSITIONING SYSTEM  
Manfred R. Kuchnle, New London, N.H., and Steven O. Cormier, Leominster, Mass., assignors to Heidelberger Druckmaschinen Aktiengesellschaft, Germany  
Continuation-in-part of Ser. No. 195,279, Feb. 14, 1994, abandoned, which is a continuation-in-part of Ser. No. 792,810, Nov. 15, 1991, Pat. No. 5,325,120. This application Apr. 20, 1995, Ser. No. 425,273

Int. Cl.<sup>6</sup> B41J 2/385; G03G 13/04; 9/08

U.S. Cl. 347-129

3 Claims



1. A positioning system comprising  
a support;  
a pair of spaced-apart rollers rotatably mounted to the support parallel to one another, each roller having a cylindrical surface and an axis of rotation;  
an endless belt loop engaged around and stretched between said rollers to form an upper belt stretch and a lower belt stretch, said belt loop having an outer surface for receiving a substrate;  
means for rotating at least one of said rollers so that the upper belt stretch moves in a selected longitudinal direction perpendicular to said roller axes;  
an electrostatic hold down grid incorporated into the cylindrical surface of at least one of said rollers, said grid including first and second arrays of electrodes, and  
a voltage source for applying an electrical potential difference between the first and second arrays of electrodes to produce electrostatic fields emanating from said cylindrical surface which are sufficiently strong to inhibit slippage of the belt loop relative to the cylindrical surface when said one of said rollers is rotated.

5,774,154  
APPARATUS FOR PRIMING AN INK DELIVERY  
SYSTEM IN AN INK-JET PRINTER

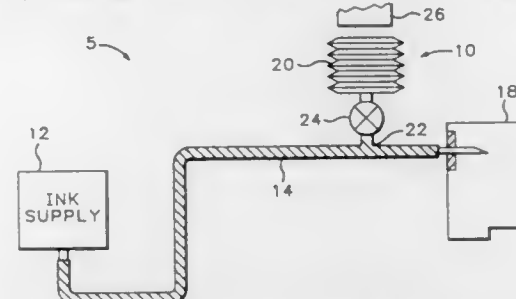
John A. Underwood, Vancouver, Wash., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 7, 1996, Ser. No. 610,821

Int. Cl.<sup>6</sup> B41J 2/175

U.S. Cl. 347-85

8 Claims



8. For use in an ink-jet printer including an ink delivery conduit extending between an upstream ink source and a downstream ink destination, an apparatus for selectively purging and priming the conduit, the apparatus comprising:

a pump mechanism including a bellows in fluid communication with the ink delivery conduit, said bellows selectively compressing to direct air into the conduit, thereby purging the conduit, and said bellows selectively expanding to draw air out of the conduit, thereby priming the conduit;  
a check valve in fluid communication with and intermediate said bellows and the conduit for selectively inhibiting air flow from said bellows into the conduit, and for selectively inhibiting ink flow from the conduit into the bellows; and  
an actuator including a movable drive member selectively compressing and expanding said bellows to effect purging and priming of the conduit upon predetermined movement of the drive member.

5,774,155  
INK-JET PRINTER HAVING DUAL DRYING SYSTEM

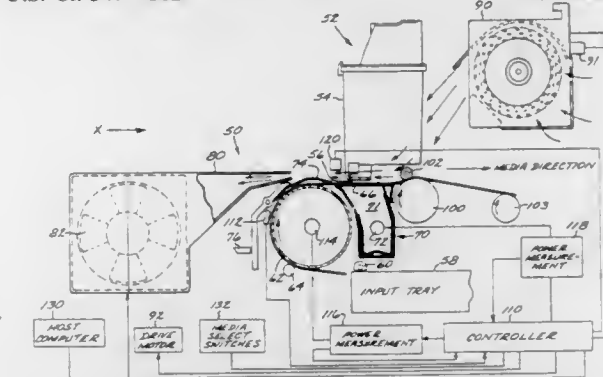
Todd R. Medin, Vancouver, Wash.; Richard A. Becker; Brent W. Richtsmeier, both of San Diego, Calif., and William D. Meyer, Ramona, Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 171,130, Dec. 20, 1993, abandoned, which is a continuation of Ser. No. 878,186, May 1, 1992, Pat. No. 5,287,123. This application Oct. 25, 1996, Ser. No. 736,893

Int. Cl.<sup>6</sup> B41V 2/01

U.S. Cl. 347-102

13 Claims



1. An ink-jet printer for printing onto a print medium and having a dual drying system, comprising:  
a printhead for printing on a print medium, said printhead comprising a plurality of ink-jet nozzles disposed at a print zone for ejecting jets of ink onto the surface of said medium in a controlled fashion;  
apparatus for advancing the print medium along a medium path to said print zone during print operations;

a print heater disposed at said print zone for heating a portion of said print medium disposed at said print zone during printing operations to dry ink ejected onto said medium;

apparatus for drying said print medium before said medium reaches said print zone to prevent uneven shrinkage of a cellulose-based print medium due to heating said medium at said print zone by said print heater, said drying apparatus comprising a heating element for heating said print medium at a location spatially separated from said print zone;

a drying apparatus controller for controlling the operation of said drying apparatus to obtain a desired heating operation from said heater element without regard to humidity levels within a printer environment or at the print zone;

a print heater controller for controlling said print heater to set said print heater at a heating range suitable for printing operations, and wherein said print heater is controlled by said print heater controller to provide a higher temperature at said print zone than said drying apparatus provides at said drying location, said print heater controller controlling the print heater in dependence on the type of print media on which print operations are being conducted by the printer and without regard to humidity levels at the print zone or within the printer environment to obtain good print quality on said print medium;

apparatus for directing a turbulent flow of air across said print zone during printing operations, said apparatus comprising a fan assembly extending substantially along a width of the print medium and disposed at an output side of the print zone to provide an unobstructed flow of air between said fan assembly and said print zone and to thereby create turbulence at said print zone, increasing the ink carrier evaporation rate; wherein said printer provides independent control of said drying apparatus and said print heater and without regard to humidity levels to obtain good print quality on said print medium.

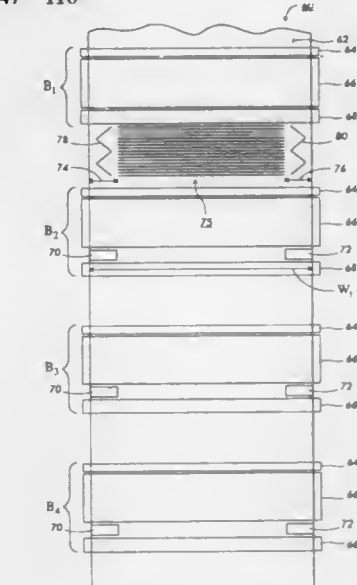
5,774,156  
IMAGE SELF-REGISTRATION FOR COLOR PRINTERS  
Jean-Michel Guerin, Glendale, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 17, 1996, Ser. No. 715,149

Int. Cl.<sup>6</sup> B41J 2/385; G03G 15/01; G01D 15/06

U.S. Cl. 347-116

2 Claims



1. In a color xerographic printing system wherein a light beam is scanned across a charged medium to discharge the medium and the discharged portion of the medium is developed with marking material:  
a light source having a laser diode for emitting a light beam;



a medium having two opposite edges, said medium having a registration marking area along one edge of said medium and a primary image area located adjacent to said registration marking area;

first charging means for charging said registration marking area and said primary image area;

means for scanning the light beam across said medium to form a latent image in said registration marking area and said primary image area;

said scanning light beam, when on, being of an intensity to discharge the charged portions of said registration marking area and said primary image area charged by said first charging means;

a first developer station having a length generally corresponding to at least a length across said medium of said registration marking area and said primary image area for developing a latent image in each of said areas;

means for detecting reflection of the scanning light beam of the image at said registration marking area which was not developed at said first developer station;

a second developer station having a length generally corresponding to the length across said medium of said primary image area and said registration marking area for developing a latent image which is formed over an image in the primary image area which was developed at said first developer station; and second charging means for restoring charge in said registration marking area;

said second charging means having a length corresponding to said registration marking area;

means for activating said second charging means after a latent image is formed over a developed image in said primary image area which was developed at said first developer station and prior to development of said last mentioned latent image at said second development station to prevent development of any latent image formed in said registration marking area over a developed image in said registration marking area which was developed at said first developer station.

5,774,157

**METHOD OF DENSITY ADJUSTMENT FOR A MAGNETIC PRINTING APPARATUS**

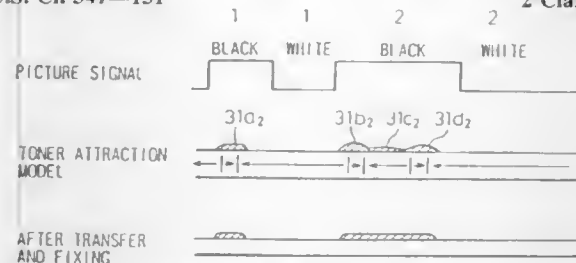
Kunio Kinoshita, Hachioji; Takashi Iwata, Yokohama, and Keiichi Ono, Iino, all of Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed May 26, 1995, Ser. No. 452,014

Claims priority, application Japan, May 30, 1994, 6-116583

Int. Cl.<sup>6</sup> B41J 2/385; G03G 13/04; G11B 9/00

U.S. Cl. 347—131 2 Claims



1. A method for adjusting the printing density in a magnetic printing apparatus, comprising the steps of:

forming, in a one-dot black image region on a recording medium, a magnetized pattern in one orientation that has at least two magnetization transfer regions;

forming, in a black image region of two or more dots, in addition to said magnetized pattern of one orientation, at least one magnetized pattern in another orientation;

forming, in a white image region on said recording medium, a magnetized pattern in said other orientation, this being longer than the magnetized pattern of said black image region;

developing the image by means of a developing magnetic field having the same orientation as said other orientation; and

changing the ratio of the length of a magnetized pattern of said one orientation to the length of a magnetized pattern of said other orientation, with the sum of both lengths kept constant, in a black image region of two or more dots.

5,774,158

**DEVICE FOR DIRECT ELECTROSTATIC PRINTING (DEP) COMPRISING ROWS OF SMALLER AND LARGER SIZED APPARATUS**

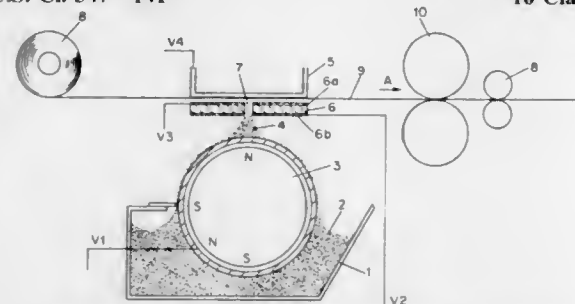
Guido Desie, Herent, and Marc Van Ostaeen, Ranst, both of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Nov. 1, 1995, Ser. No. 551,674

Claims priority, application European Pat. Off., Nov. 4, 1994, 94203221

Int. Cl.<sup>6</sup> B41J 2/39; 2/395; 2/385; G03G 9/08

U.S. Cl. 347—141 10 Claims



1. An apparatus for direct electrostatic printing comprising:

- a printhead structure comprising:
  - a plurality of first apertures;
  - a plurality of second apertures, said first apertures being at least 50% larger in area than said second apertures; and
  - a plurality of control electrodes on a back side of said printhead structure, an individual one of said control electrodes arranged around each of said first and second apertures; and
- a toner delivery means facing a front side of said printhead structure for delivering toner particles to said first and second apertures.

5,774,159

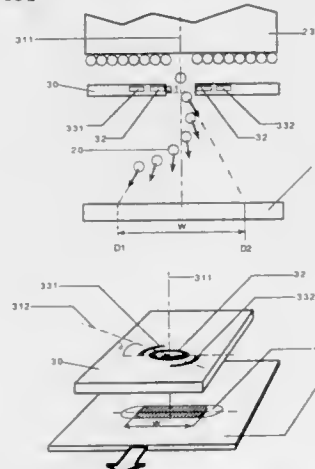
**DIRECT PRINTING METHOD UTILIZING CONTINUOUS DEFLECTION AND A DEVICE FOR ACCOMPLISHING THE METHOD**

Ove Larson, Västra Frölunda, Sweden, assignor to Array Printers AB, Västra Frölunda, Sweden

Filed Sep. 13, 1996, Ser. No. 713,413

Int. Cl.<sup>6</sup> B41J 2/39; 2/395; 2/40

U.S. Cl. 347—151 12 Claims



1. A direct printing method in which an electrical potential pattern is produced by an electrode array disposed between a

particle source and a back electrode, said electrode array comprising a plurality of print electrodes and a plurality of deflection electrodes, said method comprising the steps of:

positioning an image receiving information carrier between the electrode array and the back electrode;

producing an electrostatic potential difference between the particle source and the back electrode to apply an attractive field to charged particles;

modulating the transport of the charged particles from the particle source toward the back electrode by performing the steps of:

applying variable print potentials, defining the image information, to the print electrodes, said print potentials having sufficient magnitude to selectively permit or restrict the transport of charged particles from the particle source toward the information carrier, said variable print potentials applied to said print electrodes for respective selected time durations during each print period; and

applying variable deflection potentials to the deflection electrodes during a deflection period said deflection potentials varying continuously during said deflection period to modify the trajectory of the particles transported toward the information carrier to define an addressable area to which said charged particles can be directed for each print electrode, said respective selected time duration for which said variable print potentials are applied to said each print electrode determining a portion of said addressable area to receive toner particles and a portion of said addressable area to not receive toner particles.

5,774,160

**LATENT IMAGE PRINTING PROCESS AND APPARATUS AND SUBSTRATE THEREFOR**

Arshavir Gundjian, Montreal, Canada, assignor to Nocopi Technologies, Inc., West Conshohocken, Pa.

Continuation of Ser. No. 652,073, May 23, 1996, Pat. No. 5,682,193, which is a division of Ser. No. 341,328, Nov. 16, 1994, Pat. No. 5,532,200, which is a continuation of Ser. No. 808,331, Dec. 16, 1991, abandoned, which is a continuation-in-part of Ser. No. 685,575, Apr. 15, 1991, abandoned. This application Mar. 31, 1997, Ser. No. 829,264

Int. Cl.<sup>6</sup> B41M 5/26; 5/28; B41J 2/32

U.S. Cl. 347—171 20 Claims



6. A latent image printing process comprising the steps of:

providing a substrate with one main surface having one of a pair of a color developer and color former dye applied thereto and defining a background color in conjunction with the one main surface, wherein the color developer and the color former dye react when mixed to produce a first spectral response which is visible relative to the background color and a covering over said one of the pair which is non-porous with respect to the other of the first pair and solvent-resistant to the other of the pair; and

removing selected portions of the covering corresponding to a desired latent image.

5,774,161

Patent Not Issued For This Number

5,774,162

**COLOR THERMAL PRINTING METHOD FOR REDUCING DISPLACEMENT OF COLOR REGISTRATIONS AND AN APPARATUS THEREFOR**

Hiroshi Fukuda, Saitama, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 132,961, Oct. 5, 1993, abandoned.

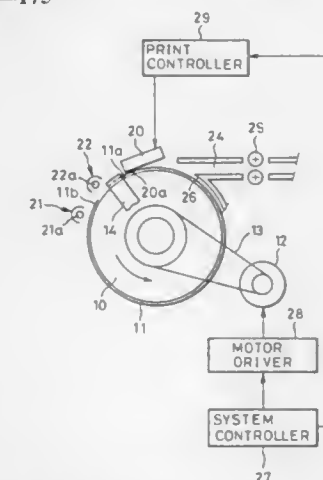
This application May 20, 1996, Ser. No. 650,548

Claims priority, application Japan, Oct. 5, 1992, 4-266243

Int. Cl.<sup>6</sup> B41J 2/325; 11/00; 33/00

U.S. Cl. 347—175

26 Claims



1. A color thermal printing method for thermally recording a plurality of color images in a plane sequential scheme during a relative motion between a thermal head and a recording paper, said thermal head having a plurality of heating elements disposed in a line in a main scan direction, said color thermal printing method comprising the steps of:

- (a) generating a bias heat energy for bias heating a pixel by each of said plurality of heating elements;
- (b) generating an image heat energy in accordance with a record density of said pixel following said step (a), to develop color of said pixel at a desired density by adding bias heat energy and said image heat energy; and
- (c) starting said relative motion upon starting the generating of said image heat energy at said step (b) or upon a lapse of a predetermined delay time from the starting of the generating said image heat energy at said step (b).

5,774,163

**BINARY WEIGHTED MODULATION FOR A PARALLEL INPUT PRINT HEAD**

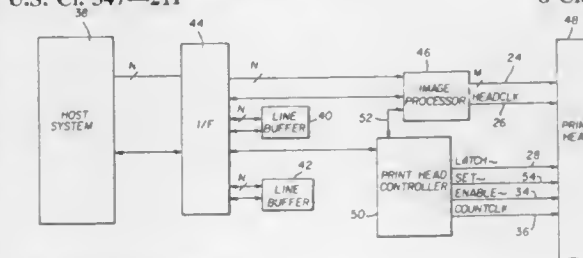
James T. Stoops, Walworth, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 20, 1995, Ser. No. 425,276

Int. Cl.<sup>6</sup> B41J 2/355

U.S. Cl. 347—211

8 Claims



6. A printer comprising:  
a parallel-input print head having an input bus of predetermined width;

a data controller adapted to split original digital image data into a plurality of data groups consisting of consecutive bits of the original image data such that the maximum width of any group is the width of the input bus of the print head;

a print head controller adapted to sequentially: load one the data bit groups to the print head and modulate the print head with a weighting which is representative of the significance of data bits of the one group in the original image data, and sequentially load each other of the data bit groups to the print head and modulate the print head with a weighting which is representative of the significance of data bits of each other group in the original image data.

5,774,164

Thermal Transfer Image-Receiving Sheet

Masayasu Yamazaki; Kenichiro Sudo; Satoru Kawai, and  
Takeshi Nozaki, all of Tokyo-To, Japan, assignors to Dai  
Nippon Printing Co., Ltd., Japan

Filed Oct. 25, 1995, Ser. No. 547,844

Claims priority, application Japan, Oct. 27, 1994, 6-287512;  
Oct. 28, 1994, 6-288907

U.S. Cl. 347—221 12 Claims

I. A thermal transfer image-receiving sheet comprising:

a substrate sheet;

an antistatic layer formed on at least one surface of said substrate sheet;

an intermediate layer formed on said antistatic layer, said intermediate layer containing (i) an acrylic polyol having an OH value of from 20 to 45 or (ii) cellulose acetate butyrate having a degree of acetylation of from 0.5 to 15%, a degree of butylation of from 20 to 60%, and a hydroxyl content of from 0.5 to 5%; and

a receptive layer formed on said intermediate layer.

5,774,165  
LIGHT EMISSION INTENSITY WIDTH COMPENSATING  
METHOD OF LED PRINT HEAD AND APPARATUS  
THEREOF

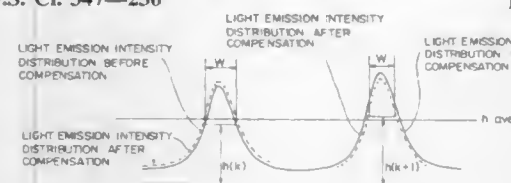
Norio Nakajima; Hisashi Tsukagoshi; Katsuya Kamimura, and Yoshihisa Aikoh, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 21, 1995, Ser. No. 517,491

Claims priority, application Japan, Sep. 22, 1994, 6-227739

Int. Cl.<sup>6</sup> B41J 2/47

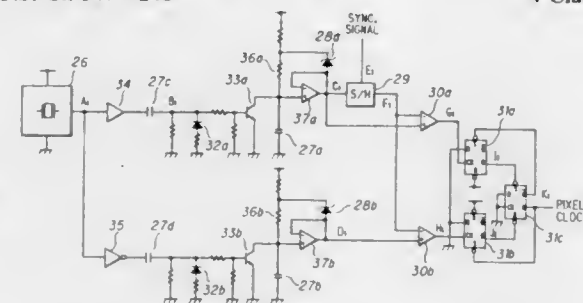
U.S. Cl. 347-236 17 Claims



1. A light emission intensity compensating method of an optical print head having a large number of light emitting devices, comprising the steps of:

- (a) measuring a light emission intensity distribution of each of the light emitting devices of the optical print head;
- (b) slicing the light emission intensity distribution corresponding to a reference light emission intensity and calculating a light emission intensity width of the reference light emission intensity; and
- (c) designating a compensation value of drive energy of each of the light emitting devices so that each light emission intensity width becomes a constant value.

5,774,166  
IMAGE FORMING APPARATUS  
Ohnishi Kazuyuki, Yamatokoriyama, Japan, assignor to Sharp  
Kabushiki Kaisha, Osaka, Japan  
Filed Jun. 14, 1996, Ser. No. 664,140  
Claims priority, application Japan, Jun. 23, 1995, 7-157950  
Int. Cl. <sup>6</sup> B41J 2/47



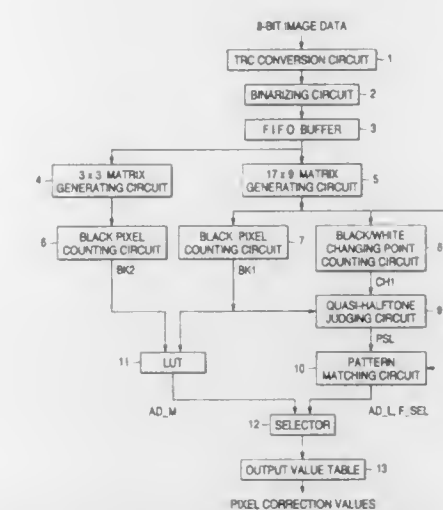
1. An image forming apparatus comprising:  
a synchronizing signal generating means for generating a synchronizing signal which instructs the time when image forming for each line in the main scan direction is to be started;  
an oscillating means for generating a first and a second analog periodic signal each having a voltage value and a frequency, wherein said voltage values periodically vary and have the same cyclic period, and a phase difference from one another, and wherein said first and second analog periodic signals are in the form of trapezoidal waves;  
sample-hold means for sampling and holding the voltage value of one of said analog periodic signals from said oscillating means in response to the input of the synchronizing signal;  
means for providing a selected comparative analog periodic signal;  
comparing means for comparing the voltage value which has been sampled and held in said sample-hold means with the comparative analog periodic signal; and  
a pixel clock generating means for generating a pixel clock signal as to be a reference signal for image forming, in accordance with the output from said comparing means.

5,774,167  
IMAGE PROCESSING DEVICE WITH DOT DIAMETER  
CONTROL

Kenji Hara, Ebina, Japan, assignor to Fuji Xerox Co., Ltd.,  
Tokyo, Japan  
Filed Feb. 2, 1996, Ser. No. 596,446  
Claims priority, application Japan, Feb. 2, 1995, 7-016200;  
Jan. 31, 1996, 8-015680

U.S. Cl. 347-254      Int. Cl.<sup>6</sup> B41J 2/45      14 Claims

1. An image processing device comprising:  
first area determining means for determining a first area around a target pixel of binary image data;  
first density calculating means for calculating a density of the determined first area based on pixel values in the first area, a first pixel value being assigned to every black pixel in said first area and a second pixel value being assigned to every white pixel in said first area; and



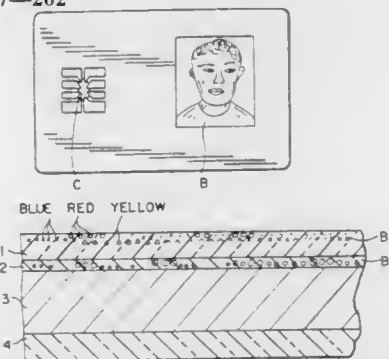
dot area control means for controlling a dot area of the target pixel so that the dot area of the target pixel becomes smaller as the calculated density of the first area becomes smaller.

5,774,168  
IDENTITY CARD AND PROCESS FOR ITS  
PRODUCTION

Rainer Blome, Paderborn, Germany, assignor to ORGA  
Kartensysteme GmbH, Paderborn, Germany  
PCT No. PCT/DE95/00637, § 371 Date Feb. 16, 1996, § 102(e)  
Date Feb. 16, 1996, PCT Pub. No. WO95/31338, PCT Pub.  
Date Nov. 23, 1995

PCT Filed May 16, 1995, Ser. No. 553,579  
Claims priority, application Germany, May 18, 1994, 44 17  
343.1

U.S. Cl. 347-262      Int. Cl.<sup>6</sup> B41J 2/45      13 Claims

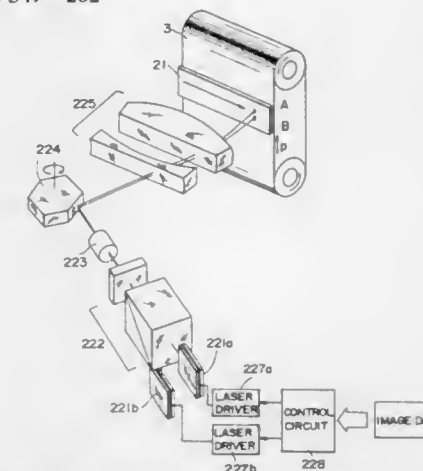


1. An identity card comprising a picture section which contains an image of a person, the picture section being formed of a surface layer, an intermediate layer below the surface layer, and an inlet layer below the intermediate layer, at least one of the surface layer, the intermediate layer and the inlet layer having pixels therein that have different levels of light absorption and are introduced point-by-point by a laser beam to create the image, the picture section further including a laser image part and a color image part arranged above the laser image part, the laser image part and the color image part cooperating to form a total image of the person, the color image part being devoid of one of a gray portion, a black portion and a color necessary to complete the total image, the laser image part having at least one of a gray portion, a black portion and the color necessary to complete the total image.

5,774,169  
IMAGE FORMING APPARATUS  
Akibito Ikegawa, Sakai; Isao Doi, Toyonaka; Masashi Yamamoto, Settsu; Seishi Ojima, Takatsuki, and Keiko Nagayasu, Ibaraki, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Mar. 28, 1996, Ser. No. 623,369  
Claims priority, application Japan, Mar. 29, 1995, 7-071235;  
Jun. 29, 1995, 7-163614

U.S. Cl. 347—262      Int. Cl.<sup>6</sup> B41J 2/47      9 Claims



9. An image forming apparatus comprising an image-bearing member having an insulation layer disposed over an electrically conductive layer and which is movable;

a photosensitive member having a photosensitive layer disposed over an electrically conductive layer and arranged so as to confront the insulated layer of the image-bearing member;

means for applying a voltage between the conductive layer of the photosensitive member and the conductive layer of the image-bearing member;

means for optical exposure of an image on the photosensitive layer while said voltage is applied; and

means for developing an electrostatic latent image formed on said image-bearing member, and

wherein the various values of the photosensitive layer construction of said photosensitive member produce the following relationship:

$$1 \times 10^{-6} \leq r \times V_s / (\mu \times e) \leq 5 \times 10^{-3}$$

when the moving speed of the photosensitive layer is set at  $\mu(\text{cm}^2/\text{v}\cdot\text{sec})$ , the thickness of the photosensitive layer is set at  $t(\text{cm})$ , the moving speed of the image-bearing member is set at  $V_s(\text{cm}/\text{sec})$ , and the electric field strength across the photosensitive layer is set at  $e(\text{v}/\text{cm})$ .

5,774,170  
SYSTEM AND METHOD FOR DELIVERING TARGETED  
ADVERTISEMENTS TO CONSUMERS

**Kenneth C. Hite, 3 Center Knolls, Bronxville, N.Y. 10708;**  
**Walter S. Ciciora, 45 Hulls Farm Rd., Southport, Conn.**  
**06490-1027; Tom Alison, 280 Barrataria Dr., St. Augustine,**  
**Fla. 32086, and Robert G. Beauregard, 66 E. Parkway, Apt**  
**1J, Scarsdale, N.Y. 10583**

Filed Dec. 13, 1994, Ser. No. 354,620  
Int. Cl.<sup>6</sup> H04N 7/10

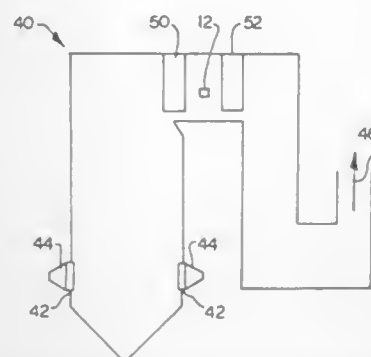
U.S. Cl. 348—9

1. A system for delivery of targeted advertisements to individual consumers each having a display site using code comparison in a control device at the display site, comprising:

- (a) the control device at the consumer display site;
- (b) a central storage system for storing a plurality of advertisements; and
- (c) means in the control device for communicating with the central storage system and for selecting an advertisement







where temperatures are below the coal ignition temperature and providing a first signal representative of the number of hot particles in said hot gases over a predetermined period of time; and

(b) circuit means connected to said means for counting said hot particles for receiving said signal representative of the number of particles in said hot gases and providing a second signal representative of the unburned carbon and other combustibles content of the fly ash produced by said boiler, said second signal being a function of said first signal.

5,774,177

## TEXTILE FABRIC INSPECTION SYSTEM

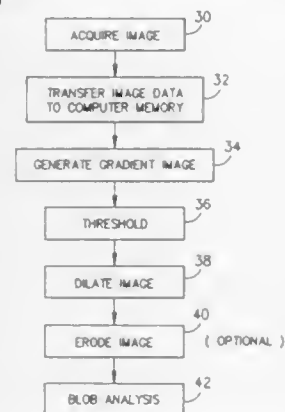
Jeffery Scott Lane, Moore, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Sep. 11, 1996, Ser. No. 710,003

Int. Cl.<sup>6</sup> H04N 7/18

U.S. Cl. 348—88

49 Claims



I. A system for inspecting textile fabric comprising:

- a means for assigning numerical brightness attributes for pixels in the field of view of a video camera;
- a memory for storing a set of said numerical brightness attributes for said pixels in said field of view of said video camera;
- a means for generating a gradient image from said set of numerical brightness attributes for said pixels in said view of said video camera for identifying gradual gray level spatial transitions;
- a means for thresholding said set of numerical brightness attributes for said gradient image;
- a means for dilating said numerical brightness attributes that have been thresholded; and
- a means for blob analysis of said numerical brightness attributes for said pixels that have been dilated and thereby identify defects in said textile fabric.

5,774,178

## APPARATUS AND METHOD FOR REARRANGING DIGITIZED SINGLE-BEAM COLOR VIDEO DATA AND CONTROLLING OUTPUT SEQUENCE AND TIMING FOR MULTIPLE-BEAM COLOR DISPLAY

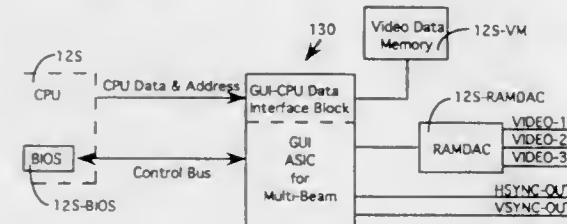
Mao-Jin Chern, 29 Industrial East 9th Road 2nd Fl., Science-Based Industrial Park, Hsinchu; Yee-Lu Zhaog, Industrial Technology Research Institute, 195 Section 4, Chung-Hsing Road, Chutung, Hsinchu; Robert Hu, 29 Industrial East 9th Road 2nd Fl., Science-Based Industrial Park, Hsinchu, and Yen-Chen Chen, Industrial Technology Research Institute, 195 Section 4, Chung-Hsing Road, Chutung, Hsinchu, all of Taiwan

Filed Mar. 20, 1996, Ser. No. 619,019

Int. Cl.<sup>6</sup> H04N 3/28; 9/31

U.S. Cl. 348—206

13 Claims



I. A multiple-beam field sequential color (FSC) display system provided for receiving a plurality of digitized single-beam image data to display a color image by employing a plurality of CRT guns to project multiple electron beams, corresponding to said digitized single-beam image data, on a monochromatic CRT screen followed by converting responsive CRT monochromatic emissions to said color image by using a liquid crystal color system (LCCS), said multiple-beam display system further comprising:

- an image data storage means including a plurality of segments;
- an image data rearranging means for rearranging and storing said plurality of digitized single-beam image data in said image data storage means according to a pre-designated multiple-beam sequence in each of said segments;
- a multiple-beam image data output control means for receiving a plurality of clock signals and display control signals to control a sequence and timing of transmitting a multiple-beam image data from said data storage means to said plurality of CRT guns for projecting said multiple beams for generating said color image; and
- a special graphic user interface (S-GUI) implemented as an application specific integrated circuit (ASIC) chip for including said image data rearranging means and said multiple-beam image data output control means.

5,774,179

## METHOD AND SYSTEM FOR FAST MICROSCANNING

Paul Chevette, Quebec, and Jean Fortin, Ste-Foy, both of Canada, assignors to Minister of National Defence, Ottawa, Canada

Filed Nov. 30, 1995, Ser. No. 565,347

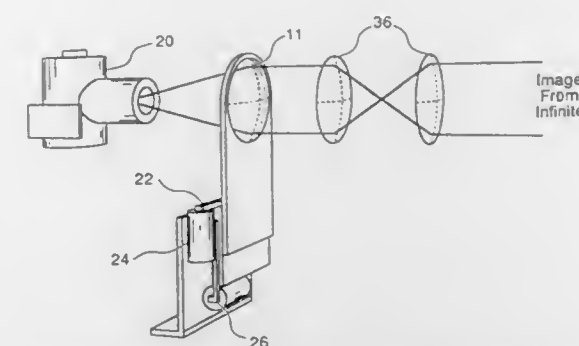
Claims priority, application Canada, Dec. 28, 1994, 2139182

Int. Cl.<sup>6</sup> H04N 5/225

U.S. Cl. 348—218

21 Claims

- I. A microscanning imaging system for inducing a predetermined amount of dither so as to capture image data at sensing elements when a lensing system is moved by a predetermined distance, comprising:
- an array of sensing elements defining an image plane;
  - a lensing system adapted to focus an image on the image plane; and
  - means coupled to the lensing system for moving the lensing system a same predetermined amount, a plurality of times, and on a predetermined plane parallel to the image plane so that the image focused by the lensing system on the array of sensing elements is displaced on the image plane by a same predetermined distance by the movement of the lensing sys-



tem to predetermined locations for scanning an image and for providing an image at a plurality of different detector locations; and, means adapted to capture an image at each said location.

5,774,180

## IMAGE SENSOR CAPABLE OF PRODUCING AN IMAGE SIGNAL FREE FROM AN AFTERIMAGE

Tsutomu Abe, and Hiroyuki Miyake, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 160,798, Dec. 3, 1993, abandoned.

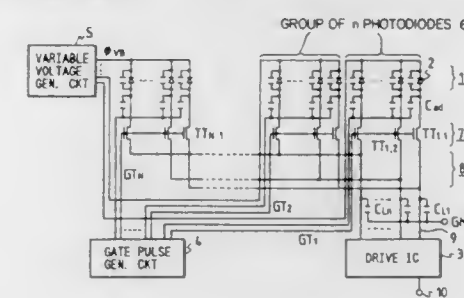
This application Mar. 28, 1996, Ser. No. 623,055

Claims priority, application Japan, Dec. 4, 1992, 4-350252

Int. Cl.<sup>6</sup> H04N 5/335

U.S. Cl. 348—241

6 Claims



3. A method for driving an image sensor in which charges photoelectrically generated in a plurality of reversely biased photodiodes are read out to produce an image signal, said drive method comprising the steps of:

- reading out charges from each of the photodiodes during a reading period while the photodiodes are reversely biased;
- forwardly biasing the photodiodes during another period after the reading period; and
- reversely biasing the photodiodes after said another period, wherein the photodiodes are kept reversely biased by grounding anodes of the photodiodes through a capacitance and supplying cathodes of the photodiodes with a positive voltage that is higher than forward voltage drops of the photodiodes.

5,774,181

## CHARGE AMPLIFIER FOR MOS IMAGING ARRAY AND METHOD OF MAKING SAME

Tai-Ching Shyu, Cupertino, and Datong Chen, Fremont, both of Calif., assignors to OmniVision Technologies Inc., Sunnyvale, Calif.

Division of Ser. No. 538,441, Oct. 3, 1995, Pat. No. 5,724,095.

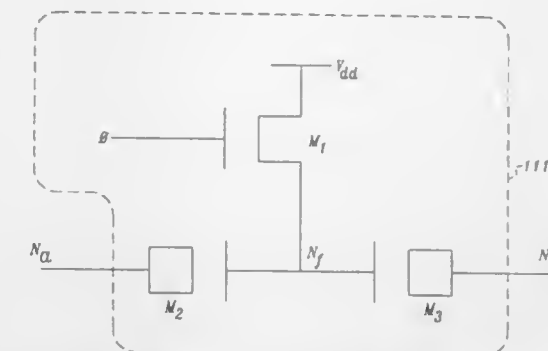
This application Jun. 10, 1997, Ser. No. 872,653

Int. Cl.<sup>6</sup> H04N 5/335

U.S. Cl. 348—300

1 Claim

I. AMOS capacitor having an input terminal and an output terminal, said MOS capacitor comprising:



a first series MOS transistor having a gate, a drain, and a source, said drain and said source of said first series MOS transistor tied together to form said input terminal;

a second series MOS transistor having a gate, a drain, and a source, said drain and source of said second series MOS transistor tied together to form said output terminal, said gate of said second MOS transistor tied to the gate of said first MOS transistor, and

a control MOS transistor having a gate, a drain, and a source, said drain of said control MOS transistor tied to said gates of said first and second series MOS transistors, said source of said control MOS transistor connected to a driving voltage source;

whereby a control signal is applied to the gate of said control MOS transistor to activate said MOS capacitor.

5,774,182

## SOLID-STATE IMAGE SENSOR DEVICE WITH PIXEL ARRAY STRUCTURE OF INTERLINE TRANSFER CCD IMAGE SENSOR

Nobuhiko Mutoh, and Nobukazu Teranishi, both of Tokyo, Japan, assignors to NEC Corporation, Japan

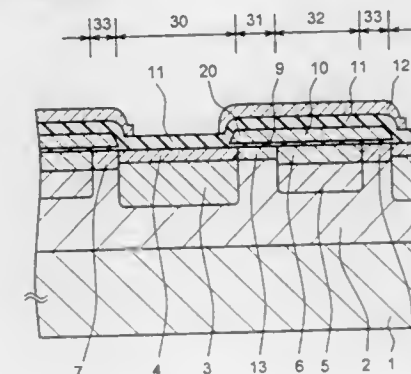
Filed Jul. 11, 1995, Ser. No. 501,257

Claims priority, application Japan, Jul. 28, 1994, 06-176388

Int. Cl.<sup>6</sup> H04N 3/14

U.S. Cl. 348—311

3 Claims



I. A solid-state image sensor device comprising:

- a photodiode section including a storage region of a second conductivity type provided in a surface portion of a first conductivity type region of a semiconductor substrate and a surface layer of the first conductivity type formed on a surface of the storage region;
- a vertical CCD register including a buried layer of the second conductivity type formed in another surface portion of said first conductivity type region and spaced apart a predetermined distance from said storage region, and a plurality of transfer electrodes intersecting with said buried layer;
- a transfer gate covering a surface of a semiconductor substrate region between said storage region and said buried layer with a gate insulating film interposed and including a transfer gate electrode; and



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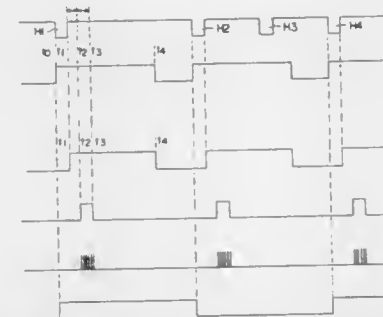
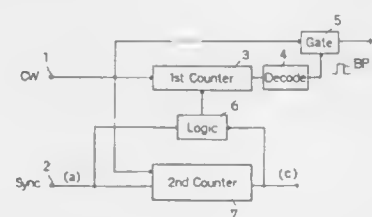
UMI

5276

OFFICIAL GAZETTE

JUNE 30, 1998

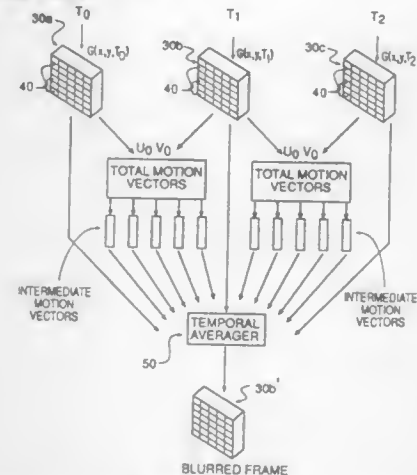
a channel control region of the second conductivity type covering an entirety of the surface of the semiconductor substrate region between said storage region and said buried layer covered by said transfer gate so as to permit a charge transfer path to form within said channel control region in operation of said device, said charge transfer path being in a portion of said channel control region neighboring said surface of said semiconductor substrate region.



**5,774,183**  
**METHOD FOR SIMULATING AN INCREASED SHUTTER TIME IN DIGITAL VIDEO**  
Jonathan K. Riek, Webster, and Sergei Fogel, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 20, 1996, Ser. No. 700,204  
Int. Cl.<sup>6</sup> H04N 7/32

U.S. Cl. 348—416 6 Claims



1. A method for processing an input digital video signal, the method comprising the steps of:

- (a) capturing first and second frames from the input digital video signal;
- (b) determining a first set of intermediate motion vectors from the first and second frames, which said first set of intermediate motion vectors represent motion of objects between frames; and
- (c) forming a blurred first frame having pixel values determined by combining pixel values in the first and second frames without creating an intermediate frame from the first set of intermediate motion vectors, wherein the combining is controlled by the first set of intermediate motion vectors.

**5,774,184**  
**COLOR BURST FORMING CIRCUIT AND COLOR BURST GATE PULSE FORMING CIRCUIT**  
Sadakazu Murakami, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

Filed Jan. 23, 1997, Ser. No. 786,334  
Claims priority, application Japan, Jan. 25, 1996, 8-010606  
Int. Cl.<sup>6</sup> H04N 9/455

U.S. Cl. 348—506 4 Claims

1. A color burst gate pulse forming circuit comprising:
- a first counter that counts a chrominance subcarrier supplied in a form of a clock;
  - a second counter that starts counting said chrominance subcarrier in synchronization with a horizontal synchronizing signal and resets itself in a period longer than half a horizontal scanning period and shorter than one horizontal scanning period;

means that controls an operation period of said first counter based on an output from said second counter and said horizontal synchronizing signal; and

means that outputs color burst gate pulses based on a count output from said first counter.

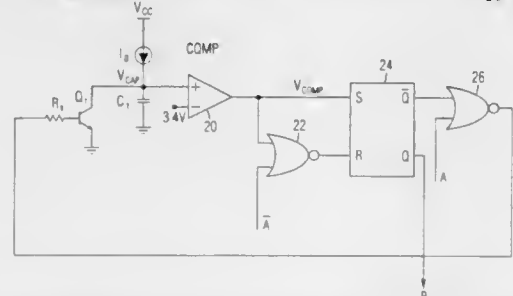
**5,774,185**  
**METHOD OF AND APPARATUS FOR REMOVING EQUALIZING PULSES WITHOUT USING EXTERNAL PINS**

Mehrdad Nayeibi, Palo Alto; Duc Ngo, San Jose, and Chun Yee, Sunnyvale, all of Calif., assignors to Sony Corporation, Tokyo, Japan, and Sony Electronics, Inc., Park Ridge, N.J.

Filed Jan. 11, 1996, Ser. No. 583,972

Int. Cl.<sup>6</sup> H04N 5/10

U.S. Cl. 348—531 19 Claims



1. An apparatus for generating an output signal representative of every horizontal synchronization pulse and every Nth vertical synchronization pulse within a composite video signal, wherein a first time period occurs between horizontal synchronization pulses and a second time period occurs between N vertical synchronization pulses, the apparatus comprising:

- a storage element for storing a level of charge;
- a charge supply circuit coupled to the storage element for raising the level of charge;
- a monitoring circuit coupled to the storage element for determining when the level of charge is above a threshold level, wherein the charge supply circuit will raise the level of charge above the threshold level in a third time period; and
- an output generating circuit coupled to the monitoring circuit for generating an output pulse signal representative of every horizontal synchronization pulse and every Nth vertical synchronization pulse, wherein the output pulse signal is only generated when the level of charge is above the threshold level and N is equal to two or more.

JUNE 30, 1998

ELECTRICAL

5277

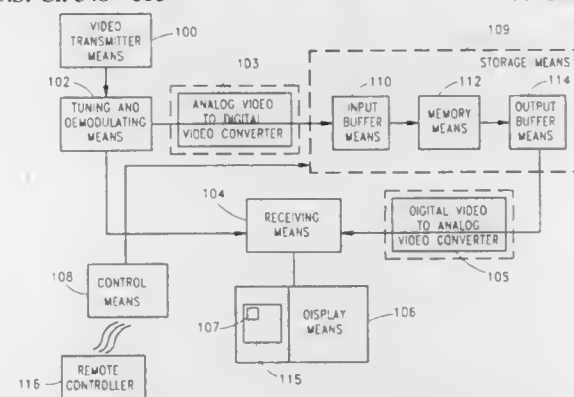
**5,774,186**  
**INTERRUPTION TOLERANT VIDEO PROGRAM VIEWING**

Marc Herbert Brodsky, Washington, D.C.; Steven Edward Millman, Spring Valley, N.Y., and Thomas Kimber Worthington, Kula, Hi., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 4, 1996, Ser. No. 659,125

Int. Cl.<sup>6</sup> H04N 5/445

U.S. Cl. 348—553 33 Claims



1. A video signal viewing apparatus having a receiver circuit, a user command circuit coupled to said receiver circuit, and a display means coupled to said receiver circuit, said apparatus further comprising:

- an input buffer circuit coupled to said receiver circuit and having an input for receiving and buffering a portion of a signal, and an input buffer output;
- a memory circuit coupled to said input buffer output for storing said portion, and having a memory output; and
- an output buffer circuit having an output buffer input coupled to said memory output for receiving and buffering said memory output, and an output buffer output; and wherein said command circuit causes said output buffer output to be coupled to said receiver circuit for feeding said portion for display on said display means upon receiving a command from a user input.

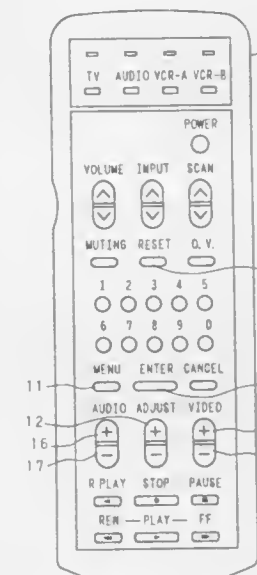
**5,774,187**  
**AUDIO/VISUAL APPARATUS FOR CONTROLLING CONTROL PARAMETERS**

Yukio Tsunoda, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 518,568, Aug. 23, 1995, abandoned, which is a continuation of Ser. No. 243,770, May 17, 1994, abandoned. This application Aug. 11, 1997, Ser. No. 907,911  
Claims priority, application Japan, May 20, 1993, 5-118468  
Int. Cl.<sup>6</sup> H04N 5/445; 5/57

U.S. Cl. 348—553 11 Claims

1. An audio/visual apparatus, comprising:
- a plurality of control parameters including at least one of a set of video parameters including sharpness and contrast, and a set of audio parameters including bias sound level and high-pitched sound level, said plurality of control parameters being sequentially selected and adjusted in a setting cycle;
  - a selecting unit which selects plural control parameters from among said plurality of control parameters, to be excluded from said setting cycle;



an excluding unit which excludes said plural control parameters selected by said selecting means from said setting cycle; and a restoring unit which restores all of said plural control parameters excluded by said excluding means back into said setting cycle in response to a single actuation of a restore switch.

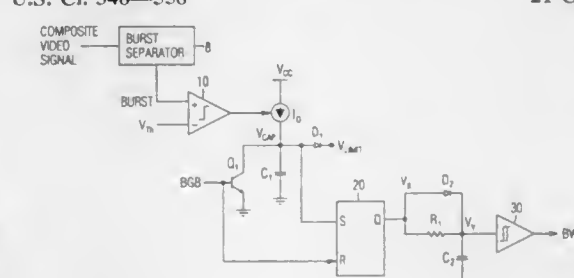
**5,774,188**  
**BLACK AND WHITE VIDEO SIGNAL DETECTOR FOR DETECTING THE ABSENCE OF A BURST SIGNAL FROM A VIDEO SIGNAL**

Duc Ngo, San Jose, and Mehrdad Nayeibi, Palo Alto, both of Calif., assignors to Sony Corporation, Tokyo, Japan, and Sony Electronics, Inc., Park Ridge, N.J.

Filed Jan. 11, 1996, Ser. No. 585,404

Int. Cl.<sup>6</sup> H04N 5/46; 9/455

U.S. Cl. 348—558 21 Claims



1. A black and white detector for detecting when a composite video signal includes color or black and white video information comprising:

- a monitoring circuit configured to receive a burst signal for monitoring the burst signal to determine whether the composite video signal includes the color information, wherein the burst signal oscillates above and below a first threshold value during a burst period when the composite video signal includes the color information and the burst signal is substantially constant during the burst period when the composite video signal includes the black and white information; and
- an output circuit coupled to the monitoring circuit for generating an output signal representative of whether the composite video signal includes the color information.

# UMI

transmitter systems, respectively, and feeding said combined  $RF_{NTSC}$  and  $RF_{HDTV}$  to said transmitter end of said transmis-

sion to the second intermediate frequency for terrestrial recep-



tion and connected as a phase comparison stage of an FM-PLL demodulator for a satellite signal for satellite reception, and  
a mixing oscillator for the second mixing stage is additionally coupled via a 90° phase shifter to an input of a third mixer stage, the third mixer stage having another input for receiving an input signal of the second mixer stage.

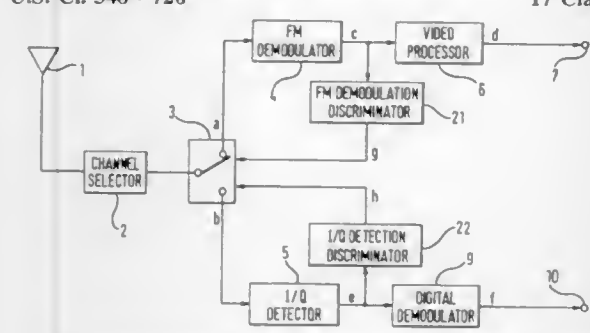
**5,774,195**  
**BROADCASTING SYSTEM DISCRIMINATING TELEVISION RECEIVER FOR DIFFERENTIATING BETWEEN ANALOG AND DIGITAL TELECAST SIGNALS**

Yasunori Miyahara, and Syun-ichi Anzai, both of Kanagawa-ken, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 670,754, Jun. 21, 1996, abandoned, which is a division of Ser. No. 377,596, Jan. 24, 1995, Pat. No. 5,598,221. This application Nov. 12, 1997, Ser. No. 967,503  
Int. Cl.<sup>6</sup> H04N 1/00

U.S. Cl. 348—726

17 Claims



1. A broadcasting system discriminating television receiver, comprising:  
an FM demodulator for generating a demodulated analog broadcasting signal by demodulating a FM-modulated analog broadcast signal when received as input;  
an I/Q wave detector for detecting an I/Q modulated digital broadcast signal when received as input;  
an FM-demodulation discriminator generating a first output based on the demodulated analog broadcasting signal indicating whether the FM-modulated analog broadcast signal has been received as input to the FM demodulator;  
a digital demodulator which demodulates the I/Q-modulated digital broadcast signal into a video signal;  
an I/Q wave detection discriminator generating a second output based on the I/Q modulated digital broadcast signal indicating whether the I/Q demodulated digital broadcast signal has been received as input to the I/Q wave detector; and  
a selector selecting one of the FM demodulator and the I/Q detector to receive a next input, the selector selecting based on the first output from the FM demodulation discriminator and second output from the I/Q wave detection discriminator.

**5,774,196**  
**METHOD AND APPARATUS OF ALIGNING COLOR MODULATION DATA TO COLOR WHEEL FILTER SEGMENTS**

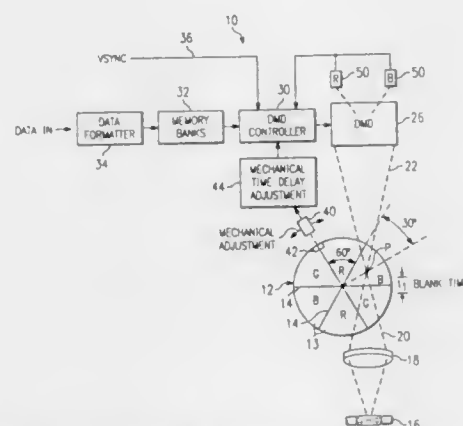
Stephen W. Marshall, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 13, 1996, Ser. No. 662,545  
Int. Cl.<sup>6</sup> H04N 9/12

U.S. Cl. 348—743

9 Claims

1. A display system, comprising:  
a light source generating light;  
a rotatable color wheel coloring said light having a plurality of colored segments and a reference marker, said segments interconnected at a spoke;



- a spatial light modulator modulating said colored light;  
a first sensor sensing said wheel reference marker and providing a first sensor output indicative of said sensed marker;  
a second sensor sensing a color of said colored light and providing a second sensor output indicative of said sensed color;  
a calibration circuit determining when said spoke is illuminated as a function of said first sensor output and said second sensor output and generating an output; and  
a control circuit controlling said spatial light modulator to modulate said colored light from said color wheel as a function of said calibration circuit output.

**5,774,197**  
**METHOD FOR DRIVING A COLOR LIQUID CRYSTAL DISPLAY**

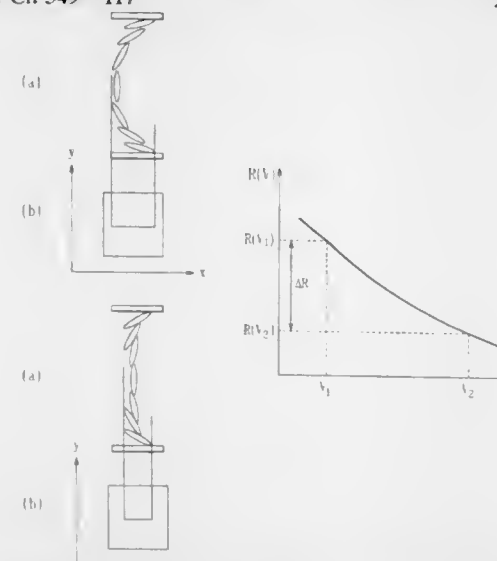
Hajime Nakamura, Kanagawa-ken, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 10, 1996, Ser. No. 763,988

Claims priority, application Japan, Feb. 19, 1996, 8-030349  
Int. Cl.<sup>6</sup> G02F 1/1335; 1/13

U.S. Cl. 349—117

5 Claims



1. A method for driving a color liquid crystal display for displaying a plurality of colors, the liquid crystal display comprising liquid crystal material sandwiched between electrodes, the thickness of the liquid crystal material comprising a cell gap, the liquid crystal display further comprising a light incident side and a light exiting side, the method comprising the steps of:  
applying a voltage (V) between the electrodes;  
applying light of wavelength (λ) to the light incident side;  
measuring a phase difference (R) between the incident light and the exiting light; and  
adjusting the voltage and wavelength to satisfy the expression  $0.4 \leq R(V)/\lambda \leq 0.85$ .

**5,774,198**  
**LIQUID CRYSTAL DISPLAY DEVICE WITH DIFFERENT ALIGNMENT THICKNESS ON OPPOSITE SUBSTRATE**

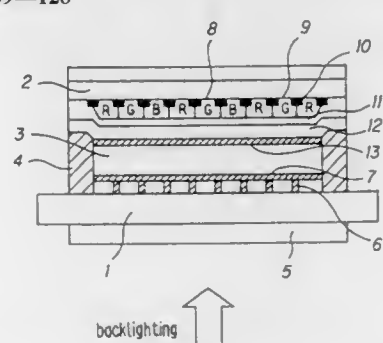
Hirohide Fukumoto; Junichi Ushiono, both of Kagoshima; Minoru Nakano, and Hideo Kataoka, both of Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 3, 1995, Ser. No. 552,805

Claims priority, application Japan, Nov. 15, 1994, 6-307033  
Int. Cl.<sup>6</sup> G02F 1/1335; 1/1337

U.S. Cl. 349—128

8 Claims



1. A liquid crystal display device comprising:  
a first insulating substrate having a plurality of pixel electrodes arranged in a matrix and a first alignment film provided on the inner surface thereof, said insulating substrate comprising a plurality of thin film transistors associated with each of the pixel electrodes;  
a second insulating substrate disposed opposed to the first insulating substrate, said second insulating substrate having facing electrodes and a second alignment film formed on the inner surface thereof;  
a liquid crystal layer interposed between the first and the second alignment films; and  
one of the first and the second alignment films having a thickness which is less than 60 nm and effective to minimize image retention and the other of the first and second alignment films having a thickness of approximately 30 nm.

**5,774,199**  
**LIQUID CRYSTAL DISPLAY DEVICE**  
Takaaki Ozawa, Suwa, Japan, assignor to Seiko Epson Corporation, Tokyo, Japan

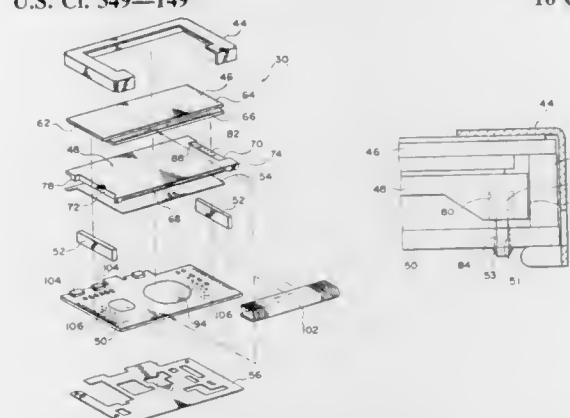
Filed Mar. 26, 1996, Ser. No. 621,834

Claims priority, application Japan, Mar. 31, 1995, 7-100552; Feb. 16, 1996, 8-054189

Int. Cl.<sup>6</sup> G02F 1/1335; 1/1345

U.S. Cl. 349—149

16 Claims



1. A liquid crystal display device comprising:  
a circuit board having an electrically conductive pattern;  
a liquid crystal display panel including a central display area and a plurality of electrode terminals disposed along a plurality of

sides and connected to said conductive pattern, said liquid crystal display panel being disposed opposite to said circuit board;

at least one elastic conductor disposed and compressed between said circuit board and said liquid crystal display panel for connecting part of said electrode terminals disposed along at least one side of said plurality of sides in said liquid crystal display panel to said conductive pattern of said circuit board;

a lamp for radiating a light toward said liquid crystal display panel; and  
a light guide plate disposed between said circuit board and said liquid crystal display panel for conducting the light from said lamp to said central display area of said liquid crystal display panel.

said light guide plate having at least one positioning portion for positioning said elastic conductor such that at least three sides of said at least one elastic conductor are surrounded by said positioning portion, said positioning portion having a height equal to or lower than that of said compressed elastic conductor, said lamp being disposed at a position between said elastic conductor and said central display area.

14. A liquid crystal display device comprising:  
a circuit board having an electrically conductive pattern;  
a substantially rectangular liquid crystal display panel having a pair of shorter sides and a pair of longer sides, said liquid crystal display panel including a central display area, a plurality of single electrode terminals disposed along at least one of said pair of longer sides and a plurality of scan electrode terminals disposed along said pair of shorter sides and connected to said electrically conductive pattern, said liquid crystal display panel being disposed opposite to said circuit board, and comprising a flexible circuit board for connecting said plurality of signal electrode terminals to the conductive pattern of said circuit board,

wherein the flexible circuit board simultaneously supplies the same signal to two of said signal electrode terminals which are disposed at positions axisymmetrical with each other about a center line bisecting said plurality of signal electrode terminals;

two elastic conductors disposed and compressed between said circuit board and said liquid crystal display panel for connecting said plurality of electrode terminals disposed along at least two sides of said liquid crystal display panel to said electrically conductive pattern of said circuit board;

a lamp for radiating a light toward said liquid crystal display panel; and

a light guide plate disposed between said circuit board and said liquid crystal display panel for conducting the light from said lamp toward said liquid crystal display panel.

said lamp being disposed between at least one of said elastic conductors and said display area,  
said light guide plate including a reflecting sheet on a top face, an outer periphery face and a bottom face of the light guide plate for avoiding any external leakage of the light from the lamp.

**5,774,200**  
**CLIP-ON AUXILIARY GLASSES AND METHOD OF MANUFACTURE**

Ryan N. Markey, Dallas, Tex., assignor to Clip Tech, Inc., Dallas, Tex.

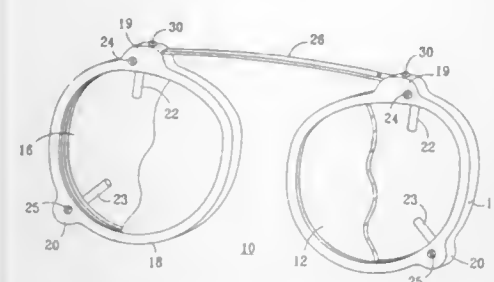
Filed Dec. 8, 1995, Ser. No. 534,484

Int. Cl.<sup>6</sup> G02C 7/16; 7/08; 13/00

U.S. Cl. 351—47

8 Claims

1. A method of preparing clip-on auxiliary eyeglasses for a pair of eyeglasses having a frame holding two lenses, comprising:  
(a) maintaining a stock of separate components comprising auxiliary lenses of various shapes, heat-softenable auxiliary rims of various circumferences, clips and bridge straps;  
(b) selecting auxiliary lenses from the stock of auxiliary lenses so that the selected auxiliary lenses generally correspond in shape to the shape of the lenses in the eyeglasses;



- (c) selecting a heat-softenable rim from the stock of heat-softenable rims for each auxiliary lens corresponding in circumference to the circumference of the auxiliary lens;
- (d) heating the selected rims to soften them;
- (e) securing the selected auxiliary lens in the softened rims;
- (f) fastening a pair of clips from the stock of clips at spaced locations on each rim; and
- (g) securing a strap connecting the rims, the strap having a length selected such that the connected rims correspond in configuration to the eyeglasses.

5,774,201

## ELLIPTICAL LENS FOR EYEWEAR

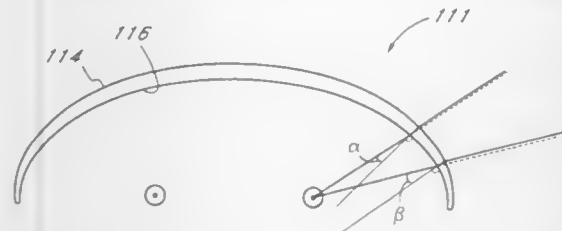
George J. Tackles, Capistrano Beach, Calif., assignor to Oakley, Inc., Foothill Ranch, Calif.

Filed Dec. 5, 1995, Ser. No. 567,474

Int. Cl.<sup>6</sup> G02C 7/02; 7/10

U.S. Cl. 351—159

11 Claims



1. An arcuately molded lens for eyeglasses for participation in active sports, such as biking, skiing, and the like, said lens comprising:

a unitary lens having a top edge and a bottom edge, the bottom edge having a nose-piece opening formed therein for mounting the lens on the nose of a wearer.

the lens having a bridge portion over the nose-piece opening, the distance separating the lower edge of the bridge portion and the top edge of the lens being defined as  $d_1$  and the distance separating the top edge of the lens and the bottom edge of the lens being defined as  $d_2$ , wherein  $d_1$  is in the range of about 1/2 inch to 1 1/2 inches, and  $d_2$  is in the range of about 1 3/4 inches to 2 3/4 inches, said dimensions providing optimum interception of light rays while allowing ventilation around the face of the wearer while participating in active sports; and

the lens having in its as-molded condition an arcuate cross-sectional configuration wherein the arc length (L) of said lens is in the range of from about 5 1/2 inches to about 7 1/2 inches, and wherein the horizontal arc of the lens has a medial portion and lateral ends, wherein the lateral ends have gradually tightening curvature relative to the curvature of the medial portion so that the horizontal arc of the lens conforms substantially to a portion of an ellipse.

5,774,202  
METHOD AND OPTICAL MEANS FOR IMPROVING OR MODIFYING COLOR VISION AND METHOD FOR MAKING SAID OPTICAL MEANS

György Ábrahám; Gutfriedné Wenzel, both of Budapest, Hungary, and Janos Szappanos, Newfane, Vt., assignors to Coloryte Hungary Optikai Kutató, Fejlesztő és Gyártó Részvénytársaság, Szeged, Hungary

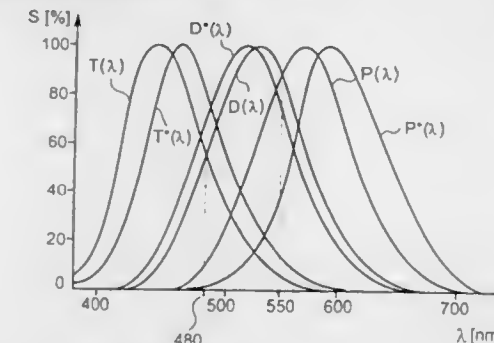
PCT No. PCT/HU93/00045, § 371 Date May 1, 1996, § 102(e) Date May 1, 1996, PCT Pub. No. WO95/05621, PCT Pub. Date Feb. 23, 1995

PCT Filed Aug. 18, 1993, Ser. No. 596,132

Int. Cl.<sup>6</sup> G02C 7/02

U.S. Cl. 351—177

23 Claims



1. A method for modifying color vision of an eye, comprising the steps of:

determining spectral sensitivity curves of color-sensitive receptors of said eye with color vision to be modified; and applying a color filter with a spectral transmission selected to correct, in at least one of three wavelength ranges in a vicinity of maximum values of the spectral sensitivity curves of the color-sensitive receptors, wavelength shifts and shape deformations of said spectral sensitivity curves along a wavelength axis, as determined, so as to correspond to spectral sensitivity curves of receptors of an eye with normal or desired color vision and wherein the spectral sensitivity curves of the color-sensitive receptors of said eye with color vision to be modified are shifted along the wavelength axis independently of each other.

5,774,203

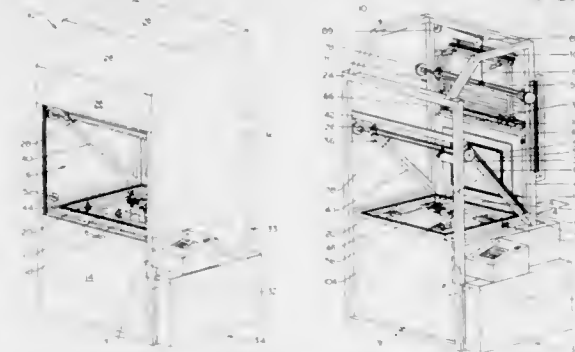
## SELF-CONTAINED FILM EXPOSING/DEVELOPING MACHINE

John G. Diehl, 22601 Corteville, St. Clair Shores, Mich. 48081  
Continuation-in-part of Ser. No. 305,086, Sep. 13, 1994, abandoned. This application Nov. 14, 1994, Ser. No. 339,503

Int. Cl.<sup>6</sup> G03B 27/32; 27/20

U.S. Cl. 355—27

18 Claims



1. A device for use in a machine for light exposing and developing images on a film requiring at least a film-activating operation prior to light exposure of an image, the device comprising:

a blanket frame juxtaposed to a frame transparent portion, said blanket frame having means movable between first and second positions for opening and closing movements relative to

said frame transparent portion and providing for nested engagement with said frame, said blanket frame having a vacuum engaging platen face to which is applied a vacuum which engages said film against said platen face during movable positioning of said blanket frame and said film, and a carriage within a complete ambient light-blocking enclosure within the said machine, said carriage movable between a first and second position and having gripping means for gripping said film so as to remove said film from said blanket frame while said blanket frame is held in an open position relative to said frame transparent portion and support said film on said carriage while transporting said film between a first and second position therein.

5,774,204

HEAT DEVELOPMENT DEVICE HAVING SHEET PRESSING MEMBERS AND WIDE HEATING PLATES  
Kenichi Suzuki, Isehara; Keiji Ohkoda, Yokohama; Kazumasa Matsumoto, Yokohama, and Satoshi Shimizu, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

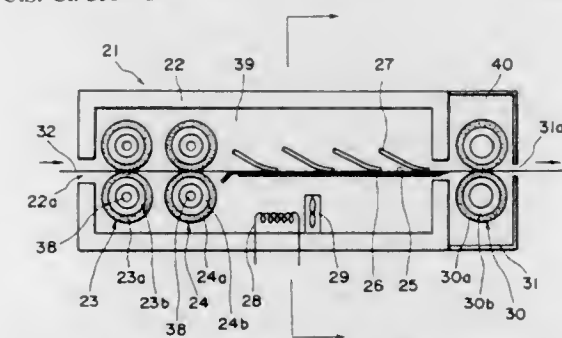
Filed Mar. 4, 1996, Ser. No. 609,783

Claims priority, application Japan, Mar. 2, 1995, 7-043105

Int. Cl.<sup>6</sup> G03B 27/32

U.S. Cl. 355—27

22 Claims



1. A heat development device for thermally developing a latent image formed on a sheet, comprising: sheet guide means in the form of a plate and heating means for heating said sheet guide means, said heating means having a width more than a width of said sheet guide means and having both ends in a widthwise direction each of which extends outwardly from a corresponding end of said sheet guide means.

5,774,205

EXPOSURE AND METHOD WHICH TESTS OPTICAL CHARACTERISTICS OF OPTICAL ELEMENTS IN A PROJECTION LENS SYSTEM PRIOR TO EXPOSURE  
Ryuichi Sato, Utsunomiya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1996, Ser. No. 682,959

Claims priority, application Japan, Jul. 21, 1995, 7-207700

Int. Cl.<sup>6</sup> G03B 27/54; 27/42; 27/52; G01B 11/00

U.S. Cl. 355—67

23 Claims

1. An exposure apparatus for producing devices, in which an original pattern is projected onto an object to be exposed, through a projection optical system, said exposure apparatus comprising: at least one optical element included in said projection optical system, the optical characteristics of each of the optical elements having been tested using a measuring beam having a first wavelength region, the optical elements having lower reflectance in a second wavelength region, selected independently of the first wavelength region, lower than in the first wavelength region; and

an exposure light source for emitting a light beam, having the second wavelength region, to irradiate the original pattern with the beam from said exposure light source, so that an

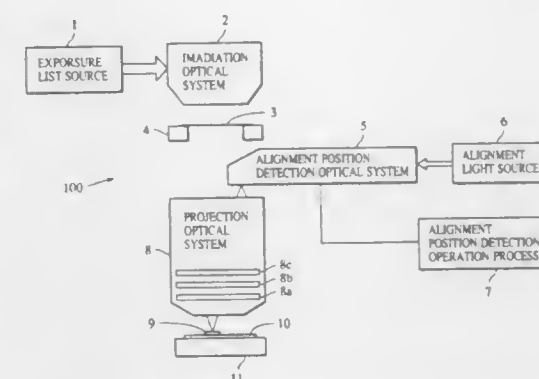


image pattern is projected onto the object, through the at least one optical element, thereby exposing the object to produce the device.

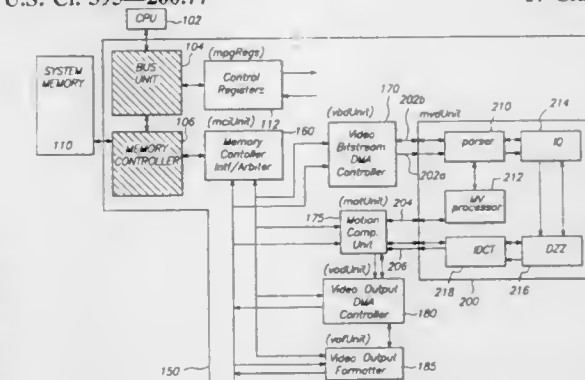
5,774,206

PROCESS FOR CONTROLLING AN MPEG DECODER  
Steve C. Wasserman, Cupertino; James Armand Baldwin, and George Mitsuoka, both of Mountain View, all of Calif., assignors to CagEnt Technologies, Inc., Santa Clara, Calif.  
Continuation of Ser. No. 439,085, May 10, 1995, abandoned.  
This application Dec. 19, 1996, Ser. No. 769,575

Int. Cl.<sup>6</sup> H04N 7/30

U.S. Cl. 395—200.77

17 Claims



1. A process for decoding MPEG encoded image data stored in a system memory utilizing a configurable image decoding apparatus, said process comprising the steps of:

- (a) establishing in the system memory a series of buffers, including a display buffer, a reference buffer and a strip buffer;
- (b) extracting macroblock information from said MPEG encoded image data, the macroblocks containing image data and motion compensation data;
- (c) extracting a series of parameters from the MPEG encoded image data for decoding the MPEG encoded data;
- (d) determining quantization factors from the encoded image data;
- (e) configuring the configurable image decoding apparatus, including
- (i) configuring a means for parsing the macroblock data into motion vectors and image data with the series of parameters for decoding the encoded data;
- (ii) configuring a means for performing inverse quantization with the quantization coefficients;
- (f) determining a decoding order of the extracted macroblock information to be decoded;
- (g) providing said extracted macroblock information to the parsing means in the decoding order;
- (h) combining decoded image data with motion vectors extracted by the parsing means; and
- (i) storing the combined data in the system memory.



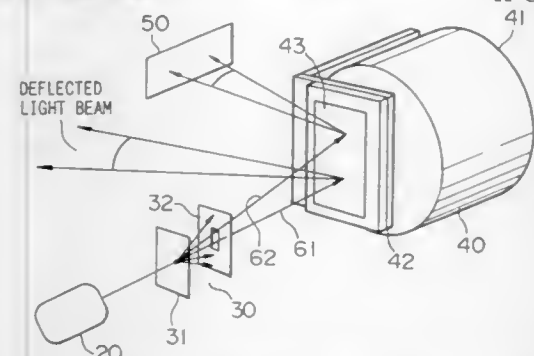
5,774,207  
LIGHT SCANNER

Masaharu Yoshida, Tokyo; Ken'ichi Arakawa, Tokorozawa, and Kazuyoshi Tateishi, Ichihara, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan  
Filed Jun. 27, 1996, Ser. No. 671,482

Claims priority, application Japan, Jun. 28, 1995, 7-162411; Sep. 14, 1995, 7-237211

Int. Cl.<sup>6</sup> G01C 3/00; G01B 11/26; 11/24  
U.S. Cl. 356—3.09

11 Claims



1. A light scanner for scanning a profile of an object, comprising:

- an optical source for emitting a source light beam;
- a source light beam separation means for separating said source light beam into a first light beam and a second light beam, the first light beam having a constant angular relationship with said second light beam, said first light beam being used for distance measurement, and said second light beam being used for deflection angle measurement;
- a movable portion having a metallic leaf and an elastic body supporting said metallic leaf;
- an electromagnet for vibrating said movable portion by intermittent electrical current;
- a mirror affixed to said movable portion for deflecting said first and second light beams; and
- a photo-detector for detecting said second light beam after deflection and outputting signals based on an incident position of said deflected second light beam.

## 5,774,208

## COAXIAL ELECTRO-OPTICAL DISTANCE METER

Mitsutaka Abe, Atsugi, Japan, assignor to Sokkia Co., Ltd., Tokyo, Japan

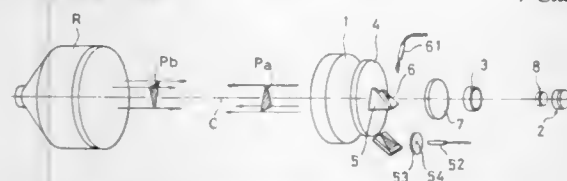
Filed Mar. 7, 1996, Ser. No. 612,448

Claims priority, application Japan, Jun. 19, 1995, 7-151922

Int. Cl.<sup>6</sup> G01C 3/08

U.S. Cl. 356—4.01

7 Claims



1. A coaxial electro-optical distance meter comprising: optical means on a light transmitting side located behind an objective lens such that light from a light transmitting member is reflected from a first reflecting surface disposed adjacent to an optical axis of said objective lens and emitted through said objective lens as transmitted light to a reflecting member disposed ahead of said objective lens;

optical means on a light receiving side arranged such that received light reflected from said reflecting member is reflected from a second reflecting surface, disposed adjacent said optical axis, to a light receiving member;

wherein said first reflecting surface is disposed such that said optical axis is positioned inside a luminous flux of said transmitted light; and

wherein said optical means on the light transmitting side includes reforming means for reforming a cross section of said luminous flux of said transmitted light into a point-asymmetrical shape.

## 5,774,209

## TRANSMITTANCE CELL FOR SPECTROPHOTOMETER

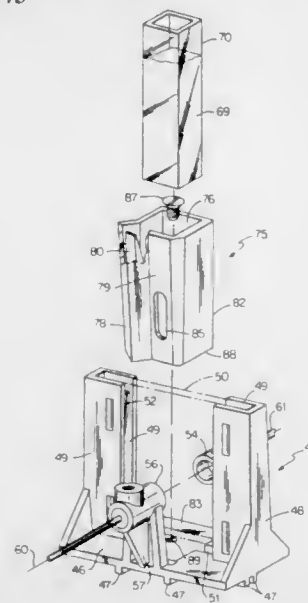
Michael A. Shestok, Rush, N.Y., assignor to Spectronic Instruments, Inc., Rochester, N.Y.

Filed Oct. 8, 1996, Ser. No. 728,298

Int. Cl.<sup>6</sup> G01N 21/01; 21/13

U.S. Cl. 356—73

18 Claims



1. Apparatus for mounting either a solid translucent sample or a liquid sample in a spectrophotometer that includes,

- a base plate,
- a pair of opposed spaced apart columns mounted upon the base plate having guide means for slidably receiving therein a solid translucent sample,
- first and second opposed optical housings mounted on said base plate that are spaced apart along an optical axis that passes between said columns,
- said first optical housing containing first optical means for directing a light beam along said optical axis,
- said second optical housing containing second optical means for receiving light from said first optical housing and transmitting said light to a spectrograph for analysis,
- a cuvette holder mounted in said base plate between said optical housings, said cuvette holder containing window means therein for permitting said light beam to pass undisturbed through said cuvette holder, and
- a transparent vile for holding a liquid sample that is removably contained within said cuvette holder to position said liquid sample in said light beam.

## 5,774,210

## PERPENDICULARITY MEASURING METHOD AND AN APPARATUS THEREOF

Dae-Gab Gweon, Yuseung-Gu; Young-Bin Cho, Seo-Gu, and Hee Hyeon Moon, Yuseung-Gu, all of Rep. of Korea, assignors to Sam Jung Co., Ltd., Rep. of Korea

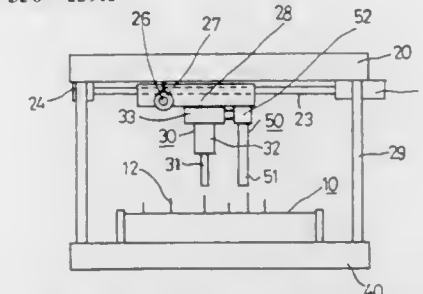
Filed Apr. 18, 1996, Ser. No. 634,463

Claims priority, application Rep. of Korea, Apr. 10, 1995, 95-24626; Apr. 18, 1995, 95-9015

Int. Cl.<sup>6</sup> G01C 1/06

U.S. Cl. 356—139.1

12 Claims



1. A perpendicularity measuring apparatus for measuring perpendicularity of an object installed to a reference plane, comprising:

- a measuring part for optically obtaining image data of the object to be measured, the image data being obtained from a front viewing plane to the object and a side viewing plane to the object, wherein the front and side viewing planes are perpendicular to the reference plane and to one another;
- measuring-part driving means for moving said measuring part towards and away from the object; and
- a data processing part for processing said image data obtained by said measuring part to calculate said perpendicularity, and outputting the result of the calculation.

## 5,774,211

## LASER LEVELING SYSTEM FOR SETTING PIPES

Fumio Ohtomo; Kunihiko Hayashi; Jun-ichi Kodaira; Hiroyuki Nishizawa; Ken-ichiro Yoshino; Satoshi Hirano, and Yohei Ogawa, all of Tokyo-to, Japan, assignors to Kabushiki Kaisha Topcon, Tokyo-to, Japan

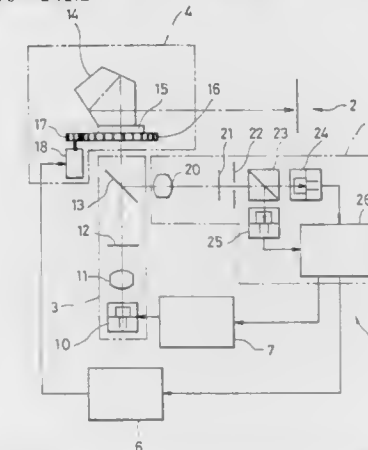
Continuation-in-part of Ser. No. 302,051, Sep. 7, 1994, Pat. No. 5,612,781. This application Apr. 4, 1996, Ser. No. 627,430

Claims priority, application Japan, Sep. 9, 1993, 5-248765; Sep. 17, 1993, 5-231522; Jun. 24, 1994, 6-166105

Int. Cl.<sup>6</sup> G01B 11/26

U.S. Cl. 356—141.2

20 Claims



1. A laser leveling system for setting pipes, comprising a laser emitter rotatably supported for emitting an irradiation light beam to

an object reflector, said irradiation light beam being a polarized irradiation light beam, said object reflector having a reflection surface for converting the direction of polarization of said polarized irradiation light beam for reflecting said polarized irradiation light beam; a reflection light beam detector for detecting a reflection light beam reflected from said object reflector; a driving unit having a first driving means for rotating said laser emitter in a vertical direction and a second driving means for rotating said laser emitter in a horizontal direction; and a controller for controlling at least one of said driving means so as to direct the irradiation light beam to the object reflector based on output from said reflection light beam detector.

## 5,774,212

## METHOD AND APPARATUS FOR DETECTING AND ANALYZING DIRECTIONALLY REFLECTIVE SURFACE FLAWS

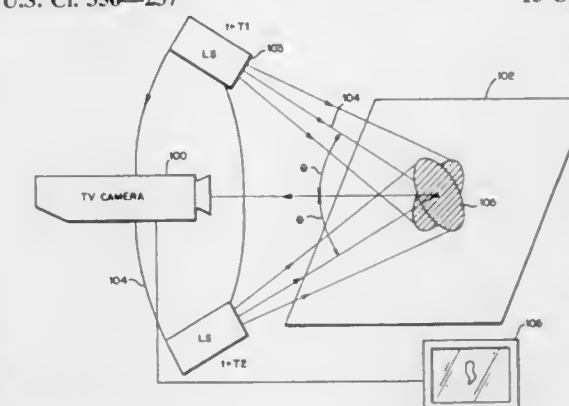
Nelson Raymond Corby, Jr., Scotia, N.Y., assignor to General Electric Co., Schenectady, N.Y.

Filed Mar. 19, 1997, Ser. No. 821,676

Int. Cl.<sup>6</sup> G01N 21/00

U.S. Cl. 356—237

13 Claims



1. An inspection system for imaging and analyzing anisotropically reflecting surface flaws of an object, comprising:

- a camera positioned to acquire a visual image of an area on a surface of an object;
  - a disk-shaped annular light source support structure having a light source mounted at an outer periphery, the light source comprising a diverging source of light for illuminating at least a portion of the area, the support structure mounted about a annular roller-bearing and the camera positioned at a center of the annular roller-bearing; and
  - a motor-driven friction drive wheel positioned against the support structure so as to cause the support structure to rotate about the camera on the roller-bearing.
- wherein rotation of the support structure causes the light source to progress in an orbital path about an axis extending between a center of image acquiring optics of the camera and a center of the area on the object while illumination from the light source is being directed approximately at the center of the area such that the area is illuminated from a variety of different directions so that any directionally reflective surface flaws will exhibit a detectable change in contrast with respect to immediately surrounding regions.

5,774,213

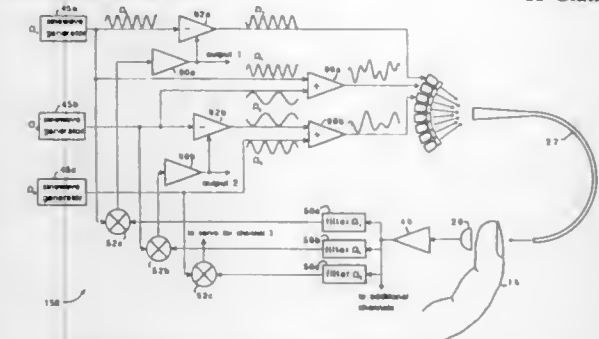
**TECHNIQUES FOR MEASURING DIFFERENCE OF AN OPTICAL PROPERTY AT TWO WAVELENGTHS BY MODULATING TWO SOURCES TO HAVE OPPOSITE-PHASE COMPONENTS AT A COMMON FREQUENCY**  
Rick P. Trebino, 425 Mulqueeney Dr., Livermore, Calif. 94550; Nicholas M. Sampas, 806 Fremont St., Menlo Park, Calif. 94025, and Eric K. Gustafson, 835 Webster St., Apt. E, Palo Alto, Calif. 94301

Continuation-in-part of Ser. No. 426,790, Apr. 21, 1995, abandoned. This application Aug. 23, 1995, Ser. No. 518,427

Int. Cl.<sup>6</sup> G01N 21/31

U.S. Cl. 356—320

11 Claims



1. Apparatus for measuring a difference between the value of an optical property of a sample at a first wavelength and the value of the optical property of the sample at a second wavelength, and a difference between the value of the optical property of the sample at the second wavelength and the value of the optical property of the sample at a third wavelength, the apparatus comprising:

first, second, and third optical sources emitting light at the first, second, and third wavelengths;

modulation means for modulating the optical power of each of said sources so that (a) the optical powers of said first and second sources have respective first and second components that vary periodically with a common frequency, wherein the periodic variation of said first component is of opposite sign to the periodic variation of said second component, and (b) the optical powers of said second and third sources have respective third and fourth components that vary periodically with an additional common frequency, wherein the periodic variation of said third component is of opposite sign to the periodic variation of said fourth component;

means for combining light from said first, second, and third sources and directing said light to engage the sample;

detection means, responsive to said light, so combined after engagement with the sample, for providing an electrical signal proportional to the total optical power of said light after engagement with the sample;

wherein said first and second components have substantially the same amplitude of power variation at said common frequency; and

means, responsive to said electrical signal, for generating (a) an output signal proportional to the amplitude of a component of said electrical signal at said common frequency, whereupon said output signal is proportional to the difference between the value of the optical property of the sample at the first wavelength and the value of the optical property of the sample at the second wavelength, and (b) an additional output signal proportional to the amplitude of a component of said electrical signal at said additional common frequency, whereupon said additional output signal is proportional to the difference between the value of the optical property of the sample at the second wavelength and the value of the optical property of the sample at the third wavelength.

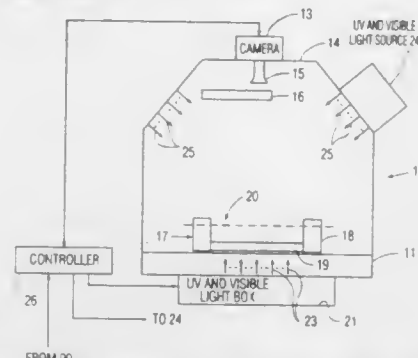
**MULTI-MODE IMAGING APPARATUS FOR RADIATION-EMITTING OR ABSORBING SAMPLES**  
Keith Neil Prettyjohns, Tucson, Ariz., assignor to Photometrics, Ltd., Tucson, Ariz.

Filed Dec. 12, 1996, Ser. No. 764,305

Int. Cl.<sup>6</sup> G01N 21/64

U.S. Cl. 356—344

19 Claims



1. Multi-mode apparatus for capturing a light image from a planar sample, said apparatus comprising a solid state camera defining a focal plane in said apparatus, said apparatus including a tray, said apparatus including means for positioning said tray in the field of view of said camera, said tray including means for accepting sample holders at different elevations, each of said sample holders being of a configuration for accepting an associated sample, said means for accepting including means for positioning said sample holder at a different elevation in said tray for positioning said sample at said focal plane.

5,774,215

**REDUCED COMPLEXITY FOURIER TRANSFORM SPECTROMETER**

Miles John Padgett, Cambridge, England; Wilson Sibbett, St Andrews, Scotland; Johannes Courtial, Veitschochheim, Germany, and Brett Alexander Patterson, Norwood, Australia, assignors to Siemens plc, Bracknell, England

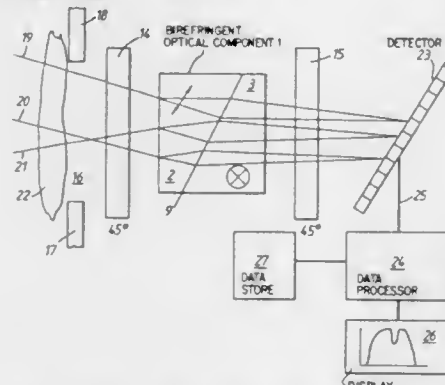
Filed Sep. 9, 1996, Ser. No. 709,296

Claims priority, application United Kingdom, Sep. 12, 1995, 9518603

Int. Cl.<sup>6</sup> G01B 9/02

U.S. Cl. 356—346

9 Claims



1. Fourier transform spectrometer for use in detecting a composition of a gas or liquid sample from light absorbed by said sample, comprising first and second polarizers, a birefringent optical component interposed between the first and the second polarizers and a detector, wherein polarization axes of the first and second polarizers are aligned so that they are substantially 45° to optic axes of the birefringent optical component, said birefringent optical component comprising first and second contiguously juxtapositioned birefringent wedges, the optic axis of the said first wedge being inclined at an angle subtended from planes perpendicular to an optical axis of the birefringent optical component and the optic axis of the second wedge being substantially perpendicular to the

optical axis of the birefringent optical component, so that light entering the spectrometer after passing through said sample is polarized by said first polarizer and is caused to split into two orthogonally polarized beams following diverging paths in the first wedge, and to converge after passing through the said second wedge, so that two polarized beams interfere in a plane behind the birefringent optical prism, where the detector is situated.

5,774,216

**RLG DITHER NOISE INJECTION BY MEANS OF REFERENCE MODULATION**

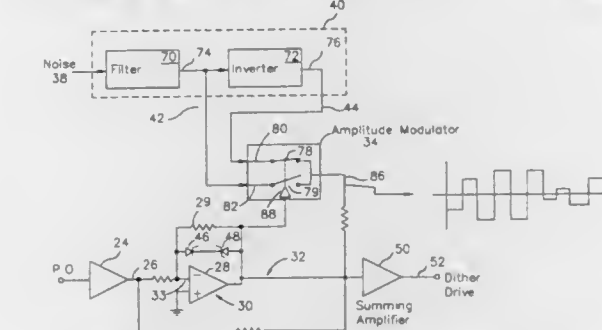
Lloyd W. Priddy, Mohtomedi, Minn., and Wesley C. Sewell, Dunedin, Fla., assignors to Honeywell, Inc., Minneapolis, Minn.

Filed Nov. 30, 1993, Ser. No. 160,003

Int. Cl.<sup>6</sup> G01C 19/70

U.S. Cl. 356—350

28 Claims



1. A dither drive for driving a dither apparatus so as to rotationally bias a ring laser gyroscope, the dither drive comprising:

pick-off means for producing a pick-off signal indicative of the rotational motion of the dither apparatus;

pick-off amplifying means for receiving the pick-off signal and amplifying the pick-off signal to produce an amplified pick-off signal;

squaring circuit means for receiving the amplified pick-off signal and producing a square wave signal having a frequency equal to that of the amplified pick-off signal;

a noise source for generating a random noise signal; modulating means for receiving the random noise signal and the square wave signal, the modulating means for generating an amplitude modulated signal in response to the square wave signal and the random noise signal wherein the amplitude modulated signal has a frequency equivalent to that of the square wave signal; and

summing means for receiving the amplitude modulated signal, the square wave signal, and the amplified pick-off signal, and producing a dither drive signal which is equal to the sum of the amplitude modulated signal, the square wave signal, and the amplified pick-off signal.

5,774,217

**MEASUREMENT OF NONLINEAR REFRACTIVE INDEX COEFFICIENT OF OPTICAL FIBER BY SAGNAC INTERFEROMETER**

Hak-Kyu Lee; Kyong-Hon Kim; Seo-Yeon Park, and El-Hang Lee, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon, Rep. of Korea

Filed Oct. 21, 1996, Ser. No. 734,265

Claims priority, application Rep. of Korea, Nov. 17, 1995, 1995-42069

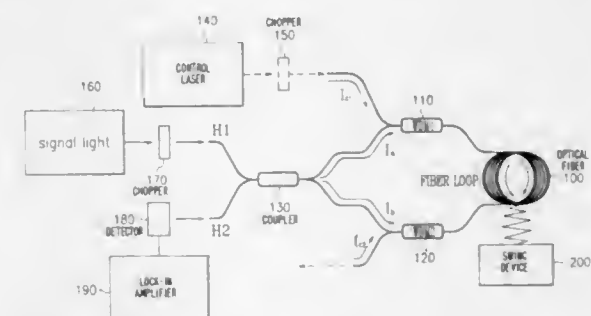
Int. Cl.<sup>6</sup> G01B 9/02

U.S. Cl. 356—350

3 Claims

1. A method of measuring nonlinear refractive index coefficient of an optical fiber in a Sagnac interferometer, said method comprising the steps of:

employing said optical fiber in said Sagnac interferometer;



splitting a signal beam into two signals; launching said two split signals into said interferometer in opposite directions;

combining and detecting said two split signals counter-propagating said interferometer; and

determining the refractive index coefficient of said optical fiber in accordance with the difference between the powers of said two split signals discriminated by a control beam;

wherein the phase shift of said two split signal beams counter-propagating the same paths of said interferometer is induced in a quasi-static state by rotating the optical fiber loop of said interferometer.

5,774,218

**LASER DOPPLER VELOCIMETER WITH ELECTRO-OPTICAL CRYSTAL**

Makoto Takamiya, Tokyo, and Hidejiro Kadowaki, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

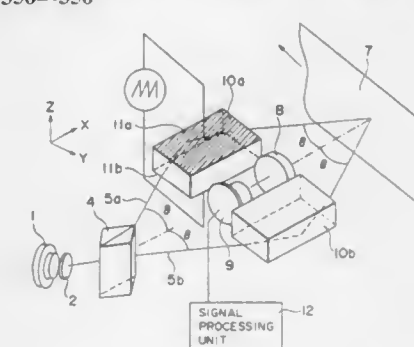
Filed Aug. 1, 1995, Ser. No. 509,936

Claims priority, application Japan, Aug. 3, 1994, 6-182299

Int. Cl.<sup>6</sup> G01B 11/02; G01P 3/36; G01N 21/00

U.S. Cl. 356—356

12 Claims



1. An apparatus for detecting displacement information of an object to be measured comprising:

a light source;

an electro-optical crystal disposed at an incidence position of a light beam from said light source, the light beam being modulated in said electro-optical crystal, the light beam being internally reflected at least once at the inner side in said electro-optical crystal and emerging therefrom; and

a light receiving element for receiving the light from the object to be measured to which the light beam having been internally reflected at least once in and having emerged from said electro-optical crystal is applied, the displacement information of the object to be measured being detected by the light reception of said light receiving element.



5,774,219

## REFLECTION-TYPE OPTICAL ENCODER WITH LIGHT RECEIVING ARRAY

Tatsuhiko Matsuura, Osaka, Japan, assignor to Mitutoyo Corporation, Kanagawa, Japan

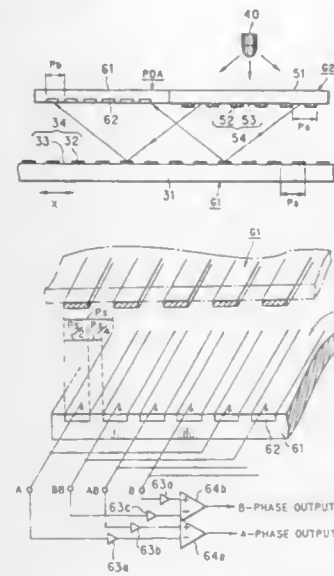
Filed Jan. 21, 1997, Ser. No. 786,668

Claims priority, application Japan, Jan. 23, 1996, 8-028596

Int. Cl.<sup>6</sup> G01B 9/02

U.S. Cl. 356—356

13 Claims



1. An optical encoder, comprising:

a first member having a main scale on which reflecting portions and non-reflecting portions are alternately arranged at a pitch  $P_s$  to form a reflection-type grating;

a second member disposed opposite to said first member with a predetermined gap so as to be relatively movable;

light emitting means disposed on said second member for irradiating said main scale and generating a reflected image pattern, said light emitting means having a primary light source which generates a diffused light, and an index scale on which light transmitting portions and non-light transmitting portions are alternately arranged to form a transmission-type grating, said index scale serving as a secondary light source array; and

a light receiving device array disposed on said second member for detecting the reflected image pattern to generate four output signals that are 90° phase-shifted sequentially, said light receiving device array having a semiconductor substrate and a plurality of light detecting devices formed thereon, the width of each light detecting device being set to  $P_s/2$  and the interval thereof being set to  $P_s/4$ , said light receiving device array and said index scale being integrally united in such a manner that a receiving surface of said light receiving device array is aligned with a grating surface of said index scale.

5,774,220

## CONTINUOUS CONTACTLESS MEASUREMENT OF PROFILES AND APPARATUS FOR CARRYING OUT THE MEASUREMENT PROCESS

Siegfried Wienecke, Dortmund, Germany, assignor to Mesacon Gesellschaft für Messtechnik mbH, Germany

Continuation of Ser. No. 272,643, Jul. 11, 1994, abandoned, which is a continuation of Ser. No. 910,321, Jul. 20, 1992, abandoned. This application Oct. 20, 1995, Ser. No. 546,512

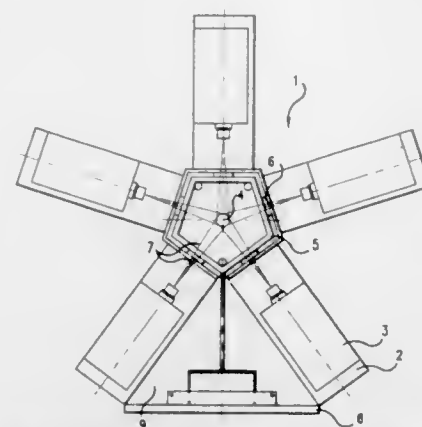
Claims priority, application Germany, Nov. 20, 1990, 40 37 383.5

Int. Cl.<sup>6</sup> G01B 11/24; 11/10

U.S. Cl. 356—376

19 Claims

1. A process for continuous and contactless measurement of the profile of a workpiece, wherein:



probe means formed of a plurality of spaced part laser beams continuously scan respective measuring regions of said workpiece in a predetermined manner, said laser beams being reflected off of said workpiece at said measuring points in accordance with the triangulation principle;

a fixed receiver uses said laser beams reflected by said workpiece on the basis of the geometrical relationships of the spacing of each measured point of said probe determined in the form of local measured data;

said plurality of spaced part laser beams and said fixed receiver are arranged in a mounting all around said profile and spaced therefrom and are arranged in predetermined angular positions with respect to one another such that a contour segment of said profile is associated with said measurement region of each respective said laser light beam as a surface segment;

the measurement regions of adjacent said laser light beams overlap one another;

the overall contour which is to be measured, said profile, is determined by the measurement regions;

a system calibration using a reference workpiece with precise contours and dimensions is carried out by determining the positions of said laser light beams; and

the data of said system calibration, predetermined set data of said profile and said local measured data resulting at the point of intersection of the measurement between with said workpiece are transferred together with a position calculation for said profiles to be measured and by way of coordinate transformations to a global coordinate system and grouped together to form an overall image.

5,774,221

## APPARATUS AND METHODS FOR PROVIDING PHASE CONTROLLED EVANESCENT ILLUMINATION

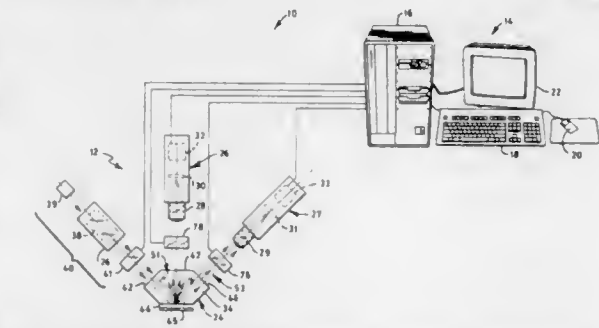
John M. Guerra, Concord, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 21, 1996, Ser. No. 700,810

Int. Cl.<sup>6</sup> G01B 11/24

U.S. Cl. 356—376

37 Claims



1. A system for providing phase controlled illumination, said system comprising:

lighting means for providing at least one beam of radiation having at least one predetermined wavelength and phase angle;

optical means for receiving said beam of radiation from said lighting means and creating at a surface a wavelength evanescent field having planes of equal intensity parallel to said surface and planes of equal phase substantially perpendicular to said surface; and

phase control means for selectively controlling said predetermined wavelength and phase angle of said beam of radiation such that the intensity of said evanescent light varies as a function of the phase of said beam and its planes of equal phase scan over said surface as said phase is changed.

5,774,222

## MANUFACTURING METHOD OF SEMICONDUCTOR SUBSTRATIVE AND METHOD AND APPARATUS FOR INSPECTING DEFECTS OF PATTERNS ON AN OBJECT TO BE INSPECTED

Shunji Maeda; Yasuhiko Nakayama; Minoru Yoshida, all of Yokohama; Hitoshi Kubota, and Kenji Oka, both of Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

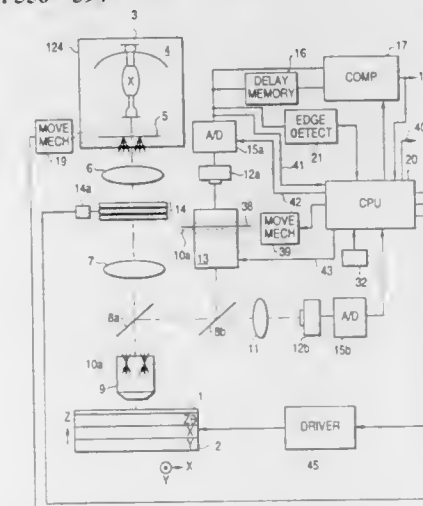
Filed Oct. 6, 1995, Ser. No. 539,886

Claims priority, application Japan, Oct. 7, 1994, 6-268130

Int. Cl.<sup>6</sup> G01N 21/88

U.S. Cl. 356—394

38 Claims



1. A method for detecting information relating to a pattern on an object to be inspected comprising the steps of:

focusing and irradiating an annular-looped diffusion illumination light formed with a plurality of virtual spot light sources onto a pattern on the object to be inspected through a pupil of an objective lens;

receiving an image of the pattern of the inspected object by focusing a first or second order diffraction light including a 0th order diffraction light which is reflected from the pattern on the inspected object by the focused and irradiated annular-looped diffusion illumination light and entered into the pupil of the objective lens;

monitoring the image received into the pupil of the objective lens and controlling the annular-looped diffusion illumination light in response thereto; and

converting the received image of the pattern of the inspected object to image signals of the pattern for obtaining information relating to the pattern.

5,774,223

## OPTICAL MEASURING METHOD AND AN OPTICAL MEASURING APPARATUS FOR DETERMINING THE INTERNAL STRUCTURE OF AN OBJECT

Tsuneaki Urakami; Mitsuharu Miwa; Yutaka Yamashita, and Yutaka Tsuchiya, all of Hamamatsu, Japan, assignors to Hamamatsu Photonics K.K., Shizuoka-ken, Japan

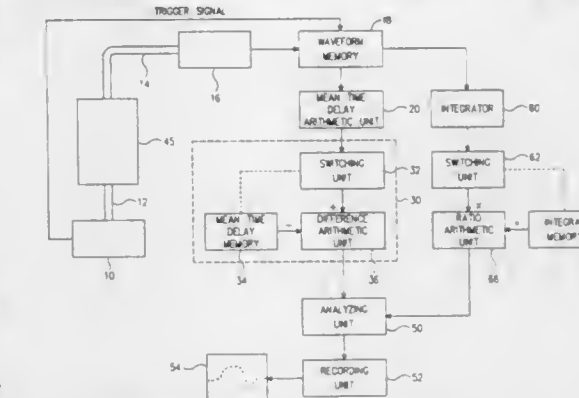
Filed Aug. 27, 1996, Ser. No. 703,766

Claims priority, application Japan, Aug. 28, 1995, 7-218510

Int. Cl.<sup>6</sup> G01B 11/00; G01M 33/48

U.S. Cl. 356—394

18 Claims



1. An optical measuring method comprising:

a first step of, in a first state in which a measured object is placed in a predetermined place, emitting probe light from a light source onto said measured object and detecting said probe light transmitted or reflected by said measured object by means of light detecting means to obtain a first mean time delay of said probe light;

a second step of, in a second state in which said measured object is not placed in said predetermined place, emitting said probe light from said light source to said predetermined place and detecting said probe light passing through said predetermined place without intervention of said measured object by said light detecting means to obtain a second mean time delay; and

a third step of subtracting said second mean time delay from said first mean time delay to obtain a true mean time delay.

5,774,224

## LINEAR-SCANNING, OBLIQUE-VIEWING OPTICAL APPARATUS

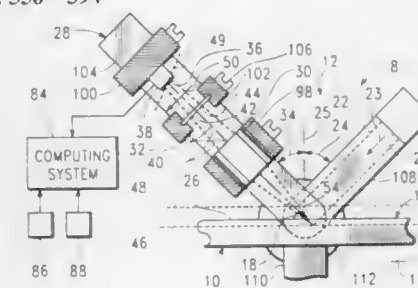
Pieter J. M. Kerstens, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 24, 1997, Ser. No. 790,354

Int. Cl.<sup>6</sup> G01B 11/00

U.S. Cl. 356—394

10 Claims



1. Apparatus for determining physical characteristics of a surface of a test specimen, wherein said surface includes a plurality of outward extending protrusions, and wherein said apparatus comprises:

a photosensitive transducer producing an output signal in response to a light pattern striking a photosensitive surface thereof, wherein a single signal value is produced in response to an illumination pattern extending in a transverse direction along said photosensitive surface;

an objective lens having an optical axis extending at an oblique viewing angle from a normal plane perpendicular to said surface of a test specimen in a viewing region of said apparatus, wherein said objective lens produces an image of said surface of a test specimen on said photosensitive surface, with movement of said test specimen in a scanning direction causing said image to flow along said photosensitive surface in said transverse direction;

specimen drive means moving said test specimen at a constant velocity past said viewing region of said apparatus, with a component of motion of said test specimen occurring in said scanning direction; and

illumination means illuminating said surface of said surface of said test specimen at an oblique illumination angle from said normal plane, with said oblique viewing angle and said oblique illumination angle extending from opposite sides of said normal plane wherein data is read from said charge coupled device in read operations, each of which provides data corresponding to a single illumination pattern extending along said charge coupled device in said longitudinal direction, and wherein, due to movement of said flowing image in said transverse direction, data from sequentially occurring read operations are derived from patterns of illumination reflected off portions of said surface of said test specimen adjacently disposed in said scanning direction, wherein an extent of a darkened region on said surface of a test specimen is determined by examining output data from said charge coupled device to determine lengths of said darkened region along first and second lines perpendicular to one another, wherein said length of said darkened region extending along said first line is determined by examining data from said photosensitive elements adjacent one another in said longitudinal direction in said sequentially occurring read operations; and wherein said length of said darkened region extending along said second line is determined by examining data from an individual read operation among said sequentially occurring read operations.

5,774,225

# SYSTEM AND METHOD FOR COLOR MEASUREMENT AND CONTROL ON-PRESS DURING PRINTING

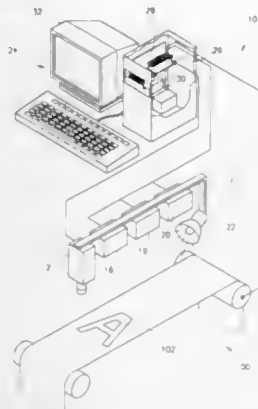
Michael D. Goldstein, Herzlia; Noam Noy, Netanya, and Roy Tenny, Ramat Hasharon, all of Israel, assignors to Advanced Vision Technology, Ltd., Herzlia, Israel

Filed Mar. 27, 1996, Ser. No. 624,886

Int. Cl.<sup>6</sup> G01J 3/46

U.S. Cl. 356—402

28 Claims



1. A method for determining, on-press during printing without using a color patch the color value of a location on a substrate being printed, the method comprising: acquiring an image of an area of an image being printed on said substrate;

substantially simultaneously with said acquiring, measuring a color value of said location; and determining a position of said location with respect to said acquired image by employing said acquired image.

5,774,226

# METHOD OF SCANNING REGISTER MARKS PRODUCED IN MULTICOLOR PRINTING

Tobias Müller, Hirschberg, Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Germany

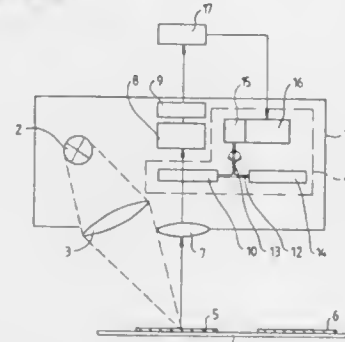
Filed Jan. 20, 1995, Ser. No. 375,966

Claims priority, application Germany, Jan. 20, 1994, 44 01 535.6

U.S. Cl. 356—418

Int. Cl.<sup>6</sup> G01N 21/25

1 Claim



1. Method of scanning register marks produced in multicolor printing which includes generating signals by means of at least one photoelectric receiver from register marks which are applied in respective colors in a register mark track on a print carrier transportable past the receiver, the register marks differing sharply in contrast with the ink on the ink carrier, determining in a circuit arrangement amplitudes of the signals from the register marks, and bringing a filter arrangement into a radiation path between a light source and the receiver for contrast matching, and which comprises:

automatically bringing one defined color filter of the filter arrangement into the radiation path and, after scanning at least one group of register marks wherein all of the colors present in the print are contained, determining a scattering of intensity maxima of the signals generated from the register marks of the at least one group of register marks, automatically bringing another defined color filter of the filter arrangement into the radiation path and, after scanning at least one group of register marks wherein all of the colors present in the print are contained, determining a scattering of intensity maxima of the signals generated from the register marks of the at least one group of register marks, and bringing the defined color filter automatically into the radiation path which is capable of producing a minimal scattering of the intensity maxima of signals.

5,774,227

# ANOMALY DETECTION MACHINE FOR FABRICATED PARTS FORMED ON A CARRIER STRIP AND METHOD OF USE

Ivan KiatHong Oei, San Diego, Calif., assignor to The Whitaker Corporation, Wilmington, Del.

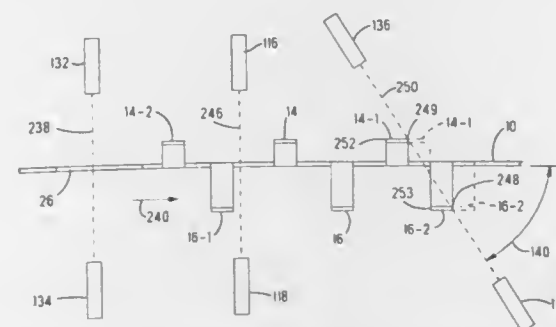
Filed Jan. 28, 1997, Ser. No. 790,034

Int. Cl.<sup>6</sup> G01N 21/89

U.S. Cl. 356—430

22 Claims

1. In a method of identifying anomalies in a plurality of spaced parts attached to a common carrier strip wherein said carrier strip includes a plurality of spaced pilot holes having a known center to



center spacing, said anomalies comprising a deformation of one or more of said parts with respect to others of said parts, comprising the steps:

- (1) transporting said carrier strip and attached parts along a feed path;
- (2) providing a first light source and first photodetector pair arranged on opposite sides of said feed path, and causing light from said first light source to extend along a first line disposed at a first angle to said feed path, in alignment with a portion of said feed path traversed by said plurality of pilot holes so that when a pilot hole is moved into alignment with said first line said first photodetector generates a first positive signal;
- (3) providing a second light source and second photodetector pair arranged on opposite sides of said feed path and causing light from said second light source to extend along a second line disposed at a second angle to said feed path and through a portion of said feed path traversed by said parts so that when a said part interrupts said light said second photodetector generates a second negative signal in response thereto and when said light is not interrupted by a said part said second photodetector generates a second positive signal;
- (4) providing a third light source and third photodetector pair arranged on opposite sides of said feed path and causing light from said third light source to extend along a third line disposed at a third angle to said feed path that is different from said second angle and through a portion of said feed path traversed by said parts so that when a said part interrupts said light said third photodetector generates a third negative signal in response thereto and when said light is not interrupted by a said part said third photodetector generates a third positive signal;
- (5) identifying said anomalies in response to said first and third positive signals and said second and third negative signals; and
- (6) signaling said identifying of said anomalies by generating an error signal.

5,774,228

# DETERIORATION DIAGNOSIS METHOD AND DEVICE OF ELECTRICAL MACHINE AND APPARATUS

Yoshitaka Takezawa, Hitachinaka; Yuzo Ito, Mito, and Shigekatsu Sato, Juou-machi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 26, 1997, Ser. No. 883,317

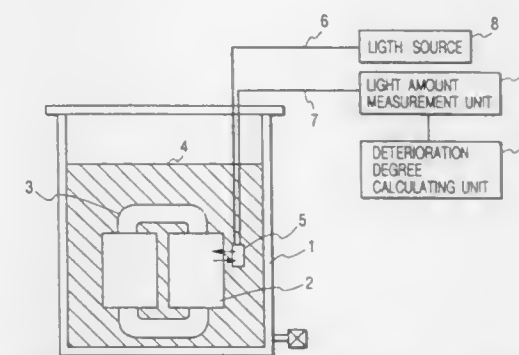
Claims priority, application Japan, Jun. 28, 1996, 8-168961

Int. Cl.<sup>6</sup> G01N 21/00

U.S. Cl. 356—432

14 Claims

1. A deterioration diagnosis method of an electrical machine and apparatus in which irradiation light from a light source of at least two kinds of homogeneous light sources having different wavelengths each other is introduced inside the electrical machine and apparatus via an irradiation use optical fiber, emitting light from the irradiation use optical fiber is transmitted through insulation medium having transmission distance a, thereafter, enters into a light receiving use optical fiber which is guided to the outside of the electrical machine and apparatus and is transferred and introduced into a light quantity measurement unit, characterized in that the deterioration diagnosis method comprising the steps of:



adjusting the intensities of the light source of homogeneous lights so that all of the intensities thereof at the light quantity measurement unit show a constant value; thereafter introducing irradiating light from the light source of homogeneous light into the inside of the electrical machine and apparatus via the irradiation use optical fiber; irradiating a surface of an insulation material located at a position having transmission distance of a/2; guiding reflecting light from the surface of the insulation material to the light quantity measurement unit by making use of the light receiving use optical fiber which guides the reflection light from the surface of the insulation material to the outside of the electrical machine and apparatus; calculating in a deterioration degree processing unit reflection absorbances (A<sub>λ</sub>) for the respective wavelengths according to equation (1) based on the output value from the light quantity measurement unit; processing either reflection absorbance difference (ΔA<sub>λ</sub>) between those for any two wavelengths according to equation (2) or reflection absorbance ratio (A<sub>λ</sub>′) between those for any two wavelengths according to equation (3); and further processing by comparison a relationship between deterioration degree of the insulation material to be measured which is stored in advance in a form of master curve and either the processed reflection absorbance difference or the processed reflection absorbance ratio to thereby judge the deterioration degree of the insulation material.

$$A_{\lambda} = -\log(R_{\lambda}/100) \quad (1)$$

$$\Delta A_{\lambda} = A_{\lambda 1} - A_{\lambda 2} \quad (\text{wherein } \lambda 1 < \lambda 2) \quad (2)$$

$$A_{\lambda}' = A_{\lambda 1}/A_{\lambda 2} \quad (\text{wherein } \lambda 1 < \lambda 2) \quad (3)$$

wherein reflectance of the insulation material to be measured at wavelength λ(nm) is assumed as R<sub>λ</sub>(%).

5,774,229

# HALFTONE SCREEN GENERATOR AND HALFTONE SCREEN AND METHOD FOR GENERATING SAME

Paul A. Delabastita, Antwerp, Belgium, assignor to AGFA-Gevaert, Mortsel, Belgium

Continuation of Ser. No. 930,289, Aug. 17, 1992, abandoned.

This application Jun. 8, 1995, Ser. No. 489,008

Int. Cl.<sup>6</sup> H04N 1/40

U.S. Cl. 358—298

8 Claims

1. A half-tone recording apparatus comprising:
  - (a) a marking engine for recording micro dots on an addressable grid on a recording medium, said marking engine also producing pairs of coordinates (U<sub>i</sub>, V<sub>j</sub>) that correspond to physical locations on said addressable grid;
  - (b) a mapping means for mapping the pairs of coordinates (U<sub>i</sub>, V<sub>j</sub>) into corresponding coordinates (X<sub>i</sub>, Y<sub>j</sub>) of a pre-rotated, multiple dot supercell in which at least some dots have their actual centers of gravity positionally displaced from their theoretical centers of gravity by the length and angle of random phase vectors;
  - (c) a means for generating a threshold value T(X<sub>i</sub>, Y<sub>j</sub>) for every position (X<sub>i</sub>, Y<sub>j</sub>) within said supercell;



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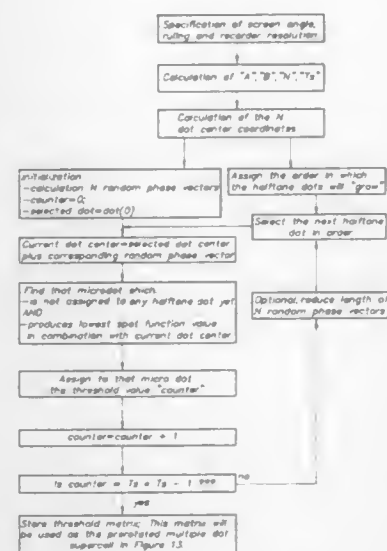
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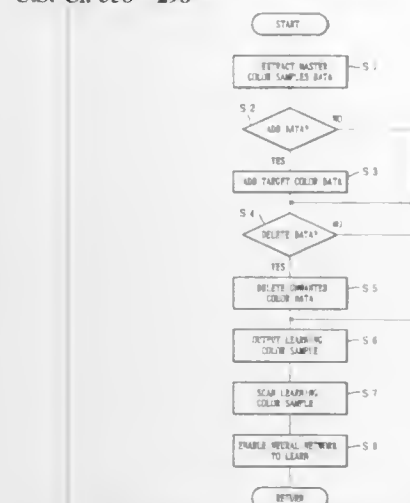
1998

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- (d) a means for image scanning a medium, said means for image scanning having a coordinate system;
- (e) a means for transforming the pairs of coordinates  $(U_i, V_j)$  into the coordinate system of said means for image scanning to produce a pair of image coordinates associated with a corresponding pixel value  $P(i, j)$  from said means for image scanning;
- (f) a means for comparing the threshold value  $T(X_i, Y_j)$  and the pixel value  $P(i, j)$ , said comparing means producing a signal representative of the results of the comparison; and,
- (g) a means responsive to said signal for controlling the recording of said marking engine on the recording medium.

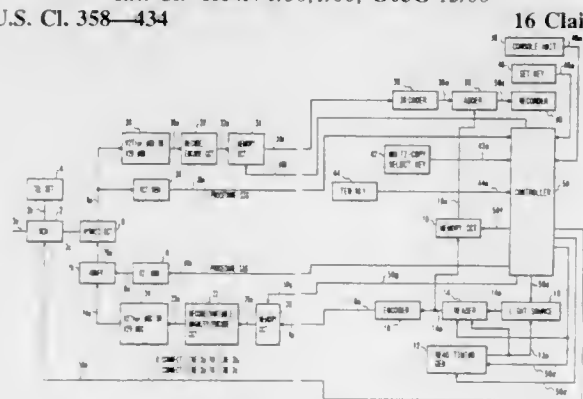
**5,774,230**  
**COLOR IMAGE PROCESSING APPARATUS FOR COLOR-CORRECTING INPUT IMAGE DATA USING NEURAL NETWORK**  
Makio Goto, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan  
Filed May 23, 1996, Ser. No. 652,790  
Claims priority, application Japan, Jun. 21, 1995, 7-155029  
Int. Cl.<sup>6</sup> H04N 1/40; 1/46; G03F 3/08; G06F 15/18  
U.S. Cl. 358—298 10 Claims



1. A color image processing apparatus including:
- read means for reading an original image;
- color correcting means for color-correcting input image data using a color-correcting neural network; and
- output means for outputting color-corrected image data;
- said color-correcting neural network learning using teacher data and learning data.

said teacher data being learning color data produced by adding data of a first color and/or deleting data of a second color to/from data of master color samples, said first color being a color to which human eyes are highly sensitive, said second color being a color to which human eyes are less sensitive, said learning data being image data produced by said read means as said read means reads an image produced by said output means based on said learning color data.

**5,774,231**  
**FACSIMILE APPARATUS WHICH CHANGES THE GENERATION TIME OF ONE LINE OF READ DATA**  
Takehiro Yoshida, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan  
Filed Jul. 5, 1994, Ser. No. 270,468  
Claims priority, application Japan, Jul. 5, 1993, 5-165630  
Int. Cl.<sup>6</sup> H04N 1/36; 1/00; G03G 15/00  
U.S. Cl. 358—434 16 Claims



1. An exposure apparatus for reproducing a pattern of a mask onto a photo-sensitive surface of a substrate using holographic techniques, comprising:

- a hologram recording plate provided with a photo-polymeric recording medium layer being able to record a hologram by a photochemical reaction;
- coherent light source means for generating a coherent light beam;
- support means adapted to hold said recording plate at a predetermined position during both a recording operation for forming a volume hologram in said recording plate and a reconstructing operation for forming an image of the thus formed
- a first illuminating optical system for introducing, during the recording operation, the coherent light beam from said coherent light source means to a mask disposed in a spaced relationship from said recording plate with a predetermined gap left therebetween so as to produce a subject beam exited from the mask and for irradiating the subject beam produced from the mask into said recording medium layer of said recording plate through said gap;
- a second illuminating optical system for irradiating, during the recording operation, the coherent light beam from said coherent light source means as a reference beam into said recording



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plate so as to interfere with the subject beam thereby forming interference fringes in said recording medium layer; means for disposing, when making a start of said reconstructing operation, the substrate at the position of the mask in place of the mask;

a third illuminating optical system for irradiating, during the reconstructing operation, a conjugate beam with the reference beam for the recording operation into said recording plate in which a volume hologram corresponding to the pattern is formed by the recording operation to form an image of the hologram on the photo-sensitive surface of the substrate;

control means for selectively controlling at least one optical system selected from one of said first illuminating optical system, said second illuminating optical system and said third illuminating optical system into an operative condition so as to establish a fixing operation in which a fixing light beam is irradiated from the selected optical system into said recording plate held by said support means in order to fix the hologram formed in said recording plate by the recording operation and further comprising a polarization converting optical element for controlling the polarization direction of a fixing light beam so as to prevent the formation of standing waves by said fixing light beam within said recording medium layer of said recording plate.

5,774,241

CONVERGING BEAM HOLOGRAPHIC DECKLIT CHMSL

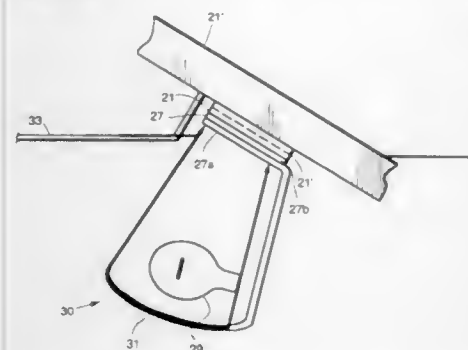
Ronald T. Smith, Corona Del Mar, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Jan. 29, 1996, Ser. No. 592,949

Int. Cl.<sup>6</sup> G02B 5/32; G03H 1/00; B60Q 1/26; 1/44

U.S. Cl. 359—15

4 Claims



1. A holographic stoplight system for a vehicle having a rear window having an inside surface and an outside surface, comprising:

- a light source for providing a converging beam that is vertically converging and predominately horizontally collimated via a para-elliptical reflection;
- a high pass filter comprises a collimating lens for collimating said converging beam to provide a predominantly collimated beam;
- a stoplight hologram supported adjacent the inside surface of the vehicle rear window for diffracting said collimated beam to provide stoplight illumination.

5,774,242  
EYE MASK FOR MEASUREMENT OF DISTORTION IN OPTICAL TRANSMISSION SYSTEMS

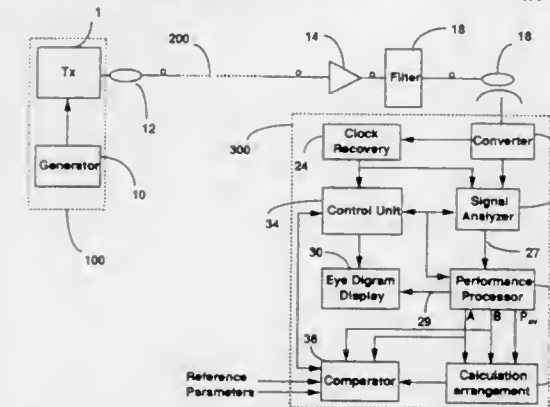
Maurice Stephen O'Sullivan; Rongqing Hui, and Jingyu Zhou, all of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jan. 15, 1997, Ser. No. 785,806

Claims priority, application Canada, May 28, 1996, 2177925 Int. Cl.<sup>6</sup> H04B 10/08

U.S. Cl. 359—110

20 Claims



16. A device for measuring distortion of an optical link comprising:

- a test modulator for generating a pseudo-random bit sequence (PRBS) of order 7 or higher and modulating a transmitter with said (PRBS);
- a reference path comprising all units of said optical link operating at the respective field parameters; and
- a distortion measurement unit, including:
  - means for converting a degraded variant of said PRBS to a digital signal synchronized with said PRBS;
  - means for processing said digital signal to obtain an analog broadband waveform; and
  - means for generating an eye averaged diagram of said analog broadband waveform using a sampling interval relatively large in comparison to the interval between two successive symbols of said digital signal.

5,774,243

CONTROL METHOD OF SELECTING WAVELENGTH OF OPTICAL FILTER, WAVELENGTH CONTROL METHOD OF OUTPUT LIGHT FROM LIGHT OUTPUTTING APPARATUS, WAVELENGTH DIVISION MULTIPLEXING METHOD IN OPTICAL COMMUNICATION SYSTEM AND METHOD FOR CORRECTING RELATION BETWEEN CONTROL

Masao Majima, Isehara, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1996, Ser. No. 725,399

Claims priority, application Japan, Oct. 5, 1995, 7-258647; Sep. 30, 1996, 8-258610

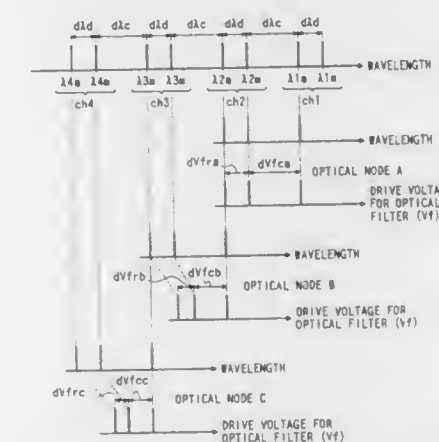
Int. Cl.<sup>6</sup> H04B 10/06

U.S. Cl. 359—124

24 Claims

1. A method for controlling a selecting wavelength of an optical filter in a light detecting device having the optical filter the selecting wavelength of which can be controlled by a control signal, comprising steps of:

- changing values of said control signal to change the selecting wavelength of said optical filter thereby within a wavelength range comprising wavelengths of light of first and second wavelengths generated by optical frequency modulation;
- detecting a difference between a first value, which is a value of said control signal when said optical filter selects said light of the first wavelength, and a second value, which is a value of said control signal when said optical filter selects said light of the second wavelength; and



determining, based on the difference between said first value and said second value, a change amount of values of the control signal necessary for a change from a state in which the selecting wavelength of said optical filter is a third wavelength with the control signal of a third value to a state in which the selecting wavelength is a fourth wavelength with the control signal of a fourth value.

5,774,244

OPTICAL COMMUNICATIONS NETWORKS

Vivek Tandon, Woodbridge; Mark Wilby, London, and Robert E. Semos, Sidcup, all of Great Britain, assignors to British Telecommunications public limited company, London, England

PCT No. PCT/GB95/00088, § 371 Date Nov. 26, 1996, § 102(e) Date Nov. 26, 1996, PCT Pub. No. WO95/19689, PCT Pub. Date Jul. 20, 1995

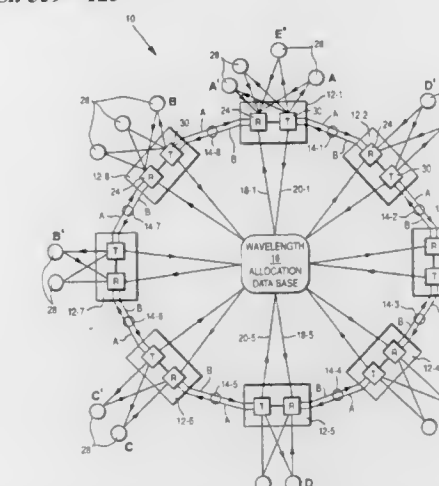
Continuation-in-part of Ser. No. 204,571, Mar. 2, 1994. This PCT application Jan. 18, 1995, Ser. No. 676,257

Claims priority, application European Pat. Off., Jan. 18, 1994, 94300347

Int. Cl.<sup>6</sup> H04J 14/02

U.S. Cl. 359—125

46 Claims



1. An optical communications network comprising:

- a plurality of optically inter-connected passive optical networks (PONs) employing wavelength division multiplexing for communications between source and destination terminals that are, in turn each coupled optically to an associated PON, and wherein first and second wavelengths are respectively allocated to the source and destination terminals on respective PONs for a call,
- each PON having a coupling means arranged to couple input signals to a downstream outgoing path to its respective terminals and to each optical link outgoing to another of the PONs,

5,774,245

OPTICAL CROSS-CONNECT MODULE

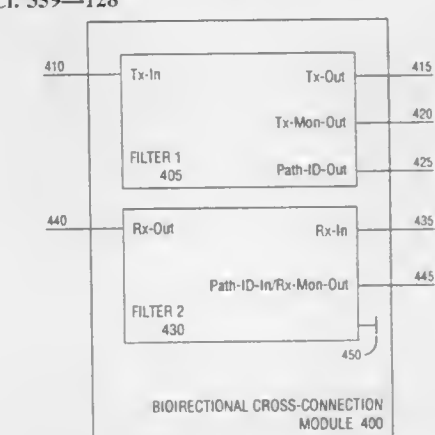
Phillip E. Baker, Tulsa, Okla., assignor to WorldCom Network Services, Inc., Tulsa, Okla.

Filed Jul. 8, 1996, Ser. No. 675,225

Int. Cl.<sup>6</sup> H04J 14/02

U.S. Cl. 359—128

51 Claims



1. An optical cross-connect module comprising:

- (a) a first filter having
  - (i) a transmit-signal input (Tx-In) port,
  - (ii) a transmit-signal output (Tx-Out) port,
  - (iii) a transmit monitor output (Tx-Mon-Out) port,
  - (iv) a path identification output (Path-ID-Out) port,
  - (v) wherein said Tx-In port is optically coupled to the Tx-Out port and to the Tx-Mon-Out port at a first wavelength, and
  - (vi) wherein said Tx-Out port is optically coupled to the Path-ID-Out port at a second wavelength; and
- (b) a second filter having
  - (i) a receive-signal input (Rx-In) port,
  - (ii) a receive-signal output (Rx-Out) port,
  - (iii) a path identification input/receive-signal monitor output (Path-ID-In/Rx-Mon-Out) port,
  - (iv) wherein said Rx-In port is optically coupled to the Rx-Out port and to the Path-ID-In/Rx-Mon-Out port at a third wavelength, and
  - (v) wherein said Path-ID-In/Rx-Mon-Out port is optically coupled to the Rx-In port at a fourth wavelength.

5,774,246

## APPARATUS FOR DEMULTIPLEXING AN OPTICAL DIGITAL SIGNAL

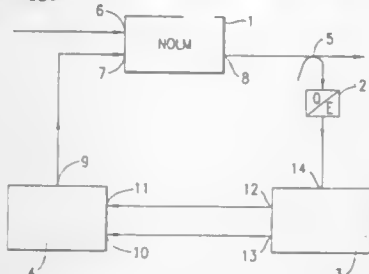
Henning Bülow, Stuttgart, Germany, assignor to Alcatel N.V., Rijswijk, Netherlands

Filed Mar. 28, 1996, Ser. No. 623,159

Claims priority, application Germany, Mar. 30, 1995, 195 11 819.7

Int. Cl.<sup>6</sup> H04J 14/08; H04B 10/06; H03L 7/083  
U.S. Cl. 359—139

6 Claims



1. An apparatus for demultiplexing a fixed-bit-rate optical digital signal, comprising an optical switching device (1) having an input (6) for the optical digital signal, an input (7) for repetitive pulses produced by a pulse generator (4), and an output (8) for a portion of the optical digital signal, characterized in that a phase control device (3) is provided which controls the pulse generator (4) in accordance with changes in the magnitude of an electric signal derived from the output (8) of the optical switching device (1), wherein the portion of the optical digital signal provided by output (8) is the same as the optical digital signal arriving at input (6) a fraction of a period of time, the optical switching device (1) providing the portion of the optical digital signal at the output (8) over a plurality of successive periods of time.

5,774,247

## OPTICAL SIGNAL TRANSCIVER FOR USE WITH DIFFUSELY TRANSMITTED OPTICAL RADIATION

John V. Taglione, Scarborough, and Maurus Cappa, Willowdale, both of Canada, assignors to International Business Machines Corporation, Armonk, N.Y.

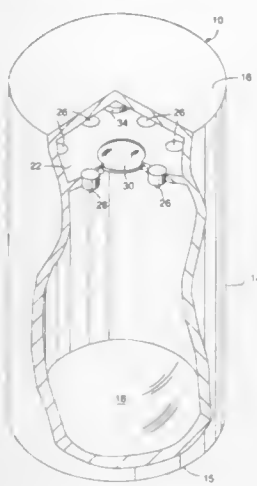
Filed Sep. 4, 1996, Ser. No. 708,863

Claims priority, application Canada, Dec. 28, 1995, 2166256

Int. Cl.<sup>6</sup> H04B 10/00

U.S. Cl. 359—152

17 Claims



II. An optical data transceiver, comprising:  
a housing including at least a portion of which is substantially transparent to a selected range of optical radiation wavelengths;  
a mirror positioned within said housing, said mirror in the form of a convex surface which is reflective to said selected range of optical radiation wavelengths;

a plurality of emitters of optical radiation in said selected range of optical radiation wavelengths, said plurality of emitters being located in said housing and located relative to said mirror such that optical radiation emitted by said plurality of emitters irradiates substantially all of the reflective convex surface of the mirror causing said optical radiation to be diffusely reflected by the mirror through said at least one portion of said housing; and

at least one detector of optical radiation in said selected range of optical wavelengths, said at least one detector being located in said housing and located relative to said mirror such that optical radiation entering said housing through said at least one portion is reflected onto said at least one detector.

5,774,248

## OPTICAL SCANNING APPARATUS

Teruo Komatsu, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 270,475, Jul. 5, 1994, abandoned.

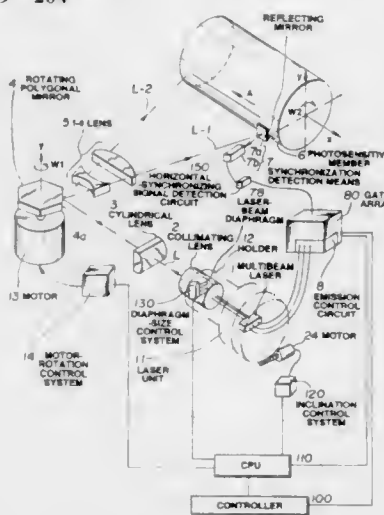
This application Aug. 25, 1997, Ser. No. 917,279

Claims priority, application Japan, Jul. 8, 1993, 5-193137

Int. Cl.<sup>6</sup> G02B 26/08

U.S. Cl. 359—204

76 Claims



1. An optical scanning apparatus for scanning plural light beams modulated with image information in a selectable one of at least two different image resolutions, said optical scanning apparatus comprising:

light-source means including a plurality of light-emitting portions which emit respective ones of plural light beams;

scanning means for scanning a predetermined surface in a scanning direction, said scanning means scanning the predetermined surface with the plural light beams from said light-source means by deflecting the plural light beams;

optical means disposed in an optical path between said light-source means and said scanning means; and

angle adjusting means for automatically changing an angle  $\theta$  between a direction in which images of the plural light beams are arranged on the predetermined surface and the scanning direction in which the plural light beams are scanned on the predetermined surface, the angle  $\theta$  being changed automatically in correspondence to the selected resolution.

5,774,249

## OPTICAL EXPOSER UNIT

Takashi Shiraishi, Sagami, and Masao Yamaguchi, Kawaguchi, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

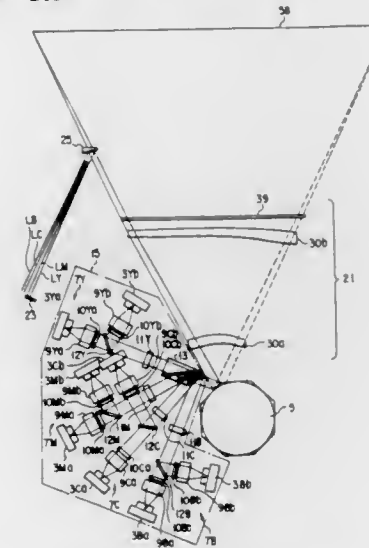
Filed Mar. 29, 1996, Ser. No. 625,552

Claims priority, application Japan, Mar. 31, 1995, 7-097626

Int. Cl.<sup>6</sup> G02B 26/08

U.S. Cl. 359—205

44 Claims



1. An optical exposer unit comprising:

at least one or more light sources having a sum total of numbers  $N_1$  to  $N_M$  ( $M$ =one or more integral number), for respectively emitting light beams;

first lens means for converting each of said light beams emitted from each of said light sources to either a convergent light beam or a parallel light beam, said first lens means including one of a finite lens and a collimate lens of the sum total of numbers  $N_1$  to  $N_M$ ;

second lens means for providing lens power of a first direction so as to converge a light beam emitted from each of said first lens means to only the first direction, said second lens means provided to be  $M$  pairs;

deflecting means for deflecting the light beams emitted from said second lens means to a second direction perpendicular to said first direction, said deflecting means including a reflection surface formed to be rotatable around a rotation axis extended to be parallel to said first direction; and

image forming means, including at least one lens, for image-forming each of said light beams deflected at an equal speed by said deflecting means at a predetermined position, said image forming means for correcting a shift of the image formed position against said predetermined position generated by a tilt of said reflection surface of said deflecting means, a curvature of at least one surface of said lens in said first direction changing along the first direction and a curvature of said second direction changing along the second direction in said image forming means.

5,774,250

## OPTICAL CONDENSER SYSTEM FOR LIGHT SCANNING APPARATUS

Katsumi Shimada, and Osamu Kuroda, both of Kanagawa-ken, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 23, 1997, Ser. No. 839,156

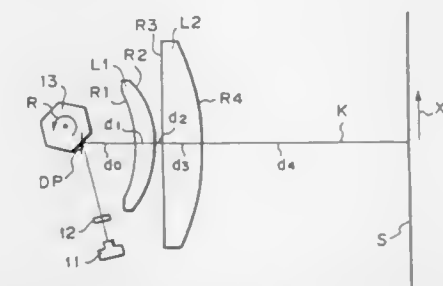
Claims priority, application Japan, Apr. 24, 1996, 8-102155

Int. Cl.<sup>6</sup> G02B 26/08

U.S. Cl. 359—205

1 Claim

1. An optical condenser system for a light scanning apparatus for focusing a light bundle deflected by a deflector on a predetermined



scanning surface and causing the light bundle to scan the scanning surface at a constant speed comprising

a first lens consisting of a single lens formed of plastic, the single lens being concave toward the deflector and each side of the single lens being an aspheric surface defined by the following formula (6), and

a second lens consisting of a plano-convex lens which is formed of glass and is convex toward the scanning surface in a cross-section taken along a plane along which the light bundle passing through the second lens is moved as a result of deflection by the deflector,

the first and second lens satisfying the following formulae (1) to (5)

$$0.1f \leq d_0 \leq 0.3f \quad (1)$$

$$0.02f \leq d_2 \leq 0.2f \quad (2)$$

$$-1.0 \times 10^2 f^3 \leq a_1 \leq -1.0 f^3 \quad (3)$$

$$5.0 \times 10 f^5 \leq a_2 \leq 5.0 \times 10^3 f^5 \quad (4)$$

$$-0.3 f \leq 1/f_1 \leq 0.3 f \quad (5)$$

$$z = c h^2 / [1 + \{1 - (1 + K)c^2 h^2\}^{1/2}] + a_1 h^4 + a_2 h^6 + a_3 h^8 + a_4 h^{10} \quad (6)$$

wherein  $f$  represents the focal length (mm) of the whole system,  $d_0$  represents the axial surface separation (mm) between the deflecting point at the deflector and the first lens,  $d_2$  represents the axial surface separation (mm) between the first lens and the second lens,  $f_1$  represents the focal length (mm) of the first lens,  $a_1$  to  $a_4$  respectively represent fourth-degree, sixth-degree, eighth-degree and tenth-degree aspheric coefficients,  $z$  represents the sag of the surface parallel to the  $z$ -axis,  $h$  represents the height above the optical axis,  $c$  represents the curvature at the pole of the surface,  $K$  represents a conic constant.

5,774,251

## OPTICAL SCANNING APPARATUS

Yoshihito Sekikawa, Saitama, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Division of Ser. No. 574,032, Dec. 18, 1995. This application Oct. 24, 1996, Ser. No. 740,128

Claims priority, application Japan, Dec. 19, 1994, 6-315091; Dec. 29, 1994, 6-315089

Int. Cl.<sup>6</sup> G02B 26/08

U.S. Cl. 359—216

2 Claims

1. An optical scanning apparatus, comprising:

a light source;

a rotational polygonal mirror having a plurality of reflecting surfaces parallel with a rotational axis, a luminous flux emergent from said light source being deflected on said reflecting surfaces in a predetermined direction at a substantially constant angular velocity;

a first optical system for forming the luminous flux emergent from said light source into a linear image which is long in a direction corresponding to a primary scanning direction in such a manner that said linear image strides said reflecting surfaces of said rotational polygonal mirror; and



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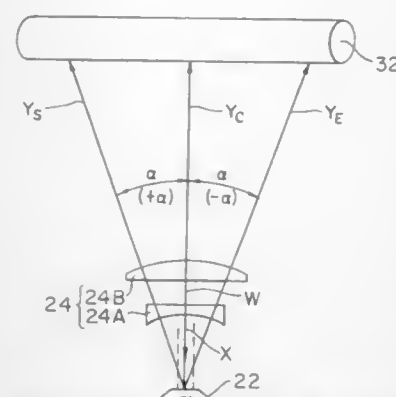
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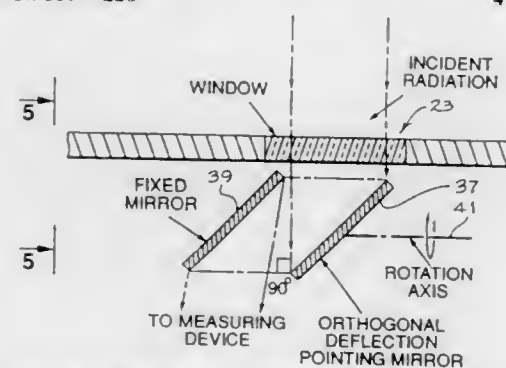
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OFFICIAL GAZETTE

JUNE 30, 1998

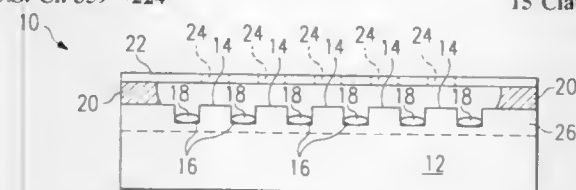


5,774,253  
COMPACT WINDOW VIEWING SYSTEM  
Lavern Charles Clune, Huntsville, Ala., assignor to Lockheed Martin Corporation, Sunnyvale, Calif.  
Filed Oct. 25, 1996, Ser. No. 738,325  
Int. Cl.<sup>6</sup> G02B 26/08  
U.S. Cl. 359—226 4 Claims



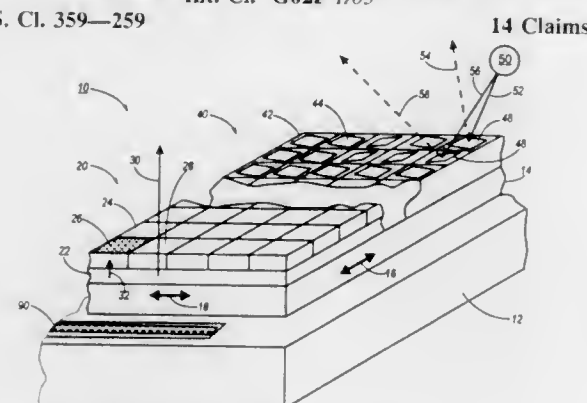
1. An orthogonal reflection pointing mirror and window combination for reducing the window size that is required for unvignetted viewing through the window over a finite range of viewing angles, said combination comprising:  
a viewing window having an input and an output and operable to receive radiation to be viewed over a finite range of incidence angles, and operable to transmit the received radiation through the output;  
a pointing mirror disposed closely adjacent to the output of the viewing window;  
rotation means mounting the pointing mirror for rotation on a rotation axis for a constant forty-five degrees of tilt with respect to the direction of radiation transmitted through the output of the viewing window for all angles of incidence of said radiation in said finite range of incidence angles, whereby the pointing mirror reflects the radiation orthogonally through ninety degrees in a direction parallel to the rotation axis of the pointing mirror even as the pointing mirror is rotated to provide different viewing angles.

5,774,252  
MEMBRANE DEVICE WITH RECESSED ELECTRODES  
AND METHOD OF MAKING  
Tsen-Hwang Lin; Gregory A. Magel, both of Dallas; Wen R. Wu, and Robert M. Boyse, both of Plano, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.  
Continuation of Ser. No. 178,956, Jan. 7, 1994. This application Apr. 19, 1996, Ser. No. 635,055  
Int. Cl.<sup>6</sup> G02B 26/08; G02B 26/06; H01L 27/14; 29/82  
U.S. Cl. 359—224 15 Claims



1. A membrane device, comprising:  
a substantially flat substrate having a top surface and a plurality of recesses formed into the surface of said substrate such that said recesses lie below said top surface of said substrate;  
a plurality of electrodes formed within said recesses;  
a spacer upon said top surface of said substrate;  
an electrostatically deformable membrane above said electrodes and supported by said spacer, wherein said membrane deflects toward said electrodes upon application of a potential difference between said electrodes and said membrane; and  
slots in said membrane, said slots being resonant for optical radiation of a predetermined wavelength.

5,774,254  
FAULT TOLERANT LIGHT MODULATOR DISPLAY SYSTEM  
Andrew A. Berlin, San Jose, Calif., assignor to Xerox Corporation, Stamford, Conn.  
Filed Jun. 26, 1997, Ser. No. 883,846  
Int. Cl.<sup>6</sup> G02F 1/03  
U.S. Cl. 359—259 14 Claims



7. A fault tolerant display system comprising  
a fixed substrate,  
a light source for producing a variable intensity light beam,  
a two-dimensional light modulator array positioned to intercept the variable intensity light beam from the light source, the two-dimensional light modulator array having a plurality of light modulators arranged in a first row and a second row, with the first row at a first row position with respect to the

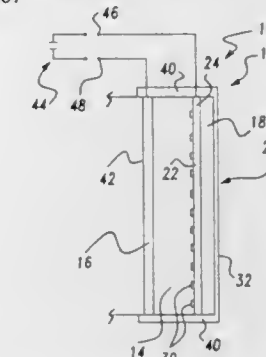
JUNE 30, 1998

ELECTRICAL

5301

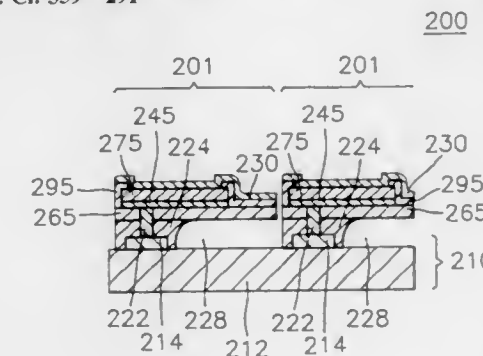
- fixed substrate and the second row at a second row position with respect to the fixed substrate,  
a movable element attaching the two-dimensional light modulator array to the fixed substrate, with the movable element moving the first row from its first row position to substantially occupy the second row position, and  
a light modulator failure compensation system for correcting for failure of at least one of the plurality of light modulators, the light modulator failure compensation system having an image rescaling module to vary apparent light modulator display intensity, and a light source intensity control for increasing intensity of the variable intensity light beam.

5,774,255  
ADAPTIVE INFRARED MODULATOR  
Bruce M. Howard, Gilbert, Ariz., assignor to McDonnell Douglas Corporation, Huntington Beach, Calif.  
Filed Sep. 23, 1996, Ser. No. 717,758  
Int. Cl.<sup>6</sup> G02F 1/153  
U.S. Cl. 359—267 19 Claims



1. A reversible electrodeposition electrochromic infrared modulator system for a spacecraft, comprising:  
a) a thermal radiator associated with a spacecraft; and  
b) an electrochromic modulator thermally connected to said thermal radiator, said modulator including:  
a working electrode including an infrared transparent substrate having a first major surface, a second major surface, and a conductive layer disposed on the second major surface of the substrate;  
a counter electrode spaced from the working electrode;  
a sealing assembly for hermetically sealing the working and the counter electrodes with a cavity defined therebetween;  
a gel electrolyte material disposed within the cavity, the gel electrolyte material including a reversible electrochromic material; and  
a reversible power source coupled to the working and the counter electrodes for providing a reversible voltage potential between the working and the counter electrodes, whereby a film of the electrochromic material plates the conductive layer in response to an on state voltage potential between the working and the counter electrodes such that reflectance of infrared energy incident on the first major surface of the substrate is increased;  
the system exhibiting a reflectance modulation of:  
(i) about 30% to 60% in the 8–12  $\mu\text{m}$  wavelength region; and  
(ii) about 35% to 55% in the 2–8  $\mu\text{m}$  wavelength region.

5,774,256  
METHOD FOR MANUFACTURING AN ARRAY OF THIN FILM ACTUATED MIRRORS  
Yong-Ki Min; Myung-Kwon Koo, and Jae-Hyuk Chung, all of Seoul, Rep. of Korea, assignors to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea  
Filed Dec. 13, 1995, Ser. No. 571,567  
Claims priority, application Rep. of Korea, Dec. 19, 1994, 94-34973; Dec. 19, 1994, 94-34975  
Int. Cl.<sup>6</sup> G02B 26/00 15 Claims



1. A method for manufacturing an array of MxN thin film actuated mirrors on a substrate including an array of MxN connecting terminals, wherein M and N are integers, for use in an optical projection system, and each of the thin film actuated mirrors has a unimorph structure, the method comprising the steps of:  
forming a thin film sacrificial layer on top of the substrate;  
creating an array of empty slots in the thin film sacrificial layer, wherein each of the empty slots exposes each of the connecting terminals, and the creation of the empty slots gives rise to sharp edges at a boundary between the thin film sacrificial layer and each of the empty slots;  
rounding off the sharp edges;  
forming a supporting member in each of the empty slots;  
depositing an elastic layer on top of the supporting members and the thin film sacrificial layer;  
forming an appropriate number of conduits, each of the conduits extending from top of the elastic layer to top of the corresponding connecting terminal;  
forming a second thin film layer and a thin film electrodisplacive layer, successively, on top of the elastic layer and the conduits;  
patterning the thin film electrodisplacive layer and the second thin film layer, respectively, into an array of MxN thin film electrodisplacive members and second thin film electrodes so that each of the thin film electrodisplacive members and the second thin film electrodes are formed on top of the supporting members with the elastic layer intervening therebetween, wherein each of the thin film electrodisplacive members and the second thin film electrodes has side surfaces;  
patterning the elastic layer into an array of elastic member until the thin film sacrificial layer is exposed;  
removing the thin film sacrificial layer to thereby form an array of MxN semifinished actuators, wherein each of the semifinished actuators is provided with a driving space; and  
forming a first thin film electrode on top of each of the semifinished actuators to thereby form the array of MxN thin film actuated mirrors.

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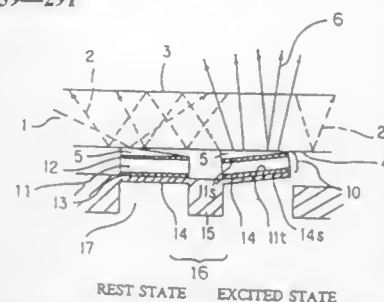
5,774,257

## DISPLAY ELEMENT AND DISPLAY APPARATUS

Kazuyoshi Shibata, Nagoya; Yukibisa Takeuchi, Nishikamogun, both of Japan; Hugh F. Frohbach, Sunnyvale, Calif.; Eric J. Shrader, Belmont, Calif., and Ronald E. Pelrine, Menlo Park, Calif., assignors to NGK Insulators, Ltd., Japan Division of Ser. No. 420,783, Apr. 12, 1995, Pat. No. 5,636,072, which is a continuation of Ser. No. 221,015, Apr. 1, 1994, abandoned. This application Oct. 21, 1996, Ser. No. 734,195 Int. Cl.<sup>6</sup> G02B 26/00

U.S. Cl. 359—291

7 Claims



1. A display element for selectively emitting light, comprising: a laminated actuator including a laminated piezoelectric body including a plurality of piezoelectric layers and a plurality of electrode layers, wherein said piezoelectric layers and said electrode layers are laminated; a fixed portion for holding said laminated actuator; displacement-transmitting means connected to said actuator for transmitting a displacement of said actuator; and a plate for transmitting and selectively emitting light, disposed closely to said displacement-transmitting means; wherein light is emitted from said plate at a position corresponding to a contact point between said displacement-transmitting means and said plate, and wherein contact between said displacement-transmitting means and said plate is caused by selectively applying a voltage to, and thus causing displacement of, said laminated actuator.

5,774,258

Patent Not Issued For This Number

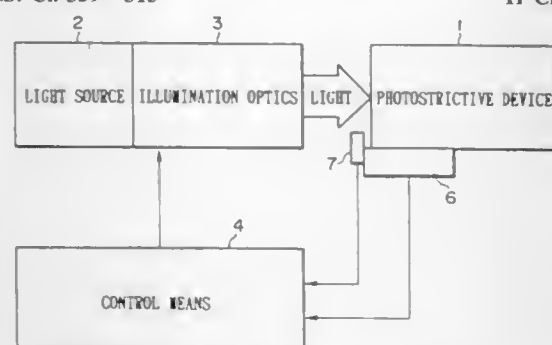
5,774,259

## PHOTORESTRICTIVE DEVICE CONTROLLER AND CONTROL METHOD THEREFOR

Susumu Saitoh, and Michiko Nakanishi, both of Tokyo, Japan, assignors to Kabushiki Kaisha Topcon, Tokyo, Japan Filed Sep. 25, 1996, Ser. No. 719,781 Claims priority, application Japan, Sep. 28, 1995, 7-251430 Int. Cl.<sup>6</sup> G02F 1/29

U.S. Cl. 359—315

11 Claims



1. A photorestrictive device comprising: a light source for irradiating light against a photorestrictive device which produces a photorestrictive effect upon receiving light;

an illumination optics for introducing light from the light source to the photorestrictive device; and a control means for controlling the energy density of light introduced to the photorestrictive device.

5,774,260

## TECHNIQUE FOR DEPTH OF FIELD VIEWING OF IMAGES WITH INCREASED CLARITY AND CONTRAST

Tony Petitto, 346 N. Palm Dr., Beverly Hills, Calif. 90210, and Stanislaw Loth, 44 Normandy Village - 44, Nanvet, N.Y. 10954

Continuation-in-part of Ser. No. 155,748, Nov. 23, 1993, Pat. No. 5,400,177. This application Nov. 22, 1994, Ser. No. 345,806

Int. Cl.<sup>6</sup> G03B 21/56

U.S. Cl. 359—451

20 Claims

1. An apparatus for depth of field viewing of a flat image by restructuring the image to restore depth in the image through interchange of perceived depth cues in place of stereopsis, comprising:

a transparent screen for positioning between a flat image and a viewer, said transparent screen including a plurality of generally parallel formed in said transparent screen and extending horizontally across the width of the screen, each of said micropisrns being vertically spaced one above the other; and an optical element positioned between said transparent screen and the viewer, said optical element operable to adjust the effective paths of light transmitted through said transparent screen.

5,774,261

## IMAGE DISPLAY SYSTEM

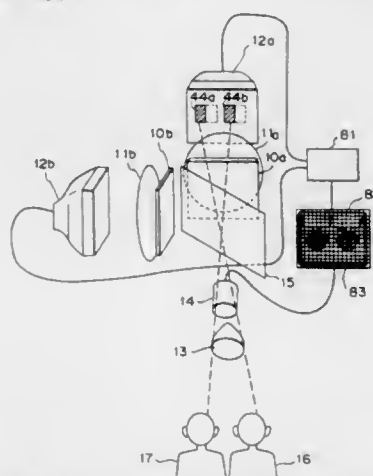
Shigeru Omori, and Jun Suzuki, both of Nakai-machi, Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan Filed Sep. 23, 1994, Ser. No. 309,504

Claims priority, application Japan, Nov. 19, 1993, 5-290950; Dec. 3, 1993, 5-304384; Dec. 3, 1993, 5-304457; Dec. 3, 1993, 5-304458; Dec. 3, 1993, 5-304459; Dec. 3, 1993, 5-304467

Int. Cl.<sup>6</sup> G02B 27/22; H04N 13/04

U.S. Cl. 359—464

28 Claims



10. An image display system for providing images such that a right eye and a left eye of an observer see different images, respectively, said image display system comprising:

position detecting means for detecting an observing position of said observer; a pair of spatial modulation devices transparent to light; a pair of back-lighting devices which display back-light images for illuminating said pair of spatial modulation devices from their back sides; control means for controlling positions of back-light images displayed on said pair of back-lighting devices so that said

5,774,263

## STEREOSCOPIC FILM CARTRIDGE FOR A STEREOSCOPIC VIEWER

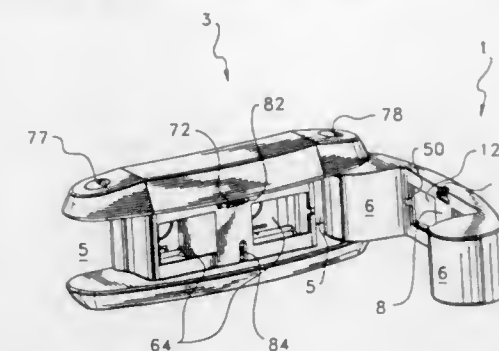
Eddy Roy, Laval; Michel Hamel, St-Pierre-d'Orléans; Claude Gosselin, Sillery, and Benoit Laflamme, Québec, all of Canada, assignors to 9010-7210 Quebec Inc., Montreal, Canada

Filed Aug. 1, 1995, Ser. No. 509,742

Int. Cl.<sup>6</sup> G02B 27/22; G03B 35/00

U.S. Cl. 359—469

15 Claims



1. A stereoscopic film cartridge for a stereoscopic viewer having binocular eyepieces and a film driving device, comprising:

an elongated film comprising a plurality of developed stereoscopic images, said elongated film being subsequently thermoformed so that said elongated film tends to roll onto itself and generally form a cylinder; and

a housing for housing the film, the housing being provided with a first opening arranged to permit engagement of the film driving device with the film when the cartridge is mounted onto the stereoscopic viewer, the housing including:

two opposite compartments having inlets for receiving ends of the film, each of the compartments having an inner surface provided with upper and lower parallel projecting bands onto which, in operation, lateral edge surfaces of the film slide; and

a guiding channel extending between the inlets of the compartments, for guiding the film between the inlets, the channel having:

a front panel provided with right and left adjacent viewing windows arranged to get in alignment with the binocular eyepieces when the cartridge is mounted onto the stereoscopic viewer, the front panel having an inner surface provided with a first pair of upper and lower parallel projecting bands; and

a rear panel comprising translucent means for permitting light to enter into the channel and illuminate the film at each one of the viewing windows, the rear panel having an inner surface provided with a second pair of upper and lower parallel projecting bands facing respectively the first pair of bands.

5,774,264

## POLARIZATION INDEPENDENT OPTICAL ISOLATOR

Yoshihiro Konno; Shigeaki Aoki, and Kazuaki Ikegai, all of Tokyo, Japan, assignors to Namiki Precision Jewel Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 375,297, Jan. 20, 1995, abandoned.

This application Sep. 9, 1996, Ser. No. 709,626

Claims priority, application Japan, Jan. 28, 1994, 6-026048 Int. Cl.<sup>6</sup> G02B 5/30; 27/28

U.S. Cl. 359—497

14 Claims

1. A polarization-independent optical isolator which consists of one Faraday rotator and three birefringent crystalline plates, at least one of said three birefringent crystalline plates having an orientation of a crystal optical axis different from an orientation of a crystal optical axis of the other birefringent crystalline plates, said orientation of said crystal optical axis of said at least one of said birefringent crystalline plates arranged to cancel a polarization

positions of back-light images correspond to the detected position of the observer;

composing means for combining images present on said pair of spatial modulation devices into one image; and

optical elements for giving directivity to back-light emitted by said pair of back-lighting devices so that one of said pair of back-lighting devices provides back-light illumination of said spatial modulation device for the right eye and the other one of said pair of back-lighting devices provides back-light illumination of said spatial modulation device for the left eye.

5,774,262

## OPTICAL SYSTEM FOR THE TWO- AND THREE-DIMENSIONAL REPRESENTATION OF INFORMATION

Armin Schwerdtner, and Holger Heidrich, both of Dresden, Germany, assignors to Technische Universität Dresden, Dresden, Germany

PCT No. PCT/DE94/00342, § 371 Date Jan. 22, 1996, § 102(e) Date Jan. 22, 1996, PCT Pub. No. WO94/23340, PCT Pub. Date Oct. 13, 1994

PCT Filed Mar. 25, 1994, Ser. No. 530,134

Claims priority, application Germany, Mar. 26, 1993, 43 09 667.0

Int. Cl.<sup>6</sup> G02B 27/24; 27/22

U.S. Cl. 359—464

16 Claims



1. An optical system for the two- or three-dimensional representation of information, comprising:

a transmission display having electronically selectable pixels in a matrix arrangement, wherein first and second sets of said selectable pixels respectively represent left and right stereoscopic semi-images simultaneously, and said transmission display having a light input side and a light output side;

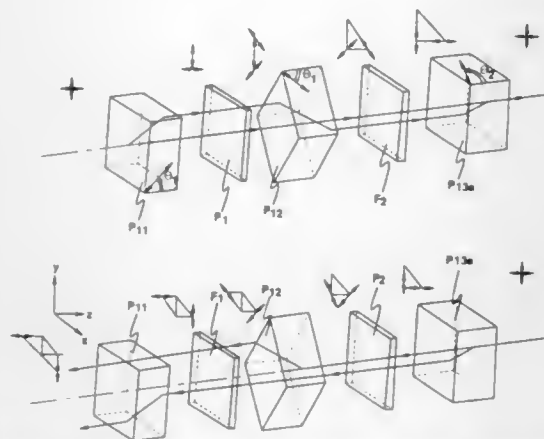
a light-source with at least one point or line source of light disposed facing the light input side of the transmission display;

collimating optics interposed between said light source and said light input side of said transmission display for collimating light incident on said light input side;

a prism mask disposed at said light output side of said transmission display and containing first and second sets of prisms with first and second prism angles in a matrix arrangement and said first and second sets of prisms having a spatial arrangement on the prism mask respectively congruent with said first and second sets of selectable pixels of the transmission display, the first set of selectable pixels for the left stereoscopic semi-image being aligned with the first set prisms and the second set of selectable pixels for the right stereoscopic semi-image being aligned with the second set of prisms for receiving light transmitted through corresponding ones of said first and second sets of pixels and directing the light to be received by a left eye and a right eye, respectively, of a viewer; and

focussing optics for an entirety of the transmission display with a focal length corresponding to a viewing distance for focussing light emitted from the first set of prisms into the left eye and for focussing light emitted from the second set of prisms into the right eye of the viewer wherein light from the light-source passing through the collimating optics is substantially parallel passing through said transmission display and entering said prism mask.





phase delay arising from different propagation rates between ordinary and extraordinary rays and induced by the propagation of the beams through said other birefringent crystalline plates, wherein said polarization phase delay is suppressed to less than 0.05 picoseconds.

5,774,265

## DURABLE RETROREFLECTIVE ELEMENTS

James P. Mathers, Woodbury; Chris J. Goodbrake, Inver Grove Heights, both of Minn.; Kathleen A. Hachey, Hudson, Wis.; Thomas P. Hedblom, Eagan, Minn.; Kathleen M. Humpal, Woodbury, Minn.; Roger W. Lange, Maplewood, Minn.; David C. May, Hudson, Wis.; Kyung H. Moh, Woodbury, and Thomas E. Forester, South St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

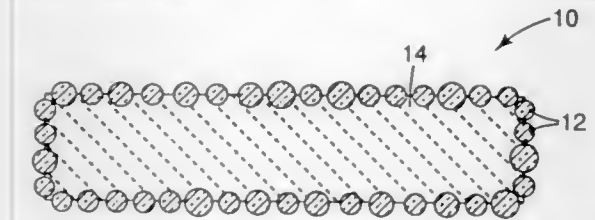
PCT No. PCT/US96/01584, § 371 Date Feb. 5, 1996, § 102(e) Date Feb. 5, 1996, PCT Pub. No. WO97/28471, PCT Pub. Date Aug. 7, 1997

PCT Filed Feb. 5, 1996, Ser. No. 591,570

Int. Cl.<sup>6</sup> G02B 5/128

U.S. Cl. 359—539

25 Claims



1. A retroreflective element comprising ceramic optical elements partially embedded in an opacified ceramic core.

5,774,266

## IMAGE STABILIZING DEVICE

Tadasu Otani, Kanagawa-ken, and Koichi Washisu, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 41,454, Apr. 2, 1993, abandoned.

This application May 19, 1995, Ser. No. 446,558

Claims priority, application Japan, Apr. 6, 1992, 4-112439; Apr. 20, 1992, 4-125369

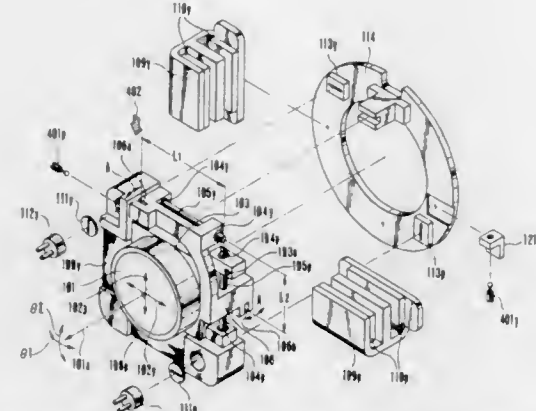
Int. Cl.<sup>6</sup> G02B 27/64

U.S. Cl. 359—554

48 Claims

26. An image-shake preventing apparatus for image stabilizing, comprising:

connecting means for connecting an image forming optical system and a movable member which moves in a first manner for preventing an image-shake of an image formed by the image forming optical system; and



adjustment means for adjusting a relationship between the image forming optical system and the movable member by moving the movable member in a manner different from the first manner.

5,774,267

## ZOOM LENS

Naoko Kodama, Kawasaki, and Koichi Ohshita, Tokyo, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

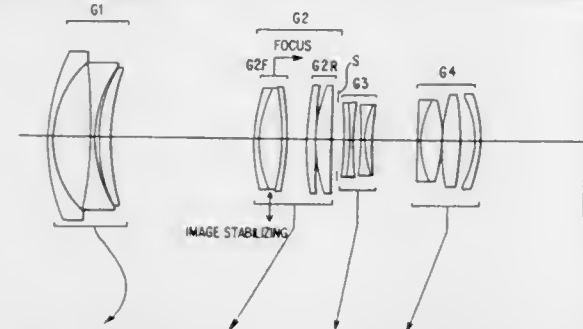
Filed Oct. 18, 1996, Ser. No. 731,774

Claims priority, application Japan, Oct. 20, 1995, 7-297867; Feb. 22, 1996, 8-059969

Int. Cl.<sup>6</sup> G02B 27/64; 15/14

U.S. Cl. 359—557

12 Claims



1. A zoom lens with a zooming ratio of at least 1.5, the zoom lens comprising, in order from an object side to an image-side:

a first lens group having a negative refractive power and a second lens group having a positive refractive power, wherein the second lens group comprises, in order from the object side:

a front group having a positive refractive power and a rear group having a positive refractive power such that when zooming from a maximum wide-angle state to a maximum telephoto state, the front group and the rear group move integrally, and a lateral magnification of the front group at an infinite focus state is always positive and decreases monotonically.

5,774,268

## HEAD- OR FACE-MOUNTED IMAGE DISPLAY APPARATUS

Junko Takahashi, Atsugi, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1996, Ser. No. 733,647

Claims priority, application Japan, Oct. 17, 1995, 7-268485

Int. Cl.<sup>6</sup> G02B 27/14

U.S. Cl. 359—630

25 Claims

1. A head- or face-mounted image display apparatus comprising an image display device for displaying an image; an optical system for projecting said image into an observer's eyeball as an enlarged image without effecting image formation on the way to said

5,774,270

## WIDE-FIELD EYEPIECE LENS

Mitsuhiko Yanari, Mitaka, Japan, assignor to Nikon Corporation, Tokyo, Japan

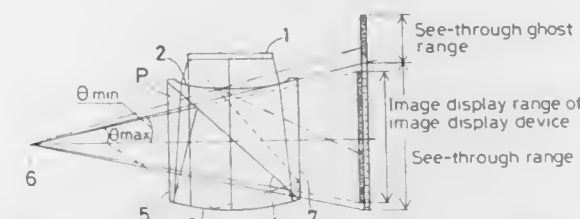
Filed Jun. 13, 1996, Ser. No. 663,449

Claims priority, application Japan, Jun. 15, 1995, 7-174204

Int. Cl.<sup>6</sup> G02B 25/00

U.S. Cl. 359—644

20 Claims



observer's eyeball; and means for mounting and retaining said image display device and said optical system on an observer's head or face;

said optical system being a prism optical system having at least four surfaces, including a back-coated mirror of positive power which is disposed to face said image display device, an image display device-side surface facing opposite to said back-coated mirror, an exit surface disposed on a side of said observer's eyeball, and a transmitting surface facing opposite to said exit surface, said prism optical system being made of a transparent medium having a refractive index larger than 1; wherein a distance between a vertex of said back-coated mirror and a vertex of said image display device-side surface satisfies the following condition:

$$0.8 \leq \theta_{\min}/\theta_{\max} \leq 1.5$$

(1)

where  $\theta_{\min}$  is a smallest of angles formed between a central axis of a virtual image field and light rays extending from an arbitrary point in an exit pupil of said optical system and touching said image display device-side surface, and  $\theta_{\max}$  is an angle formed between the central axis of the virtual image field and a light ray extending from a central point in the exit pupil of said optical system to an upper edge of the virtual image field.

5,774,269

## IMAGE PICK-UP APPARATUS

Rudolph M. Snoeren, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

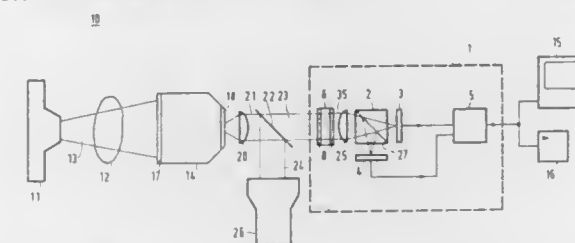
Filed Mar. 19, 1996, Ser. No. 618,230

Claims priority, application European Pat. Off., Mar. 21, 1995, 95200682

Int. Cl.<sup>6</sup> G02B 27/14

U.S. Cl. 359—636

15 Claims



1. An image pick-up apparatus, comprising:

a beam splitter for splitting a light beam carrying an optical image into sub-beams carrying sub-images,

at least two image sensors for deriving electronic sub-image signals from the sub-images,

a combination unit for combining electronic sub-image signals so as to form an electronic image signal of a composite image, and

a depolarizing element which is arranged in the light beam carrying an optical image and in front of the beam splitter in order to reduce the linear polarization degree of the light of the optical image reaching the beam splitter.

5,774,271

## LAMP ASSEMBLY

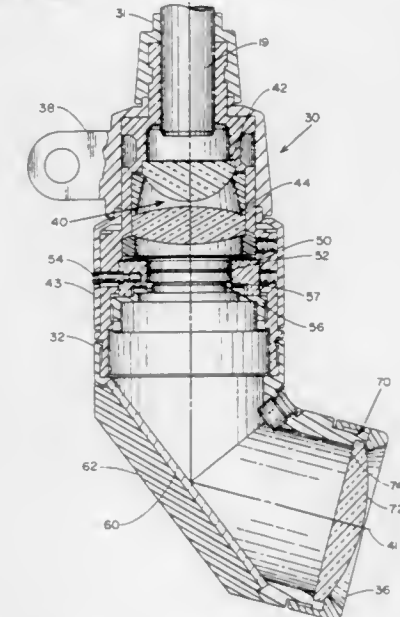
William H. Lagerway, Auburn; Jeffrey Perkins, Tully, and Steven R. Slawson, Auburn, all of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.

Filed Jul. 29, 1996, Ser. No. 681,894

Int. Cl.<sup>6</sup> G02B 3/00; F21V 7/04

U.S. Cl. 359—649

27 Claims



1. A lamp assembly comprising:

first optical means for collecting and collimating a light from a light source, said first optical means being disposed at one end of said assembly;

second optical means disposed at an opposite end of said assembly for projecting the collimated light as an illuminated light spot at a predetermined distance from said assembly and including at least one objective element;

and an iris disposed between said first and second optical means, said iris having an adjustable opening for selectively varying

the size of the illuminated light spot between a minimum and a maximum spot diameter at said predetermined distance, wherein said light spot is focused at said predetermined distance at only a first iris opening position, is characterized by:

means for focusing the illuminated light spot at said predetermined distance for at least one other iris opening position.

5,774,272

# LOW-MAGNIFICATION APOCHROMATIC MICROSCOPE OBJECTIVE LENS

Katsuya Watanabe, Yokohama, Japan, assignor to Nikon Corporation, Tokyo, Japan

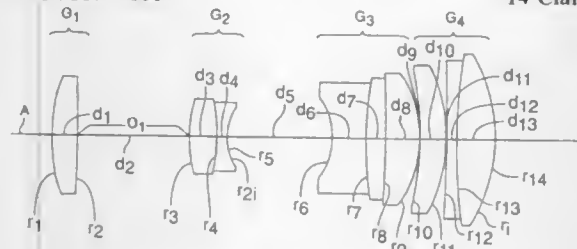
Filed Oct. 15, 1996, Ser. No. 730,070

Claims priority, application Japan, Nov. 14, 1995, 7-321159

Int. Cl.<sup>6</sup> G02B 3/00; 9/36

U.S. Cl. 359—660

14 Claims



1. A low-magnification objective lens for a microscope, the objective lens comprising, in order from the object side to the image side:

- a first lens group having a positive refractive power and a focal length  $f_1$ ;
- a second lens group having a negative refractive power and a focal length  $f_2$ , and comprising a negative meniscus lens with a concave surface oriented toward the image side;
- a third lens group having a negative refractive power and comprising at least one cemented surface;
- a fourth lens group having a positive refractive power and comprising a positive meniscus lens element having a convex surface oriented toward the image side, and a positive cemented lens including a negative lens element having a focal length  $f_{4n}$ , cemented to a positive lens element having a focal length  $f_{4p}$ ; and
- the objective lens having an overall focal length  $f$  and satisfying the following conditions:

$$1.2 < f_1/D_1 < 2.3$$

$$0.4 < |r_2/f_2| < 0.6$$

$$0.2 < |r_1/f_1| < 0.3$$

$$1.2 < |f_{4n}/f_{4p}| < 2.6$$

$$\theta_{4n} - \theta_{4p} < 0.005$$

wherein  $D_1$  is the axial distance from a lens surface in the first lens group closest to the image side to a lens surface in the second lens group closest to the object side;  $r_2$  is the curvature radius of a lens surface in the second lens group closest to the image side;  $r_1$  is the curvature radius of a lens surface of the objective lens overall that is closest to the image side;  $\theta_{4n}$  is the partial dispersion ratio of the negative lens element in the cemented lens in the fourth lens group; and  $\theta_{4p}$  is the partial dispersion ratio of the positive lens element in the cemented lens in the fourth lens group, wherein  $\theta = (n_D - n_C)/(n_F - n_C)$ , and  $n_D$ ,  $n_F$ , and  $n_C$  are D-line, F-line, and G-line refractive indices, respectively.

5,774,273

# VARIABLE-GEOMETRY LIQUID-FILLED LENS APPARATUS AND METHOD FOR CONTROLLING THE ENERGY DISTRIBUTION OF A LIGHT BEAM

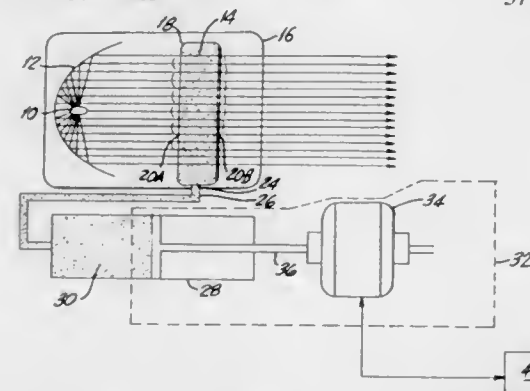
James M. Bornhorst, Desoto, Tex., assignor to Vari-Lite, Inc., Dallas, Tex.

Filed Aug. 23, 1996, Ser. No. 702,785

Int. Cl.<sup>6</sup> G02B 1/06

U.S. Cl. 359—665

37 Claims



1. An apparatus for controlling the distribution of a light beam, comprising:

- a liquid cell lens containing an optically transparent liquid and having at least one flexible optically transparent membrane, said membrane containing an array of microcells, each of said microcells being in fluid communication with each other, and at least one rigid member supporting said flexible optically transparent membrane; and
- means for communicating said optically transparent liquid to said liquid cell lens.

5,774,274

# VARIABLE FOCUS LENS BY SMALL CHANGES OF THE EQUATORIAL LENS DIAMETER

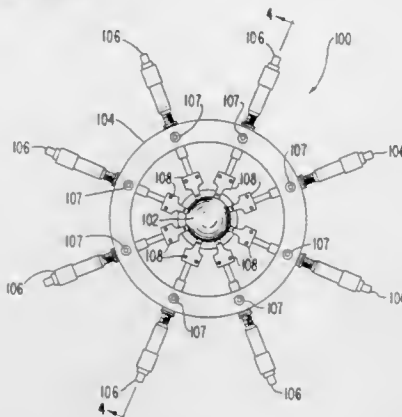
Ronald A. Schachar, P.O. Box 796728, Dallas, Tex. 75379

Filed May 12, 1995, Ser. No. 439,942

Int. Cl.<sup>6</sup> G02B 1/06; 3/14

U.S. Cl. 359—666

33 Claims



1. A variable focus lens comprising

- a synthetic elastically deformable lens body comprising two transparent webs intersecting an optical axis and meeting in an elastically expandable periphery surrounding said optical axis, said webs and said periphery defining a cavity, said cavity being filled with a transparent fluid or deformable solid medium, and
- expanding means for expanding said periphery in a plane generally perpendicular to said optical axis, wherein said expanding means applies radially outward directed forces immediately to said periphery of said lens symmetrically in each meridian of said lens.

5,774,275

# VARIABLE MAGNIFICATION VIEWFINDER

Hiroyuki Hamano, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

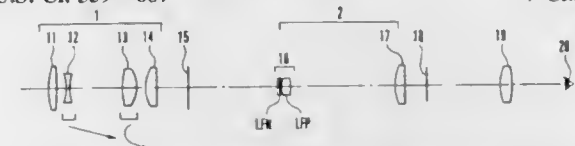
Filed Aug. 10, 1995, Ser. No. 513,557

Claims priority, application Japan, Aug. 30, 1994, 6-230781; Oct. 31, 1994, 6-290436

Int. Cl.<sup>6</sup> G02B 15/14

U.S. Cl. 359—687

7 Claims



1. A variable magnification viewfinder comprising an objective lens unit consisting of, from front to rear, a first lens unit having a positive refractive power and composed of a single lens, a second lens unit having a negative refractive power and composed of a single lens, a third lens unit having a positive refractive power and composed of a single lens and a fourth lens unit having a positive refractive power and composed of a single lens, wherein zooming is performed by axially moving said second lens unit and said third lens unit.

5,774,276

# ZOOM LENS SYSTEM

Kiyotaka Inadome, Kawasaki, Japan, assignor to Nikon Corporation, Tokyo, Japan

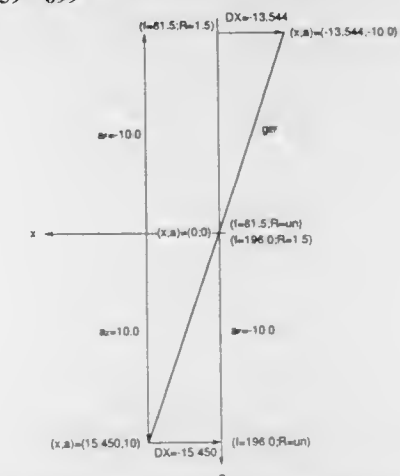
Filed Jan. 27, 1997, Ser. No. 790,762

Claims priority, application Japan, Feb. 7, 1996, 8-020931

Int. Cl.<sup>6</sup> G02B 15/14; G03B 3/00; 1/18

U.S. Cl. 359—699

4 Claims



1. A zoom lens system in which a movement locus of a focusing lens unit is defined by synthesizing a focus cam and a zoom compensation cam so as to achieve an in-focus state by a substantially constant amount of rotation for an identical object distance independently of a zooming state upon expression of a predetermined movement locus for zooming by an amount of movement, in a direction of an optical axis, of lens units, and an angle of rotation of a rotatable lens barrel, wherein when ratios  $(dB/dx)$  of an amount  $dB$  of infinitesimal movement of an imaging plane to an amount  $dx$  of infinitesimal movement, in the direction of the optical axis, of said focusing lens unit at infinity position to a closest distance position at a wide-angle end and a telephoto end are respectively represented by  $\gamma_{\infty}$  and  $\gamma_{TR}$ , amounts of movement, in the direction of the optical axis, of said focusing lens unit required for focusing from an infinity position to a closest distance position at a wide-angle end and a telephoto end are respectively represented by  $\Delta x_{WR}$  and  $\Delta x_{TR}$ , and an amount of rotation of said focusing lens unit on said focus cam corresponding to zooming from the wide-angle end to the telephoto end and an amount of rotation corresponding to focusing from an infinity in-focus state to a closest in-focus state are respectively repre-

sented by  $a_z$  and  $a_F$ , said zoom lens satisfies the following conditional formulas at least at the telephoto end:

$$0.60 < \gamma_{TR}/\Delta x_{WR} < 1.70$$

$$0.50 < \Delta x_{TR}/\Delta x_{WR} < 2.00$$

$$0.30 < a_F/a_z < 2.50$$

5,774,277

# OPTICAL APPARATUS

Haruhiko Yamanouchi, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

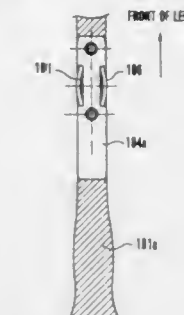
Division of Ser. No. 95,399, Jul. 21, 1993, abandoned. This application May 30, 1995, Ser. No. 452,530

Claims priority, application Japan, Jul. 24, 1992, 4-218167

Int. Cl.<sup>6</sup> G02B 1/00

U.S. Cl. 359—702

6 Claims



1. An optical apparatus comprising:

- an operation member supported in such a way as to permit a moving operation;
- a guide member having a guide slot for guiding a movement of said operation member, said guide slot being configured for keeping a substantially constant operating force required for operating said operation member and to effect partly varied contact pressure between said guide member and said operation member; and
- an optical adjustment mechanism arranged to perform an optical adjusting action by a cam mechanism in association with the moving operation of said operation member.

5,774,278

# SPECTRAL FILTER

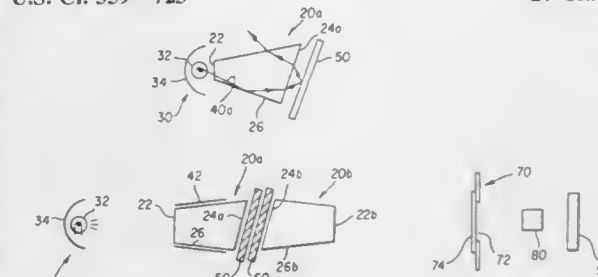
Martin Charles Kaplan, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 30, 1995, Ser. No. 565,327

Int. Cl.<sup>6</sup> G02B 3/00

U.S. Cl. 359—723

27 Claims



1. A spectral filtration system, comprising:

- a collimating non-imaging optic having entry and exit faces, the exit face being tilted relative to the entry face; and
- a spectral filter positioned so as to receive light from, or transmit light to, a face of the non-imaging optic, and wherein the non-imaging optic alters the degree of collimation of a light beam passing through it by at least one internal reflection.



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5,774,279

## RETROFOCUS PHOTOGRAPHIC LENS

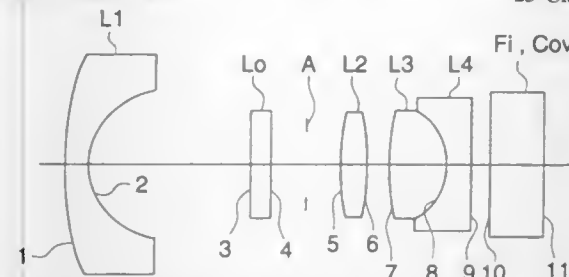
Toshihiko Kiriki, and Tsutomu Kawano, both of Tokyo, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Oct. 15, 1996, Ser. No. 730,062

Claims priority, application Japan, Oct. 19, 1995, 7-271243; Dec. 11, 1995, 7-321692; Feb. 19, 1996, 8-030668; Apr. 11, 1996, 8-089387

U.S. Cl. 359—753 Int. Cl.<sup>6</sup> G02B 13/04; 3/02

25 Claims



1. A retrofocus type lens system comprising from an object side: (a) a front lens group including at least one negative lens; and (b) a rear lens group, including at least two positive lenses and a negative lens,

wherein a positive lens of the rear lens group is provided closest to an object side and is made of glass,

and wherein more than half of the lenses of said front and rear lens groups are made of plastic, and satisfy the following conditional expression,

$$0.7 < f_G / f < 4.0$$

where  $f_G$  represents a focal length of said positive lens of the rear lens group provided closest to the object side, and  $f$  represents a focal length of the retrofocus type lens system,

further satisfying the following conditional expressions:

$$25 < V_N < 37 \text{ and}$$

$$0.8 < D / f < 7.0$$

where  $V_N$  represents an Abbe's number of d-line of said negative lens in the rear lens group, and  $D$  represents an equivalent air distance between a surface of the front lens group provided closest to the image side and a surface of the rear lens group provided closest to the object side.

5,774,280

## LENS BARREL AND OPTICAL APPARATUS

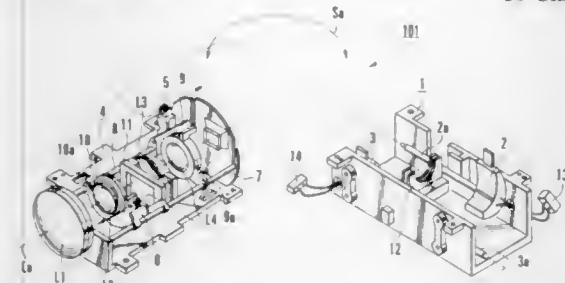
Kenji Miyauchi, and Masatoshi Nagano, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 2, 1996, Ser. No. 691,705

Claims priority, application Japan, Aug. 25, 1995, 7-240746; Aug. 25, 1995, 7-240747

U.S. Cl. 359—819 Int. Cl.<sup>6</sup> G02B 7/02

10 Claims



2. A lens barrel comprising:

a first housing half, said first housing half holding a movable element; and

a second housing half, said second housing half holding a driving mechanism for moving said movable element,

wherein a housing is formed by joining said first housing half and said second housing half to each other at one of a first boundary plane which includes an optical axis and a second boundary plane which is adjacent to the first boundary plane.

5,774,281

## OPTICAL PICKUP DEVICE FOR LIGHT COLLECTION ONTO AN OPTICAL RECORDING MEDIUM

Fumisada Maeda, Tokyo; Isao Ichimura, Kanagawa; Kenji Yamamoto, Saitama; Kiyoshi Ohsato, Chiba, and Toshio Watanabe, Kanagawa, all of Japan, assignors to Sony Corporation, Japan

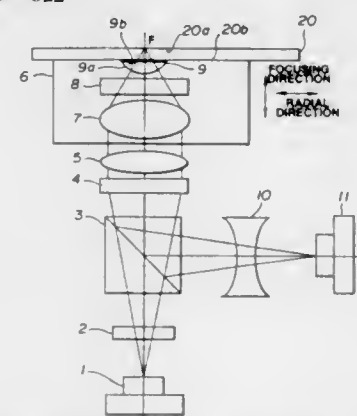
Filed Feb. 7, 1996, Ser. No. 597,978

Claims priority, application Japan, Feb. 15, 1995, 7-026562

Int. Cl.<sup>6</sup> G02B 7/02

U.S. Cl. 359—822

14 Claims



1. An optical pickup device for collecting the light from a light source on a signal recording surface of an optical recording surface, comprising:

at least one objective lens;

a lens holder for holding said objective lens;

a convex lens having a planar surface facing the optical recording medium and having a pre-set refractive index;

a slider configured for securing said convex lens and for sliding in contact with the optical recording medium; and

thrusting supporting means connecting with said lens holder and said slider for thrusting and supporting the slider into sliding contact with said optical recording medium.

5,774,282

## APPARATUS FOR ADJUSTING LENS POSITION IN FOCAL LENGTH VARIABLE LENS

Shinsuke Kohmoto, and Norio Sato, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 30, 1996, Ser. No. 689,048

Claims priority, application Japan, Aug. 10, 1995, 7-204874

Int. Cl.<sup>6</sup> G02B 7/02

U.S. Cl. 359—823

18 Claims

1. A lens position adjusting apparatus for adjusting an axial position of a lens in a focal length variable lens, comprising:

a plurality of lens groups, including a rearmost lens group;

a lens frame which holds said rearmost lens group;

a lens frame holder which engages with said lens frame through a threaded engagement; and

5,774,284

## INFORMATION REPRODUCTION APPARATUS FOR A CAMERA

Akira Egawa, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 913,819, Jul. 16, 1992, Pat. No. 5,438,461.

This application Apr. 12, 1995, Ser. No. 420,804

Claims priority, application Japan, Jul. 19, 1991, 3-203645; Jul. 19, 1991, 3-203650; Jul. 19, 1991, 3-203656

Int. Cl.<sup>6</sup> G11B 5/00; 5/09

U.S. Cl. 360—1

6 Claims

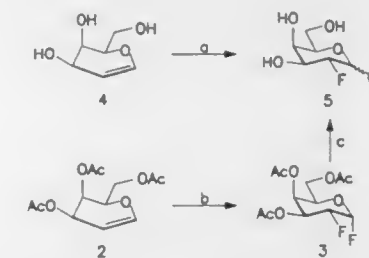


FIG. 1

an engagement tooth array portion, formed along a rear end of said lens frame, said engagement tooth array portion comprising a plurality of engaging teeth, each extending in a direction substantially parallel to an optical axis and facing towards a rear of said focal length variable lens.

5,774,283

## EXTERIOR REARVIEW MIRROR FOR VEHICLES, ESPECIALLY FOR MOTOR VEHICLES

Bernd Nagel, Leonberg, and Bernd Waldmann, Esslingen, both of Germany, assignors to Reitter &amp; Schefenacker GmbH &amp; Co. KG, Esslingen, Germany

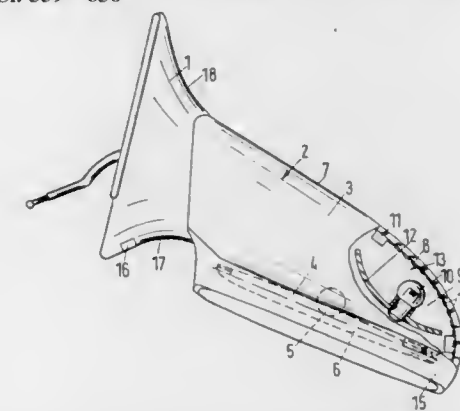
Filed Oct. 17, 1996, Ser. No. 733,347

Claims priority, application Germany, Oct. 18, 1995, 195 38 770.8

Int. Cl.<sup>6</sup> G02B 7/182; B60R 1/06; 1/12; G08C 19/00

U.S. Cl. 359—838

16 Claims



1. An exterior rearview mirror for a motor vehicle, said exterior rearview mirror comprising:

a mirror support;

a mirror housing connected with a first end to said mirror support;

said mirror housing having a mounting chamber with a light-transmissive window and a holder for a mirror pane;

a turn signal light positioned in said mounting chamber behind said window;

two first receivers for receiving wireless remote control signals positioned in said mounting chamber behind said window; wherein said two first receivers are spaced from one another; wherein said window, at least in an area where said two first receivers are positioned, is transmissive for said wireless remote control signals;

wherein said two first receivers have overlapping receiving ranges.

5,774,285

## SELECTION OF OPTIMAL READ/WRITE CHANNEL PARAMETERS IN A HARD DISC DRIVE

Roger J. Kassab, Shrewsbury, Mass., and Ghassan M. Abdellnour, Oklahoma City, Okla., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Mar. 26, 1996, Ser. No. 622,665

Int. Cl.<sup>6</sup> G11B 27/36; 5/02; 5/09

U.S. Cl. 360—31

9 Claims

1. A method for optimizing parameter values in a read/write channel of a disc drive, comprising the steps of:

(a) obtaining a population of error rate points for selected ranges of a plurality of input parameter values, the population of error rate points characterized as a set of individual error rate points, each error rate point having a corresponding error rate value resulting from a unique combination of input parameter values;

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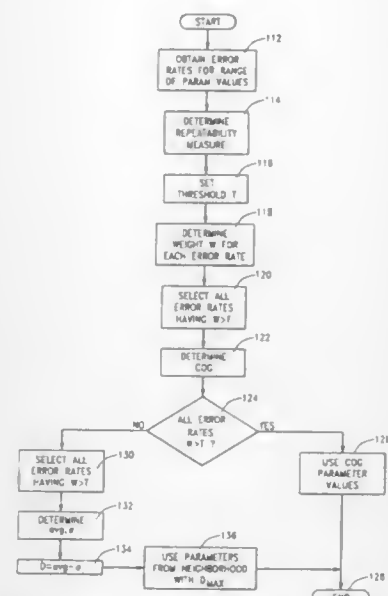
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- (b) determining a weight for each of the error rate points using a minimum error rate value from the population of error rate points obtained in step (a);
- (c) determining a center of gravity from error rate points having associated weights greater than a selected threshold, the center of gravity corresponding to a unique combination of parameter values;
- (d) when all of the error rate points have associated weights greater than the threshold:
- (i) storing the unique combination of parameter values corresponding to the center of gravity; and thereafter,
- (ii) using the stored parameter values during operation of the read/write channel; and
- (e) when at least one of the error rate points has an associated weight that is less than or equal to the threshold:
- (i) identifying each set of error rate points bounded by error rate points having weights that are equal to or greater than the threshold;
- (ii) characterizing variation in error rates among neighboring error rate points for each of the error rate points in each set of points;
- (iii) storing the parameter values corresponding to the error rate point having the least variation; and thereafter
- (iv) using the stored parameter values during operation of the read/write channel.

5,774,286

**MAGNETIC DISK DRIVE IN WHICH READ DATA IS DEMODULATED USING MAXIMUM LIKELIHOOD DETECTION METHOD**

Kaneyasu Shimoda, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 271,656, Jul. 7, 1994, abandoned.

This application Aug. 2, 1996, Ser. No. 691,428

Claims priority, application Japan, Oct. 13, 1993, 5-255684

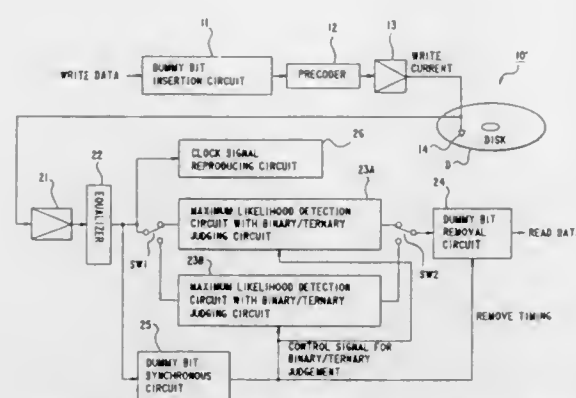
Int. Cl.<sup>6</sup> G11B 5/09

U.S. Cl. 360—46

19 Claims

1. A magnetic disk drive for writing data to a magnetic disk by a head, equalizing a reproduced signal read out from said magnetic disk by a head at the time of reproduction, by using an equalization circuit for reproduced signals, and demodulating the data by effecting maximum likelihood detection for the reproduced signal after equalization, comprising:

- a dummy bit insertion circuit for periodically inserting "I" as a dummy bit into a data string of write data to make run length limited code sequences;
- maximum likelihood detection circuits with binary/ternary judging circuit, each being disposed at a post-stage of said equalization circuit of said reproduced signal, switching a threshold



level by a timing signal provided from outside, effecting binary judgement at respective positions of a plurality of dummy bits in said reproduced signal after equalization and retrieving a path by regarding that a path merge unconditionally exists, and effecting ternary judgement at code strings for maximum likelihood detection;

- a dummy bit removing means, operably coupled to said maximum likelihood detection circuits, for removing said dummy bits from detected data sequences of said maximum likelihood detection circuits with binary/ternary judging circuit, in accordance with a timing signal inputted from outside; and
- a dummy bit synchronous circuit, disposed at a post-stage of said equalization circuit of said reproduced signals; (a) for generating timing signals synchronized with the positions of said dummy bits in said reproduced signals after equalization, (b) m for outputting said timing signals to said maximum likelihood detection circuits with binary/ternary judging circuit and to said dummy bit removing means, and (c) for providing maximum likelihood detection in parallel by extracting a code string interposed by said dummy bits based on said timing signals generated by said dummy bit synchronous circuit.

5,774,287

**SYSTEM AND METHOD EMPLOYING BUFFERING MECHANISM WITH INTERFACE FOR PROVIDING COMPATIBILITY BETWEEN RECORDING FORMATS**

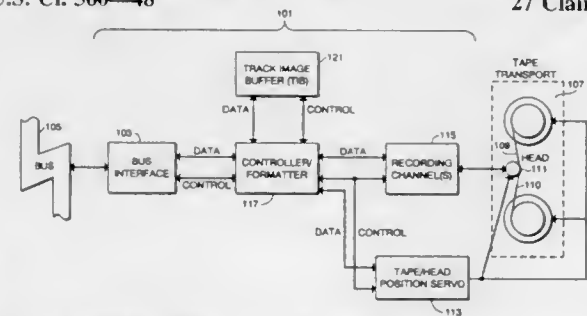
Michael L. Leonhardt, and Charles A. Milligan, both of 2270 S. 88th St., Louisville, Colo. 80028

Filed Dec. 9, 1994, Ser. No. 352,464

Int. Cl.<sup>6</sup> G11B 5/09

U.S. Cl. 360—48

27 Claims



1. An apparatus, adapted for use with a data processing means, for reading and writing data for said data processing means on a removable recording medium in accordance with a predetermined data format having a given data rate level of performance, comprising:

- a. drive means for transferring data to and from said medium;
- b. controller means, operatively connected to said drive means, for controlling operation of said drive means;
- c. interface means, operatively connected to said controller means, for connecting said apparatus to said data processing means and for allowing data flow between said controller means and said data processing means; and

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d. buffering means, operatively connected to said controller means, for imaging data in a format other than said predetermined data format such that data is selectively imaged in said buffering means during said transferring of data having a higher performance data reading and writing format with a data rate level of performance greater than said predetermined data format to said medium and a lower performance data reading and writing format with a data rate level of performance lesser than said predetermined data format from said medium.

5,774,288

**DATA RECORDER**

Akihiro Kikuchi, and Yoshihiro Yoshiura, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

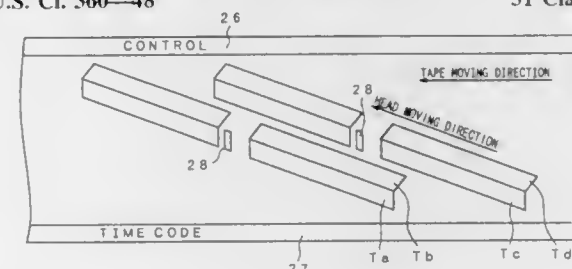
Filed Jan. 17, 1996, Ser. No. 587,530

Claims priority, application Japan, Jan. 20, 1995, 7-025902

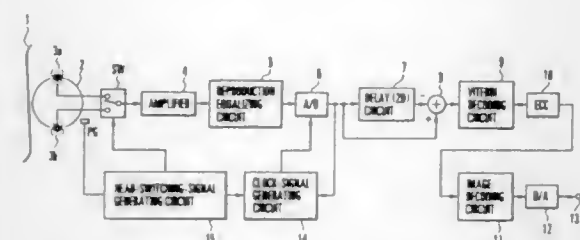
Int. Cl.<sup>6</sup> G06F 17/30

U.S. Cl. 360—48

31 Claims







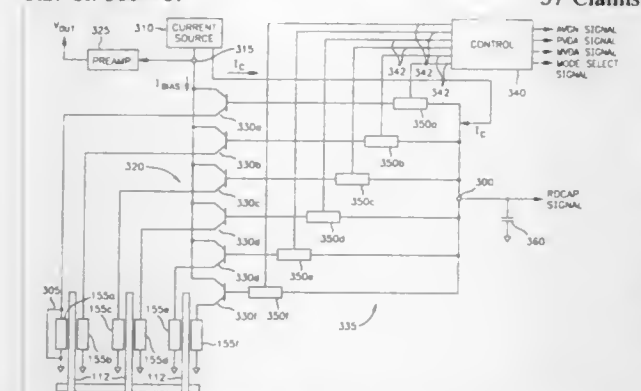
(c) controlling means for controlling a clock-signal generating operation of said generating means according to i.e. azimuth angle of each of the plurality of heads.

**5,774,291**  
**VOLTAGE MEASUREMENT CIRCUIT FOR A**  
**MAGNETORESISTIVE HEAD INSTALLED IN A DISK**  
**ENCLOSURE**

John Thomas Contreras, San Jose; Glen Alan Garfunkel, Palo Alto, and Calvin Shizuo Nomura, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 28, 1996, Ser. No. 623,449  
Int. Cl.<sup>6</sup> G11B 5/03; 5/09

U.S. Cl. 360—67 37 Claims



1. A circuit for measuring the voltage across a magnetoresistive (MR) head installed on an actuator arm for a disk drive unit, comprising:

- a control unit for supplying a measurement enable signal; and
- a measurement circuit module situated proximate to said actuator arm, comprising a current bias circuit responsive to said control unit for supplying a bias current to the MR head, a common node, coupled to the current bias circuit, providing a voltage signal responsive to the voltage across the MR head, an amplifier having an input node and an output node, and an input switch, responsive to the measurement enable signal, coupled between the input node and the common node.

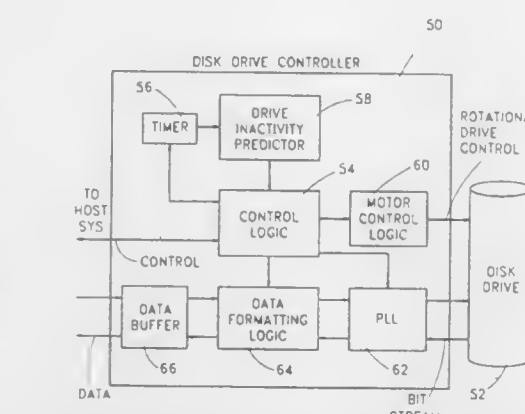
**5,774,292**  
**DISK DRIVE POWER MANAGEMENT SYSTEM AND**  
**METHOD**

Christos John Georgiou, White Plains, and Edward Scott Kirkpatrick, Croton-on-Hudson, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 13, 1995, Ser. No. 421,271  
Int. Cl.<sup>6</sup> G11B 15/46

U.S. Cl. 360—73.03 17 Claims

1. A method for conserving electrical power during inactivity periods between computer disk accesses, comprising the steps of:
- a) monitoring each occurrence of a disk access, said disk access comprising at least one of a read operation and a write operation;
  - b) measuring the time duration of inactivity periods between each disk access;



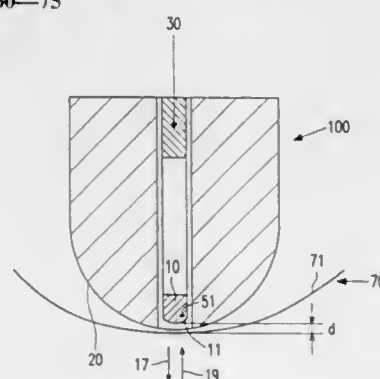
- c) predicting the time duration of a next inactivity period following the measured inactivity periods based on the measured time duration of the inactivity periods;
- d) following a period of disk activity, reducing the rotational speed of the disk if the predicted time duration is greater than a predetermined value;
- e) upon a subsequent disk access, reading/writing from/to the disk while the disk is rotating at the reduced rotational speed.

**5,774,293**  
**MAGNETIC RECORDING AND/OR REPRODUCING**  
**APPARATUS WITH AUTOMATIC CONTROL OF**  
**SEPARATION BETWEEN THE MAGNETIC HEAD AND**  
**THE RECORD CARRIER SURFACE**

Steven E. Stupp, Mountain View, Calif., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 3, 1996, Ser. No. 656,745  
Claims priority, application European Pat. Off., Jun. 1, 1995, 95201439

Int. Cl.<sup>6</sup> G11B 15/48 12 Claims



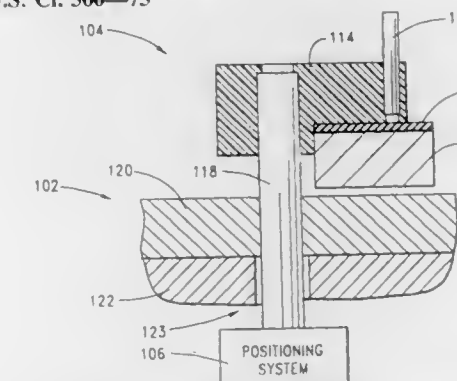
1. An apparatus for recording and/or reproducing information on a recording surface of an magnetic record carrier, comprising:
- a magnetic head having a face with a magnetic gap therein;
  - a guide for positioning the magnetic head so that the face thereof is in close proximity to the recording surface of the record carrier;
  - an actuator coupled to said head for moving it in a direction normal to said recording surface so as to change the separation distance between the face of said head and said recording surface, the direction of said movement being forward going toward the recording surface and being reverse going away from said recording surface;
  - detection means coupled to said head for generating a detection signal when the face of said head comes into contact with said recording surface; and
  - control means coupled to said detection means and responsive to said detection signal to provide a control signal to the actuator which is responsive thereto to move said head in said reverse

direction so as to increase the separation distance between the face of said head and said recording surface.

**5,774,294**  
**SERVO TRACK WRITER WITH TUNED DAMPER**  
Louis John Fioravanti, Edmond, Okla., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Aug. 21, 1996, Ser. No. 701,164  
Int. Cl.<sup>6</sup> G11B 21/02

U.S. Cl. 360—75 10 Claims



1. A servo track writer for writing servo information to a head disc assembly, the head disc assembly including a disc and a rotary actuator adjacent the disc, the actuator including a read/write head for selectively magnetizing the disc, the servo track writer comprising:

- a mounting fixture for mounting the head disc assembly, the mounting fixture providing a mechanical reference for the servo track writer as servo information is written to the head disc assembly;
- a pusher block assembly, mounted to the mounting fixture and proximate to the actuator of the head disc assembly, for mechanically positioning the actuator; and
- position control means for controlling the position of the actuator, the position control means comprising:
  - a motor connected to the pusher block assembly;
  - a positioning system for detecting the position of the actuator and outputting control signals to the motor in order to adjust the position of the actuator in response to the detected position of the actuator and a desired position of the actuator;

wherein the pusher block assembly comprises:

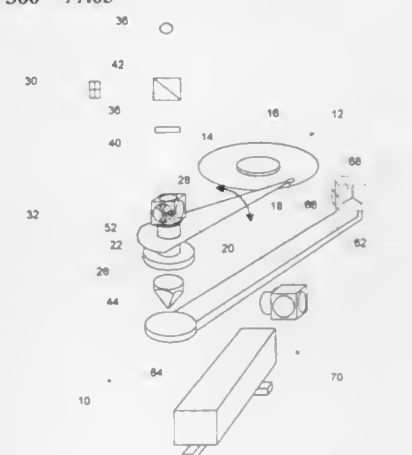
- a shaft supported by the mounting fixture, the shaft defining a first axis;
- a clamp portion, attached to the shaft, for rotation about the first axis, the rotation of the clamp portion controlled by the motor;
- a pusher pin, extending from the clamp portion, the pusher pin engaging the actuator in order to position the actuator as the servo information is written to the disc, the pusher pin disposed at a selected distance from the shaft so that the pusher pin travels along an arcuate path as the clamp portion rotates about the first axis;
- a dampening block having a selected mass; and
- a dampening pad disposed between and attached to the clamp portion and the dampening block so that the dampening block is mechanically isolated by the dampening pad, the dampening pad comprising a layer of compliant material;

wherein the mass of the dampening block and the compliance of the dampening pad are selected to provide a desired resonant frequency response for the pusher block assembly.

**5,774,295**  
**SERVO TRACK WRITING TECHNIQUE**  
John C. Tsai, Saratoga, Calif., assignor to Excel Precision, Inc., Santa Clara, Calif.

Filed Mar. 14, 1997, Ser. No. 818,330  
Int. Cl.<sup>6</sup> G11B 5/596

U.S. Cl. 360—77.03 18 Claims



1. A servotrack writing apparatus, for writing servotacks in a computer disk drive workpiece having a read-write head mounted on a movable actuator assembly, the writing apparatus comprising:

- a light source which produces a light beam;
  - reference optical target means, for receiving said light beam when the workpiece is not mounted in the writing apparatus, and for redirecting said light beam as a reference beam; and
  - workpiece optical target means which is mounted on the actuator assembly of the workpiece, for receiving said light beam when the workpiece is mounted in the writing apparatus and redirecting a first portion of said light beam as a verification beam and redirecting a second portion of said light beam as a tracking beam;
- common optical means, for directing said reference beam and said verification beam; and
- a reference detector, for detecting said reference beam when the workpiece is not mounted in the writing apparatus, thereby permitting calculation of a reference incidence position, and for detecting said verification beam when the workpiece is mounted in the writing apparatus, thereby permitting calculation of a verification incidence position for comparison with said reference incidence position, to derive mounting deviation information about the workpiece which is usable to correct mounting of the workpiece and to compensate measurements made based upon location of the workpiece;
  - a tracking detector, for detecting said tracking beam and thereby permitting the writing apparatus to direct the workpiece such that position and movement of the actuator assembly of the workpiece are synchronized with said tracking detector;
  - tracking optical target means which is mounted in fixed relationship with said tracking detector;
  - measuring means, for determining location of said tracking optical target means, and thereby inferring location of said tracking detector; and
  - positioning means, for positioning said tracking detector and said tracking optical target means, thereby permitting the writing apparatus to position the tracking detector as desired, based upon feedback from the measuring means of position of the tracking optical target means, and to thereby place the synchronized actuator assembly bearing the read-write head within the workpiece while servotacks are written.

5,774,296

Patent Not Issued For This Number





5,774,301

**APPARATUS FOR LATCHING AND EJECTING CARTRIDGES FROM A CARTRIDGE TAPE DRIVE IN A STORAGE LIBRARY SYSTEM AND DETECTION SYSTEM THEREFOR**

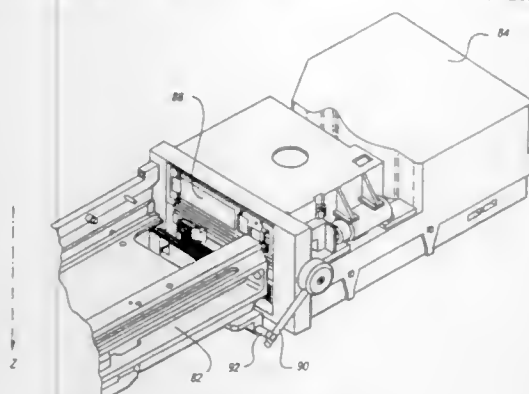
Joseph P. Manes, 7571 Ames St., Arvada, Colo. 80003; Donald B. Wait, 740 34th St., Boulder, Colo. 80303; Joseph P. Falace, 131 S. Madison Ave., Louisville, Colo. 80027; Randal Fird, 1340 Ithaca Dr., Boulder, Colo. 80303; David Black, 13122 Bellaire Dr., Thornton, Colo. 80241; Daniel Plutt, 1049 E. Iliff Way, Superior, Colo. 80027; Robert S. Creager, P.O. Box 1319, Berthoud, Colo. 80513; Adam Mehlberg, 632 Pratt, St., Longmont, Colo. 80501, and Scott Wilson, 2196 W. 116th Ave., Westminster, Colo. 80234

Filed Nov. 15, 1996, Ser. No. 746,729

Int. Cl.<sup>6</sup> G11B 15/38

U.S. Cl. 360—92

5 Claims



1. A storage library system comprising:  
a cartridge tape drive for receiving a cartridge;  
a robotically actuated hand assembly;  
a pin extending from the hand assembly; and  
a rotatable lever extending from the cartridge tape drive and pivotable between a first position in which the cartridge is locked in the tape drive, and a second position in which the cartridge is ejected from the tape drive;  
wherein the pin is operative to engage said rotatable lever for pivoting the lever between said first and second positions when the hand assembly is robotically actuated.

5,774,302

**SPIN DRIVE MOTOR FOR A DISK STORAGE DEVICE**  
Dieter Elsaesser, St. Georgen, and Johann Von Der Heide, Schramberg, both of Germany, assignors to Papst Licensing, GmbH, Spaichingen, Germany

Continuation of Ser. No. 227,645, Apr. 14, 1994, Pat. No. 5,422,769, which is a continuation of Ser. No. 47,308, Apr. 19, 1993, Pat. No. 5,446,610, which is a continuation of Ser. No. 883,478, May 15, 1992, Pat. No. 5,216,557, which is a continuation of Ser. No. 682,495, Apr. 9, 1991, Pat. No. 5,128,819, which is a continuation of Ser. No. 259,132, Oct. 18, 1988, Pat. No. 5,006,943, which is a continuation of Ser. No. 32,954, Mar. 31, 1987, Pat. No. 4,779,165, which is a continuation of Ser. No. 733,231, May 10, 1985, abandoned, which is a continuation-in-part of Ser. No. 412,093, Aug. 27, 1982, abandoned. This application Jun. 6, 1995, Ser. No. 468,096

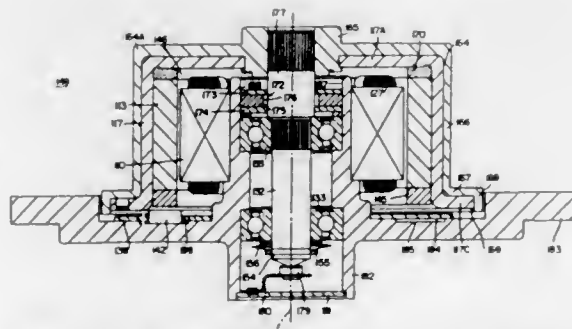
Claims priority, application Germany, Sep. 7, 1981, 31 35 385.1; Switzerland, Jun. 1, 1984, 2680/84; Mar. 30, 1985, 01374/85

Int. Cl.<sup>6</sup> G11B 17/08

U.S. Cl. 360—98.07

16 Claims

1. A spin motor for rotating a storage disk in a disk storage device, comprising:  
a stator and a winding on said stator;  
an external rotor coaxially surrounding said stator and spaced therefrom by a substantially cylindrical air gap, said rotor having a permanent magnetic rotor magnet and a soft mag-



netic yoke, and a hub concentric to said yoke, said hub being connected to the rotor for rotation therewith and having a cylindrical disk support portion which can pass through a central opening of a storage disk for receiving at least one storage disk, said hub having an outwardly radially projecting flange at one axial extremity of said rotor; and a support member contiguous with the disk storage device for supporting said stator, said support member including a radially extending flange adjacent said axial extremity of said rotor, said support member flange having a recess cooperating with said outwardly radially projecting flange of said hub to allow said outwardly radially projecting flange to nest in said recess, thereby making the motor more compact.

5,774,303

**SPUTTER INDUCED MICRO-TEXTURING ENHANCEMENT FOR MAGNETIC HEAD STRUCTURES**

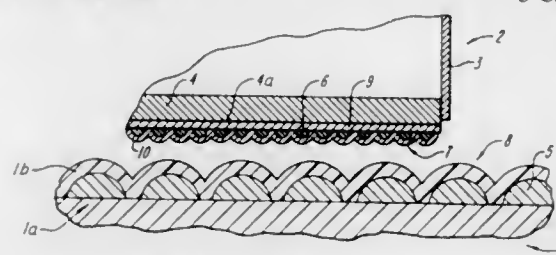
Edward F. Teng, Sunnyvale; Kent Kaufman, Los Gatos; Atef H. Eltoukhy, Saratoga, and Phuong Nguyen, Milpitas, all of Calif., assignors to StorMedia, Inc., Santa Clara, Calif.

Filed Mar. 24, 1995, Ser. No. 409,698

Int. Cl.<sup>6</sup> G11B 5/60; 21/21

U.S. Cl. 360—103

3 Claims



1. In a magnetic head for reading/writing magnetic media and which includes media data sensing means, and slider rail means engagingly facing magnetic media surface means; the improvement comprising: solidified, sputter deposited, mutually spaced, globular configurations supported by supporting portions of said slider rail means and operable to face said magnetic media; said slider rail means supported globular configurations being generally uniform in height, as measured generally normal to said slider rail means supporting portions; generally uniform in dispersion array as measured generally parallel to said slider rail means supporting portions, comprising a eutectic alloy substantially free of angular extremities; said media data sensing means having been shielded from sputter deposition of said globular configurations during the sputter deposition thereof on said slider rail means; said globular configurations substantially preventing angular surface engagement between said magnetic head and said magnetic media; said globular configurations being operable to insure generally uniform engagement between said slider rail means and said magnetic media; and said globular configurations comprise said eutectic alloy material, with

said eutectic alloy comprising about 65% by weight Indium and about 35% by weight Bismuth.

5,774,304

**DISC HEAD SLIDER HAVING CENTER RAIL WITH ASYMMETRIC EDGE STEPS**

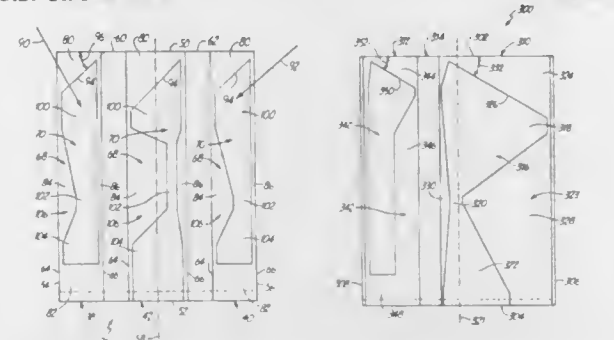
Peter Crane, Richfield, and Robert Edward Chapin, Burnsville, both of Minn., assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed May 3, 1996, Ser. No. 642,755

Int. Cl.<sup>6</sup> G11B 21/21

U.S. Cl. 360—103

18 Claims



1. A disc head slider for communicating with a rotating disc, the slider comprising:  
a slider body having leading, trailing, inside and outside slider edges relative to the disc; and  
an inside rail, an outside rail and a center rail positioned on the slider body, each rail including inside and outside rail edges, a bearing surface and an edge step surface extending along the inside rail edge, which is raised from the slider body and recessed from the bearing surface;  
wherein the bearing surface of each rail narrows from a leading portion of the bearing surface to a waist portion of the bearing surface and widens from the waist portion of the bearing surface to a trailing portion of the bearing surface to thereby define a waist step area of the edge step surface of each rail; and  
wherein the waist step area of the center rail is greater than the waist step area of the inside rail and the waist step area of the outside rail.

13. A disc head slider for communicating with a rotating disc, the slider comprising:  
a slider body having leading, trailing, inside and outside slider edges relative to the disc and having a center line which extends from the leading slider edge to the trailing slider edge;  
a center rail positioned substantially along the center line;  
a first side rail positioned generally along the outside slider edge;  
wherein each rail includes inside and outside rail edges, a bearing surface and an edge step surface along the inside rail edge which is raised from the slider body and recessed from the bearing surface;  
wherein the bearing surface of each rail narrows from a leading portion of the bearing surface to a waist portion of the bearing surface and widens from the waist portion of the bearing surface to a trailing portion of the bearing surface to thereby define a waist step area of the edge step surface of each rail; and  
wherein the waist step area of the center rail is greater than the waist step area of the first side rail.

5,774,305

**HEAD GIMBAL ASSEMBLY TO REDUCE SLIDER DISTORTION DUE TO THERMAL STRESS**

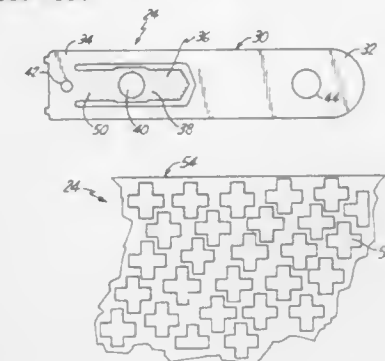
Zine-Eddine Boutaghou, Rochester, Minn., assignor to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Jun. 7, 1995, Ser. No. 486,009

Int. Cl.<sup>6</sup> G11B 5/48; 21/16

U.S. Cl. 360—104

16 Claims



1. A head gimbal assembly for a magnetic disc drive, comprising:  
a slider;  
a gimbal having an interface, defining a plane, attached to the slider; and  
a discontinuity means for localizing deformation of the slider and gimbal when the head gimbal assembly is subjected to thermal stress, the discontinuity means positioned whereby any linear cross section through the gimbal interface perpendicular to the plane of the interface intersects the discontinuity means.

5,774,306

**MULTI-CHANNEL, HIGH SPEED, TAPE HEAD CONTOUR**

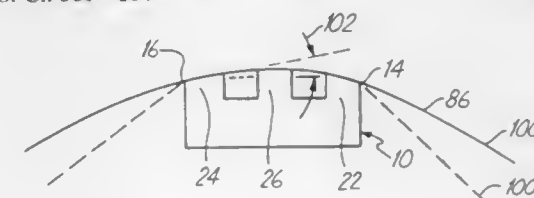
Jianmin Wang, and Mark Troutman, both of Londonderry, United Kingdom, assignors to Seagate Technology, Inc., Scotts Valley, Calif.

Filed Jan. 15, 1997, Ser. No. 783,570

Int. Cl.<sup>6</sup> G11B 5/22

U.S. Cl. 360—104

22 Claims



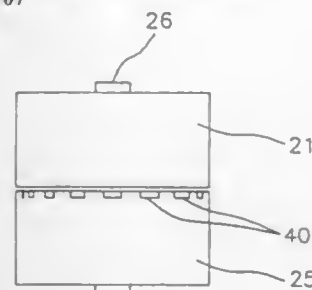
1. A magnetic tape head comprising:  
a body having a leading edge, a trailing edge, first and second side edges and a body surface;  
first, second and third raised rails extending from the body surface, between the first and second side edges, and forming a head-to-tape interface, wherein the second raised rail is disposed between and spaced from the first and third raised rails;  
a transducer carried by the second raised rail; and  
first and second longitudinal slots in the second raised rail which are disposed about the transducer and which form relieved surfaces which are recessed from the head-to-tape interface.

5,774,307  
HEAD DRUM ASSEMBLY DESIGNED TO PREVENT A  
MAGNETIC TAPE FROM ADHERING TO A DRUM  
SURFACE

Dong-Ho Kang, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Rep. of Korea  
Filed Mar. 26, 1997, Ser. No. 824,481  
Claims priority, application Rep. of Korea, Mar. 28, 1996, 96-8773

Int. Cl.<sup>6</sup> G11B 15/61  
U.S. Cl. 360—107

6 Claims



1. A head drum assembly comprising:  
a plurality of vent holes formed through an upper drum to allow air above the upper drum to be in communication with a space disposed between the upper drum and a lower drum;  
wherein an air flow is created within the space in response to a rotational movement of the upper drum, in such a manner that air is introduced through the vent holes and is radially and outwardly directed away from the space; and  
a plurality of outlet ports for guiding the directed air against a magnetic tape retained around the head drum assembly wherein the plurality of outlet ports are arranged along a periphery of the lower drum, having substantially same separation therebetween, to communicate with the space and wherein dimension of the outlet ports becomes progressively larger along a travelling direction of the magnetic tape.

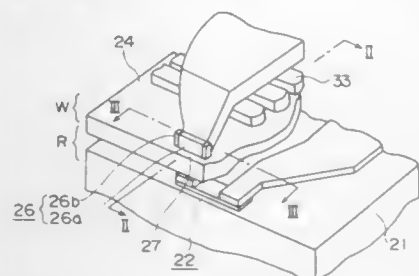
5,774,308  
THIN FILM INDUCTIVE HEAD AND MAGNETIC  
WRITING/READING DRIVE INCLUDING THE SAME

Yoshinori Ohtsuka, and Junzo Toda, both of Kanagawa, Japan, assignors to Fujitsu Limited, Kawasaki, Japan  
Filed Oct. 15, 1996, Ser. No. 730,101

Claims priority, application Japan, Apr. 26, 1996, 8-106931  
Int. Cl.<sup>6</sup> G11B 5/31; 5/39; 5/187

U.S. Cl. 360—126

13 Claims



1. A thin film inductive head comprising:  
a lower magnetic core formed on an under layer;  
an insulating layer formed on said lower magnetic core;  
a conductor coil passing through said insulating layer substantially in parallel with a surface of said lower magnetic core;  
an upper magnetic core formed on said insulating layer, and separated from said lower magnetic core at a narrow part of a front end portion, and contacting said lower magnetic core at a region away from said front end portion;  
a gap layer of insulator sandwiched between said lower magnetic core and said narrow part of said upper magnetic core; and

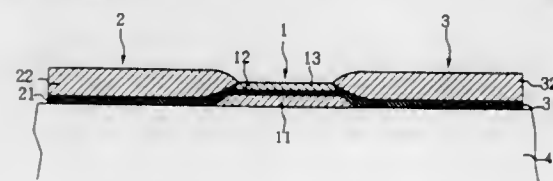
first high saturated magnetic flux density films formed on both sides of said narrow part of said upper magnetic core, said first high saturated magnetic flux density films having higher saturated magnetic flux density than that of said upper magnetic core.

5,774,309  
MAGNETIC TRANSDUCER AND THIN FILM  
MAGNETIC HEAD

Yasufumi Uno, Minamisaku-gun; Kiyosumi Kanazawa, Miyotamachi, and Masato Takahashi, Usudamachi, all of Japan, assignors to TDK Corporation, Tokyo, Japan  
Continuation of Ser. No. 530,722, Sep. 15, 1995, abandoned.  
This application Mar. 25, 1997, Ser. No. 824,135  
Claims priority, application Japan, Sep. 16, 1994, 6-222121  
Int. Cl.<sup>6</sup> G11B 5/39

U.S. Cl. 360—113

5 Claims



1. A magnetic transducer comprising a central active area and end passive areas, supported by a supporting body wherein:  
said central active area includes a magnetoresistive film, a nonmagnetic spacer film and a soft magnetic film with said magnetoresistive film constituting the lowermost layer on top of said supporting body, said nonmagnetic spacer film laminated on top of said magnetoresistive film and said soft magnetic film laminated on top of said nonmagnetic spacer film to provide a lateral bias field to said magnetoresistive film, so that the product of the saturation magnetization and the volume of the magnetoresistive film is greater than the product of the saturation magnetization and the volume of the soft magnetic film;  
said end passive areas each include a magnetic domain control film and a lead conductive film and are connected to two side surfaces of said central active area,  
said magnetic domain control film having electrical and magnetic continuity with said magnetoresistive film; and  
said lead conductive film being in contact with and laminated on top of said magnetic domain control film.

5,774,310  
MAGNETIC HEAD AND MAGNETIC RECORDING  
APPARATUS WHICH PREVENT GENERATION OF A  
FALSE MAGNETIC HEAD TENDING TO DISTURB A  
PREVIOUSLY FORMED MAGNETIC RECORDING  
TRACK

Shigeyoshi Takai, Neyagawa, and Fumio Sakai, Nabari, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 28, 1996, Ser. No. 704,242

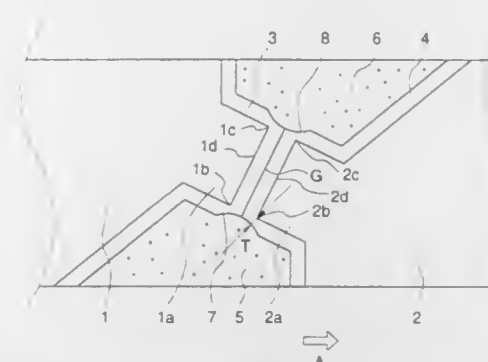
Claims priority, application Japan, Sep. 1, 1995, 7-225161  
Int. Cl.<sup>6</sup> G11B 5/23

U.S. Cl. 360—119

18 Claims

1. A magnetic recording apparatus comprising a plurality of magnetic heads for forming respective recording tracks of respective azimuth angles on a recording tape, at least one of the magnetic heads comprising:

a pair of magnetic cores to be energized magnetically, one of the magnetic cores including a first projection having three sides connected respectively at a first corner portion and a second corner portion with an end portion formed along the side between the first and second corner portions, and another one of the magnetic cores including a second projection having



three sides connected respectively at a third corner portion and a fourth corner portion with another end portion formed along the side between the third and fourth corner portions;  
high-saturation-magnetic-flux-density layers arranged on the magnetic cores respectively so that one of the high-saturation-magnetic-flux-density layers covers at least said end portion of said one of said magnetic cores and another one of the high-saturation-magnetic-flux-density layers covers at least said another end portion of said another one of said magnetic cores, and a saturation-magnetic-flux-density of the high-saturation-magnetic-flux-density layers being higher than that of the magnetic cores; and  
a magnetic gap between the high-saturation-magnetic-flux-density layers on said end portion of said one of said magnetic cores and said another end portion of said another one of said magnetic cores for magnetizing partially the recording tape; the first and third corner portions being adjacent to each other on opposite sides of said magnetic gap, the second and fourth corner portions being adjacent to each other on opposite sides of said magnetic gap, and said end portion and said another end portion being adjacent to each other on opposite sides of said magnetic gap;  
wherein said one of the magnetic cores is a front magnetic core in a magnetic head proceeding direction relative to the recording tape, said another one of the magnetic cores is a rear magnetic core in the magnetic head proceeding direction, a distance between said first corner portion and a previously formed recording track is smaller than a distance between said second corner portion and the previously formed recording track in a width direction of the recording track, said first corner portion is rear relative to said second corner portion in the magnetic head proceeding direction, and wherein the high-saturation-magnetic-flux-density layer continuously extends around the first corner portion with a thickness not less than 0.5  $\mu\text{m}$ .

5,774,311  
SMALL CORE MAGNETIC HEAD WITH NON-  
MAGNETIC SIDE SUPPORT

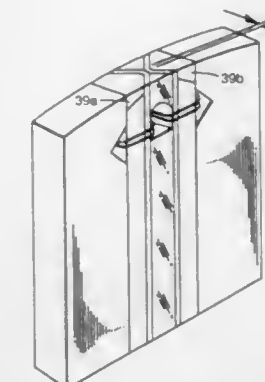
Beverly R. Gooch, Sunnyvale, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Continuation of Ser. No. 543,249, Oct. 13, 1995, abandoned.  
This application Mar. 24, 1997, Ser. No. 822,884

U.S. Cl. 360—125

6 Claims

1. A magnetic head for recording and/or reproducing high frequency signals in a pre-selected track within a magnetic recording medium, comprising:  
an elongate magnetic intercore consisting of first and second elongate magnetic members bonded together along their length on each inner side of said intercore by a ceramic material extending the entire length of said magnetic members that forms a recording gap between said members, and  
elongate non-magnetic side blocks secured to the magnetic members on each outer side of said intercore, one end of said intercore and side block structure being shaped into a contoured medium bearing surface extending across the end of said intercore members and said adjoining side blocks, and



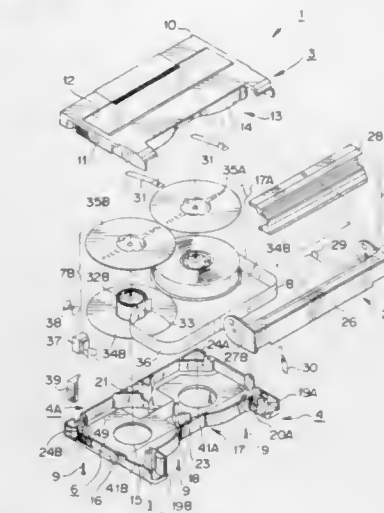
said intercore having a winding window formed in the central portion thereof and through said gap, at a location proximate to said medium bearing surface, and said medium bearing surface including a capping layer of non-magnetic material at the top of each elongate magnetic member so as to minimize tape wear, and  
a winding arranged through said winding window to encompass the portion of the cross-section of each elongate magnetic member that is adjacent to the winding window, for selectively producing read and write signals within the magnetic intercore of said head upon energization by high frequency signals such that flux within the head is substantially confined to the cross-sections of the magnetic members of the intercore located adjacent to the winding window substantially reducing the leakage flux within the head.

5,774,312  
TAPE CASSETTE

Masanori Abe, and Kazuo Ozawa, both of Miyagi, Japan, assignors to Sony Corporation, Japan  
Filed Oct. 25, 1996, Ser. No. 736,606  
Claims priority, application Japan, Oct. 31, 1995, 7-284191; Nov. 15, 1995, 7-296955; Nov. 28, 1995, 7-309138; Dec. 14, 1995, 7-325768; Dec. 15, 1995, 7-327737; Feb. 29, 1996, 8-043735

Int. Cl.<sup>6</sup> G11B 23/02  
U.S. Cl. 360—132

12 Claims



1. A tape cassette, comprising:  
an upper cassette half and a lower cassette half,  
a pair of tape reels housed between said upper and lower cassette halves a tape-shaped recording medium placed between said pair of tape reels, wherein  
one of the cassette halves includes a reel unlock portion and, said upper and lower cassette halves made from a synthetic resin.



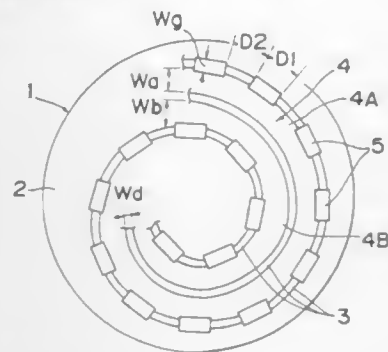
said lower cassette half further including a design statement detection portion and an aperture generally aligned with one of said reels; and  
a metallic plate integrated into said lower cassette half for forming a portion of a tape reel rotation area, said metallic plate having a pair of reel bearing holes.

5,774,313  
MAGNETIC DISK WHICH REDUCES DETERIORATION  
IN REGENERATED SIGNALS DUE TO OPTICAL SERVO  
GROOVES

Kenji Tanaka; Teruhisa Miyata, both of Otokuni-Gun; Akira Miyake, Toride, and Nobuhiro Umebayashi, Tsukuba, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka-Fu, Japan  
Filed Aug. 15, 1995, Ser. No. 515,446  
Claims priority, application Japan, Aug. 15, 1994, 6-214218  
Int. Cl.<sup>6</sup> G11B 5/596

U.S. Cl. 360—135

16 Claims



7. A magnetic disk comprising:

a disk body; and

a magnetic recording layer formed on said disk body, said magnetic recording layer comprising data tracks and grooves for optical servo formed at specified intervals parallel with the data tracks, the grooves overlapping on the data tracks such that the data tracks are narrowed where the grooves overlap, the magnetic disk further having plural guard bands, a guard band being between adjacent data tracks and the grooves being formed only on every other guard band, wherein a width of the grooves  $W_g$  has a value satisfying a relation

$$(W_g - W_d) / W_d \leq 0.375,$$

wherein  $W_d$  denotes a width of the guard bands and  $W_g$  denotes a width of the data track formed on the magnetic disk, the magnetic disk having plural data tracks and plural guard bands, a guard band being between adjacent data tracks and the grooves being formed only on every other guard band.

5,774,314  
MEDIUM PLAYER WITH TIME-WISE BAR DISPLAY OF  
ITEMS

Josephus H. Eggen; Joanne H. D. M. Westerink, and Reinder Haakma, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

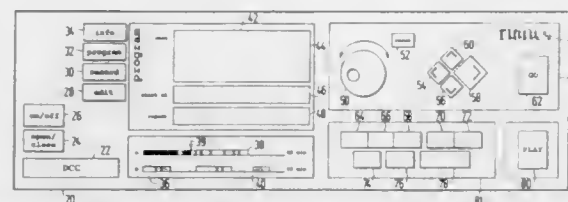
Filed Sep. 22, 1992, Ser. No. 949,290  
Claims priority, application European Pat. Off., Oct. 2, 1991, 91202565

Int. Cl.<sup>6</sup> G11B 27/19; 27/34

U.S. Cl. 360—137

15 Claims

1. A consumer apparatus for reading a removable information carrier having a linear sequence of information elements and for reproducing said sequence of information elements, said apparatus having interface means for interfacing to said information carrier, read means for, through said interface means, reading said information elements inclusive of content information indicating respective subsequences of said information elements each as an



information item, and first visual display means for indicating respective activity levels of said information elements along said sequence, characterized in that said first visual display means has bar display means for displaying said sequence as a bar, and sub-bar display means for displaying within said bar said subsequences each as an identifiable and discrete sub-bar having at least a particular minimum length, but otherwise, a length which is proportional to a length of the represented sub-sequence, said bar display means further including visible separation indications between each of the sub-bar display means.

5,774,315  
POWER SURGE SUPPRESSION CIRCUIT FOR HOT  
PLUG ENVIRONMENTS

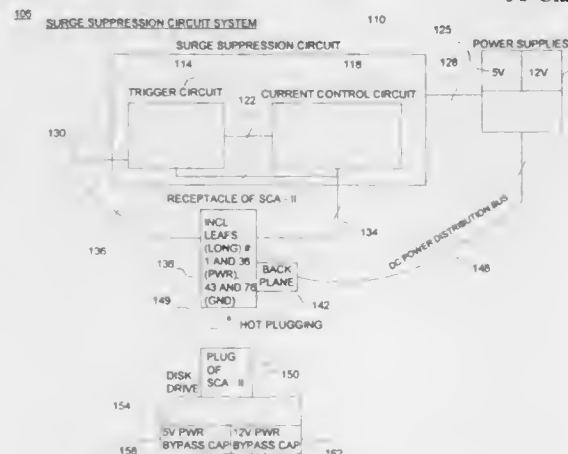
Georg A. Mussenden, Boca Raton, Fla., assignor to Core Engineering, Inc., Boca Raton, Fla.

Filed Aug. 19, 1996, Ser. No. 699,488

Int. Cl.<sup>6</sup> H02H 9/00

U.S. Cl. 361—18

31 Claims



1. An apparatus for charging a capacitance having a first and a second potentials operable with a power supply having a first and a second potentials, the apparatus comprising:  
a trigger circuit for coupling to the capacitance and for coupling to the power supply; and  
a current control circuit coupled to the trigger circuit, the current control circuit for coupling to the capacitance and for coupling to the power supply for substantially ceasing to conduct current when the capacitance is charged to a third potential.

5,774,316  
GROUND FAULT DETECTOR FOR LINE-POWERED  
TELEPHONE NETWORK

John S. McGary; Barry C. Zitting, both of Huntsville, and Steven M. Robinson, Madison, all of Ala., assignors to Adtran, Inc., Huntsville, Ala.

Filed Aug. 26, 1996, Ser. No. 704,464

Int. Cl.<sup>6</sup> H02H 3/00

U.S. Cl. 361—42

30 Claims

12. A ground fault detection and power control system for a communications network having a conductive link for transporting telecommunication signals and power for one or more communication circuits coupled to said conductive link, comprising:

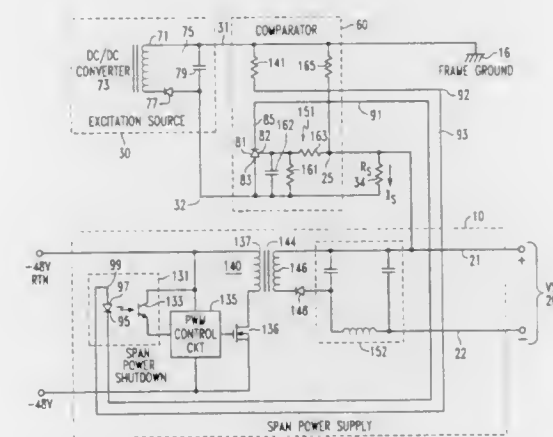
5,774,318  
I.C. POWER SUPPLY TERMINAL PROTECTION CLAMP  
Steven W. McClure, Playa Del Rey, and Lloyd F. Linder, Agoura Hills, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Nov. 27, 1996, Ser. No. 753,647

Int. Cl.<sup>6</sup> H02H 9/00

U.S. Cl. 361—56

26 Claims



an electrical excitation source coupled through an auxiliary conductive path coupled to said conductive link; and  
a ground fault sensor coupled in circuit with said auxiliary conductive path for monitoring said auxiliary path for a prescribed change in an electrical characteristic thereof representative of a person forming a ground fault with said conductive link by being coupled between said conductive link and a ground reference and, in response to said ground fault, being operative to protect said person from an electrical hazard by substantially reducing power applied to said conductive link.

5,774,317  
PLUG-THROUGH TRANSIENT VOLTAGE SURGE  
SUPPRESSION

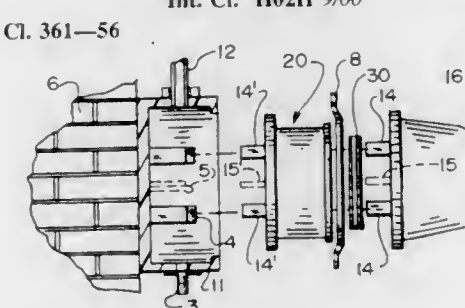
Edward F. Allina, Treasure Island, Fla., assignor to Stanley F. Allina, Jr., Lake Park, Fla.

Continuation-in-part of Ser. No. 479,856, Feb. 14, 1990, abandoned, which is a continuation-in-part of Ser. No. 923,524, Oct. 28, 1996, Pat. No. 4,931,895. This application Feb. 5, 1993, Ser. No. 14,379

Int. Cl.<sup>6</sup> H02H 9/00

U.S. Cl. 361—56

10 Claims



3. Transient voltage surge suppression (TVSS) apparatus adapted to protect a watt-hour meter and electrical equipment metered thereby from lightning or switching transient voltage surges, comprising  
a circuit board

- carrying means substantially non-conductive at normal power voltage but conductive at higher voltages, including varistors as the sole variable resistance components thereof adapted to clip transient voltage surges and shunt surge currents to ground,
- being adapted to fit around the blade-like terminals normally protruding from a watt-hour meter into jaws of a powered socket within an electrical utility box or panel, and
- further adapted to be supported at least in part by contact with whatever blade-like terminals may engage the jaws of the socket.

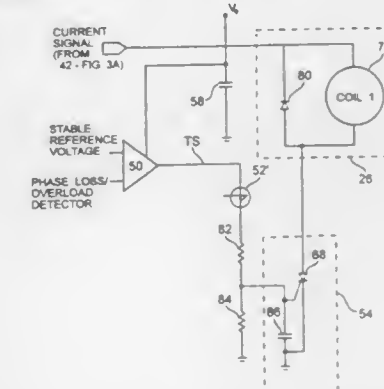
5,774,319  
ENERGY VALIDATION ARRANGEMENT FOR A SELF-  
POWERED CIRCUIT INTERRUPTER

Michael Baron Carter, Clayton; Roger Alan Plemmons, Raleigh; Barry Noel Rodgers, Raleigh; Timothy Brian Phillips, Raleigh, and George Marshall Horne, Cary, all of N.C., assignors to Square D Company, Palatine, Ill.

Continuation-in-part of Ser. No. 147,280, Oct. 27, 1993, abandoned. This application Nov. 15, 1995, Ser. No. 558,310  
Int. Cl.<sup>6</sup> H02H 3/00

U.S. Cl. 361—93

54 Claims



48. A circuit interrupter arrangement for interrupting current in a circuit path, wherein the current in the circuit path is controlled by a contactor control circuit operating a contactor coil for selectively closing and opening contacts electrically in series with the circuit path, the interrupter arrangement comprising:

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JUNE 30, 1998

a power supply circuit extracting operating power from the contactor control circuit operating the contactor coil and providing a voltage signal relative to common;

a fault detection circuit, responsive to a fault in the circuit path, for sending an electrical signal commanding that the circuit path be interrupted by using the voltage signal provided by the power supply circuit; and

a trip mechanism constructed and arranged for interrupting the current in the circuit path in response to the electrical signal.

5,774,320

**MODULAR CURRENT TRANSFORMER FOR ELECTRONIC CIRCUIT INTERRUPTERS**

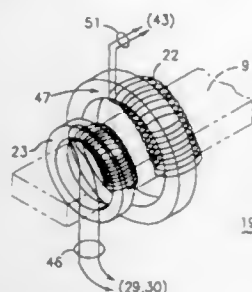
Raymond K. Seymour, Plainville, Conn., and Ertugrul Berkcan, Niskayuna, N.Y., assignors to General Electric Company, New York, N.Y.

Filed Oct. 24, 1996, Ser. No. 736,090

Int. Cl.<sup>6</sup> H02H 3/00

U.S. Cl. 361—93

12 Claims



1. A circuit breaker comprising:

a plastic case and a plastic cover;

a pair of separable contacts within said case and arranged for separation upon occurrence of an overcurrent condition in a protected electrical circuit;

an electronic trip unit in said cover controlling said separable contacts and determining said overcurrent condition; and

a modular transformer within said case electrically connected with said trip unit and electro-magnetically coupled with a metal strap, said transformer comprising a first winding concentrically arranged about said strap for providing sample current flow to said trip unit, a metal core concentrically arranged about said first winding, and a second winding concentrically arranged about said core for providing electric power to said trip unit.

5,774,321

**POWER SUPPLY CIRCUIT WITH LOAD PROTECTION FUNCTION**

Yong-Ho Kim, Seoul, and Young-Sik Lee, Kyungki-do, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

Filed Aug. 30, 1996, Ser. No. 706,018

Claims priority, application Rep. of Korea, Aug. 30, 1995, 27623/1995; Nov. 11, 1995, 40872/1995

Int. Cl.<sup>6</sup> H02H 3/00

U.S. Cl. 361—94

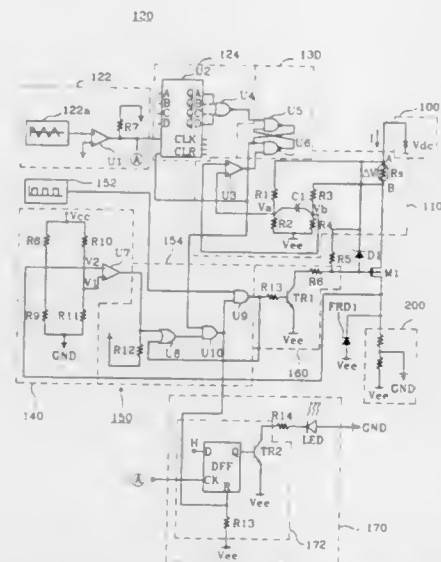
10 Claims

8. A power supply circuit for controlling the flow of power from a power source to a load, the circuit comprising:

a short-circuit detector coupled to the load to monitor the current flowing through the load, the short-circuit detector generating a short-circuit signal when the current flowing through the load exceeds a predetermined level;

a timer that generates a timer signal;

a latch coupled to the short-circuit detector and the timer, the latch generating a latch signal responsive to the short-circuit signal and periodically toggling the latch signal responsive to the timer signal after the short-circuit signal is generated; and



a switch coupled to the power source to control the flow of power to the load responsive to the latch signal;

wherein the latch includes:

a first NAND gate having a first input terminal for receiving the timer signal, a second input terminal, and an output terminal for transmitting the latch signal; and

a second NAND gate having a first input terminal coupled to the output terminal of the first NAND gate, a second input terminal for receiving the short-circuit signal, and an output terminal coupled to the second input terminal of the first NAND gate.

5,774,322

**THREE WIRE POWER SUPPLY CIRCUIT**

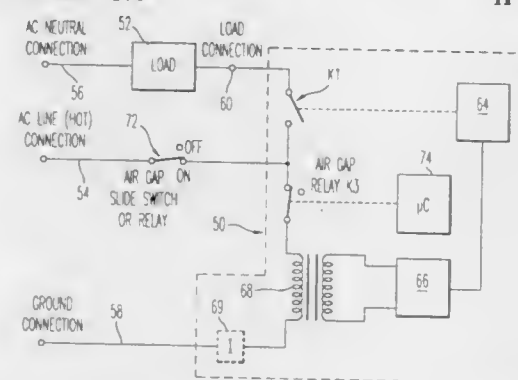
Mark Richard Walter, Bridgeport; David Philip Eckel, Wetherfield, and Thomas James Batko, Wallingford, all of Conn., assignors to Hubbell Incorporated, Orange, Conn.

Continuation-in-part of Ser. No. 412,502, Mar. 29, 1995, which is a continuation of Ser. No. 382,691, Feb. 2, 1995, abandoned. This application Jul. 13, 1995, Ser. No. 501,847

Int. Cl.<sup>6</sup> H01H 47/22

U.S. Cl. 361—170

11 Claims



1. A power supply circuit for use in combination with a load and an alternating current (AC) power source for selectively connecting and disconnecting the load and the AC power source, the load being connected between a neutral conductor of the AC power source and the power supply circuit, the power supply circuit being connected to a hot line conductor and a ground conductor of the AC power source, the power supply circuit comprising:

a relay having one terminal connected to said load and another terminal connected to said line conductor;

a control circuit for selectively operating said relay; and

a transformer, the primary winding of said transformer being connected in series with said line conductor and said ground conductor for supplying power to said control circuit when

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the load is disconnected from the AC power source via said relay, said transformer being configured to step down the voltage between said line conductor and said ground conductor.

5,774,323

**DETECTION OF CONTACT POSITION FROM COIL CURRENT IN ELECTROMAGNETIC SWITCHES HAVING AC OR DC OPERATED COILS**

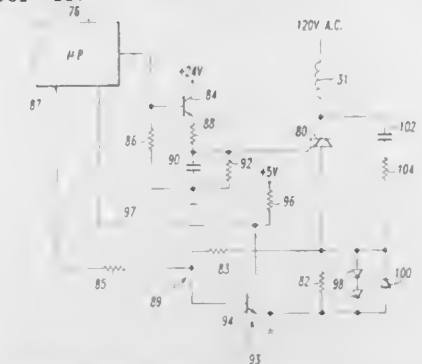
Mark E. Innes, and John H. Blakely, both of Asheville, N.C., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 31, 1995, Ser. No. 558,605

Int. Cl.<sup>6</sup> H01H 47/22

U.S. Cl. 361—187

9 Claims



1. An electromagnetic switch comprising:

separable contacts comprising a fixed contact structure and a movable contact structure having a closed position and an open position;

an electromagnet for opening and closing said separable contacts and comprising an AC coil, a core associated with said coil, an armature on which said moveable contact structure is carried, energizing means energizing said coil with an AC voltage to generate AC coil current and attract said armature toward said core to a closed position in which said separable contacts are closed, biasing means biasing said armature away from said core to an open position to form a gap between said core and said armature and in which said contacts are open, said coil having a first inductance when said armature is in said open position and a second inductance when said armature is in said closed position; and

position indicating means monitoring coil current and generating a position signal indicating armature position and, therefore, contact position as a function of said coil current as affected by said first inductance and by said second inductance, said position indicating means comprising means measuring AC coil current generated by said AC voltage applied to said coil by said energizing means, means comparing said coil current to a threshold value and generating a position signal indicating that said separable contacts are closed when coil current is below said threshold value and indicating that said separable contacts are open when said coil current is above said threshold value.

5,774,324

**SCOROTRON CHARGER FOR USE IN AN IMAGE FORMING APPARATUS**

Shigeki Hayashi; Munetaka Mukainishi, and Takeshi Aoki, all of Osaka, Japan, assignors to Mita Industrial Co., Ltd., Osaka-fu, Japan

Filed Nov. 4, 1996, Ser. No. 740,889

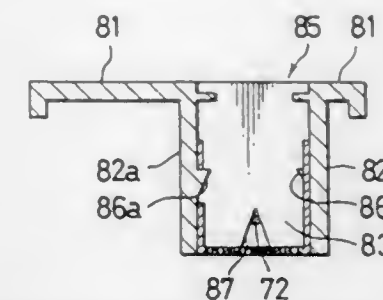
Claims priority, application Japan, Nov. 10, 1995, 7-293178

Int. Cl.<sup>6</sup> G03G 15/02

U.S. Cl. 361—225

5 Claims

1. A scorotron charger for charging a photosensitive member in an image forming apparatus, the scorotron charger comprising: a charging wire extending in a specified direction;



a housing member including a pair of side walls each extending in a direction parallel to the charging wire;

an electrode member having a substantially U-shaped cross section, mounted to the housing member, including a bottom plate with a grid electrode and a pair of upright side plates extending along the charging wire

a plurality of cutouts formed in the side plates;

said cutouts being disposed at positions in said side plates such that entire peripheries of said cutouts are further from said bottom plate than said charging wire is from said bottom plate; and

a plurality of projections formed on the side walls of the housing member at positions corresponding to respective ones of the cutouts for engaging with the cutouts and securing said electrode member in said housing member.

5,774,325

Patent Not Issued For This Number

5,774,326

**MULTILAYER CAPACITORS USING AMORPHOUS HYDROGENATED CARBON**

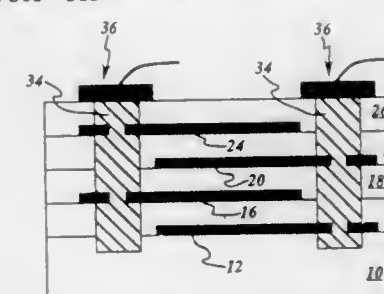
Paul Alan McConnelee, Schenectady; Kevin Matthew Durocher, Waterford, and Richard Joseph Saia, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 25, 1995, Ser. No. 519,274

Int. Cl.<sup>6</sup> H01G 4/06; 4/28; 4/236

U.S. Cl. 361—313

9 Claims



1. A multilayer capacitor comprising: a substrate;

a plurality of metal electrode layers mounted on the substrate alternately with a plurality of dielectric layers, each dielectric layer comprising amorphous hydrogenated carbon, the electrode layers and the dielectric layers capable of acting as a capacitor and having at least two holes therein, each hole intersecting respective alternating ones of the electrode layers; and

an electrically conductive material situated in each hole for coupling the respective alternating ones of the electrode layers.



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HIGH DIELECTRIC CAPACITORS

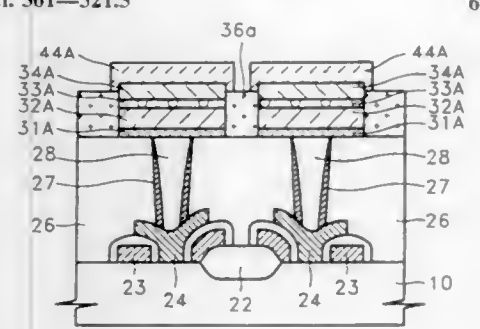
Soon-oh Park, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea  
Filed Nov. 27, 1996, Ser. No. 757,502

Claims priority, application Rep. of Korea, Nov. 29, 1995, 95-44902

Int. Cl.<sup>6</sup> H01G 4/06

U.S. Cl. 361—321.5

6 Claims



1. A high dielectric capacitor comprising:  
an integrated circuit substrate;  
a first electrode layer on the integrated circuit substrate;  
a layer of high dielectric material on the first electrode layer opposite the integrated circuit substrate;  
a second electrode layer on the layer of high dielectric material opposite the first electrode layer;  
wherein said first electrode layer, said high dielectric layer and said second electrode layer define a capacitor cell unit having a continuous sidewall which extends from the first electrode layer beyond the layer of high dielectric material and to the second electrode layer; and  
an insulating spacer on said sidewall and extending at least from the first electrode layer to the second electrode layer and ending before a surface of the second electrode layer opposite the layer of high dielectric material.

5,774,328

REGISTER ENCLOSURE FOR USE WITH A UTILITY METER

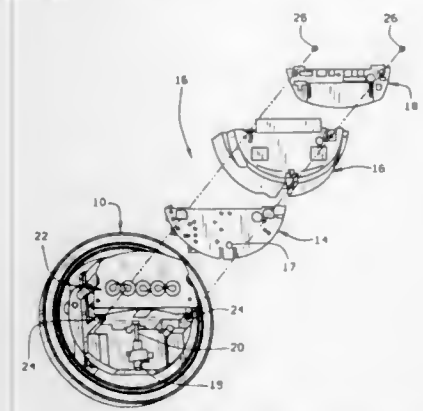
William O. Rector; Patrick J. Horan, both of Dover, and David Dopp, Somersworth, all of N.H., assignors to General Electric Company, New York, N.Y.

Filed Apr. 15, 1996, Ser. No. 632,569

Int. Cl.<sup>6</sup> H02B 9/00

U.S. Cl. 361—667

19 Claims



14. An electric meter register enclosure assembly comprising:  
an electric meter;  
a meter frame;  
a register enclosure mounted to said meter frame;  
a register circuit board partially enclosed in said register enclosure and carrying electrical components and a light emitting diode;  
said register enclosure including:

a shroud at least partially blocking the register circuit board from direct sunlight, said shroud comprising sidewalls closely positioned proximate sides of the meter frame;  
a plurality of positioning ribs and positioning snaps engaging said register circuit board;  
retaining means on said shroud securely engaging the register circuit board; wherein said positioning ribs and snaps and said retaining means securely position and engage said register circuit board; and  
a clamping snap mounting said register enclosure on a rear bearing of the electricity meter.

5,774,329

COMPUTER WITH DETACHABLE KEYBOARD UNIT

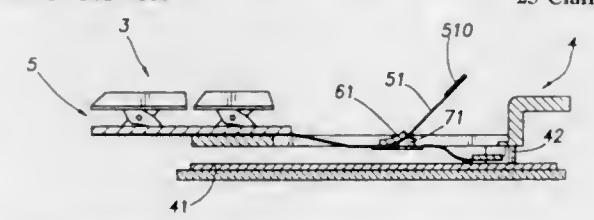
Ping-Huang Kuo, Taipei City, Taiwan, assignor to Compaq Computer Corporation, Houston, Tex.

Filed Dec. 13, 1996, Ser. No. 766,522

Int. Cl.<sup>6</sup> G06F 1/16; H05K 7/02

U.S. Cl. 361—680

23 Claims



1. Electronic apparatus comprising:  
electrical circuitry;  
a component having a flexible connector with an outer portion removably connectable to said electrical circuitry, and an intermediate portion disposed between said component and said outer portion of said flexible connector; and  
protective structure operative to maintain a constant positional relationship between said intermediate portion and the electrical circuitry in a manner preventing a force exerted on said component, and moving it relative to said electrical circuitry, from being transmitted to said outer portion of said flexible connector and disconnecting it from said electrical circuitry.

5,774,330

APPARATUS FOR SUPPORTING OPERATIONAL COMPONENTS OF A PERSONAL COMPUTER

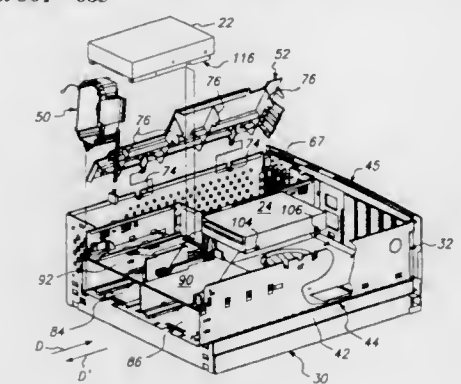
Jimmy A. Melton, San Jose; Wayman Lee, Santa Clara, both of Calif., and Wayne H. Miller, West Linn, Oreg., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 1, 1995, Ser. No. 431,418

Int. Cl.<sup>6</sup> H05K 5/00

U.S. Cl. 361—683

7 Claims



1. A personal computer comprising a chassis including upright outer side walls; a power supply; a motherboard mounted in said chassis; said chassis forming a space for receiving expansion cards; a plurality of vertical slots disposed in said chassis and facing said space for receiving ends of respective expansion cards;

5,774,331

PORTABLE WORKSTATION HAVING ENVIRONMENTALLY SEALED COMPONENTS

Gary M. Sach, Villa Park, Calif., assignor to Raytheon Company, Los Angeles, Calif.

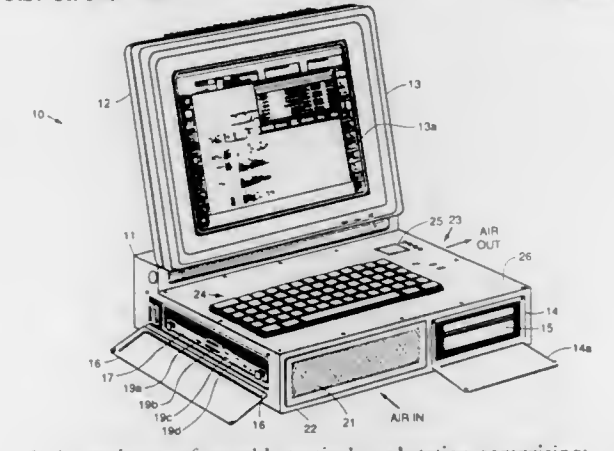
Continuation of Ser. No. 641,931, May 1, 1996, abandoned.

This application Oct. 6, 1997, Ser. No. 944,219

Int. Cl.<sup>6</sup> G06F 1/16; H05K 5/06

U.S. Cl. 361—683

16 Claims



1. A weatherproof portable tactical workstation comprising:  
a housing having an integrated lockable rotatable top cover;  
a display panel disposed in the top cover that has a viewing screen;  
at least one removable hard drive disposed in the housing;  
a hard drive receiver integral to the housing operable to contain the hard drive, the hard drive receiver further comprising a hard drive cover operable to close and seal the hard drive receiver;  
at least one processor card disposed in the housing;  
a processor box disposed within the housing operable to contain the processor card, the processor box further comprising a processor box cover operable to close and seal the processor box;  
an air filter is disposed on the surface of the housing;  
a fan disposed adjacent a surface of the housing for drawing air through the filter and the housing to cool the workstation;  
a keyboard that is exposed to a user when the top cover is opened to expose the viewing screen, the keyboard protected by the top cover when the top cover is closed; and  
a single power supply disposed in the housing for providing the sole supply of all voltages and timing signals to the display panel, the keyboard, the processor card, the hard drive, and the fan.

5,774,332

VERTICALLY ORIENTED DOCKING STATION APPARATUS FOR A PORTABLE COMPUTER

Mark H. Ruch, Titenbury, and Steven S. Iliomer, Houston, both of Tex., assignors to Compaq Computer Corporation, Houston, Tex.

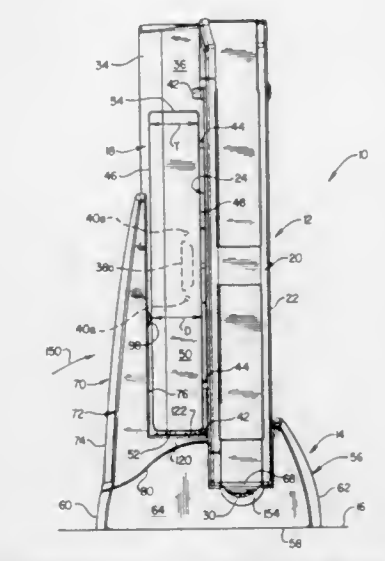
Continuation of Ser. No. 664,681, Jun. 17, 1996, Pat. No. 5,687,060. This application Oct. 15, 1997, Ser. No. 950,623

Int. Cl.<sup>6</sup> G06F 1/16; H05K 7/10; 7/16

U.S. Cl. 361—686

9 Claims

1. A computer docking station stand comprising:



a first portion operative to support a portable computer docking station;  
a second portion upon which a portable computer may be placed; and  
a third portion operative to engage the portable computer, and hold the portable computer against a predetermined portion of the supported portable computer docking station, in response to the placement of the portable computer on said second portion of said stand.

5,774,333

THERMALLY EFFICIENT PORTABLE COMPUTER INCORPORATING DEPLOYING CPU MODULE

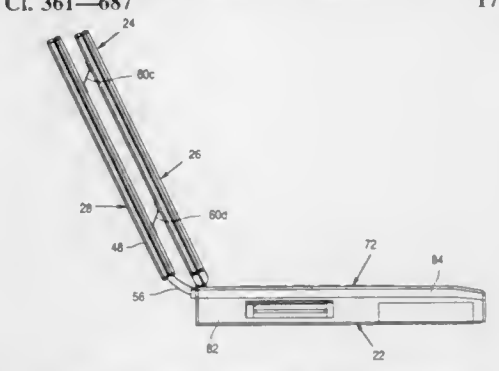
Craig M. Janik, Los Altos Hills; Dennis J. Boyle, Palo Alto; Ryan H. Mongan, Redwood City, and Michael J. Shawver, Oakland, all of Calif., assignors to Speculative Incorporated, Palo Alto, Calif.

Filed Aug. 23, 1996, Ser. No. 708,093

Int. Cl.<sup>6</sup> G06F 1/20; H05K 7/20

U.S. Cl. 361—687

17 Claims



1. A portable computer comprising, in combination  
a flat panel display;  
a CPU module containing a CPU;  
a user-interface control means for controlling the computer;  
a base containing a plurality of components associated with portable computers;  
means for connecting said flat panel display, said CPU module, said user-interface control means and said base in a substantially closed planar module when the computer is closed and moving said flat panel display for viewing when the computer is open; and  
a deploying means activated by a thermal monitoring subsystem, for automatically positioning said CPU module adjacent to said flat-panel display when the computer is closed, and separating said CPU module from said flat-panel display and said base, when necessitated by internal temperatures, during use.

9. A portable computer comprising in combination a display module comprising a flat-panel display, a bezel, and a rear cover;
- CPU module containing a CPU and a plurality of components associated with a portable computer motherboard, a heat-spreading front cover element facing said display module, and a rear cover;
- a base containing a keyboard, a plurality of connectors, a plurality of media, batteries, a printed circuit board, a pointing device, a top cover, and a bottom cover;
- means for connecting said display module, said CPU module and said base in a substantially closed planar module when the computer is closed and for moving said display module with respect to said base for viewing when the computer is open;
- a plurality of compliant flexures for positioning said CPU module adjacent to said display module when the computer is closed, and positioning said CPU module heat-spreading front cover parallel to and spaced away from said display module when the computer is being used and,
- an extensible signal relaying means for maintaining functional connection of said CPU module to said base, and of said CPU module to said display module.

5,774,334

## LOW THERMAL RESISTANT, FLUID-COOLED SEMICONDUCTOR MODULE

Keizo Kawamura, Ibaraki-ken; Noriyuki Ashiwake, Tsuchiura; Takahiro Daikoku, Ushiku; Akio Idei, Hadano; Kenichi Kasai, Ushiku; Hideyuki Kimura, Tsuchiura; Atsuo Nishihara, Inayor; Toshio Hatada, Tsuchiura, and Shigeyuki Sasaki, Ibaraki-ken, all of Japan, assignors to Hitachi, Ltd., Japan

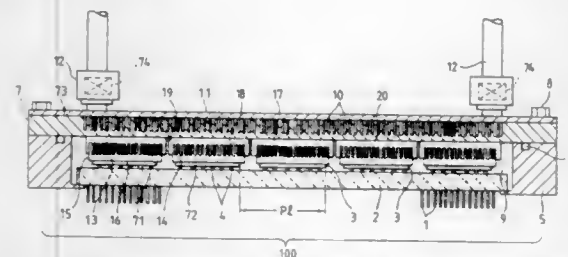
Filed Aug. 28, 1995, Ser. No. 520,338

Claims priority, application Japan, Aug. 26, 1994, 6-202217

Int. Cl.<sup>6</sup> H05K 7/20

U.S. Cl. 361—699

15 Claims



1. A low thermal resistant, fluid-cooled semiconductor module comprising:
- a circuit board;
- a plurality of semiconductor devices having a first surface for mounting on said circuit board and a second surface opposed to said first surface;
- a housing associated with said circuit board;
- first heat conducting members, each of which has a plurality of first heat transfer surfaces perpendicular to the second surface of the semiconductor devices, disposed between said semiconductor devices and said housing; and
- second heat conducting members each of which has a plurality of second heat transfer surfaces perpendicular to the second surface of the semiconductor devices, disposed between said semiconductor devices and said housing,
- wherein the first and second heat transfer surfaces are arranged opposite to each other to form a clearance therebetween of substantially from 5 to 25  $\mu$ m, a thickness of the first fins and the second fins is within a range of 0.3 to 0.5 mm and a height of the first and the second fins is within a range of 1.54 to 4 mm.

5,774,335  
HEAT SINK ASSEMBLY WITH HEIGHT ADJUSTABLE MOUNTING CLIP

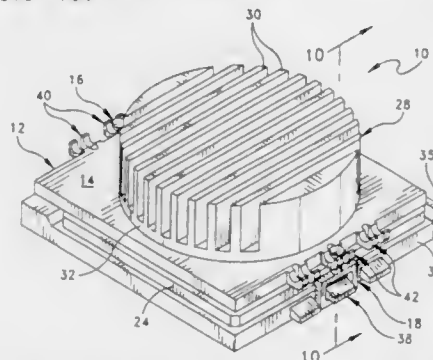
Rodney H. Pare, West Warwick, and William B. Rife, Greenville, both of R.I., assignors to Chip Coolers, Inc., Warwick, R.I.

Filed Apr. 8, 1997, Ser. No. 833,660

Int. Cl.<sup>6</sup> H05K 7/20

U.S. Cl. 361—704

15 Claims



1. A heat sink assembly for removing heat from an electronic device package installed in a socket having protrusions emanating therefrom, comprising:
- a top planar member with a first end and a second end opposing said first end;
- a first leg removably connected to and downwardly depending from said first end of said top member; said first leg including a first elongated shaft member, with an upper and bottom end, having a plurality of spaced apart radial flanges along its length; first engagement element affixed to said bottom end of said first elongated shaft member for securing said first leg to one of said protrusions emanating from said socket; said first leg being removably connected to said first end of said top planar member via one of said radial flanges;
- a second leg removably connected to and downwardly depending from said second end of said top planar member; said second leg including a second elongated shaft member, with an upper and bottom end, having a plurality of spaced apart radial flanges along its length; second engagement element affixed to said bottom end of said second elongated shaft member for securing said second leg to one of said protrusions emanating from said socket; said second leg being removably connected to said second end of said top planar member via one of said radial flanges;
- a heat sink member disposed in communication with said electronic device package; said heat sink member having a flat bottom surface;
- heat sink member being adjustably connected to said top planar member for maintaining said heat sink member in flush thermal communication with said electronic device package installed in said socket;
- whereby connection of said first end of said top planar member to a selected one of said radial flanges on said first leg and connection of said second end of said top planar member to a selected one of said radial flanges on said second leg defines a distance between said top planar member and said electronic device package to accommodate said heat sink member.

5,774,336

HIGH-TERMINAL CONDUCTIVITY CIRCUIT BOARD  
Ralph I. Larson, Bolton, Mass., assignor to Heat Technology, Inc., South Lancaster, Mass.

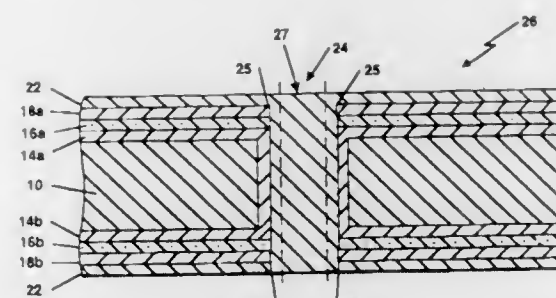
Continuation-in-part of Ser. No. 603,210, Feb. 20, 1996. This application Sep. 13, 1996, Ser. No. 712,950

Int. Cl.<sup>6</sup> H05K 7/20

U.S. Cl. 361—720

8 Claims

1. A circuit board comprising:



- a base layer having first and second opposing surfaces and at least one hole formed therein, each of the at least one holes having a hole surface;
- an anodized layer disposed over the first and second surfaces of said base layer including at least a portion of the hole surface of at least one hole formed in said base layer;
- a conductive layer disposed over said anodized layer, said conductive layer having at least one hole formed therein wherein each of the at least one holes of said conductive layer are aligned over each of the at least one holes in said base layer;
- a plating layer disposed over said conductive layer and the anodized portions of the hole surfaces in each of the at least one holes in said base layer; and
- a bond film disposed between the anodized layer and the conductive layer.

5,774,337

## APPLIANCE HAVING EMI SHIELDING

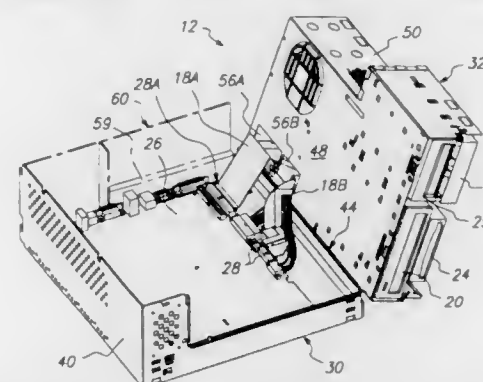
Wayman Lee, Santa Clara, Calif.; Wayne H. Miller, West Linn, and Bradley C. Helm, Tualatin, both of Oreg., assignors to Apple Computer, Inc., Cupertino, Calif.

Filed May 1, 1995, Ser. No. 431,421

Int. Cl.<sup>6</sup> G06F 1/16; H05K 7/14

U.S. Cl. 361—725

18 Claims



1. An appliance comprising:
- a metallic chassis including a first chassis section forming a first space, and a second chassis section mounted to said first chassis section and forming a second space;
- a metallic upright wall connected to said first chassis section; first and second electromagnetic wave-generating components disposed in said first space and second spaces, respectively;
- a front opening formed in said second chassis section communicating said second space with the exterior and aligned with said second electromagnetic wave-generating component; and
- a rear opening formed in said second chassis section and arranged such that said upright wall extends across and shields said rear opening;
- said second chassis section including a floor and side walls projecting upwardly therefrom, said upright wall of said first chassis section including an upwardly facing, inwardly stepped horizontally extending ledge comprising electrically conductive material on which a rear portion of said floor rests, said upright wall of said first chassis section including an inwardly stepped vertical shoulder comprising electrically conductive material facing and engaging a rear end of one of said side walls of said second chassis section;
- said first and second chassis sections defining electromagnetic shielding for resisting the passage of electromagnetic waves from said first and second spaces to the exterior, and for resisting the passage of electromagnetic waves between said first and second spaces.

ally conductive material facing and engaging a rear end of one of said side walls of said second chassis section;

said first and second chassis sections defining electromagnetic shielding for resisting the passage of electromagnetic waves from said first and second spaces to the exterior, and for resisting the passage of electromagnetic waves between said first and second spaces.

5,774,338

## BODY INTEGRAL ELECTRONICS PACKAGING

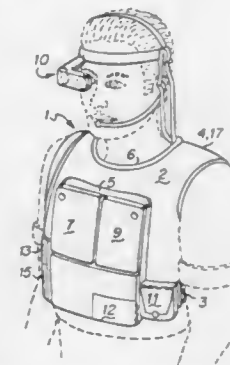
Francis Christopher Wessling, III, Madison, Ala., assignor to McDonnell Douglas Corporation, Huntington Beach, Calif.

Filed Sep. 20, 1996, Ser. No. 717,410

Int. Cl.<sup>6</sup> H05K 5/00; A45F 5/02; G06F 1/16

U.S. Cl. 361—730

10 Claims



1. A body integral electronics package for mounting an electronic apparatus upon a human torso, wherein said package comprises:
- a garment for installation upon said human torso, wherein said garment includes a front and back panel for at least partially covering torso;
- a first pocket located on said front panel for containing said electronic apparatus wherein said pocket substantially covering the area overlying the breasts and midriff sections of said torso;
- a second pocket, located on the back panel of said garment, sized to receive a power supply;
- an electronic apparatus disposed in said front pocket and comprising a plurality of electronic modules spaced in an array which defines a surface area that covers at least the right and left sides of the chest and midriff area of said torso, said electronic modules of said array being closely spaced together for facilitating fast data transfer between said electronic modules, wherein said electronic apparatus further comprises flexible connecting means for interconnecting said electronic modules such that said electronic modules can move relative to each other, said flexible connecting means directly connecting said electronic modules located on the left side of said chest with electronic modules located on the right side of said chest, said flexible connecting means also directly interconnecting electronic modules on the chest portion with the modules on the midriff portion to thereby allow flexible electrical connection between said electronic modules on the left and right portions of the torso and between said electronic modules on the chest and midriff sections of the torso;
- a power supply disposed in said second pocket for supplying electrical power to said plurality of electronic modules, wherein said power supply is sized independently of said electronic modules such that said power supply can be sized to provide sufficient power to each of the electronic modules of said electronic apparatus.



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5,774,339

IC CARD AND METHOD OF MAKING THE SAME  
Jun Ohbuchi, Hiroshi Miura, Kiyotaka Nishino, Shigeo Onoda, Tetsuro Washida, and Makoto Omori, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

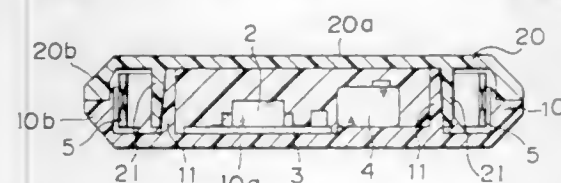
Filed Dec. 2, 1996, Ser. No. 759,002

Claims priority, application Japan, May 30, 1996, 8-136599

Int. Cl.<sup>6</sup> H05K 1/14

U.S. Cl. 361-737

6 Claims



1. An IC card which comprises:

a first cover including a first flat panel portion and a first upright wall portion formed adjacent a perimeter of the flat panel portion, said first upright wall defining a chamber for storing IC parts in cooperation with said first panel portion;

a second cover including a second flat panel portion and a second upright wall portion formed adjacent a perimeter of the flat panel; and

said first and second covers being mated together with the first and second upright walls respectively having a first joint face and a second joint face thereof bonded together in a butt fashion;

wherein each of the first and second covers further include respectively each peripheral upright walls formed therein along the outer perimeter of the associated cover so as to define a reservoir inside accommodating a portion of an adhesive material squeezing through a clearance between the first and second upright walls from the chamber for storing the IC parts when said first and second covers are mated together.

5,774,340

PLANAR REDISTRIBUTION STRUCTURE AND  
PRINTED WIRING DEVICE

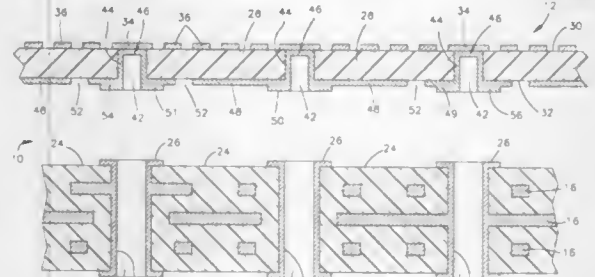
Chi Shih Chang, Austin, Tex., and Frank Daniel Egitto, Binghamton, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 28, 1996, Ser. No. 697,655

Int. Cl.<sup>6</sup> H01R 9/09; H05K 1/11

U.S. Cl. 361-771

11 Claims



1. A planar redistribution structure for subsequent lamination to a printed wiring device, said structure having vias not exposed to a top surface of said structure, said structure comprising:

a fluoropolymer-based dielectric sheet having a top surface and a bottom surface;

said top surface comprising signal redistribution lines and input/output pads, said lines and pads being substantially the same height;

said bottom surface comprising a ground plane and joining patterns for signal, power and ground connections.

5,774,341

SOLDERLESS ELECTRICAL INTERCONNECTION  
INCLUDING METALLIZED HOOK AND LOOP  
FASTENERS

Glenn F. Urbish, Coral Springs; Robert W. Pennisi; William Boone Mullen, III, both of Boca Raton, and Dale W. Dorinski, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 20, 1995, Ser. No. 575,652

Int. Cl.<sup>6</sup> H01R 9/09; H05K 7/02

U.S. Cl. 361-774

26 Claims



1. A solderless electrical interconnection having electrically conductive hook fasteners in a first substrate and electrically conductive loop fasteners on a second substrate, comprising:

electrically conductive hook fasteners generally formed in the shape of a 'J' and having a head portion, a shank portion, and a hook portion;

a first substrate having the hook fasteners embedded therein, the head portion exposed on a first side of the substrate, the shank portion embedded within the substrate, and the hook portion protruding out of an opposing second side of the substrate;

the head portion of selected electrically conductive hook fasteners electrically connected to a metal circuit pad that is formed on the first side of the substrate to provide an electrical pathway between the metal circuit pad and the hook portion of the selected electrically conductive hook fasteners; and

the hook portion of the selected electrically conductive hook fasteners mating and interlocking to electrically conductive loop fasteners on a second substrate to mechanically connect the first substrate to the second substrate and to provide an electrical connection from the metal circuit pads to the electrically conductive loop fasteners.

5,774,342

ELECTRONIC CIRCUIT WITH INTEGRATED  
TERMINAL PINS

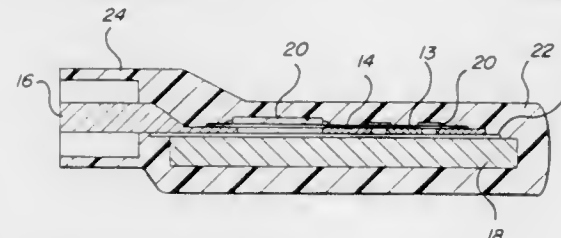
Scott David Brandenburg, and Jeffery Ralph Daanen, both of Kokomo, Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Filed Sep. 26, 1996, Ser. No. 721,396

Int. Cl.<sup>6</sup> H01R 13/08

U.S. Cl. 361-774

5 Claims



1. An electronic circuit comprising:  
a plurality of conductors mounted on a substrate;

each conductor having a thin conductive pathway integral with a thick rigid terminal pin at one end composed solely of conductive material;

the terminal pins being arranged in a connector array; and

electrical components connected to the conductive pathways.

5,774,343

HINGED FRONT PANEL ASSEMBLY FOR CIRCUIT  
CARDS

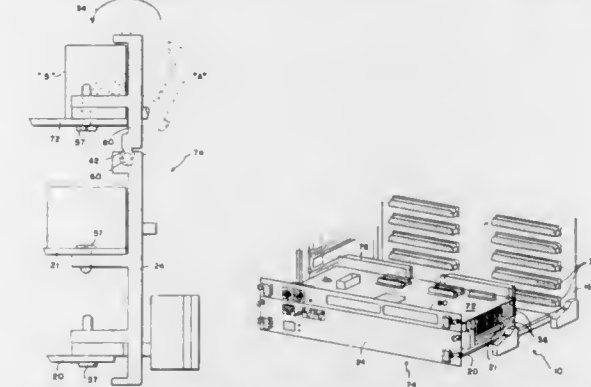
Matthew C. Benson, Fitchburg, and Kenneth D. Gagnon, Westminster, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 28, 1996, Ser. No. 671,856

Int. Cl.<sup>6</sup> H05K 7/14

U.S. Cl. 361-796

38 Claims



1. A panel to which a first circuit card can be mounted for installation in electronic equipment, said panel comprising:

A) a face plate;

B) a card attaching structure connected to said face plate for attaching said first circuit card to said face plate; and

C) a hinge component connected to said face plate for interlocking with a second hinge component of a second panel, wherein said hinge component includes a groove extending along substantially an entire first side of said face plate and opening on at least a first end of said face plate.

5,774,344

RF SHIELD FOR CIRCUIT CARD HAVING A SOLID  
FIRST FLANGE

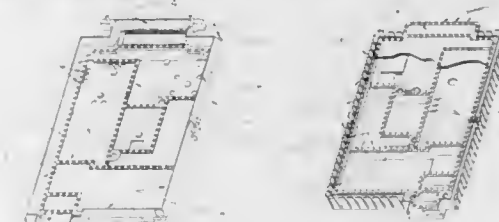
Matthew P. Casebolt, Fremont, Calif., assignor to Metromic, Inc., Los Gatos, Calif.

Filed Dec. 6, 1995, Ser. No. 569,403

Int. Cl.<sup>6</sup> H05K 7/14

U.S. Cl. 361-800

18 Claims



9. A shield against electromagnetic energy for an electromagnetic circuit card, said shield comprising:

a box enclosure for said electromagnetic circuit card, said box enclosure having a first casing and a second casing, said second casing being formed of metallized plastic, said first casing having a solid first flange of a first contour defining side walls surrounding said electromagnetic circuit card and said second casing having a second flange of a second contour defining side walls, wherein said second flange comprises closely-spaced fingers, said fingers confronting, being in electrical contact with and mating in substantially full length with

5,774,345

SWITCHING POWER SUPPLY WITH SURGE CURRENT  
AND SURGE VOLTAGE PREVENTION

Koji Yoshida, Hirakata; Takuya Ishii, Suita, and Hiroyuki Handa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

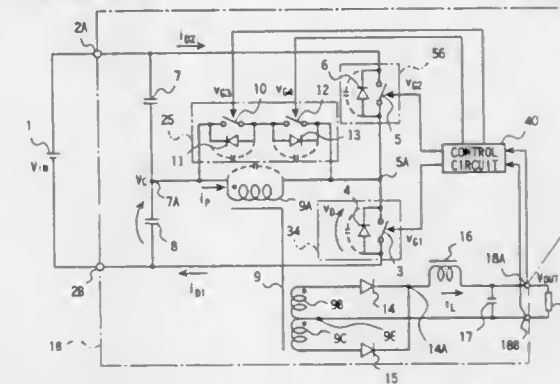
Filed Oct. 3, 1996, Ser. No. 725,366

Claims priority, application Japan, Oct. 4, 1995, 7-257382

Int. Cl.<sup>6</sup> H02M 3/335

U.S. Cl. 363-17

8 Claims



1. A switching power supply apparatus comprising:

at least two capacitors for dividing an input voltage to produce a divided voltage;

a transformer having a primary winding;

two switching means for switching a direction of application of said divided voltage to generate an alternating current output voltage to said primary winding; and

bidirectional switching means for short-circuiting said primary winding during nonconductive periods of said two switching means.

5,774,346

FAMILY OF ZERO VOLTAGE SWITCHING DC TO DC  
CONVERTERS WITH COUPLED OUTPUT INDUCTOR

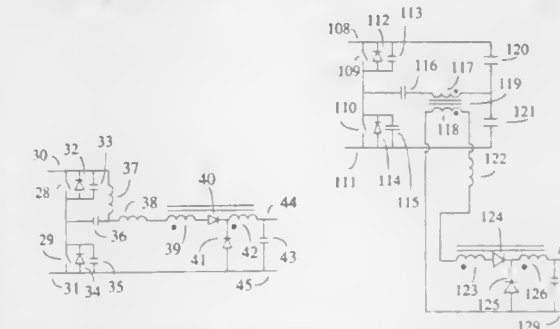
Franki Ngai Kit Poon, Flat 4, 12/F, Yee Mei House, Yee Kok Court, 341 Cheung Sha Wan Road, Kowloon, and Man Hay Pong, Room 1616, Block D, Kornhill, Quarry Bay, both of Hong Kong

Filed Jan. 24, 1997, Ser. No. 787,296

Int. Cl.<sup>6</sup> H02M 3/335

U.S. Cl. 363-17

6 Claims



1. A power converter comprising:  
a first input terminal and a second input terminal for connection to a DC source;

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a first output terminal and a second output terminal for connection to a DC load;

a first and a second switch means each having at least a first and a second switch terminal, the first switch and the second switch being connected in series and coupled to the first and second input terminals;

a first diode connected in parallel with the first switch, with its cathode connected to the input terminal with higher potential;

a second diode connected in parallel with the second switch, with its anode connected to the input terminal with lower potential, the first and second diode may be combined part of the first and second switch respectively;

a first capacitor connected in parallel with the first diode;

a second capacitor connected in parallel with the second diode, the first and second capacitor may be combined part of the first and second switch respectively;

means by which the first and second switches periodically and alternately closing, the first switch closed for a first time period and the second switch closed for a second time period, a third time period during which the two switches are opened separates the end of the first time period and the beginning of the second time period, only one or none of the switches being closed at any given time, while a fourth time period separates the end of the second time period and the beginning of the first period, the third time period and the fourth time period being equal in magnitude;

means by which the first switch closed when the voltage across this switch is substantially zero;

means by which the second switch closed when the voltage across this switch is substantially zero;

a third capacitor which is coupled to a node joining the first switch and the second switch;

a first inductor with one of its two terminals connected to the third capacitor, and the other terminal connected to the input terminal with lower potential;

a second inductor with the first of its two terminals connected to a node joining the third capacitor and the first inductor;

a third inductor with the first of its two terminals connected to the second terminal of the second inductor;

a third diode with its cathode connected to the cathode of a fourth diode, and the anode of this third diode is connected to the second terminal of the third inductor;

a fourth diode with its cathode connected to the cathode of the third diode, and the anode of this fourth diode is connected to a node joining the input terminal with lower potential;

a fourth inductor with the first of its two terminals connected to a node joining the cathodes of the third and the fourth diode; magnetic means which couples the third inductor and the fourth inductor magnetically;

a fourth capacitor with the first of its two terminals connected to the second terminal of the fourth inductor, the two terminals of the fourth capacitor are connected to the output terminals;

a connection connecting the output terminal with lower potential and the input terminal with lower potential.

5,774,347

**APPARATUS AND METHOD FOR SUPPLYING POWER TO AN ELECTRONIC DEVICE REQUIRING A MONETARY SUPPLY OF EXTRA HIGH POWER**

Hideaki Nakanishi, Machida, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 595,895, Feb. 6, 1996, abandoned.

This application Aug. 12, 1997, Ser. No. 909,971

Claims priority, application Japan, Feb. 6, 1995, 7-017711

Int. Cl.<sup>6</sup> H02M 3/335

U.S. Cl. 363—21

5 Claims

1. A power supply unit for momentarily supplying an in-rush power to an electronic device and then changing to a lower power constant voltage/constant current state, comprising:

a converter converting an alternating current input terminal electrical voltage into a direct current output terminal electrical voltage;



a voltage control operatively connected to said converter and keeping said output terminal electrical voltage at a first voltage value  $V_1$  until said output terminal current is increased up to a first current value  $I_1$  at which time said first voltage value  $V_1$  is decreased, said first current value  $I_1$  being supplied momentarily to activate said electronic device;

a first current control operatively connected to said converter and keeping said output terminal current at said first current value  $I_1$  while said output terminal voltage decreases from said first voltage value  $V_1$  to a second voltage value  $V_2$  where said second voltage value  $V_2$  is less than said first voltage value  $V_1$ ;

said first current control being further operative to decrease said output terminal current from said first current value  $I_1$  to a second current value  $I_2$  where  $I_2$  is less than  $I_1$  when said output terminal voltage reaches said second voltage value  $V_2$ ; and

a second current control operatively connected to said converter and keeping said output terminal current at said second current value  $I_2$  while said output terminal voltage is maintained at a voltage which is equal to or lower than said second voltage value  $V_2$ .

5,774,348

**LIGHT-WEIGHT DC TO VERY HIGH VOLTAGE DC CONVERTER**

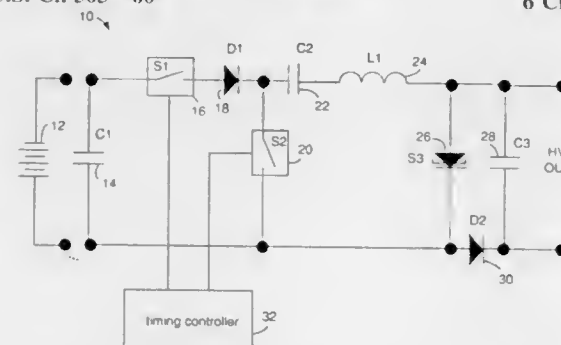
Robert L. Druce, Union City; Hugh C. Kirbie, Dublin, and Mark A. Newton, Livermore, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 24, 1996, Ser. No. 669,073

Int. Cl.<sup>6</sup> H02M 3/07

U.S. Cl. 363—60

6 Claims



1. A low voltage DC to high voltage DC power converter, comprising:

a silicon opening switch (SOS) (26) that provides for the passing of a reversed-biased current up until a predetermined amount of charge has passed through and that then abruptly opens, wherein a reset is provided by a forward-biased current;

an input network connected across the SOS (26) and that includes a series connection of a first switch (20), a first capacitor (22) and an inductor (24), wherein an input voltage is accepted across the first switch (20), while open, that charges said first capacitor (22) through said inductor (24) and the SOS (26); and

an output network connected across the SOS (26) and that includes a series connection of a diode (30) and a second capacitor (28), wherein a charge pumping of said second capacitor (28) to a high voltage occurs by interrupting current through said inductor (24) in successive cycles of forward and reverse biasing the SOS (26) with the first switch (20).

5,774,349

**HIGH-VOLTAGE GENERATOR**

Peter Tichy, Uttenreuth; Gerhard Nagengast, Eggolsheim; Norbert Wackerbauer, Fuerth; Richard Elchhorn, Hirschald, and Udo Jansohn, Burghann, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

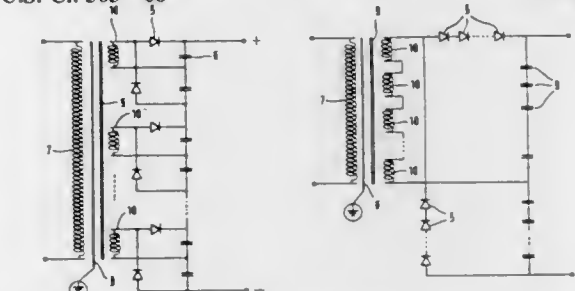
Filed Sep. 26, 1996, Ser. No. 720,286

Claims priority, application Germany, Oct. 16, 1995, 195 38 488.1

Int. Cl.<sup>6</sup> H05G 1/10

U.S. Cl. 363—68

4 Claims



1. A high-voltage generator comprising:

a high-voltage transformer having a secondary side with a plurality of windings;

a plurality of winding circuit boards, each having at least one of said windings printed thereon; and

a common circuit board, to which all of said winding circuit boards are mounted so as to project substantially perpendicularly from said common circuit board, and to which all of said winding circuit boards are electrically connected.

5,774,350

**INTEGRATED LOW DISSIPATION POWER CONTROLLER**

Joseph Notaro, Hascallucia, Conn.; Antoine Pavlin, Puyricard, France; Jean-Michel Ravon, Fuveau, France, and Luc Wulard, Pourrieres, France, assignors to SGS-Thomson Microelectronics S.A., Saint Genis, France

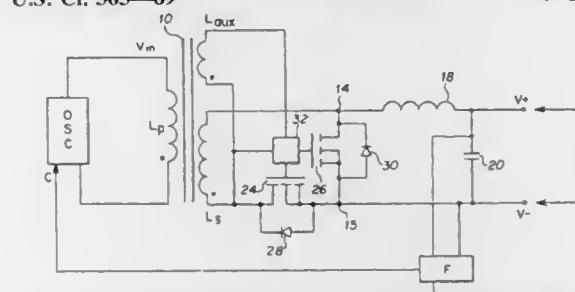
Filed Apr. 5, 1996, Ser. No. 628,831

Claims priority, application France, Apr. 7, 1995, 95-04193

Int. Cl.<sup>6</sup> H02M 7/217

U.S. Cl. 363—89

9 Claims



1. A switched mode power supply for rectifying an alternating voltage ( $V_{in}$ ) comprising a control circuit for MOSFET transistors

5,774,351

**SERIES RESONANT DC-TO-AC INVERTER SYSTEM**

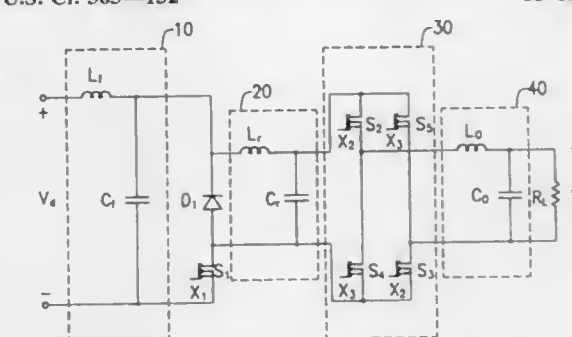
Guan-Chyun Hsieh, and Chang-Huan Liu, both of Taipei, Taiwan, assignors to National Science Council, Taipei, Taiwan

Filed May 21, 1996, Ser. No. 651,097

Int. Cl.<sup>6</sup> H02H 7/122; H02M 1/12

U.S. Cl. 363—132

12 Claims



1. A series resonant DC-to-AC inverter, comprising:

a series resonant circuit including a resonant inductor and a resonant capacitor, coupled to a DC voltage;

a diode having an anode and a cathode, connected in parallel with the series resonant circuit, the anode of the diode being connected to a negative terminal of the DC voltage, the cathode of the diode being connected to a positive terminal of the DC voltage;

a first means responsive to a pulse-width-modulated signal for switching the conduction condition between the series resonant circuit and the DC voltage to generate a unipolar composite sinusoidal signal at the resonant capacitor;

a cycloconverter for transforming the unipolar composite sinusoidal signal to a bipolar composite sinusoidal signal, connected in parallel with the resonant capacitor of the series resonant circuit; and

a means for filtering out high-frequency components of the bipolar composite sinusoidal signal and generating an AC voltage.

5,774,352

**POWER CIRCUIT FOR DRIVING A CAPACITIVE LOAD**

Masaaki Mihara, Chiba, Japan, assignor to SGS-Thomson Microelectronics K.K., Tokyo, Japan

Filed Dec. 14, 1995, Ser. No. 572,118

Claims priority, application Japan, Dec. 14, 1994, 6-310564

Int. Cl.<sup>6</sup> H02M 3/335; 7/217

U.S. Cl. 363—133

25 Claims

1. A power circuit comprising:

a differential amplifier having first and second inputs and an output, the first input being connected to receive a first voltage;

a phase inverter having an input connected to receive the output of said differential amplifier and having first and second outputs with first and second phases;



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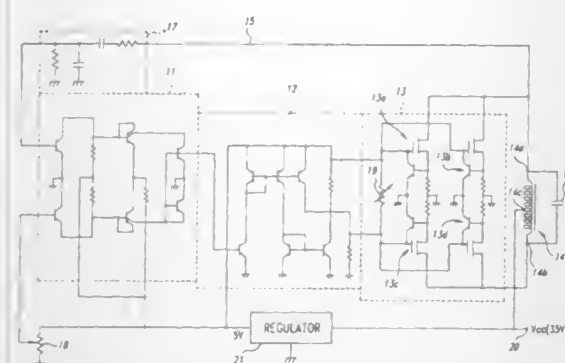
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JUNE 30, 1998



a push-pull drive circuit having first and second inputs connected to the first and second outputs of said phase inverter and having first and second outputs;  
a feedback path coupling the first output of said push-pull drive circuit to the second input of said differential amplifier; and  
an autotransformer having first and second ends coupled between the first and second outputs of said push-pull drive circuit, said autotransformer having a tap connected to a source of a second voltage that is higher than the first voltage.

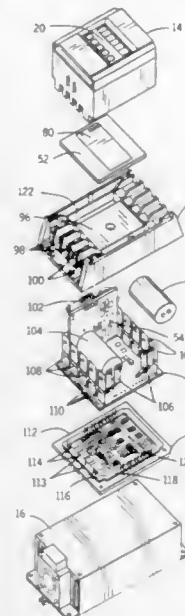
5,774,353

#### FIXTURE FOR MOTOR CONTROLLER POWER SUBSTRATE AND MOTOR CONTROLLER INCORPORATING

Christopher J. Wieloch, Brookfield, Wis., assignor to Allen Bradley Company, Inc., Milwaukee, Wis.  
Division of Ser. No. 421,588, Apr. 12, 1995, Pat. No. 5,699,609.  
This application Feb. 19, 1997, Ser. No. 802,145  
Int. Cl.<sup>6</sup> H02M 1/00

U.S. Cl. 363-146

20 Claims



1. A fixture for securing conducting pins to a power substrate module, the module including a base having a mounting area surrounded by a plurality of sides and electrically conductive regions on at least two sides of the mounting area, the mounting area being configured to receive at least one power electronic component, the fixture comprising a substantially planar support configured to be disposed over the module generally parallel to the conductive regions and to extend around the at least two sides and over the electrically conductive regions, the fixture forming a recess through which the mounting area is accessible after the fixture is disposed over the module, the planar support having a plurality of apertures formed therein for permanently receiving conducting pins and retaining the conducting pins over corresponding electrically conductive regions of the module base.

5,774,354

#### PROGRAMMABLE CONTROLLER AND EXCLUSIVE CONTROL COMMUNICATING METHOD THEREFOR

Shun Ohta, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

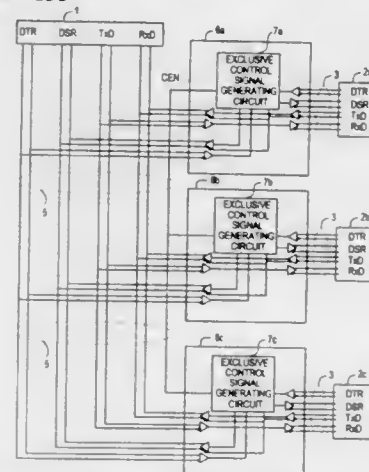
Continuation of Ser. No. 365,248, Dec. 28, 1994, abandoned.

This application May 20, 1997, Ser. No. 859,364

Claims priority, application Japan, Dec. 28, 1993, 5-338340  
Int. Cl.<sup>6</sup> G05B 15/00

U.S. Cl. 364-131

9 Claims



1. A programmable controller comprising:  
a basic section, comprising a CPU unit and at least an I/O unit or a specific function unit, which controls the programmable controller;  
a plurality of program devices for executing download/upload of a program or a monitoring operation of a program in said CPU unit, at least a first one of said plurality of program devices being connected to said basic section;  
a first extended section comprising an I/O unit or a specific function unit;  
a first bus extension unit connecting said first of the program devices to said basic section;  
a second bus extension unit connecting said basic section to said first extended section, and connecting a second of said plurality of program devices to said basic section; and  
an exclusive control signal generator for generating and outputting an exclusive control signal to each bus extension unit for instructing operation of each bus extension unit, wherein each bus extension unit receives the exclusive control signal, and in response to the exclusive control signal only one of the bus extension units operates to provide data communication between the program device connected thereto and the CPU unit.

5,774,355

#### EQUIPMENT CONTROL SYSTEM AND METHOD

Yoshihiro Mizuno, Tokyo; Ryohci Inaba, Kawasaki, and Hideki Yamaguchi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 360,456, Dec. 21, 1994, abandoned.

This application Dec. 9, 1996, Ser. No. 762,527

Claims priority, application Japan, Dec. 27, 1993, 5-348568  
Int. Cl.<sup>6</sup> G06F 19/00

U.S. Cl. 364-140

25 Claims

1. A device control system having a first unit and a plurality of second units, said first and second units being individually provided, comprising:  
first control means for outputting an operation signal based on an operation sequence of to-be-controlled equipment in said first unit;  
first communication means for transmitting the operation signal to said plurality of second units;  
second communication means for informing conditions of said equipment mutually among said plurality of second units to

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#### HUMAN FACTORED INTERFACE INCORPORATING ADAPTIVE PATTERN RECOGNITION BASED CONTROLLER APPARATUS

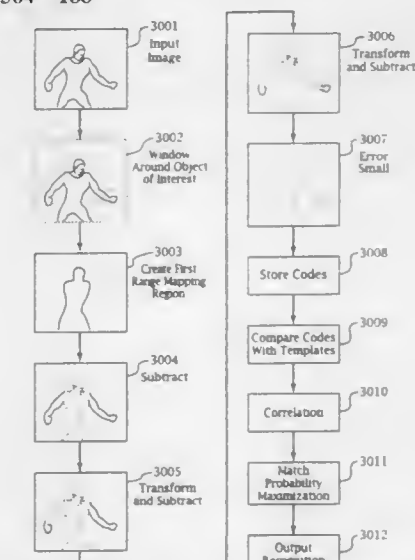
Steven M. Hoffberg, 29 Buckout Rd., West Harrison, N.Y. 10604, and Linda I. Hoffberg-Borghesani, 40 Jackson Dr., Acton, Mass. 01720

Continuation of Ser. No. 812,805, Dec. 23, 1991. This application Jun. 6, 1995, Ser. No. 471,215

Int. Cl.<sup>6</sup> G05B 9/02

U.S. Cl. 364-188

27 Claims



1. A human interface device for a user comprising:  
a data transmission selector for selecting at least one of a plurality of simultaneously transmitted programs being responsive to an input;  
a program database containing information relating to at least one said plurality of programs, having an output;  
a graphical user interface for receiving user commands; and  
a controller for controlling said graphical user interface and said data transmission selector, said controller determining a user characteristic based on implicit data, receiving said output of said program database and presenting, based on said user characteristic and said program database, information relating to at least one of said plurality of programs on said graphic user interface in association with a command, said graphic user interface allowing the user to select said command and thereby authorize an operation in relation to said at least one of said plurality of programs.

5,774,358

#### METHOD AND APPARATUS FOR GENERATING INSTRUCTION/DATA STREAMS EMPLOYED TO VERIFY HARDWARE IMPLEMENTATIONS OF INTEGRATED CIRCUIT DESIGNS

Curtis K. Shrote, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 1, 1996, Ser. No. 625,153

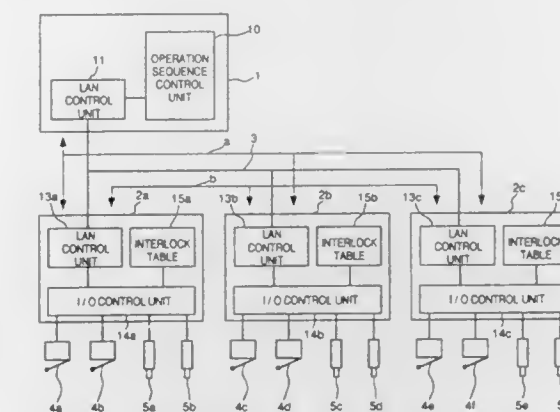
Int. Cl.<sup>6</sup> G06F 15/00; G05B 19/42

U.S. Cl. 364-191

20 Claims

19. An apparatus for generating an instruction/data stream used to verify a hardware implementation of an integrated circuit design comprising:

a processor, wherein the processor processes instructions;  
a processor bus operably coupled to the processor;  
an input/output interface operably coupled to the processor bus, wherein the processor may control the flow of data through the input/output interface;  
memory operably coupled to the processor bus for storing data and instructions, wherein the memory stores instructions for:



obtain condition information including conditions of a device detected by other second units; and  
second control means for performing drive control of said equipment on the basis of the operation signal input by said first communication means and said condition information.

5,774,356

#### IMAGE FORMING APPARATUS WITH JOB PRIORITY MANAGEMENT OF OUTPUT PROCESSING

Masayuki Hisatake, and Yoshibiko Nemoto, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

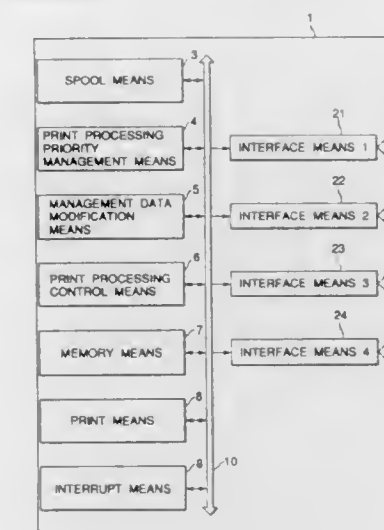
Filed May 24, 1995, Ser. No. 449,100

Claims priority, application Japan, May 25, 1994, 6-111106

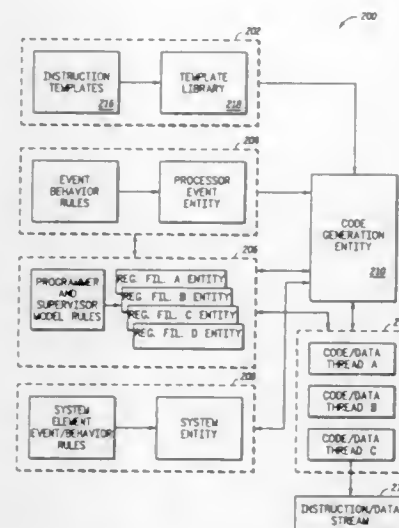
Int. Cl.<sup>6</sup> G05B 13/02

U.S. Cl. 364-148

14 Claims



1. An image forming apparatus comprising:  
image data input means for inputting image data;  
image data storage means for storing the input image data in units of a job that requires image formation;  
job volume recognition means for recognizing volumes of the respective jobs stored in the image data storage means; and  
processing priority determination means for determining a processing priority order of the jobs stored in the image data storage means based on the job volumes recognized by the job volume recognition means and for prohibiting a job from being skipped that has been skipped a predetermined number of times.

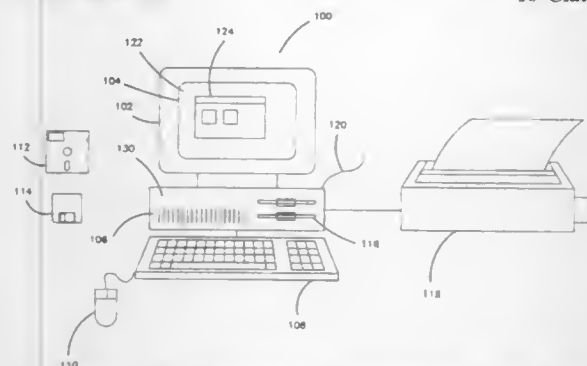


receiving a plurality of templates, wherein each of the plurality of templates describes at least a partial behavior of the integrated circuit design for a respective instruction; receiving a plurality of register models, wherein the plurality of register models describe the operation of a plurality of registers within the integrated circuit design; receiving a plurality of exception events, wherein each of the plurality of exception events corresponds to a potentially problematic operation of the hardware implementation of the integrated circuit design; processing the plurality of templates, the plurality of register models, and the plurality of exception events to produce the instruction/data stream, wherein the instruction/data stream includes a plurality of events, and wherein an execution of the instruction/data stream by the hardware implementation verifies the operation of the hardware implementation.

**5,774,359**  
**METHOD FOR GENERATING AN EXTENDED ROLLING BALL FILLET SURFACE BETWEEN TWO SURFACES**  
Sanjeev K. Taneja, Bloomfield, Mich., assignor to Autodesk, Inc., San Rafael, Calif.

Filed Sep. 17, 1996, Ser. No. 714,844  
Int. Cl.<sup>6</sup> G06F 19/00; G06T 17/00  
U.S. Cl. 364—191

18 Claims



1. A method for generating an extended fillet surface with a computer which smoothly connects a first base surface and a second base surface together, the computer having a processor, data storage device, display device, and data input device, the method comprising the steps of:  
(a) creating an offset surface for the first base surface at a distance equal to a fillet radius;  
(b) creating an envelope surface for a boundary curve of the second base surface;  
(c) determining an intersection between the offset surface and the envelope surface;  
(d) creating a spine curve of the intersection;

(e) projecting a first contact curve onto the first base surface according to the spine curve;  
(f) projecting a second contact curve onto the second base surface according to the spine curve;  
(g) creating a set of arcs between the first contact curve and the second contact curve, wherein an endpoint of each arc within the set of arcs is tangent to the first base surface; and  
(h) constructing the extended fillet surface from the set of arcs.

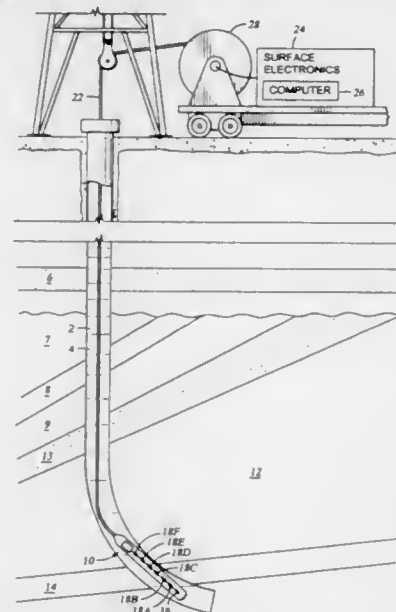
**5,774,360**  
**METHOD OF CORRECTING FORMATION RESISTIVITY WELL LOGS FOR THE EFFECTS OF FORMATION LAYER INCLINATION WITH RESPECT TO THE WELLBORE**

Jiaqi Xiao, Houston, and Qiang Zhou, Missouri City, both of Tex., assignors to Western Atlas International, Inc., Houston, Tex.

Filed Mar. 26, 1996, Ser. No. 622,365  
Int. Cl.<sup>6</sup> G06F 19/00

U.S. Cl. 702—6

13 Claims



1. A method for correcting response of an induction well logging instrument for effects of inclination of earth formations with respect to an axis of said instrument, said instrument having a transmitter and a plurality of receivers at spaced apart locations, said method comprising:

calculating expected responses of said receivers in simulated media each having a different conductivity, said step of calculating performed for a plurality of different inclinations of said media with respect to said axis of said instrument, said step of calculating performed for a plurality of different conductivity contrasts between said media;  
calculating 2-dimensional filters corresponding to a charge effect portion of each of said expected responses;  
calculating 2-dimensional filters corresponding to a volumetric effect portion of each of said expected responses;  
determining an angle of inclination with respect to said axis of said instrument of said earth formations;  
determining an approximate conductivity contrast of said earth formations;  
interpolating coefficients between ones of said 2-dimensional charge effect filters having simulated inclinations and conductivity contrasts closest to said angle of inclination and said approximate conductivity contrast of said earth formations;  
applying said interpolated charge effect coefficients to measured responses of said instrument, thereby generating charge effect-filtered measured responses;  
interpolating coefficients between ones of said 2-dimensional volumetric effect filters having simulated inclinations and

conductivity contrasts closest to said angle of inclination and said conductivity contrast of said earth formations; and  
applying said interpolated volumetric effect filter coefficients to said charge effect-filtered measured responses thereby generating corrected responses.

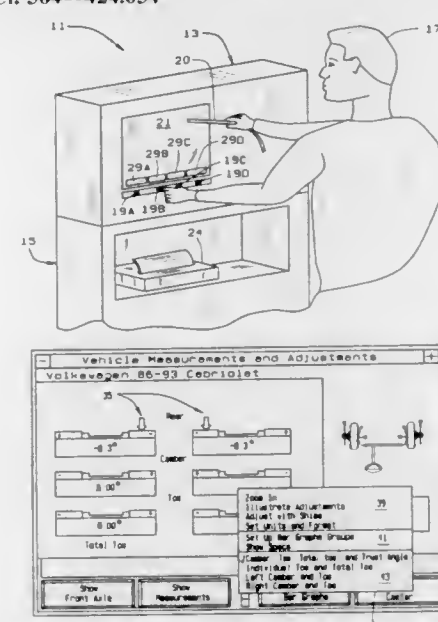
**5,774,361**  
**CONTEXT SENSITIVE VEHICLE ALIGNMENT AND INSPECTION SYSTEM**

Nicholas J. Colarelli, III, Creve Coeur; Timothy A. Larson, Ferguson; Timothy A. Strega, St. Louis, and Daniel B. January, St. Peters, all of Mo., assignors to Hunter Engineering Company, Bridgeton, Mo.

Filed Jul. 14, 1995, Ser. No. 502,497  
Int. Cl.<sup>6</sup> G06F 17/30

U.S. Cl. 364—424.034

42 Claims

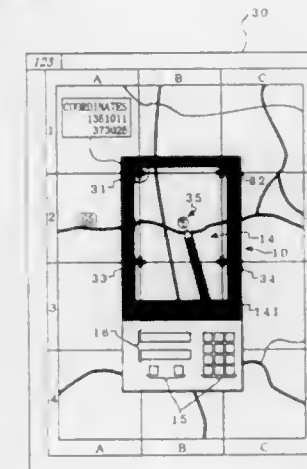


1. A vehicle alignment system comprising:  
sensors for obtaining vehicle alignment data from a vehicle under test;  
a controller operatively connected to the sensors for determining measured vehicle alignment angles from the vehicle alignment data;  
a display for visually displaying representations of the measured vehicle alignment angles to an operator, said display being operatively connected to the controller so that the controller causes the display of representations of a plurality of different measured vehicle alignment angles at one time;  
an input device operable by the operator to select the representation of a desired one of the plurality of different measured vehicle alignment angles being displayed;  
a memory having stored therein, for each selectable vehicle alignment angle, a set of choices of a plurality of different operations associated with that particular selectable vehicle alignment angle;  
said controller being operatively connected to the input device and to the memory such that upon selection of a selectable vehicle alignment angle by the operator, the controller retrieves the set of choices of different operations associated with the selected vehicle alignment angle and causes the display of said set of choices on the display.

**5,774,362**  
**INPUT DEVICE FOR NAVIGATION SYSTEMS**  
Seiichi Suzuki, and Hiroki Ishikawa, both of Tokyo-to, Japan, assignors to Kabushikikaisha Equos Research, Japan  
Filed Feb. 29, 1996, Ser. No. 609,977  
Claims priority, application Japan, Mar. 7, 1995, 7-074388  
Int. Cl.<sup>6</sup> G01C 21/20

U.S. Cl. 364—443

16 Claims



1. An input device for a vehicle navigation system for use with a printed map, comprising:  
map data memory means for storing discrimination information for identification of any one of plural map sections, said discrimination information including plural sets of geographic coordinates correlated with at least one representative point for each of the respective plural map sections;  
discrimination information input means for inputting information identifying a selected map section from information provided on the printed map;  
geographic coordinates acquisition means for obtaining, from said map data memory means, geographic coordinates of at least said one representative point of the section corresponding to the identifying information input by said discrimination information input means;  
a transparent tablet for superimposing on the selected map section to output positional information for a point designated on said transparent tablet;  
geographic coordinate calculating means for calculating geographic coordinates of the designated point based upon the geographic coordinates of at least said one representative point of the section, the positional relationship between said one representative point and said transparent tablet, and said positional information output from said transparent tablet; and  
output means for outputting the geographic coordinates calculated by said geographic coordinate calculating means to the vehicle navigation system.

**5,774,363**  
**PAGE ARRANGEMENT ORDER DETERMINATION METHOD**

Hajime Sato, Masakatsu Yanaga, Keisuke Iguchi, Norio Kajima, and Yasu Sato, all of Tokyo, Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan  
Continuation-in-part of Ser. No. 77,519, Jun. 17, 1993, abandoned. This application Jun. 7, 1995, Ser. No. 484,330  
Claims priority, application Japan, Jun. 18, 1992, 4-184370; Jun. 18, 1992, 4-184371

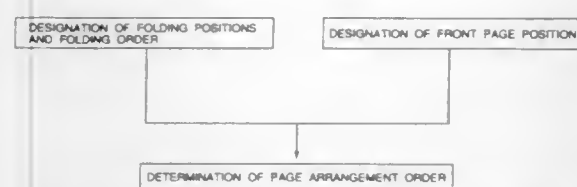
Int. Cl.<sup>6</sup> G06F 19/00

U.S. Cl. 364—468.03

4 Claims

1. A method of determining an arrangement of a plurality of pages, which define a signature, that are reproduced on a photosensitive machine plate, comprising the steps of:  
preparing a computer including a calculation program for determining the arrangement of the pages under an assumption that positions of the pages on the photosensitive machine plate are





determined successively from a first page to a last page in the signature, and a position symmetrical with a page  $G_n$  with respect to a folding position  $F_n$  is determined as a page  $G(n+1)$ , the calculation program calculating the relationship between positions of pages to be reproduced on the photosensitive machine plate and positions of folding  $F_n$  according to an operation procedure  $P_n$  expressed by the following formula:

$$P_n = P(n-1) \rightarrow F_n \rightarrow P(n-1)^{-1}$$

wherein,  $n$  associated with parameters  $G$ ,  $P$  and  $F$  indicate positive numbers,  $P(n-1)^{-1}$  indicates an inverse of  $P(n-1)$ ; inputting into the computer data designating a folding order; and inputting into the computer data designating a position of the first page of the signature.

5,774,364

## FASTENING DEVICE

Rolf Kamps, Wuppertal, Germany, assignor to Stocko Fasteners GmbH, Wuppertal, Germany

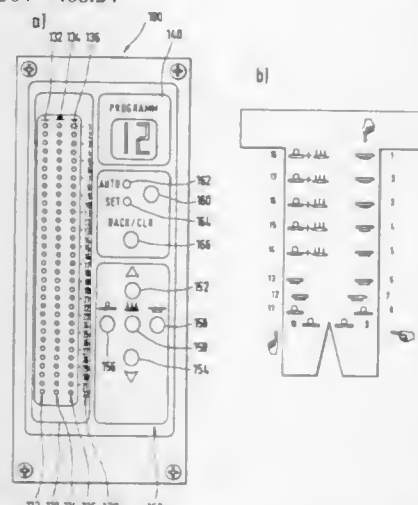
Filed Aug. 23, 1996, Ser. No. 702,162

Claims priority, application Germany, Aug. 24, 1995, 195 31 176.0

Int. Cl.<sup>6</sup> G06F 19/00; A41H 37/04

U.S. Cl. 364-468.24

23 Claims



1. A device for sequentially fastening elements of different types to a carrier material in accordance with a predetermined program including a plurality of program steps carried out in a sequence, wherein each program step determines the type of one element to be fastened. The device comprising a display arranged on a control panel for displaying the program, the display comprising a plurality of display fields, each display field being assigned to one of the program steps and being configured to be operated for indicating the type of said the element being fastened with the assigned program step.

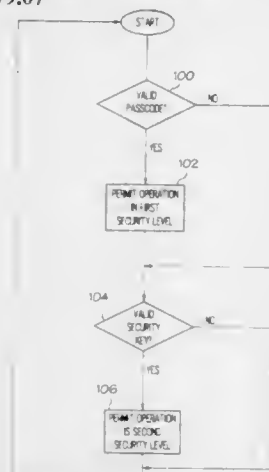
5,774,365  
DOCUMENT DISPENSER OPERATOR SECURITY  
Philip G. Ladue, Bellbrook; Lance E. Kelley, Springfield; John H. King, Kettering, and William V. Harrison, Beavercreek, all of Ohio, assignors to The Standard Register Company, Dayton, Ohio

Filed Apr. 24, 1996, Ser. No. 637,129

Int. Cl.<sup>6</sup> G06F 17/60

U.S. Cl. 364-479.07

16 Claims



1. A document dispenser comprising:  
a dispenser controller programmed to control the operation of the document dispenser;  
a document printer in communication with said dispenser controller;  
a document data input device in communication with said dispenser controller;  
a passcode entry device in communication with said dispenser controller;  
at least one security key receiver in communication with said dispenser controller and arranged to detect the presence of a valid physically transportable security key;  
a security controller in communication with said dispenser controller, arranged to control electronic access to a first security level by permitting dispenser operation in said first security level when a valid passcode is entered at said passcode entry device, and arranged to control electronic access to a second security level by permitting dispenser operation in said second security level when said valid physically transportable security key is detected by said security key receiver.

5,774,366

## METHOD FOR OBTAINING THE FUNDAMENTAL AND ODD HARMONIC COMPONENTS OF AC SIGNALS

Robert W. Beckwith, 2794 Camden Rd., Clearwater, Fla. 34619  
Continuation-in-part of Ser. No. 493,423, Jun. 22, 1995, abandoned. This application Dec. 16, 1996, Ser. No. 767,287

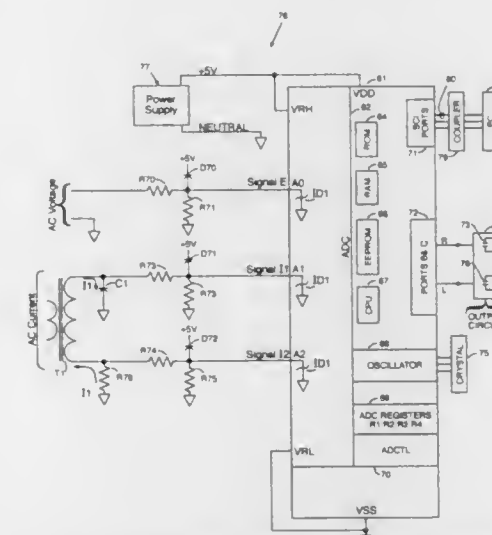
Int. Cl.<sup>6</sup> G01R 19/00

U.S. Cl. 364-487

18 Claims

1. Devices for obtaining the fundamental and odd harmonic components of alternating current (AC) voltages and currents comprising in combination:

- analog to digital converter (ADC) means,
- microprocessor means for inputting signals proportional to said AC voltages and currents to said ADC means,
- first microprocessor program means for obtaining selected numbers,  $m$ , samples of said AC signals from said ADC means at equally spaced increments of signal angle  $\Theta$ ,
- microprocessor memory means for storing precomputed stacks of  $m/2$  values of  $n \times \sin \Theta$  where  $n=1, 3, 5, \dots, (m/2-1)$  with  $n=1$  corresponding to the fundamental component and  $n=3$  to  $(m/2-1)$  corresponding to odd orders of harmonics of said signals, and
- second microprocessor program means for summing products of said samples as they are taken and successive values from



said stacks starting with values at the bottom and proceeding to values at the top of said selected stacks and continuing summing said products starting with values at the top and proceeding to values at the bottom of said selected stack whereby the sums of said products are proportional to real ( $x$ ) terms of fundamental and harmonic components of said signal corresponding to the stacks elected for each harmonic.

5,774,367

## METHOD OF SELECTING DEVICE THRESHOLD VOLTAGES FOR HIGH SPEED AND LOW POWER

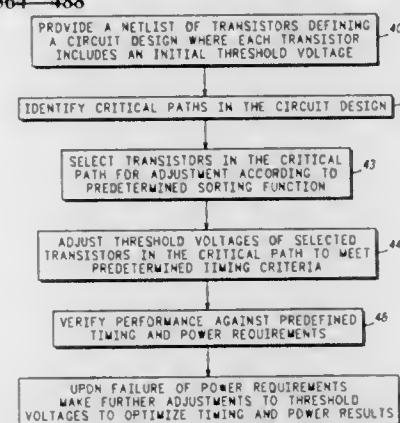
Alberto J. Reyes, Phoenix; Daniel J. Snyder, Peoria; Sleiman N. Chamoun, and Karen S. Ramondetta, both of Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 24, 1995, Ser. No. 506,447

Int. Cl.<sup>6</sup> G06F 15/00

U.S. Cl. 364-488

19 Claims



1. A computer implemented method of selecting a device threshold voltage, comprising the steps of:  
identifying a critical path through a circuit;  
selecting devices in said critical path according to a predetermined cost function to adjust the threshold voltage of at least one of the selected devices, wherein the cost function includes at least two components, a first component dependent on process parameters and a second component dependent on design specific parameters; and  
adjusting the threshold voltage of said at least one of the selected devices in said critical path to meet predetermined timing criteria.

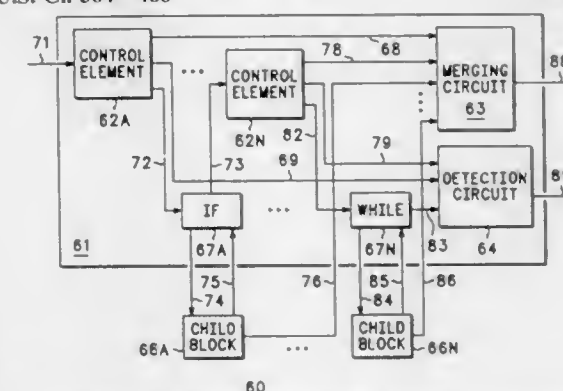
5,774,368

## CONTROLLER STRUCTURE TEMPLATE AND METHOD FOR DESIGNING A CONTROLLER STRUCTURE

Chih-Tung Chen, Chandler; Kayhan Kucukcakar, Scottsdale; Thomas E. Tkacik, Phoenix, all of Ariz., and Rajesh Gupta, Bombay, India, assignors to Motorola, Inc., Schaumburg, Ill.  
Filed Oct. 20, 1995, Ser. No. 546,044  
Int. Cl.<sup>6</sup> G06F 17/50

U.S. Cl. 364-488

22 Claims



1. A method for generating a controller structure, comprising the steps of:  
inputting at least one behavioral specification comprising a list of statements;  
scheduling, allocating, and binding of the at least one behavioral specification to produce a component netlist,  
dividing the list of statements of the at least one behavioral specification resulting from said step of scheduling, allocating, and binding into at least one statement block;  
grouping the list of statements from each statement block into at least one cluster of statements for generating the controller structure that controls the component netlist that is being allocated by said step of scheduling, allocating, and binding;  
mapping each statement block into at least one control block; and  
mapping each cluster of statements into a control element, wherein the at least one control block and the control element cooperate to form the controller structure, wherein said controller structure comprises:  
a first finite state machine which serves as a first control element having at least one input and at least one output;  
a second finite state machine which serves as a second control element having at least one input and at least one output; and  
a merging logic circuit having a plurality of inputs and an output, wherein a first output of the first finite state machine is coupled to a first input of the plurality of inputs of the merging logic circuit and a first output of the second finite state machine is coupled to a second input of the plurality of inputs of the merging logic circuit, wherein the first and second finite state machines and the merging logic circuit cooperate to form a controller structure.

5,774,369

## COMPUTER PROGRAM PRODUCT FOR ENABLING A COMPUTER TO REMOVE REDUNDANCIES USING QUASI ALGEBRAIC METHODS

Paul William Horstmann, Pleasant Valley; Thomas Edward Rosser, Poughkeepsie, both of N.Y., and Prashant Srinivasrao Sawkar, Glenshaw, Pa., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 723,121, Jun. 28, 1991, Pat. No. 5,524,082. This application Jun. 6, 1995, Ser. No. 466,917  
Int. Cl.<sup>6</sup> G06F 17/50

U.S. Cl. 364-489

16 Claims

1. A computer program product, comprising:  
a computer usable medium having computer readable program code means embodied in said medium for establishing a network configuration in accordance with a plurality of pro-

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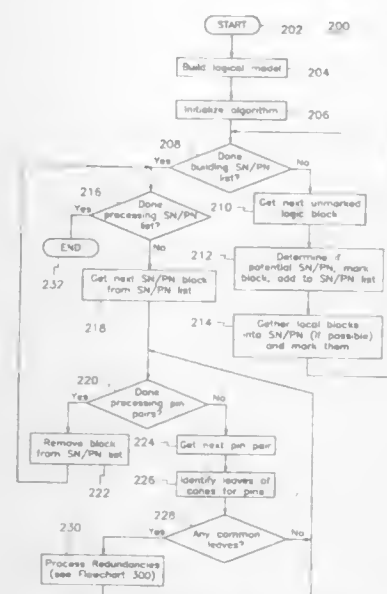
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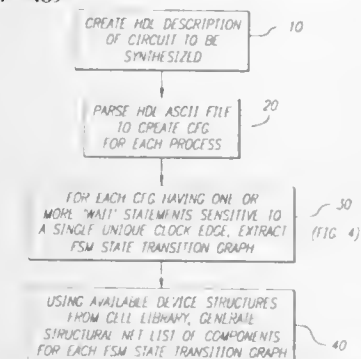
5,774,370  
METHOD OF EXTRACTING IMPLICIT SEQUENTIAL  
BEHAVIOR FROM HARDWARE DESCRIPTION  
LANGUAGES

Jean-Charles Gioni, Woodside, Calif., assignor to VLSI Technology, Inc., San Jose, Calif.

Filed Sep. 18, 1995, Ser. No. 531,996

Int. Cl.<sup>6</sup> G06F 17/50

U.S. Cl. 364-489



1. A method of extracting finite state machine (FSM) circuit architecture in the form of a structural netlist from implicit sequential behavior specified in a hardware description language (-HDL) circuit description, said method comprising the steps of:

Parsing the HDL description to create a plurality of control flow graphs (CFGs) by performing lexical and syntactic analysis for each process of the HDL description;

Identifying one or more of said plurality of CFGs which specify implicit sequential behavior incorporating one or more wait nodes each of which are sensitive to the same unique clock edge;

Evaluating each of the nodes of the identified CFGs using a breadth first search, said step of evaluating further comprising the steps of:

Assigning each of the wait nodes to a state;

Evaluating all executable paths between each of the wait nodes;

Building a state transition table (STT) based on said step of evaluating; and

Generating a structural netlist based on the STTs.

5,774,371  
SEMICONDUCTOR INTEGRATED CIRCUIT AND  
LAYOUT DESIGNING METHOD FOR THE SAME

Yoshiyuki Kawakami, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

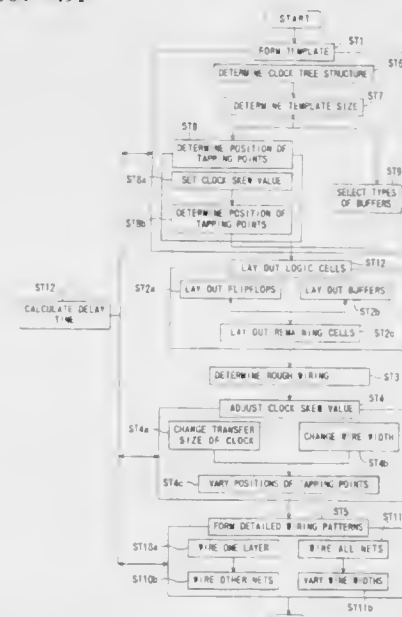
Filed Aug. 1, 1995, Ser. No. 509,937

Claims priority, application Japan, Aug. 3, 1994, 6-182286; Dec. 16, 1994, 6-313398

Int. Cl.<sup>6</sup> H02B 1/20; H01L 23/482

U.S. Cl. 364-491

15 Claims



1. A method of designing a layout of a semiconductor integrated circuit including a plurality of functional blocks each of which includes a plurality of cells each including at least one element, the plurality of cells being classified into a first type of cells receiving a clock signal and a second type of cells not receiving a clock signal, the method comprising the steps of:

a first step of approximately laying out the functional blocks in the semiconductor integrated circuit;

a second step of approximately laying out block external wiring from a first clock input port of the semiconductor integrated circuit to second clock input ports of the functional blocks, by approximately determining a block external delay time of the clock signal for each functional block, the block external delay time representing the delay time from the first clock input port to the second clock input port of a given functional block;

a third step of sequentially determining the layout of the first type of cells, the layout of the second type of cells, block internal wiring and the block external wiring in this order, by calculation of a total delay time of the clock signal for each of the first type of cells which is a sum of the block external delay time from the first clock input port to each second clock input port of each of the functional blocks and block internal delay time, which is the delay time from the second clock input port to each of the first type of cells, so that a clock skew defined as a difference in the delay time among the first type of cells is within a first predefined range and that the total delay time of each of the first type of cells is within a second predefined range; and

a fourth step of forming wiring patterns in accordance with the wiring determined in the third step.

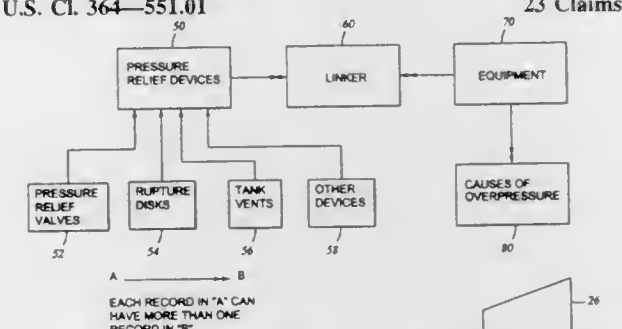
5,774,372  
PRESSURE PROTECTION MANAGER SYSTEM &  
APPARATUS

Pat Berwanger, 4615 SW. Freeway, Suite 925, Houston, Tex. 77027

Filed Mar. 29, 1996, Ser. No. 624,174

Int. Cl.<sup>6</sup> G01B 17/00

U.S. Cl. 364-551.01



1. An apparatus for determining and documenting overpressure protection due to causes of overpressure associated with equipment and pressure relief devices the apparatus comprising: a computer system comprising a memory device, a processing device, a program in communication with the processing device and memory device, the processing device performing tasks required by the program, the memory device further comprising:

a relational database structure, the relational database structure comprising:

- (a) an equipment database,
- (b) a pressure relief devices database,
- (c) a linker database communicating with the pressure relief devices database and the equipment database, and
- (d) a causes of overpressure database communicating with the equipment database.

5,774,373  
APPARATUS AND METHOD FOR MEASURING AN  
OBJECT'S ANGULAR INCLINATION IN MULTIPLE  
AXES

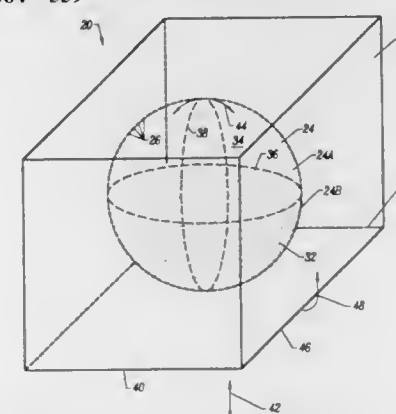
Jeffrey Duane Northcutt, Sunnyvale, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed May 20, 1996, Ser. No. 655,563

Int. Cl.<sup>6</sup> G01C 9/06

U.S. Cl. 364-559

20 Claims



1. A position sensing apparatus, comprising:  
an insulating body with an internal surface defining a void within said insulating body;

a set of electrical contacts positioned on said internal surface and insulated from one another by said insulating body;

a set of electrodes connected to said set of electrical contacts and extending through said insulating body to the outer perimeter of said insulating body;

a first fluid, with a first electrical property, positioned within said void of said insulating body; and

a second fluid, with a second electrical property distinct from said first electrical property, positioned within said void of said insulating body, said first fluid and said second fluid being selected such that they do not intermix and thereby divide said void into a first region and a second region, said first region presenting a first set of electrical signals on the electrical contacts within said first region and said second region presenting a second set of electrical signals on the electrical contacts within said second region, wherein said first set of electrical signals and said second set of electrical signals specify a first angular inclination value corresponding to the pitch of said insulating body and a second angular inclination value corresponding to the roll of said insulating body.

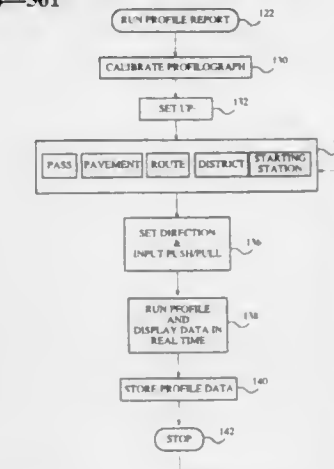
5,774,374  
ROAD SURFACE MEASURING DEVICE AND METHOD  
Dennis P. Scott, Sausalito; Mark Richtman, Novato, and Larry D'Arcangelis, Burlingame, all of Calif., assignors to Surface Systems, Inc., Sausalito, Calif.

Filed Oct. 2, 1995, Ser. No. 538,041

Int. Cl.<sup>6</sup> G01B 5/28

U.S. Cl. 364-561

32 Claims



1. An apparatus comprising:

an odometer configured to measuring the horizontal movement of the apparatus in either a first direction or a second direction;

a road surface measuring device configured to generate a first set of data points indicative of a first road surface profile when the apparatus is traveling in the first direction and configured to generate a second set of data points indicative of a second road surface profile when the apparatus is traveling in the second direction, the first set of data points and the second set of data points being correlated depending on the travel direction of the apparatus;

a computation device configured to generate a first plot of the profile of the first road surface from the first set of data points and to generate a second plot of the profile of the second road surface from the second set of data points.



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**5,774,375**  
**METHOD AND APPARATUS FOR THE CORRECTION OF SIGNAL-PAIRS**

Hermann Behrent, Kuddewürde, Germany, assignor to SICAN Gesellschaft für Silizium-Anwendungen und CAD/CAT Niedersachsen mbH, Hannover, Germany

PCT No. PCT/DE95/01125, § 371 Date Feb. 27, 1997, § 102(e) Date Feb. 27, 1997, PCT Pub. No. WO96/07235, PCT Pub. Date Mar. 7, 1996

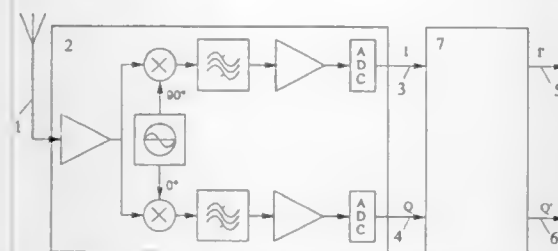
PCT Filed Aug. 24, 1995, Ser. No. 793,673

Claims priority, application Germany, Aug. 29, 1994, 44 30 679.2

Int. Cl.<sup>6</sup> G01G 25/00

U.S. Cl. 364—571.01

11 Claims



1. A method for the correction of the amplitude  $\alpha$  and phase error  $\delta$  between signal-pairs which comprise inphase signal (I) and quadrature signal (Q) which represent vectors, and in which the values for correction are determined by calculating most probable correction values of offsets from a center point of the signal-pairs using signal probes  $I_k$  from the signal stream of the inphase signal (I) and signal probes  $Q_k$  from the signal stream of the quadrature signal (Q) followed by calculating corrections of the signals as a function of said calculated most probable values, the method comprising the steps of correcting the offsets from said center point, and calculating and correcting the amplitude  $\alpha$  and the phase  $\delta$  as a function of said signal probes  $I_k$  and  $Q_k$  only after a preceding correction of the offsets from the center point.

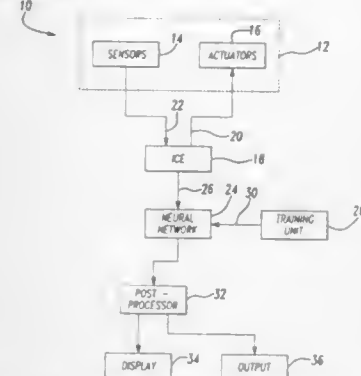
**5,774,376**  
**STRUCTURAL HEALTH MONITORING USING ACTIVE MEMBERS AND NEURAL NETWORKS**

Raymond A. Manning, 910 Luray St., Long Beach, Calif. 90807

Filed Aug. 7, 1995, Ser. No. 592,747  
Int. Cl.<sup>6</sup> G05D 19/00

U.S. Cl. 364—508

23 Claims



1. A system for monitoring structural integrity, said system comprising:  
a mechanical structure;  
an actuator attached to said mechanical structure for generating vibrations in said structure in response to an input signal;  
means for generating said input signal;  
a sensor attached to said mechanical structure member for sensing said vibrations and generating an output signal in response thereto; and

trainable adaptive interpreter means coupled to said sensor for receiving said sensor output and generating an output which characterizes the structural integrity of said mechanical structure, said characterized structural integrity being indicative of damage to said mechanical structure.

**5,774,377**  
**METHOD AND APPARATUS FOR MONITORING A SUBSYSTEM WITHIN A DISTRIBUTED SYSTEM FOR PROVIDING AN ARCHIVE OF EVENTS WITHIN A CERTAIN TIME OF A TRAP CONDITION**

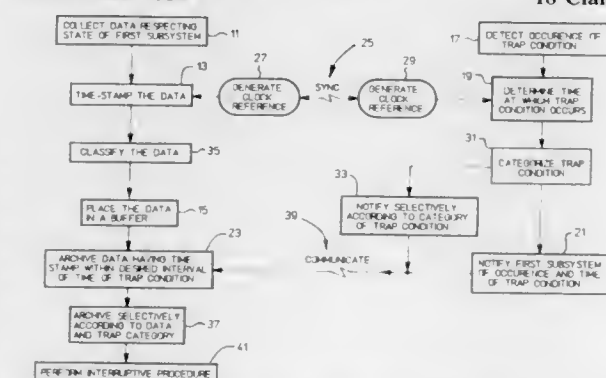
John C. Eidson, Palo Alto, and Keith Edward Moore, Mountain View, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 30, 1991, Ser. No. 737,621

Int. Cl.<sup>6</sup> H04B 17/00

U.S. Cl. 364—550

18 Claims



1. A method of automatically monitoring the behavior over time of a plurality of interacting subsystems of a distributed system, the method comprising the following steps carried out automatically by the interacting subsystems:

- collecting data respecting a first subsystem by using data collection means that is local to the first subsystem;
- time-stamping the data;
- placing the data in a local buffer in the first subsystem;
- detecting occurrence of a trap condition by means of a sensor that is local to a second subsystem;
- determining, locally in the second subsystem, at what time the trap condition occurs;
- notifying the first subsystem of the occurrence of the trap condition and its time of occurrence; and
- archiving any data that have been placed in the local buffer and that carry a time-stamp within a desired interval of the time of the occurrence of the trap condition and thereby providing a history of the first subsystem during the desired time interval.

**5,774,378**  
**SELF-VALIDATING SENSORS**  
Janice Ching-Yi Yang, East Killara, Australia, assignor to The Foxboro Company, Foxboro, Mass.

Continuation-in-part of Ser. No. 406,805, Mar. 20, 1995, Pat. No. 5,570,300, which is a continuation of Ser. No. 51,192, Apr. 21, 1993, abandoned. This application Aug. 30, 1996, Ser. No. 705,982

Int. Cl.<sup>6</sup> G01C 25/00

U.S. Cl. 364—571.02

28 Claims

1. A method of compensating for variations in a transfer function of a sensor, comprising:  
identifying a desired transfer function for the sensor;  
determining an actual transfer function for the sensor;  
receiving a measurement produced by the sensor;

**5,774,380**  
**STATE CAPTURE/REUSE FOR VERILOG SIMULATION OF HIGH GATE COUNT ASIC**

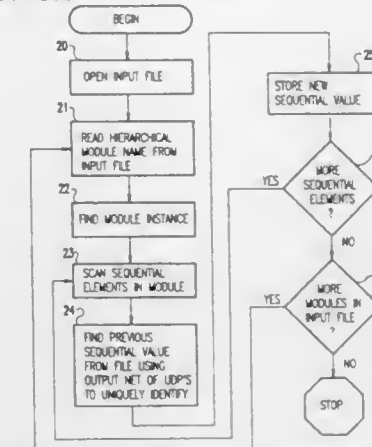
Lansing Dunn Pickup, Colchester; Paul Richard Schwartz, Williston, and Todd William Westervelt, Colchester, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 8, 1996, Ser. No. 613,275

Int. Cl.<sup>6</sup> G06F 15/20

U.S. Cl. 364—578

4 Claims



modifying the measurement based on the desired and actual transfer functions to produce a modified measurement; and  
providing the modified measurement as a measurement value for the sensor.

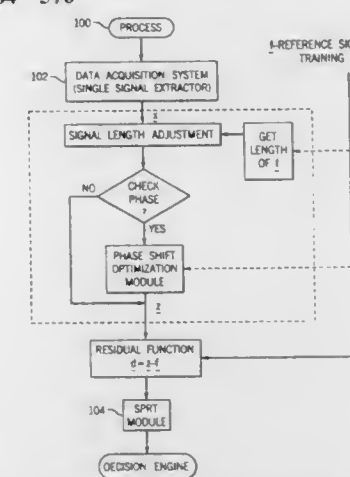
**5,774,379**  
**SYSTEM FOR MONITORING AN INDUSTRIAL OR BIOLOGICAL PROCESS**  
Kenneth C. Gross; Stephan W. Wegerich; Rick B. Vilim, all of Argonne, and Andrew M. White, Skokie, all of Ill., assignors to The University of Chicago, Chicago, Ill.

Filed Jul. 21, 1995, Ser. No. 505,453

Int. Cl.<sup>6</sup> G01R 17/00

U.S. Cl. 364—576

16 Claims



1. A method for monitoring an industrial testing process, comprising the steps of:

- (a) providing to a data acquisition system a set of industrial testing signals over a time length and a reference signal over another time length, said industrial testing signals and said reference signal being aperiodic within said time lengths;
- (b) adjusting the time length of the industrial signals to the time length of the reference signal, forming a difference between the time length adjusted industrial signals and the reference signal; and
- (c) outputting the difference between the time length adjusted testing signals and the reference signal for variance minimization and repeating steps (b) and (c) until achieving a minimum variance.

**5,774,381**  
**MODELING AND SIMULATION OF CATALYTIC CRACKING**

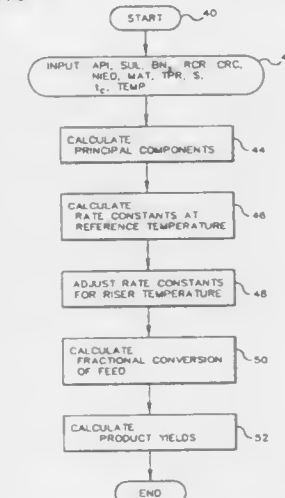
Paul F. Meier, 1100 Cherokee, Bartlesville, Okla. 74003

Filed Mar. 4, 1992, Ser. No. 845,971

Int. Cl.<sup>6</sup> G06F 17/00

U.S. Cl. 364—578

15 Claims



1. A method of simulating a hydrocarbon cracking reaction in which a computer is used to predict results of a catalytic cracking

reaction wherein a feedstream, which contains a multiplicity of hydrocarbons of complex high molecular weight molecules having various boiling ranges, is contacted with an active catalyst under cracking conditions to produce at least one hydrocarbon reaction product of a lower molecular weight, said method comprising the following steps:

- defining for said computer a plurality of lumps for said multiplicity of hydrocarbons, wherein said lumps are defined according to boiling range into lumped species representing a reactants lump, an intermediate component lump, and at least one reaction product lump;
- defining in said computer a reaction conversion network for said lumped species with reaction paths in said conversion network flowing from heavier to lighter components;
- constructing a chemical kinetic cracking equation in terms of reactants and product lumps for each step in said reaction network, wherein said equation integrates catalyst decay with chemical kinetics;
- constructing a data base of historical data wherein said data is produced by measurements made on a reactor operating under cracking conditions said historical data further including measured bulk properties of both oil and catalyst, and providing said computer with said historical data base for simulating said cracking reaction;
- calculating reaction rate constants in said computer for said kinetic cracking equations, wherein said reaction rate constants are determined from a plurality of bulk properties of both oil and catalyst from said historical operating data of said reactor;
- calculating values in said computer for conversion of said feedstream and values for yield of said reaction product based on reaction rate constants determined in step (e); and
- providing computer generated displays of conversion of said feedstream and yield of said product which simulate said cracking reaction.

5,774,382

**METHOD FOR GENERATING A TABLE MODEL OF A DEVICE**

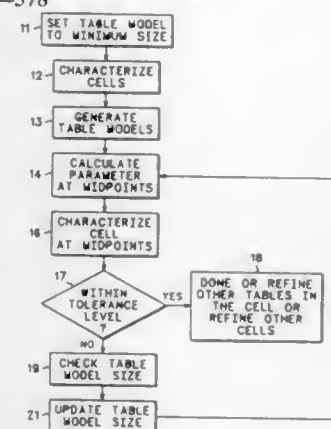
Sean C. Tyler, and Timothy J. Jennings, both of Chandler, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 31, 1995, Ser. No. 509,596

Int. Cl.<sup>6</sup> G06G 7/62

U.S. Cl. 364-578

21 Claims



1. A computer implemented method for generating a table model of a device that is used for manufacturing the device, comprising the steps of:

- measuring first and second values of an independent variable and respective first and second values of a dependent variable, wherein the independent variable is independent of a physical process and the dependent variable is dependent on the physical process during design of the device;
- storing the first and second values of the independent variable and the respective first and second values of the dependent

variable in an initial table, wherein the first and second values of the independent variable and the respective first and second values of the dependent variable are used in the initial table as minimum and maximum values of the initial table, respectively;

- determining a calculated value of the dependent variable for a selected value of the independent variable, wherein the selected value of the independent variable is between the first and second values of the independent variable;
- determining an actual value of the dependent variable for the selected value of the independent variable;
- determining an error value between the calculated value of the dependent variable for the selected value of the independent variable and the actual value of the dependent variable for the selected value of the independent variable;
- comparing the error value with an acceptance value;
- modifying one of the initial table or a modified table in accordance with a result of comparing the error value with an acceptance value by repeating steps (c) through (g) to generate the table model;
- generating a device design using the table based model; and
- manufacturing the device in accordance with the device design.

5,774,383

**PORTABLE COMPUTER FOR ONE-HANDED OPERATION**

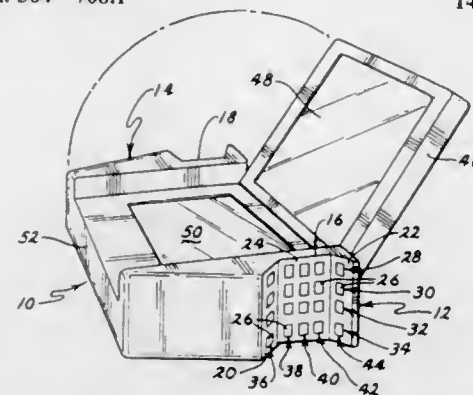
Elmer J. Hanks, 1768 Colfax Ave. South, Minneapolis, Minn. 55403

Continuation-in-part of Ser. No. 117,995, Sep. 8, 1993, Pat. No. 5,388,061. This application Feb. 7, 1995, Ser. No. 384,903

Int. Cl.<sup>6</sup> G06F 1/00

U.S. Cl. 364-708.1

14 Claims



- A portable computer having a data processor, comprising:
  - at least one keypad having a multiplicity of manually actuable keys, said keypad including a generally flat intermediate segment having a lower edge and an upper edge, a first angled segment projecting generally upwardly from said upper edge of said intermediate segment and forming a first obtuse angle with said intermediate segment, and a second angled segment projecting generally upwardly from said lower edge of said intermediate segment, said second angled segment forming a second obtuse angle with said intermediate segment and positioned generally opposably to said first angled segment;
  - at least one data display screen for viewing data resulting from the keypad and computing operations of the portable computer; and
  - communication means for linking the portable computer to telephone lines for voice and data transmission.

5,774,384

**KEYBOARD WITH ELEVATABLE KEYS**

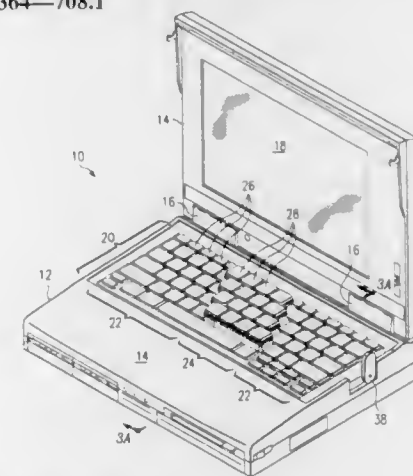
Ken Okaya; Stephen Burke, and John Busch, all of Austin, Tex., assignors to Dell, U.S.A., L.P., Austin, Tex.

Filed Dec. 13, 1995, Ser. No. 571,381

Int. Cl.<sup>6</sup> G06F 1/16

U.S. Cl. 364-708.1

35 Claims



- A keyboard assembly, comprising:

- a base;
- a first demi-board comprising a first key array, said first demi-board supported in a first plane relative to said base;
- a second demi-board comprising a second key array, said second demi-board supported in the first plane and movable to a second plane parallel to the first plane and elevated relative to said base; and
- an elevator device for selectively moving said second demi-board in a direction orthogonal to the first and second planes between the first plane in which said first and second key arrays are substantially even relative to one another and the second plane in which said first and second key arrays are vertically offset relative to one another.

5,774,385

**METHOD AND APPARATUS FOR DATA COMPRESSION**

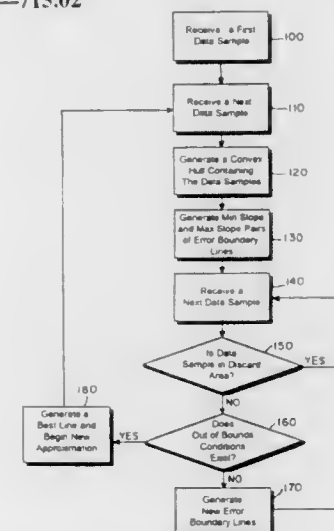
Edgar H. Bristol, Foxboro, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Sep. 9, 1996, Ser. No. 708,808

Int. Cl.<sup>6</sup> G06F 7/00

U.S. Cl. 364-715.02

31 Claims



- A method for compressing a data stream representative of measured values by a transducer having data samples with at least first and second degrees of freedom, the method comprising the steps of:

- receiving first and second data samples of the data stream from the transducer;
- generating a first pair and a second pair of error boundaries, each of the first pair and the second pair including an upper boundary and a lower boundary separated by a predetermined error value, wherein the upper boundary of the first pair includes the second data sample, the lower boundary of the first pair includes the first data sample, the upper boundary of the second pair includes the first data sample, and the lower boundary of the second pair includes the second data sample;
- receiving a next data sample of the data stream from the transducer;
- discarding the next data sample and repeating step (C) when a value of the next data sample is greater than the lower boundary of the second pair of error boundaries and is less than the upper boundary of the first pair of error boundaries;
- recognizing a segment end condition when the value of the next data sample is greater than the upper boundary of the second pair of error boundaries or the value of the next data sample is less than the lower boundary of the first pair of error boundaries;
- if a segment end condition does not exist:
  - modifying at least one of the first and second pairs of error boundaries such that each boundary of the first pair and the second pair of error boundaries includes at least one previous data sample and such that for each one of the pair of error boundaries, all previous data samples are either contained within an area between the upper boundary and the lower boundary of the one of the pair of error boundaries or are located on one of the upper boundary and the lower boundary of the one of the pair of error boundaries;
  - continuing from step (C); and
- if a segment end condition does exist, generating a best fit line segment of the data samples received in steps (A) and (C) thereby compressing a segment of the data stream.

5,774,386

**METHOD AND APPARATUS FOR PERFORMING FUNCTION EVALUATION USING A CACHE**

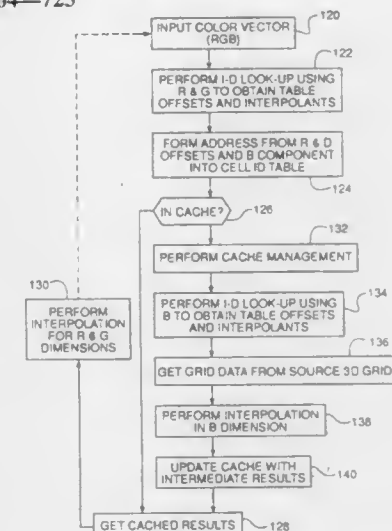
George Boynton Pawle, North Reading, Mass., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 17, 1996, Ser. No. 633,332

Int. Cl.<sup>6</sup> G06F 17/17

U.S. Cl. 364-723

6 Claims



- A method of evaluating a function having a plurality of input variables, comprising the steps of:
  - partitioning the function into first and second sets of subfunctions, in which the first set subfunctions are functions of a first subset of the input variables, and the second set subfunctions are functions of a second subset of the input variables and intermediate results of the first set subfunctions, the partition-



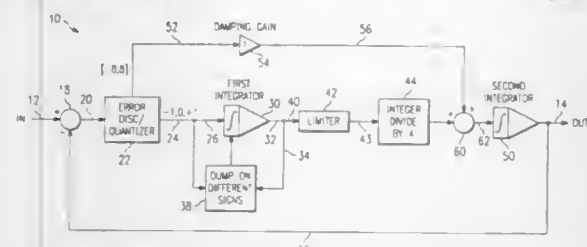
ing is such that the functional composition of the second set subfunctions with the first set subfunctions is equivalent to the function;  
using the first subset of the input variables to determine if said intermediate results exist in a cache memory;  
when said intermediate results do not exist in cache memory, evaluating the first set of subfunctions using the first subset of input variables to obtain intermediate results;  
storing the intermediate results in a cache memory;  
completing evaluation of the function by evaluating the second set subfunctions using the intermediate results and the second subset of the input variables; and  
performing subsequent evaluations of the function by using the intermediate results when the intermediate results exist in the cache memory.

#### 5,774,387 TRACKING FILTER

Stephen W. Marshall, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.  
Filed Jun. 12, 1996, Ser. No. 662,803  
Int. Cl.<sup>6</sup> G06F 17/10

U.S. Cl. 364—724.011

9 Claims



1. A filter having an input and an output, comprising:  
(a) a first circuit receiving an input signal from said filter input and a feedback signal from said filter output and providing a first signal indicative of a difference therebetween;  
(b) an error discriminator providing a first output indicative of a sign of said first signal;  
(c) a first integrator having an input receiving said discriminator first output, said first integrator providing a second signal to its output, and further resetting said second signal to a predetermined value when a sign of said second signal is different than a sign of said received discriminate first output;  
(d) a second circuit adding said second signal from said first integrator and said first output from said error discriminator, and generating a third signal being indicative of said addition; and  
(e) a second integrator having an input receiving said third signal from said second circuit and having its output connected to the filter output.

#### 5,774,388 DEVICE FOR ELECTRONICALLY CALCULATING A FOURIER TRANSFORM AND METHOD OF MINIMIZING THE SIZE OF INTERNAL DATA PATHS WITHIN SUCH A DEVICE

Christophe Joanblanc, La Terrasse, and Emmanuel Bidet, Grenoble, both of France, assignors to France Telecom, France

PCT No. PCT/FR94/00996, § 371 Date Jun. 7, 1995, § 102(e) Date Jun. 7, 1995, PCT Pub. No. WO95/04963, PCT Pub. Date Feb. 16, 1995

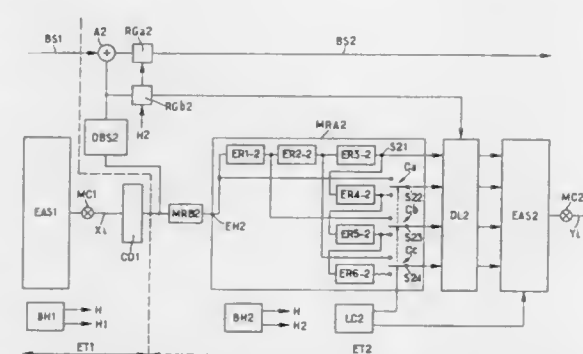
PCT Filed Aug. 10, 1994, Ser. No. 416,907

Claims priority, application France, Aug. 11, 1993, 93 09865 Int. Cl.<sup>6</sup> G06F 15/00

U.S. Cl. 364—726

20 Claims

1. Electronic device for calculating a Fourier transform of a predetermined initial size, comprising a plurality (t) of successive processing stages where t is an integer, connected in series between



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conductive to transmit an output of said first inverter to said first bit line when information is read out from said memory cell.

5,774,394

**MAGNETIC MEMORY CELL WITH INCREASED GMR RATIO**

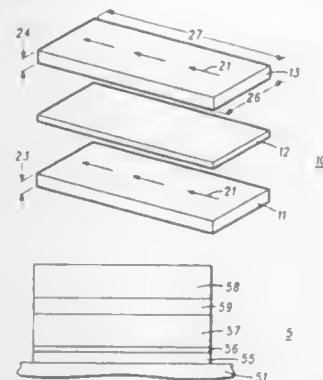
Eugene Chen; Saied A. Tehrani, both of Tempe, and Steven A. Voight, Gilbert, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 22, 1997, Ser. No. 862,090

Int. Cl.<sup>6</sup> G11C 11/15

U.S. Cl. 365—158

17 Claims



1. A magnetic memory cell with increased GMR ratio comprising:

a layer of an oxide of a magnetic material;  
a first layer of non-magnetic material positioned on a major surface of the layer of an oxide;

first and second layers of magnetic material stacked in parallel, overlying relationship and separated by a second layer of non-magnetic material sandwiched therebetween so as to form a magnetic memory cell, the first layer of magnetic material having a first major surface adjacent the second layer of non-magnetic material and an opposite major surface positioned on the first layer of non-magnetic material so that the first layer of non-magnetic material is sandwiched between the first layer of magnetic material and the layer of an oxide; and

the first layer of non-magnetic material having a thickness which prevents the layer of an oxide from pinning the first layer of magnetic material and adapts the first layer of magnetic material to the layer of an oxide so as to increase the GMR ratio of the magnetic memory cell.

5,774,395

**ELECTRICALLY ERASABLE REFERENCE CELL FOR ACCURATELY DETERMINING THRESHOLD VOLTAGE OF A NON-VOLATILE MEMORY AT A PLURALITY OF THRESHOLD VOLTAGE LEVELS**

Robert B. Richart, and Shyam Garg, both of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Nov. 27, 1996, Ser. No. 757,987

Int. Cl.<sup>6</sup> G11C 11/34

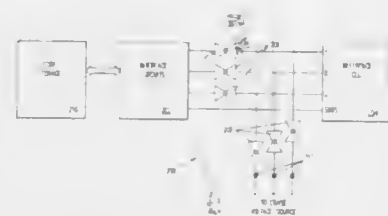
U.S. Cl. 365—185.2

26 Claims

1. A circuit comprising:

an interface circuit for interfacing to a nonvolatile memory, the nonvolatile memory including an individual memory cell, the interface circuit including a comparing circuit for comparing a data level of the individual memory cell to a reference data level;

a programmable and electrically erasable reference cell circuit generating the reference data level of a plurality of reference data levels defining a plurality of data states of the individual memory cell;



a first plurality of conductive lines coupling the interface circuit to the reference cell circuit;

a second plurality of conductive lines for coupling the interface circuit to an erase voltage source; and

a plurality of switches alternatively blocking the first plurality of conductive lines while coupling the second plurality of conductive lines and coupling the first plurality of conductive lines while blocking the second plurality of conductive lines.

5,774,396

**FLASH MEMORY WITH ROW REDUNDANCY**

Peter W. Lee, Saratoga, Calif.; Hsing-Ya Tsao, and Fu-Chang Hsu, both of Taipei, Taiwan, assignors to Aplus Integrated Circuits, Inc., Saratoga, Calif.

Continuation-in-part of Ser. No. 624,322, Mar. 29, 1996, Pat.

No. 5,646,890, Ser. No. 645,630, May 14, 1996, Pat. No.

5,687,121, Ser. No. 664,639, Jun. 17, 1996, Ser. No. 676,066,

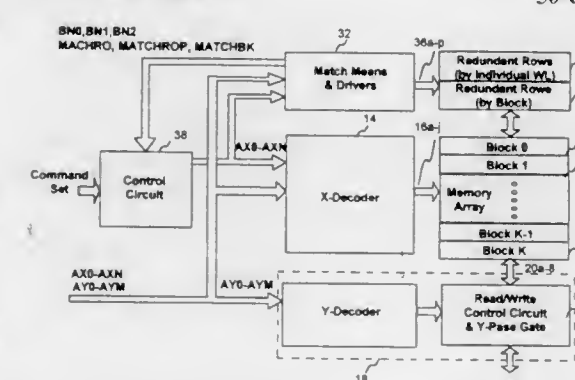
Jul. 5, 1996, and Ser. No. 691,281, Aug. 1, 1996. This applica-

tion Dec. 9, 1996, Ser. No. 762,707

Int. Cl.<sup>6</sup> G11C 16/06

U.S. Cl. 365—185.09

30 Claims



1. A flash memory with row redundancy, comprising:

an input terminal to receive an address and a command signal;  
a flash transistor array having primary blocks and secondary blocks, each block including a plurality of transistors organized in rows and columns and having respective wordlines, bitlines and a source line;

a wordline decoder coupled to said input terminal and to said primary blocks and configured to decode a portion of said address and to receive a control signal to selectively apply a predetermined voltage to a wordline;

5,774,398

**NON-VOLATILE SEMICONDUCTOR MEMORY HAVING A MEMORY CELL ARRAY DIVIDED INTO MEMORY CELL GROUPS**

Shinji Ishida, Kumamoto, Japan, assignor to NEC Corporation, Japan

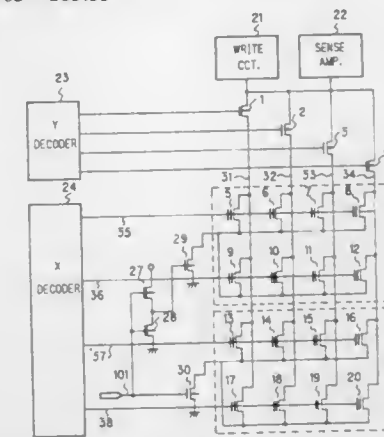
Filed Nov. 22, 1996, Ser. No. 755,410

Claims priority, application Japan, Nov. 29, 1995, 7-311261

Int. Cl.<sup>6</sup> G11C 11/34

U.S. Cl. 365—185.11

4 Claims



5,774,397

**NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE AND METHOD OF PROGRAMMING A NON-VOLATILE MEMORY CELL TO A PREDETERMINED STATE**

Tetsuo Endoh; Yoshiyuki Tanaka, both of Yokohama; Seiichi Aritome; Riichiro Shirota, both of Kawasaki; Susumu Shuto, Ichikawa; Tomoharu Tanaka, Yokohama; Gertjan Hemink, Kawasaki, and Toru Tanzawa, Ebina, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 266,633, Jun. 28, 1994, Pat. No.

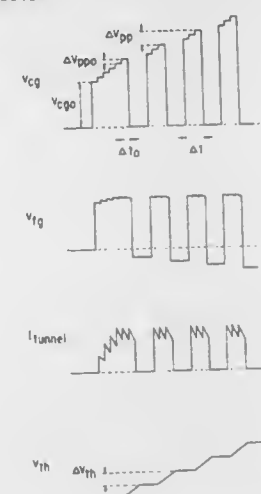
5,555,204. This application Sep. 10, 1996, Ser. No. 711,652

Claims priority, application Japan, Jun. 29, 1993, 5-158386; Dec. 13, 1993, 5-311740

Int. Cl.<sup>6</sup> G11C 7/00

U.S. Cl. 365—185.19

54 Claims



1. A method of programming a non-volatile memory cell to a predetermined state, comprising:

applying a programming pulse to said memory cell so as to program said memory cell to said predetermined state, said programming pulse having a programming voltage gradually raised up and being divided into plurality of sub-pulses; determining whether said memory cell has been successfully programmed to said predetermined state; and

terminating application of said programming pulse to said memory cell if said memory cell has been successfully programmed to said predetermined state;

wherein a first pulse of said plurality of sub-pulses has a first pulse duration and pulse durations of remaining subsequent sub-pulses are shorter than said first pulse duration.

5,774,399

**FLASH MEMORY DEVICE**

Gyu Wan Kwon, Ichon, Rep. of Korea, assignor to Hyundai Electronics Industries, Co., Ltd., Kyungki-Do, Rep. of Korea

Filed Oct. 18, 1996, Ser. No. 730,874

Claims priority, application Rep. of Korea, Oct. 18, 1995, 95-35938

Int. Cl.<sup>6</sup> G11C 11/34; 7/00

U.S. Cl. 365—185.18

13 Claims

1. A flash memory device comprising:

a memory cell array composed of a plurality of memory cell blocks;

a negative charge pump;

a plurality of switching circuits coupled between said negative charge pump and said memory cell blocks;



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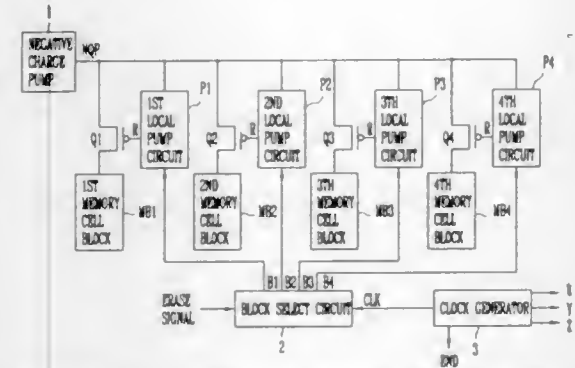
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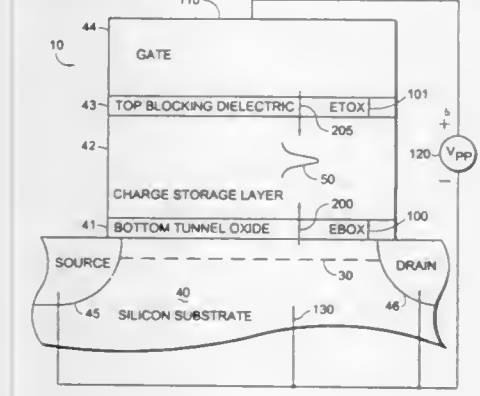
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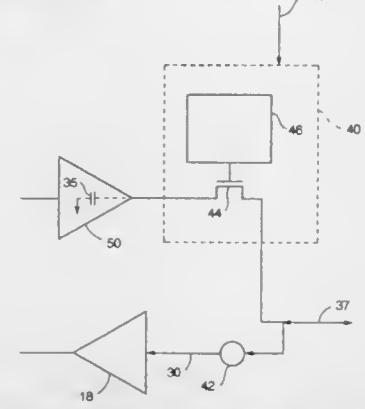
a plurality of local pump circuits for operating said plurality of switching circuits; and  
a block selection circuit for sequentially operating said local pump circuits according to the input of an erasing signal.

**5,774,400**  
**STRUCTURE AND METHOD TO PREVENT OVER ERASURE OF NONVOLATILE MEMORY TRANSISTORS**  
Loren T. Lancaster, and Ryan T. Hirose, both of Colorado Springs, Colo., assignors to NVX Corporation, Colorado Springs, Colo.  
Filed Dec. 23, 1996, Ser. No. 772,970  
Int. Cl.<sup>6</sup> G11C 11/40  
U.S. Cl. 365—185.3 33 Claims



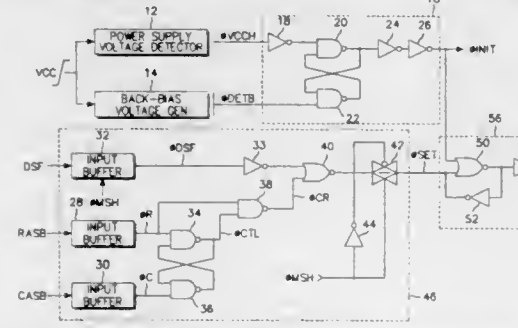
1. A non-volatile integrated memory device, comprising:  
a semiconductor substrate;  
a memory transistor in said substrate, said memory transistor having an electrically alterable threshold voltage, said memory transistor having a source region, a drain region, a channel region between said source and drain regions in said substrate, a gate, and a charge storage layer between at least portions of said gate and said substrate;  
means for simultaneously injecting charge into said charge storage layer from at least a first node and a second node during a write operation in which the threshold voltage of said memory transistor is charged;  
and means for setting current flows from said first and second nodes to be substantially equal in magnitude when a predetermined value is achieved during the write operation.

**5,774,401**  
**DATA INPUT/OUTPUT CIRCUIT FOR PERFORMING HIGH SPEED MEMORY DATA READ OPERATION**  
Frankie E. Roohparvar, Cupertino, Calif., assignor to Micron Technology, Inc., Boise, Id.  
Division of Ser. No. 499,025, Jul. 6, 1995, Pat. No. 5,663,908.  
This application Apr. 4, 1997, Ser. No. 833,315  
Int. Cl.<sup>6</sup> G11C 13/00  
U.S. Cl. 365—189.02 4 Claims



1. An input/output data circuit for use in an integrated circuit memory system having an array of memory cells and at least one contact pad for providing an electrical interface between the memory system and an operating environment, with the contact pad functioning to both receive data to be programmed into the memory and to provide data read from the memory, said data circuit comprising:  
a data read path extending between the contact pad and the array of memory cells, the data read path including sense amplifier means for determining a programmed state of a selected cell of the array; and  
a data program path extending between the contact pad and the array of memory cells, the data program path including  
(1) programming means for applying a programming voltage to a selected cell of the array; and  
(2) disconnect means for electrically disconnecting an output of the programming means from the read data path when not performing a programming operation on the cell of the array.

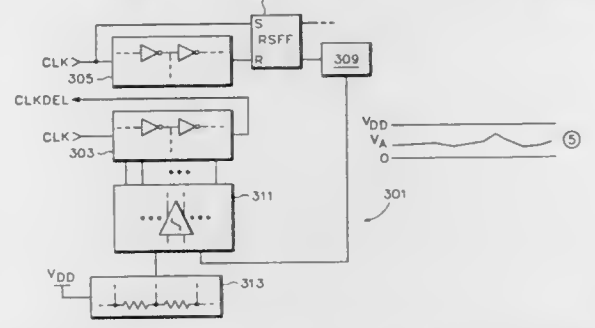
**5,774,402**  
**INITIALIZATION CIRCUIT FOR A SEMICONDUCTOR MEMORY DEVICE**  
Cheol-Ha Lee, Kyungki-do, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea  
Filed Aug. 23, 1996, Ser. No. 697,356  
Claims priority, application Rep. of Korea, Aug. 23, 1995, 26181/1995  
Int. Cl.<sup>6</sup> G11C 7/00  
U.S. Cl. 365—191 19 Claims



1. An initialization circuit for a semiconductor memory device comprising:  
an initialization signal generator that generates an initialization signal responsive to a plurality of control signals including a

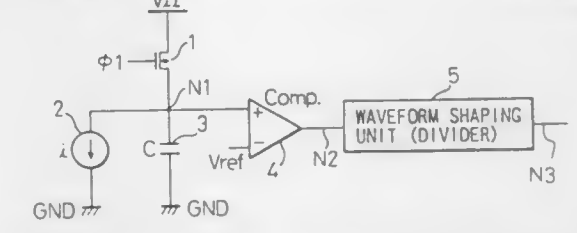
row address signal and a column address signal wherein the initialization signal generator activates the initialization signal only when the column address signal is activated before the row address signal, the initialization signal generator including:  
a plurality of input terminals for receiving the plurality of control signals;  
an output terminal for transmitting the initialization signal; and  
a control clock generator coupled to the plurality of input terminals, the control clock generator generating a control clock signal responsive to the control signals.

**5,774,403**  
**PVT SELF ALIGNING INTERNAL DELAY LINE AND METHOD OF OPERATION**  
Airell Clark, II, Albany; Billy E. Thayer, Corvallis; Daryl E. Anderson, Corvallis, and Jeffrey A. Hintzman, Corvallis, all of Oreg., assignors to Hewlett-Packard, Palo Alto, Calif.  
Filed Jun. 12, 1997, Ser. No. 873,854  
Int. Cl.<sup>6</sup> G11C 8/00  
U.S. Cl. 365—194 13 Claims



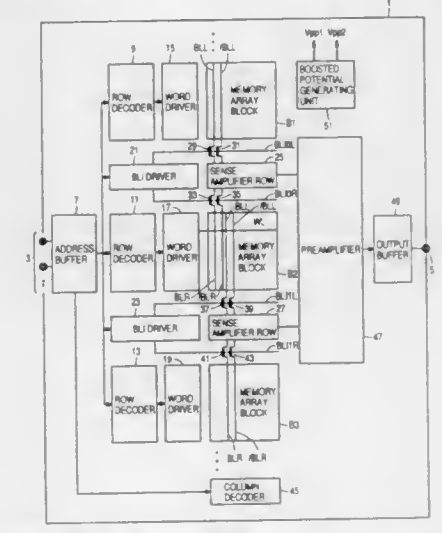
6. A PVT self-aligning delayed-signal generating circuit device, having a predetermined system voltage signal input and a predetermined system timing signal input, said device comprising:  
first delay means for receiving said system timing signal and for transmitting a first delayed-signal;  
connected to said first delay means, first means for comparing said first delayed-signal to said system timing signal and for resultantly transmitting a signal indicative of variances of system performance due to PVT factors;  
connected to said first delay means, second means for comparing a series of reference signals directly related to said system voltage signal to said signal indicative of variances of system performance; and  
connected to said system timing signal, second delay means for generating dynamically a PVT self-aligning delayed-signal, said second delay means is connected to said second means for comparing such that said means for comparing changes said system timing signal into said PVT self-aligning delayed-signal by dynamically changing a length of delay introduced into said system timing signal by said second delay means in accordance with comparison of respective said reference signals to said signal indicative of variances of system performance due to PVT factors, said second delay means having an output for transmitting said PVT self-aligning delayed-signal.

**5,774,404**  
**SEMICONDUCTOR MEMORY HAVING SELF-REFRESH FUNCTION**  
Satoshi Eto, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan  
Filed Jul. 25, 1995, Ser. No. 507,640  
Claims priority, application Japan, Oct. 21, 1994, 6-256952; Mar. 15, 1995, 7-055946  
Int. Cl.<sup>6</sup> G11C 7/00  
U.S. Cl. 365—222 34 Claims



1. A semiconductor memory for controlling a timing of refreshing a plurality of memory cells, comprising:  
a capacitor for holding charge;  
a comparison circuit for comparing the voltage of an end of said capacitor with a reference voltage;  
a precharge circuit having at least one transistor for precharging said capacitor, the transistor of said precharge circuit having a first electrode connected to a first power source line, a second electrode connected to the end of said capacitor and an end of a current source, and a control electrode to receive a timing control signal for controlling the switching of said precharge circuit, and wherein the other ends of said capacitor and said current source are connected to a second power source line; and  
said current source for discharging said capacitor, said current source having a positive temperature coefficient to increase a current to flow as temperature rises, wherein the timing of refreshing said memory cells is controlled based on a temporal change, in a voltage of said capacitor.

**5,774,405**  
**DYNAMIC RANDOM ACCESS MEMORY HAVING AN INTERNAL CIRCUIT USING A BOOSTED POTENTIAL**  
Shigeki Tomishima, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
Filed Oct. 21, 1996, Ser. No. 734,334  
Claims priority, application Japan, Mar. 28, 1996, 8-074647  
Int. Cl.<sup>6</sup> G11C 7/00  
U.S. Cl. 365—226 18 Claims



1. A dynamic random access memory, comprising:  
a plurality of internal circuits;

a plurality of boosted potential supply lines provided corresponding to said plurality of internal circuits each for supplying a boosted potential to a corresponding one of said internal circuits; and

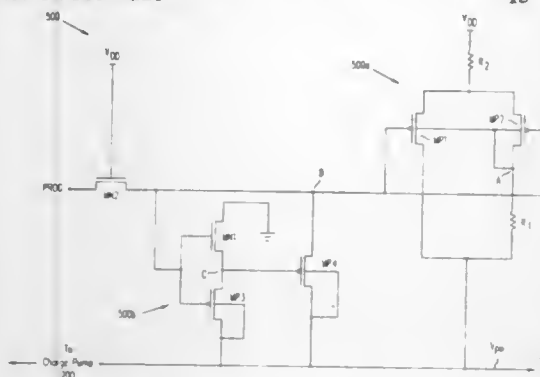
a plurality of boosted potential generating means provided corresponding to said plurality of internal circuits each for generating a boosted potential to be applied to a corresponding one of said boosted potential supply lines, wherein each boosted potential generating means generates said boosted potential such that a potential level of the corresponding one of said boosted potential supply lines attains a potential level required by the corresponding one of said plurality of internal circuits.

5,774,406  
SWITCHING CIRCUIT FOR CONTROLLED  
TRANSITION BETWEEN HIGH PROGRAM AND ERASE  
VOLTAGES AND A POWER SUPPLY VOLTAGE FOR  
MEMORY CELLS

Vikram Kowshik, Fremont, Calif., assignor to Programmable  
Microelectronic Corporation, San Jose, Calif.  
Filed Oct. 3, 1996, Ser. No. 722,429  
Int. Cl. G11C 7/02

U.S. Cl. 365—226

15 Claims



1. A switching circuit for providing selected voltages to an associated memory array using a program voltage line, said switching circuit comprising:

- an input node for receiving a control signal, said control signal comprising two logic levels; and
- a first stage connected between a source of supply voltage and said program voltage line, said first stage isolating said program voltage line from said source of supply voltage in response to said control signal indicating a program operation and electrically connecting said program voltage line to said source of supply voltage in response to said control signal indicating a read operation.

5,774,407  
DRAM BIT LINE SELECTION CIRCUIT FOR  
SELECTING MULTIPLE PAIRS OF LINES

Sam Soo Kim, Seoul, Rep. of Korea, assignor to LG Semicon  
Co., Ltd., Chungcheongbuk-Do, Rep. of Korea  
Filed Oct. 28, 1996, Ser. No. 738,707

Claims priority, application Rep. of Korea, Dec. 27, 1995,  
1995-58903

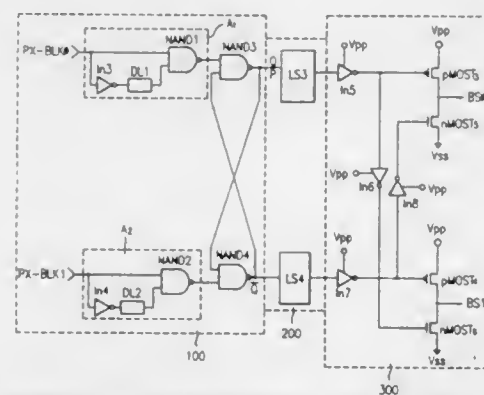
Int. Cl. G11C 8/00

U.S. Cl. 365—230.03

17 Claims

1. A DRAM bit line selection circuit for selecting multiple pairs of bit lines connecting a bidirectional sense amplifier and a cell array having at least two blocks, the bit line selection circuit comprising:

- a block selecting circuit for receiving block selection coding signals corresponding to each block, generating a first signal corresponding to a selected block and a second signal corre-



sponding to a non-selected block, and maintaining the first signal and the second signal until a non-selected block is selected;

a level transition unit for outputting a transition signal having one of a first level (Vpp) and a second level (Vcc) in response to an output from the block selecting circuit; and

a bit line selecting signal generating unit for generating a bit line selecting signal in response to the transition signal of the level transition unit, wherein the bit line selecting signal corresponding to the selected block maintains the first level (Vpp), and changes to a third level (Vss) when the non-selected block is selected;

wherein the first level (Vpp) is greater or equal to a sum of the second level (Vcc) and a threshold voltage of PMOS and nMOS transistors (Vth), and the third level (Vss) is lower than the second level (Vcc).

5,774,408  
DRAM ARCHITECTURE WITH COMBINED SENSE  
AMPLIFIER PITCH

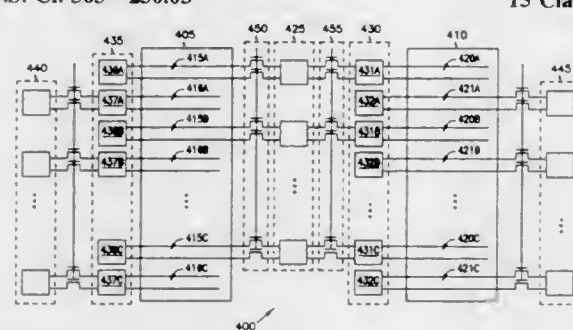
Brian M. Shirley, Boise, Id., assignor to Micron Technology,  
Inc., Boise, Id.

Filed Jan. 28, 1997, Ser. No. 790,375

Int. Cl. G11C 8/00; 7/02

U.S. Cl. 365—230.03

15 Claims



1. An integrated circuit memory, comprising:

first and second memory array portions, each having a plurality of digit line pairs;

- a first plurality of first type sense amplifiers, interposed between the first and second memory array portions, of which there is one first type sense amplifier for every two digit line pairs in each of the first and second memory array portions; and
- a second plurality of second type sense amplifiers, interposed between the first and second memory array portions, of which there is one second type sense amplifier for each digit line pair in the second memory array portion.

5,774,409  
MULTI-BANK DRAM SUITABLE FOR INTEGRATION  
WITH PROCESSOR ON COMMON SEMICONDUCTOR  
CHIP

Akira Yamazaki, and Katsumi Dosaka, both of Hyogo, Japan,  
assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo,  
Japan

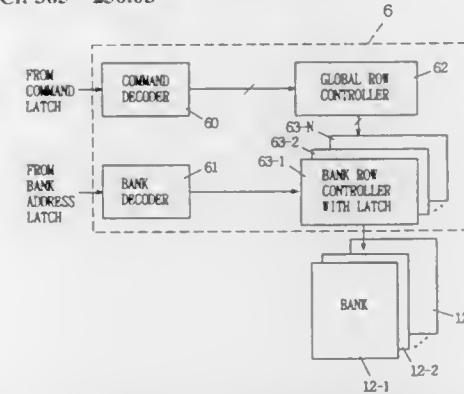
Filed Feb. 10, 1997, Ser. No. 797,081

Claims priority, application Japan, Apr. 22, 1996, 8-100146

Int. Cl. G06F 12/08

U.S. Cl. 365—230.03

5 Claims



1. A semiconductor memory device comprising:

- a memory array having a plurality of memory blocks each having a plurality of memory cells arranged in a matrix of rows and columns;
  - a global control means provided in common to said plurality of memory blocks, for receiving a control signal instructing an operation to generate an internal control signal corresponding to said control signal;
  - a plurality of local control means provided corresponding to said plurality of memory blocks, for receiving said internal control signal to drive corresponding memory blocks in accordance with said internal control signal when activated; and
  - a bank decoder receiving and decoding a bank address signal specifying a memory block among said plurality of memory blocks for generating a memory block specifying signal to activate a local control means corresponding to the specified memory block.
- each of said plurality of local control means including a latch for latching a driving signal corresponding to the internal control signal.

5,774,410  
SEMICONDUCTOR STORAGE DEVICE  
Yasunobu Nakase, Tokyo, Japan, assignor to Mitsubishi Denki  
Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 751,160, Nov. 15, 1996, abandoned.

This application Aug. 21, 1997, Ser. No. 916,010

Claims priority, application Japan, May 8, 1996, 8-113592

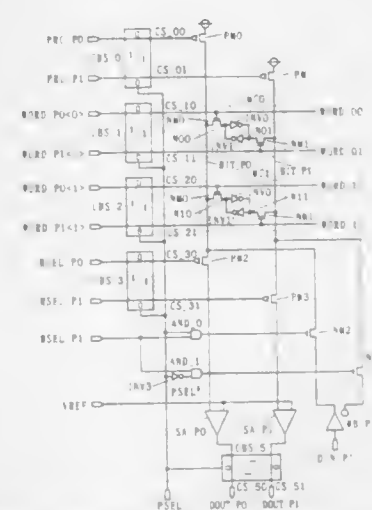
Int. Cl. G11C 8/00

U.S. Cl. 365—230.05

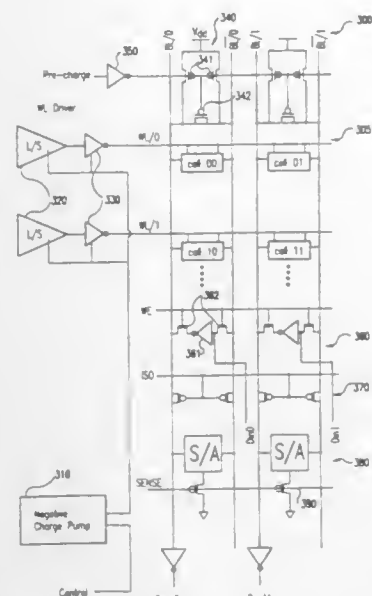
21 Claims

1. A semiconductor storage device, comprising:

- a first port for reading only;
- a second port for reading and writing;
- first and second bit lines provided corresponding to said first and second ports, respectively;
- a plurality of first and second word lines each provided corresponding to said first and second ports, respectively, said plurality of first and second word lines corresponding to each other in a one-to-one manner;
- a plurality of memory cells, provided between said first and second bit lines said plurality of memory cells each having first and second nodes providing signals in a logically inverted relation to each other, wherein said first node is connected to said first bit line when the first word line corresponding to said first bit line, in said plurality of first word lines, is in an active state and said second node is







transfer gate means connected to respective ones of word lines and bit lines for controlling connection of each of said controlled elements to respective ones of said bit lines, and means for limiting peak parasitic bipolar transient discharge current through a respective transfer gate means from a node of respective deselected ones of said controlled elements.

5,774,412

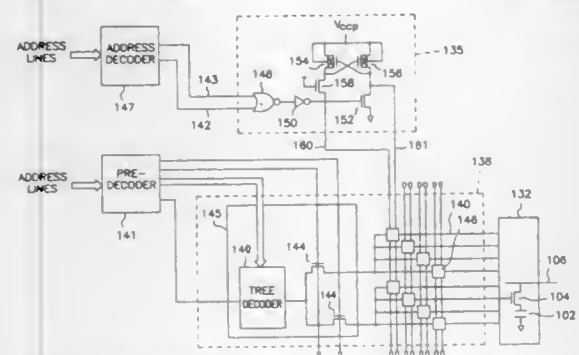
## LOCAL WORD LINE PHASE DRIVER

George B. Raad, Todd Merritt, and Paul S. Zagar, all of Boise, Id., assignors to Micron Technology, Inc., Boise, Id.  
Continuation of Ser. No. 494,535, Jun. 26, 1995, Pat. No. 5,586,080. This application Sep. 9, 1996, Ser. No. 706,647

Int. Cl.<sup>6</sup> G11C 8/00

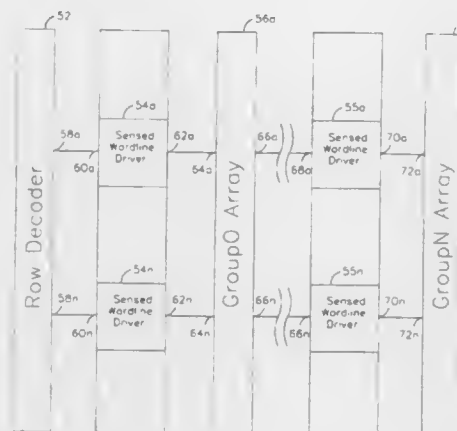
U.S. Cl. 365—230.06

9 Claims



1. An integrated circuit memory comprising:  
a address decode circuit;  
a plurality of local phase lines; and  
distributed local phase driver circuits each comprising:  
input circuitry for receiving input signals provided by the address decode circuit identifying one of the distributed local phase driver circuits, the input circuitry producing an output signal in response to the input signals; and  
a pull-up circuit coupled to the plurality of local phase lines and the input circuitry, the pull-up circuit driving one of the plurality of local phase lines to a voltage level higher than a supply voltage level in response to the output signal.

5,774,413  
SENSED WORDLINE DRIVER  
Jeffery Scott Hunt, Ackerman, Miss., assignor to Cypress Semiconductor Corporation, San Jose, Calif.  
Filed Dec. 12, 1996, Ser. No. 764,329  
Int. Cl.<sup>6</sup> G11C 8/00  
U.S. Cl. 365—230.06  
19 Claims



1. A circuit comprising:  
a plurality of wordline drivers, wherein a first one of said wordline drivers is configured to: (i) receive a control signal, (ii) receive a select signal and (iii) present an enable signal; and  
a plurality of group arrays, each configured to turn on in response to said enable signal and said control signal, and a first one of which is configured to present a second control signal to a next one of said wordline drivers, wherein only one of said group arrays is on at a time.

5,774,414

## MEMORY DEVICE AND PRODUCTION METHOD

Hanno Melzner, Unterhaching, and Armin Kohlhasse, Neubiberg, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

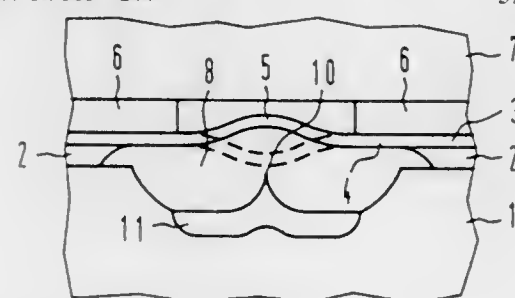
Filed Aug. 9, 1996, Ser. No. 694,531

Claims priority, application European Pat. Off., Aug. 9, 1995, 95 112 547.5

Int. Cl.<sup>6</sup> G11C 7/00

U.S. Cl. 365—244

57 Claims



1. A memory device, comprising:  
a substrate;  
a multiplicity of memory cells disposed on said substrate for at least intermittent stable storage of at least two different information states;  
a writing device associated with said memory cells for selectively putting one of said multiplicity of memory cells into a predetermined information state by external action; and  
a reading device associated with said memory cells for detection of an information state of a selected memory cell;  
said memory cells having a miniaturized mechanical element with a micromechanical diaphragm being under a compressive stress; and

said reading device associated with said memory cells having a field emissions point disposed at a given distance from said diaphragm.

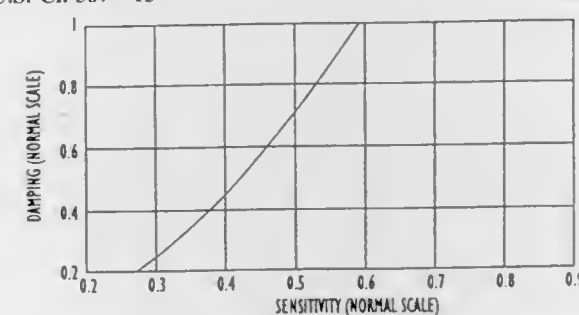
5,774,415  
GEOPHONE NORMALIZATION PROCESS  
Ernest M. Hall, Houston, and James Willers, Missouri City, both of Tex., assignors to Geo Space Corporation, Houston, Tex.

Filed Dec. 6, 1996, Ser. No. 761,456

Int. Cl.<sup>6</sup> G01V 13/00

U.S. Cl. 367—13

7 Claims



6. A method of controlling the magnetic field strength of an electromagnetic geophone, comprising the steps of:  
a) providing a respective specified center value each for a geophone sensitivity parameter and for a geophone damping parameter;  
b) magnetizing an electromagnetic geophone to full saturation;  
c) measuring the value for said fully saturated geophone sensitivity parameter and damping parameter;  
d) partially demagnetizing said geophone;  
e) measuring the value for said partially demagnetized geophone sensitivity parameter and damping parameter;  
f) calculating a plot representing geophone demagnetization versus demagnetization force by utilizing said measured fully saturated geophone sensitivity and damping parameters as one point on said plot and utilizing said measured partially demagnetized geophone sensitivity parameter and damping parameter as another point on said plot;  
g) calculating an amount of demagnetization required to provide said geophone with sensitivity and damping parameters each within  $\pm 2$  percent deviation from their respective specified center values by utilizing said geophone demagnetization plot; and  
h) demagnetizing said geophone such that sensitivity and damping parameters are within  $\pm 2$  percent from their respective specified center values.

5,774,416

## METHOD AND DEVICE FOR ATTENUATING WATER COLUMN REVERBERATIONS USING CO-LOCATED HYDROPHONES AND GEOPHONES IN OCEAN BOTTOM SEISMIC PROCESSING

Selwa Sadek, Houston; Jack Kinkad, Cypress; Bill Cafarelli, Houston, and Joe Sanders, Sugar Land, all of Tex., assignors to PGS, Tensor, Inc.

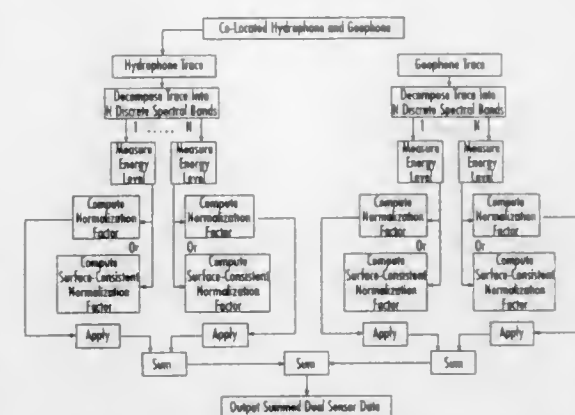
Filed Apr. 7, 1995, Ser. No. 418,507

Int. Cl.<sup>6</sup> G01V 1/38

U.S. Cl. 367—24

29 Claims

1. A process for attenuating noise is co-located hydrophone/geophone data, said process comprising:  
receiving a hydrophone signal at a hydrophone seismic sensor located at a hydrophone/geophone receiver location from a seismic signal source;  
decomposing said hydrophone signal into a plurality of bandwidth-limited hydrophone signals;



receiving a geophone signal at a geophone seismic sensor located at the hydrophone/geophone receiver location from the seismic signal source;  
decomposing said geophone signal into a plurality of bandwidth-limited geophone signals, the pass-bands of the bandwidth-limited geophone signals being substantially equal to the pass-bands of the bandwidth-limited hydrophone signals;  
normalizing said hydrophone and geophone signals; and  
combining the normalized signals;  
wherein coherent noise is attenuated in the combined and normalized signals.

5,774,417

## AMPLITUDE AND PHASE COMPENSATION IN DUAL-SENSOR OCEAN BOTTOM CABLE SEISMIC DATA PROCESSING

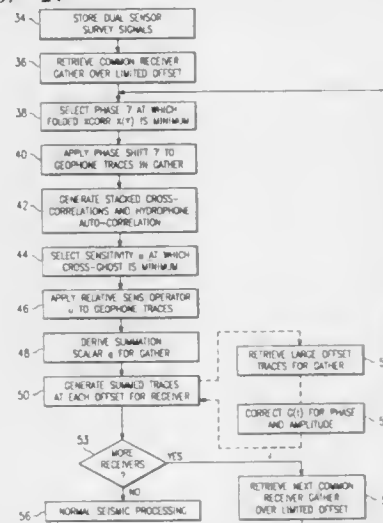
Dennis Corrigan, Plano, Tex., and Vaughn L. Ball, Kemang, Indonesia, assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Oct. 25, 1996, Ser. No. 738,026

Int. Cl.<sup>6</sup> G01V 1/28; 1/38

U.S. Cl. 367—24

23 Claims



1. A method of filtering the effects of ghost reflections from dual sensor marine seismic survey signals, comprising the steps of:  
retrieving signals corresponding to a plurality of pairs of pressure and velocity traces measured at a first receiver location in the survey, wherein the pressure and velocity traces in each pair each include a modulated signal corresponding to energy imparted from a common source location in the survey and reflected from a subsurface reflecting interface;  
from the plurality of pairs of pressure and velocity traces, estimating a relative phase angle between the modulated signals of the pressure and velocity traces;

phase-modifying the pressure and velocity traces in each pair, relative to one another, with a phase shift corresponding to the estimated relative phase angle;  
 from the plurality of pairs of pressure and velocity traces, estimating a relative sensitivity between the modulated signals of the pressure and velocity traces;  
 amplitude-modifying the pressure and velocity traces in each pair, relative to one another, with an amplitude scalar corresponding to the estimated relative sensitivity; and  
 after the phase-modifying and amplitude-modifying steps, performing a weighted summing of the pressure and velocity traces in each pair, using a summation scalar as a weighting factor, to generate a plurality of summed traces.

5,774,418

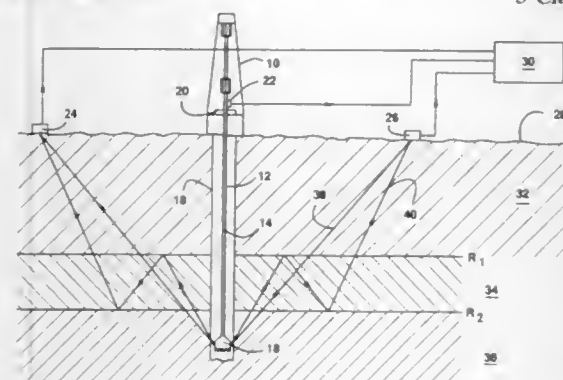
## METHOD FOR ON-LINE ACOUSTIC LOGGING IN A BOREHOLE

Jean Magendie, and Elyes Draoui, both of Pau, France, assignors to Elf Aquitaine Production, France  
 Continuation of Ser. No. 569,165, Dec. 22, 1995, abandoned.

This application Apr. 3, 1997, Ser. No. 826,499  
 Claims priority, application France, Apr. 28, 1994, 94/05166  
 Int. Cl.<sup>6</sup> G01V 1/40

U.S. Cl. 367—25

3 Claims



1. An on-line acoustic logging method, in which a drilling bit arranged at one end of a drilling string and rotated in a hole is used as the acoustic source, the method comprising the steps of:  
 measuring, at the upper end of the string, the acceleration and force of the vibrations produced in the string by the rotating drilling bit;  
 processing the acceleration and force measurements of the vibrations measured at the upper end of the string to deduce the pilot signals emitted by the bit downhole;  
 receiving acoustic signals emitted by the bit at at least one point on the ground remote from the bit, and  
 processing these signals to obtain data relating to the rock surrounding the hole by comparing the acoustic signals received on the ground with the deduced pilot signals, wherein the acceleration and force measurements of the vibrations measured at the upper end of the string are processed by applying to them the following transfer function to determine the force and acceleration values emitted by the bit downhole:

$$M_{pipe} = \begin{pmatrix} ch(g \cdot L) & -j \cdot Z \cdot sh(g \cdot L) \\ -W \cdot sh(g \cdot L) & ch(g \cdot L) \end{pmatrix} \cdot \begin{pmatrix} -j \cdot Z \cdot sh(g \cdot L) \\ W \end{pmatrix}$$

in which:

$$g^2 = -\left(\frac{W}{a}\right)^2 + \frac{j \cdot W \cdot c}{(\rho \cdot S \cdot a)^2}$$

$$Z^2 = (\rho \cdot S \cdot a)^2 - \frac{j \cdot c}{W} \cdot \rho \cdot S \cdot a^2$$

and in which:

L: length of the pipe  
 a: propagation velocity of the vibrations in the pipe.  
 S: cross-sectional area of the pipe.  
 c: damping of the vibrations in the pipe.  
 ρ: density of the pipe.  
 j: complex ( $j^2 = -1$ ).

5,774,419

## HIGH SPEED POINT DERIVATIVE MICROSEISMIC DETECTOR

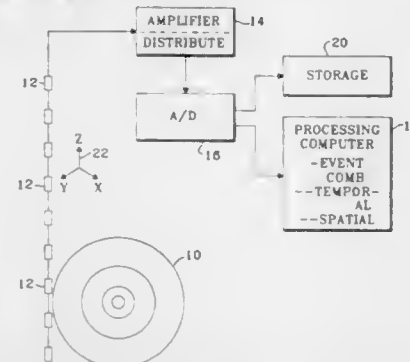
James Eugene Uhl; Norman Raymond Warpinski, and Ernest Blayne Whetten, all of Albuquerque, N. Mex., assignors to Gas Research Institute, Chicago, Ill.

Filed Jun. 18, 1996, Ser. No. 665,471

Int. Cl.<sup>6</sup> G01V 1/28

U.S. Cl. 367—38

16 Claims



11. A method for detecting microseismic events in a continuous stream of microseismic signal data obtained from a plurality of receiver stations disposed to sense microseismic waves impinging thereon, the method comprising the steps of:

determining an ambient noise level present in signals obtained from said plurality of stations;

combing through time by derivative transforming the signal data from a selected one of said stations, and comparing an obtained derivative transform value to a trip level threshold;

declaring a trial microseismic event when the derivative transformed value exceeds said trip level threshold; and

combing through space to verify a declared trial microseismic event by applying said combing through time step to another one of said plurality of stations; and

declaring a valid microseismic event when said comb through space reveals that the trip threshold was exceeded by a derivative transformed value obtained from said another one of said plurality of stations.

5,774,420

## METHOD AND APPARATUS FOR RETRIEVING LOGGING DATA FROM A DOWNHOLE LOGGING TOOL

Dale R. Heyse, Sugar Land, and Al Jerabek, Houston, both of Tex., assignors to Halliburton Energy Services, Inc., Houston, Tex.

Filed Aug. 16, 1995, Ser. No. 515,985

Int. Cl.<sup>6</sup> G01V 1/40

U.S. Cl. 367—83

10 Claims

1. A method for retrieving data from an MWD/LWD tool while downhole, comprising:

providing in a drill string in a well a programmable, downhole tool capable of acquiring data and storing it in memory;

acquiring data while drilling a well and storing said data, said data being correlated with a sequential time record in memory; and

5,774,422

## METHOD OF AMPLITUDE SHADING IN THE TIME DOMAIN TO CONTROL SIDE LOBES IN THE FREQUENCY DOMAIN

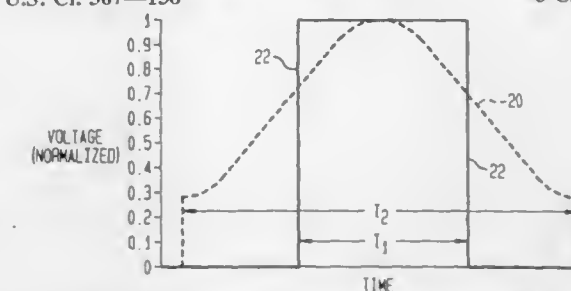
Michael J. Sullivan, Oakdale, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 15, 1997, Ser. No. 919,179

Int. Cl.<sup>6</sup> G01S 15/00

U.S. Cl. 367—138

6 Claims



transmitting a signal to said tool from a surface system by means of a mud pulse telemetry system while downhole instructing said tool to transmit by means of said mud pulse telemetry system selected stored data from memory, where said signal includes time record data selection information.

5,774,421

## UNDERWATER MEASUREMENT DEVICE

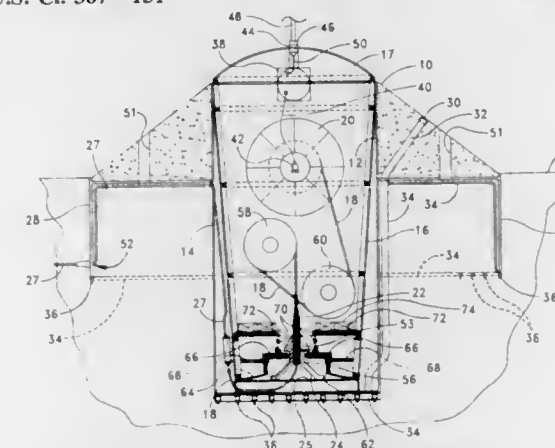
Harold T. Vincent, II, North Kingstown, and Robert A. Connerney, Middletown, both of R.I., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 4, 1997, Ser. No. 912,971

Int. Cl.<sup>6</sup> H04B 11/00

U.S. Cl. 367—131

15 Claims



1. An underwater measurement device comprising:

a housing for disposition on a sea bed surface;

an opening defined by said housing and extending through said housing;

a buoy sized and configured for disposition in said opening, and buoyant so as to be floatable out of said opening and toward a sea surface;

docking linkage means automatically operative to lock said buoy in said housing when said buoy is fully drawn into said housing, and for releasing said buoy upon floatation of said buoy upwardly;

a cable interconnecting said housing and said buoy;

a winch in said buoy adapted to pay out and take in said cable to permit said buoy to rise toward the sea surface and be drawn into said opening; and

a sensor fixed to said buoy for obtaining measurements.

5,774,423

## ACOUSTIC SENSOR AND ARRAY THEREOF

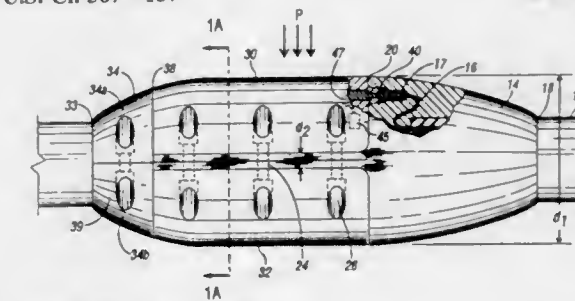
Richard E. Pearce, Roanoke, and Richard C. Farris, Dickinson, both of Tex., assignors to Innovative Transducers Inc., Fort Worth, Tex.

Filed Dec. 15, 1995, Ser. No. 573,009

Int. Cl.<sup>6</sup> H04R 17/00

U.S. Cl. 367—157

18 Claims



16. A sensor array, comprising:

(a) a cable having a plurality of serially spaced take-out conductors along the length of the cable;

(b) a separate hydrophone placed coupled to each said take-out conductor, each said hydrophone having two segments, each segment having:

(i) a substrate having an outer surface with a concavity thereon and an inner surface that is adapted to be removably attached on the cable,

(ii) a diaphragm placed on the concavity to form an enclosed chamber,

(iii) a flexible piezoelectric material bonded to the diaphragm; and



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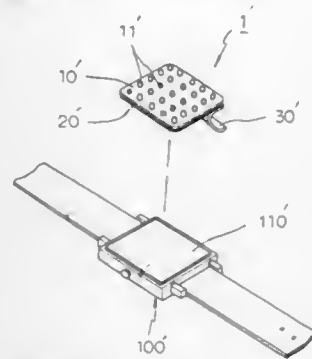
JUNE 30, 1998

(iii) an insulating material placed on the piezoelectric material to seal the piezoelectric material from the outside environment, and wherein the two segments are securely placed around the cable and electrically connected to each other.

5,774,424  
ACUPRESSURE STIMULATOR FOR A WATCH  
Tae Woo Yoo, 807, 1-Dong, Hanyang Apt., 32-5, Banpo-dong, Seocho-ku, Seoul, Rep. of Korea  
Filed Jan. 21, 1997, Ser. No. 784,571  
Claims priority, application Rep. of Korea, Aug. 23, 1996, 96-25365

Int. Cl.<sup>6</sup> G04B 47/00  
U.S. Cl. 368—10

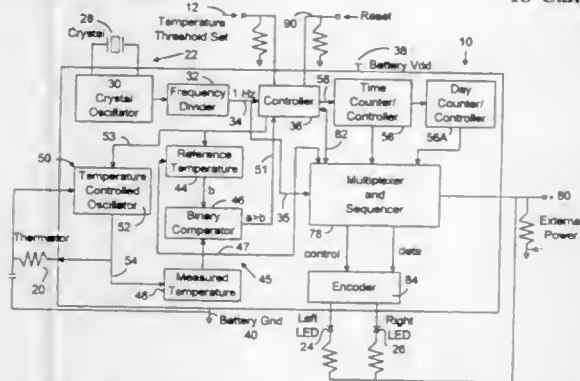
4 Claims



1. A watch comprising:  
a watch body, said watch body having an underside;  
a watch band for holding the watch body on a wrist of a person; and  
at least three pointed protuberances projected from the underside of the watch body for applying finger-pressure on the wrist of the person, in order to press and stimulate each blood vessel around the wrist to continuously stimulate blood flow thereat.

5,774,425  
TIME MONITORING APPLIANCE  
Andre Ivanov, Richmond, and Alan Arthur Lowe, Vancouver, both of Canada, assignors to The University of British Columbia, Vancouver, Canada  
Filed Nov. 15, 1996, Ser. No. 749,686  
Int. Cl.<sup>6</sup> G04B 47/00; G04F 8/00; G01K 1/02  
U.S. Cl. 368—11

18 Claims



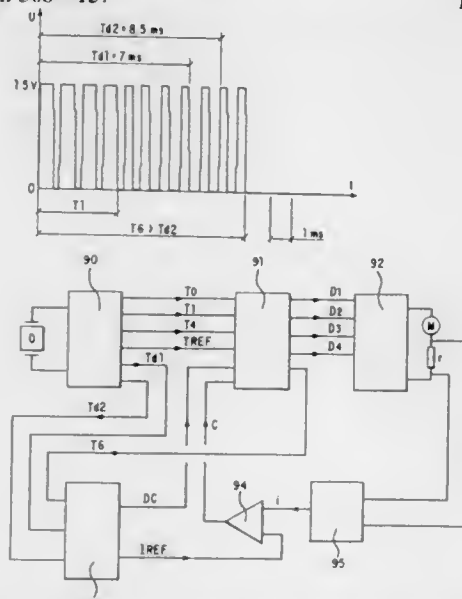
1. An apparatus for monitoring time of use of an appliance comprising a battery powered integrated circuit having a continuously operating timing oscillator means providing uniformly spaced time increment pulses, a controller, a sensor for sensing a condition indicating said appliance is in use, means for recurrently activating said sensor after time intervals each composed of a preselected number of said time increment pulses, said means for recurrently activating said sensor activating said sensor for time increments each of sufficient duration for said sensor to detect said

condition, means for determining if said sensed condition is on one side of or another side of a selected threshold for said condition, a counter for counting said time increment pulses, means for setting said counter to an ON position if said sensed condition is on said one side of said threshold and to an OFF position when said sensed condition is on said other side of said threshold, said ON position activating said counter to accumulate said time increment pulses continuously over succeeding of said time interval composed of a preselected number of said time increment pulses plus said time increment of sufficient duration for said sensor to detect said condition and record time of use based on counted number of said time increment pulses and thereby continue to accumulate said time increment pulses until said means for setting is set to said OFF position when said sensed condition is on said other side of said threshold and said OFF position activating means for preventing said counter from accumulating said time increment pulses until said means for setting sets said counter to said ON position.

5,774,426  
METHOD AND DEVICE FOR FEEDING A SINGLE-PHASE STEPPING MOTOR  
Mai Xuan Tu, Ecublens, and Michel Schwab, Bienne, both of Switzerland, assignors to Detra SA, Bienne, Switzerland  
Filed Jan. 28, 1997, Ser. No. 790,018  
Claims priority, application European Pat. Off., Feb. 13, 1996, 96810084

Int. Cl.<sup>6</sup> G06F 1/04; H02P 1/40  
U.S. Cl. 368—157

11 Claims



1. A method of feeding a single-phase stepping motor (M) for a timepiece, adapted to supply the motor with a sequence of chopped voltage pulses of total duration  $T_0$ , variable as a function of load conditions and as a function of the feed voltage, wherein said sequence of pulses of total duration  $T_0$  is made up of a first sequence, of total duration  $T_1$ , of chopped pulses during which the cyclical ratio of said pulses is constant and of a second sequence of partial voltage pulses, each being of constant duration  $T_4$  and of the same polarity as the pulses of the first sequence of total duration  $T_1$ , separated from each other by time intervals  $T_s$ , during which the coil of the motor is short-circuited, the first time interval  $T_s$ , being delimited by the end of the first sequence of pulses of total duration  $T_1$  and by the instant following that end when the current of the coil is smaller or equal to a reference value  $I_{ref}$ , the other time intervals  $T_s$ , being delimited by the end of a said pulse of duration  $T_4$  and by the instant following that end when the current of the coil is smaller or equal to the reference value  $I_{ref}$ , the said reference value  $I_{ref}$  and said cyclical ratio of pulses of the first sequence of total duration  $T_1$  being adapted as a function of the level of load of the motor.

JUNE 30, 1998

ELECTRICAL

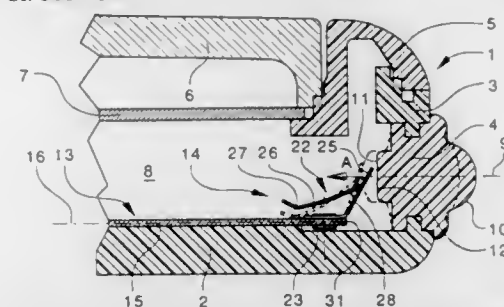
5357

5,774,427  
ELECTRIC SWITCH DEVICE ON A PRINTED CIRCUIT AND WATCH COMPRISING SUCH A DEVICE  
Jean-Philippe Rebeaud, Cressier, Switzerland, assignor to Eta Sa Fabriques D'Ebauches, Grenchen, Switzerland  
Filed Sep. 30, 1997, Ser. No. 941,291  
Claims priority, application European Pat. Off., Dec. 2, 1996, 96119280

Int. Cl.<sup>6</sup> G04C 17/00

U.S. Cl. 368—321

12 Claims



1. An electric switch device on a printed circuit comprising an insulating substrate which extends substantially in a plane in the area of the switch and which carries at least one conductive pad of said printed circuit, said switch device further comprising a contact element fixed to a point of attachment which is fixed with respect to said substrate, said contact element being able to be deformed elastically between a rest position in which it does not contact said conductive pad and a closing position in which a contact portion of said contact element is in contact with said pad, and a control element which is able to move in a direction of pressure substantially parallel to the plane of said substrate and distant from said plane to push said contact element in said direction in order to place said contact element in its closing position, wherein said point of attachment is situated close to the plane of said substrate and wherein said contact element is flexible between said point of attachment and a point of application of said pressure, so that it bends under said pressure and that said contact portion follows a trajectory approximately perpendicular to the plane of said substrate when it comes into contact with said conductive pad.

5,774,428  
METHOD AND APPARATUS FOR MAGNETO-OPTICAL RECORDING OR REPRODUCING USING MODULATED MAGNETIC FIELD

Tomoyuki Miyake, Nara; Nobuo Ogata, Shiki-gun, and Kunio Kojima, Nabari, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

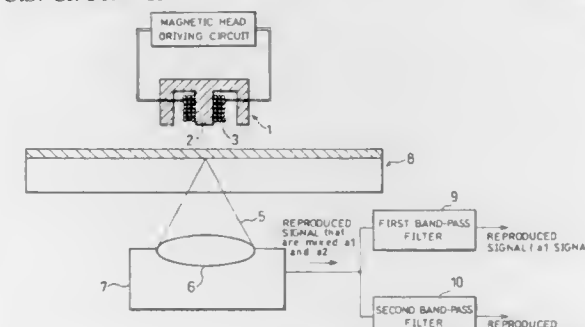
Filed Jun. 27, 1996, Ser. No. 671,898

Claims priority, application Japan, Jul. 11, 1995, 7-175208

Int. Cl.<sup>6</sup> G11B 11/00

U.S. Cl. 369—13

15 Claims



1. A magneto-optical recording method for recording information on a magneto-optical recording medium, comprising the steps of:

generating a plurality of signals to be recorded, said signals having different frequency bands which do not overlap each other;

deciding a recording order for recording said plurality of signals; recording a first data signal among said plurality of signals on a track of said magneto-optical recording medium to have a recording bit width  $W_1$  in the recording order by modulating a recording magnetic field according to said first data signal and applying said recording magnetic field to said magneto-optical recording medium; and

recording a second data signal different from said first data signal among said plurality of signals in a portion of said track of said magneto-optical recording medium wherein said first data signal is recorded to have a recording bit width  $W_2$  which is narrower than said recording bit width  $W_1$  in the recording order by modulating said recording magnetic field according to said second data signal and applying said recording magnetic field to said magneto-optical recording medium.

5,774,429  
MAGNETO-OPTICAL RECORDING MEDIUM, AND INFORMATION RECORDING/REPRODUCTION METHOD USING THE MEDIUM

Naoki Nishimura, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

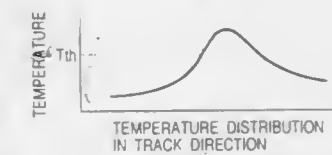
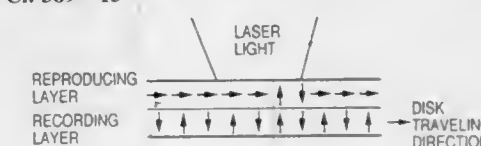
Division of Ser. No. 389,767, Feb. 16, 1995, abandoned. This application Mar. 5, 1997, Ser. No. 812,308

Claims priority, application Japan, Feb. 18, 1994, 6-020761

Int. Cl.<sup>6</sup> G11B 11/00

U.S. Cl. 369—13

2 Claims



1. An information recording method for recording information on a magneto-optical recording medium using a light beam, the magneto-optical recording medium comprising:

a transparent substrate;

a first magnetic layer supported by the substrate, the first magnetic layer being in an in-plane magnetization state at room temperature and being in a perpendicular magnetization state when the temperature of the first magnetic layer is within a predetermined temperature range between room temperature and the Curie temperature of the first magnetic layer; and

a second magnetic layer supported by the first magnetic layer, the second magnetic layer having a Curie temperature higher than room temperature and lower than the Curie temperature of the first magnetic layer, the second magnetic layer being in a perpendicular magnetization state when the temperature of the second magnetic layer is between room temperature and the Curie temperature of the second magnetic layer, wherein a direction of magnetization of the first magnetic layer is anti-parallel to a direction of magnetization of the second magnetic layer when the first and second magnetic layers are in their perpendicular magnetization states, said method comprising the steps of:

moving the medium;

applying a bias magnetic field having an intensity  $H_b$  to a portion of the medium using bias magnetic field applying means; and

selectively irradiating the portion of the medium to which the bias magnetic field is applied with one of a first kind of light beam and a second kind of light beam, using an optical head, in accordance with information to be recorded, wherein

- (a) the first kind of light beam has an intensity that raises the temperature of the medium to a temperature T1 that is higher than the Curie temperature of the second magnetic layer and falls within the predetermined temperature range, wherein the second magnetic layer loses its magnetization when its temperature rises above its Curie temperature, the magnetization of the first magnetic layer becomes oriented in a direction of the bias magnetic field at the temperature T1 and, when the temperature of the second magnetic layer cools to its Curie temperature and the second magnetic layer regains its magnetization,

- (i) the condition  $\sigma_w/(2M_s - h_2) - H_c < H_b$  is satisfied, where  $\sigma_w$  is a magnetic wall energy between the first and second magnetic layers,  $M_s$  is the saturation magnetization of the second magnetic layer,  $h_2$  is the film thickness of the second magnetic layer, and  $H_c$  is the coercive force of the second magnetic layer, and

- (ii) the magnetization of the second magnetic layer becomes oriented in the direction of the bias magnetic field, and the second magnetic layer retains its magnetization state while its temperature thereafter cools to room temperature, and

- (b) the second kind of light beam has an intensity that raises the temperature of the medium to a temperature T2 that falls within the predetermined temperature range and that is higher than the temperature T1,

wherein the second magnetic layer loses its magnetization when its temperature rises above its Curie temperature, the magnetization of the first magnetic layer becomes oriented in a direction of the bias magnetic field at the temperature T2 and, when the temperature of the second magnetic layer cools to its Curie temperature and the second magnetic layer regains its magnetization,

- (i) the condition  $\sigma_w/(2M_s - h_2) - H_c > H_b$  is satisfied, and
- (ii) the magnetization of the second magnetic layer becomes oriented in a direction that is anti-parallel to the direction of the magnetization of the first magnetic layer through an exchange-coupling force, and the second magnetic layer retains its magnetization state while its temperature thereafter cools to room temperature.

5,774,430

**OPTICAL MODULATION OVERWRITABLE  
MAGNETOOPTICAL RECORDING MEDIUM**

Takashi Ikeda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

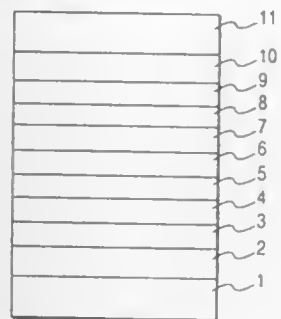
Filed Mar. 28, 1997, Ser. No. 827,467

Claims priority, application Japan, Apr. 1, 1996, 8-078954

Int. Cl. G11B 11/00

U.S. Cl. 369—13

2 Claims



1. A magnetooptical recording medium comprising:  
a transparent substrate;

a first magnetic layer composed chiefly of GdFeCo, said first magnetic layer serving as a reproducing layer;

a second magnetic layer, said second magnetic layer serving as a memory layer;

a third magnetic layer, said third magnetic layer serving as an intermediate layer;

a fourth magnetic layer, said fourth magnetic layer serving as a writing layer;

a fifth magnetic layer, said fifth magnetic layer serving as a switching layer; and

a sixth magnetic layer, said sixth magnetic layer serving as an initializing layer;

wherein said first, second, third, fourth, fifth and sixth magnetic layers are laid down over said substrate in this order, coercive-force energy of said fourth magnetic layer near a Curie temperature of said second magnetic layer is equal to or more than  $5 \times 10^4$  erg/cc, and a relation of  $2E_w t_w < \sigma_w - \sigma_c$  is satisfied at room temperature where  $E_w$ ,  $t_w$ ,  $\sigma_w$  and  $\sigma_c$  are respectively coercive-force energy of said fourth magnetic layer, a layer thickness of said fourth magnetic layer, an energy density of an interfacial magnetic wall to be formed in said fifth magnetic layer and an energy density of an interfacial magnetic wall to be formed in said third magnetic layer.

5,774,431

**TABLE-OF-CONTENTS CACHING METHOD FOR  
STORED COMPACT DISCS**

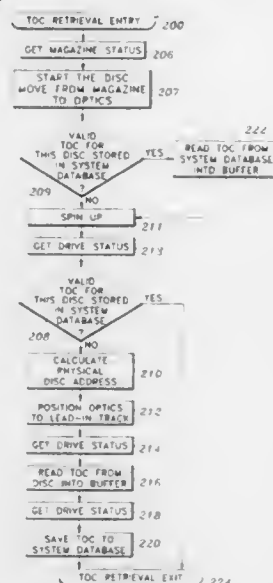
Eric Rene Bos, Fountain Valley, and Robert L. Montelius, Jr., Laguna Hills, both of Calif., assignors to MultiDisc Technologies, Newbury Park, Calif.

Filed Jan. 29, 1997, Ser. No. 790,561

Int. Cl. G11B 17/22

U.S. Cl. 369—30

7 Claims



1. A method for enhancing access to a CD-ROM stored in a magazine, the method comprising the steps of:

- a) loading a CD-ROM into a CD-ROM reader;  
b) reading a table of contents from the CD-ROM;  
c) storing the table of contents at a known location in a non-volatile memory;  
d) storing the CD-ROM at a known location within a magazine;  
e) correlating for substantially simultaneous retrieval the location of the table of contents and the location of the CD-ROM;  
f) retrieving the table of contents and the CD-ROM to the CD-ROM reader; and

- g) accessing the contents of the CD-ROM through employment of the retrieved table of contents without re-reading from and confirming the table of contents of the CD-ROM.

5,774,432

**FOCUSING SYSTEM AND METHODS FOR MULTI-  
TRACK OPTICAL DISK APPARATUS**

Amir Alon, Sunnyvale, Calif.; Jacob Finkelstein, Kfar Saba, Israel; Itzhak Katz, Petach-Tikva, Israel; Michael Naor, Rehovot, Israel, and Shlomo Shapira, Petach-Tikva, Israel, assignors to Zen Research N.V., Curacao, Netherlands Antilles

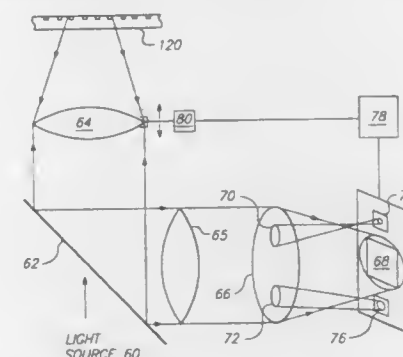
Division of Ser. No. 531,764, Sep. 20, 1995, Pat. No. 5,708,634.

This application Apr. 25, 1997, Ser. No. 842,936

Int. Cl. G11B 7/095

U.S. Cl. 369—44.23

15 Claims



1. A method of correcting the focus in apparatus for simultaneously reading multiple tracks of an optical disk, the apparatus including a light source providing a wide-area field of illumination that covers multiple tracks, an image detector, an objective, and a servo-system that moves the objective, the method comprising steps of:

- providing a lens having first and second micro-lenses of different focal lengths;  
providing first and second focus detectors generating outputs;  
positioning the first and second focus detectors adjacent to the image detector;  
positioning the lens within a light beam reflected from the optical disk corresponding to the wide-area field of illumination so that light passing through the first micro-lens is directed to the first focus detector and light passing through the second micro-lens is directed to the second focus detector, the first micro-lens having a focal length shorter than a distance between the first micro-lens and the first focus detector, the second micro-lens having a focal length longer than a distance between the second micro-lens and the second focus detector; and

- computing an error signal from the outputs of the first and second focus detectors to drive the servo-system responsive to a distortion of the light beam reflected from the optical disk.

5,774,433

**OPTICAL RECORDING/REPRODUCING APPARATUS  
USING THREE COUNT CONTROL SIGNALS FOR  
COUNTING A NUMBER OF TRACKS CROSSED BY A  
LIGHT BEAM**

Takao Rokutan, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 14, 1996, Ser. No. 615,775

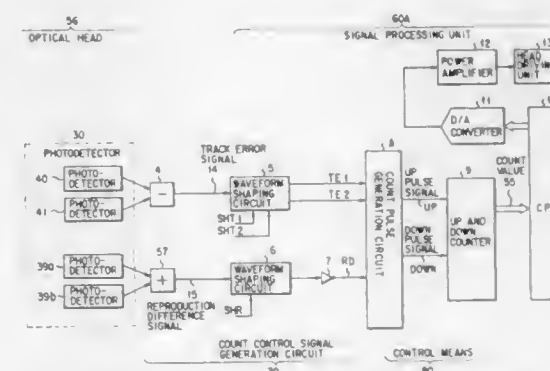
Claims priority, application Japan, Mar. 22, 1995, 7-062534

Int. Cl. G11B 7/085

U.S. Cl. 369—44.28

6 Claims

1. An optical recording/reproducing apparatus, comprising:  
a photodetector for detecting a response light beam of a light beam irradiated on an optical recording medium having a plurality of tracks on which data is recorded and a plurality of guide tracks arranged to separate said plurality of tracks;  
a count control signal generation circuit for performing a predetermined calculation of an output from said photodetector, thereby generating three binary count control signals having different phases with respect to each other so that a position of



the light beam on said tracks and said guide tracks along a direction of the light beam crossing said tracks is reflected; and

a count unit for counting a number of tracks crossed by the light beam based on the three count control signals generated by said count control signal generation circuit while recognizing a moving direction of the light beams;

wherein said count unit comprises:

- a count pulse generation circuit for generating a count pulse based on a positioning transition path of the light beam which transits in accordance with the three count control signals; and

- a track count circuit for counting count pulses output from said count pulse generation circuit.

5,774,434

**METHODS AND APPARATUS FOR RECORDING DATA  
ON AND DELETING ALREADY RECORDED DATA  
FROM A RECORDING MEDIUM**

Yuji Arataki, Tokyo, and Hiroshi Yamaguchi, Chiba, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 422,121, Apr. 13, 1995, abandoned.

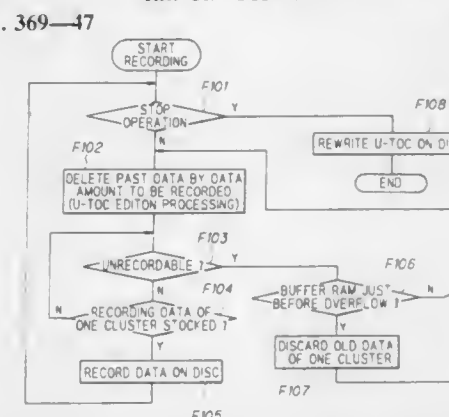
This application Nov. 1, 1996, Ser. No. 742,958

Claims priority, application Japan, Apr. 20, 1994, 6-104358

Int. Cl. G11B 7/00

U.S. Cl. 369—47

22 Claims



1. A recording method for a recording medium, the recording medium having a data recording area on which data are recorded and a management data area on which management data are recorded so as to manage a data recorded area and a data recordable area of the data recording area, comprising the steps of:

- when new data are to be over-written on already-recorded data of the recording medium, moving a recording head to a position of the recordable area on the basis of the management data which are recorded on the management data area; recording the new data to the recordable area, starting at the position to which the recording head has been moved; measuring the amount of the new data to be recorded on the recordable area; and editing the management data to delete an amount of the already-recorded data in an amount equal to that of the new data.



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OFFICIAL GAZETTE

JUNE 30, 1998

5,774,435  
DISC DEVICE

Yoshiaki Hirano, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

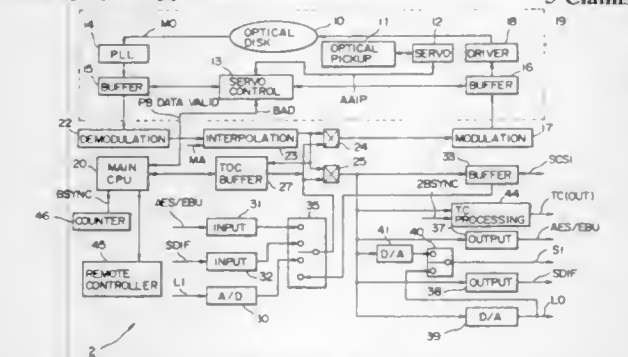
Filed Aug. 22, 1996, Ser. No. 701,723

Claims priority, application Japan, Aug. 23, 1995, 7-235918

Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369—50

5 Claims



1. A disc device for reproducing and outputting an information signal recorded on a disc-shaped recording medium, comprising: reproducing means for reproducing said information signal from said disc-shaped recording medium, said information signal being sequentially input and converted to a data structure having a specified format in specified block units, and time code generating means for generating a time code of said information signal reproduced by said reproducing means based on said information signal blocks and block addresses; wherein position information indicating recording and playback positions is previously recorded on said disc-shaped recording medium by preformatting, and said information signal recorded on said disc-shaped recording medium is recorded on said disc-shaped recording medium in said block units based on said position information.

5,774,436  
METHOD OF TRANSMITTING IDENTIFICATION DATA FOR SERVO CONTROL IN A DISC PLAYER

Jong-Sik Jeong, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea

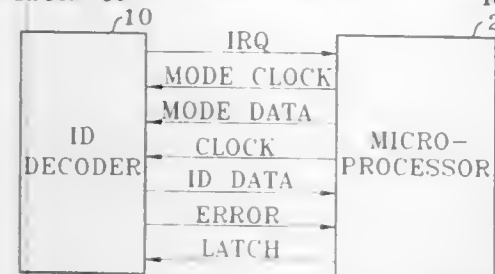
Filed Jan. 15, 1997, Ser. No. 783,702

Claims priority, application Rep. of Korea, Jan. 15, 1996, 96-632

Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369—50

10 Claims



5. A disc player for performing servo control operations using ID data, which represents a start of each sector recorded on a disc, said disc player comprising:

an ID decoder for decoding ID data extracted from a signal recorded on the disc, and outputting the decoded ID data at a first transmission rate; and control means, coupled to said ID decoder, for performing servo control operations based on the ID data output by said ID decoder, said control means comprising means for comparing said first transmission rate with an ID data processing rate of said control means and producing a compare signal corresponding to a difference between said first transmission rate and said ID data processing rate, and means for varying the

first transmission rate of the decoded ID data in the ID decoder based on said compare signal.

5,774,437  
ROTATION CONTROL APPARATUS AND ROTATION CONTROL METHOD FOR DISK TYPE INFORMATION RECORD MEDIUM

Masayoshi Yoshida, Tokorozawa-shi, Japan, assignor to Pioneer Electronic Corporation, Tokyo-to, Japan

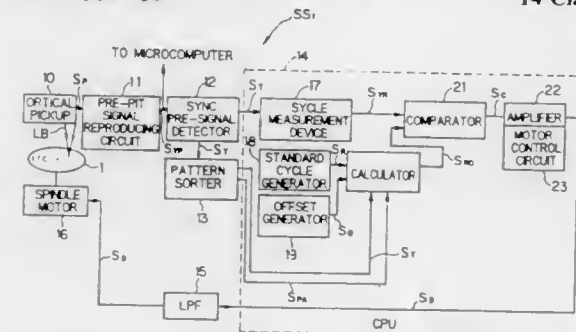
Filed Feb. 11, 1997, Ser. No. 798,056

Claims priority, application Japan, Feb. 13, 1996, 8-025626

Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369—50

14 Claims



1. A method of controlling a rotation of a motor to rotate an information record medium, on which a plurality of synchronization signals are recorded by a predetermined record interval such that a record interval of two consecutive synchronization signals is transiently changed from the predetermined record interval, said method comprising the steps of:

detecting the synchronization signals one after another from said information record medium; generating a standard signal having a predetermined cycle which is set in advance in correspondence with the predetermined record interval; detecting a changing amount of an interval, at which the synchronization signals are detected by said synchronization signals detecting step, from the predetermined record interval; and controlling the rotation of the motor to be in a predetermined rotation condition corresponding to the predetermined cycle by canceling the changing amount detected by said changing amount detecting step, on the basis of the standard signal generated by said standard signal generating step and the changing amount detected by said changing amount detecting step.

5,774,438  
DATA WRITING DENSITY JUDGING APPARATUS AND METHOD

Chong Yeop Park; Chang Woo Nam, both of Seoul, and Jong Jun Lee, Kyungki-do, all of Rep. of Korea, assignors to LG Electronics, Inc., Seoul, Rep. of Korea

Filed Oct. 31, 1995, Ser. No. 550,652

Claims priority, application Rep. of Korea, Nov. 1, 1994, 1994/28521; Dec. 24, 1994, 1994/36512; Dec. 24, 1994, 1994/365213

Int. Cl.<sup>6</sup> G11B 3/90

U.S. Cl. 369—54

10 Claims

1. A data writing density judging method for reproducing a disc, comprising the steps of: detecting a high frequency analog signal which indicates an amount of cross talk generated when a beam is scanned while a pickup moves in a traversing direction to a disc track after a focusing servo operation; obtaining a minimum value and a maximum value of the high frequency analog signal; obtaining a ratio value from the minimum and maximum values;

JUNE 30, 1998

ELECTRICAL

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5,774,440  
OPTICAL DATA STORAGE AND RETRIEVAL SYSTEM AND METHOD

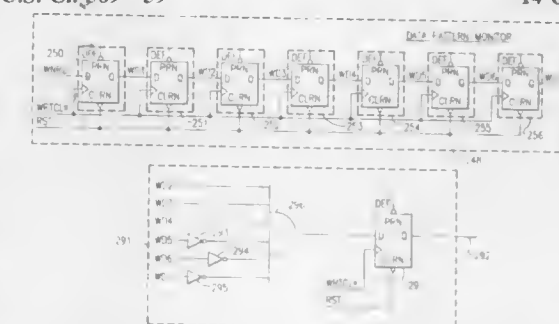
Noboru Kimura, Torrance; Ronald G. Vitullo, Laguna Niguel, and Yasuhiro Yamazaki, Cypress, all of Calif., assignors to Discovision Associates, Irvine, Calif.

Division of Ser. No. 964,518, Jan. 25, 1993, Pat. No. 5,537,379, which is a continuation-in-part of Ser. No. 934,401, Aug. 24, 1992, which is a continuation-in-part of Ser. No. 698,673, May 10, 1991, abandoned, and Ser. No. 758,059, Sep. 12, 1991, abandoned. This application Jun. 7, 1995, Ser. No. 487,354

Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369—59

14 Claims



comparing the ratio value with a predetermined standard value; and determining a data writing density of the disc based on the comparison result.

5,774,439  
OPTICAL-DISK RECORDING AND REPRODUCING APPARATUS AND OPTICAL DISK FOR RECORDING INFORMATION ON LANDS AND GROOVES

Kazuhiro Aoki, Suita; Motoshi Ito, Moriguchi, and Shunji Oohara, Higashiosaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

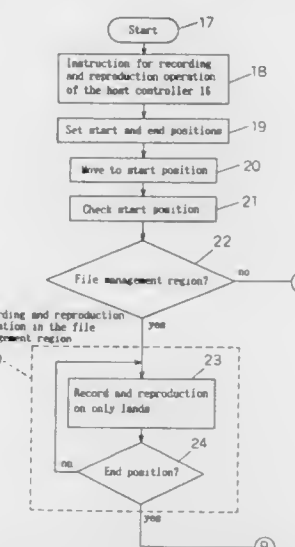
Filed Sep. 1, 1994, Ser. No. 299,606

Claims priority, application Japan, Sep. 16, 1993, 5-230074

Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369—54

2 Claims



1. An optical-disk recording and reproducing apparatus using an optical disk having a first region of lands and grooves and a second region of lands and grooves in which information is recorded, the apparatus comprising:

an optical head for applying laser light to the optical disk to yield an output of its reflected light; recording circuit for controlling the laser light of the optical head; a reproduction circuit for reproducing the output of the optical head; a detector circuit for detecting a signal recorded on the optical disk from a signal of the reproduction circuit; a servo circuit for applying servo by using the signal of the reproduction circuit; and a controller for controlling the servo circuit by using a signal of the detector circuit such that first information is recorded on only either lands or grooves and only in a first region of the optical disk, and second information is recorded on both lands and grooves only in a second region of the optical disk.

5,774,441  
METHOD OF AND APPARATUS FOR RECORDING/REPRODUCING VIDEO DATA IN DATA UNITS AS A UNIT OF DATA CORRESPONDING TO A PREDETERMINED NUMBER OF PICTURES

Masaki Nakagawa, Zama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

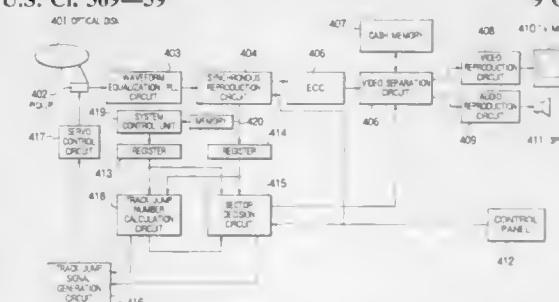
Filed Apr. 4, 1995, Ser. No. 416,195

Claims priority, application Japan, Apr. 8, 1994, 6-070900

Int. Cl.<sup>6</sup> G11B 7/00

U.S. Cl. 369—59

9 Claims



1. A method for recording and reproducing video data which are compression-encoded, the method comprising:

179-281 O.G. - 98 - 31 : QL 3

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grouping and recording the video data in a plurality of data units, each data unit being a unit of data corresponding to a predetermined number of pictures including at least one Group of Pictures, each of said data units having a first header and a first data portion, said first data portion having a plurality of sectors, each of said sectors having a second header and a second data portion in which the video data are recorded; and reproducing the recorded video data based on the data units.

5,774,442

**DISK TRANSFERRING DEVICE WITH A SINGLE MOTOR FOR MOVING A DISK ALONG FIRST AND SECOND POSITION AND FOR SEPARATING THE DISK GUIDES WHEN THE DISK IS IN THE SECOND POSITION**

Niro Nakamichi, Tokyo, Japan, assignor to Nakamichi Corporation, Tokyo, Japan

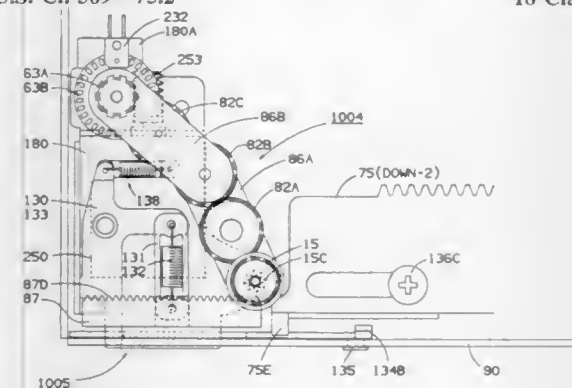
Filed Mar. 5, 1996, Ser. No. 611,534

Claims priority, application Japan, Mar. 5, 1995, 7-72285

Int. Cl.<sup>6</sup> G11B 17/04

U.S. Cl. 369—75.2

18 Claims





5,774,447

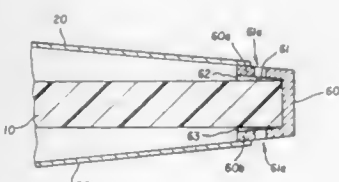
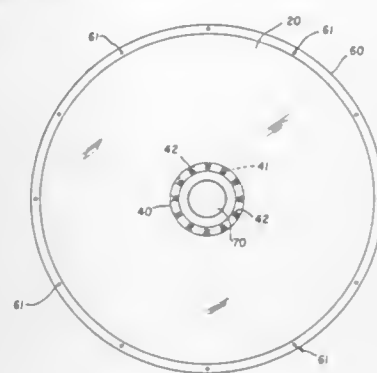
**OPTICAL DISCS WITH COVER SHEETS AND DYNAMIC PRESSURE STABILIZATION OF THE ENCLOSED AIR**  
Boris A. Shtipelman, Rochester, and James A. Barnard, Scottsville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 22, 1996, Ser. No. 755,085

Int. Cl.<sup>6</sup> G11B 7/24;33/14

U.S. Cl. 369—291

2 Claims



1. An optical disc having a substrate in which data can be written on or read from, said optical disc being adapted to be inserted and clamped onto a spindle in a disc drive and having first and second transparent cover sheets disposed over upper and lower surfaces of the substrate, respectively, comprising:

- said optical disc having a perimeter ring on an edge thereof and first and second spacers formed adjacent to a central opening in the optical disc;
- said first and second transparent cover sheets spaced from the upper and lower surfaces of the substrate, respectively, the perimeter ring includes a plurality of upper and lower air passages, respectively formed in upper and lower portions of the perimeter ring, that respectively lead from upper and lower spaces, respectively located between the first transparent cover sheet and the upper surface of the substrate and between the second transparent cover sheet and the lower surface of the substrate, to the outside atmosphere, and the first and second spacers being formed with a plurality of air passages leading from the outside atmosphere to the upper and lower spaces, respectively;
- filters provided across the air passages in the first and second spacer and the perimeter ring to prevent contaminants from the atmosphere from entering into the upper and lower spaces; and
- whereby the first and second transparent cover sheets are prevented from deflecting due to pressure differences between the outside atmosphere and the air in the upper and lower spaces by permitting a continuous flow of air through the air passages in the first and second spacers to the upper and lower spaces and out through the upper and lower air passages in the perimeter ring to the outside atmosphere when the optical disc is rotated.

5,774,448

**AIR SANDWICHED OPTICAL DISCS WITH CLOSABLE PRESSURE RELIEF HOLES**

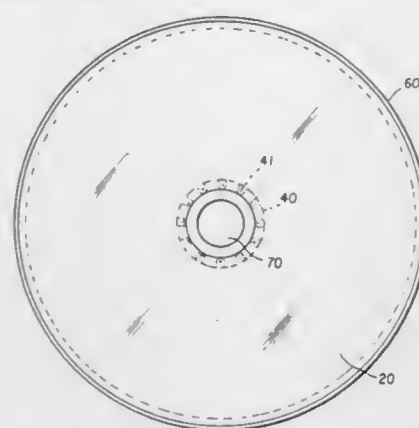
Boris A. Shtipelman, Rochester, and James A. Barnard, Scottsville, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 22, 1996, Ser. No. 756,197

Int. Cl.<sup>6</sup> G11B 7/24;33/14

U.S. Cl. 369—291

7 Claims



1. An optical disc having a substrate in which data can be written on or read from, such optical disc being adapted to be inserted and clamped onto a spindle in a disc drive and having a transparent cover sheet disposed over the substrate surface, comprising:

- means for holding the cover sheet at spaced inner and outer radii so that it is positioned to have a desired spacing from the substrate to prevent contaminants from passing to the substrate surface;
- means for preventing the transparent cover sheet from deflecting due to pressure differences between the outside atmosphere and the air in the space between the substrate surface and the transparent cover sheet, including:
  - means defining a plurality of passages substantially close to the center of the optical disc which provide communication between the atmosphere and the space between the transparent cover sheet and the substrate surface and located so that they are closed when the optical disc is inserted and clamped onto the spindle of a disc drive to close the passages to prevent further communication between the outside atmosphere and the space between the substrate surface and the transparent cover sheet.

5,774,449

**MULTIMEDIA-BASED DECISION SUPPORT SYSTEM FOR HAZARDS RECOGNITION AND ABATEMENT**

John B. Czachowski, Knoxville, Tenn., and John T. Zoldak, Alexandria, Va., assignors to Lockheed Martin Energy Systems, Inc., Oak Ridge, Tenn.

Filed Mar. 31, 1995, Ser. No. 415,054

Int. Cl.<sup>6</sup> G06F 17/40

U.S. Cl. 364—506

11 Claims

1. A system for monitoring a site and reporting at least one finding specific to the site, comprising:  
at least one portable data collection module including means for inputting site-specific findings data;  
memory means for storing optional categories of findings and a plurality of optional specific findings under each general category, including means for storing code reference data corresponding to each specific finding;  
means for displaying the optional categories and specific findings, and means for entering categories and specific findings chosen from those displayed including means for displaying the code reference data corresponding to each entered specific finding; and

5,774,451

Patent Not Issued For This Number

5,774,452

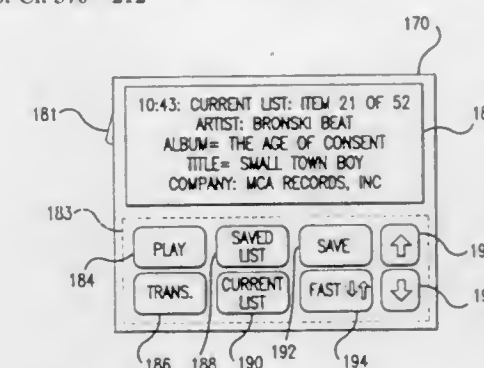
**APPARATUS AND METHOD FOR ENCODING AND DECODING INFORMATION IN AUDIO SIGNALS**  
Jack Wolosewicz, Cambridge, Mass., assignor to Aris Technologies, Inc., Cambridge, Mass.

Filed Mar. 14, 1995, Ser. No. 404,278

Int. Cl.<sup>6</sup> H04H 5/00

U.S. Cl. 370—212

12 Claims



means for generating a report for each finding based on the site-specific findings data.

5,774,450

**METHOD OF TRANSMITTING ORTHOGONAL FREQUENCY DIVISION MULTIPLEXING SIGNAL AND RECEIVER THEREOF**

Yasuo Harada, Kobe; Tomohiro Kimura, Kawachinagano; Hiroshi Oue, Neyagawa; Yasuo Nagaishi, Ikoma; Hiroshi Hayashino, Takarazuka, and Yasuhiro Uno, Katano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

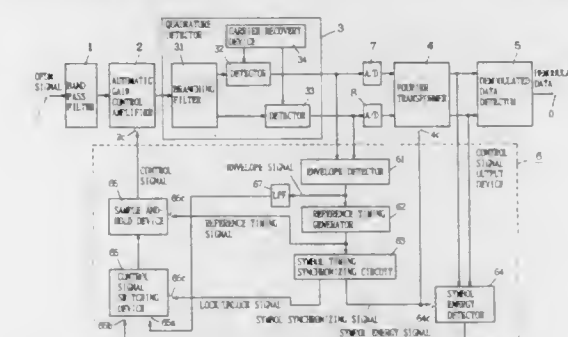
Filed Dec. 29, 1995, Ser. No. 580,887

Claims priority, application Japan, Jan. 10, 1995, 7-002053; Jan. 10, 1995, 7-002054

Int. Cl.<sup>6</sup> H04J 11/00; H04L 27/34

U.S. Cl. 370—206

16 Claims



1. A method of transmitting an orthogonal frequency division multiplexing signal for each of a plurality of symbols having a predetermined length, from a transmitting end to a receiving end through a wire or radio transmission line, said method comprising:  
the transmitting end continuously transmitting a first symbol which includes data to be transmitted, a multiplexing signal of the data randomly changing; and  
the transmitting end intermittently transmitting a second symbol having a predetermined particular pattern, every time a predetermined number of the first symbols are transmitted; and  
the receiving end demodulating data on the basis of the received first symbol; and  
the receiving end correcting the variation in a receiving level based on the received second symbol.

5,774,453

**INPUT/OUTPUT BUFFER TYPE ATM SWITCH**  
Maki Fukano; Tatsuo Nakagawa, and Kenji Yamada, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Apr. 16, 1996, Ser. No. 633,214

Claims priority, application Japan, Apr. 18, 1995, 7-092217; Int. Cl.<sup>6</sup> H04L 12/56

U.S. Cl. 370—231

4 Claims

1. An ATM switch having an input buffer memory and an output buffer memory for storing cells at each of a plurality of input ports and a plurality of output ports, and the cells inputted from each of input ports being switched and distributed to the output ports by a main body of the switch arranged between each of the input ports and each of the output ports, said ATM switch comprising:  
an output buffer means corresponding to each of the output port for storing cells to be outputted to the output port comprising:  
a first logical queue containing a plurality of first: priority queues for storing cells depending on traffic priority indicated by the cell inputted to the output buffer means;

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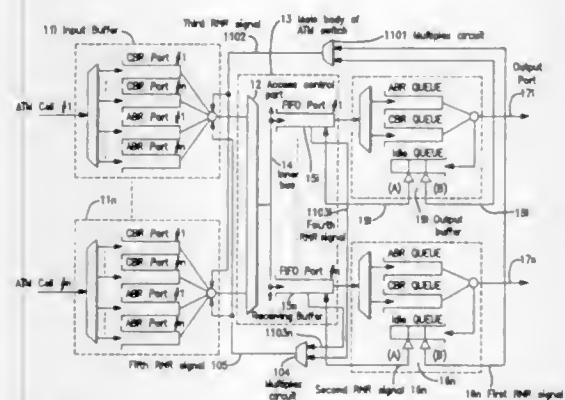
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an idle queue for supervising remaining capacity to be used of the first logical queue, and for generating a plurality of overflow signals corresponding to a plurality of predetermined threshold values of remaining capacity depending on defining congestion states of the output buffer means, each of the overflow signals containing discriminating information of the output buffer means as origin of the overflow signal being generated;

an input buffer means corresponding to each of the input port for storing cells to be outputted to the main body of the switch comprising:

a plurality of second logical queues, each corresponding to each of the output ports, and each containing a plurality of second priority queues for storing cells depending on traffic priority indicated by the cell inputted to the input buffer means;

a control means for stopping cell output from the second priority queues, having predetermined traffic priority corresponding to the congestion state represented by the overflow signal being received, corresponding to the output buffer means generating the overflow signal, unless otherwise other higher second priority queues contain no cell to be outputted.

5,774,454  
COMPENSATED UPC/NPC ALGORITHM TO  
GUARANTEE THE QUALITY OF SERVICE IN ATM  
NETWORKS

Yong-Jin Kim; Il-Young Chong, and Jin-Pyo Hong, all of Daejeon, Rep. of Korea, assignors to Electronics and Telecommunications Research Institute, Daejeon-shi, Rep. of Korea

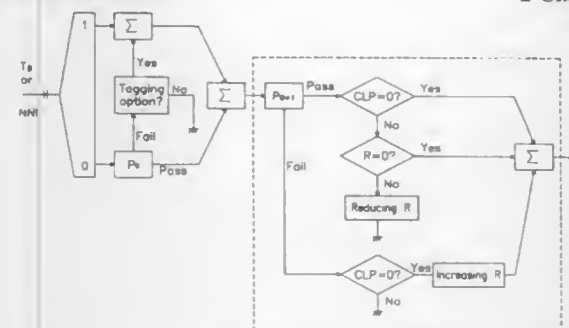
Filed Nov. 27, 1995, Ser. No. 562,885

Claims priority, application Rep. of Korea, Dec. 22, 1994, 1994-36020

Int. Cl.<sup>6</sup> H04L 12/26; 12/56

U.S. Cl. 370—232

2 Claims



1. UPC/NPC method for guaranteeing the quality of service in an asynchronous transfer mode networks including the steps of performing a conformance test for a stream of cell loss priority (CLP)=0 cells; passing a conformable cell and transmitting a

non-conformable cell with a tag of CLP=1 or rejecting the non-conformable cell by a tagging option, the method comprising the steps of:

a first procedure including:

adding the passed CLP=0 cells and CLP=1 cells with the tag to the previous stream of CLP=1 cells;  
evaluating whether CLP=0+1 cells are conformable or not; ensuring to admit CLP=0 cells to the networks that pass the test regardless of the result of the conformance evaluation for CLP=0+1; and  
writing the number of CLP=0 cells that pass against the test for CLP=0 into a register R; and

a second procedure including:

rejecting the non-conformable CLP=1 cells by the conformance evaluation test for CLP=0+1 of said first procedure; and  
rejecting CLP=1 that pass the conformance tests by the number of the value of the register R so as to guarantee CLR for the stream of CLP=0+1 cells.

5,774,455  
DATA TRANSMISSION APPARATUS AND METHOD AND  
DATA COMMUNICATION SYSTEM CONDUCTING  
VARIABLE BIT-RATE DATA TRANSMISSION

Fumiyoshi Kawase, Iwatsuki; Takanori Hisanaga, and Koh Kamizawa, both of Nakai-machi, all of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

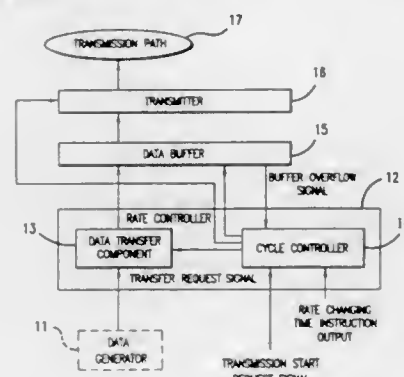
Filed Jun. 20, 1996, Ser. No. 666,234

Claims priority, application Japan, Jun. 21, 1995, 7-154618

Int. Cl.<sup>6</sup> H04J 3/16

U.S. Cl. 370—232

5 Claims



1. A digital data transmission apparatus comprising:  
digital data storing means for storing digital data to be transmitted;

digital data output means for outputting said digital data stored in said digital data storing means to a transmission path; and  
control means for controlling a transmission rate which is an amount of data outputted per a unit time by said digital data output means so that said transmission rate increases in accordance with passage of time.

said control means comprising:

transfer request signal output means for outputting a transfer request signal which requests said digital data output means to output said digital data to said transmission path; and  
cycle control means for increasing the number of said transfer request signals output by said transfer request signal output means in every predetermined time.

said digital data output means transmits a predetermined amount of said digital data to said transmission path in accordance with said transfer request signal output by said transfer request signal output means.

5,774,456  
METHOD AND APPARATUS FOR ADOPTING  
PERFORMANCE REPORT MESSAGES IN A  
TELECOMMUNICATIONS SYSTEM

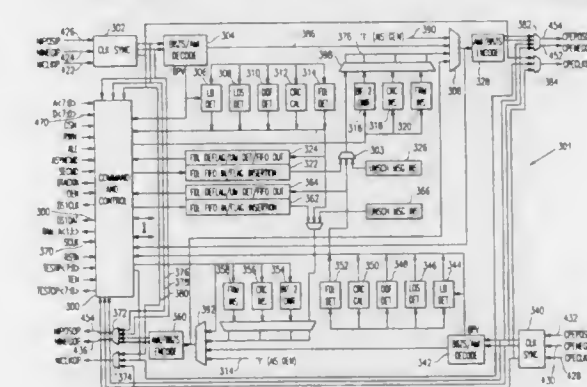
Edward T. Ellebracht; Paul R. Hartmann, both of Escondido; Ramone A. Hecker, Del Mar; Kevin T. Pope, Poway, and Maynard A. Wright, Citrus Heights, all of Calif., assignors to Applied Digital Access, Inc., San Diego, Calif.

Continuation-in-part of Ser. No. 372,819, Dec. 23, 1994, Pat. No. 5,566,161. This application Sep. 30, 1996, Ser. No. 723,096

Int. Cl.<sup>6</sup> H04J 3/14

U.S. Cl. 370—242

12 Claims



1. A method for determining whether an event originated within customer premises equipment or network equipment within a telephone system, including the steps of:

(a) receiving at a network interface, a first signal from a customer premises equipment, the first signal including a performance report message;

(b) determining whether any conditions are present in the first signal which would cause a diagnostic bit within a performance report message to be set if the performance report message were being generated based upon the condition of the first signal;

(c) if any conditions are present in the first signal which would cause a diagnostic bit within a performance report message to be set if the performance report message were being generated based upon the condition of the first signal, then modifying the performance report message by setting the U2 bit of a performance report message generated by the customer premises equipment and received as part of the first signal; and

(d) sending the performance report message generated by the customer premises equipment and received as part of the first signal to the network with the U2 bit set if the performance report message has been modified, and sending the performance report message generated by the customer premises equipment and received as part of the first signal to the network with the U2 bit not set if the performance report message has not been modified.

5,774,457  
MULTI-POINT VIDEO CONFERENCE CONTROL  
APPARATUS

Junichi Iizawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 18, 1996, Ser. No. 751,724

Claims priority, application Japan, Nov. 21, 1995, 7-302650

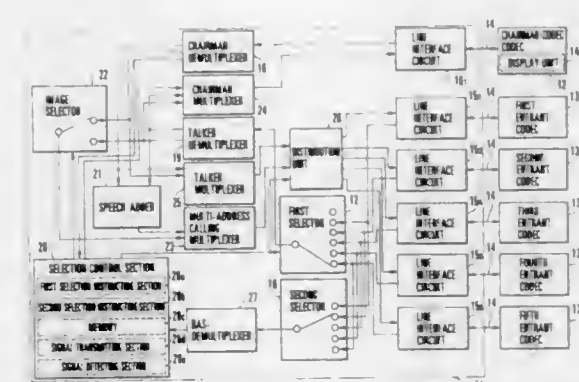
Int. Cl.<sup>6</sup> H04N 7/15

U.S. Cl. 370—260

8 Claims

1. A multi-point video conference control apparatus comprising:  
first signal separation means for separating a multiplexed signal transmitted from a specific first terminal station into video and speech signals;

first multiplexed signal selection means for selecting one of multiplexed signals transmitted from a plurality of second terminal stations other than said first terminal station;



second signal separation means for separating the multiplexed signal selected by said first multiplexed signal selection means into video and speech signals;

speech signal addition means for adding the speech signals output from said first and second signal separation means;

video signal selection means for selecting one of the video signals output from said first and second signal separation means;

talk request signal detection means for detecting a talk request signal indicating a talk request transmitted from one of said second terminal stations;

first selection instructing means for, when a talk request signal is detected, instructing said first multiplexed signal selection means to select a multiplexed signal from one of said second terminals which is a talk request source on the basis of the detected talk request signal;

second selection instructing means for instructing said video signal selection means to select a video signal from said second signal separation means when a talk request signal is detected, and instructing said second selection instructing means to select a video signal from said first signal separation means when no talk request signal is detected by said talk request signal detection means;

first signal multiplexing means for multiplexing the video signal selected by said video signal selection means and the speech signal output from said speech addition means; and

signal distribution means for, when a talk request signal is detected, transmitting a signal based on the multiplexed signal transmitted from said first terminal station to one of said second terminal stations which is the talk request source, and transmitting the multiplexed signal from said first signal multiplexing means to said second terminal stations other than the talk request source, and when a talk request is not detected by said talk request signal detection means, transmitting the multiplexed signal from said first signal multiplexing means to all said second terminal stations.

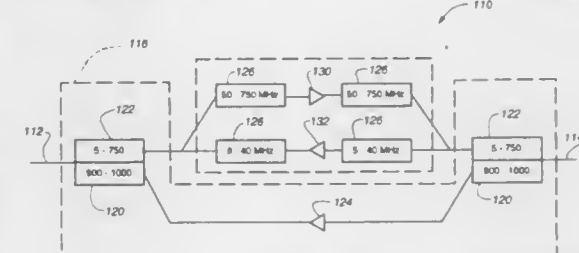
5,774,458  
MULTIPLEX AMPLIFIERS FOR TWO-WAY  
COMMUNICATIONS IN A FULL-SERVICE NETWORK  
Louis D. Williamson, Denver, Colo., assignor to Time Warner Cable, Stamford, Conn.

Filed Dec. 14, 1995, Ser. No. 572,141

Int. Cl.<sup>6</sup> H04B 1/56; H04L 5/14

U.S. Cl. 370—276

13 Claims



1. An apparatus for amplifying upstream and downstream signals, said signals comprising at least three different portions of a



communications spectrum and wherein at least two said portions require amplification in opposing upstream and downstream directions; said apparatus comprising:

- an upstream port wherein upstream signals are input into said apparatus;
- a downstream port wherein downstream signals are input into said apparatus;
- a first stage connected to said upstream and said downstream ports, said first stage filtering out a first portion of said spectrum and passing said first portion between said upstream and downstream ports, said first stage comprising a first pair of first stage filters for filtering said first portion from said upstream and said downstream signals and a second pair of first stage filters for passing the remaining spectrum;
- a second stage connected to said second pair of first stage filters, said second stage filtering out a second and a third portion from said remaining spectrum; said second stage comprising a first pair of second stage filters for filtering said second portion and a second pair of second stage filters for filtering said third portion;

wherein said first stage and said second stage are electrically isolated.

5,774,459

#### METHOD OF MANAGING THE TRANSMISSION OF MESSAGES FROM A SET OF TRANSMITTERS TO A SINGLE RECEIVER ON A SINGLE CHANNEL

Bruno Charat, Aubagne, France, assignor to Gemplus Card International, Gemenos, France

PCT No. PCT/FR94/00569, § 371 Date Nov. 13, 1995, § 102(e) Date Nov. 13, 1995, PCT Pub. No. WO94/27253, PCT Pub. Date Nov. 24, 1994

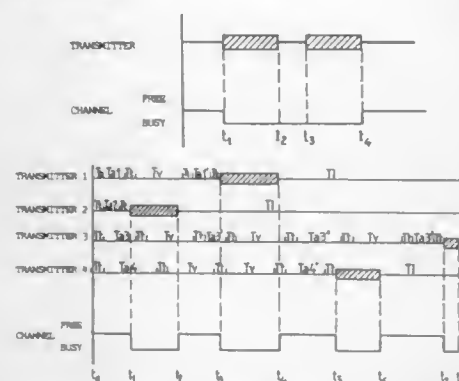
PCT Filed May 11, 1994, Ser. No. 553,356

Claims priority, application France, May 12, 1993, 93/05723

Int. Cl.<sup>6</sup> H04B 7/00

U.S. Cl. 370—310

19 Claims



1. A method of managing the transmission of messages from first, second and third transmitters to a single receiver on a single channel, the method comprising the steps of:

receiving, at the receiver, a transmission from the first transmitter;

sending, from the receiver to the second and third transmitters, a binary information element indicating that the channel is busy, the binary information element being sent when the receiver receives the transmission from the first transmitter and continuing at least throughout the period of transmission by the first transmitter;

receiving the binary information element at the second and third transmitters, and in response inhibiting any attempted transmission by the second and third transmitters, completing the transmission from the first transmitter to the receiver;

preparing, at the second transmitter, to make a transmission from the second transmitter to the receiver, including the steps of: testing the state of engagement of the channel for a first time, and then

if the first test indicates that the channel is busy, then repeating the first testing step, and

if the first test indicates that the channel is free, then entering into a state of standby for a random period, and then

testing the state of engagement of the channel for a second time, and then

if the second test indicates that the channel is free, then sending the transmission from the second transmitter to the receiver, and

if the second test indicates that the channel is busy, then entering into a state of standby for a period substantially equal to the average period of transmission of a message from one of the transmitters to the receiver and thereafter returning to the first testing step; and

wherein the first, second and third transmitters are each approximately the size and weight of a credit card.

5,774,460

#### LOCAL ISDN RADIO TRANSMISSION SYSTEM

Reinhard Schiffer, Klaus Jäckel, Bruno Stadler, and Holger Vogel, all of Berlin, Germany, assignors to Krone Aktiengesellschaft, Berlin-Zehlendorf, Germany

PCT No. PCT/DE94/00878, § 371 Date Jul. 3, 1996, § 102(e) Date Jul. 3, 1996, PCT Pub. No. WO95/05053, PCT Pub. Date Feb. 16, 1995

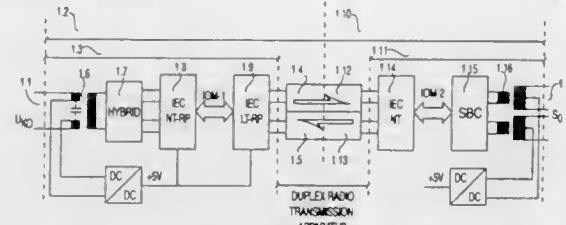
PCT Filed Jul. 28, 1994, Ser. No. 592,426

Claims priority, application Germany, Aug. 5, 1993, 43 26 749.1

Int. Cl.<sup>6</sup> H04Q 7/24; 7/30; 11/04

U.S. Cl. 370—329

13 Claims



1. A local ISDN transmission system comprising a central base station and a plurality of subscriber radio terminals, wherein the base station has a plurality of communication channels and is connectable to subscriber ports of one of a local switching center, a store-and-forward center and a private branch exchange to provide subscribers with access to a public ISDN telephone system through an S<sub>0</sub> wireless transmission interface and is responsive to an activation request from a subscriber radio terminal for opening any available and free communication channel for a communication, wherein the plurality of subscriber terminals is greater than the plurality of communication channels and the S<sub>0</sub> interface is an unrestricted interface and transmits a net bit rate of the subscriber terminal unrestricted through the communication channel, wherein an intermediate generator in the base station and in each subscriber terminal dividing an ISDN two-wire subscriber connection line between a line termination section and a network termination section communicating by radio transmission and wherein the intermediate generator upon the occurrence of an activation request by a subscriber terminal allocates a communication channel within waiting and monitoring periods for the activation of the ISDN two-wire subscriber connecting line and wherein a delay system delays the activation request by a delay period sufficient to switch the allocated communication channel and activate a radio system of the subscriber terminal.

5,774,461

#### MEDIUM ACCESS CONTROL AND AIR INTERFACE SUBSYSTEM FOR AN INDOOR WIRELESS ATM NETWORK

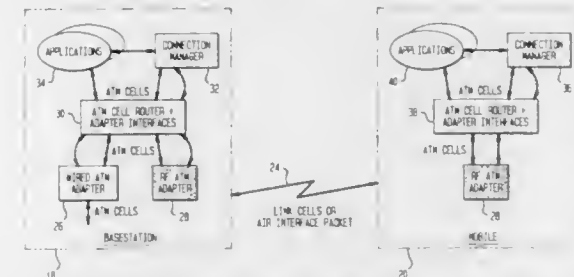
Eoin Hyden, Madison; Mani Bhushan Srivastava; John Andrew Trotter, both of Chatham; Prathima Agrawal, New Providence, and Paul Krzyzanowski, Fanwood, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Sep. 27, 1995, Ser. No. 534,761

Int. Cl.<sup>6</sup> H04L 12/56

U.S. Cl. 370—329

12 Claims



1. In a digital communication network comprising at least one base station and at least one endpoint, a system for delivering digital packets between said at least one endpoint and said at least one base station, said system comprising:

transporting means for wirelessly transmitting and receiving said digital packets between said at least one base station and said at least one end point;

a link cell for linking said at least one base station and said at least one end point, said link cell containing a header portion and a body portion, said header portion containing a token, said token enabling said transporting means for wirelessly transporting over a selected channel said packets between said at least one base station and said at least one end point, and said header portion contains a forward error correction code, said forward error correction code providing error detection and error correction that relies solely on a one-way communication of data bits from a sender to a wherein said transporting means is responsive to said link cell for coordinating transfer of said digital packets between said at least one base station and said at least one end point.

5,774,462

#### UNIQUE WORD RECOGNITION SYSTEM

Iliroyasu Ishikawa, and Hideo Kobayashi, both of Saitama, Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 393,901, Feb. 24, 1995, abandoned.

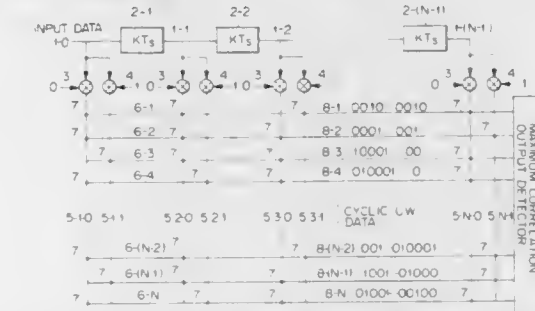
This application Aug. 11, 1997, Ser. No. 907,777

Claims priority, application Japan, Feb. 28, 1994, 6-052530

Int. Cl.<sup>6</sup> H04J 3/06

U.S. Cl. 370—350

7 Claims



7. A unique word recognition system in a radio communication system including a plurality of slave stations and a master station for communication with said slave stations, comprising:

each slave station including a cyclic unique word detector, the cyclic unique word detector including a series of delay circuits, a plurality of pairs of multipliers, a plurality of unique word correlators and a maximum level detector, said plurality

of unique word correlators each having a specific unique word pattern, and each unique word correlator defining TDM frame timing for frame synchronization between said master station and said slave station.

said unique word pattern in each unique word correlator being obtained by shifting a reference unique word pattern by predetermined symbols cyclically,

the number of said unique word correlators in each slave station being the same as the number of symbols in a unique word, each of said unique word correlators providing a correlation output value between a received frame signal and each of said unique words,

a specific unique word correlator being selected so that the selected correlator provides the maximum correlation value among the correlators higher than a predetermined threshold value,

wherein a TDM frame timing is determined according to the unique word correlator which provides said maximum correlation value, so that time necessary to establish frame synchronization in a slave station is shortened.

5,774,463

#### SWITCHING MATRIX WITH CONTENTION ARBITRATION

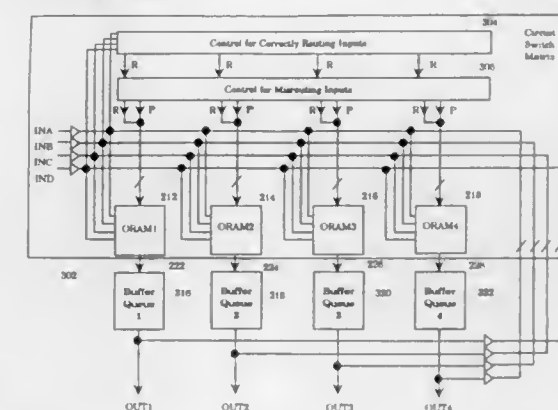
Michael Cooperman, Framingham; Nee-Ben Gee, Needham, and John Edmund Rathke, Waltham, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 29, 1995, Ser. No. 581,722

Int. Cl.<sup>6</sup> H04L 12/50

U.S. Cl. 370—355

17 Claims



1. A circuit switch matrix for switching a plurality of inputs to a plurality of output ports, each of said inputs designating one of said ports as a respective destination, said circuit switch matrix comprising, in combination:

a plurality of storing means, each of said storing means operatively connected to a respective one of said output ports, for storing said inputs temporarily until each of said inputs are routed to one of said output ports;

a first control means, operatively connected to said storing means and said output ports, for correctly routing at least one of said inputs to said respective destination if none of said inputs has already been routed to said respective destination, wherein, said first control means includes, in combination at each of said output ports:

an input ordering means, operatively connected to a respective output port, for determining a sequential order of said inputs;

a header decode input for receiving header decode control signals that determine which of said inputs designates said respective output port as a respective destination, to provide a set of contending inputs;

a correctly routing means, operatively connected to said input ordering means and said header decode input, for selecting from said set of contending inputs, a correctly routed input that occurs first in said sequential order of said inputs; switching means for routing said correctly routed input to said respective output port; and

a correct route status output for providing correct route status signals indicating one of whether said correctly routed input has been routed and whether none of said inputs has been routed, to said respective output port by the first control means; and

a second control means, operatively connected to said storing means, said output ports, and said first control means, for misrouting any of said inputs that has not been correctly routed by said first control means, to one of said output ports that has not been designated as a respective destination by any of said inputs.

5,774,464  
METHOD FOR MANAGEMENT OF MULTICAST CONNECTIONS AND SWITCHING NODE TERMINATION REALIZING SAID METHOD

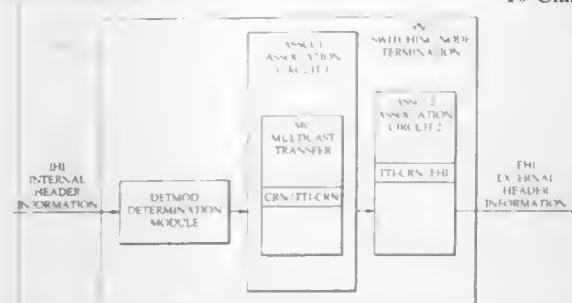
Ludwig Alice Julienne Pauwels, Beveren, and Pascal Albert Emile Lefebvre, Brussels, both of Belgium, assignors to Alcatel Alsthom Compagnie Generale d'Electricite, Paris, France  
Filed Nov. 7, 1996, Ser. No. 744,333

Claims priority, application European Pat. Off., Nov. 7, 1995, 95203016

Int. Cl.<sup>6</sup> H04L 12/56

U.S. Cl. 370—390

10 Claims



1. A method for use in a switching network over which data packets are transferred and which includes a plurality of switching nodes, a switching node termination (SNT) in at least one switching node, for associating in said switching node termination (SNT) internal header information (IHI) included in an internal data packet received by said switching node termination and identifying an internal connection within said at least one switching node and ending in said switching node termination, to external header information (EHI) included in an external data packet and identifying an outgoing external connection external to said at least one switching node and originating from said switching node termination, said internal header information including a connection reference number (CRN) and a transfer type associated to said internal connection, characterized in that said method comprises the steps of:

- determining said transfer type;
- associating to said connection reference number (CRN) and based on said transfer type a transfer type independent connection reference number (TTI-CRN) which is allocated by said switching node termination (SNT); and
- associating to said transfer type independent connection reference number said external header information (EHI).

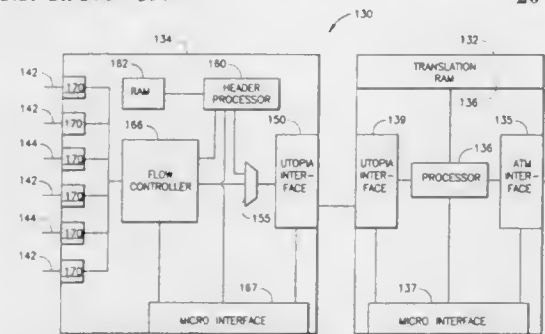
5,774,465  
METHOD AND APPARATUS FOR PROVIDING MULTIPLE MULTICAST COMMUNICATION SESSIONS IN AN ATM DESTINATION SWITCH

Joseph C. Lau, Shelton, and Subhash C. Roy, Hamden, both of Conn., assignors to Transwitch Corp., Shelton, Conn.  
Filed May 17, 1996, Ser. No. 650,910

Int. Cl.<sup>6</sup> H04Q 11/04

U.S. Cl. 370—397

20 Claims



1. A telecommunications destination switch, comprising:
  - a) at least one telecommunications network interface means for receiving an incoming telecommunications cell having a data portion and a header portion having a VPI/VCI;
  - b) decoder means for decoding said incoming telecommunications cell to obtain said VPI/VCI of said incoming telecommunications cell;
  - c) index means for providing said incoming telecommunications cell with additional routing information based on information related to said VPI/VCI;
  - d) multicast indicator storage means for storing a plurality of output channel indications, said multicast indicator storage means being indexed by said additional routing information;
  - e) a plurality of line interfaces; and
  - f) means for providing copies of said data portion of said incoming telecommunications cell with identical header portions to at least one of said plurality of line interfaces based on an indexed one of said plurality of output channel indications.

5,774,466  
REGULATION METHOD AND APPARATUS FOR ATM CELL DELAY VARIATION

Shinichi Hamamoto, Yamato; Masashi Hiraiwa, and Atsuo Hatono, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

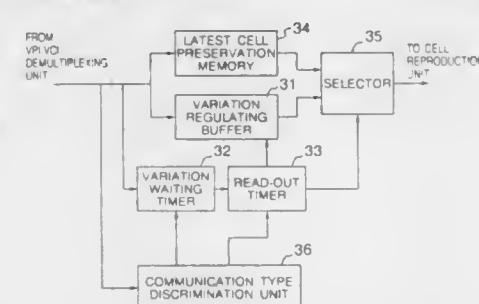
Filed Nov. 17, 1995, Ser. No. 560,011

Claims priority, application Japan, Nov. 28, 1994, 6-293318

Int. Cl.<sup>6</sup> H04L 7/00

U.S. Cl. 370—416

9 Claims



1. A regulation apparatus for ATM cell delay variation in an Asynchronous Transfer Mode (ATM) multiplex communication system, wherein multimedia information including sound, image, and data is transformed into cells upon transmission and transferred, and the cells are reproduced to original information upon reception, thereby performing a communication, said apparatus comprising:

a delay variation regulating buffer for temporarily storing cells received from an ATM network;

a variation waiting timer for controlling a waiting time which extends from the time a first cell of each burst communication is received by said delay variation regulating buffer to the time read-out of cells is started;

a read-out timer for controlling intervals at which the cells are read out after the read-out of the cell is started; and

communication type discriminating means for discriminating a type of communication to be performed for each of the cells based on the cell and for setting times appropriate to the discriminated communication type to said variation waiting timer and said read-out timer, respectively,

wherein said communication type discriminating means sets the waiting time for regulating a delay variation to said variation waiting timer depending on the discriminated communication type.

5,774,467  
METHOD AND DEVICE FOR TRANSFORMING A SERIES OF DATA PACKETS BY MEANS OF DATA COMPRESSION

José Manuel Herrera Van Der Nood, Rotterdam; Eric Simon Trommel, Zoetermeer; Johannes Bernardus Roubos, Delft, and Ben Schellingerhout, Rijswijk, all of Netherlands, assignors to Koninklijke PTT Nederland NV, Groningen, Netherlands

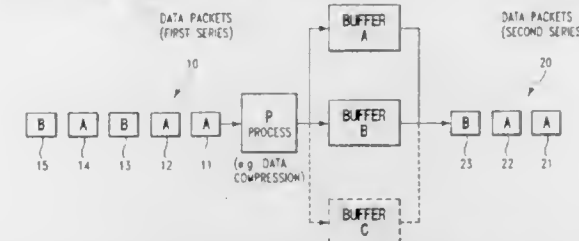
Filed Jan. 5, 1995, Ser. No. 368,986

Claims priority, application Netherlands, Jan. 21, 1994, 9400100; Nov. 25, 1994, 9401980

Int. Cl.<sup>6</sup> H04J 3/24

U.S. Cl. 370—428

29 Claims



1. A method for converting a first series of data packets, each packet having a header field and a data field, into a second series of data packets, each packet having a header field and a data field, wherein both series of packets comprise packets from a plurality of channels, said method comprising the steps of:
  - compressing any data contained within said data fields of said first series without compressing said header fields;
  - buffering the compressed data per channel; and
  - accommodating the compressed data into said data fields of said second series such that said data contained within said data field of said second series contains data of only one of said plurality of channels.

5,774,468  
TERMINAL UNIT FOR WIRELESS COMMUNICATION NETWORK

Hidehiko Maruyama, and Yoshikazu Ikegami, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Nov. 3, 1995, Ser. No. 553,025

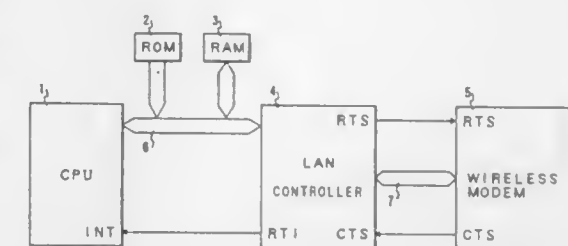
Claims priority, application Japan, Nov. 8, 1994, 6-273296

Int. Cl.<sup>6</sup> H04J 3/02

U.S. Cl. 370—445

2 Claims

1. A terminal unit for a wireless communication network, which transfers communication data by using a predetermined band, comprising:
  - a wireless modem having a function of determining whether an input is a request-to-send signal input as a transmission request during reception of communication data, said modem



modulating communication data to be transmitted and performing wireless transmission of the data in response to the request-to-send signal input when no communication data is being received and demodulated, and temporarily outputting a clear-to-send signal and disabling the clear-to-send signal thereafter in response to the request-to-send signal input when communication data is being received;

- a wire network controller coupled directly to said wireless modem, said controller responding to a reception of a data transmission request from said terminal unit by generating and outputting the request-to-send signal to said wireless modem after completion of a reception of communication data when the communication data is being received, and immediately generating and outputting the request-to-send signal to said wireless modem when no communication data is being received, said wire network controller determining interruption of transmission of transmission data and outputting a request-to-interrupt signal when the clear-to-send signal from said wireless modem is temporarily input and disabled thereafter; and

control means coupled to said wireless network controller for requesting said network controller to perform data transmission, performing back-off processing upon reception of the request-to-interrupt signal, and causing said network controller to generate request-to-send signal to said wireless modem after a determined back-off period elapses.

5,774,469  
COMBINED MINICELL ALIGNMENT AND HEADER PROTECTION METHOD AND APPARATUS

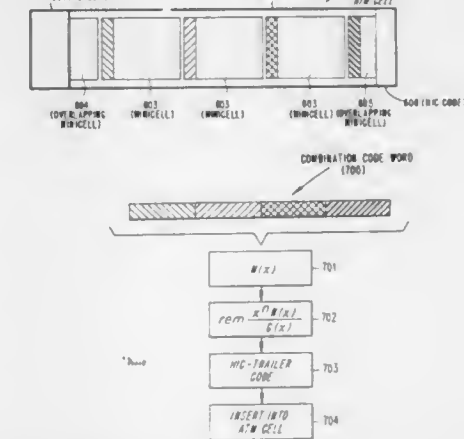
Anders Wirkestrand, Stockholm, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Apr. 1, 1996, Ser. No. 626,000

Int. Cl.<sup>6</sup> H04J 3/24

U.S. Cl. 370—473

14 Claims



1. In a telecommunication system, a method for generating a data packet comprising the steps of:
  - generating at least one minicell, wherein each minicell comprises a user data portion and a header;
  - inserting at least part of said at least one minicell into the data packet;



generating a header integrity check trailer code from a combination code, wherein the combination code comprises information contained in the header of each of the minicells that were inserted into the data packet; and inserting the header integrity check trailer code into the data packet.

5,774,470

**DIGITAL SIGNAL PROCESSOR, ERROR DETECTION METHOD, AND RECORDING MEDIUM REPRODUCER**  
Takushi Nishiyama, Machida; Shoichi Miyazawa, Yokohama; Kazutoshi Ashikawa, Maebashi; Ryushi Shimokawa, Takasaki, and Seichi Mita, Tsukuba, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

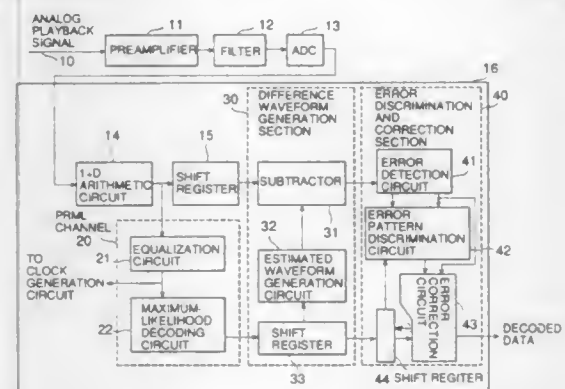
Filed Sep. 6, 1995, Ser. No. 524,040

Claims priority, application Japan, Sep. 6, 1994, 6-212730

Int. Cl. G11B 20/18

U.S. Cl. 371—3

12 Claims



1. A digital signal processor for decoding a signal encoded by a predetermined data encoding system, said digital signal processor comprising:

- a decoding circuit for encoding the encoded signal;
  - an estimated waveform generation circuit for generating a signal waveform estimated to result when noise of the encoded signal is removed from a decode value decoded by said decoding circuit;
  - a difference waveform generation circuit for generating a difference waveform representing a difference between the signal waveform generated by said estimated waveform generation circuit and the encoded signal; and
  - a detection circuit for detecting a decode error in said decoding circuit based on the difference waveform generated by said difference waveform generation circuit;
- wherein said predetermined data encoding system is a GCR (group coded recording) system, said decoding circuit for decoding the encoded signal by a partial response maximum likelihood system, and said detection circuit for detecting the decode error when an absolute value of amplitude of the difference waveform generated by said difference waveform generation circuit is greater than a predetermined threshold.

5,774,471

**MULTIPLE LOCATION REPAIR WORD LINE REDUNDANCY CIRCUIT**

Yong H. Jiang, Milpitas, Calif., assignor to Integrated Silicon Solution Inc., Santa Clara, Calif.

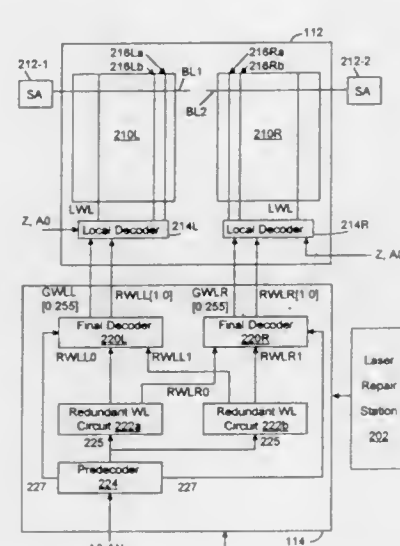
Filed Dec. 17, 1996, Ser. No. 767,797

Int. Cl. G06F 11/00

U.S. Cl. 371—10.3

6 Claims

1. For use in a static memory including first and second sub-arrays responsive respectively to first and second sets of global word lines, a multilocation word line repair circuit, comprising:



a storage circuit configured to store address of a defective global word line, the stored address corresponding to a global word line in each of the first and second sets;

a redundancy decoder configured to decode the stored address from memory address lines;

a selector circuit configured to activate upon decoding by the redundancy decoder of the stored address at least one redundant global word line to repair the defective global word line within a group of global word lines selected from:

- (a) the first set of global word lines,
- (b) the second set of global word lines, or
- (c) the first and second sets of global word lines; and

a deselector circuit to disable the defective global word line within the selected group of word lines.

5,774,472

**SEMICONDUCTOR MEMORY DEVICE CAPABLE OF REALIZING STABLE TEST MODE OPERATION**

Hideto Matsuoka, Hyogo, Japan, assignor to Mitsubishi Denki

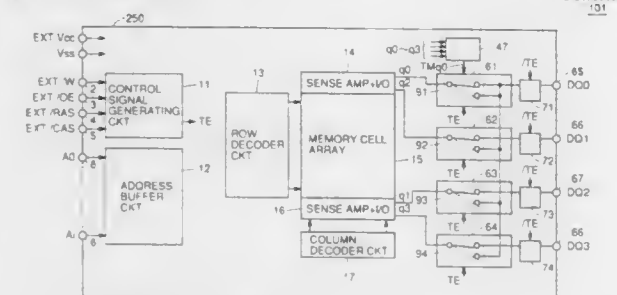
Kabushiki Kaisha, Tokyo, Japan

Filed May 30, 1997, Ser. No. 866,369

Int. Cl. G06F 11/00

U.S. Cl. 371—21.1

7 Claims



1. A semiconductor device, comprising:

operation mode detecting means for detecting designation of a prescribed test mode in response to an external control signal, for activating a test mode signal;

an internal circuit responsive to an external control signal for storing an externally applied data, outputting stored data, and outputting data of a result of a prescribed process based on said data;

a plurality of input/output pads receiving said external control signal or a plurality of said data, or applying externally a plurality of data; and

a plurality of input/output buffer means provided corresponding to said input/output pads, buffering and applying to said internal circuit the externally applied corresponding said data

and the control signal, or for buffering and applying to corresponding said input/output pad the data applied from said internal circuit.

said plurality of input/output buffer means including

a first input/output buffer means receiving either said data or the control signal from corresponding said input/output pad no matter whether an operation mode is said prescribed test mode or not, and

a plurality of second input/output buffer means not receiving said data or said control signal from corresponding said input/output pad when operation mode is said prescribed test mode;

said semiconductor memory device further comprising

a plurality of CMOS logic gates provided corresponding to said second input/output buffer means respectively, controlled by said test mode signal in said prescribed test mode, each cutting signal transmission between an input node of corresponding said second input/output buffer means and corresponding said input/output pad.

5,774,473

**SCAN LATCH AND TEST METHOD THEREOF**  
Andrew Harley, Patchway, United Kingdom, assignor to SGS-Thomson Microelectronics Limited, Bristol, United Kingdom

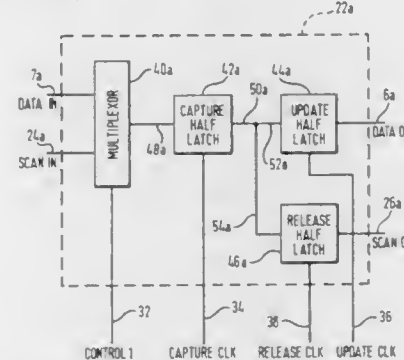
Filed Oct. 30, 1995, Ser. No. 558,595

Claims priority, application United Kingdom, Oct. 31, 1994, 9421977

Int. Cl. G06F 11/00

U.S. Cl. 371—22.3

27 Claims



1. Scan test circuitry including:

a scan latch comprising a plurality of capture half-latches connected in parallel between an input node and an intermediate node and a release half-latch connected between the intermediate node and a scan output node, each capture half-latch having a control terminal, a capture select terminal and a release select terminal, said control terminals receiving a common timing control signal, said capture select terminals receiving respective capture select signals for controlling the capture of data inputted to the scan latch, and said release select terminals receiving respective release select signals for controlling the release of data from the capture half-latches;

control circuitry for generating release select signals and capture select signals for selectively controlling said capture half-latches in a normal functional mode of operation;

test control circuitry for generating release select signals and capture select signals for selectively enabling said capture half-latches in a test mode, said test control circuitry comprising:

a test controller for supplying a sequence of test data bits to the scan latch under the control of the timing control signal, and addressing circuitry for simultaneously addressing both the capture select terminal and the release select terminal of each capture half-latch in turn, wherein each capture half-latch can be tested successively.

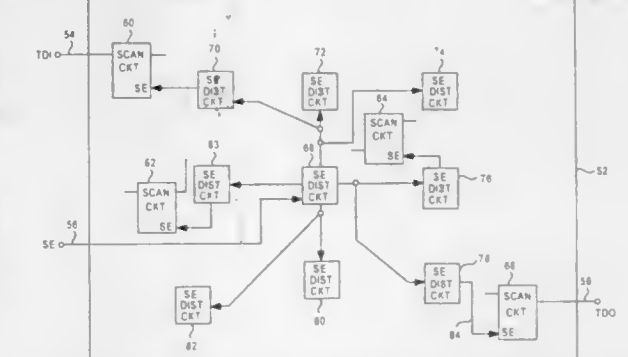
5,774,474

**PIPELINED SCAN ENABLE FOR FAST SCAN TESTING**  
Sridhar Narayanan, and Marc E. Levitt, both of Sunnyvale, Calif., assignors to Sun Microsystems, Inc., Palo Alto, Calif.  
Filed Mar. 14, 1996, Ser. No. 616,112

Int. Cl. G01R 31/28

U.S. Cl. 371—22.31

18 Claims



1. An integrated circuit chip supporting scan testing in a test mode and functional operation in a functional mode, said integrated circuit comprising:

- functional circuitry;
- a plurality of scan circuits residing on said integrated circuit chip, said scan circuits being coupled to said functional circuitry in the functional mode and being coupled to one another to form at least one serial chain in the test mode; and
- a plurality of scan enable distribution circuits residing on said integrated circuit for distributing a scan enable signal to said scan circuits, the scan enable signal being operable to switch said scan circuits between the test mode and the functional mode.

5,774,475

**TESTING SCHEME THAT RE-USES ORIGINAL STIMULUS FOR TESTING CIRCUITRY EMBEDDED WITHIN A LARGER CIRCUIT**

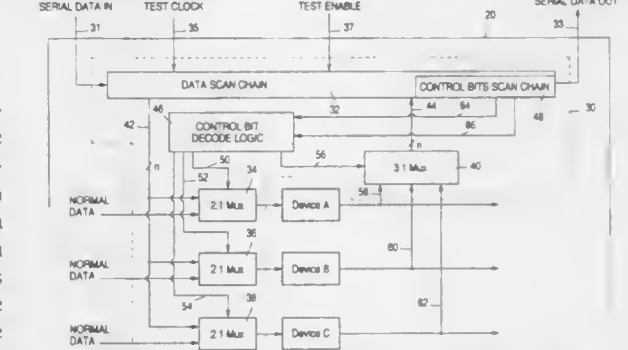
Fazal Ur Rehman Qureshi, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Dec. 5, 1996, Ser. No. 760,979

Int. Cl. G01R 31/28

U.S. Cl. 371—22.31

18 Claims



1. A testing circuit for use in testing an X number of portions of circuitry embedded within a larger circuit, comprising:

a serial to parallel data chain having a serial data input, a serial data output, a parallel load output configured to load test data into one of the portions of circuitry, a parallel unload input configured to receive test data from one of the portions of circuitry, and a test enable signal which enables one of the serial data input and the parallel unload input;

an X number of input multiplexers which each have an input coupled to the parallel load output of the serial to parallel data chain and an output coupled to a different one of the X number of portions of circuitry; and

an output multiplexer having an output and an X number of inputs, the output of the output multiplexer being coupled to

the parallel unload input of the serial to parallel data chain and each of the inputs of the output multiplexer being coupled to a different one of the X number of portions of circuitry.

5,774,476  
TIMING APPARATUS AND TIMING METHOD FOR WRAPPER CELL SPEED PATH TESTING OF EMBEDDED CORES WITHIN AN INTEGRATED CIRCUIT

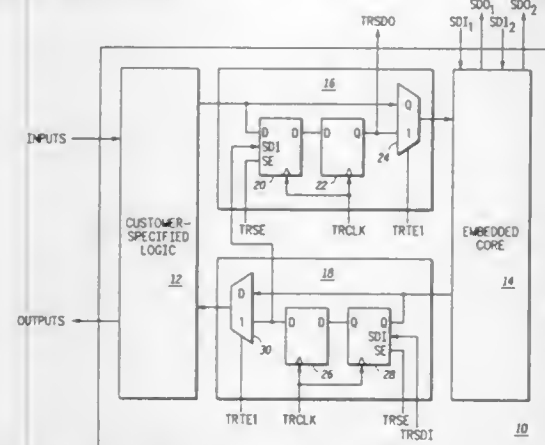
Matthew D. Pressly, and Grady L. Giles, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 3, 1997, Ser. No. 794,743

Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 371—22.31

38 Claims



1. An integrated circuit comprising: an embedded core which is adapted to receive a first clock; a plurality of test cells coupled to one or more input/output lines of the embedded core, the plurality of test cells being adapted to receive a second clock different from the first clock, the second clock being skewed by a skew time from the first clock and the plurality of test cells being used to test an operation of the embedded core; and test circuitry coupled to receive the first and second clock wherein the circuitry is used to determine the skew value to allow skew-compensated testing of the embedded core.

5,774,477  
METHOD AND APPARATUS FOR PSEUDORANDOM BOUNDARY-SCAN TESTING

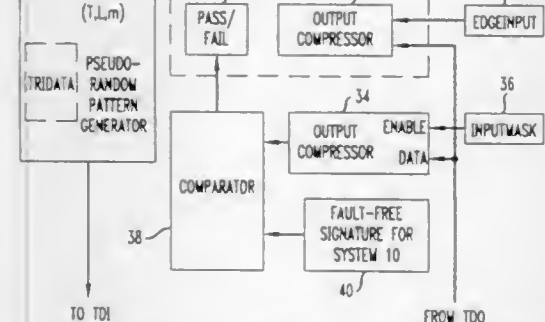
Wuudiann Ke, Mercer County, N.J., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 22, 1995, Ser. No. 577,454

Int. Cl.<sup>6</sup> G01R 31/28

U.S. Cl. 371—22.32

13 Claims



1. A method for Boundary-Scan testing a system having at least one chain of serially-connected Boundary-Scan cells, comprising the steps of:

generating a pseudorandom test pattern containing a plurality of values corresponding in number to the Boundary-Scan cells; filtering the pseudorandom test pattern to modify any value that may cause a signal conflict upon application of the pattern to the chain of Boundary-Scan cells; applying the pseudorandom test pattern to the chain of Boundary-Scan cells by shifting each value into a corresponding Boundary-Scan to shift-out a value previously shifted into the cell; filtering the shifted-out values to mask any value that is non-deterministic; and comparing the filtered shifted-out values to a set of reference values representing a fault free condition.

5,774,478  
INTERPOLATION CIRCUIT FOR INTERPOLATING ERROR DATA BLOCK GENERATED IN  $\epsilon\Delta$  MODULATED DATA STREAM

Masayoshi Noguchi, Chiba, and Gen Ichimura, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

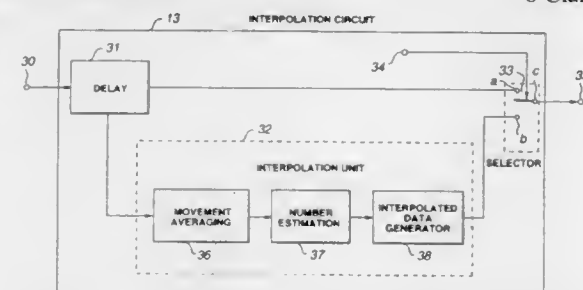
Filed Mar. 20, 1996, Ser. No. 619,794

Claims priority, application Japan, Mar. 24, 1995, 7-066425

Int. Cl.<sup>6</sup> G06F 11/00; 7/38

U.S. Cl. 371—31

8 Claims



1. An interpolation apparatus for interpolating a defective data block constituted by pre-set bits, said defective data block having been produced during transmission of digital data digitized by  $\epsilon\Delta$  modulation, comprising:

means for calculating a first average value of a data string positioned upstream of the defective data block and not containing the defective data block, a second average value of a data string positioned downstream of the defective data block and not containing the defective data block, and a third average value based upon data lying directly ahead of and following the defective data block in the data string containing the defective data block, the data strings consisting of strings of 1-bit data; means for generating interpolated data based upon the first average value and the second average value as calculated by said calculating means; means for estimating an arraying pattern of the defective data block based upon the interpolated data generated by said generating means and said third average value as found by said calculating means; and interpolated data generating means for determining interpolated data of the defective data block based upon the arraying pattern estimated by the estimation means.

5,774,479  
METHOD AND SYSTEM FOR REMOTE PROCEDURE CALL VIA AN UNRELIABLE COMMUNICATION CHANNEL USING MULTIPLE RETRANSMISSION TIMERS

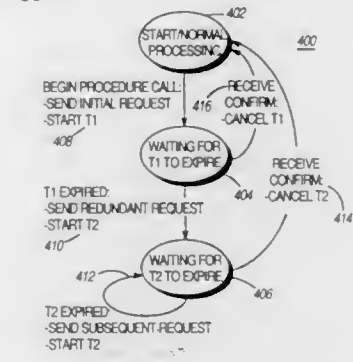
Whay Chiou Lee, Cambridge; Yue Long Chen, Medfield, and James A. Pasco-Anderson, Needham, all of Mass., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 30, 1995, Ser. No. 413,561

Int. Cl.<sup>6</sup> H04L 1/08; G06F 11/00

U.S. Cl. 371—33

14 Claims





detecting at a second computer sub-system an original error in data received from a first computer sub-system that uses a first error identification technique; and  
producing at said second computer sub-system a first perpetuated error in said data in accordance with a second error identification technique.

5,774,483

**METHOD AND APPARATUS FOR RECOVERING AN IMAGE IN A VIDEO TELEPHONE SYSTEM**

Jae-Sik Hwang, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

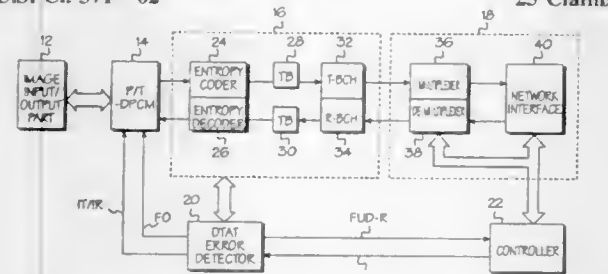
Filed May 31, 1994, Ser. No. 252,000

Claims priority, application Rep. of Korea, May 31, 1993, 9524/1993

Int. Cl.<sup>6</sup> H04L 1/16

U.S. Cl. 371—62

25 Claims



1. An image recovery apparatus in a video telephone system having image input-output means for providing an image signal and for enabling a visual display of a received image signal, said image recovery apparatus comprising:

image compression coder means for coding the image signal, and alternatively for decoding received coded image data;  
entropy means for compressing, coding and outputting entropy coded data in dependence upon reception of the image data provided from said image compression coder means, and alternatively for decoding, expanding, and providing entropy decoded data to said image compression coder means;  
network interface means for multiplexing said entropy coded data and control data to produce multiplexed data to a transmission line, and alternatively for de-multiplexing received multiplexed data from said transmission line to produce de-multiplexed data to said entropy means and to simultaneously extract and output coded data from the received multiplexed data;

controller means connected to said network interface means, for providing said control data to said network interface means in response to reception of a fast up-date request signal, and alternatively for producing a fast up-date request acknowledge signal in response to reception of said output coded data extracted from said received multiplexed data; and

error detector means connected to said entropy means, for generating the fast up-date request signal to said controller means when a checked frame interval of said de-multiplexed data received from said network interface means exceeds a frame interval of an expected length of a frame after checking header data contained in said de-multiplexed data, and alternatively for setting a transmission mode of said image compression coder means in response to reception of said fast up-date request acknowledge signal provided from said controller means.

5,774,484

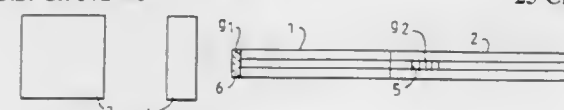
**TWO-STAGE MONO-MODE OPTICAL FIBRE LASER**  
Richard Wyatt, Felixstowe, and Jonathan R. Armitage, Ipswich, both of Great Britain, assignors to British Telecommunications PLC, London, England

Continuation of Ser. No. 241,895, May 13, 1994, Pat. No. 5,422,897. This application Jul. 29, 1996, Ser. No. 688,003  
Claims priority, application European Pat. Off. Jan. 28, 1994, 94300665

Int. Cl.<sup>6</sup> H01S 3/07

U.S. Cl. 372—6

25 Claims



1. A laser comprising:

- a) an optical pump source to provide pump light at a wavelength of  $\lambda_1$ ; and  
b) an optical cavity pumped in use by said optical pump source, said optical cavity being defined by first and second feedback means and said optical cavity including:  
c) a first waveguide portion which is capable of laser action with an emission at a wavelength of  $\lambda_2$  when pumped at a wavelength of  $\lambda_1$ , said first waveguide portion exhibiting multi-transverse mode behavior at  $\lambda_2$ ; and  
d) a second waveguide portion optically coupled to the first waveguide portion, said second waveguide portion exhibiting substantially single transverse mode behavior at  $\lambda_2$ .

5,774,485

**WAVELENGTH-TUNABLE LASER DEVICE**

Karl-Ulrich Stein, Unterhaching, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

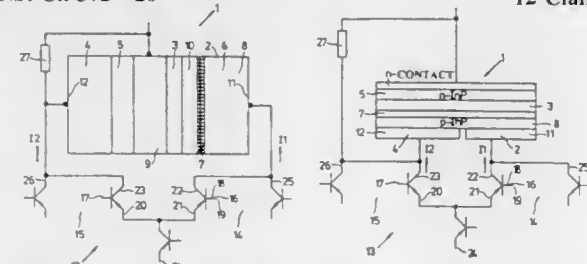
Filed Sep. 17, 1996, Ser. No. 714,852

Claims priority, application Germany, Sep. 20, 1995, 195 34 937.7

Int. Cl.<sup>6</sup> H01S 3/10; 3/13; 3/00; 3/19

U.S. Cl. 372—20

12 Claims



12. A wavelength-tunable laser device, comprising:

- an active part having an active laser region for generating a laser light emission with a predetermined emission wavelength;  
a tuning part having a tuning region associated with the active laser region and for tuning the emission wavelength of the laser light emitted by the active region;  
a variable modulation current for controlling intensity of the emitted laser light emission connected to the active part;  
an electrical tuning current connected to the tuning part for controlling the emission wavelength of the emitted laser light; the tuning current being derived from the variable modulation current; and  
a differential amplifier circuit having a first circuit branch for supplying said tuning current and a second circuit branch for supplying said variable modulation current, the first and second circuit branches being commonly connected at one end to a current source so that the variations in the modulation current also appear in the tuning current but in opposite phase so that resulting optical properties of resonator volume do not change and frequency modulation arising in the active laser region dependent on the variable modulation current is compensated.

5,774,486

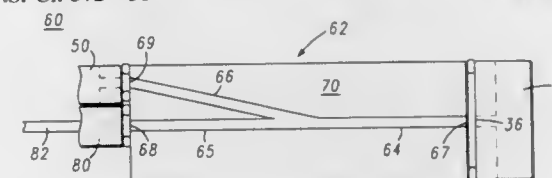
**WAVEGUIDE POWER MONITORING SYSTEM FOR VERTICAL CAVITY SURFACE EMITTING LASERS**  
Wenbin Jiang, Phoenix, and Michael S. Leiby, Apache Junction, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 30, 1996, Ser. No. 641,256

Int. Cl.<sup>6</sup> H01S 3/13; 3/00; G02B 6/26; 6/36

U.S. Cl. 372—31

10 Claims



1. A power monitoring system comprising:

- a vertical cavity surface emitting laser generating an emission;  
a beam splitter optically positioned to receive the emission and split the emission into a first portion and a second portion having a ratio of no greater than 1:9, respectively, the beam splitter including an optical waveguide having a channel split into two channels and defined by a cladding region, the channels being filled with an optically transparent polymer; and  
a monitor optically positioned to receive the first portion of the emission.

5,774,487

**FILAMENTED MULTI-WAVELENGTH VERTICAL-CAVITY SURFACE EMITTING LASER**

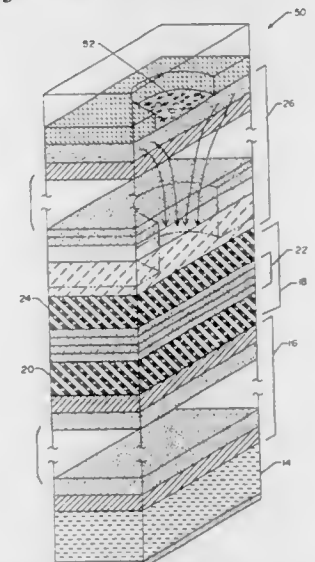
Robert A. Morgan, Plymouth, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 16, 1996, Ser. No. 734,403

Int. Cl.<sup>6</sup> H01S 3/19

U.S. Cl. 372—45

36 Claims



- I. A VCSEL for providing a filamented light output, comprising:  
a first mirror region electrically coupled to a first terminal, the first mirror region generally having a first reflectance value;  
a second mirror region situated substantially parallel to the first mirror region and electrically coupled to a second terminal, the second mirror region generally having a second reflectance value;  
at least one of the first and second mirror regions having a number of discrete locations, wherein each of the number of discrete locations has a different reflectance value than the corresponding first and second reflectance value; and  
an active region situated between the first and second mirror regions.

5,774,488

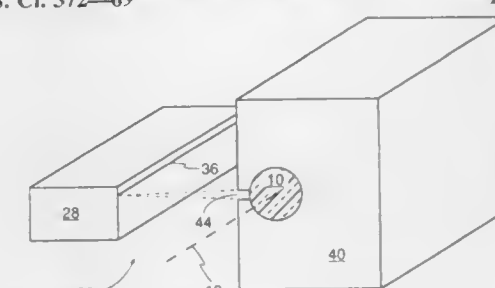
**SOLID-STATE LASER WITH TRAPPED PUMP LIGHT**  
Jeffrey D. Kmetec, Los Gatos, Calif., assignor to Lightwave Electronics Corporation, Mountain View, Calif.

Filed Jun. 30, 1994, Ser. No. 268,781

Int. Cl.<sup>6</sup> H01S 3/094

U.S. Cl. 372—69

10 Claims



6. An optical engine, comprising:

- an optically active body extending along a longitudinal axis;  
a thermally conductive body in thermal contact with said optically active body and having an aperture extending along said longitudinal axis with sides extending in a direction transverse to said longitudinal axis; and  
a semiconductor laser diode positioned to irradiate optical energy through and closely accommodated by said aperture into said body;  
wherein said sides are sized to multiply reflect said optical energy from said laser diode.

5,774,489

**TRANSVERSELY PUMPED SOLID STATE LASER**

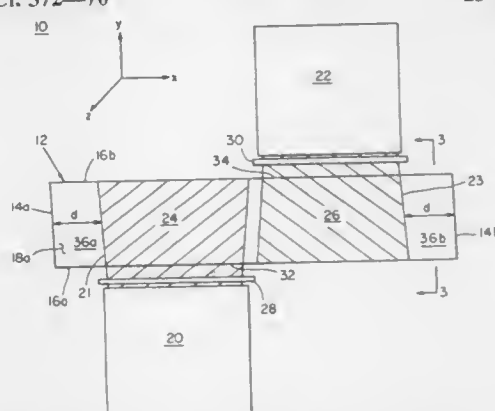
Peter Moulton, Concord; James Harrison, Belmont, and Robert J. Martisen, Amesbury, all of Mass., assignors to Schwartz Electro-Optics, Inc., Orlando, Fla.

Filed Mar. 28, 1996, Ser. No. 623,157

Int. Cl.<sup>6</sup> H01S 3/091

U.S. Cl. 372—70

23 Claims



I. A transversely pumped solid state laser comprising:

- a solid state gain medium having thickness, width and longitudinal dimensions;  
means for forming a laser cavity with the medium for generating a laser beam along said longitudinal dimension; and  
a semiconductor laser pump source for directing a collimated pump beam to said medium along the width dimension transversely to said longitudinal dimension constrained toward the center of said medium and having a width which is substantially shorter than said longitudinal dimension of said medium for spacing the edges of said collimated beam away from the longitudinal ends of said medium to reduce the effects of pump-induced thermal distortion on the generated laser beam and thereby to provide a high quality diffraction-limited laser beam independent of pump source power.

5,774,490

**DIODE-PUMPED TM: YAG/HBR FOUR MICRON LASER SYSTEM**

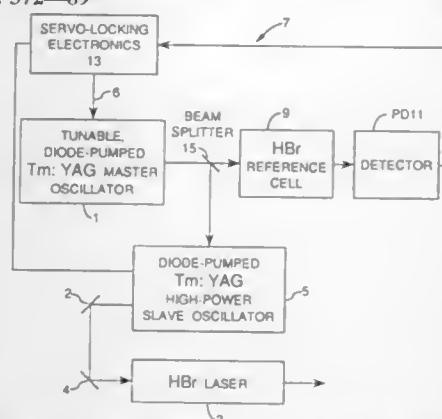
Harold C. Miller, Albuquerque, N. Mex.; Dan Radzykewycz, Nashville, Tenn., and Gordon Hager, Rio Rancho, N. Mex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 7, 1996, Ser. No. 734,617

Int. Cl.<sup>6</sup> H01S 3/095

U.S. Cl. 372-89

18 Claims



1. Laser system capable of producing laser radiation in an atmospherically transmissive window near four microns comprising:

- a master laser oscillator for producing output light over a range of several nanometers overlapping several lines in the (2.0) absorption band of hydrogen bromide;
- a hydrogen bromide laser; and
- a slave laser power oscillator seeded by said master oscillator and optically coupled between said master laser oscillator and said hydrogen bromide laser for exciting the (2.0) band of said hydrogen bromide laser by pumping, thereby to cause the hydrogen bromide laser to lase around four microns.

5,774,491

**ENERGY EXCHANGE BETWEEN A LASER BEAM AND CHARGED PARTICLES USING INVERSE DIFFRACTION RADIATION AND METHOD FOR ITS USE**

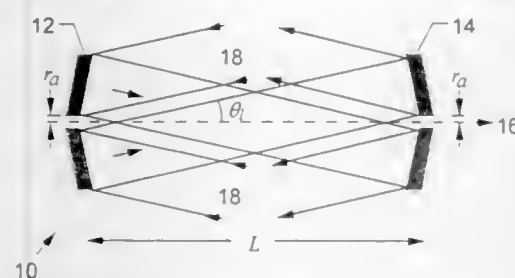
Wayne D. Kimura, Bellevue; Richard D. Romea, Seattle, and Loren C. Steinhauer, Bothell, all of Wash., assignors to STI Optonics, Inc., Bellevue, Wash.

Filed Jul. 9, 1996, Ser. No. 675,999

Int. Cl.<sup>6</sup> H01S 3/08

U.S. Cl. 372-98

31 Claims



1. A method for exchanging energy between a relativistic particle beam, containing one or more charged particles, and a laser beam, the exchange of energy occurring due to inverse diffraction radiation, the method comprising the steps of:

- supplying a first optical element having an aperture;
- supplying a second optical element having an aperture;
- positioning the first and second optical elements so that the relativistic particle beam passes through the aperture in the first optical element and then through the aperture in the

second optical element, the apertures of the first and second optical elements being separated by a predetermined distance of separation, L;

- causing said laser beam to interact with said first element so that said laser beam intersects the particle beam at a predetermined angle,  $\theta_1$ , between the first and second elements;
- causing energy to exchange between said laser beam and the particle beam, wherein a net exchange of energy occurs because the interaction region is limited by the first and second optical elements, to produce inverse diffraction radiation; and
- causing the laser beam to interact with said second element after interacting with said particle beam.

5,774,492

**LOW-COMPLEXITY DIRECT CONVERSION RECEIVER FOR DELAY-AND-CORRELATE TRANSMITTED REFERENCE SIGNALING**

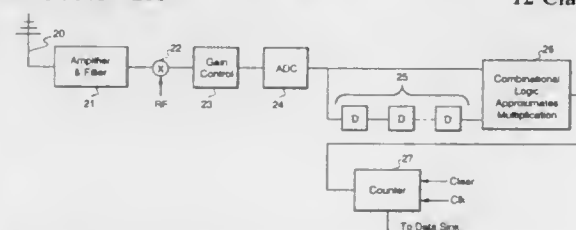
Eugene Joseph Orlowski, Jr., Scotia, and John Anderson Fergus Ross, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 2, 1996, Ser. No. 691,253

Int. Cl.<sup>6</sup> H04B 1/707

U.S. Cl. 375-206

12 Claims



1. A direct conversion receiver for delay-and-correlate transmitted reference spread spectrum signaling, comprising: means for converting a received direct sequence spread spectrum signal having a predetermined chipping rate to a baseband signal; an analog-to-digital converter for sampling the baseband signal at a rate greater than the chipping rate of the direct sequence spread spectrum signal; delay means coupled to the analog-to-digital converter output for generating a delayed signal; multiplier logic for receiving output signals from said analog-to-digital converter and said delay means and for generating control output signals; and a counter responsive to said control output signals for incrementing or decrementing a count or recycling.

5,774,493

**SEQUENCE CONSTRUCTIONS FOR DELAY-AND-CORRELATE TRANSMITTED REFERENCE SIGNALING**

John Anderson Fergus Ross, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 2, 1996, Ser. No. 691,254

Int. Cl.<sup>6</sup> H04B 1/707

U.S. Cl. 375-206

5 Claims

1. In a direct conversion delay-and-correlate transmitted reference spread spectrum signaling system, a transmitter comprising: a sequence generator for generating a sequence signal characterized as  $x(1), x(2), x(3), \dots, x(N)$ , where  $x(j)$  are elements of the sequence, said sequence generator being adapted to modify the sequence signal to generate an enhanced sequence signal having improved autocorrelation properties; a first multiplier for generating a first product signal by multiplying the sequence signal from the sequence generator and input data to be transmitted; a first delay device for delaying the product signal from said multiplier by a delay  $d$ , where twice the delay,  $2d$ , is an odd number of chip intervals;

5,774,495

**COMMUNICATION APPARATUS**

Mitsuhiko Noda, Kyoto, Japan, assignor to Rohm Co., Ltd., Kyoto, Japan

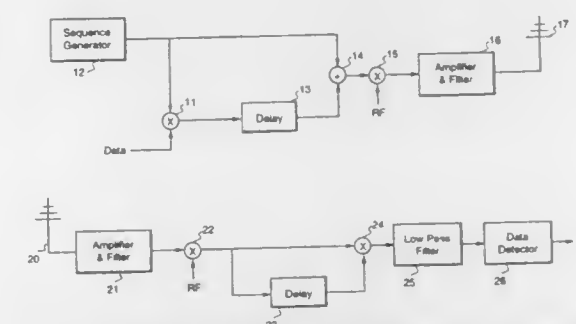
Filed Mar. 21, 1996, Ser. No. 619,169

Claims priority, application Japan, Mar. 24, 1995, 7-065365

Int. Cl.<sup>6</sup> H04B 1/38

U.S. Cl. 375-222

2 Claims



- a summer for generating a summed signal for summing the delayed product signal with the sequence signal from said sequence generator; and
- first radio frequency means, including a mixer, for converting said summed signal to a signal for transmission.

5,774,494

**FREQUENCY ERROR CORRECTION DEVICE OF A SPREAD-SPECTRUM COMMUNICATION RECEIVER**

Mamoru Sawahashi, Yokosuka, and Tomohiro Dohi, Yokohama, both of Japan, assignors to NTT Mobile Communications Network Inc., Tokyo, Japan

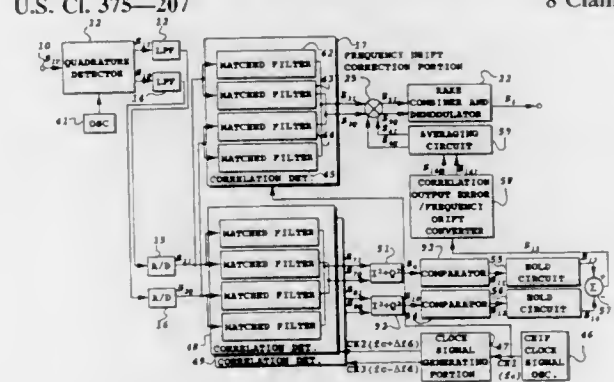
Filed Nov. 18, 1994, Ser. No. 342,349

Claims priority, application Japan, Nov. 26, 1993, 5-295891

Int. Cl.<sup>6</sup> H04B 15/00

U.S. Cl. 375-207

8 Claims



1. A frequency error correction device of a spread spectrum receiver which receives a spread-spectrum signal, said frequency error correction device comprising:

- a first correlation detector despread the spread-spectrum signal;
- a first clock signal generating portion for producing a first clock signal for driving said first clock signal for driving said first correlation detector;
- a frequency error detection circuit detecting a frequency error between a chip frequency of said spread-spectrum signal and a frequency of said first clock signal, thereby producing a frequency error signal;
- a frequency drift converter converting the frequency error signal into a frequency drift signal as drift correction signal; and
- a frequency drift correction portion performing frequency correction of an output of said first correlation detector in accordance with said frequency correction signal outputted from said frequency drift converter.

5,774,496

**METHOD AND APPARATUS FOR DETERMINING DATA RATE OF TRANSMITTED VARIABLE RATE DATA IN A COMMUNICATIONS RECEIVER**

Brian K. Butler, Solana Beach; Roberto Padovani, San Diego, and Ephraim Zehavi, Del Mar, all of Calif., assignors to QUALCOMM Incorporated, San Diego, Calif.

Continuation of Ser. No. 233,570, Apr. 26, 1994, Pat. No.

5,566,206. This application Jun. 4, 1996, Ser. No. 658,030

Int. Cl.<sup>6</sup> H04B 17/00

U.S. Cl. 375-225

51 Claims

1. In a receiver of a variable-rate communication system, a method for determining a data rate of a received signal comprising the steps of:





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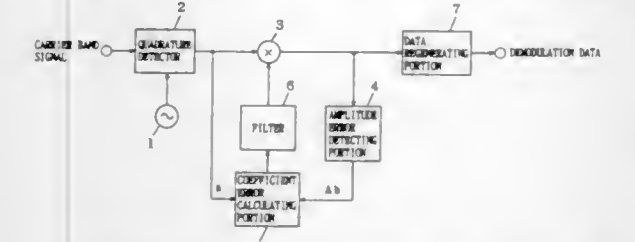
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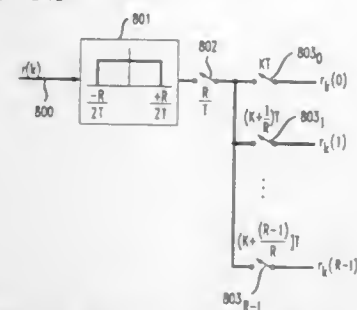
UMI

5,774,503  
DEMODULATION METHOD AND DEMODULATION  
DEVICE  
Koichiro Tanaka, Katano; Tomonori Shlomi, Hirakata, and  
Yasuo Nagaishi, Ikoma, all of Japan, assignors to Matsushita  
Electric Industrial Co., Ltd., Osaka, Japan  
Filed Aug. 20, 1996, Ser. No. 697,164  
Claims priority, application Japan, Aug. 22, 1995, 7-213626  
Int. Cl.<sup>6</sup> H04L 27/14; 27/16; 27/22  
U.S. Cl. 375—324 5 Claims



1. A method for correcting a phase error of an inputted carrier band signal and demodulating the carrier band signal, comprising: converting said carrier band signal into an equivalent low-frequency signal; performing a complex multiplication of said equivalent low-frequency signal and a complex coefficient to obtain a detection signal; detecting a complex amplitude error of said detection signal; performing a complex division of said complex amplitude error by said equivalent low-frequency signal to calculate a complex coefficient error; subtracting a complex number which is obtained by multiplying a low-frequency component of said complex coefficient error by a constant from said complex coefficient to obtain a new complex coefficient; and converting said detection signal into demodulation data.

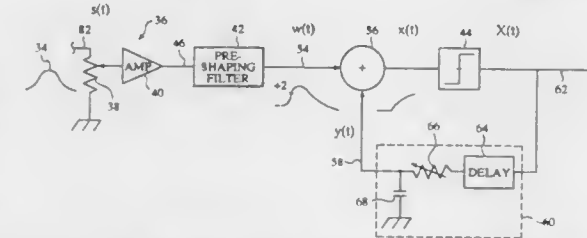
5,774,504  
EQUALIZATION AND DECODING FOR DIGITAL  
COMMUNICATION CHANNEL  
Stephen Russell Huszar, Bridgewater, and Nambirajan  
Seshadri, Chatham, both of N.J., assignors to Lucent Tech-  
nologies Inc., Murray Hill, N.J.  
Continuation of Ser. No. 398,400, Mar. 3, 1995, abandoned,  
which is a continuation of Ser. No. 816,510, Dec. 31, 1991,  
abandoned. This application Nov. 17, 1995, Ser. No. 560,428  
Int. Cl.<sup>6</sup> H03D 1/00  
U.S. Cl. 375—341 37 Claims



1. A method for decoding a time varying signal which was received from a communications channel, said time varying signal representing a sequence of symbols that was transmitted through the communications channel at a symbol rate of 1/T, said method comprising the steps of: sampling said time varying signal at a sampling rate of R/T, wherein R ≥ 2, to generate a set of R sample d values; utilizing a multi-state trellis to generate a set of estimated values for each one of a set of candidate symbol sequences; comparing ones of said set of R sample d values with corresponding ones of said set of estimated values for each of said candidate symbol sequences to form an error signal; and

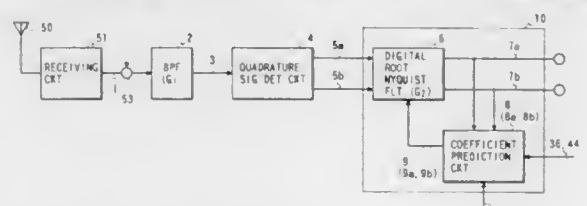
selecting the candidate symbol sequence yielding the minimum value for said error signal as a decoded version of the sequence of symbols transmitted through said communications channel.

5,774,505  
INTERSYMBOL INTERFERENCE CANCELLATION  
WITH REDUCED COMPLEXITY  
Richard A. Baugh, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.  
Filed Apr. 4, 1996, Ser. No. 628,173  
Int. Cl.<sup>6</sup> H03K 5/12; H04B 3/14; G11B 5/09  
U.S. Cl. 375—348 20 Claims



1. A signal processing channel for reducing intersymbol interference in a sequence of data symbols comprising: a channel input; pre-shaping means connected to said channel input for decreasing amplitude-transition times at leading edges of data symbols received at said channel input and for increasing amplitude-transition times at trailing edges of said data symbols, thereby sharpening said leading edges of data symbols within a shaped output of said pre-shaping means; decision means, connected to said pre-shaping means, for generating a 2-level output in response to said data symbols; and an exponential decay feedback filter for cancelling exponential decay at said trailing edges of said data symbols within said shaped output prior to input of said data symbols to said decision means, said feedback filter having an input connected to receive said 2-level output and having a cancellation output connected between said pre-shaping means and said decision means to combine said cancellation output with said shaped output, said feedback filter having a resistance-capacitance circuit to define said exponential decay cancellation and having a delay to determine timing of introducing said exponential decay cancellation to said shaped output of said pre-shaping means.

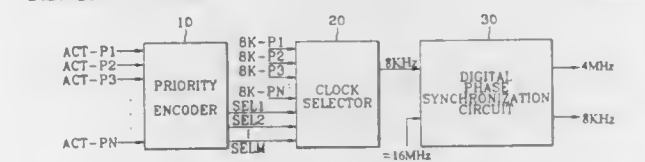
5,774,506  
DATA RECEIVING APPARATUS  
Sadaki Futagi, Sagami, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan  
Filed Jan. 24, 1997, Ser. No. 787,710  
Claims priority, application Japan, Feb. 9, 1996, 8-046840  
Int. Cl.<sup>6</sup> H04B 1/10  
U.S. Cl. 375—350 10 Claims



1. A data receiving apparatus comprising: receiving means for receiving a transmission signal including a channel of quadrature signals and generating an intermediate frequency signal from said received transmission signal;

bandpass filter means for extracting said channel of quadrature components from said intermediate frequency signal; quadrature detection means for effecting a quadrature detection to said intermediate frequency signal from said bandpass filter means and generating quadrature signals; a digital root nyquist filter for effecting digital-root-nyquist-filtering to said quadrature signals from said quadrature detection means with a coefficient; and coefficient prediction means responsive to the quadrature signals from said digital root nyquist filter for predicting said coefficient and supplying said coefficient to said digital root nyquist filter.

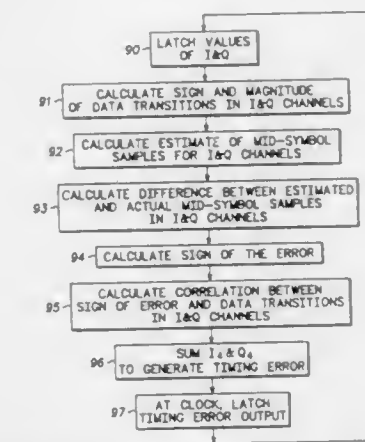
5,774,507  
SYNCHRONOUS CLOCK CONTROLLER FOR DIGITAL  
EXCHANGE  
Chang-Rae Jeong, Seoul, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Kyungki-do, Rep. of Korea  
Filed Jun. 10, 1996, Ser. No. 660,940  
Claims priority, application Rep. of Korea, Jun. 9, 1995, 15236/1995  
Int. Cl.<sup>6</sup> H04L 7/00 12 Claims



1. A synchronous clock controller for a digital exchange having a plurality of office line cards, comprising: a priority encoder for encoding priority information signals respectively provided from said office line cards, and generating a selection signal indicating one of said office line cards having a highest priority among said office line cards in dependence upon said priority information signals; means for receiving office line clock signals respectively provided from said office line cards, and outputting a selected one of said office line clock signals provided from said office line card indicated by said selection signal; and means for phase synchronizing said selected office line clock signal with an internal reference clock signal, and generating a reference synchronization clock signal and a bit synchronization clock signal in response to said phase synchronizing.

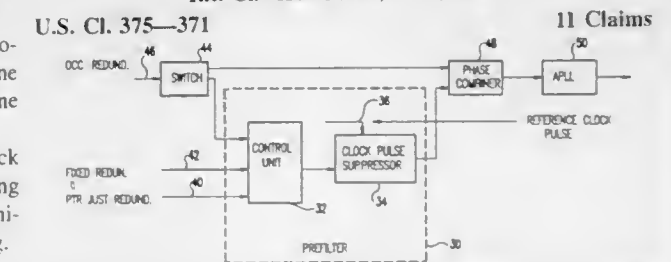
5,774,508  
DATA SYNCHRONIZER PHASE DETECTOR AND  
METHOD OF OPERATION THEREOF  
Kurt Albert Kallman; Scott David Blanchard, both of Mesa, and William Alexander Bucher, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.  
Filed Jan. 2, 1996, Ser. No. 581,979  
Int. Cl.<sup>6</sup> H04L 7/02 29 Claims

1. In a data synchronizer phase detector, a method of generating a timing error signal comprising the steps of: sampling, by a sampler responsive to a demodulated sequence of data symbols, said data symbols at a desired portion of said data symbols; and generating, by a timing error estimator, said timing error signal representing the difference between an estimated mid-symbol sample and an actual mid-symbol sample, said timing error signal being supplied to said sampler.



wherein generating said timing error signal is performed using only one or more sign detection operations, one or more addition operations, and one or more multiplication operations.

5,774,509  
METHOD FOR THE REDUCTION OF PHASE NOISE  
INTRODUCED BY THE SDH NETWORK  
(SYNCHRONOUS DIGITAL HIERARCHY NETWORK) BY  
POINTER JUSTIFICATION AND INTEGRATED  
CIRCUITS FOR THE IMPLEMENTATION OF THE  
METHOD  
Silvano Frigerio, Cantù; Stefano Gastaldello, Teolo, and Giovanni Russo, Lentini, all of Italy, assignors to Alcatel Telettra S.p.A., Milan, Italy  
Continuation-in-part of Ser. No. 810,719, Dec. 18, 1991, abandoned. This application May 23, 1994, Ser. No. 247,607  
Claims priority, application Italy, Dec. 21, 1990, 22495/90  
Int. Cl.<sup>6</sup> H04L 7/00; 25/36; 25/40 11 Claims



1. A method for reducing phase noise introduced by pointer justifications from an SDH network (Synchronous Digital Hierarchy Network) in a transmitted numerical signal, in which method, occasional redundancies associated with bit justifications, fixed redundancies, and occasional prefiltered redundancies associated with the pointer justifications are combined, and wherein the combined signal is filtered in an PLL (Analog Phase Locked Loop), said method further comprising the steps of: selecting whether the occasional redundancies associated with bit justifications are to be prefiltered; prefiltering, in a two-stage prefilter, the occasional redundancies associated with the pointer justifications together with at least a part of the fixed redundancies, with or without the occasional redundancies associated with bit justifications to obtain a prefilter output; and combining the prefiltered fixed redundancies and prefiltered occasional redundancies associated with the pointer justifications with the occasional redundancies associated with the bit justifications whenever the redundancies with the bit justifications are not prefiltered.



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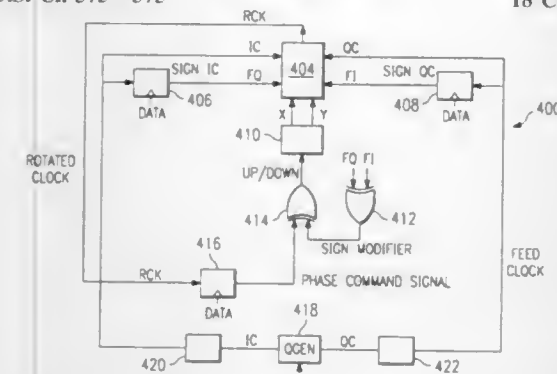
5,774,510  
FIRST-ORDER LOOP CONTROL CONFIGURATION FOR  
A PHASE-ROTATOR BASED CLOCK  
SYNCHRONIZATION CIRCUIT

Martin J. Izzard, Dallas, Tex., assignor to Texas Instruments  
Incorporated, Dallas, Tex.

Continuation of Ser. No. 255,213, Jun. 7, 1994, Pat. No.  
5,526,380. This application Mar. 1, 1996, Ser. No. 609,304  
Int. Cl.<sup>6</sup> H03D 3/02

U.S. Cl. 375—375

18 Claims



1. Electronic circuitry for producing a clock signal and changing the phase of the clock signal within one quadrant in response to a feed clock signal, a quadrature feed clock signal and input data, said circuitry comprising:

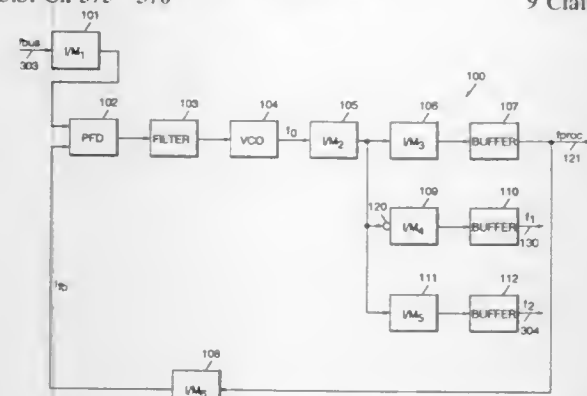
- circuitry for providing an I-phase quadrant pointer;
- circuitry for providing a Q-phase quadrant pointer;
- a first logic gate for accepting said I-phase quadrant pointer and said Q-phase quadrant pointer and for producing a sign modifier signal;
- circuitry for providing a phase command signal in response to receipt of said input data and said produced clock signal which has a phase which was changed within one quadrant in response to said feed clock and quadrature feed clock signals;
- a second logic gate for accepting said phase command signal and said sign modifier signal and for producing an up/down signal, said up/down signal specifies the manner in which to change said phase of said produced clock signal; and
- wherein said electronic circuitry is operable to re-map the phase of one quadrant into that of any of the other three quadrants by means of decoding said I-phase quadrant pointer and said Q-phase quadrant pointer.

5,774,511  
PROCESSOR CLOCK CIRCUIT

David William Boerstler, Round Rock, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed Apr. 19, 1996, Ser. No. 635,103  
Int. Cl.<sup>6</sup> H03D 3/00

U.S. Cl. 375—376

9 Claims



1. A circuit for generating one or more clock signals, the circuit comprising:

- a first divider circuit receiving a reference clock signal having a frequency F1, wherein the first divider circuit has a first divide ratio M1;
- a phase locked loop ("PLL") circuit coupled to the first divider circuit, wherein a feedback path of the PLL circuit includes a second divider circuit having a second divide ratio M6;
- output circuitry, coupled to the PLL circuit, for outputting an output clock signal having a frequency  $F2=F1 \cdot M6/M1$ , wherein M1 and M6 are positive integers;
- a third divider circuit coupled to the PLL circuit, wherein the third divider circuit has a third divide ratio M5, and wherein an output of the third divider circuit has a frequency that is proportional to  $(M6 \cdot F1)/(M1 \cdot M5)$ ; and
- a fourth divider circuit coupled to the PLL circuit, the fourth divider circuit including an inverter circuit at its input so that the output of the fourth divider circuit is out of phase with the output of the third divider circuit, and wherein the output of the fourth divider circuit is synchronous with the output of the third divider circuit.

5,774,512  
HIGHER ORDER DIGITAL PHASE LOOP FILTER

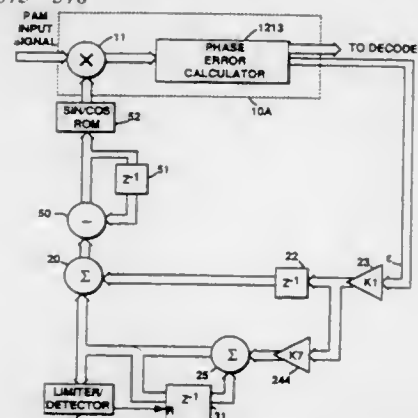
Bhaves Bhalchandra Bhatt, Franklin Park, N.J., assignor to RCA Thomson Licensing Corporation, Princeton, N.J.  
PCT No. PCT/US94/00390, § 371 Date Jun. 27, 1996, § 102(e)  
Date Jun. 27, 1996, PCT Pub. No. WO95/19676, PCT Pub. Date Jul. 20, 1995

PCT Filed Jan. 12, 1994, Ser. No. 666,463

Int. Cl.<sup>6</sup> H04L 27/06

U.S. Cl. 375—376

5 Claims



1. In a carrier recovery circuit including a loop filter (14) of the form which includes a signal summing circuit (25) and a signal storage element (31) coupled between an output port and an input port of said signal summing circuit to form an integrator, an improvement comprising: detection means (30) coupled to said signal summing circuit, for detecting when sums output from said signal summing circuit exceed predetermined limits, and for resetting signal in said storage element to a predetermined value when such sums exceed such limits.

5,774,513  
HEAD AREA CABLE TRAY BRIDGE

William Urko, West Granby, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.  
Filed Jan. 14, 1997, Ser. No. 783,240  
Int. Cl.<sup>6</sup> G21C 19/00

U.S. Cl. 376—263

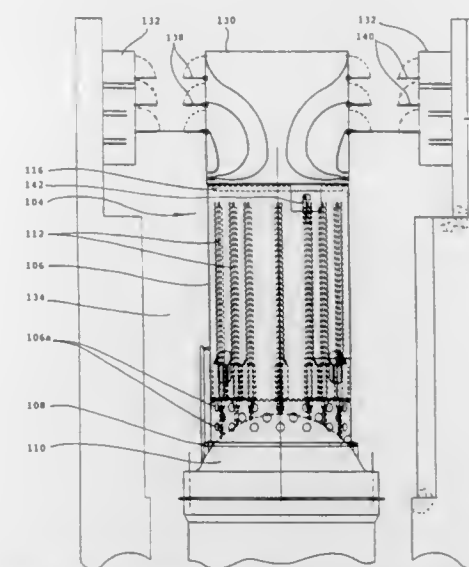
8 Claims

- 1. A cable support arrangement for a nuclear reactor system comprising:
- a terminal panel supported on a wall of a cavity in which a pressure vessel of the nuclear reactor system is disposed;
- a cylindrical housing disposed above the pressure vessel;
- a first cable support tray pivotally mounted on the terminal panel, said first cable support tray being pivotal between an

JUNE 30, 1998

ELECTRICAL

5385



- open position wherein it extends toward the cylindrical housing and spans a distance between the terminal panel and the cylindrical housing, and a closed folded position;
- a second cable support tray pivotally mounted on the cylindrical housing, said second cable support tray being pivotal between an open position wherein it extends toward the terminal panel so as to span a distance between the terminal panel and the cylindrical housing, and a closed folded position wherein it lies essentially flush with the side of the cylindrical housing; and
- a plurality of cables which are housed within said cylindrical housing; said cables being arranged to remain connected at their respective first ends to predetermined devices which are associated with the pressure vessel and which are at least in part surrounded by said cylindrical housing, said cables being arranged to be drawn out of the cylindrical housing and extend across said first and second trays, which acts as a support arrangement between said housing and said terminal panel, and to be releasably connected to said terminal panel.

5,774,514  
ENERGY AMPLIFIER FOR NUCLEAR ENERGY  
PRODUCTION DRIVEN BY A PARTICLE BEAM  
ACCELERATOR

Carlo Rubbia, 9, Chemin des Tulipiers, Geneva, Switzerland, 1200  
PCT No. PCT/EP94/02467, § 371 Date Apr. 24, 1996, § 102(e)  
Date Apr. 24, 1996, PCT Pub. No. WO95/12203, PCT Pub. Date May 4, 1995

PCT Filed Jul. 25, 1994, Ser. No. 632,424

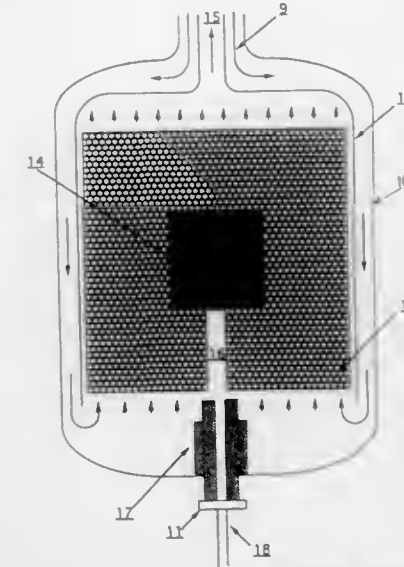
Claims priority, application European Pat. Off., Oct. 29, 1993, 93117587

Int. Cl.<sup>6</sup> G21C 1/30

U.S. Cl. 376—193

36 Claims

- 1. A method of producing energy from a nuclear fuel material including a fertile element, comprising the steps of:
- arranging said fuel material within an enclosure also containing heavy nuclei;
- directing a high energy particle beam into the enclosure, whereby interaction of said particle beam with said heavy nuclei contained in the enclosure produces high energy spallation neutrons;



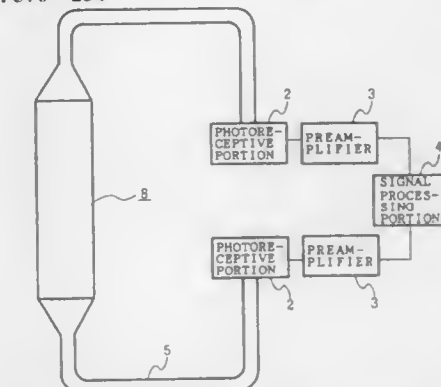
- multiplying the neutrons produced by said directing step by a steadily sub-critical process of breeding of a fissile element from said fertile element of the fuel material via a  $\beta$ -precursor of said fissile element and fission of the fissile element, said breeding and fission process being carried out inside the enclosure; and
- recovering thermal energy evolved from said sub-critical breeding and fission process.

5,774,515  
PARTICLE MEASURING APPARATUS, METHOD FOR  
PARTICLE MEASUREMENT, AND NUCLEAR POWER  
PLANT

Hirotsugu Fujiwara, Kazunori Ikegami, and Hiroshi Nishizawa, all of Tokyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan  
Filed Nov. 16, 1995, Ser. No. 559,339  
Claims priority, application Japan, Jun. 13, 1995, 7-145801  
Int. Cl.<sup>6</sup> G21C 17/00; G01T 1/20

U.S. Cl. 376—254

23 Claims



- 1. A particle measuring apparatus comprising:
- neutron/charged particle converting means for generating charged particles in response to the incidence of neutrons and ionizing radiation, said neutron/charged particle converting means being provided in a linear form so as to intersect the emission path of said neutrons and ionizing radiation;
- emission transmitting means for emitting light in response to the incidence of ionizing radiation or charged particles, and transmitting the light;
- photoreceptive means, connected to both ends of said neutron/charged particle converting means, for receiving the light transmitted by said emission transmitting means through at least two different transmitting paths and producing output signals in response to received light in each transmitting path; and

signal processing means for processing the output signals from the photoreceptive means, detecting a time difference between said output signals to determine an incidence position of said neutrons and ionizing radiation, and counting a quantity of said output signals received from said photoreceptive means.

5,774,516

# MODIFICATION OF OXIDE FILM ELECTRICAL CONDUCTIVITY TO MAINTAIN LOW CORROSION POTENTIAL IN HIGH-TEMPERATURE WATER

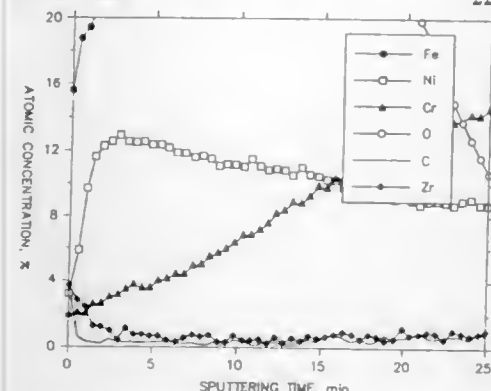
Samson Hettiarachchi, Menlo Park, Calif.; Young J. Kim, Clifton Park; Peter L. Andresen, Schenectady, both of N.Y., and Thomas P. Diaz, San Martin, Calif., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 265,598, Jun. 24, 1994, abandoned, which is a continuation-in-part of Ser. No. 209,175, Mar. 10, 1994, abandoned, which is a continuation-in-part of Ser. No. 143,513, Oct. 29, 1993, abandoned, and a continuation-in-part of Ser. No. 143,514, Oct. 29, 1993, Pat. No. 5,448,605. This application Aug. 15, 1996, Ser. No. 698,178

Int. Cl. G21C 9/00

U.S. Cl. 376—305

22 Claims



1. A method for treating a metal component to mitigate cracking in a surface of said metal component during use in a water-cooled nuclear reactor or associated equipment, comprising the steps of: forming an oxide film on said surface of said metal component; and

doping said oxide film with species selected from the group consisting of a non-noble metal and a non-metal which is conductive or semi-conductive whereby said species are incorporated in said oxide film to reduce the electrochemical corrosion potential of said surface and thereby mitigate cracking.

5,774,517

# REGULATION OF THE CORE COOLANT FLOW RATE OF A NATURAL CIRCULATION REACTOR

Carlos Palavecino, Neu Isenburg, and Herbert Schmidt, Erzhausen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 21, 1997, Ser. No. 828,722

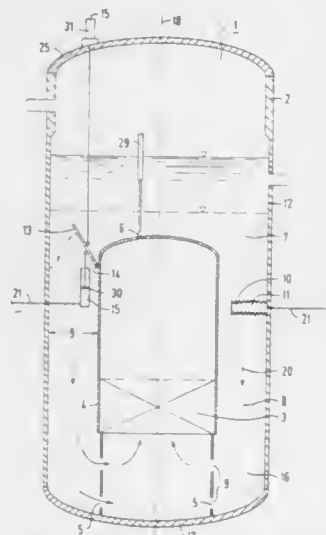
Claims priority, application Germany, Sep. 21, 1994, 44 33 702.7

Int. Cl. G21C 1/08; 1/5/02

U.S. Cl. 376—352

15 Claims

1. A natural circulation reactor, comprising: a reactor pressure vessel; a reactor core; a core jacket disposed within said reactor pressure vessel, surrounding said reactor core, and having at least one inlet port and one outlet port for core coolant;



a flow path for the core coolant formed between said core jacket and said reactor pressure vessel, leading through said at least one inlet port into said core jacket, and having a flow cross section; and

at least one throttle element disposed in said flow path for varying said flow cross section to regulate a core coolant flow rate, and said at least one throttle element being a swelling body disposed outside said core jacket.

5,774,518

# DISCRETE TABLET COUNTING MACHINE

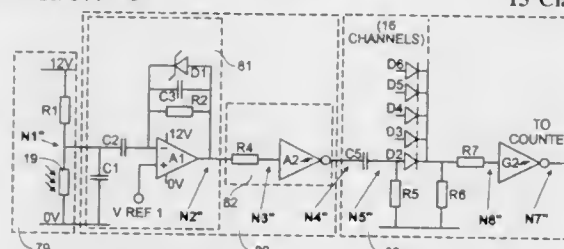
John Kirby, 610 S. 28th St. P.O. Box 124, Washougal, Wash. 98671

Filed Jan. 30, 1997, Ser. No. 791,288

Int. Cl. G06M 7/00

U.S. Cl. 377—6

15 Claims



1. A machine for counting discrete tablets, comprising:

a feeder including a hopper for receiving a plurality of tablets and means for dispersing a flow of tablets to be counted approximately evenly among a plurality of channels, each channel having a falling stream;

a plurality of detectors individually associated with each channel for detecting each of the tablets passing down each falling stream and generating a detect signal which varies as discrete tablets passing down each stream interrupt a beam of light from a light source to the respective receiver;

a plurality of detecting circuits, each detecting circuit individually coupled to a respective detector to receive the detect signal therefrom and produce a detector output signal;

a counter coupled to said plurality of detecting circuits for counting the detector output signals for the total number of tablets in all of the streams; and

a switching device coupled to each of said plurality of detecting circuits to limit detector saturation and tablet under-counting.

5,774,519

# METHOD OF AND APPARATUS FOR CALIBRATION OF CT SCANNERS

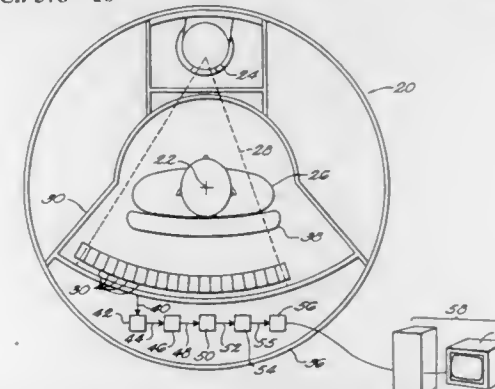
Walter W. Lindstrom, Rockport, and John Scott McCauley, Jr., Brookline, both of Mass., assignors to Analogic Corporation, Peabody, Mass.

Filed Jan. 30, 1997, Ser. No. 791,384

Int. Cl. A61B 6/03

U.S. Cl. 378—18

18 Claims



1. A method for calibrating radiation detectors in a computed tomography (CT) scanner comprising the steps of: directing a radiation beam at a plurality of radiation detectors through a phantom having known attenuation characteristics, the phantom attenuating the beam and the detectors generating measured attenuation data therefrom; back-projecting the measured attenuation data to generate a measured phantom image; converting the measured phantom image to an ideal phantom image using the known phantom characteristics; forward-projecting the ideal phantom image to generate ideal attenuation data; and generating calibration values for each detector by cross-referencing corresponding ideal attenuation data and measured attenuation data.

5,774,520

# DENSITOMETER FOR DETERMINING THE DENSITY DISTRIBUTION AND VARIATION OF DENSITY OF AN OBJECT

Herbert Howard Bolotin, 18 Amess Street, North Carlton, Victoria 3054, Australia

PCT No. PCT/US94/09862, § 371 Date May 13, 1996, § 102(e) Date May 13, 1996, PCT Pub. No. WO95/06874, PCT Pub. Date Mar. 9, 1995

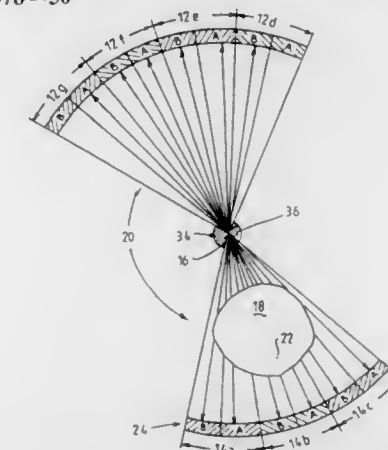
PCT Filed Sep. 1, 1994, Ser. No. 604,945

Claims priority, application Australia, Sep. 2, 1993, PM0959

Int. Cl. G01N 23/02; 23/06

U.S. Cl. 378—50

20 Claims



1. A densitometer for determining the density distribution and variation of density of an object comprising:

at least one source of oppositely directed photons emitted simultaneously and with the same selected energy to which materials forming the object present substantially the same absorptivity;

at least one pair of photon detectors to detect photons emitted in coincidence from the photon source, with the source of oppositely directed photons located on a line passing through each detector of the detector-pair at its point of photon detection; means for positioning an object whose density is to be measured by the densitometer between the photon source and one of the photon detectors to thereby block that photon detector;

means for varying the relative angular orientation between the object and the line passing through the source and the pair of detectors; and means for determining the distribution and variation of density of the object by comparing the number of coincident photons detected by the blocked and unblocked detectors along a plurality of paths of different angular orientations.

5,774,521

# REGULARIZATION TECHNIQUE FOR DENSITOMETRIC CORRECTION

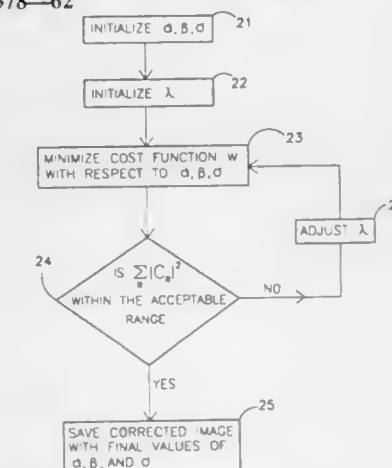
Robert Alan Close, Manhattan Beach, and James Stuart Whiting, Los Angeles, both of Calif., assignors to Cedars-Sinai Medical Center, Los Angeles, Calif.

Filed Jul. 8, 1996, Ser. No. 676,735

Int. Cl. G01N 23/04

U.S. Cl. 378—62

22 Claims



1. A method for recording an x-ray image of a subject having an unknown x-ray density distribution and correcting for image degradation effects, the method comprising:

placing the subject between an x-ray source and an x-ray detector;

placing a reference object between the x-ray source and the x-ray detector, said reference object having a known x-ray density distribution that is substantially spatially uncorrelated to the x-ray density distribution of the subject;

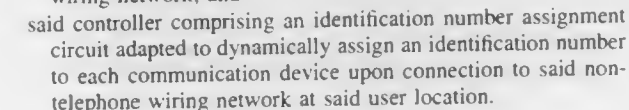
producing digital information representing at least one x-ray image using the x-ray detector, said image comprising images of the subject and the reference object as well as image degradation effects; and

processing the digital information until a measurement of the correlation between the density distributions of the reference object and the subject is substantially within a predefined range, whereby the processed digital information represents corrected density distribution of the subject free from the image degradation effects; and displaying the processed digital information.



# UMI

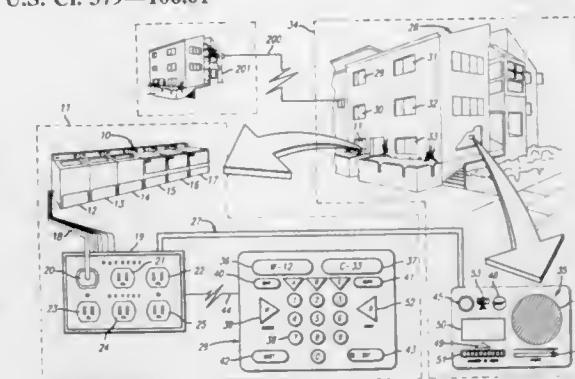
1. A system for providing communication channels between one or more communication devices at a user location and a telephone network using a non-telephone wiring network, comprising:

[illegible]

converting, in video and audio converters, at least part of said video signal and said audio signal to a format suitable for receiving at a television receiver;

supplying the converted video signal and the converted audio signal to said television receiver;

converting, in a voice converter, at least part of said voice signal to a format suitable for transmission over a telephone link;



said controller further comprising a reservation unit for selectively controlling the electrical power consuming devices to accept control inputs from only a specified user in response to the number of devices of the selected device type available for a reservation and the reservation request signal; and

a remote transceiver including:  
a transmitter for generating and transmitting interrogation signals including the call back request signal and the reservation request signal;  
a receiver for receiving the status signals and the call back; and  
at least one indicator for producing indications of the status signals and the call back.

5,774,529

#### APPARATUS TO PROVIDE A REMOTE DISPLAY OF THE OPERATING CONDITION OF A WATER TREATMENT SYSTEM

James Johannsen, 3704 Moorland Rd., Minnetonka, Minn. 55345, and Jeffrey A. Zimmerman, 3851 Main St. NE., Blaine, Minn. 55434

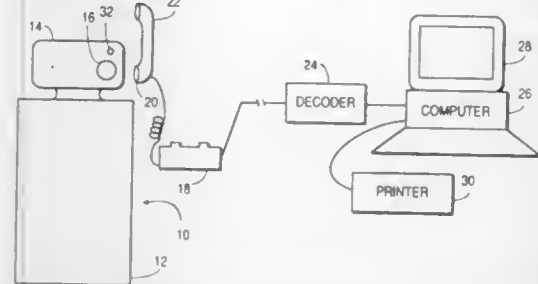
Continuation of Ser. No. 314,578, Sep. 28, 1994, abandoned.

This application Apr. 18, 1996, Ser. No. 634,315

Int. Cl.<sup>6</sup> H04M 11/00

U.S. Cl. 379—106.03

13 Claims



1. Apparatus for providing a remote display of the operating status of a water treatment system having an electronic control comprising:

an electronic memory associated with the electronic control for storing data indicative of the operating status of the water treatment system, a send only data transmitter including, a tone generator associated with said electronic memory, a manual activator coupled to said tone generator, said manual activator operable by a person to activate said tone generator to generate tone pulses indicative of the data stored in said electronic memory, a telephone system including a microphone positioned by said person to receive said tone pulses, a decoding means at a location remote from said water treatment system, said decoding means receiving said tone pulses transmitted through said telephone system, and providing an output of digital signals indicative of the operating status of said water treatment system,

a second electronic control for processing said digital signals so as to provide a readable display of the operating status of said water treatment system at the location remote from said water treatment system.

5,774,530

#### TELECOMMUNICATIONS NETWORK CIRCUIT USAGE MEASUREMENT

Robert H. Montgomery, Herndon, and J. Alfred Baird, Fairfax, both of Va., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.

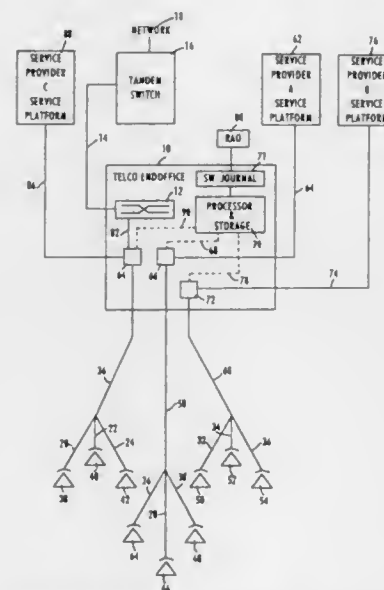
Continuation-in-part of Ser. No. 598,772, Feb. 9, 1996. This application Feb. 9, 1996, Ser. No. 598,869

Int. Cl.<sup>6</sup> H04M 15/00

U.S. Cl. 379—112

27 Claims

1. A communication system comprising a switched telephone network connected by program controlled switches (PCSs) controlled by a data switched common channel signaling (CCS) network having a central controller and storage, said communication system including at least one end office switch having access to communication with said CCS network and central controller, and



lines for connecting said end office switch to customer premises, at least certain of said lines connected to customer premises being disconnected from said end office switch;

monitors connected to said disconnected lines connected to customer premises;

at least one service provider connected to said disconnected lines having associated monitors and connected to customer premises for providing signals over said lines to terminals at said customer premises;

said monitors including detectors for detecting the commencement and discontinuance of signals from said service provider on said lines;

said monitors being connected to said end office switch and having access to communication with said central controller via said data switched common channel signaling network;

said central controller and storage storing information regarding the times of commencement and discontinuance of service provider signals on said lines connected to said service provider.

5,774,531

#### TELECOMMUNICATIONS SYSTEM AND METHOD FOR AUTOMATIC CALL PROCESSING ACCORDING FOREGOING INBOUND AND OUTBOUND CALLS TO ARBITRARY DELEGATES

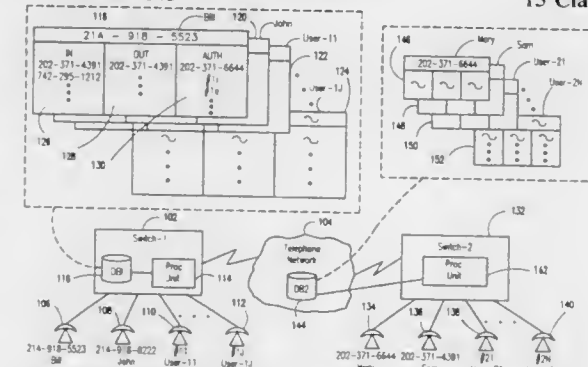
William J. Johnson, Flower Mound, Tex., assignor to MCI Communications Corporation, Washington, D.C.

Filed Aug. 21, 1996, Ser. No. 701,470

Int. Cl.<sup>6</sup> H04M 15/00

U.S. Cl. 379—113

15 Claims



1. A telecommunications system for processing telephone calls according to foregoing inbound and outbound calls to arbitrary delegates, comprising:

at least one switching office, located in a network of a telecommunications service provider, for establishing a voice path between a calling and a called party;

a plurality of telecommunications service subscribers, including said calling party, connected to said switching office, said plurality of telecommunications service subscribers desiring to obtain a voice communication among themselves;

a processor, located in said switching office, for carrying out a sequence of instructions embodied in a computer-readable medium;

a database connected to said processor, for providing a computer file which includes computer-readable information about a service subscriber in said plurality of telecommunications service subscribers, said computer-readable information being arranged as a user journal corresponding to said service subscriber, wherein said user journal includes a first list comprising at least one telephone number of a first set of service subscribers initiating a telephone call to said service subscriber, a second list comprising at least one telephone number of a second set of service subscribers receiving a telephone call from said service subscriber, and a third list comprising at least one telephone number of a third set of service subscribers who are authorized to access said first and second lists, wherein said processor, responsive to said sequence of instructions generated from commands input by a user, accesses said database to perform a call processing function using either said telephone number of said first set of service subscribers or said telephone number of said second set of service subscribers located in said first and second lists, respectively.

5,774,532

#### SINGLE NETWORK RECORD CONSTRUCTION

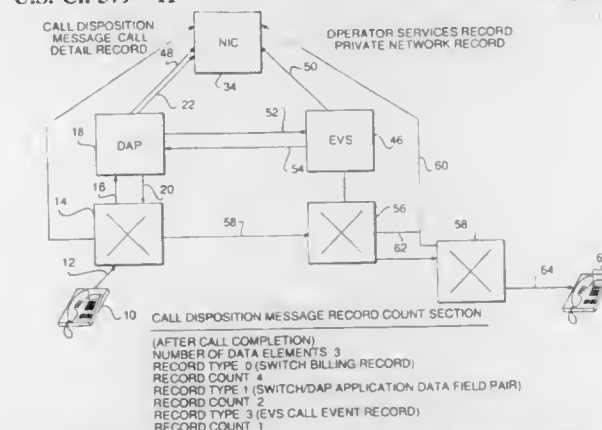
Louis G. Gottlieb; Isaac K. Elliott, both of Colorado Springs, and Kevin R. Witzman, Monument, all of Colo., assignors to MCI Corporation, Washington, D.C.

Filed Apr. 21, 1995, Ser. No. 426,257

Int. Cl.<sup>6</sup> H04M 15/00

U.S. Cl. 379—11

10 Claims



1. In a network having multiple network elements that affect transmission of a call between origination and terminal points, a system for constructing a single network record, the system comprising:

means for creating a data buffer, at a first network element, that processes the call from an origination point;

means for routing the call between the origination point and a plurality of network elements;

each network element that receives the routed call incrementing a count in a portion of the Record Count Section of the buffer;

a terminal switch for connecting the routed call to a terminal point and creating a single call disposition message with finalized counts in the Record Count Section of the buffer;

means for transferring the call disposition messages to a network information concentration means to inform the latter as to the

finalized counts, corresponding to the number of call records it will receive from network elements participating in a call; and

means for subsequently transferring actual call records from the participating network elements to the network information concentration means for merger of records into a single network record.

5,774,533

#### METHOD AND SYSTEM FOR PROVIDING A BILLING DIRECTED COMMUNICATION SERVICE

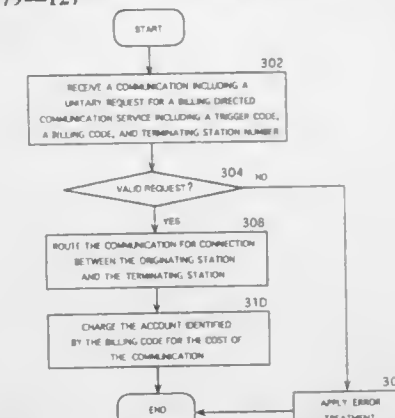
Navneet A. Patel, Marietta, Ga., assignor to BellSouth Corporation, Atlanta, Ga.

Filed Aug. 14, 1996, Ser. No. 702,385

Int. Cl.<sup>6</sup> H04M 15/00

U.S. Cl. 379—127

26 Claims



1. A method of providing a billing directed communication service, comprising the steps of:

receiving a communication from an originating station associated with an account number identifying an account that is normally charged for telephone calls initiated from the originating station, said communication comprising a unitary request for said billing directed communication service, said unitary request comprising a trigger code, a billing code identifying a billing account that is different from the account that is normally charged for telephone calls initiated from the originating station, and a terminating station number associated with a terminating station;

determining whether said unitary request is valid by comparing the received billing code to a list of billing codes in a subscriber profile; and

if said unitary request is valid, routing said communication for connection between said originating and terminating stations, and charging a cost associated with the provision of said communication to the billing account identified by the received billing code.

5,774,534

#### CONTEXT-BASED TRANSACTIONS USING BROADCAST ADVERTISING

Daniel J. Mayer, Warren, N.J., assignor to AT&T Corp., Middletown, N.J.

Continuation of Ser. No. 364,563, Dec. 27, 1994, abandoned.

This application Jun. 18, 1997, Ser. No. 877,894

Int. Cl.<sup>6</sup> H04M 15/00; 15/06; 3/42; 7/00

U.S. Cl. 379—142

49 Claims

1. A method for completing transactions relating to advertisements of a plurality of advertisers, the advertisements including a response telephone number and broadcast by a broadcast network broadcasting in a plurality of different geographic areas, said method comprising:

routing a call placed to said response telephone number by a recipient of one of said advertisements; and to a switch in a





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OFFICIAL GAZETTE

JUNE 30, 1998

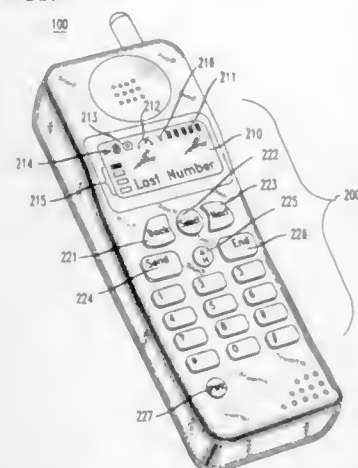
**5,774,540**  
**HIERARCHICAL MENU SCREEN INTERFACE FOR**  
**DISPLAYING AND ACCESSING TELEPHONE**  
**TERMINAL FEATURES**

Joanne W. Davidson, Keansburg; William F. Dudley, Jr., Jackson; David A. Fishman, Lakewood, all of N.J.; David M. Gresham, East Hampton, N.Y.; Kenneth Kasiske, Jackson, N.J.; Michael L. Moroze, Broomfield, Colo.; Elizabeth Bauer-Nilsen Sanders, Columbus, Ohio; Alessandro A. Subrizi, San Francisco, Calif.; and Susan L. Tuttle, East Windsor, N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Filed Nov. 15, 1995, Ser. No. 559,517  
Int. Cl.<sup>6</sup> H04M 1/00

U.S. Cl. 379—387

26 Claims



1. An arrangement for accessing selectable features of a telephone terminal, the arrangement comprising:  
means for displaying a plurality of menu screens in a display device at said telephone terminal, each one of the plurality of menu screens containing an indication of one of a plurality of selectable features of said telephone terminal available at each one of a plurality of selectable levels, an indication of the total number of selectable levels associated with said indicated feature, and an indication of which of said associated selectable levels is being displayed; and  
a plurality of button means coupled to said means for displaying for accessing each one of the plurality of menu screens, a first one of the plurality of button means providing a means for moving from a displayed first menu screen at a first selectable level forward to a second menu screen at said first selectable level, a second one of the plurality of button means providing a means for moving backward from said displayed first menu screen to a third menu screen at said first selectable level, and a third one of the plurality of button means providing a means for selecting one from the plurality of menu screens at a second selectable level.

**5,774,541**  
**OPTICALLY-COUPLED DATA ACCESS ARRANGEMENT**  
**AND TRANSIBYBRID**

Robert Krause, Menlo Park, Calif., assignor to Siemens Components, Inc., Cupertino, Calif.

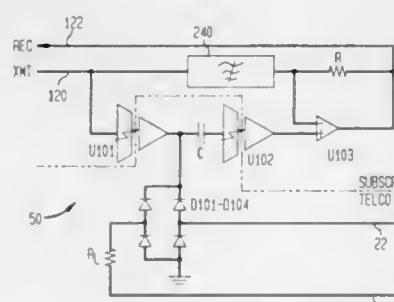
Continuation of Ser. No. 507,602, Jul. 26, 1995, abandoned, which is a continuation of Ser. No. 191,841, Feb. 4, 1994, abandoned. This application Mar. 8, 1996, Ser. No. 608,324  
Int. Cl.<sup>6</sup> H04M 1/58

U.S. Cl. 379—405

10 Claims

9. An apparatus for connecting a two-wire bidirectional first communications system to a second communications system having separate receive and transmit ports comprising:

- a first port for connection to the two-wire bidirectional first communications system;
- a second port for connection to the receive port of the second communications system;



a third port for connection to the transmit port of the second communications system;  
first means for transferring signals received at the first port to the second port and suppressing signals originating at the third port, the first means having an output provided to the second port;  
second means for isolating the first communications system from the second communications system and transferring signals originating at the third port to the first port, the second means being connected between the third port and the first port; and  
third means for isolating the first communications system from the second communications system and transferring signals received at the first port, the third means being connected between the first port and the first means.

**5,774,542**  
**SNAP-IN COVER FOR A PAYPHONE NUMBER PLATE**  
Leo Francis Casey, Lexington; David Michael Otten, Newton, and Thomas Hamilton Warner, Bedford, all of Mass., assignors to International Totalizing Systems, Inc., Bradford, Mass.

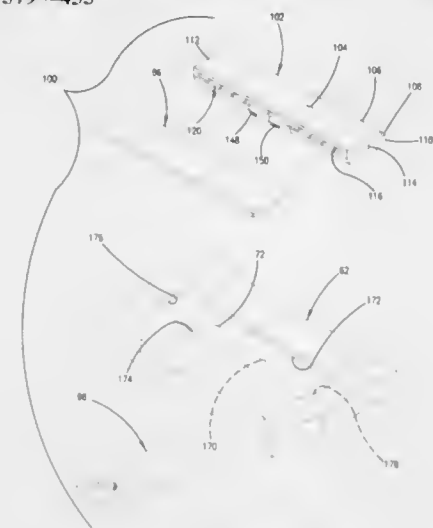
Continuation of Ser. No. 525,417, Sep. 8, 1995, abandoned.

This application Jun. 20, 1997, Ser. No. 880,020

Int. Cl.<sup>6</sup> H04M 1/00; G09F 3/18; 3/20

U.S. Cl. 379—433

23 Claims



1. A number plate cover that is externally installed into a housing faceplate of a public telephone, the cover is resistant to tampering, the cover comprising a parallelepiped having side faces, a top face, a bottom face and an open front face to form an envelope-shaped pocket into which a number plate is inserted, and at least one cantilevered arm attached to the parallelepiped, the arm terminating in a tab wherein the arm is parallel to the bottom face of the parallelepiped, the cover being retained in a generally rectangular-shaped recess on the housing faceplate when the tab engage an edge of the recess.

JUNE 30, 1998

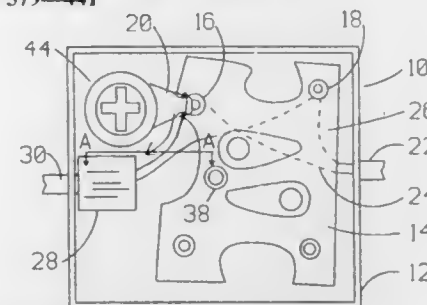
ELECTRICAL

5395

**5,774,543**  
**TELEPHONE JACKET SECURITY DEVICE**  
Calvin Flowers, 8135 S. Ada, Chicago, Ill. 60620  
Filed Nov. 13, 1995, Ser. No. 555,887  
Int. Cl.<sup>6</sup> H04M 1/00

U.S. Cl. 379—441

5 Claims

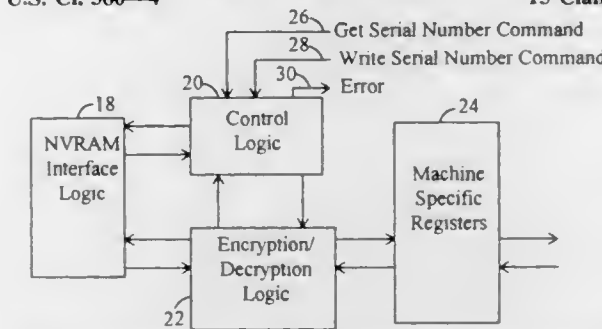


5. A locking phone jack apparatus having:  
a standard phone jack assembly with a phone jack box cover,  
a non-reversible fastener securing the phone jack box cover to the phone jack assembly,  
a rotatable lock with a contact arm made from either aluminum or copper, or an alloy of either, with the contact arm further having a ground or transmission wire contact,  
a ground wire,  
a transmission wire carrying a dial tone,  
a standard phone line receptacle connected to both the transmission wire and the ground wire,  
an integral phone jack line connected to the phone jack wherein the rotatable arm is capable of swinging between a first open circuit position to a second closed circuit position enabling the apparatus to selectively allow access to and from the dial tone.

**5,774,544**  
**METHOD AN APPARATUS FOR ENCRYPTING AND**  
**DECRYPTING MICROPROCESSOR SERIAL NUMBERS**  
Sherman Lee, Rancho Palos Verdes, Calif.; James R. MacDonald, Buda, and Michael T. Wisor, Austin, both of Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.  
Filed Mar. 28, 1996, Ser. No. 623,024  
Int. Cl.<sup>6</sup> H04L 9/00

U.S. Cl. 380—4

13 Claims



3. A computer system for encrypting a microprocessor serial number comprising:

- a central processing unit including at least one register for storing at least one encryption key and an unencrypted microprocessor serial number;
- a memory unit coupled to said central processing unit for storing an encrypted microprocessor serial number;
- encryption/decryption circuitry coupled to said at least one register and said memory unit for encrypting said unencrypted microprocessor serial number using said at least one encryption key; and
- interface circuitry coupled to said encryption/decryption circuitry and said memory unit for transferring said encrypted microprocessor serial number to said memory unit.

**5,774,545**  
**METHOD AND APPARATUS FOR ENHANCING**  
**SECURITY IN AND DISCOURAGING THEFT OF VLSI**  
**AND ULSI DEVICES**

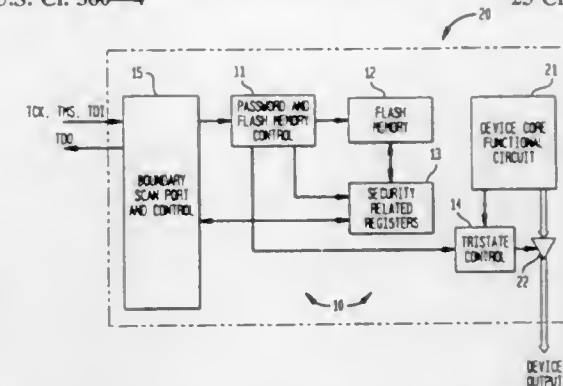
Partha Raghavachari, Chicago, Ill., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Mar. 28, 1996, Ser. No. 623,271

Int. Cl.<sup>6</sup> H04L 9/00

U.S. Cl. 380—4

25 Claims



1. A large scale integrated device having a core functional circuit and at least one output port, said device comprising:  
a security mechanism;  
a controller to control the operation of the security mechanism;  
a boundary scan port electrically coupled to said controller, said boundary scan port providing an interface between the security mechanism and an external medium;  
a flash memory electrically coupled to said controller, said flash memory providing the security mechanism with non-volatile storage of predetermined information and data;  
a set of security registers for providing functional support to said controller, said security registers electrically coupled to said flash memory, said controller and said boundary scan port; and  
tristate control logic for providing said controller with functional control over the core functional circuit and the output ports of the large scale integrated device, said tristate logic control electrically coupled to said controller, the core functional circuit and output ports of the device.

**5,774,546**  
**SECURE ACCESS SYSTEM UTILIZING AN ACCESS**  
**CARD HAVING MORE THAN ONE EMBEDDED**  
**INTEGRATED CIRCUIT AND/OR PLURALITY OF**  
**SECURITY LEVELS**

Doron Handelman, Givatim; Moshe Kranc; David Fink, both of Jerusalem; Arnold Zucker, Ramat Modim; Perry Smith, Jerusalem, and Gerson Bar-on, Kohav Hashahar, all of Israel, assignors to News Datacom Ltd., England

Division of Ser. No. 375,995, Jan. 20, 1995, Pat. No. 5,666,412.

This application Jan. 8, 1997, Ser. No. 780,501

Claims priority, application Israel, Oct. 3, 1994, 111151

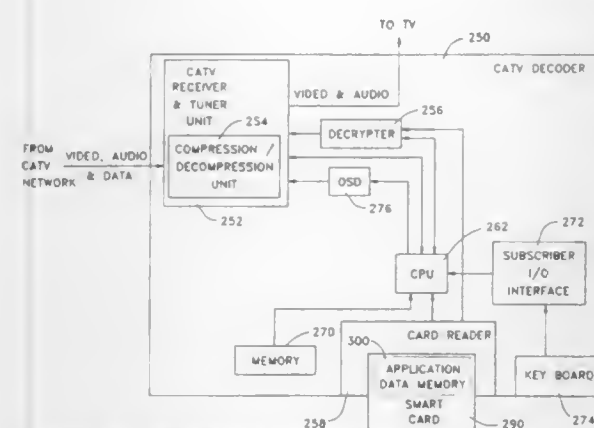
Int. Cl.<sup>6</sup> H04L 9/00; H04N 7/167; G06F 7/04

U.S. Cl. 380—4

19 Claims

8. In a CATV network, wherein CATV transmissions are transmitted to a multiplicity of subscriber units, each including a CATV decoder and a television, a method for accessing data comprising:  
inserting an IC card into an IC card receptacle forming part of an IC card reader and Writer coupled to said CATV decoder;  
addressing said IC card to enable access to video data stored in a memory embodied in said IC card by communicating any of seeds, keys and access control algorithms from said IC card to said CATV decoder;





reading said data stored in said memory; and providing said data to said television, wherein said addressing step includes employing a plurality of distinct decryption levels for decrypting said video data.

5,774,547

Patent Not Issued For This Number

5,774,548

#### DIGITAL BROADCAST TRANSMITTING AND RECEIVING SYSTEM AND TRANSMITTING AND RECEIVING APPARATUS THEREOF

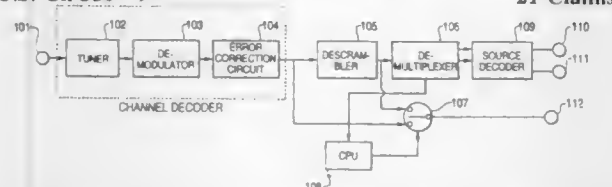
Yumi Bando; Toshinori Murata; Takumi Okamura; Kenji Katsumata; Masaru Nanki; Takanori Eda; Satoshi Imuro, and Satoru Takashimizu, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 4, 1996, Ser. No. 707,530

Claims priority, application Japan, Sep. 5, 1995, 7-227722

Int. Cl.<sup>6</sup> H04K 1/02; H04N 7/167

U.S. Cl. 380—9 21 Claims



1. A digital access control system for preventing unauthorized access to a descrambled digital signal, said system including a digital broadcast receiving system comprising:

- a descrambler for receiving a scrambled digital signal and restoring a descrambled digital signal therefrom;
- a demultiplexer for demultiplexing the descrambled digital signal and extracting demultiplexed signals and control information therefrom; and
- a selector for receiving said control information and selectively outputting, according to a content of said control information, an output corresponding to either one of the scrambled digital signal and the descrambled digital signal so as to control access to the descrambled digital signal according to a content of said control information.

#### 5,774,549 METHOD AND APPARATUS THAT PROCESSES A VIDEO SIGNAL TO GENERATE A RANDOM NUMBER GENERATOR SEED

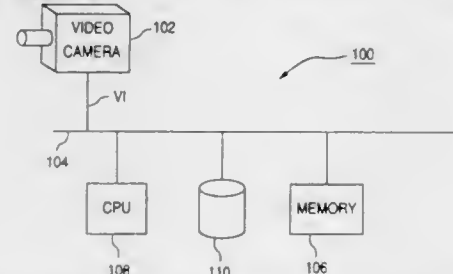
Jakob Nielsen, Atherton, Calif., assignor to Sun Microsystems, Inc., Mountain View, Calif.

Filed Dec. 4, 1995, Ser. No. 566,964

Int. Cl.<sup>6</sup> H04N 7/167; H04L 9/00; 9/08

U.S. Cl. 380—20

18 Claims



1. A method, executed in a computer system, for determining a seed for use in encrypting a digital signal, comprising the steps of: receiving a video image signal that includes a video image; processing the video image to generate a seed; and providing the generated seed as the determined seed wherein the video image signal that includes a video image is a first video image signal that includes a first video image, and further comprising the steps of: storing the determined seed as a previously determined seed; receiving a second video image signal that includes a second video image; receiving a third video image signal that includes a third video image; determining a difference between the third video image and the second video image; and processing the third video image to generate a seed only if the difference between the third video image and the second video image exceeds a threshold.

9. An article of manufacture comprising:

a computer usable medium having computer readable program code embodied therein that causes a computer to determine a seed for use in encrypting a digital signal, the computer readable program code in said article of manufacture comprising:

computer readable program code that causes the computer to receive a video image signal that includes a video image; computer readable program code that causes the computer to process the video image to generate a seed; and computer readable program code that causes the computer to provide the generated seed as the determined seed, wherein the video image signal includes a plurality of pixel signals, each pixel signal including at least one color signal, wherein the computer readable program code that causes the computer to process the video signal to generate the seed comprises:

computer readable program code that causes the computer, for each pixel signal, to logically combine the color signals of that pixel to generate a pixel component for that pixel signal; computer readable program code that causes the computer to generate the seed based on the generated pixel components.

11. The article of manufacture of claim 9, wherein each pixel signal is associated with a different position in the video signal, and the computer readable program code further comprises:

computer readable program code that causes the computer to provide a multiplication factor for each different position in the video signal; and computer readable program code that causes the computer, for each generated pixel component, to multiply that generated pixel component by the multiplication factor provided for the position in the video signal of the pixel from which that pixel component was generated, to produce a multiplied generated pixel component, and

the computer readable program code that causes the computer to generate the seed based on the generated pixel components includes computer readable program code that causes the computer to generate the seed based on the multiplied generated pixel components generated from the pixel components.

5,774,550

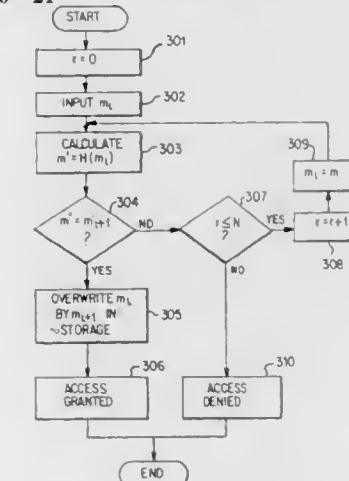
#### VEHICLE SECURITY DEVICE WITH ELECTRONIC USE AUTHORIZATION CODING

Horst Brinkmeyer, Waiblingen; Michael Daiss, Filderstadt; Günter Schwegler, Weinstadt, and Bertolt Krüger, Bonn, all of Germany, assignors to Mercedes-Benz AG, Germany  
Continuation of Ser. No. 415,376, Apr. 3, 1995. This application Jun. 26, 1997, Ser. No. 882,929

Claims priority, application Germany, Apr. 1, 1994, 44 11 451.6

Int. Cl.<sup>6</sup> H04L 9/16

U.S. Cl. 380—21



1. Vehicle security device having an electronic use-authorization coding arrangement comprising:

- a user-end key unit for successively transmitting items of user code information, which items differ from one another;
- a vehicle-end device for receiving the transmitted items of user code information, and generating as a function thereof an item of actual authorization information; and
- means for comparing said item of actual authorization information with an item of desired authorization information present at the vehicle unit, and for generating an item of use-enabling information based on a result of said comparing; wherein: said user-end key unit includes a signature generating component which utilizes a digital signature algorithm, and which signal generating component has stored therein an item of secret encryption information, for encrypting and transmitting user code information or synchronization information, said user code information or synchronization information containing an item of new desired authorization information, together with a signature generated by said digital signature algorithm; and said vehicle end device includes a verification component which utilizes said digital signature algorithm, and which verification component contains an item of nonsecret decryption information, for receiving and decrypting said user code information or synchronization information.

5,774,551

#### PLUGGABLE ACCOUNT MANAGEMENT INTERFACE WITH UNIFIED LOGIN AND LOGOUT AND MULTIPLE USER AUTHENTICATION SERVICES

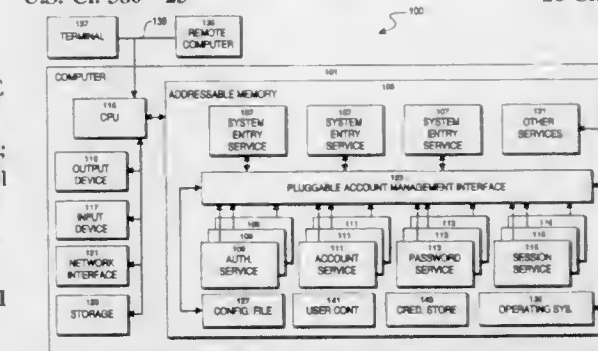
Tajen R. Wu, Fremont; William A. Shannon, Los Altos; Paul Fronberg, Redwood City; Donald R. Stephenson, Pleasanton, and Vipin Samar, Cupertino, all of Calif., assignors to Sun Microsystems, Inc., Mountain View, Calif.

Filed Aug. 7, 1995, Ser. No. 499,487

Int. Cl.<sup>6</sup> H04L 9/32

U.S. Cl. 380—25

26 Claims



1. A computer system providing multiple account management services to a user connecting to the computer system with a first system entry service, comprising:

- at least one system entry service, each system entry service providing a method to connect a user to the computer system during a session;
- at least one account management service comprising a plurality of operations for managing user specific account data for users of the computer system;
- a storage facility having a plurality of services associations, each service association identifying a system entry service and at least one account management service; and
- an application programming interface mediating between the system entry services and the account management services, the application programming interface providing a plurality of API methods, each API method invoking at least one operation of at least one selected account management service in response to an invocation of the application programming interface to provide the operation, the application programming interface determining from the storage facility the at least one selected account management service associated with a selected system entry service used to connect the user to the computer system.

5,774,552

#### METHOD AND APPARATUS FOR RETRIEVING X.509 CERTIFICATES FROM AN X.500 DIRECTORY

Francine Gail Grimmer, Poway, Calif., assignor to NCR Corporation, Dayton, Ohio

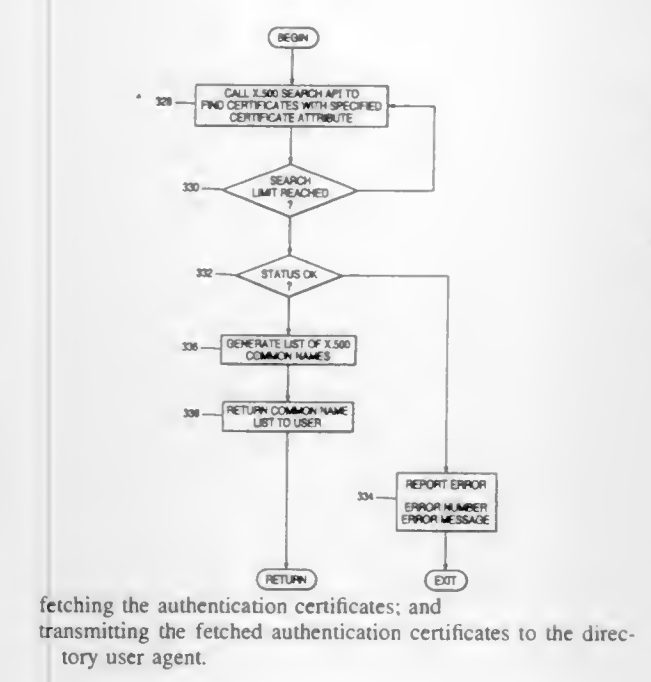
Filed Dec. 13, 1995, Ser. No. 572,261

Int. Cl.<sup>6</sup> H04L 9/00

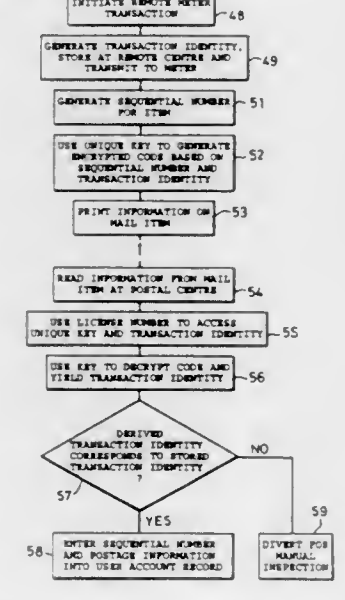
U.S. Cl. 380—25

32 Claims

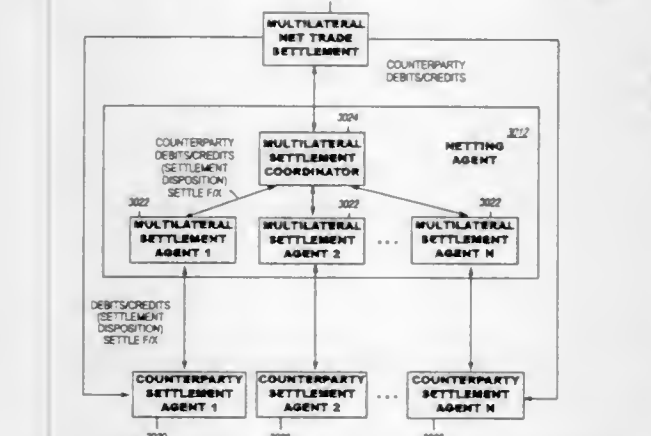
1. A method of retrieving an authentication certificate from a directory accessible by a directory service agent in a directory user agent, comprising the steps of: transmitting an open connection message comprising a search criteria message including certificate attributes to establish communication between the directory user agent and the directory service agent; searching the directory for authentication certificates responsive to the search criteria message;



5,774,554  
POSTAGE METER SYSTEM AND VERIFICATION OF POSTAGE CHARGES  
Dennis Thomas Gilham, Brentwood, United Kingdom, assignor to Neopost Limited, Essex, United Kingdom  
Filed Mar. 18, 1996, Ser. No. 617,326  
Claims priority, application United Kingdom, Mar. 17, 1995, 9505433  
Int. Cl.<sup>6</sup> H04L 9/00; G06F 7/06  
U.S. Cl. 380—51 3 Claims



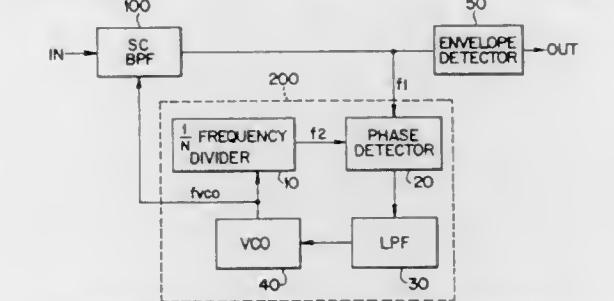
5,774,553  
FOREIGN EXCHANGE TRANSACTION SYSTEM  
Sholom S. Rosen, New York, N.Y., assignor to Citibank N.A., New York, N.Y.  
Filed Nov. 21, 1996, Ser. No. 754,694  
Int. Cl.<sup>6</sup> H04L 9/00; G07F 19/00  
U.S. Cl. 380—49 23 Claims



21. A realtime multilateral foreign exchange settlement system, comprising:  
a computer implemented netting system;  
a processor-based multilateral settlement coordinator (MSC) having a first money module and a first host application, where said first host application receives debit and credit data from said netting system;  
a plurality of processor-based multilateral settlement agents (MSAs) each having a second money module and a second host application; and  
a plurality of processor-based counterparty settlement agents (CSAs) each having a third money module and a third host application;  
wherein said second and third money modules communicate via cryptographically secure sessions;  
where said first money module receives electronic money from said third money modules of net debit CSAs via said second money modules;  
where when all net debit counterparties have paid, said first money module sends said electronic money to said third money modules of net credit CSAs via said second money modules.

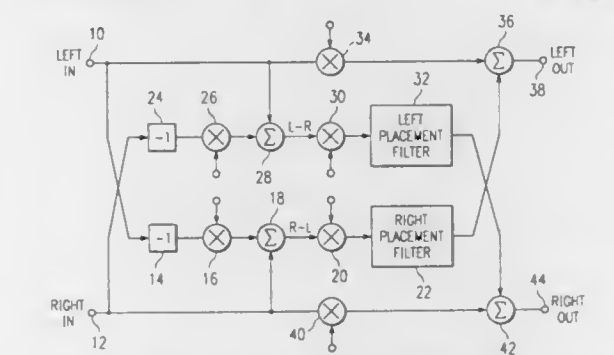
1. A method of verifying postage charges used by a mail sender against postage purchase from a remote center by the mail sender including the steps of:  
a) generating a new transaction identity number at the remote center each time a transaction to purchase postage is effected between the remote center and a postage meter used by the mail sender;  
b) transmitting the new transaction identity number to the postage meter;  
c) generating at the postage meter a serial number for each mail item processed by the postage meter;  
d) storing at the postage meter a key uniquely associated with the postage meter and storing said key in a data base of keys at the remote center;  
e) using said key to generate an encrypted code based on the serial number and the transaction identity number;  
f) printing on each mail item a franking impression, said encrypted code and a meter identification number identifying the postage meter; and  
at a postal authority mail handling depot the steps of:  
g) reading at least the meter identification number and the encrypted code from a mail item received at the postal authority mail handling depot;  
h) using the meter identification number to determine said key from the database of keys;  
i) using the meter identification number to determine the current transaction identity number stored at the remote center;  
j) using said key to decrypt the encrypted code to yield the transaction identity number from said encrypted code; and  
k) comparing the current transaction identity number stored in the remote center with the transaction identity number obtained from the encrypted code printed in the printed information.

5,774,555  
SWITCHED CAPACITOR BANDPASS FILTER FOR DETECTING PILOT SIGNAL  
Jeoung-in Lee, Bucheon, and Yank-gyun Kim, Seoul, both of Rep. of Korea, assignors to Samsung Electronics Co., Ltd., Rep. of Korea  
Filed Aug. 19, 1996, Ser. No. 699,610  
Claims priority, application Rep. of Korea, Aug. 12, 1994, 94-19947  
Int. Cl.<sup>6</sup> H04H 5/00 7 Claims  
U.S. Cl. 381—4 50



1. An apparatus for detecting a pilot signal comprising:  
a switched capacitor band pass filter for receiving a composite signal made of an audio signal and an amplitude-modulated pilot signal, filtering the amplitude-modulated pilot signal in response to a clock signal and outputting the filtered amplitude-modulated pilot signal;  
a phase detector for detecting a phase difference between the filtered amplitude-modulated pilot signal and a frequency divided signal;  
a low-pass filter for low-pass-filtering the phase difference;  
a voltage-controlled oscillator for outputting the clock signal having the frequency determined by the output signal of said low-pass filter;  
a (1/N) frequency divider for (1/N) dividing the clock signal and outputting a (1/N) divided signal as the frequency divided signal; and  
an envelope detector for detecting an envelope of the filtered amplitude-modulated pilot signal and outputting the detected envelope as the pilot signal, wherein the frequency of the pilot signal has information used to discriminate a broadcasting state.

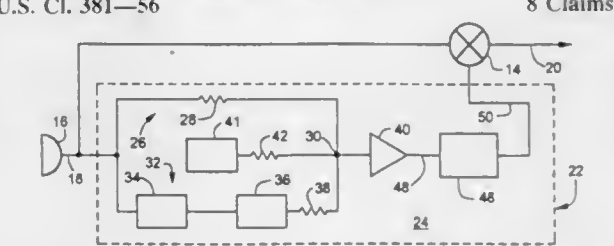
5,774,556  
STEREO ENHANCEMENT SYSTEM INCLUDING SOUND LOCALIZATION FILTERS  
Danny D. Lowe, Scott Willing, William Gonnason, Mark Williams, and Don Lafont, all of Calgary, Canada, assignors to QSound Labs, Inc., Alberta, Canada  
Continuation-in-part of Ser. No. 115,577, Sep. 3, 1993, Pat. No. 5,440,638. This application Aug. 7, 1995, Ser. No. 511,788  
Int. Cl.<sup>6</sup> H04S 5/00 4 Claims  
U.S. Cl. 381—17



1. Stereo sound field enhancement apparatus receiving left-channel and right-channel audio signals, comprising:

means for receiving the left-channel and right-channel audio signals and for producing a left output signal from which a portion of audio information common to the right-channel audio signal is absent and for producing a right output signal from which a portion of audio information common to the left-channel audio signal is absent;  
a right placement filter receiving said right output signal and producing a left audio image processed signal, said right placement filter including three cascaded filter units having identical structure and having different respective pole and zero coefficients;  
a left placement filter receiving said left output signal and producing a right audio image processed signal, said left placement filter including three cascaded filter units having identical structure and having different respective pole and zero coefficients;  
means for receiving the right-channel audio signal and producing a delayed right-channel signal;  
means for receiving the left-channel audio signal and producing a delayed left-channel signal; and  
means for combining said left audio image processed signal and said delayed left-channel signal to produce a left-channel output signal and for combining said right audio image processed signal and said delayed right-channel signal to produce a right-channel output signal.

5,774,557  
AUTOTRACKING MICROPHONE SQUELCH FOR AIRCRAFT INTERCOM SYSTEMS  
Robert Winston Slater, 48 W. 938 Chandelle, Hampshire, Ill. 60140  
Filed Jul. 24, 1995, Ser. No. 506,365  
Int. Cl.<sup>6</sup> H04R 29/00 8 Claims  
U.S. Cl. 381—56



1. An automatic adjusting microphone audio squelch system for use in aircraft and other high noise environments including digital means for outputting a signal representative of the presence of valid voice audio from a microphone, the digital means having an input, the input defining a first signal input level whereby the digital means will not represent the presence of a valid voice audio signal so long as the input to the digital means remains below said first signal level and defining a second higher signal input level whereby the digital means will represent the presence of a valid voice audio signal so long as the input to the digital means exceeds said second signal level; means for generating a composite audio signal, said means including a microphone audio input adapted for connection to a microphone and a composite signal output, said signal output being connected to the input of the digital means, the generating means including means for automatically maintaining the composite output signal below said first signal level in response to an aircraft noise signal without voice audio on the microphone input and for automatically permitting the composite signal to exceed the second signal level when a voice audio signal is present on the microphone audio input whereby the squelch will automatically compensate for changes in the continuous aircraft or other environmental noise and maintain a microphone in its off condition and will, further, automatically enable a microphone when voice audio is present.



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5,774,558

## SOUND IMAGER

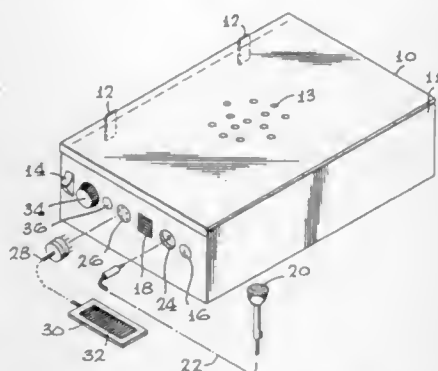
Doris Drucker, Claremont, Calif., assignor to RSQ, LLC, Claremont, Calif.

Filed Oct. 24, 1996, Ser. No. 736,197

Int. Cl.<sup>6</sup> H04R 29/00

U.S. Cl. 381—56

12 Claims



1. A sound imager for visually displaying the volume of acoustic signals comprising a power supply; transducer means connected to said power supply for receiving said signals and converting them into a voltage which corresponds to the level of sound of said signals; amplifying means connected to said transducer means for amplifying said voltage; signal processing means connected to said amplifying means; a display driver connected to said signal processing means; and display means adapted to receive voltage from said display driver to display a spectrographic image in which diverse colors correspond to predetermined levels of sound; said signal processing means including capacitance means connected to receive the output of said amplifying means such that in the absence of said acoustic signals, said display means have no output.

5,774,559

## METHOD AND APPARATUS FOR DETERMINING PERCEIVED ROUGHNESS OF POWERTRAIN SOUNDS

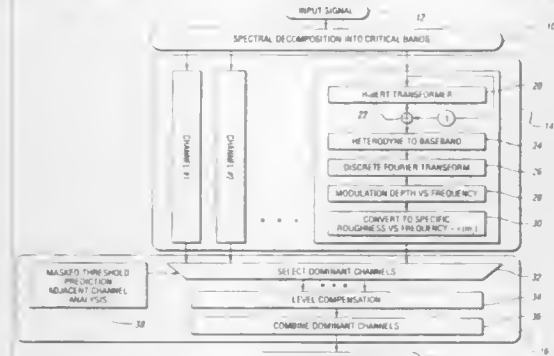
Ben John Feng, Ann Arbor, Mich., assignor to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Feb. 3, 1997, Ser. No. 790,872

Int. Cl.<sup>6</sup> H04R 29/00

U.S. Cl. 381—56

13 Claims



1. A roughness analyzer for predicting perceived roughness of powertrain sounds comprising: an auditory filterbank for spectrally decomposing powertrain sound signals into a set of critical bandwidth signals; means for determining the specific roughness of said critical bandwidth signals; means for summing the specific roughness of only those individual signals that dominate the sensation of roughness to obtain an overall roughness measure.

5,774,560

## DIGITAL ACOUSTIC REVERBERATION FILTER NETWORK

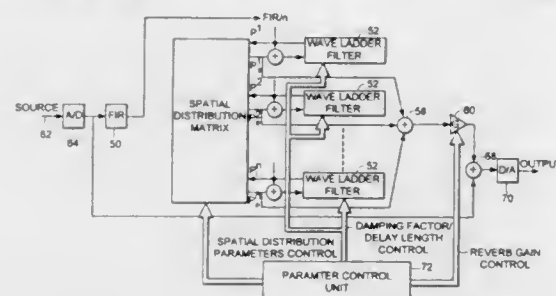
Alvin Wen-Yu Su, Chang-Hwa County, and Li-Wei Wang, Tao-Yuan County, both of Taiwan, assignors to Industrial Technology Research Institute, Hsinchu, Taiwan

Filed May 30, 1996, Ser. No. 656,850

Int. Cl.<sup>6</sup> H03G 3/00

U.S. Cl. 381—63

23 Claims



1. A reverberation network for processing an audio signal, said reverberation network comprising:

a plurality of wave-ladder filters, each of which simulates a corresponding reflected audio signal from wave propagation in a selected direction, wherein each of said plurality of wave-ladder filters receives as input a signal including a component derived from the audio signal before the audio signal passes through any of the wave-ladder filters; and an adder which combines the corresponding reflected signals of said plurality of wave-ladder filters to produce a reverberation signal.

5,774,561

## SUBBAND ACOUSTIC ECHO CANCELLER

Akira Nakagawa, Kokubunji; Yoichi Haneda, Tokyo; Shoji Makino, Machida; Suehiro Shimauchi, and Junji Kojima, both of Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Corp., Tokyo, Japan

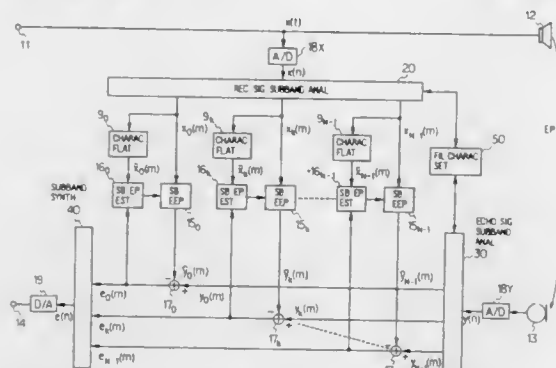
Filed Aug. 12, 1996, Ser. No. 695,446

Claims priority, application Japan, Aug. 14, 1995, 7-206929

Int. Cl.<sup>6</sup> H04B 3/20

U.S. Cl. 381—66

16 Claims



1. A subband acoustic echo canceller which outputs a received signal to an echo path and, at the same time inputs it into an estimated echo path to generate an echo replica and subtracts said echo replica from an echo signal picked up via said echo path, said subband acoustic echo canceller comprising:

a received signal subband analysis part for dividing said received signal into a plurality of subband signals; an echo signal subband analysis part for dividing said echo signal into a plurality of subband echo signals; a plurality of subband estimated echo paths, each formed by a digital filter which is provided in each subband supplied with the corresponding subband received signal and generates a subband echo replica;

a plurality of subband subtraction parts for subtracting said subband echo replicas provided by said plurality of subband estimated echo paths from said plurality of subband echo signals to generate subband error signals, respectively; a plurality of subband echo path estimation parts for estimating the transfer functions of said subband estimated echo paths from said subband error signals and said subband received signals by an adaptive algorithm so that said subband error signals are reduced to zero; and

a subband synthesis part for synthesizing said subband error signals;

said received signal subband analysis part and said echo signal subband analysis part including a plurality of received signal band-pass filters and a plurality of echo signal band-pass filters for dividing said received signal and said echo signal into pluralities of subbands to generate said subband received signals and said subband echo signals, respectively, and decimation parts for decimating said subband received signals and said subband echo signals at predetermined decimation ratios to generate said plurality of subband received signals and said plurality of subband echo signals, respectively; and

means for setting the stop-band attenuation of each of said received signal band-pass filters of said received signal subband analysis part at a value smaller than the stop-band attenuation of each of said echo signal band-pass filters of said echo signal subband analysis part to thereby flatten the frequency characteristics of the subband received signals relative to the subband echo signals.

5,774,562

## METHOD AND APPARATUS FOR DEREVERBERATION

Kenichi Furuya, and Yutaka Kaneda, both of Tokorozawa, Japan, assignors to Nippon Telegraph and Telephone Corp., Tokyo, Japan

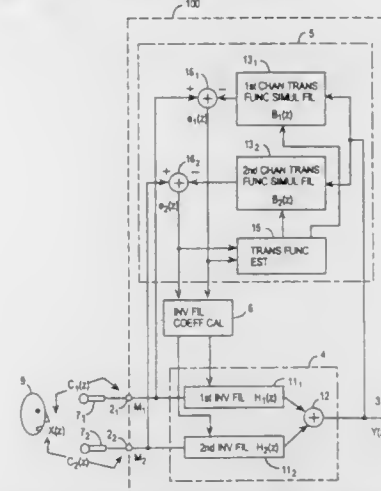
Filed Mar. 24, 1997, Ser. No. 822,006

Claims priority, application Japan, Mar. 25, 1996, 8-68550

Int. Cl.<sup>6</sup> H04B 3/20; H04M 1/00; 9/00

U.S. Cl. 381—66

17 Claims



1. A method of dereverberation in which reverberant components are eliminated from a reverberant sound in a reverberant room, comprising the steps of:

- using at least two microphones disposed at different locations to receive a reverberant sound from a sound source to provide first and second received signals as inputs;
- applying first and second inverse filter processing to the first and the second received signals and adding the results of the processing together to provide a dereverberated signal, the processings using inverse filter coefficients corresponding to first and second transfer functions from the sound source to respective inputs of the first and the second received signals;
- delivering the dereverberated signal as a dereverberated sound signal while determining evaluation values which cor-

respond to residual reverberant components on the basis of the first and the second received signals and the dereverberated signal;

- determining the inverse filter coefficients used in the inverse filter processing so that the evaluation values are brought most close to 0, and using the inverse filter coefficients thus determined to update the inverse filter coefficients; and
- returning to the step (a) and repeating the steps (a)–(d) again.

5,774,563

## COMBINED ELECTRONIC ACOUSTIC STETHOSCOPE

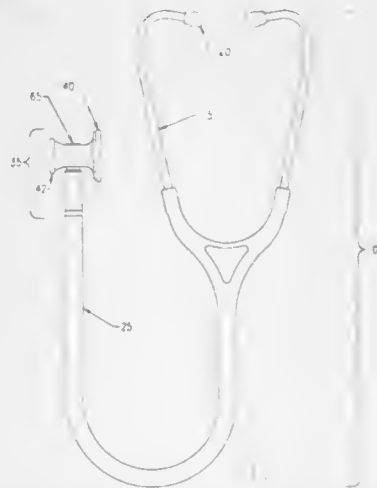
Richard J. DesLauriers, 78 Joseph St., Waterbury, Conn. 06705, and James M. Muskatello, 51 W. Pines Dr., Southington, Conn. 06489

Filed Jul. 11, 1996, Ser. No. 680,274

Int. Cl.<sup>6</sup> A61B 7/04

U.S. Cl. 381—67

15 Claims



1. A combined electronic acoustic stethoscope having a compact conventional appearance comprising:

- a spool;
- a spool communication port located in said spool;
- a head assembly rotatably mounted on said spool, comprising:
  - a diaphragm;
  - a bell;
  - a battery holder;
  - a microphone;
  - a speaker;
- signal processing means enabling a sound to be simultaneously recorded and monitored by a user; and,

a programmable switch centrally located on top of said head assembly for selecting between a conventional mode in which said diaphragm and said bell are operative to receive sounds and acoustically transmit the received sounds to a user's ear through a continuous unimpeded air canal, and an electronic mode in which said microphone and said signal processing means operate to receive sounds and transmit the received sounds through the speaker;

said programmable switch and said spool integrated together such that by actuating said programmable switch said spool communication port opens and closes different acoustic ports within said head assembly;

said signal processing means controlled by said programmable switch;

said microphone, speaker, signal processing means and programmable switch concealed within the head assembly thereby providing the stethoscope with said compact conventional appearance;

a conduit assembly having a proximal end and a distal end, the proximal end of the conduit assembly connected to the spool; and,

a first and a second ear piece connected to the distal end of the conduit assembly.

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5,774,564

**ACTIVE CONTROLLER USING LATTICE-TYPE FILTER AND ACTIVE CONTROL METHOD**

Masaki Eguchi, Uji, and Fumio Kokubo, Kitakatsuragi-gun, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

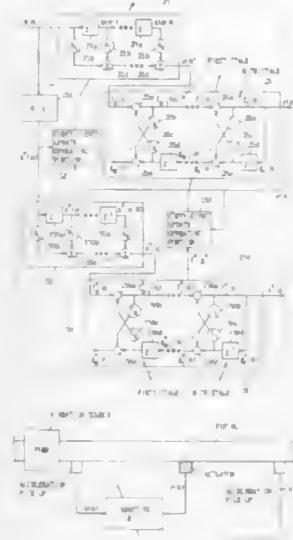
Filed Oct. 13, 1994, Ser. No. 322,147

Claims priority, application Japan, Oct. 13, 1993, 5-255877

Int. Cl.<sup>6</sup> H03B 29/00; A61F 11/06

U.S. Cl. 381—71.11

21 Claims



1. An active controller, comprising:

detecting means for detecting an amount of a physical phenomena and generating a detect signal corresponding to the detected amount of the physical phenomena;

signal processing means for applying a predetermined processing to said detect signal and generating a control signal, said signal processing means having

a non-recursive all zero digital filter receiving said detect signal for carrying out a first filtering process, and

a lattice-type multi-stage all pole digital filter, receiving an output signal from said non-recursive all zero digital filter after the first filtering process, for carrying out a second filtering process on the output signal to generate said control signal;

output means for converting said control signal from said signal processing means into an amount of the physical phenomena for output;

error signal generating means, coupled to receive the amount of the physical phenomena provided from said output means, for generating an error signal indicative of a difference between a desired amount of the physical phenomena and the received amount of the physical phenomena; and

adapting means for adjusting filtering characteristics of said non-recursive all zero digital filter and said lattice-type multi-stage all pole digital filter so that a magnitude of said error signal becomes minimum, according to said detect signal and said error signal.

said adapting means including means coupled to receive said error signal and an interference signal which is indicative of an estimation of both a characteristic of an error propagation path and said output signal applied to said lattice-type multi-stage all pole digital filter, for adapting the filter characteristics of said lattice-type multi-stage all pole digital filter.

5,774,565

**ELECTRONIC CANCELLATION OF AMBIENT NOISE IN TELEPHONE HEADSET**

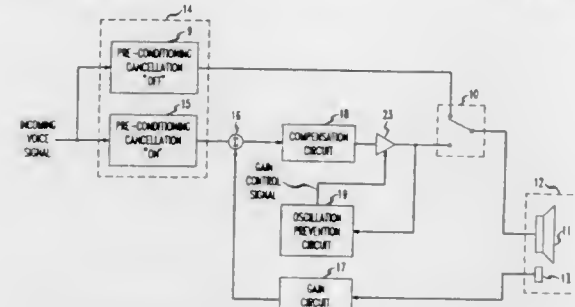
Roger David Benning, Long Valley; Elliot Andrew Fischer, Madison; Patricia Lee Greene, Mountain Lakes; Charles Sanford, Somerset, and Robert Edward Schneider, Wayne, all of N.J., assignors to Lucent Technologies Inc., Murray Hill, N.J.

Continuation of Ser. No. 285,614, Aug. 3, 1994, abandoned, which is a continuation of Ser. No. 971,009, Nov. 2, 1992. This application Oct. 28, 1996, Ser. No. 493,017

Int. Cl.<sup>6</sup> H04R 27/00

U.S. Cl. 381—83

4 Claims



1. In an ambient noise reducing telephone comprising a speaker-receiver, an incoming signal path to said receiver, an error microphone disposed at said receiver for picking up ambient noise signal at said receiver, and a noise-cancelling circuit responsive to error microphone output for generating an interfering acoustic signal which diminishes the amplitude of said noise signal, the improvement comprising:

(a) first and second incoming speech preconditioning circuits, said second preconditioning circuit disposed in the incoming signal path such that an incoming signal must traverse said second preconditioning circuit prior to said noise-cancelling circuit;

said first preconditioning circuit consisting of means for adjusting said incoming signal in frequency response in relation to the frequency response of said speaker-receiver so that the output of said speaker-receiver is essentially flat from about 500 Hz. to 3000 Hz. when said noise-cancelling circuit is inactive;

said second preconditioning circuit consisting of means for adjusting said incoming signal in frequency response in relation to the frequency response of the combination of said speaker-receiver and said noise-cancelling circuit so that the output of said speaker-receiver is essentially flat from about 500 Hz. to 3000 Hz. when said noise-cancelling circuit is active;

(b) switch means for selectively passing the output of either said first or said second preconditioning circuit to said speaker-receiver according to whether said noise-cancelling circuit is, respectively, inactive or active; and

(c) an oscillation prevention circuit comprising: high-pass filter means having input and output ports, said input being connected to the output of said second preconditioning circuit, for removing signals below about 1000 Hz.; an energy-measuring circuit connected to said output port, for generating periodic measures of the energy level of signals in said output port; and

variably settable threshold means for receiving an output of said energy-measuring circuit indicative of the onset of oscillations, and for sending a control signal to an output amplifier of the noise-cancelling circuit to reduce amplification by a predetermined amount for a preselected period, thereby to drive said output amplifier out of an oscillatory mode.

5,774,566

**DEVICE FOR TREATING SIGNALS**

Robert Huber, Unterengstringen, and Peter Fisch, Renens, both of Switzerland, assignors to Studer Professional Audio AG, Regensdorf, Switzerland

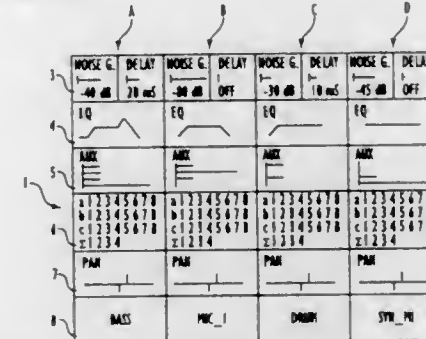
Filed Dec. 11, 1995, Ser. No. 570,489

Claims priority, application Switzerland, Dec. 15, 1994, 3801/94

Int. Cl.<sup>6</sup> H04B 1/00

U.S. Cl. 381—119

13 Claims



1. An audio mixing device for adjusting and controlling audio signals received through a plurality of channels comprising: a plurality of adjustable elements for adjusting the audio signals associated with each of the plurality of channels; each adjustable element coupled with at least one control element for controlling the audio signal; the control elements positioned on a control surface, the control surface including a plurality of image display devices associated with each adjustable element; the plurality of image display devices simultaneously displaying a plurality of images comprising an actual setting of each adjustable element and a plurality of functional responses of the audio signal associated with each actual setting; and at least one additional display that simultaneously displays an enhanced image of a respectively selected at least one of the plurality of images.

5,774,567

**AUDIO CODEC WITH DIGITAL LEVEL ADJUSTMENT AND FLEXIBLE CHANNEL ASSIGNMENT**

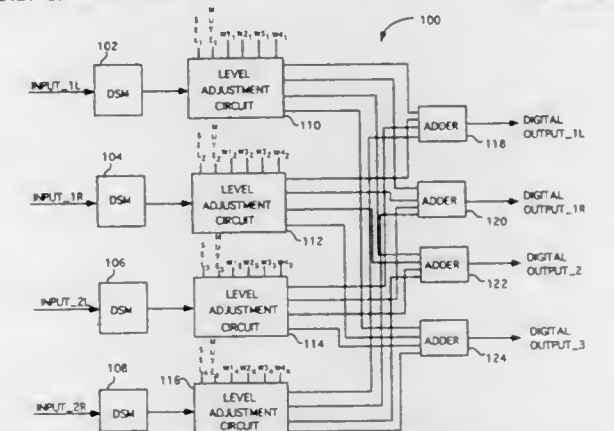
Lawrence F. Heyl, Mountain View, Calif., assignor to Apple Computer, Inc., Cupertino, Calif.

Filed Apr. 11, 1995, Ser. No. 420,359

Int. Cl.<sup>6</sup> H04B 1/00

U.S. Cl. 381—119

13 Claims



1. An apparatus for coding and decoding sound signals, said apparatus receiving a plurality of input sound signals on input signal lines and producing a plurality of digital output signals on output signal lines, said apparatus comprising:

a plurality of delta sigma modulators, each of said delta sigma modulators receiving a different one of the input sound sig-

nals and producing a serial digital sound signal having pulses determined by the corresponding input sound signal;

a plurality of level adjustment circuits, each of said level adjustment circuits corresponding to one of said delta sigma modulators and receiving the serial digital sound signal produced thereby, and each of said level adjustment circuits receiving a predetermined weight value for each of the output signal lines and respectively outputting a weighted digital signal for each of the output signal lines based on the corresponding weight value, the predetermined weight values being independently selectable; and

a plurality of combiners, each of said combiners respectively combining the outputted weighted digital signals corresponding to one of the output signal lines.

5,774,568

**METHOD OF TESTING A SURFACE NON-DESTRUCTIVELY IN PARTICULAR IN A HOSTILE ENVIRONMENT**

Gérard Freneix, Saint Sébastien, France, assignor to GEC Alsthom Systemes et Services SA, Paris, France

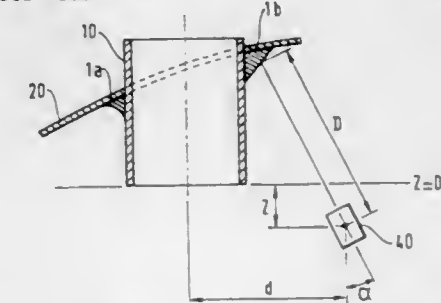
Filed Jan. 26, 1996, Ser. No. 592,462

Claims priority, application France, Jan. 27, 1995, 95 00962

Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382—100

12 Claims



1. A method for testing a surface for defects non-destructively, comprising the steps of:

(a) disposing a remote-controlled video camera in the vicinity of said surface for supplying video images of said surface, said video camera being supported by an instrumented positioning device;

(b) using known input parameters to synthesize a three-dimensional synthesized image representing an ideal model of said surface;

(c) superimposing a two-dimensional projection of the synthesized image onto a corresponding video image to obtain a superimposed image;

(d) calibrating said synthesized image so as to overlap the corresponding video image to obtain data representing a calibrated image substantially corresponding to the surface;

(e) transferring a defect image from said corresponding video image onto the calibrated image to obtain data representing a two-dimensional projected image of the defect; (f) projecting the two-dimensional projected image of said defect image onto said three-dimensional synthesized image of said surface to obtain data representing a three-dimensional resultant image which substantially corresponds to the surface; and

(g) processing the data of the three-dimensional resultant image so as to analyze and characterize said defect image of the surface.



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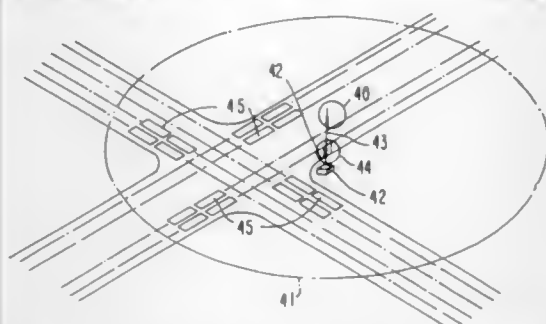
## SURVEILLANCE SYSTEM

H. Eugene W. Waldenmaler, One Barksdale Rd., White Plains, N.Y. 10607

Continuation of Ser. No. 279,916, Jul. 25, 1994, abandoned.  
This application Dec. 10, 1996, Ser. No. 762,927Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382—100

9 Claims



1. An adaptive learn mode method applied to the digital, time tagged, video data of a traffic surveillance system which eliminates or minimizes the need for operator intervention during setup or use of the surveillance system and the surveillance system's data processing, wherein the adaptive learn mode method comprises a set of steps to establish and update functions that scale and align a coordinate system defined in object space to that of the coordinate system defined in surveillance camera's pixel space, or image plane, so that a-priori limits, boundaries, images and criteria established in object space may be applied to the acquired data in pixel space, wherein the said adaptive learn mode method comprises:

- executing one set of steps if installation site-specific data files are present;
- executing a different set of steps if installation site-specific data files are not present and the data processing determines that the parallelism of object motion, or traffic lanes, are within a specified limit, i.e., the slopes of all best fit matrix equations are within the equivalent of some angle implying that an intersection is not present; and
- executing a different set of steps if installation site-specific data files are not present and the data processing determines that the parallelism of object motion, or traffic lanes, exceeds a specified limit, i.e., the slopes of all best fit matrix equations equals or exceeds the equivalent of some angle implying that a standard intersection is present.

5,774,570

## DOCUMENT PROCESSING SYSTEM WITH AN IMAGE EDITING FUNCTION

Yasuko Toju, Edogawa-ku, and Naoki Hayashi, Nakai-machi, both of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

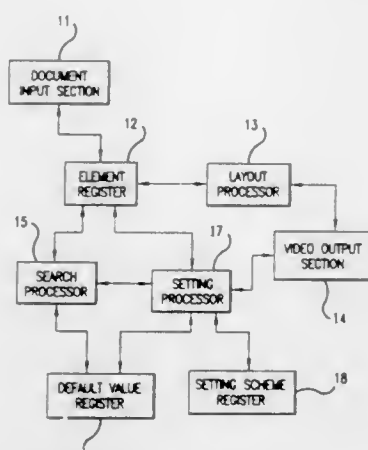
Filed Jun. 3, 1996, Ser. No. 657,107

Claims priority, application Japan, Aug. 18, 1995, 7-232060  
Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382—112

24 Claims

1. A document processing system comprising:
- first information containing a first visual feature of a first element of a document;
  - second information containing a second visual feature of the first element of the document;
  - element information register means which holds the first information and the second information which determine the visual features of the document element;
  - first default value register means which holds a default value of the first information;
  - discrimination means which detects whether or not the first information of a document element held by said element information register means is different from the default value; and



setting means which alters the second information for a document element when that document element has first information different from the default value.

5,774,571

## WRITING INSTRUMENT WITH MULTIPLE SENSORS FOR BIOMETRIC VERIFICATION

James Marshall, "Denbrae", Brady Road, Lyminge, Folkestone, Kent, CT18 8EU, United Kingdom, assignor to Edward W. Ellis, and James Marshall, both of Kent, United Kingdom

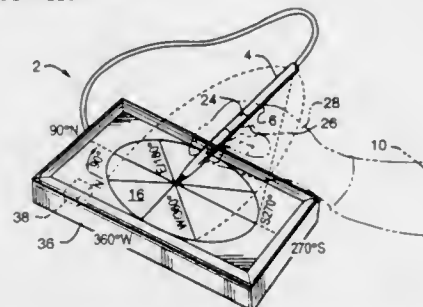
Filed Jul. 27, 1995, Ser. No. 507,859

Claims priority, application United Kingdom, Aug. 1, 1994, 9415627

Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382—119

4 Claims



1. Verification apparatus comprising a writing instrument having in combination:

- a body;
- grip sensing and recording means which during a period of an intended movement with the writing instrument by a person senses all points of contact with the writing instrument by the person holding it by a sensitive sleeve that identifies the points of contact by reference to a grid on the sleeve and measures pressure of the contact and variations of the contact and pressure, captures measured data, and compares the captured data with previously recorded data;
- writing pressure sensing and recording means which during the period of the intended movement senses contact between the writing instrument and a writing surface and measures pressure of the contact, captures measured data, and compares the captured data with previously recorded data; and
- gyroscope position sensing and recording means which during the period of the intended movement senses movement of the writing instrument relative to a writing tip of the writing instrument and variations thereof, correlates a pattern of the movement and the variations thereof with positional coordinates by reference to a hemisphere projected over a base circle, the centre of which is a first point of contact of the writing instrument with the writing surface, captures data recording the pattern of the movement and the variations thereof, and compares the captured data with previously recorded data.

5,774,572

## AUTOMATIC VISUAL INSPECTION SYSTEM

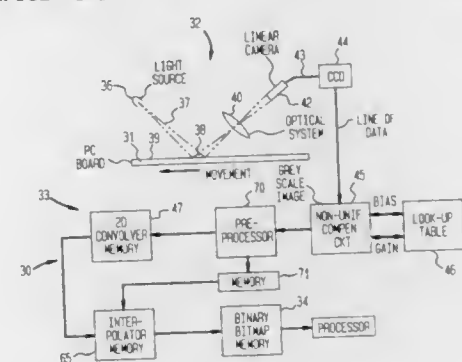
Amiram Caspi, Rehovot, Israel, assignor to Orbotech Ltd., Yavne, Israel

Continuation of Ser. No. 961,070, Oct. 14, 1992, abandoned, which is a continuation of Ser. No. 804,511, Dec. 10, 1991, abandoned, which is a continuation of Ser. No. 684,583, Dec. 20, 1984, abandoned. This application May 17, 1993, Ser. No. 61,344

Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382—141

67 Claims



1. A process for producing a binary map of an object having edges comprising:

- sampling the object to obtain grey level values at discrete sampling points for producing a digital grey scale image of the object with a given resolution; and
- processing the grey scale image to produce a digital map of the object having a resolution greater than said given resolution, such that the location of an edge of the object in the higher resolution map is related by a scale factor to the location of the corresponding edge in the object independently of the relative location of said edge with respect to the locations of said discrete sampling points.

5,774,573

## AUTOMATIC VISUAL INSPECTION SYSTEM

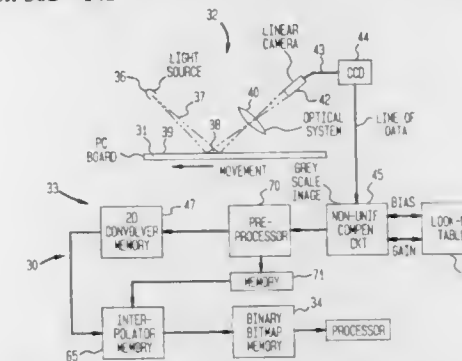
Amiran Caspi, Rehovot, and Zeev Smilansky, Kfar Meishar, both of Israel, assignors to Orbotech Ltd., Yavne, Israel

Continuation-in-part of Ser. No. 61,344, Apr. 21, 1993, which is a continuation of Ser. No. 961,070, Oct. 14, 1992, abandoned, which is a continuation of Ser. No. 804,511, Dec. 10, 1991, abandoned, which is a continuation of Ser. No. 684,583, Dec. 20, 1984, abandoned. This application Mar. 17, 1995, Ser. No. 405,938

Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382—141

16 Claims



1. A process for producing a binary map of an object having a surface each elemental area of which has one or the other of two properties, said process comprising:

- scanning said surface to obtain data representative of a grey scale image of said surface with a given resolution;
- processing said data representative of said grey scale image to produce data representative of a map of said object having

signed values that identify adjacent elemental areas of said surface having different properties, said map having the same resolution as said grey scale image; and

- converting said data representative of a map of said object having signed values to a binary map of said surface with a resolution higher than the resolution of said grey scale image.

5,774,574

## PATTERN DEFECT DETECTION APPARATUS

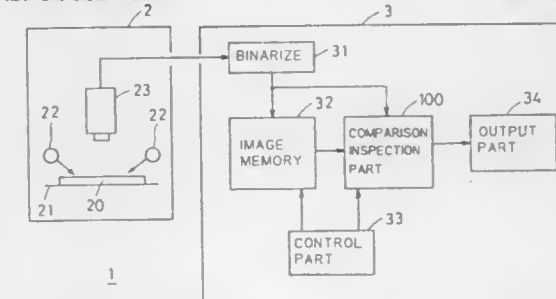
Tetsuo Hoki, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Nov. 28, 1995, Ser. No. 563,684

Claims priority, application Japan, Nov. 30, 1994, 6-296448  
Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382—149

10 Claims



1. A method for detecting a defect of an objective image by comparing said objective image with a reference image, comprising the steps of:

- determining maximum whole deviation of said objective image from said reference image;
- dividing said objective image into a plurality of divided images;
- determining a part of said reference image corresponding to each divided image;
- determining a plurality of reference partial images around said part of said reference image; and
- comparing each divided image with said plurality of reference partial images to detect said defect of said objective image, wherein positional maximum intra-deviations within each divided image corresponding to said maximum whole deviation of said objective image are no larger than a pixel of said objective image, and said plurality of reference partial images are distributed from said part of said reference image over a distribution width not less than said maximum whole deviation of said objective image.

5,774,575

## INSPECTION APPARATUS, AND EXPOSURE APPARATUS AND DEVICE MANUFACTURING METHOD USING THE INSPECTION APPARATUS

Hiroshi Tanaka, and Michio Kohno, both of Utsunomiya, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1996, Ser. No. 584,538

Claims priority, application Japan, Jan. 12, 1995, 7-003298; Oct. 26, 1995, 7-279018

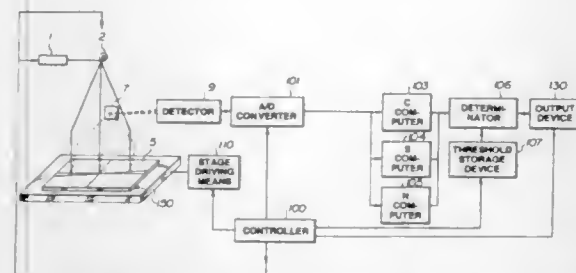
Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382—149

38 Claims

1. An inspection apparatus for inspecting foreign matter on the substrate, said apparatus comprising:

- illuminating means for projecting a light beam having a predetermined distribution intensity onto the substrate having a predetermined pattern formed thereon and foreign matter thereon;
- light sensing means for sensing light from the substrate and photoelectrically converting the light to an electrical signal, the electrical signal having a pattern signal component repre-



sending light from the predetermined pattern and a foreign matter signal component, representing light from foreign matter on the substrate;

converting means for converting the electrical signal output by said light sensing means into a digital signal having a pattern signal component and a foreign matter signal component; and processing means for emphasizing the digital foreign matter signal component as compared to the digital pattern signal component by performing calculation processing on the digital signal based on treating the foreign matter signal component as a specific distribution determined by the predetermined distribution and treating the pattern signal component as a random noise signal.

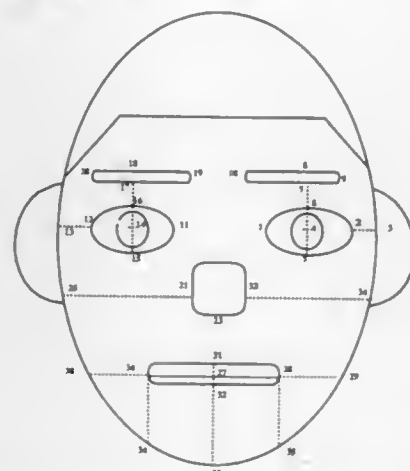
#### 5,774,576 PATTERN RECOGNITION BY UNSUPERVISED METRIC LEARNING

Ingemar J. Cox, Lawrenceville, and Peter N. Yianilos, Princeton, both of N.J., assignors to NEC Research Institute, Inc., Princeton, N.J.

Filed Jul. 17, 1995, Ser. No. 503,051  
Int. Cl.<sup>6</sup> G06K 9/62

U.S. Cl. 382-160

8 Claims



1. The method of pattern recognition comprising the steps of: estimating a metric from a mixture of multi-variate normal densities representing a statistical model of training data; forming a matrix for each element of the mixture; reducing off-diagonal matrix entries to produce an adjusted metric; and using said adjusted metric to classify incoming queries.

#### 5,774,577 COMPACT IMAGE CONVERSION SYSTEM OPERABLE AT A HIGH SPEED

Hiroaki Ueda, Tokyo, and Yushi Niwa, Osaka, both of Japan, assignors to NEC Corporation, Tokyo, Japan

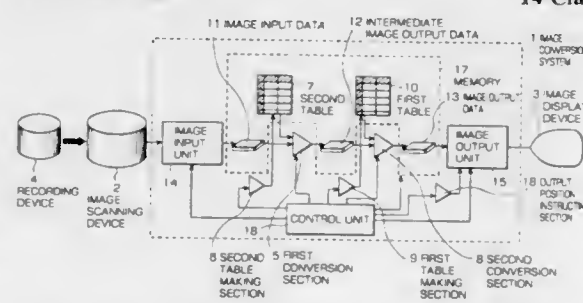
Filed Jul. 17, 1995, Ser. No. 503,270

Claims priority, application Japan, Jul. 15, 1994, 6-164307

Int. Cl.<sup>6</sup> G06K 9/00

U.S. Cl. 382-162

14 Claims



1. An image conversion system for converting image input data to image output data corresponding to a reproduced image, comprising:

image input means for supplying said image input data;  
image output means for outputting said image output data;  
a first table which corresponds to a plurality of color information numbers, said plurality of color information numbers being dependent on said image output means, with a plurality of color information to be output by said image output means as said image output data;  
a second table which corresponds to said image input data supplied from said image input means with said plurality of color information numbers in said first table, said correspondence being based on a result of a dither operation;  
first conversion means for converting said image input data into corresponding ones of said plurality of color information numbers with respective picture element positions in said reproduced image, with reference to said second table; and  
second conversion means for converting said corresponding ones of said plurality of color information numbers, from said first conversion means, into a corresponding plurality of color information corresponding to said reproduced image, with reference to said first table.

#### 5,774,578 APPARATUS FOR AND METHODS OF UTILIZING DENSITY HISTOGRAMS FOR CORRECTING OBJECTIVE IMAGES

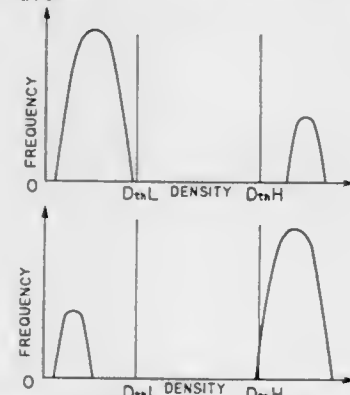
Shinji Shimizu, Kyoto, Japan, assignor to Dainippon Screen Mfg. Co., Ltd., Kyoto, Japan

Filed Mar. 18, 1996, Ser. No. 617,360

Claims priority, application Japan, Mar. 17, 1995, 7-086269  
Int. Cl.<sup>6</sup> G06K 9/00; 9/34

U.S. Cl. 382-170

6 Claims



1. An apparatus for correcting an objective image, comprising:

- a) memory means for storing a plurality of image-correction procedures;  
b) display means for displaying said objective image;  
c) designation means for designating a part of said objective image on said display means to determine a partial image;  
d) first automatic means for automatically determining an image-type of said partial image from a density distribution on said partial image, said first automatic means including:  
d-1) histogram means for detecting a density histogram on said partial image, to thereby determine said density distribution, said histogram means including:  
d-1-1) peak-detector means for detecting peaks of said density histograms, and  
d-1-2) peak-comparator means for comparing said peaks with each other to determine said image-type of said partial image;  
e) second automatic means for automatically determining one of said plurality of image-correction procedures according to said image-type of said partial image; and  
f) correction means for correcting said partial image in accordance with said selected image-correction procedure.

#### 5,774,579 BLOCK SELECTION SYSTEM IN WHICH OVERLAPPING BLOCKS ARE DECOMPOSED

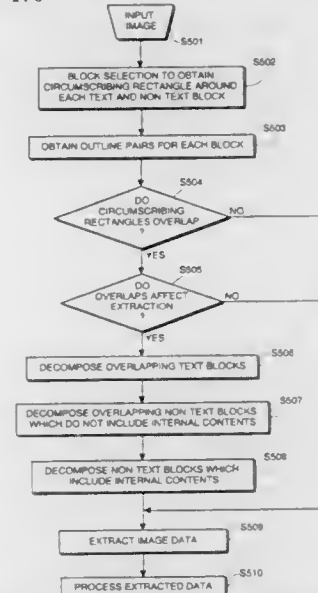
Shin-Ywan Wang, Tustin, Calif., and Toshiaki Yagasaki, Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 11, 1995, Ser. No. 514,250

Int. Cl.<sup>6</sup> G06K 9/34

U.S. Cl. 382-176

19 Claims



1. An image processing method for processing image data which includes both text areas and non-text areas, comprising the steps of:

performing block selection to obtain circumscribing rectangles around each block of text type areas in the image data and around each block of non-text type areas in the image data; obtaining, for each text and non-text block, an outline composed of outline pairs, the outline surrounding a plurality of connected components;  
determining whether the circumscribing rectangles overlap; decomposing overlapped rectangles into non-overlapping rectangles based on the circumscribing rectangles and the obtained outlines;  
extracting image data based on the circumscribing rectangles for non-overlapped rectangles and based on the decomposed rectangles for overlapped rectangles; and  
processing the extracted image data.

#### 5,774,580 DOCUMENT IMAGE PROCESSING METHOD AND SYSTEM HAVING FUNCTION OF DETERMINING BODY TEXT REGION READING ORDER

Takashi Saitoh, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 241,999, May 12, 1994, abandoned.

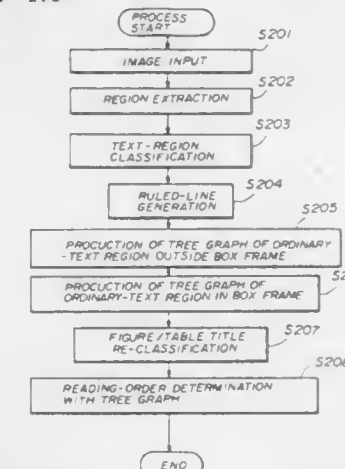
This application Aug. 18, 1995, Ser. No. 516,686

Claims priority, application Japan, May 12, 1993, 5-110397; Nov. 18, 1993, 5-288960; Dec. 24, 1993, 5-327015

Int. Cl.<sup>6</sup> G06K 9/34

U.S. Cl. 382-176

34 Claims



1. A document image processing method comprising machine implemented steps of:

- a) extracting text regions from an input document image;  
b) classifying said text regions into:  
(b1) in-order reading regions of text which are to be successively read in a predetermined order and  
(b2) different-attribute regions of text;  
c) detecting a construction of said in-order reading regions but not of said different-attribute regions; and  
d) determining the reading order, in which said in-order reading regions are to be read, using said construction.

#### 5,774,581 DEVICE FOR SEGMENTING A DISCRETE ASSEMBLY OF DATA

Carola Fassnacht, Hamburg, Germany, and Pierre Alain Devijver, Brest, France, assignors to U.S. Philips Corporation, New York, N.Y.

PCT No. PCT/IB95/00076, § 371 Date Oct. 12, 1995, § 102(e) Date Oct. 12, 1995, PCT Pub. No. WO95/22806, PCT Pub. Date Aug. 24, 1995

PCT Filed Feb. 3, 1995, Ser. No. 532,670

Claims priority, application France, Feb. 16, 1994, 94 01769; Dec. 7, 1994, 94 14726

Int. Cl.<sup>6</sup> G06K 9/34

U.S. Cl. 382-180

8 Claims

1. A device for segmenting a discrete assembly of data corresponding to sites (m,n), with m being between 1 and M inclusive and n being between 1 and N inclusive, based on digital input signals corresponding to said data, characterized in that it comprises, in series:

- (A) a sub-assembly for initial segmentation by extracting the histogram of said digital input signals, computing the average values from T classes and classification by searching that average value which is most approximate to a digital input signal being processed thereby producing a set of initial labels;  
(B) a sub-assembly for determining and updating probabilities, receiving said labels on the one hand and said digital input signals on the other hand and comprising:





5,774,585

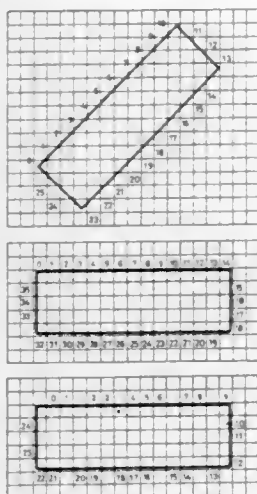
METHOD OF DETERMINING THE SHAPE OF A BODY  
Franz Häring, Neutraubling, Germany, assignor to Kronos AG  
Hermann Kroneder Maschinenfabrik, Germany  
Filed Nov. 17, 1995, Ser. No. 560,363

Claims priority, application Germany, Dec. 8, 1994, 44 43 728.5

Int. Cl. G06K 9/46

U.S. Cl. 382—203

16 Claims



1. A method of determining the shape of a body, comprising the step of detecting a contour of said body, wherein said contour of said body is firstly stored into a cartesian coordinate system, then represented as a number of pixels or points  $P(i)$ , and the numbering of said points is then modified such that a number  $M$  of said points for a specific said contour is independent of the angular position of said contour,

said modified numbering being obtained by rating a diagonal orientation of said contour within a pixel as a whole point and by defining the numbering  $f$  for said point through an algorithm  $f := f + 1$ , and by giving a horizontal orientation or a vertical orientation of said contour within a pixel a lower rating, the numbering  $f$  being then defined through an algorithm  $f := f + 1/\sqrt{2}$ , and the number of said point being defined as the integer part of  $f$ , and with one of two of said points being omitted, if said two points have the same number,

and next, said contour being represented as said number of pixels with said modified numbering is converted into a contour function which is independent of the position of said body and that said contour function is compared with a predetermined reference contour function for a known shape.

5,774,586

METHOD AND APPARATUS FOR STANDARDIZATION  
OF INPUTS TO WORD RECOGNITION SYSTEMS

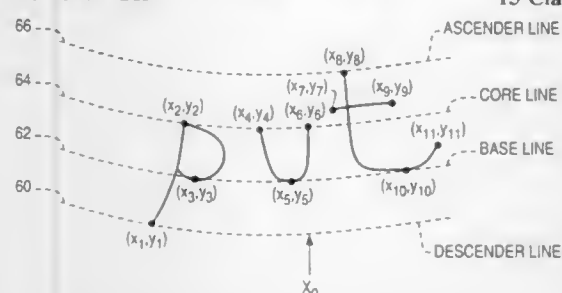
Yann Andre LeCun, Lincroft, N.J., assignor to NCR Corporation, Dayton, Ohio

Filed May 4, 1994, Ser. No. 237,813

Int. Cl. G06K 9/80; G06T 3/00

U.S. Cl. 382—215

13 Claims



1. An apparatus for recognizing groups of symbols, comprising:

standardizing means for standardizing a group of symbols where each symbol in said group has a plurality of points each described by a set of coordinates,

said standardizing means standardizing said group of symbols to form a standardized group of symbols by transforming said coordinates of said points into transformed coordinates using a set of characteristics of a plurality of curves fitted to said points, a first curve belonging to said plurality of curves being fitted to maxima points belonging to said plurality of points, said first curve being fitted to said maxima points by minimizing a first cost where said first cost increases with said first curve's distance from said maxima points;

wherein said standardizing means fits said plurality of curves to said points by fitting a second curve belonging to said plurality of curves to said maxima points, said second curve being fitted to said maxima points by minimizing a second cost where said second cost increases with said second curve's distance from said maxima points and by minimizing a third cost where said third cost increases with a displacement in spacing between said plurality of curves; and

classifier means that receives an input representative of said standardized group of symbols for recognizing said group of symbols.

5,774,587

METHOD OF OBJECTS RECOGNITION

Alexander Dmitriev, Krilatskie holmista, 1, ap. 343, 121609, Moscow; Yuri Andaecev, Neftjuikov st., 1, ap. 26, 141700p10 Paveltsevo, Moscow Reg.; Yuri Belsky, Suoboda St., 81/2, ap. 370, 123981 Moscow; Dmitry Kuminov, Kezhenskaya St., 1a/2, ap. 601, 113303, Moscow; Andzei Panas, Vokzalnaya St., 17, ap. 24, 141120 Fyzazino, and Sergai Starkov, Engels St., 2, ap. 166, 249020 Olninsk, all of Russian Federation

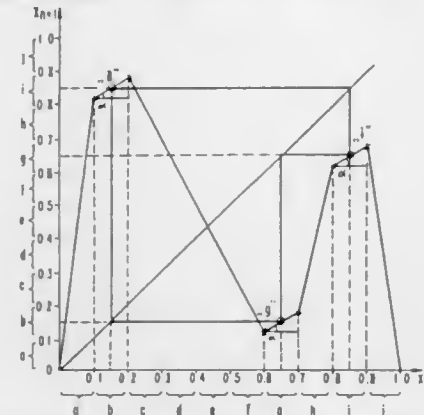
PCT No. PCT/RU94/00044, § 371 Date Dec. 1, 1995, § 102(e) Date Dec. 1, 1995, PCT Pub. No. WO95/24015, PCT Pub. Date Sep. 8, 1995

PCT Filed Mar. 3, 1994, Ser. No. 556,938

Int. Cl. G06K 9/72; 9/46; G10L 5/06

U.S. Cl. 382—229

13 Claims



1. A method for recognition of objects, comprising:

transforming representations  $K$  of reference objects into corresponding reference signals, sampled with a predetermined step  $\Delta t$ , and quantized into information parameters along an entire range  $L$  of variations at  $N$  levels,  $N$  being a number selected in such a way that each of  $N$  quantization levels can be found in the set of all  $K$  reference signals not more than once;

formatting for the set of all  $K$  reference signals, a dynamic system, which can be described with not less than a predetermined degree of approximation by a mapping of a  $d$ -dimensional cube ( $d \geq 1$ ) into itself, being time iterated with a predetermined step  $\Delta t$  and which comprises  $K$  limit cycles each corresponding to one of  $K$  reference signals;

transformation of the representation being into samples  $I_s$  ( $S=1, 2, \dots, M; M \geq N$ ) of information signal sampled with a time

step  $\Delta t$  and quantized into the information parameters in the range  $L$  according to said  $N$  levels;

feeding of samples  $I_s, \dots, I_{S+B}$  ( $B=0, 1, \dots$  so that  $M-S-2B \geq R$ , where  $R \geq 1$  is defined by a confidence condition) of information signal to an input of the dynamic system as initial conditions of its functioning;

deciding on recognition of an object in accordance with the result of the functioning of the dynamic system;

after feeding the samples  $I_s, \dots, I_{S+B}$  of the information signal to the input of the dynamic system, operating the dynamic system to:

in a case where a phase trajectory of the dynamic system in the process of its functioning does not reach any  $K$  limit cycles, inputting the samples  $I_{S+B+1}, I_{S+2B}$  of the information signal to the dynamic system as initial conditions for its operation, and starting the dynamic system up again;

in a case where a phase trajectory of the dynamic system in the process of its functioning reaches one of its  $K$  limit cycles, comparing a reference signal corresponding to this limit cycle to the information signal;

the decision on recognition of an object being made in the case the information signal coincides with said reference signal with a degree of similarity not less than a predetermined one; the reference signal coinciding with the information signal with the degree of similarity not less than the predetermined one being indicated; and

in a case where said reference signal coincides with the information signal with the degree of similarity less than the predetermined one, or in a case where the phase trajectory of the dynamic system in the process of its functioning does not reach any  $K$  limit cycles when  $B$  samples from the number of  $M-R$  of the first samples of information signal have been subsequently fed to its input, the decision shall be made to deny recognition of an object.

5,774,588

METHOD AND SYSTEM FOR COMPARING STRINGS  
WITH ENTRIES OF A LEXICON

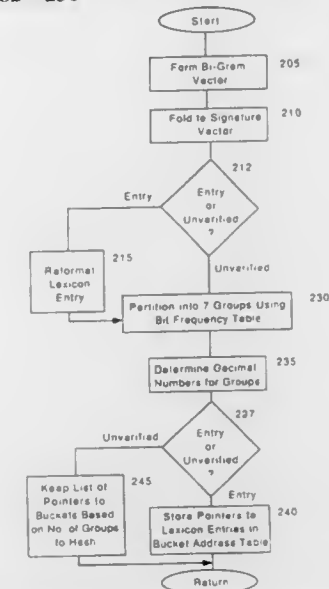
Liang Li, Monroe, Conn., assignor to United Parcel Service of America, Inc., Atlanta, Ga.

Filed Jun. 7, 1995, Ser. No. 477,481

Int. Cl. G06K 9/36; 9/72

U.S. Cl. 382—230

17 Claims



1. A method of comparing strings with entries of a lexicon, comprising the steps of:

organizing entries of the lexicon by, for each entry:

- (a) forming an  $n$ -gram vector representing a lexicon entry;
- (b) folding said  $n$ -gram vector into a signature vector by combining multiple  $n$ -grams into bits;

(c) creating a list of bits having the same  $n$ -grams as the bits of the signature vector, beginning with the bit occurring most frequently in the lexicon and continuing in descending order;

(d) creating a partitioned vector whose element values are binary numbers whose digits represent the bits of the list of bits, partitioned into groups of digits forming the binary numbers, the digits being set or not set depending on whether the bit of the signature vector having the same  $n$ -grams is set;

(e) establishing a plurality of buckets having addresses corresponding to all possible element values of the partitioned vector;

(f) indexing said lexicon entry to the one or more of said buckets having an address corresponding to an element value of said lexicon entry's partitioned vector;

reducing the number of lexicon entries to be compared to a particular unverified string by:

creating a partitioned vector for said unverified string according to steps (a)-(d);

indexing said unverified string to those buckets whose addresses correspond to an element value of said unverified string's partitioned vector; and

comparing a representation of said unverified string with representations of only those lexicon entries that are indexed to the bucket addresses to which said unverified string is indexed.

5,774,589

IMAGE PROCESSING SYSTEM

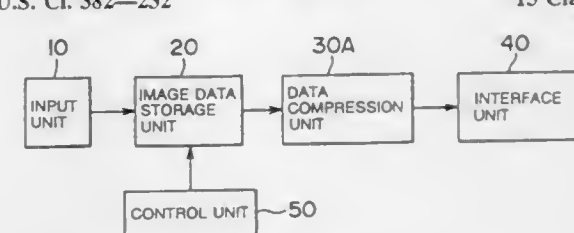
Hirokazu Aritake; Masato Nakashima; Satoshi Maeda, and Manabu Ishimoto, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Sep. 8, 1995, Ser. No. 525,030

Claims priority, application Japan, Feb. 14, 1995, 7-025495

Int. Cl. G06K 9/36

13 Claims



1. An image processing system, comprising:

a control unit for outputting a synchronizing signal;

an input unit for inputting a plurality of images which consist of frames and represent views of an object from various directions respectively;

an image data storage unit for temporarily storing plural newest frames of each of the plurality of images input from said input unit by updating storing contents synchronizing with the synchronizing signal input from said control unit;

a data compression unit for compressing frames which are simultaneously stored into said image data storage unit and the plurality of images synchronizing with the synchronizing signal, therein generating a plurality of compression data successively; and

an interface unit for multiplexing the plurality of compression data input from said data compression unit and outputting multiplexed data to an external device.

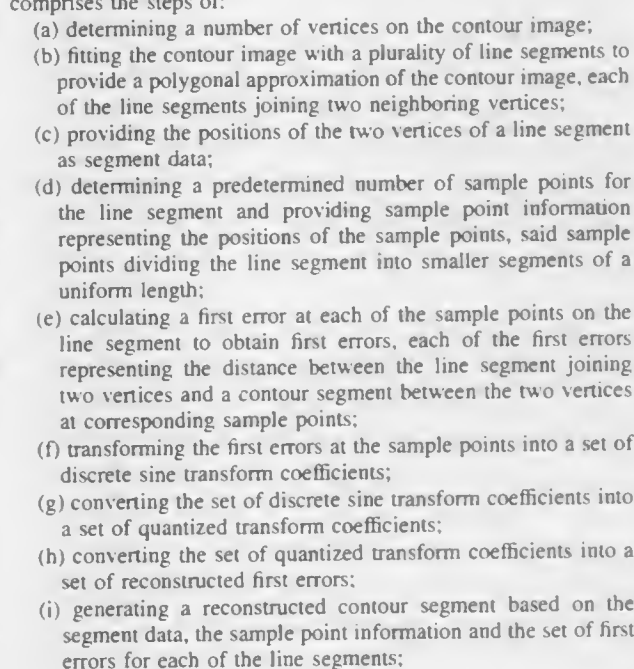


# UMI

### 5 Claims



## 14 Claims



- (j) calculating a second error representing the number of mismatched pixels between the reconstructed contour segment and its corresponding contour segment;
- (k) comparing the second error to a predetermined threshold value;
- (l) coding the set of quantized transform coefficients and the segment data of the contour segment if the second error is determined to be smaller than said threshold value;
- (m) segmenting the contour segment further into a pair of newly segmented contour segments by adding an extra vertex on the contour segment and repeating the steps (c) to (k) for each of said pair of the newly segmented contour segments using a corresponding line segment if the second error is determined to be equal to or larger than said threshold value; and
- (n) repeating the steps (c) to (m) for each of said plurality of line segments formed by the vertices determined at the step (a).

5,774,596

**ADAPTIVE CONTOUR CODING METHOD FOR ENCODING A CONTOUR IMAGE IN A VIDEO SIGNAL**  
Jin-Hun Kim, Seoul, Rep. of Korea, assignor to Daewoo Electronics Co., Ltd., Seoul, Rep. of Korea

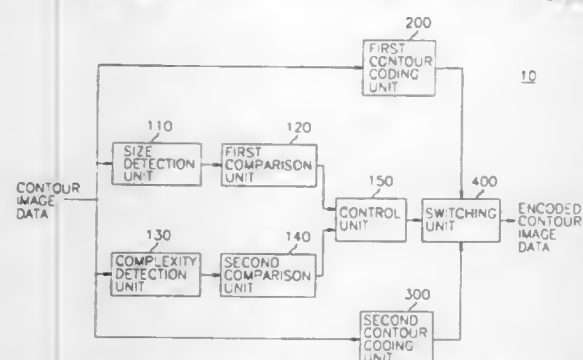
Filed Jun. 24, 1996, Ser. No. 669,660

Claims priority, application Rep. of Korea, May 8, 1996, 1996-14969

Int. Cl. G06K 9/46; 9/36; H04N 5/14

U.S. Cl. 382-242

8 Claims



1. A method for adaptively encoding a contour image of an object included in a video frame of a video signal wherein the video frame is divided into a multiplicity of blocks, each of the blocks having KxL pixels with K and L being positive integers, respectively, and the contour image consists of a plurality of contour pixels, the contour pixels representing pixels located on a contour, said method comprising the steps of:

- (a) coding the contour image by using a first and a second contour coding methods to thereby provide first and second coded contour data, respectively, the first coded contour data being capable of representing the contour image more precisely than the second coded contour data;
- (b) detecting the number of contour blocks, each of the contour blocks including one or more contour pixels therein;
- (c) comparing the number of contour blocks with a first predetermined threshold value;
- (d) calculating curvatures of the contour at selected contour pixels to thereby determine a mean curvature based on the calculated curvatures wherein a curvature of the contour at a selected contour pixel denotes an angle change between two lines that pass therethrough, each of the two lines being drawn through said selected contour pixel and another contour pixel located a predetermined number of contour pixels away therefrom in one direction along the contour;
- (e) comparing the mean curvature with a second predetermined threshold value; and
- (f) selecting the first coded contour data if the number of contour blocks is smaller than the first predetermined threshold value and the mean curvature is greater than or equal to the second predetermined threshold value and selecting the

second coded contour data if otherwise, to thereby provide the selected coded contour data as encoded contour image data.

5,774,597

**IMAGE COMPRESSION AND DECOMPRESSION USING OVERLAPPED COSINE TRANSFORMS**

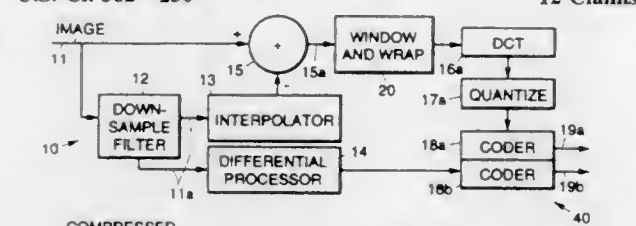
Dennis L. Wilson, Palo Alto, Calif., assignor to GE Medical Systems, Inc., Milwaukee, Wis.

Filed Sep. 5, 1995, Ser. No. 523,767

Int. Cl. G06K 9/36; 9/46

U.S. Cl. 382-250

12 Claims



1. Apparatus for compressing digitized data corresponding to an image, said apparatus comprising:

smooth discrete cosine transform and wrapping means for processing the digitized data to produce a set of transform coefficients, and for folding the transform coefficients to form an image that is the same size as the image corresponding to the digitized data;

discrete cosine transform means for discrete cosine transforming the coefficients produced by the smooth discrete cosine transform and wrapping means;

quantizing means for quantizing the discrete cosine transformed coefficients produced by the discrete cosine transform means; and

first encoding means for encoding the transformed and quantized coefficients to provide compressed digitized data comprising a compressed image.

5,774,598

**SYSTEM AND METHOD FOR SAMPLE RATE CONVERSION OF AN IMAGE USING DISCRETE COSINE TRANSFORMS**

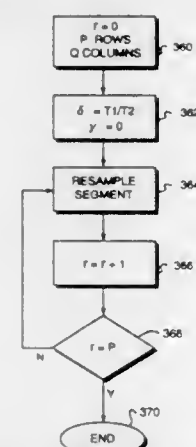
Lon E. Sunshine, Boston; Michael L. Reisch, Carlisle, and Munib A. Wober, Haverhill, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 159,795, Nov. 30, 1993, abandoned. This application May 15, 1995, Ser. No. 440,631

Int. Cl. G06K 9/36; 9/46

U.S. Cl. 382-250

7 Claims



1. In image processing, a sample rate conversion system for one of upsampling and downsampling an electrical image signal representing an input image of pixels having a predetermined first sampling rate in a spatial domain, said system comprising:

means for acquiring the image signal from an image signal source;

means for initializing one of a column index and a row index corresponding to columns and rows, respectively, of said input image;

means for selecting a sampling rate conversion ratio  $\delta$  defined as the first sampling rate divided by a predetermined second sampling rate;

means for generating DCT coefficients of a segment of said image signal related to said one of the column index and the row index by taking a discrete even cosine transformation (DCT) of said segment; and

means for generating modified IDCT coefficients, related to said DCT coefficients, by taking a modified inverse discrete even cosine transform (IDCT) of said DCT coefficients of said segment using a modified-IDCT basis matrix dependent upon both said sampling rate conversion ratio and an offset, said offset being dependent upon said sampling rate conversion ratio and said one of the column index and the row index, wherein said modified IDCT coefficients represent said one of the upsampled and downsampled image signal and wherein said modified IDCT is mathematically defined as:

$$\hat{s}(y)_{1+y-\gamma} = \sqrt{2/N} \sum_{V=0}^{N-1} C_V s(v) \cos \pi(2(j+\gamma)\delta + 1)$$

where:

 $0 \leq y \leq (N-1)$ 

N is a number of said pixels in said each segment;

V and y are integers;

S(v) represents the DCT coefficients;

s(y) represents the modified IDCT coefficients;

 $\delta$  is the sampling rate conversion ratio; $\gamma$  is the offset; $C_v = 1/\sqrt{2}$  for  $v=0$ ; and $C_v = 1$  for  $v \neq 0$ .

5,774,599

**METHOD FOR PRECOMPENSATION OF DIGITAL IMAGES FOR ENHANCED PRESENTATION ON DIGITAL DISPLAYS WITH LIMITED CAPABILITIES**

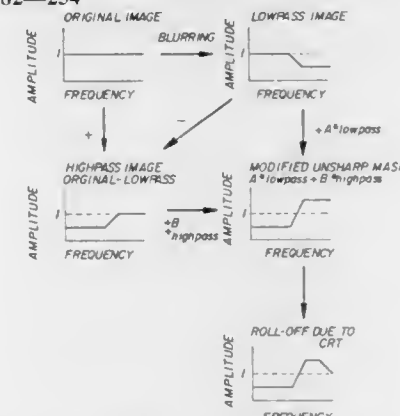
Edward Muka, Saint Louis, Mo.; Paul C. Ho, Madison, Wis., and Bruce Raymond Whiting, Plano, Tex., assignors to Eastman Kodak Company, Rochester, N.Y., and Washington University, St. Louis, Mo.

Filed Mar. 14, 1995, Ser. No. 404,399

Int. Cl. G06K 9/40

U.S. Cl. 382-254

26 Claims



1. A method of displaying an image on a display device which has known characteristics and is operated in a controlled fashion, comprising the steps of:

providing a digital image signal of a visual image having a luminance dynamic range DR image for display on an electronic display device having a luminance dynamic range DR display, where DR image is greater than DR display;

determining a low frequency component signal of said digital image signal;

determining a high frequency component signal of said digital image signal;

producing an attenuated low frequency component signal of said digital image from said low frequency component signal by means of a low boost parameter which is a function of DR image and DR display;

producing an amplified high frequency component signal of said digital image signal from said high frequency component signal by means of a high boost parameter which is a function of said low boost parameter; and

combining said attenuated low frequency component signal and said amplified high frequency signal to produce a precompensated image signal which has improved luminance dynamic range and spatial frequency characteristics when the image is presented for display on said display device in a high ambient light environment.

5,774,600

**METHOD OF PIXEL AVERAGING IN A VIDEO PROCESSING APPARATUS**

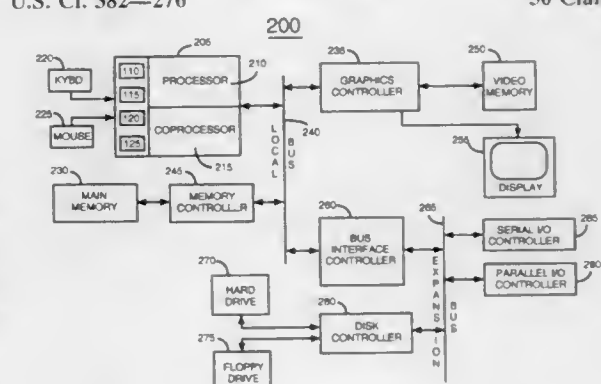
Geoffrey S. Strongin; Yi Liu, and Michael R. Tucker, all of Austin, Tex., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 18, 1995, Ser. No. 424,028

Int. Cl. G06K 9/36

U.S. Cl. 382-276

30 Claims



1. A method of pixel value averaging comprising the steps of:

loading a first plurality of pixel values into respective segments of a first register, each of the segments of the first register having a most significant bit;

loading a second plurality of pixel values into respective segments of a second register, each of the segments of the second register having a most significant bit;

shifting the first plurality of pixel values in the first register to the right by one bit;

masking the most significant bit of each of the segments of the first register to obtain a first masked quotient in each of the segments of the first register;

shifting the second plurality of pixel values in the second register to the right by one bit;

masking the most significant bit of each of the segments of the second register to obtain a second masked quotient in each of the segments of the second register; and

adding the second masked quotients in the segments of the second register to respective first masked quotients in the segments of the first register to provide a plurality of pixel value averages.



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5,774,601

SYSTEM AND METHOD FOR ADAPTIVE  
INTERPOLATION OF IMAGE DATA

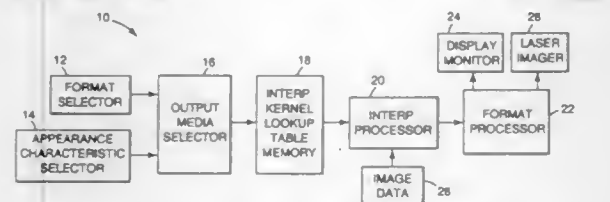
Abolghassem B. Mahmoodi, St. Paul, Minn., assignor to Ima-  
tion Corp., Oakdale, Minn.

Continuation of Ser. No. 344,561, Nov. 23, 1994, abandoned.  
This application Mar. 18, 1997, Ser. No. 816,816

Int. Cl.<sup>6</sup> G06K 9/42

U.S. Cl. 382—298

42 Claims



1. A system for performing interpolation on image data repre-  
sentative of a plurality of pixels within one or more images to  
produce interpolated image data representing interpolated pixels,  
said system comprising:

media selection means for selecting one of a plurality of phys-  
ical imaging media on which a visible presentation of said one  
or more images is to be formed;

format selection means for selecting one of a plurality of formats  
for presentation of said one or more images on said imaging  
media, each of the formats specifying a number of said  
images on said imaging media and a size of each of said  
images;

appearance characteristic selection means for selecting one of a  
plurality of appearance characteristics of said presentation of  
said one or more images on said imaging media;

a memory storing a plurality of different interpolation kernel  
lookup tables, each of said interpolation kernel lookup tables  
containing a plurality of interpolation coefficients;

interpolation kernel selection means for automatically selecting,  
based on a combination of the format selected by said format  
selection means, the media selected by said media selection  
means, and the appearance characteristic selected by said  
appearance characteristic selection means, one of said inter-  
polation kernel lookup tables stored in said memory; and

interpolating means for applying the interpolation coefficients  
contained in the selected interpolation kernel lookup table to  
said image data to produce said interpolated image data.

5,774,602

WRITING DEVICE FOR STORING HANDWRITING

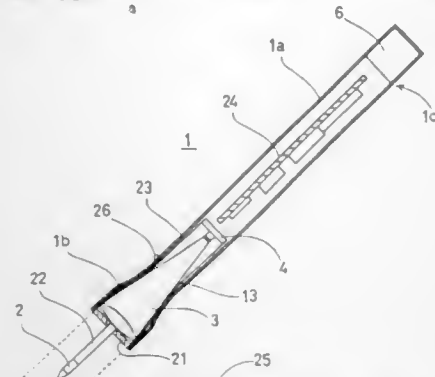
Toshio Taguchi, Kiyoshi Agusa, both of Kyoto; Shin-ichiro  
Yamamoto, Nagoya, and Hiroki Nakamura, Kyoto, all of  
Japan, assignors to Yashima Electric Co., Ltd., Kyoto, Japan  
Filed Jul. 13, 1995, Ser. No. 501,867

Claims priority, application Japan, Jul. 13, 1994, 6-161291;  
Aug. 12, 1994, 6-190220; Aug. 22, 1994, 6-196797

Int. Cl.<sup>6</sup> G06K 9/22

U.S. Cl. 382—314

23 Claims



1. A writing device for storing handwriting, comprising:  
a writing section for writing handwriting on a writing medium,

an image pickup means for picking up an image of a predeter-  
mined extent of the writing medium which extent includes a  
leading edge of the writing section and handwriting just  
written by the writing section,

an image data taking means for taking image data picked up by  
the image pickup means at every predetermined sampling  
time,

a storing means for sequentially storing the image data taken by  
the image data taking means at every predetermined sampling  
time,

an image data outputting means for sequentially reading out the  
image data stored by the storing means and for outputting the  
read out image data,

a power supply section for supplying power to the image pickup  
means, the image data taking means and the storing means,  
and

a case body means for housing the image pickup means, the  
image data taking means, the storing means and the power  
supply section therein.

5,774,603

OPTICAL CHEMICAL SENSOR

Christopher P. Moore, Harrow; Jean C. Robert, Chalon-Sur-  
Saone; Robert G. Blue, Auldhouse, and George Stewart,  
Ayrshire, all of United Kingdom, assignors to Eastman  
Kodak Company, Rochester, N.Y.

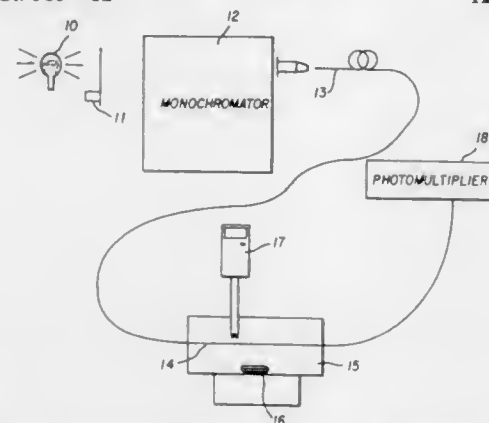
Filed Mar. 3, 1997, Ser. No. 811,086

Claims priority, application United Kingdom, Mar. 2, 1996,  
9604542

Int. Cl.<sup>6</sup> G02B 6/00

U.S. Cl. 385—12

12 Claims



1. An optical chemical sensor comprising an optical waveguide  
having a light transmitting substrate and a coating of an environ-  
mentally sensitive compound in a binder on the substrate charac-  
terized in that the binder is a Zr/Si sol-gel glass.

5,774,604

USING AN ASYMMETRIC ELEMENT TO CREATE A 1XN  
OPTICAL SWITCH

Terrance G. McDonald, Plano, Tex., assignor to Texas Instru-  
ments Incorporated, Dallas, Tex.

Filed Oct. 23, 1996, Ser. No. 735,630

Int. Cl.<sup>6</sup> G02B 6/26

U.S. Cl. 385—18

5 Claims

1. An optical switch for switching light between optical fibers,  
comprising:

an input optical fiber for bringing light into a switch package;  
a micromechanical structure placed in said package such that  
light from said input optical fiber is transmitted over said  
structure when said structure is in an unaddressed state;

5,774,606

OPTICAL FIBER TRANSMISSION SYSTEM WITH A  
PASSIVE OPTICAL ROUTER

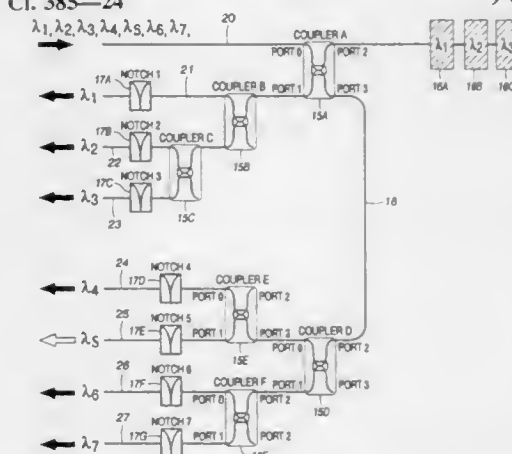
Miriam R. de Barros, Scotch Plains; Lars Erik Eskildsen, Fair  
Haven, both of N.J., and Gerald Nykolak, Long Island, N.Y.,  
assignors to Lucent Technologies, Inc., Murray Hill, N.J.

Filed May 17, 1996, Ser. No. 649,091

Int. Cl.<sup>6</sup> G02B 6/293

U.S. Cl. 385—24

9 Claims



a first output optical fiber, wherein said first output fiber is  
positioned such that light is received by said first output fiber  
when said micromechanical structure is in said unaddressed  
state;

an offset mirror, wherein said offset mirror is positioned such  
that light is transmitted to and reflected off of said offset  
mirror when said micromechanical structure is in an  
addressed and deflected state, and wherein said offset mirror  
is stepped such that a different optical fiber receives said light  
depending upon the position of said micromechanical struc-  
ture; and

at least one other optical output fiber for receiving light from  
said offset mirror, such that only one of said other output  
fibers receives said light at any one instant in time.

5,774,605

RIBBON ARRAY OPTICAL SWITCH AND OPTICAL  
SWITCH ARCHITECTURE UTILIZING SAME

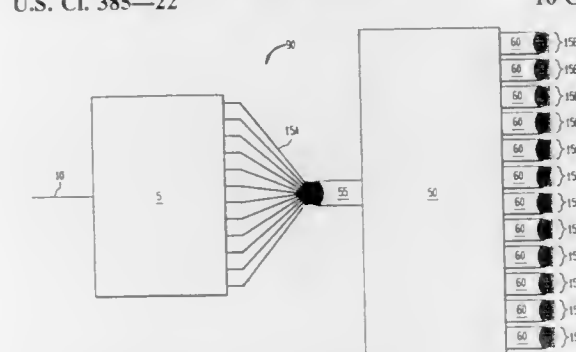
Leonard George Cohen, Atlanta, Ga., assignor to Lucent Tech-  
nologies, Inc., Murray Hill, N.J.

Filed Oct. 31, 1996, Ser. No. 741,895

Int. Cl.<sup>6</sup> G02B 6/26

U.S. Cl. 385—22

10 Claims



1. A ribbon array switch, comprising:

(a) a switch housing;

(b) a rotatable arm rotatably mounted to said switch housing;

(c) an input ribbon array mounted to said rotatable arm, said  
input ribbon array comprising a plurality of input optical  
fibers;

(d) a plurality of output ribbon arrays mounted on an outer  
periphery of said switch housing, each of said output ribbon  
arrays comprising a plurality of output optical fibers; and

(e) a motor connected to said rotatable arm for rotating said  
rotatable arm along said outer periphery of said switch hous-  
ing wherein said input ribbon array can be selectively aligned  
with any one of said output ribbon arrays such that said input  
optical fibers are optically connected to corresponding ones of  
said output optical fibers.

5,774,607

LENSED-FIBER WITH CASCADED GRADED-INDEX  
FIBER CHIP CONFIGURATION

Kazuo Shiraishi, Saitama; Kazuhito Matsumura, Utsunomiya,  
and Isamu Ohishi, Tokyo, all of Japan, assignors to The  
Furukawa Electric Co., Ltd., Tokyo, Japan

PCT No. PCT/JP96/00398, § 371 Date Sep. 27, 1996, § 102(e)  
Date Sep. 27, 1996, PCT Pub. No. WO96/26459, PCT Pub.  
Date Aug. 29, 1996

PCT Filed Feb. 22, 1996, Ser. No. 718,375

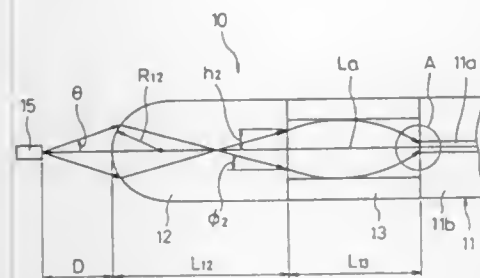
Claims priority, application Japan, Feb. 23, 1995, 7-035282;  
Mar. 3, 1995, 7-044456

Int. Cl.<sup>6</sup> G02B 6/32

U.S. Cl. 385—33

5 Claims

1. A lensed-fiber comprising:  
a single-mode fiber including a core and a cladding;  
a coreless fiber having a coreless isotropic refractive index and a  
convex surface at a first end thereof; and



a square-law index fiber having a square-law index profile, said square-law index fiber being positioned between said single-mode fiber and said coreless fiber so as to connect an end of said single-mode fiber to a second end of said coreless fiber; wherein the following relationship is satisfied when a light beam to be propagated through said single-mode fiber is emitted onto said lensed-fiber:

$$\begin{bmatrix} h_1 \\ \phi_1 \end{bmatrix} = \begin{bmatrix} 0 & (-1)^N A_e \\ (-1)^{N-1} A_e & 0 \end{bmatrix} \begin{bmatrix} h_2 \\ \phi_2 \end{bmatrix} = \begin{bmatrix} (-1)^N A_e \phi_2 \\ (-1)^{N-1} h_2 / A_e \end{bmatrix}$$

where  $\phi_1$  is an incidence angle of said light beam on a connecting surface between said single-mode fiber and said square-law index fiber,

$h_1$  is an incidence position of said light beam measured from an optical axis on said connecting surface between said single-mode fiber and said square-law index fiber,

$\phi_2$  is an incidence angle of said light beam on a connecting surface between said coreless fiber and said square-law index fiber,

$h_2$  is an incidence position of said light beam measured from an optical axis on said connecting surface between said coreless fiber and said square-law index fiber,

$N$  is a natural number, and

$A_e$  is a convergence parameter of said square-law index fiber expressed by  $A_e = a/(2\Delta)^{1/2}$ , where  $a$  is a core diameter of said square-law index fiber, and  $\Delta$  is a specific refractive index difference of said square-law index fiber.

5,774,608

## OPTICAL COUPLING SYSTEMS WITH BEND

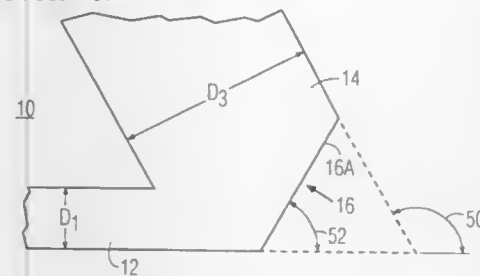
Gary R. Allen, Chesterland; William J. Cassarly; John M. Davenport, both of Lyndhurst, and Richard L. Hansler, Pepper Pike, all of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 530,651, Sep. 20, 1995. This application  
Filed Feb. 11, 1997, Ser. No. 798,972

Int. Cl.<sup>6</sup> G02B 6/26

U.S. Cl. 385—39

7 Claims



1. A coupling member for use in coupling non-coherent light from a source of light to a light distribution harness, said coupling member incorporating a bend and comprising:

(a) a light transmissive body including an inlet arm for receiving light from the light source, and an outlet arm for providing light to a leading end of a light distribution harness; said light transmissive body further including a bend portion from which said inlet and outlet arm portions project;

(b) said inlet and outlet arm portions having respective central longitudinal inlet and outlet axes which intersect in said bend portion to define a bend plane;

(c) said inlet arm portion having a cross section, with respect to said inlet axis, that is rectangular; a pair of inlet sides of said inlet arm portion being parallel to said bend plane;

(d) said outlet arm portion having a cross section, with respect to said outlet axis, that is rectangular; a pair of outlet sides of said outlet arm portion being parallel to said bend plane;

(e) the cross-sectional width of said pair of inlet sides at a position adjacent said bend portion being dimensioned smaller than the cross-sectional width of said pair of outlet sides at a position adjacent said bend portion in such manner that substantially all light directed from said inlet portion to said bend portion reaches said outlet arm portion, and light rays parallel to said inlet axis are reflected in said bend portion to be directed substantially parallel to said outlet axis; and

(f) said bend portion being configured to achieve a non-perpendicular bend between said inlet and outlet axes.

5,774,609

## METHOD AND ARRANGEMENT FOR COUPLING A WAVE GUIDE TO A COMPONENT

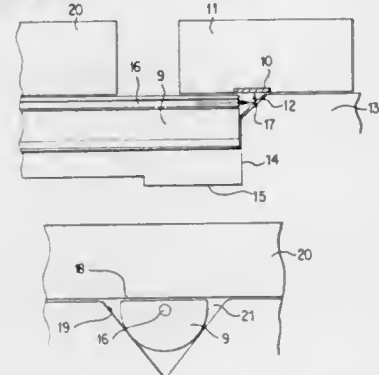
Lennart Bäcklin, Stockholm; Ylva Bäcklund, Uppsala; Håkan Elderstig, Bromma; Stefan Lindgren, Täby, and Odd Steijer, Bromma, all of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jan. 27, 1997, Ser. No. 786,734

Claims priority, application Sweden, Jan. 26, 1996, 9600292  
Int. Cl.<sup>6</sup> G02B 6/30

U.S. Cl. 385—49

11 Claims



1. An arrangement for coupling a waveguide to a light-emitting or light-detecting component, the arrangement comprising:

a sloped reflective surface arranged with a slope forward of the waveguide and beneath the component, the waveguide being bevelled such that the waveguide has a non-circular cross-section so that a core of the waveguide lies relatively close to an active surface of the component when the waveguide is coupled to said component.

5,774,610

## FIBER OPTIC PROBE

Patrick E. O'Rourke, Martinez, Ga., and William R. Toole, Jr., Aiken, S.C., assignors to Equitech Int'l Corporation, Aiken, S.C.

Filed Jul. 8, 1996, Ser. No. 676,432

Int. Cl.<sup>6</sup> G02B 6/26

U.S. Cl. 385—52

18 Claims

1. A fiber optic probe for use in light scattering measurements, said probe comprising:

a probe body having an interior and a longitudinal axis; at least one light-transmitting fiber in said interior, said transmitting fiber having a first optic axis;

5,774,612

## ADAPTED FOR INTERCONNECTING OPTICAL FIBER CONNECTORS

Yuriy Belenkiy, Niles; Igor Grois, Northbrook; Mark Margolin, Lincolnwood, and Ilya Makhlin, Wheeling, all of Ill., assignors to Molex Incorporated, Lisle, Ill.

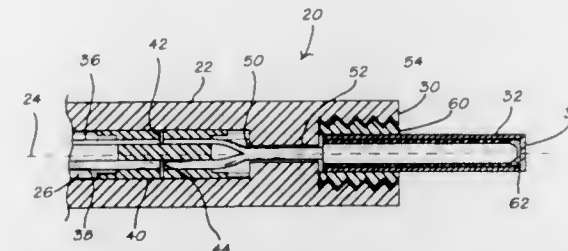
Continuation of Ser. No. 510,212, Aug. 2, 1995, abandoned.

This application Jul. 25, 1997, Ser. No. 900,344

Int. Cl.<sup>6</sup> G02B 6/38

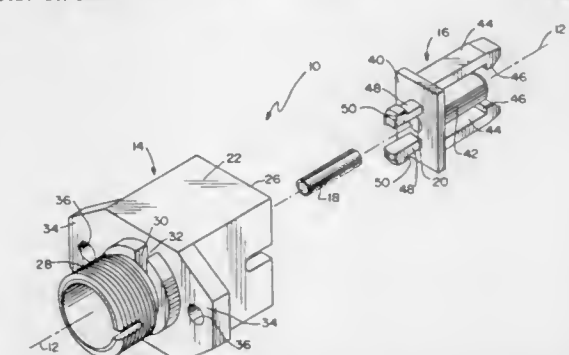
U.S. Cl. 385—72

3 Claims



at least one light-receiving fiber in said interior, said receiving fiber having a second optic axis; and

coupling means in said interior for holding said transmitting and receiving fibers in a fixed position with respect to each other within said coupler, said coupling means including means for aligning said transmitting and receiving fibers so that, when at least one fiber of said fibers in said coupling means is cut into two portions, each portion having a optic axis, said coupling means furthers alignment of said portions so that said optic axes of said portions approximately coincide.



1. An adapter assembly for interconnecting a FC-type optical fiber connector to a SC-type optical fiber connector generally along an optical axis, each connector including an axially projecting ferrule, and the adapter assembly being constructed as a double-ended receptacle for receiving the connectors at opposite ends thereof, comprising:

a unitary, one piece adapter housing having an axial cavity extending in a direction between opposite ends of the housing, one end of the housing having a screw-type connection for interconnection with the FC-type optical fiber connector, and the opposite end of the adapter housing being open for providing an access into the cavity; and

a unitary, one piece insert being insertable through said opposite end of the housing so as to be mounted in the axial cavity of the adapter housing and including a push-pull-type connection for interconnection with the SC-type optical fiber connector inserted through said opposite open end of the adapter housing.

5,774,611

## OPTICAL RECEPTACLE AND HOUSING THEREFOR

Ryo Nagase, and Shin-ichi Iwano, both of Mito, Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

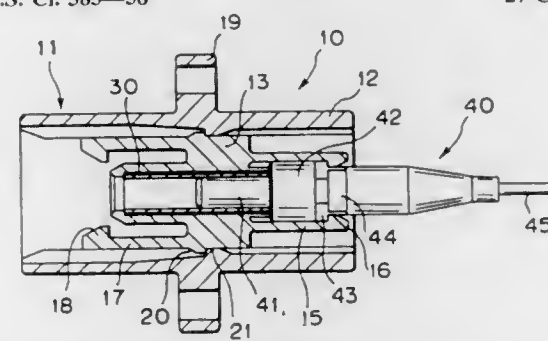
Filed Mar. 6, 1996, Ser. No. 611,779

Claims priority, application Japan, Mar. 8, 1995, 7-048061

Int. Cl.<sup>6</sup> G02B 6/38

U.S. Cl. 385—58

27 Claims



1. An optical receptacle comprising:

a housing having a base end and a nose end, said housing comprising an individual inner part and an individual outer part having fixed therein said inner part;

a first ferrule fitted to the base end of said housing;

wherein said inner part is an integral molded article which comprises:

a sleeve for fitting said first ferrule in alignment with a second ferrule fixed in an optical fiber connector plug adapted to be connected to the nose end of said housing;

first hook portions for holding said first ferrule fitted to the base end of said housing;

second hook portions for holding said optical fiber connector plug at a fitting position of said optical fiber connector plug; and

wherein an opening in said outer part at the base end of said housing is sized to accommodate insertion of said inner part into said outer part.

5,774,613

## FERRULE FOR AN OPTICAL FIBER CONNECTOR

Takashi Tanabe, and Koji Yamamoto, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

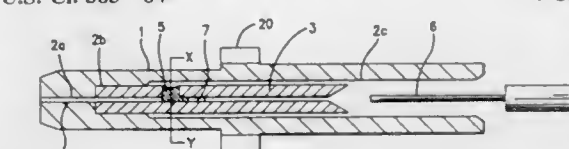
Filed Feb. 9, 1996, Ser. No. 599,125

Claims priority, application Japan, Feb. 10, 1995, 7-023064

Int. Cl.<sup>6</sup> G02B 6/36

U.S. Cl. 385—84

4 Claims



1. A ferrule for an optical fiber connecting comprising:

a capillary having a first and second end and including an axial through bore for receiving an optical fiber, said through bore being flared outward at said first end of said capillary, said capillary including a through notch extending from a wall of said axial through bore to an outer periphery of said capillary; a sleeve having an axial through bore, said sleeve surrounding said capillary and enclosing said second end of said capillary and comprising an integral holding section for directly holding a built-in fiber in said axial through bore, an axis of said axial through bore being substantially coincident with an axis of said holding section, said axial through bore in said integral holding section being flared at said second end of said capillary.



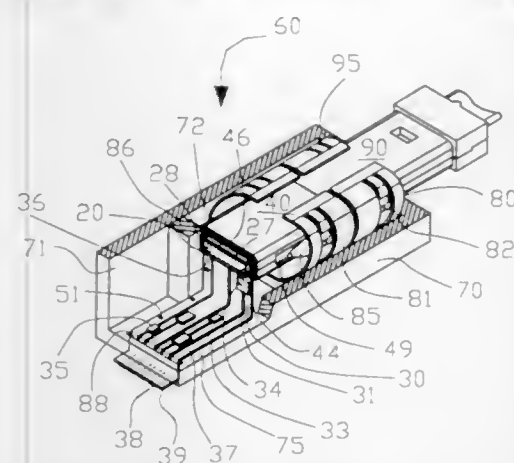
**5,774,614**  
**OPTOELECTRONIC COUPLING AND METHOD OF MAKING SAME**

Patrick B. Gilliland, 5451 NE River Rd., Chicago, Ill. 60656; James W. McGinley, 105 N. Summit Dr., Schaumburg, Ill. 60194, and Roger E. Weiss, 10 Mary Way, Foxborough, Mass. 02035

Filed Jul. 16, 1996, Ser. No. 680,834  
Int. Cl.<sup>6</sup> G02B 6/36

U.S. Cl. 385—88

20 Claims



1. An optoelectronic coupling comprising:  
a first ferrule having an end face and an optical fiber mounted therein perpendicular to the end face, the first ferrule having an alignment groove at a side;  
a housing having an alignment assembly mounted therein including an alignment member for abutting against the alignment groove of the first ferrule and aligning the first ferrule within the housing;  
a second optical ferrule of an external optical connector mounted in the housing and abutting the first optical ferrule within the alignment assembly;  
an optoelectronic device having a cavity therein and an active side being mounted to a flexible substrate; and  
the flexible substrate mounted to the end face between the optoelectronic device and the optical ferrule wherein the cavity is aligned with the optical fiber.

**5,774,615**  
**OPTICAL FIBER WITH A METAL LAYER TO MAINTAIN THE DESIRED SHAPE OF THE OPTICAL FIBER**

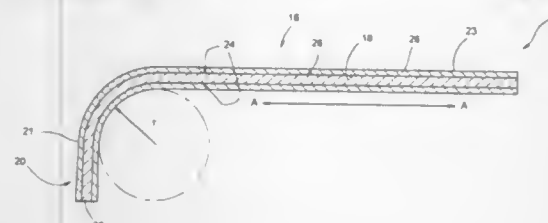
Yoshito Uda; Toshiaki Kuroha, both of Osaka, and Katsuhiko Kobayashi, Chiba, all of Japan, assignors to Topcon Corporation, Tokyo, Japan

Filed Dec. 22, 1995, Ser. No. 577,632

Claims priority, application Japan, Dec. 26, 1994, 6-337851  
Int. Cl.<sup>6</sup> G02B 6/02

U.S. Cl. 385—128

10 Claims



1. An optical fiber comprising:  
a light transmitting portion having a first end, a second end, and an outer surface, said light transmitting portion being formed in a desired shape;  
at least two metal layers, one of said at least two metal layers applied directly to said outer surface of said light transmitting portion and the other of said at least two metal layers applied

to said one metal layer to maintain the desired shape of said light transmitting portion.

**5,774,616**  
**SEMICONDUCTOR LASER MODULE AND METHOD FOR FABRICATING THE SAME**

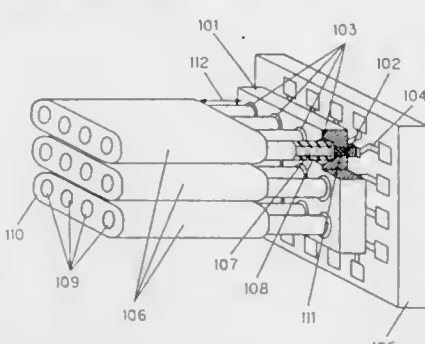
Kenichi Matsuda, Moriguchi, Japan, assignor to Matsushita Electrical Industrial Co., Ltd., Osaka, Japan

Filed Jun. 25, 1996, Ser. No. 669,952

Claims priority, application Japan, Jun. 27, 1995, 7-160404  
Int. Cl.<sup>6</sup> G02B 6/36

U.S. Cl. 385—89

26 Claims



1. A semiconductor laser module, comprising:  
a semiconductor substrate;  
a plurality of surface emitting lasers formed on a primary plane of the semiconductor substrate;  
a plurality of guiding holes formed on a secondary plane of the semiconductor substrate, the secondary plane being opposite to the primary plane; and  
an optical fiber tape including a plurality of optical fibers and a covering material which fixes the plurality of optical fibers in parallel with each other, one tip of the optical fiber tape being adjoined to the secondary plane of the semiconductor substrate;  
wherein a pitch of the respective surface emitting lasers is equal to an interval of a center of the respective optical fibers, the respective surface emitting lasers comprise a layered structure for emitting light which is grown on the semiconductor substrate,  
the respective guiding holes are aligned with the respective surface emitting lasers so that a center of a light beam emitted from each of the surface emitting lasers and a center of each of the guiding holes are at approximately the same position on the secondary plane of the semiconductor substrate,  
a diameter of each of the guiding holes is substantially equal to an outer diameter of each of the optical fibers, and  
a portion of the respective optical fibers at tips thereof is exposed from the covering material and inserted into the respective guiding holes.

**5,774,617**  
**OPTICAL FIBRE MANIFOLD**  
Anthony John Stockman, Woodbridge; Simon Charles Tristan Benton, Felixstowe, and Matthew John Polaine, Cambridge, all of United Kingdom, assignors to Miniflex Limited, United Kingdom

PCT No. PCT/GB94/00938, § 371 Date Dec. 15, 1995, § 102(e) Date Dec. 15, 1995, PCT Pub. No. WO94/25886, PCT Pub. Date Nov. 10, 1994

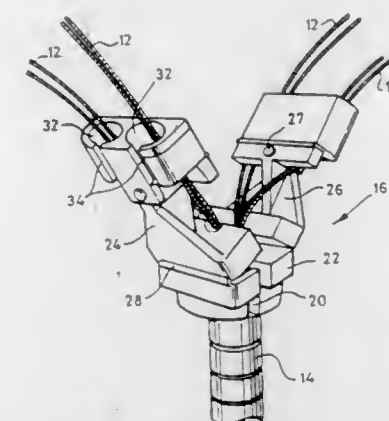
PCT Filed Apr. 26, 1994, Ser. No. 535,167  
Claims priority, application United Kingdom, Apr. 27, 1993, 9308689

Int. Cl.<sup>6</sup> G02B 6/36

U.S. Cl. 385—134

13 Claims

1. An optical fibre manifold having a body and a body closure, wherein the body has an inlet mouth leading to an inlet channel, a



plurality of outlet channels communicating with the inlet channel and an outlet mouth leading from each outlet channel, the inlet and outlet mouths being adapted to receive fibre protection sleeves introduced into the mouths in an axial direction and to retain sleeves thus introduced against radial and axial movement, wherein fibre can be placed laterally into the inlet channel, into the outlet channels and into the inlet and outlet mouths before the body closure is brought into its closing position on the body, and after the body closure is brought into position, lateral access to the inlet and outlet channels is closed and wherein each fibre passage leading, within the manifold, from an inlet to an outlet is configured to guide the fibre through the passage in such a way as to avoid any impairment of the optical and/or mechanical performance characteristics of the fibre.

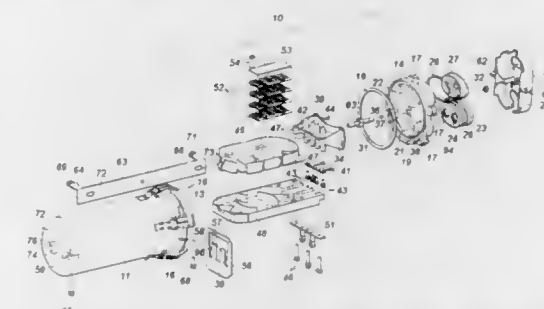
**5,774,618**  
**COMPACT CLOSURE FOR OPTICAL FIBER CABLE**  
Wesley Willing Jones, Lawrenceville, Ga., assignor to Lucent Technologies Inc., Murray Hill, N.J.

Filed Dec. 19, 1996, Ser. No. 773,811

Int. Cl.<sup>6</sup> G02B 6/36

U.S. Cl. 385—135

20 Claims



12. A closure for receiving optical fiber cables comprising:  
an elongated substantially cylindrical cover member having a closed end and an open end;  
an end plate for closing said open end, said end plate having an inner face and an exterior side and first and second bores extending therethrough for receiving one or more grommet sealing members through which the cables pass;  
a sealing member for providing a substantially water and air tight seal between the open end of said cover member and said end plate;  
said end plate having lug members on the periphery thereof; clamping means on said cover member for engaging said lug members for clamping said end plate to said cover member;  
at least one grommet sealing member in one of said, first and second bores adapted to receive one or more cables passing therethrough, each of said grommet members forming a substantially water-tight seal between the cables and said end plate;  
a backbone support member extending from said inner face of said end plate, said backbone support member having means

for partially blocking said first and second bores to restrict inward movement of said grommet sealing members in said bores and a support platform extending from said means for blocking;

a cable sheath grip member;  
said platform having means thereon for supporting said sheath grip member in spaced relation to said platform; and  
said platform further having means thereon for mounting one end of a cable organizer thereto.

**5,774,619**  
**PRECISION DEFORMATION MECHANISM AND METHOD**

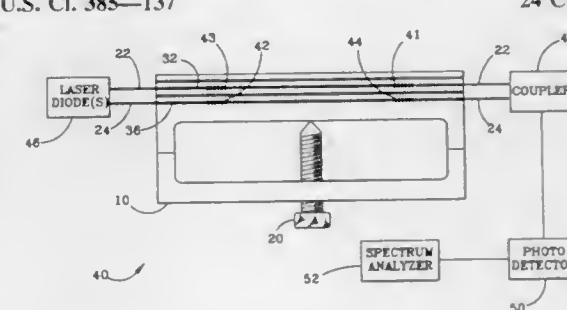
Hans Bruesselbach, Calabasas, Calif., assignor to Hughes Electronics Corporation, El Segundo, Calif.

Filed May 15, 1996, Ser. No. 647,541

Int. Cl.<sup>6</sup> G02B 6/34

U.S. Cl. 385—137

24 Claims



8. An optical fiber length adjustment mechanism, comprising:  
a first beam,  
a second beam joined to said first beam at two places, both beams being deformable between said places, said beams forming two parallel opposing beams, and  
an extendible and retractable element mounted between said first and second beams and between said places, said element exerting force on both of said beams simultaneously such that when extended or retracted said force is respectively increased or decreased on said beams, said force causing both of said beams to deform between said places, whereby said deformation is shared between the two beams such that the deformation of said second beam reduces the amount by which said first beam deforms for a given force, and  
one or more optical fibers mounted in tight contact to one of said beams, said fibers each containing one or more optical gratings, said fibers positioned on said beam such that said deformation causes the length of each fiber and the period of each grating to change.

**5,774,620**  
**FLUORIDE GLASS FIBER**  
Yoshiki Nishida; Terutoshi Kanamori, both of Ibaraki; Tadashi Sakamoto, Kanagawa; Yasutake Ohishi, and Shoichi Sudo, both of Ibaraki, all of Japan, assignors to Nippon Telegraph and Telephone Corporation, Tokyo, Japan

Filed Jan. 24, 1997, Ser. No. 788,385

Int. Cl.<sup>6</sup> G02B 6/00

U.S. Cl. 385—141

11 Claims

1. Fluoride glass comprising 10 to 30 mol % of InF<sub>3</sub>, 7 to 30 mol % of GaF<sub>3</sub>, 10 to 19 mol % of ZnF<sub>2</sub>, 4 to 30 mol % of BaF<sub>2</sub>, 0 to 24 mol % of SrF<sub>2</sub>, 0 to 30 mol % of PbF<sub>2</sub>, and 1.5 to 10 mol % of

VOL

1  
2  
1  
1

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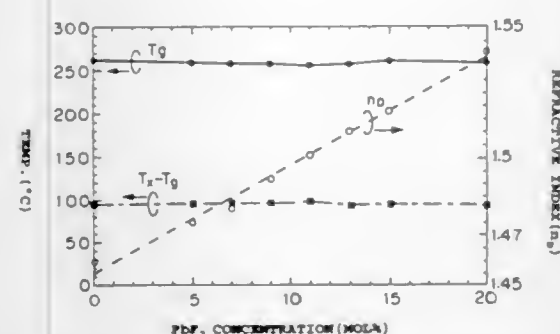
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1998

UMI



at least one member selected from the group consisting of LaF<sub>3</sub>, YF<sub>3</sub>, GdF<sub>3</sub> and LuF<sub>3</sub>, 1.5 to 30 mol % of LiF, 0 to 30 mol % of NaF, and 0 to 15 mol % of an additive, with the total amount of all components being 100 mol %.

5,774,621

Patent Not Issued For This Number

5,774,622

**VIDEO SIGNAL RECORDING/REPRODUCING DEVICE FOR FACILITATING RAPID SEARCHING OF THE VIDEO SIGNAL**

Shiro Kato, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka-fu, Japan

Continuation of Ser. No. 22,659, Mar. 1, 1993, abandoned.

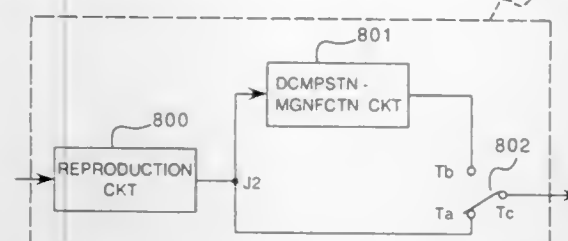
This application May 16, 1995, Ser. No. 442,140

Claims priority, application Japan, Feb. 28, 1992, 4-042874

Int. Cl.<sup>6</sup> H04N 5/91; 5/93

U.S. Cl. 386—68

25 Claims



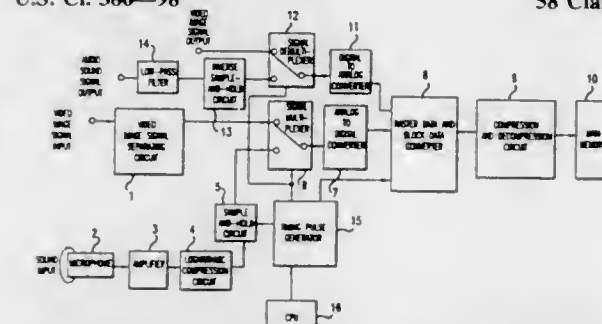
1. A digested video signal producing device comprising: reproducing means for reproducing a first video signal previously recorded on a first predetermined portion of a recording medium and for outputting said reproduced first video signal; sampling means for receiving only said reproduced first video signal and periodically sampling a predetermined number of continuing fields of said reproduced first video signal at a predetermined number of fields, F, to produce a second video signal, said second video signal representing a motion image equivalent of the first video signal at a rate of F divided by the predetermined number of continuing fields times a normal playback speed, said predetermined number F being greater than one, the sampling means counts the number of fields in the reproduced first video signal based on vertical blanking periods and, each time the predetermined number F of fields is reached, the sampling means samples the predetermined number of continuing fields of the reproduced first video signal; and storage means for storing said second video signal and for transferring said stored second video signal when desired.

**5,774,623**  
**VIDEO IMAGE AND AUDIO SOUND SIGNAL PROCESSOR HAVING SIGNAL MULTIPLEXER AND SINGLE DATA COMPRESSION SYSTEM FOR DIGITAL VIDEO RECORDING AND PLAYBACK APPARATUS**  
Eiichi Maeda, Kawasaki, and Norihiro Sakaguchi, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 10, 1996, Ser. No. 629,900  
Claims priority, application Japan, Apr. 12, 1995, 7-086955  
Int. Cl.<sup>6</sup> H04N 5/76; 5/225; 5/92

U.S. Cl. 386—98

58 Claims



1. A video image and studio sound signal processor, comprising: a sample-and-hold circuit for sampling an analog audio sound signal in synchronism with a horizontal synchronizing signal of an analog video image signal, and for holding such a sampled analog audio sound signal to output a held analog audio sound signal; a signal multiplexer for multiplexing said analog video image signal and said held analog audio sound signal output by said sample-and-hold circuit; a timing pulse generator for generating a timing pulse for controlling said signal multiplexer; a first converter for converting an analog multiplexed signal including said analog video image signal and said analog audio sound signal output from said signal multiplexer into a digital signal; a second converter for converting an output from said first converter into a plurality of data blocks; and a data compressor for compressing video image data and audio sound data, which are converted into compressed data blocks by said second converter, in a unit of a block.

**5,774,624**  
**IMAGE SIGNAL RECORDING APPARATUS HAVING INTRAPICTURE AND INTERPICTURE CODING MODES**  
Masahiko Enari, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 992,851, Dec. 16, 1992, abandoned.  
This application May 30, 1995, Ser. No. 453,437

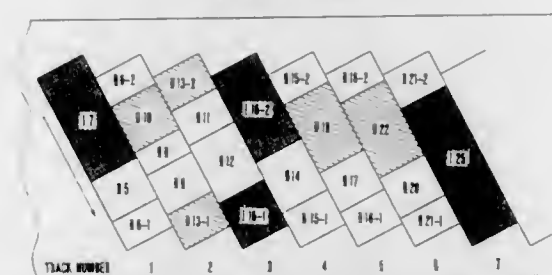
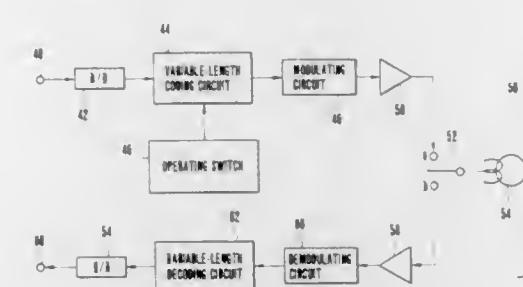
Claims priority, application Japan, Dec. 25, 1991, 3-343584; Dec. 25, 1991, 3-343585

Int. Cl.<sup>6</sup> H04N 5/76; 5/92

U.S. Cl. 386—111

19 Claims

1. An image signal recording apparatus comprising: (a) inputting means for inputting an image signal sequentially containing a plurality of picture signals indicative of pictures correlated to one another, each picture signal having an amount of information; (b) compressing means for compressing the amount of information of each picture signal and outputting compressed picture signals, said compressing means being capable of selectively assuming an intrapicture coding mode for executing compression by using only a correlation within individual pictures of the image signal and an interpicture coding mode for executing compression by using a correlation between a plurality of pictures of the image signal; (c) recording means for recording the compressed picture signals output by said compressing means in a multiplicity of discontinuous tracks on a tape-shaped recording medium, the com-



pressed picture signals being recorded such that boundaries of the plurality of picture signals are located at variable positions of the tracks;

(d) operating means operable for commanding said recording means to start recording; and

(e) controlling means responsive to an operation of said operating means for controlling said compressing means so that a compressed picture signal for one picture first recorded on the recording medium is a picture signal compressed in the intrapicture coding mode and is recorded from one of predetermined positions of the respective discontinuous tracks but picture signals compressed in the intrapicture coding mode and continuously recorded are recorded from variable positions of the track, the predetermined positions being aligned in a longitudinal direction of the recording medium irrespective of the previous recording so that the facilitation of editing with respect to recording units is made up of plural sequential pictures without substantially lowering the efficiency with respect to compression.

**5,774,625**  
**ARRANGEMENT FOR MONITORING THE ROTATIONAL SPEED OF A ROTARY-ANODE DRIVE MOTOR OF X-RAY**

Gerd Vogler, Minden, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

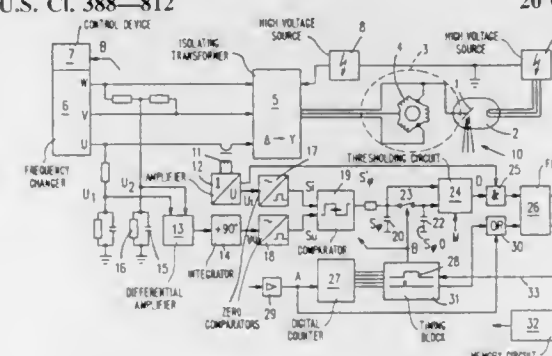
Filed Dec. 13, 1995, Ser. No. 571,505

Claims priority, application Germany, Dec. 14, 1994, 44 44 361.7

Int. Cl.<sup>6</sup> H05G 1/34

U.S. Cl. 388—812

20 Claims



1. An X-ray apparatus, comprising a rotary-anode X-ray tube, and a control unit for supplying currents to a rotary-anode drive motor of the X-ray tube, said control unit comprising a device for monitoring the rotational speed of the rotary-anode drive motor, a sensor circuit for determining an angle signal which is dependent

on a phase angle between a reference voltage and a current associated with the motor, a comparator circuit for detecting the angle signal variation which serves as a criterion for the rotational speed of the motor, and also comprising a frequency changer characterized in that there is provided a device for producing a keying signal during a brief keying period for triggering a reduction of the frequency of the current supplied to the rotary anode drive motor during the keying period from an operating frequency to a keying frequency, in order to determine from the resultant angle signal whether the motor was rotating at a predetermined operating rotational speed prior to the beginning of the keying signal.

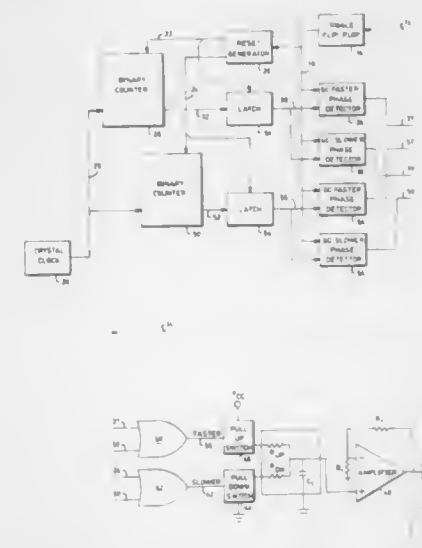
**5,774,626**  
**PROGRAMMABLE DUAL-PHASE DIGITAL MOTOR CONTROL WITH SLIDING PROPORTIONALITY**  
Edwin K. Shenk, Westford, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 16, 1995, Ser. No. 558,737

Int. Cl.<sup>6</sup> G05F 1/10

U.S. Cl. 388—815

13 Claims



1. A digital motor control system for controlling the rotational speed of a motor driven by a drive voltage, said digital motor control system comprising:

sensor means coupled to the motor so as to produce a pulse signal comprising a series of pulses occurring at a frequency representative of the rotational speed of the motor;

a flip-flop in electrical communication with said pulse signal, said flip-flop generating a flip-flop output signal comprising a series of pulses, each said flip-flop pulse having a rising edge corresponding to the rising edge of a sensor means pulse, and a falling edge corresponding to the rising edge of the subsequent sensor means pulse;

reset means in electrical communication with said flip-flop output signal pulses, said reset means generating a first set of reset pulses corresponding to the rising edges of said flip-flop pulses and a second set of reset pulses corresponding to the falling edges of said flip-flop pulses;

oscillator means having a substantially fixed frequency;

first binary counter means in electrical communication with said oscillator means and said first set of reset pulses, for generating a first reference signal corresponding to the rising edges of said flip-flop pulses;

second binary counter means in electrical communication with said oscillator means and said second set of reset pulses, for generating a second reference signal corresponding to the falling edges of said flip-flop pulses;

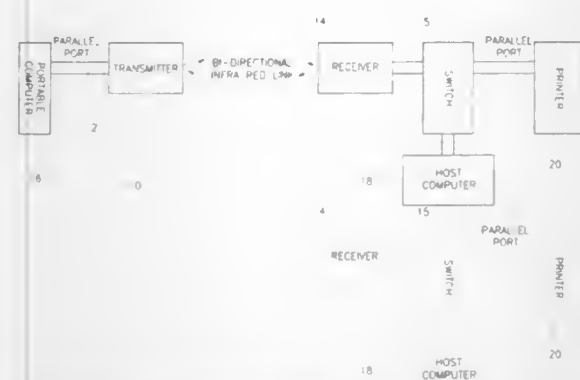


# UMI

179-281 O.G. - 98 - 33 : OL 3







generating a set of printer data and control information signals in accordance with data available at a printer output port of the alternate computer;

transmitting said printer data and said control information signals via a T-connected cordless link;

receiving said transmitted printer data and said control information signals over said T-connected cordless link; and

switching between one of normal and temporary shared access modes to control the dedicated printer respectively, via the host computer through the hard-wired link in said normal mode, and via the alternate computer through said T-connected cordless link in said temporary shared access mode, in accordance with said printer data and said control information signals, without requiring cabling changes in the hard-wired link.

wherein as part of said switching step, a predetermined interval is defined beyond which inactivity of the host computer enables the alternate computer to control the dedicated printer in said temporary shared access mode, and

a predetermined period is defined beyond which inactivity of the alternate computer enables the host computer to regain control of the dedicated printer from said temporary shared access mode, said predetermined period exceeding a time period associated with an unintended interruption in transmission of said printer data.

5,774,638

#### PRINT CONTROLLING METHOD AND APPARATUS USING A PLURALITY OF PROCESSORS

Seiji Kageyama, Yokohama; Hiroaki Kanbayashi, Sagami-hara, and Shinya Sakaguchi, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 925,624, Aug. 6, 1992, abandoned.

This application Oct. 21, 1996, Ser. No. 734,685

Claims priority, application Japan, Aug. 6, 1991, 3-196872

Int. Cl.<sup>6</sup> G06F 15/00

U.S. Cl. 395—114

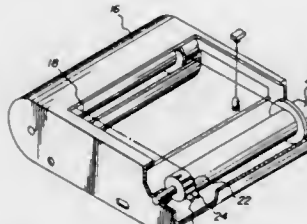
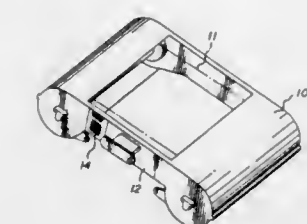
39 Claims

37. A print controlling method wherein drawing processes for respective pages are performed in accordance with print commands by a plurality of processors, comprising the steps of:

storing said print commands ranging over a plurality of pages in a command buffer;

performing, in at least one of said plurality of processors, a first process for detecting page breaks in said command buffer and determining drawing attribute parameters for respective pages which are identified based on said detected page breaks; and

performing in said plurality of processors, a second process for drawing upon receiving said detected page breaks and said determined drawing attribute parameters for said respective pages, data associated with print commands of said respective pages defined by said page breaks in page buffers using said drawing attribute parameters for said respective pages;



wherein said first process and said second process are performed in parallel with each other to effect a drawing process.

5,774,639

#### PRINTER MEDIA INCLUDING COMPRESSED SENSITOMETRY CURVE INFORMATION

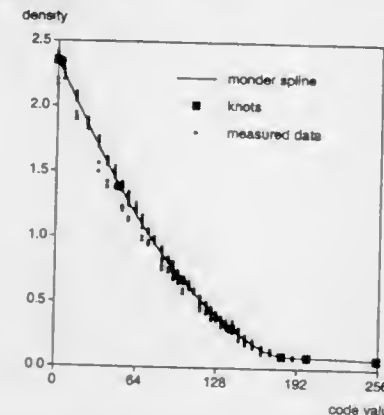
Jay S. Schildkraut, Rochester; Kevin E. Spaulding, Spencerport, and John P. Spence, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 17, 1995, Ser. No. 390,616

Int. Cl.<sup>6</sup> G06K 15/00

U.S. Cl. 395—115

25 Claims



I. A product for use with a printer adapted to use a set of spline coefficients to construct a sensitometric curve, said product comprising:

imaging media having a predetermined sensitometry; and memory in which is stored a set of such spline coefficients which represent the predetermined sensitometry of the media.

5,774,640

#### METHOD AND APPARATUS FOR PROVIDING A FAULT TOLERANT NETWORK INTERFACE CONTROLLER

Kay M. Kurio, Austin, Tex., assignor to Tandem Computers Incorporated, Cupertino, Calif.

Filed Oct. 21, 1991, Ser. No. 781,422

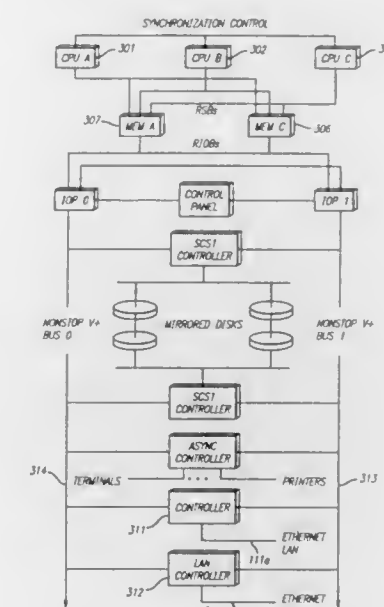
Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395—182.02

18 Claims

I. An apparatus for providing a fault-tolerant interface for a computer, comprising:

first and second means for connecting said computer to said network, said first and second means for connecting being provided, respectively, with first and second identifiers for



uniquely identifying said first and second means for connecting said computer to said network, said first means for connecting being initially enabled so as to allow data to flow between said network and said computer through said first means for connecting;

means for periodically detecting whether a fault has occurred in said first means for connecting, said means for detecting causing a first message to be sent through said first means for connecting to be received by said second means for connecting, and causing a second message to be sent through said second means for connecting to be received by said first means for connecting;

means for disabling said first means for connecting when said fault is detected;

means for substituting, in said second means for connecting, said first identifier for said second identifier when said fault is detected; and

means for enabling, when said fault is detected, said second means for connecting so as to allow data to flow between said network and said computer through said second means for connecting.

5,774,641

#### COMPUTER STORAGE DRIVE ARRAY WITH COMMAND INITIATION AT RESPECTIVE DRIVES

Shah Mohammad Rezaul Islam, Cary; Andrew Boyce McNeill, Jr., Apex, both of N.C., and Bruce M. Cassidy, Pleasanton, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 14, 1995, Ser. No. 528,484

Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 395—182.04

8 Claims

8. An apparatus for storing and retrieving data received from a connected data processing system, said apparatus comprising:

a plurality of storage units for performing data processing operations, each having a dedicated controller wherein said dedicated controller includes:

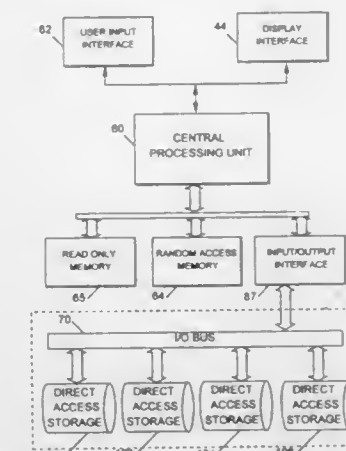
(a) means for calculating parity data;

(b) means for monitoring said data processing operations within a selected one of said plurality of storage units;

(c) means for generating commands for execution by a selected one of said dedicated controllers in a selected one of said plurality of storage units; and

(d) means for transferring data to a selected one of said plurality of storage units; and

communication means coupled to each of said dedicated controllers within each of said storage units for communicating said commands and data between said dedicated controllers,



wherein said means for generating commands for execution by a selected one of said dedicated controllers in a selected one of said plurality of storage units includes means for generating commands for reconstructing data from data stored in selected ones of said plurality of storage units, wherein said commands are intended for execution by selected ones of said dedicated controllers in said plurality of storage units.

5,774,642

#### ARCHITECTURE FOR DYNAMIC SERVICE PROCESSOR EXCHANGE PROVIDING MULTITASKING ENVIRONMENT WHERE MULTIPLE PROCESSORS HAVE ACCESS TO A SYSTEM CONFIGURATION TABLE

Robert Flon, Versailles, and Jean-François Bonnafoux, Lamorlaye, both of France, assignors to Bull S.A., Paris, France

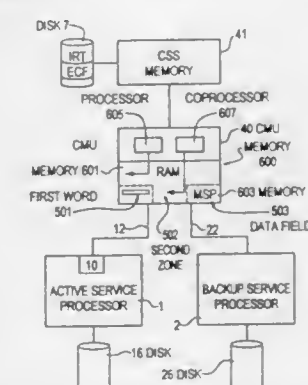
Continuation of Ser. No. 391,618, Feb. 21, 1995, abandoned, which is a continuation of Ser. No. 852,128, Apr. 28, 1992, abandoned. This application Mar. 25, 1996, Ser. No. 621,862

Claims priority, application France, Aug. 9, 1990, 90 10180

Int. Cl.<sup>6</sup> G06F 11/14

U.S. Cl. 395—182.11

5 Claims



1. A computer system comprising a active service processor connected by a network and a maintenance unit (CMU) to a central system (4), said active service processor (1) being connected to a backup service processor (2) by the network end the maintenance unit (CMU), where said active service processor and said backup service processor each have an operating system, a supervisor program, at least one utility comprising a "body" portion and a "presentation" portion comprising an interface with an operator allowing a display of a window type with a menu bar, and a maintenance station handler (MSH) interface (10, 20) for processing communications with other service processors by means of the maintenance unit (CMU), said supervisor program managing the at least one service and starting the at least one service, said supervisor program having access to a system configuration table containing a description of said computer system, said system configuration table being located in a central system storage means which is in communication with said central system (4),

wherein the maintenance unit (CMU) has a random access memory (600) which communicates through the central system with said central system storage means containing the system configuration table, and

wherein the supervisor program of the active service processor and the backup service processor contain a CMU access method routine (CAM) to access the system configuration table contained in the central system storage means, to transfer said system configuration table to a hard disk (16, 26) of a corresponding one of said active service processor and said backup service processor, respectively, and to load said system configuration table into the random access memory (600) of the maintenance unit (CMU),

and wherein the supervisor program of the backup service processor (2) contains a routine which, upon a failure of the active service processor (1) manifested by an event sent by the maintenance unit (CMU) to the backup service processor (2), launches the supervisor program of the backup service processor (2), and by a body CMU access method module (LBCAM) of the CMU access method routine (CAM) of the backup service processor reading the configuration table in the random access memory (600) of the maintenance unit (CMU) to copy said configuration table from said random access memory (600) onto the hard disk (26) of the backup service processor (2), and wherein

said random access memory (600) is divided into first and second parts, said first part (601) accessible only by a processor (605) of the maintenance unit (CMU), and said second part being a maintenance station processor (MSP) accessible only by a coprocessor (607) of the maintenance unit (CMU) by executing messages sent by the CMU access method routine (CAM) to the maintenance unit (CMU), said CMU access method routine (CAM) being launched by said active service processor (1), and wherein

the MSP part of the random access memory is divided into three zones:  
a first zone containing a word indicating current length of the memory;  
a second list zone containing file labels; and  
a third zone containing data, and wherein  
the labels in the second zone contain:  
file information including a file name, allocated space for the file, creation date of the file, and current size of the file;  
information indicating whether the allocated space is fixed or variable; and  
a flag having a value which indicates that a write session has not been validly executed.

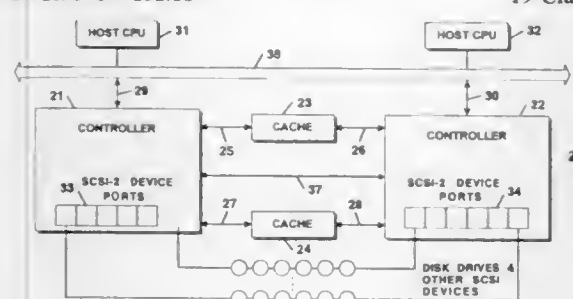
#### 5,774,643 ENHANCED RAID WRITE HOLE PROTECTION AND RECOVERY

Clark E. Lubbers; Susan G. Elkington, both of Colorado Springs, and Ronald H. McLean, Elbert, all of Colo., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Oct. 13, 1995, Ser. No. 542,536  
Int. Cl.<sup>6</sup> C06F 11/10

U.S. Cl. 395—182.18

19 Claims



1. A method of reconstructing data in a computer system employing a Parity RAID protection scheme for a striped array of storage devices that employ parity recovery in the event of a crash,

said computer system including a write back cache composed of non-volatile memory for storing (1) write data outstanding that is to be written to storage devices, and (2) metadata information; said metadata information comprising a first field containing an LBA of said write data outstanding, a second field containing device IDs that correspond to said write data outstanding, and a third field containing status that indicates consistent or inconsistent write slice parity, comprising the steps of:

storing old data in said non-volatile memory from storage devices that are intended for said write data outstanding, to protect said old data in the event a crash occurs during a write to a storage device;

storing old parity that corresponds to said old data in said non-volatile memory;

determining from said metadata information where a given write data outstanding was intended when a crash occurs;

determining whether parity is consistent across a write slice corresponding to said given write data outstanding, and if parity is not consistent, using said old data stored in said non-volatile memory and said old parity stored in said non-volatile memory to reconstruct said given write data outstanding to thereby insure consistent parity, whereby;

only slices of said given write data outstanding whose parity is not consistent and are affected by the crash have to be reconstructed.

#### 5,774,644 METHOD AND APPARATUS FOR GENERATING A PAIR OF INTEROPERATING COMMUNICATIONS PROGRAMS

Philip William McKinstry, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 17, 1993, Ser. No. 169,444  
Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 395—783.01

38 Claims



1. A method for automatically testing a pair of communications programs for utilization within a computer network environment wherein said communications programs are used to establish a communication link between two computer systems, each of which executes one of said communications programs, said method comprising the steps of:

(a) comparing a first communications program with a second communications program to determine whether the communications programs are capable of establishing said communication link, said comparing step further comprising the steps of:  
(1) determining whether said first or second communications program is controlling said communication link;

- (2) processing verbs contained in a first function of the controlling communications program;
- (3) processing verbs contained in a first function of the non-controlling communications program that is a responsive function to said first function in said controlling communications program;
- (4) repetitively comparing processed functions and verbs contained in said controlling communications program with responsive processed functions and verbs in said non-controlling communications program; and
- (5) repetitively comparing processed functions and verbs in said non-controlling communications program with the responsive processed functions and verbs in said controlling communications program;
- (b) determining errors in said communications programs that would inhibit establishment of said communication link; and
- (c) resolving said errors in such a manner as to enable the establishment of said communication link between said first and second communications programs.

#### 5,774,645 PROCESS AND DEVICE FOR IDENTIFYING FAULTS IN A COMPLEX SYSTEM

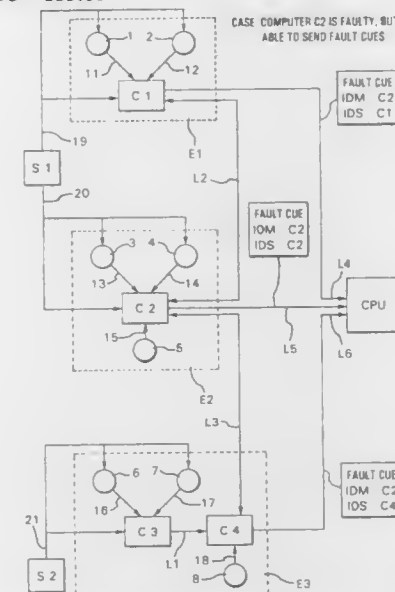
Jean-Philippe Beaujard, Toulouse, and André Fernekas, Laverne, both of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Aug. 29, 1995, Ser. No. 521,060

Claims priority, application France, Aug. 29, 1994, 94 10363  
Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 395—183.01

9 Claims



1. A process for identifying faults in a complex system containing a plurality of elements connected together, a process according to which:

- a) said complex system is divided into a plurality of sets of elements, each of said sets being capable of issuing, upon a fault relating directly or indirectly to at least one of the elements of this set, a fault cue;
  - b) all the fault cues issued are centralized;
  - c) the fault cues issued during a predetermined period and which relate to one and the same faulty element are grouped together; and
  - d) for each of said groupings carried out, the element which is actually faulty and which is at the origin of the relevant fault cues is determined,
- wherein:
- a fault cue includes an identification indicator, designating the element which the set regards as being faulty, and an origin indicator designating said issuing set;
- in step c):

the fault cues for which the identification indicator of one of said fault cues corresponds to the origin indicator of another of said fault cues are grouped together, respectively in first data groups, and, for each first data group thus formed, the fault cues, not already grouped together, for which the identification indicator corresponds to the identification indicator of one of said fault cues of the group, is added thereto; and

fault cues which are not grouped together in said first data groups, for which the identification indicators are the same, are grouped together, respectively in second data groups, each of said first and second data groups thus formed containing fault cues having as origin the fault of one and the same element; and

in step d), the element which is actually faulty is:  
for the fault cues which were not able to be grouped together, the element designated by the identification indicator;  
for the first data groups, either the element designated by the identification indicator which, as the case may be, does not correspond to any origin indicator of the group, or, when a fault cue of the group contains an identification indicator and an origin indicator which are identical, the element designated by these identical indicators; and  
for the second data groups, the element designated in a common manner by the identification indicators.

#### 5,774,646 METHOD FOR DETECTING FAULTY ELEMENTS OF A REDUNDANCY SEMICONDUCTOR MEMORY

Saverio Pezzini, Vimercate; Roberto Ganzelmi, Vittuone, and Maurizio Peri, Bergamo, all of Italy, assignors to SGS Thomson Microelectronics S.r.l., Agrate Brianza, Italy

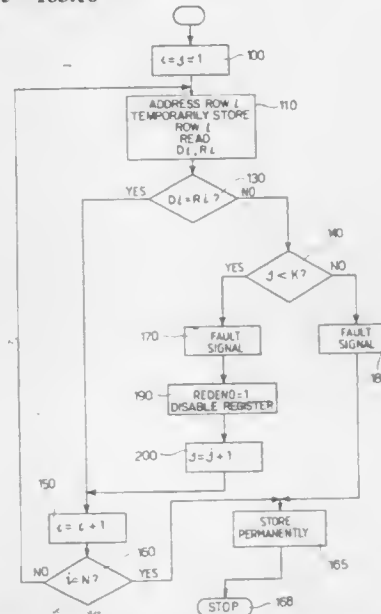
Filed Jul. 26, 1994, Ser. No. 280,761

Claims priority, application European Pat. Off., Jul. 26, 1993, 93830329

Int. Cl.<sup>6</sup> G06F 11/20

U.S. Cl. 395—183.18

5 Claims



1. A method of detecting whether an element of a plurality of elements in a first memory is faulty, the method comprising the steps of:

- (a) addressing of one of the plurality of elements in the first memory, the plurality of elements each having an address, in order to access a content of the one of the plurality of elements and to provide the address of the one of the plurality of elements to a second memory for storage of the address in one of a plurality of registers of the second memory;
- (b) comparing after step (a), the content of the one of the plurality of elements to a reference; and



(c) changing a state of the plurality of registers of the second memory if the content and the reference are unequal; wherein each of the plurality of registers of the second memory includes a first portion and a second portion, wherein step (a) includes the step of storing the address of the one of the plurality of elements in the first portion of the one of the plurality of registers, and wherein step (c) includes the step of storing a code in a second portion of the one of the plurality of registers to change the state of the one of the plurality of registers.

5,774,647

## MANAGEMENT OF MEMORY MODULES

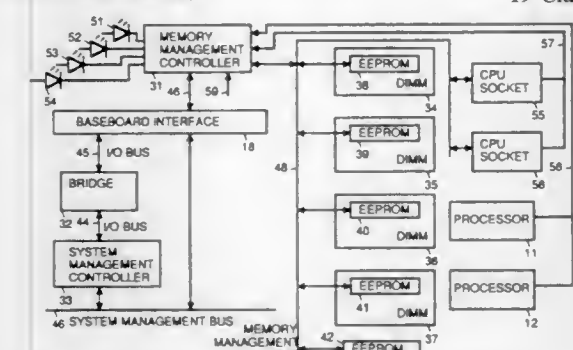
Michael B. Raynham, Los Gatos; Myron R. Tuttle, Santa Clara; Andy Kim-Sang Yu, Saratoga; Brian E. Donne, Gilroy, and James K. Gendreau, Fremont, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 15, 1996, Ser. No. 649,752

Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 395—185.01

19 Claims



1. A method for managing a memory module comprising:
  - (a) within the memory module providing a management memory which provides permanent storage for management information; and,
  - (b) storing within the management memory, an error log which indicates a time stamp for errors which occur in normal operation of the memory module.

5,774,648

## ADDRESS GENERATOR FOR ERROR CONTROL SYSTEM

Rom-Shen Kao, and Vickie L. Gibbs, both of Durham, N.C., assignors to Mitsubishi Semiconductor of America, Inc., Durham, N.C.

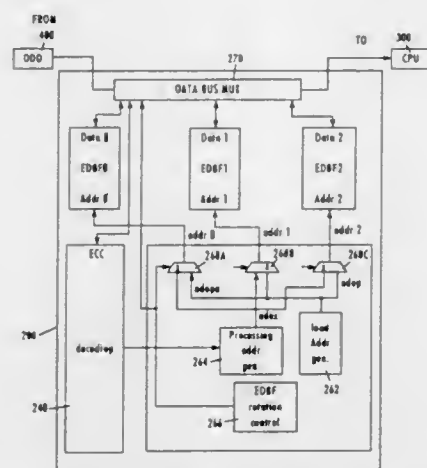
Filed Oct. 2, 1996, Ser. No. 725,685

Int. Cl.<sup>6</sup> G06F 11/10

U.S. Cl. 395—185.01

24 Claims

12. An error control chip for correcting errors in an optical disk storage, comprising:
  - an encoder/decoder circuitry for encoding original data provided by a central processor for storing in said optical disk storage, and for decoding stored data read by an optical disk drive from said disk storage, encoded data being supplied to an optical disk drive, and decoded data being supplied to said central processor,
  - first, second and third working buffers for storing data during an encoding/decoding procedure, and



an address generator for providing each of said central processor, disk drive, and encoder/decoder circuitry with an access to one of said first, second and third working buffers in each cycle of the encoding/decoding procedure.

5,774,649

## MICROPROCESSOR MALFUNCTION PREVENTION CIRCUIT

Young-ok Goh, Suwon, Rep. of Korea, assignor to Samsung Electronics Co., Ltd., Suwon, Rep. of Korea

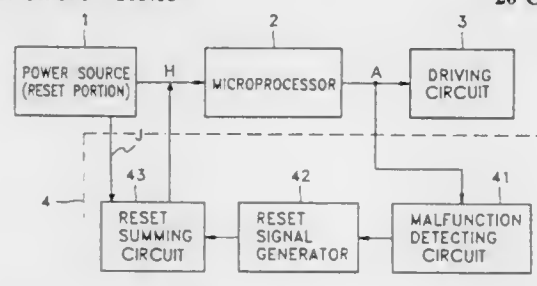
Filed Apr. 1, 1996, Ser. No. 626,047

Claims priority, application Rep. of Korea, Apr. 7, 1995, 95-8116

Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 395—185.08

20 Claims



1. A circuit for resetting a microprocessor, comprising:
  - a coupling capacitor providing an input terminal for receiving binary signals generated by said microprocessor;
  - a first transistor having a control electrode separated from said input terminal by said capacitor, said control electrode of said first transistor being electrically coupled to a second terminal provided by said coupling capacitor, and electrodes of a principal electrically conducting channel coupled between reference potentials of different magnitude;
  - a second transistor complementary to and coupled in electrical cascade with said first transistor, said second transistor having a control electrode forming a first node coupled to a first one of said electrodes of said principal electrically conducting channel of said first transistor, said second transistor having electrodes of a principal electrically conducting channel coupled between said reference potentials;
  - a second capacitor coupled between said first node and one of said reference potentials;
  - reset signal generation means coupled to a second node formed with a first one of said electrodes of said principal electrically conducting channel of said second transistor for generating an initial reset signal for resetting said microprocessor in response to a malfunction detection signal occurring at said second node in response to said binary signals continuously exhibiting a single voltage representing an occurrence of malfunction by said microprocessor; and

reset summing means for generating a synthesized reset signal by synthesizing said initial reset signal with a power reset signal, and resetting said microprocessor by providing said synthesized reset signal to said microprocessor.

5,774,650

## CONTROL OF ACCESS TO A NETWORKED SYSTEM

Sydney George Chapman, Winchester, and Michael George Taylor, Southampton, both of United Kingdom, assignors to International Business Machines Corporation, Armonk, N.Y.

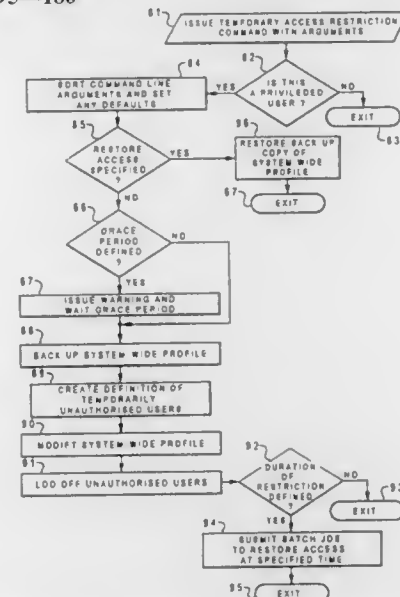
Filed Sep. 1, 1994, Ser. No. 299,864

Claims priority, application United Kingdom, Sep. 3, 1993, 9318331

Int. Cl.<sup>6</sup> G06F 11/34

U.S. Cl. 395—186

17 Claims



12. A method of temporarily preventing access to a data processing system connectable over a network to a plurality of computers, said data processing system having means for restricting user access to the data processing system, wherein said means for restricting access performs a user authentication procedure in which, at logon, the user's identity is compared to a list of a plurality of authorized users, said means for restricting access further having a system-wide profile referenced by all users of the data processing system at logon, the method comprising the steps of:
  - referencing a list of temporarily unauthorized users from the system-wide profile;
  - denying access to said data processing system to a user listed within said list of temporarily unauthorized users; and
  - logging off users already logged on to the data processing system who are listed within said list of temporarily unauthorized users.

5,774,651

## FALSE STATEMENT DETECTION SYSTEM

Ryota Akiyama, and Makoto Yoshioka, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 28, 1996, Ser. No. 654,343

Claims priority, application Japan, Sep. 20, 1995, 7-242126

Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 395—186

13 Claims

6. A false statement detection system used in a software distribution system including at least one user terminal and a center connected to the user terminal, the center notifying the user terminal of decoding information on condition that a user of the user

5,774,652

## RESTRICTED ACCESS COMPUTER SYSTEM

Perry Smith, 4600 Franklin Ave., Yellowknife, Northwest Territories, Canada, X1A 2N8

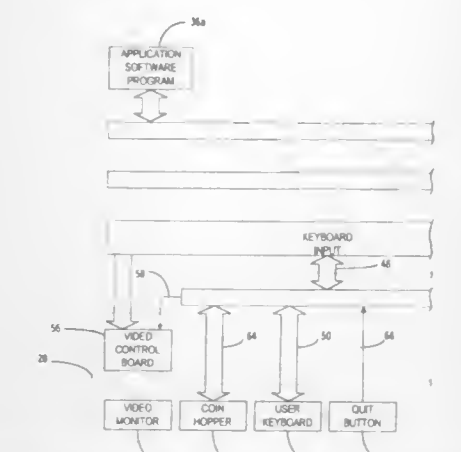
Filed Sep. 27, 1996, Ser. No. 720,111

Int. Cl.<sup>6</sup> G06F 11/00

U.S. Cl. 395—186

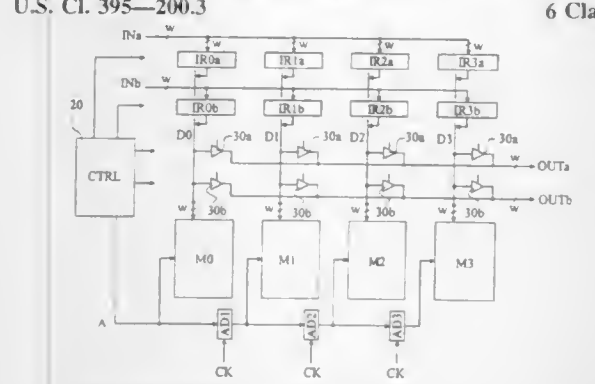
24 Claims

1. A method of converting a general purpose computing platform into a limited access computer system that allows a user limited access to at least one application program installed on the general purpose computing platform, the method comprising the steps of:



connecting a control hardware device to a communications port of the general purpose computing platform, where the control hardware device comprises means for booting up the general purpose computing platform;  
installing a control software program on the general purpose computing platform;  
altering the general purpose computing platform such that the control software program runs whenever the general purpose software program boots up;  
booting up the general purpose computing platform to form the limited access computer system; and  
establishing a communication link between the control software program and the control hardware device, where the control hardware device re-boots the general purpose computing platform to form the limited access computer system whenever the communication link between the control software program and the control hardware device is disrupted.

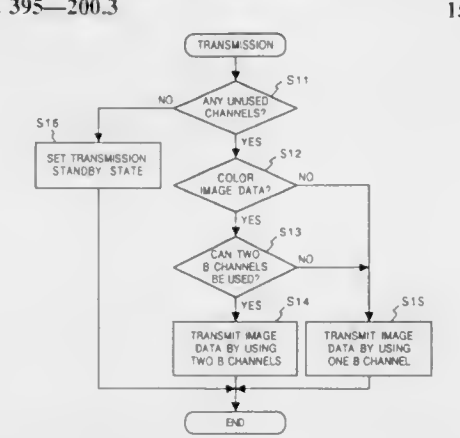
5,774,653  
**HIGH-THROUGHPUT DATA BUFFER**  
Manolis Katevenis, Iraklio, Greece, assignor to Foundation of Research and Technology-Hellas, Crete, Greece  
Filed Jul. 24, 1995, Ser. No. 506,019  
Claims priority, application Greece, Aug. 2, 1994, 940100383  
Int. Cl.<sup>6</sup> G06F 13/00  
U.S. Cl. 395—200.3  
6 Claims



1. A data switch for transferring packets of a multiple of N words arriving at the rate of one word per clock cycle on any of M input links, each to a selected one of output links, where N and M are integers, such that N>M, comprising:  
a data buffer including a series of N memories, each memory having an access control bus for receiving address and read/write control signals, and control circuitry for successively providing the same access control signals to all of the memories of the series of memories, such that the time separating the receipt of access control signals to one memory from the receipt of the same access control signals to the next memory is equal to at least one complete memory access cycle;  
means associated with each input link for providing consecutive words from the input link to the N memories in the order in

which said memories are subjected to a same write access by said control circuitry;  
means associated with each output link for providing the outputs of the N memories to the output link in the order in which said memories are subjected to a same read access by said control circuitry;  
means associated with each memory for successively providing the memory with words present on the input links at the rate at which the memory is subjected to write accesses by said control circuitry, and for successively providing the output links with the output of the memory at the rate the memory is subjected to read accesses by said control circuitry.

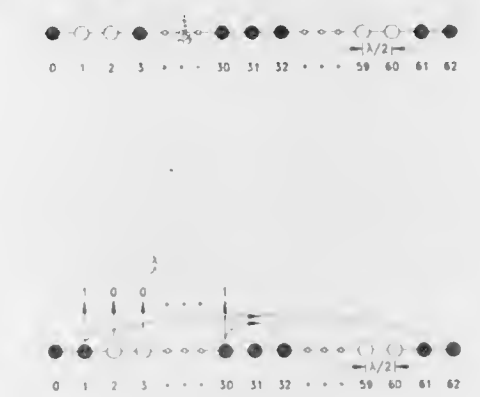
5,774,654  
**COMMUNICATION TERMINAL APPARATUS AND COMMUNICATION METHOD FOR COMMUNICATING DATA THROUGH A PLURALITY OF COMMUNICATION CHANNELS**  
Nobuhiko Maki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan  
Continuation of Ser. No. 144,559, Nov. 2, 1993, abandoned.  
This application Jan. 29, 1997, Ser. No. 790,111  
Claims priority, application Japan, Nov. 5, 1992, 4-295608  
Int. Cl.<sup>6</sup> H01H 67/00  
U.S. Cl. 395—200.3  
15 Claims



1. A communication terminal apparatus, accommodating a line having a plurality of communication channels, for transmitting image data through the plurality of communication channels to a communication party, each of the communication channels being a same kind and having a same capacity for transmitting data per unit time, said apparatus comprising:  
detecting means for detecting unused states of the plurality of communication channels;  
recognizing means for recognizing an attribute associated with the image data, the attribute indicating a data amount of the image data;  
determining means for determining an optimal number of channels of the plurality of communication channels to be used for transmission of the image data, on the basis of the unused states detected by the detecting means and the attribute recognized by the recognizing means, said determining means being able to determine the optimal number of channels to be less than a total number of unused channels indicated by the unused states; and

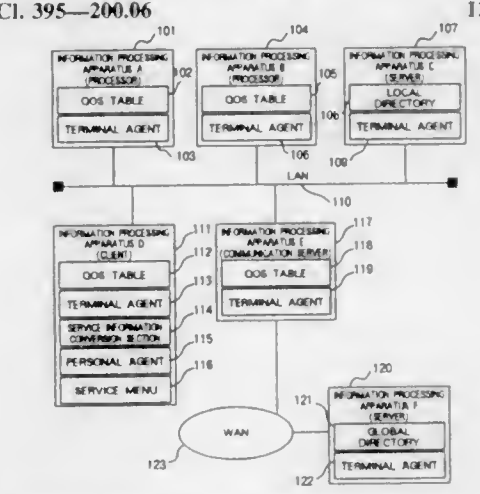
transmitting means for transmitting the image data to the communication party by distributing the image data among the determined number of channels of the plurality of communication channels,  
wherein said recognizing means recognizes the attribute of the image data by checking whether the image data is color image data or monochrome image data.

5,774,655  
**METHOD AND APPARATUS FOR DISPLAYING MULTIPLE REPRESENTATIONS OF CONNECTIONS IN A COMMUNICATIONS NETWORK WITH DIFFERING LEVELS OF DETAIL**  
Jacobus Johannes Bloem, The Hague, and Harrold Bastiaan Korte, Voorschoten, both of Netherlands, assignors to Koninklijke PTT Nederland N.V., Netherlands  
Continuation of Ser. No. 504,889, Jul. 20, 1995, abandoned.  
This application May 7, 1997, Ser. No. 852,726  
Claims priority, application European Pat. Off., Jul. 22, 1994, 94202151  
Int. Cl.<sup>6</sup> H04J 12/00  
U.S. Cl. 395—200.5  
7 Claims



5. A server for use in a communications network, said server being arranged for:  
generating, in response to a service request provided by a client, a multiple representation of a desired connection to be established within the network, the multiple representation comprising first and second single representations, said first and second representations being alternately available to the client, wherein:  
the first representation displays a first group of pre-defined operational attributes of the connection at a first level of detail, wherein the first group of attributes are not modifiable by the client; and  
the second representation displays a second group of pre-defined operational attributes of the connection at a second level of detail, with the first level providing less detail than the second level, and each of the operational attributes in the second group provides additional detail of the connection with respect to a corresponding one of the operational attributes in the first group;  
providing the first representation to the client; and  
if the client requests additional detail from the server with respect to the desired one connection, providing, to the client,

5,774,656  
**INFORMATION PROCESSING SYSTEM AND METHOD AND SERVICE SUPPLYING METHOD FOR USE WITHIN A NETWORK**  
Ryulchi Hattori, Yokohama; Toshihiko Ogura, Ebina; Takashi Oeda, Yokohama; Koichi Okazawa, Ebina; Hideki Osaka, Hiratsuka; Tsumehiro Tobita, Yokohama, and Tsutomu Hara, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed May 3, 1995, Ser. No. 434,291  
Claims priority, application Japan, May 6, 1994, 6-094431  
Int. Cl.<sup>6</sup> G06F 13/368  
U.S. Cl. 395—200.06  
12 Claims



1. An information processing system, comprising:  
a plurality of information processing apparatuses each having a QOS table to which information of functions and performance is registered;  
a network for connecting the plural information processing apparatuses to each other;  
a local directory connected to the network for controlling a plurality of QOS tables in a unit of local areas, the local areas being a set of small-sized areas;  
a global directory for controlling a plurality of local directories in a global area of the unit of local areas; and  
an agent function operable in either one of the information processing apparatuses for referencing the respective contents of the global and local directories and converting the information of functions and performance registered to the QOS table into service information representing quality of service, thereby supplying a user with the obtained service information,  
wherein the agent function includes:  
a terminal agent which is in charge of a client's interface to be used by each user and which provides the user and thereby supplying the service information representing quality of services that are common among individual users; and  
a personal agent which makes inquiries of said global and local directories about the functions and performances of each apparatus connected to the client server system, converts the functions and performances obtained as a result of the inquiries to service information required by the user, and supplies the user with said service information.



5,774,657

## COMMUNICATION DATA PROCESSOR

Naoki Okamura, Nara; Noriyuki Takao, and Hidetoshi Takano, both of Toyota, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, and Sharp Kabushiki Kaisha, Osaka, both of Japan

Continuation of Ser. No. 265,360, Jun. 24, 1994, abandoned.

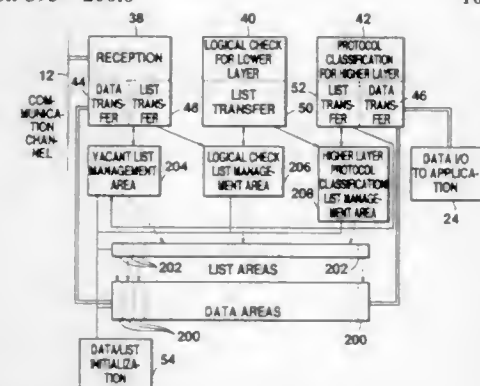
This application Sep. 16, 1996, Ser. No. 713,572

Claims priority, application Japan, Jun. 30, 1993, 5-161044

Int. Cl.<sup>6</sup> G06F 13/42; H04L 29/06

U.S. Cl. 395—200.6

10 Claims



1. A communication data processor comprising:

storage means having a plurality of data areas, said storage means being capable of storing a communication data in any one of the plurality of data areas;

multilayered processing means for performing a multilayered processing of the communication data stored in the plurality of data areas, said multilayered processing including a plurality of layer specified processing means, each associated with a corresponding one of said plurality of layer specified processing, each of said plurality of layer specified processing means being operative to perform its own layer specified processing of the communication data while using at least one of the plurality of data areas in which the communication data to be processed has been stored; and

a plurality of data area list delivery means, each for delivering part of a data area list containing data area management information from one of the plurality of said layer specified processing means, said one being a source, to another of the plurality of layer specified processing means, said other being a destination, wherein the data area management information comprises data area pointers specifying a memory space of said storage means occupied by at least one of the plurality of data areas to be managed by said data area list and storing communication data subjected to the layer specified processing by the source and to be subjected to the layer specified processing by the destination, wherein the data area list includes:

a plurality of list areas, on the storage means corresponding to any one of the plurality of data areas, for storing: (1) a self-list pointer for specifying itself, (2) at least one of a plurality of adjacent list pointers, each for specifying another one of the plurality of list areas to be managed, and (3) said data area pointer, wherein said plurality of list areas are sequentially chained into an annulus through the at least one of the plurality of adjacent list pointers of the plurality of list areas; and

a plurality of list management areas, on the storage means, for storing a list chain pointer for specifying at least one of the plurality of data areas to be managed by said data area list and a list depth pointer for indicating the number of at least one of the plurality of data areas to be managed by said data area list.

5,774,658

## ARRANGEMENT FOR ACCESSING MEDIA IN A NETWORK HAVING UNIVERSAL MULTIPLE ACCESS NODES AND CARRIER SENSE NODES

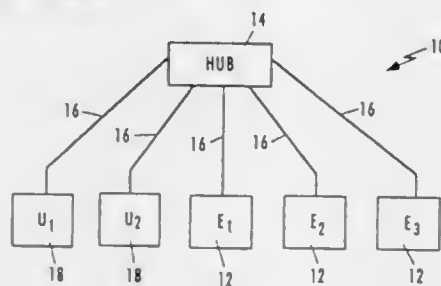
Mohan Kalkunte, Sunnyvale; Jayant Kadambi, Milpitas, and Jim Mangin, San Ramon, all of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 17, 1996, Ser. No. 713,880

Int. Cl.<sup>6</sup> G06F 3/00

U.S. Cl. 395—200.6

23 Claims



1. A method of controlling access to a network media, comprising:

determining a first number of first stations adapted to access the network media using a time slot multiple access protocol, where each first station accesses the network media only during a corresponding assigned time slot;

determining a second number of at least one second station adapted to access the network media using only a carrier sense protocol;

selecting a number of available time slots in accordance with the first and second numbers; and

assigning to each of the first stations a corresponding one of the available time slots, the at least one second station having access to the network media during an unassigned time slot.

5,774,659

Patent Not Issued For This Number

5,774,660

## WORLD-WIDE-WEB SERVER WITH DELAYED RESOURCE-BINDING FOR RESOURCE-BASED LOAD BALANCING ON A DISTRIBUTED RESOURCE MULTI-NODE NETWORK

Juergen Brendel, Redwood City; Charles J. Kring, Sunnyvale; Zaide Liu, Santa Clara, and Christopher C. Marino, Mountain View, all of Calif., assignors to Resonate, Inc., Mountain View, Calif.

Filed Aug. 5, 1996, Ser. No. 691,006

Int. Cl.<sup>6</sup> G06F 13/00; 17/30

U.S. Cl. 395—200.31

16 Claims

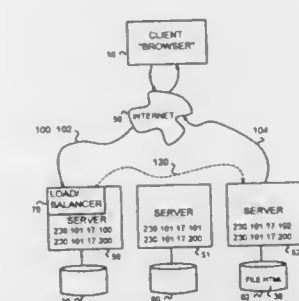
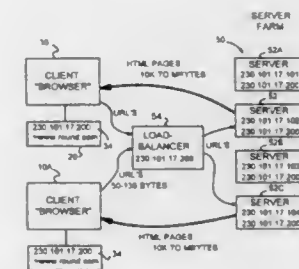
1. A web site for sending resources to a browser on a client connected to a computer network, the web site comprising:

a network connection point for receiving incoming data packets from the computer network and for transmitting outgoing data packets to the computer network;

local network, coupled to the network connection point, for transferring data packets;

a plurality of network nodes containing web servers with resources, the plurality of network nodes connected to the local network, the plurality of network nodes including means for transmitting the resources as outgoing data packets to the client, the plurality of network nodes including means for sending the outgoing data packets over the local network to the network connection point;

wherein the plurality of network nodes containing web servers together contain all resources at the web site, but each network node in the plurality of network nodes contains only a portion of all the resources at the web site;



a balancer network node containing a load balancer, receiving the incoming data packets transmitted over the local network from the network connection point, the load balancer for determining an assigned server in the plurality of network nodes for responding to a request from the client in an incoming data packet, the load balancer including means for transferring a connection to the client to the assigned server; wherein the balancer network node containing the load balancer is connected to the network connection point by the local network which is also connected to the plurality of network nodes,

wherein network nodes are segregated to contain different resources, and wherein all resources at the web site are not mirrored to all network nodes at the web site,

wherein the load balancer further comprises: content means for storing an indication of which network nodes in the plurality of network nodes contain each resource;

URL means, receiving incoming data packets from the client containing a request for a resource, for determining a requested resource from the incoming data packets;

compare means, coupled to the content means and coupled to the URL means, for comparing the requested resource to the indication of which network nodes in the plurality of network nodes contain each resource, and for outputting a list of network nodes containing the requested resource;

balancing means, receiving the list of network nodes containing the requested resource, for choosing as an assigned node one of the network nodes in the list of network nodes,

whereby the incoming data packets are routed to the balancer network node but outgoing data packets bypass the balancer network node and whereby the load balancer chooses an assigned node based on the resources contained by each network node, the load balancer performing resource-based load balancing.

5,774,661

## RULE ENGINE INTERFACE FOR A VISUAL WORKFLOW BUILDER

Surajit Chatterjee, Falls Church; Man-Hon Edwin Leong, Reston, and Scott M. Schneider, Centerville, all of Va., assignors to Network Imaging Corporation, Herndon, Va.

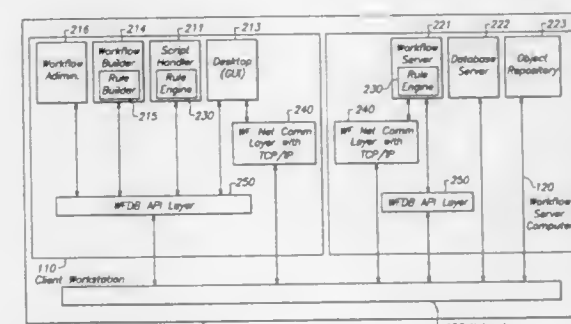
Filed Apr. 18, 1995, Ser. No. 423,972

Int. Cl.<sup>6</sup> G06F 15/16

U.S. Cl. 395—200.33

6 Claims

4. A computer-implemented method of automatically generating and controlling workflows, the workflows including a plurality of processes, the method comprising:



generating, by a workflow builder structure of a client computer, a workflow that includes steps for routing objects retrieved from an object repository; connecting said client computer to a server computer in which is disposed said object repository and a first rule engine; routing said objects by said first rule engine to said client computer; evaluating said objects by a second rule engine disposed in said client computer; and routing said objects by a script handler disposed in said client computer in response to the results of said evaluating.

5,774,662

## SYSTEM FOR SERVER OBTAINING TERMINAL ADDRESS VIA SEARCHING ADDRESS TABLE OR VIA BROADCASTING TO ALL TERMINALS THROUGH EXCHANGE IN RESPONSE TO TERMINAL ADDRESS INTERROGATION REQUEST

Kazuo Sakagawa, Kawasaki, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

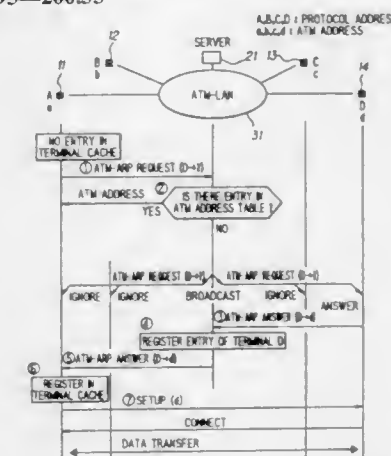
Filed May 22, 1995, Ser. No. 446,496

Claims priority, application Japan, Jul. 5, 1994, 6-153381

Int. Cl.<sup>6</sup> G06F 12/02

U.S. Cl. 395—200.33

15 Claims



1. An address management method in a communication system equipped with a plurality of terminals, a server having an address table for storing a corresponding relationship between a protocol address and terminal address of each terminal, and an exchange which accommodates each terminal and the server, said method comprising:

a first step in which an originating terminal sends a terminal address interrogation request to the server if the terminal address of another party's terminal is unknown at the time of communication;

a second step in which the server, upon receiving the terminal address interrogation request from the terminal, refers to the address table and searches for a terminal address corresponding to a protocol address contained in said interrogation request;





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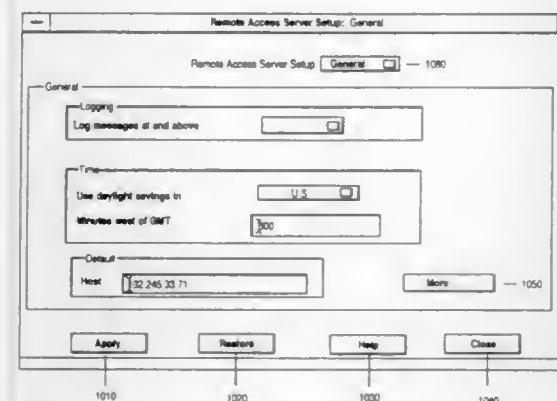
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ner or in a second manner, said first manner indicating that the parameters have identical values for all of said set of selected network devices, and said second manner indicating that the parameters are not identical in all of said set of selected network devices.

5,774,668

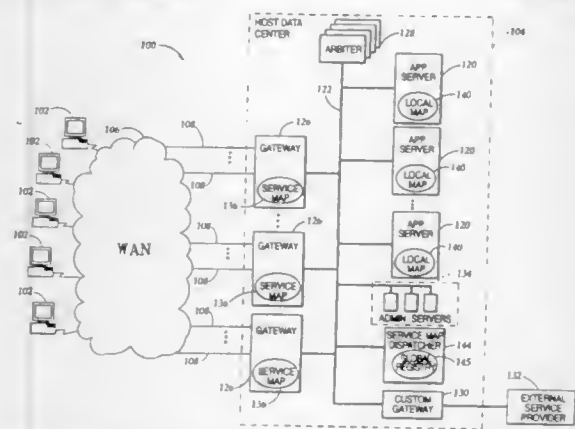
SYSTEM FOR ON-LINE SERVICE IN WHICH GATEWAY COMPUTER USES SERVICE MAP WHICH INCLUDES LOADING CONDITION OF SERVERS BROADCASTED BY APPLICATION SERVERS FOR LOAD BALANCING  
Philippe Choquier, Paris, France; Jean-Francois Peyroux, Bellevue, and William J. Griffin, Bothell, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Jun. 7, 1995, Ser. No. 472,807

Int. Cl.<sup>6</sup> G06F 13/14

U.S. Cl. 395—200.53

59 Claims



55. A method of disseminating load data of a plurality of servers to a plurality of routing computers that route client requests to the servers based on the load data received from a dispatcher entity, the servers, the routing computers and the dispatcher entity interconnected by a local area network, the method comprising the steps of:

- at each server of the plurality of servers, automatically determining a current load on the respective server, and automatically transmitting load data that reflects the current load to the dispatcher entity of the local area network; and
- at the dispatcher entity, automatically compiling the load data received from each of the plurality of servers into a map, and broadcasting the map on the local area network to allow the routing computers to obtain the load data of the plurality of servers.

5,774,669  
SCALABLE HIERARCHICAL NETWORK  
MANAGEMENT SYSTEM FOR DISPLAYING NETWORK  
INFORMATION IN THREE DIMENSIONS

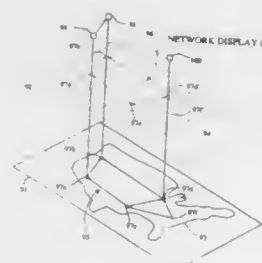
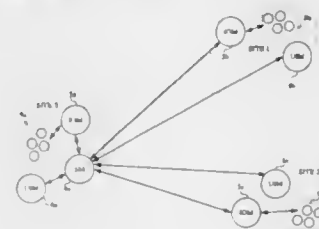
Jude George, San Jose; Leslie Schlecht, Ben Lomand; James D. McCabe, Sunnyvale, and John LeKashman, Jr., Los Gatos, all of Calif., assignors to The United States of America as represented by the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 28, 1995, Ser. No. 505,723

Int. Cl.<sup>6</sup> G06F 13/14; 13/00

U.S. Cl. 395—200.54

20 Claims



1. A network management system having multiple network sites, comprising:

- at least a single standard network management protocol agent; at least a first and a second input/output module respectively at a first and a second site which connect to said at least a single standard network management protocol agent, said standard network management protocol agent and said input/output modules being configured for standard network management protocol communications;
- a three dimensional display of network information from the first and second network sites according to an open software interconnect layer with routing direction being indicated with arrows and objects being repositioned in the views, and
- a server module connected to said at least a first and a second input/output module, said server module and said input/output modules being configured for hierarchical network management system communication, by asking a selected node for the node's routing table of adjacent nodes, and asking each of the adjacent nodes for the adjacent nodes' respective routing tables.

5,774,670  
PERSISTENT CLIENT STATE IN A HYPERTEXT  
TRANSFER PROTOCOL BASED CLIENT-SERVER  
SYSTEM

Lou Montulli, Palo Alto, Calif., assignor to Netscape Communications Corporation, Mountain View, Calif.

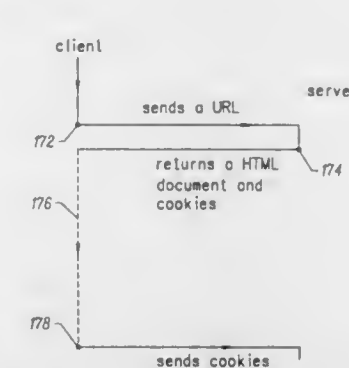
Filed Oct. 6, 1995, Ser. No. 540,342

Int. Cl.<sup>6</sup> G06F 13/38; 17/30

U.S. Cl. 395—200.57

26 Claims

1. A method of transferring state information between an http server and an http client, said method comprising the steps of: requesting a file on said http server from said http client;



transmitting said file from said http server to said http client; transmitting a state object from said http server to said http client; and storing said state object on said http client.

5,774,671  
SERVICE CHANGEABLE SYSTEM AT AN  
INFORMATION CENTER

Kazuo Satoh, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

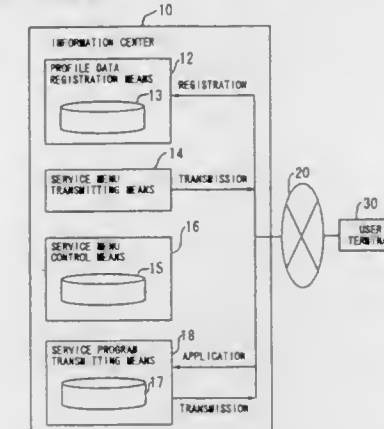
Filed Jun. 3, 1996, Ser. No. 655,680

Claims priority, application Japan, Oct. 24, 1995, 7-275507

Int. Cl.<sup>6</sup> G06F 3/14; 15/16

U.S. Cl. 395—200.61

15 Claims



1. A service changeable system for an information center, in which one of a plurality of services received from the information center through a communication line is changed to another of the plurality of services, the system comprising:

- profile data registration means, in the information center, for performing a registration processing to create profile data regarding the user upon receipt of a registration request from a user terminal, the profile data indicating a user's tastes regarding the available services;
- service menu control means for controlling service menu data regarding the different services handled by the information center;
- service menu transmitting means for retrieving the registered profile data and service menu data, creating a service menu specific to the user by selecting services that match the tastes of the user, and transmitting the created menu to the user terminal; and
- service program transmitting means for receiving a request for one of the plurality of services chosen by the user, based on the created menu, and transmitting a service program which provides the user with the chosen service.

5,774,672  
DATA TRANSMISSION SYSTEM FOR DISTRIBUTING  
VIDEO AND MUSIC DATA

Yasuhiro Funahashi; Kazunori Ikami; Osamu Nishimura; Yuji Kiyohara, all of Nagoya; Yoshihiko Hibino, Hashima-gun, and Yuichi Yasutomo, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, and Xing Inc., both of Nagoya, Japan

Continuation of Ser. No. 274,750, Jul. 14, 1994, abandoned.

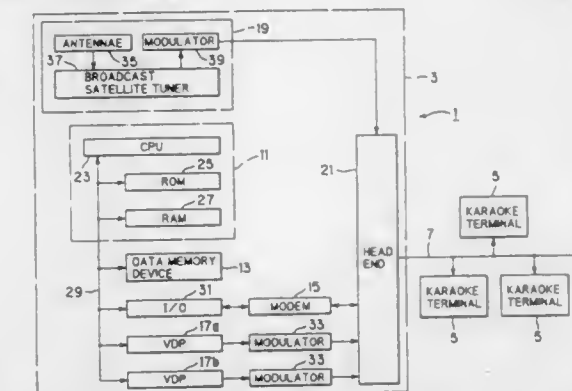
This application Apr. 30, 1997, Ser. No. 841,335

Claims priority, application Japan, Jul. 16, 1993, 5-177013

Int. Cl.<sup>6</sup> H04L 5/00

U.S. Cl. 395—200.61

19 Claims



1. A data transmission system for transmitting, to each of a plurality of terminals, information which each terminal desires to receive, the data transmission system comprising:

- a central control unit; and
- a plurality of terminals connected to said central control unit via a transmission line, wherein said central control unit includes data storing means for storing a plurality of data units and data multiplexing transmission means for serially transmitting the plurality of data units, each indicative of an individual information, over several channels via the transmission line to each of the plurality of terminals via the transmission line, the data multiplexing transmission means including modulating means for modulating each of the plurality of data units into an alternating current signal of a frequency band corresponding to one of the several channels, to thereby transmit the each data unit over the corresponding channel, and

wherein each of the plurality of terminals includes:

- selecting means for selecting a data unit, indicative of information that the each terminal desires to receive, from the plurality of data units transmitted from the central control unit, each selecting means including: channel selecting means for selecting a channel over which the data unit indicative of the desired information is transmitted;
- data selecting means for selecting one data unit indicative of the desired information out of the plurality of data units transmitted over the channel selected by the channel selecting means, the data storage means storing the selected data unit at least temporarily until the output means processes the data unit;
- judging means for determining which of the plurality of data units transmitted from the central control unit is indicative of the desired information; and
- data input means for storing, into the data storage means, one data unit determined indicative of the desired information, the data storage means temporarily storing the data unit, the output means processing the data unit stored in the data storage means to output the desired information; and
- request input means for inputting a request for receiving the data unit of the desired information, the data transmission means of the central control unit serially and repeatedly transmitting the plurality of data units regardless of whether a request is inputted by the request input means of each terminal, the judging means determining, in

accordance with the inputted request, which of the plurality of data units is the data unit of the desired information

output means for processing the data unit; selected by the selecting means and for outputting the desired information;

terminal data storage means for storing at least the data unit selected by the selecting means, the terminal data storage means storing the selected data unit at least temporarily until the output means processes the data unit; and

channel information storing means for storing channel information that indicates over which of the several channels each of the plurality of data units is transmitted, wherein the channel selecting means selects the channel over which the data unit indicative of the desired information is transmitted, in accordance with the channel information.

5,774,673

**SYSTEM FOR COMMUNICATING BETWEEN A DYNAMIC GROUP OF APPARATUSES**

Leonardus G. M. Beuk, and Anna J. P. M. Engel, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

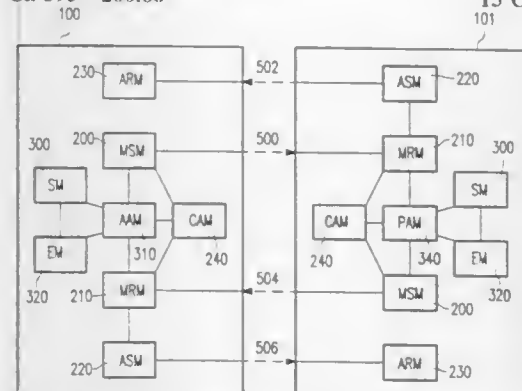
Filed Jul. 2, 1996, Ser. No. 673,882

Claims priority, application European Pat. Off., Jul. 5, 1995, 95201836

Int. Cl.<sup>6</sup> G06F 13/38; 15/16

U.S. Cl. 395—200.66

13 Claims



1. A communication system comprising:

a sending apparatus;

a receiving apparatus;

said sending apparatus comprising message sending means for transmitting a message frame;

said receiving apparatus comprising message receiving means for receiving a message frame;

said system comprising at least three apparatuses, each apparatus being a sending apparatus as well as a receiving apparatus;

said message frame comprising a message type field for distinguishing between at least a first and second type of message frame, said first type of message frame being a group frame and comprising a channel field for identifying a communication channel, and said second type of message frame being a broadcast frame;

each apparatus comprising:

storage means for storing at least one application, each application being identified by an application identification, and each application corresponding to at least one application stored in the storage means of another apparatus;

execution means for executing selected application of said at least one application;

active activation means for actively activating a selected application, said active activating comprising the steps of:

causing said message sending means to transmit a broadcast frame for requesting the activation of said selected application, said broadcast frame comprising the identification of said selected application;

determining for said selected application a corresponding communication channel, said communication channel being referred to as first communication channel; and

causing said execution means to execute said selected application, said application, while being executed by said execution means, communicating to said corresponding applications using group frames, whose channel field comprises the identification of said first communication channel; and

passive activation means for passively activating an application, said passive activating comprising the steps of:

upon said message receiving means receiving a broadcast frame which requests the activation of a local application, verifying whether the local application, which corresponds to the application identified by said broadcast frame, should be locally activated, and

if said application should be activated:

determining from the information supplied in said broadcast frame a corresponding communication channel, said communication channel being the same as said first communication channel; and

causing said execution means to execute said local application, said local application, while being executed by said execution means, communicating using group frames, whose channel field comprises the identification of said first communication channel.

5,774,674

**SYSTEM FOR NEGOTIATING AT LEAST TWO SETS OF VIDEO CAPABILITIES BETWEEN TWO NODES TO PERFORM VIDEO CONFERENCING BETWEEN THE NODES ACCORDING TO THE SELECTED SET**

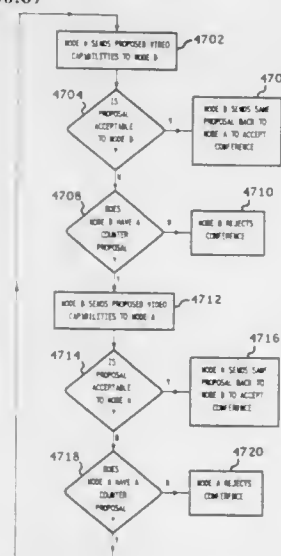
Michael Gutmann; Katherine Cox, both of Hillsboro, and Reed Sloss, Beaverton, all of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 341,402, Nov. 16, 1994, Pat. No. 5,524,110, which is a continuation-in-part of Ser. No. 340,172, Nov. 15, 1994, abandoned, which is a continuation-in-part of Ser. No. 157,694, Nov. 24, 1993, Pat. No. 5,506,954. This application Jun. 7, 1995, Ser. No. 479,294

Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395—200.67

24 Claims



1. A computer-implemented process for video conferencing, comprising the steps of:

5,774,676

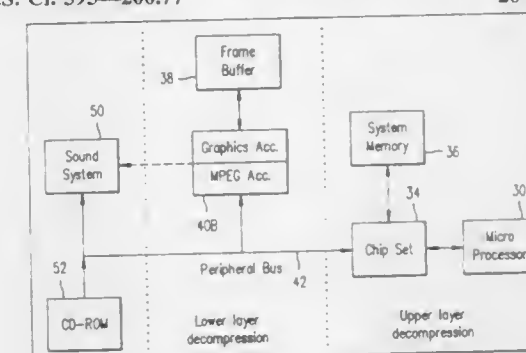
**METHOD AND APPARATUS FOR DECOMPRESSION OF MPEG COMPRESSED DATA IN A COMPUTER SYSTEM**  
Charles C. Stearns, San Jose, and Stephanie W. Ti, Milpitas, both of Calif., assignors to S3, Incorporated, Santa Clara, Calif.

Filed Oct. 3, 1995, Ser. No. 538,887

Int. Cl.<sup>6</sup> G06F 17/00

U.S. Cl. 395—200.77

26 Claims



5,774,675

**HEADER CONVERTING METHOD**

Yoshihiro Uchida, Kanagawa, Japan, assignor to Fujitsu Limited, Kanagawa, Japan

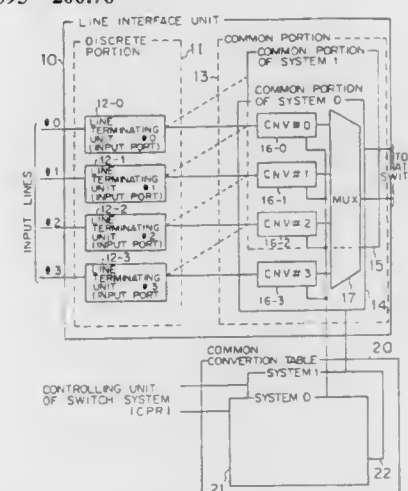
Filed May 8, 1996, Ser. No. 644,392

Claims priority, application Japan, May 8, 1995, 7-109754

Int. Cl.<sup>6</sup> G06F 13/14; 13/38; H04L 12/28

U.S. Cl. 395—200.76

25 Claims



1. A header converter, provided with a plurality of input ports receiving a fixed length packet, for converting a routing information in a header field of the fixed length packet having an information field and the header field, said header converter comprising:

a plurality of header analyzers, operatively connected to the input ports, for analyzing the header of the fixed length packet received at each of the input ports and extracting a first routing information from the header;

a conversion information store, accessed by each of said plurality of header analyzers, for collating the first routing information included in the header of the fixed length packet received at each of the input ports with a second routing information to be converted from the first routing information of the header; and

a converter, operatively connected to at least one of said plurality of header analyzers, for converting the first routing information into the second routing information from said conversion information store and providing with the second routing information to the header field of the input fixed length packet.

5,774,677

**DUAL INTERLEAVED BLOCK MOTION COMPENSATION**

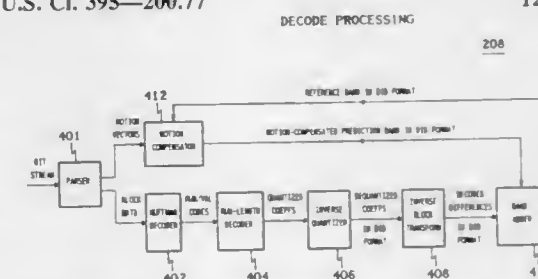
Larry Wickstrom, Portland, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Jun. 28, 1996, Ser. No. 673,344

Int. Cl.<sup>6</sup> H04N 7/12

U.S. Cl. 395—200.77

12 Claims



1. A method for processing image data, comprising the steps of:

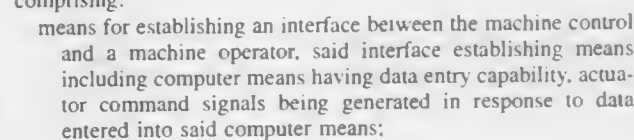
(a) providing input reference frame image data stored in an interleaved format;

(b) applying a first motion vector to the input reference frame image data in the interleaved format to generate a first block of motion-compensated prediction frame image data; and

(c) applying a second motion vector to the input reference frame image data in the interleaved format to generate a second block of motion-compensated prediction frame image data, wherein the first and second blocks are interleaved together in the interleaved format.









portable terminal means, said portable terminal means including a display and means for entering book parameter related data, said display having indicia unique to the machine elements to be adjusted; and

data link means for exchanging data between said portable terminal means and said computer means whereby repositioning of the machine elements can be accomplished by entering data into said portable terminal means and transmitting said data to said computer means via said data link means, and the actual position of a machine element can be displayed at said portable terminal means.

5,774,689

**NETWORK CONFIGURATION MANAGEMENT SYSTEM FOR DIGITAL COMMUNICATION NETWORKS**

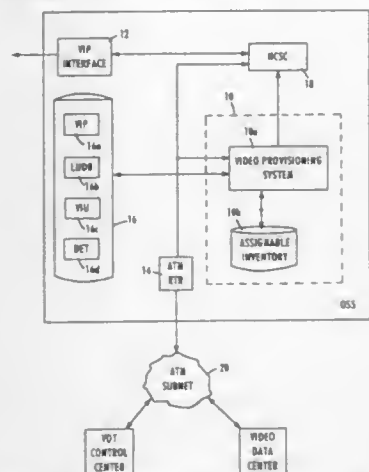
David C. Curtis; Kathleen P. Curtis, both of Chester Springs; David D. Denunzio, Glenside, all of Pa.; William P. Reed, Haddonfield, N.J., and Robert A. Wolak, Audubon, Pa., assignors to Bell Atlantic Network Services, Inc., Arlington, Va.

Filed Sep. 22, 1995, Ser. No. 532,314

Int. Cl.<sup>6</sup> G06F 15/173

U.S. Cl. 395—500

22 Claims



1. A system for establishing and maintaining an infrastructure for a digital communication system providing digital services, comprising:

- a library system identifying relationships between a first group of objects representing respective parameters of an infrastructure component, a second group of objects representing respective characteristics of an infrastructure option, and a third group of objects representing available physical connections for connecting a plurality of the infrastructure components in a specified pattern, the library system identifying at least one logical configuration for each of the infrastructure components that corresponds to one of the identified relationships that identifies the corresponding parameters with corresponding connection sequences to obtain a corresponding infrastructure option;
- a model system for creating provisioning models identifying families of said infrastructure components performing the respective infrastructure options, each of said provisioning models comprising a first and second handoff object identifying a first and second connection of the corresponding provisioning model, and a location object identifying a path of the corresponding provisioning model, said model system comprising a routing algorithm for assembling a sequence of the provisioning models to provide at least one path model supplying the corresponding infrastructure options between identified locations to provide a digital service;
- an inventory system identifying logical assignments available from the library system to provide the infrastructure options in accordance with the provisioning models and provisioned logical assignments; and

a contract system for assigning the logical assignments identified by the inventory system to said provisioned logical assignments to provide a specified infrastructure option between two specified locations.

5,774,690

**METHOD FOR OPTIMIZATION OF ELEMENT PLACEMENT IN A THINNED ARRAY**

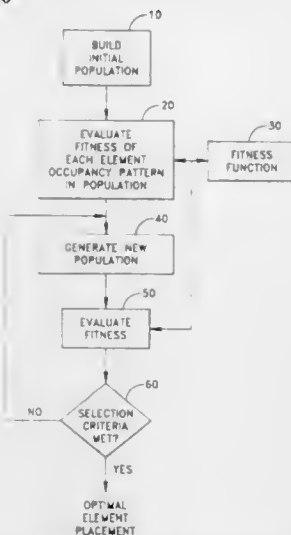
Daniel J. O'Neill, Jamestown, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 14, 1995, Ser. No. 536,310

Int. Cl.<sup>6</sup> H04B 17/00

U.S. Cl. 395—500

17 Claims



1. A method for determining placement of elements within a discrete lattice array comprising the steps of:

- building a plurality of arrays, wherein each array is defined by an element placement pattern indicating the placement and weighting of each element within the array, said plurality of arrays defining an initial population;
- determining a fitness value for each array within said plurality of arrays in the initial population using a fitness function which provides a measure of a relationship between peak sidelobe level and mainlobe width of an angular response of an array;
- generating a reproduction population by selecting arrays from the initial population with probability proportional to their fitness values;
- generating a successor population from said reproduction population, said successor population comprising a plurality of arrays wherein each array is defined by an element placement pattern indicating the placement and weighting of each element within the array;
- generating a fitness value for each array in the successor population using said fitness function; and
- repeating the steps of generating a reproduction set, generating a successor population, and generating a fitness value for each array in the successor population until the successor population meets a threshold.

5,774,691

Patent Not Issued For This Number

5,774,692

**OUTER QUANTIFIERS IN OBJECT-ORIENTED QUERIES AND VIEWS OF DATABASE SYSTEMS**

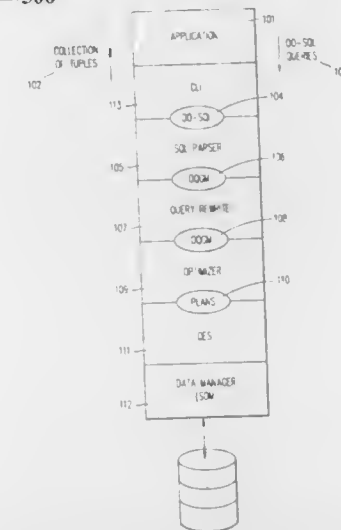
Philip L. Boyer, and Gerald G. Kiernan, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 5, 1995, Ser. No. 539,662

Int. Cl.<sup>6</sup> G06F 17/30

U.S. Cl. 395—500

18 Claims



1. A method executed in a computer in a database management system for processing a query, said method comprising:

- receiving said query having a quantifier defined over an entity, said quantifier having a special designation; and
- processing said query by returning a result set including the entity if the entity has an empty subset, as a consequence of said special designation.

5,774,693

**MULTIPROCESSOR PARALLEL COMPUTING DEVICE FOR APPLICATION TO THE EXECUTION OF A NUMERICAL SIMULATION SOFTWARE PROGRAM**

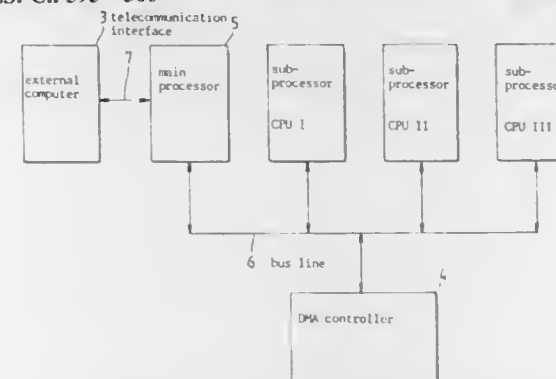
Hsin-Chih Hsu, and Kuang-Ping Ma, both of Taipei, Taiwan, assignors to Kaimei Electronic Corp., Taipei, Taiwan

Filed Feb. 28, 1996, Ser. No. 608,478

Int. Cl.<sup>6</sup> G06F 7/544

U.S. Cl. 395—500

6 Claims



1. A multiprocessor parallel computing device for application to the execution of a numerical simulation software program, comprising an external computer, a main processor, a plurality of sub-processors, and a DMA (direct memory access) controller, said external computer communicating with said main processor through a telecommunication interface, said sub processors being respectively connected to said main processor by the bus line, the

multiprocessor parallel computing device being controlled to proceed with a numerical simulation in analyzing a domain by computing the values of variables E and H of each equal cell being divided from said domain at every time point (T=0, 1, 2, 3, . . . n; n is an integer), the components of the values of the variables E and H at X-axis, Y-axis, Z-axis in a three-dimensional space being:

$$E_x^n = f(E_x^{n-1}, H_y^{n-1}, H_z^{n-1})$$

$$E_y^n = f(E_y^{n-1}, H_x^{n-1}, H_z^{n-1})$$

$$E_z^n = f(E_z^{n-1}, H_x^{n-1}, H_y^{n-1})$$

$$H_x^n = f(H_x^{n-1}, E_y^{n-1}, E_z^{n-1})$$

$$H_y^n = f(H_y^{n-1}, E_x^{n-1}, E_z^{n-1})$$

$$H_z^n = f(H_z^{n-1}, E_x^{n-1}, E_y^{n-1})$$

in which, the component of the values of the variables E or H at a particular time point T=n is affected by the same component of the precedent time point T=n-1 and the other two components of the values of the variable E or H at the precedent time point T=n-1, and the components can be represented by the following functions:

therefore, the variables of every equal cell of the domain is computed subject to the distribution of the values in said functions as:

- (1) when T=0, said main processor is controlled by said DMA controller to store the initial values  $E_x^0, E_y^0, E_z^0, H_x^0, H_y^0, H_z^0$  of the three components of the variables E and H in the memories of said sub-processors;
- (2) before the computation of the value of each component when T=1, said DMA controller proceeds with the duplication and transferring of the data contents of the memories of said sub processors through said bus line, so that the data stored in the memories of the respective sub-processors conform with the aforesaid relationship among the component functions;
- (3) when said DMA controller finishes the duplication and transferring of data, said sub-processors compute the values  $E_x^1, E_y^1, E_z^1$  of the respective components of the variable E at T=1, and then store the values thus obtained in the respective memories;
- (4) then, said DMA controller duplicates and transfers the data contents of the memories of said sub-processors through said bus line, so that the data stored in the memories of the respective sub processors conform with the aforesaid relationship among the component functions;
- (5) when said DMA controller finishes the duplication and transferring of the initial values  $E_x^0, E_y^0, E_z^0$  of every component of said variable E, said sub-processors compute the values  $H_x^1, H_y^1, H_z^1$  of the respective components of the variable H at T=1, and then store the values thus obtained in the respective memories;
- (6) then, said main processor fetches the values of  $E_x^1, E_y^1, E_z^1, H_x^1, H_y^1, H_z^1$  from said sub processors through said DMA controller, and then adjust the contents of the memories of said sub processors through said DMA controller so as to conform with the relationship among the component functions;
- (7) by means of repeating the aforesaid steps (2)–(6), the computation of every component of the variables E and G of every equal cell of the domain at every time point from T=2 to T-n is finished; by means of repeating the aforesaid steps from (1) to (7), the computation of every cell of the domain is finished.

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## METHOD AND APPARATUS FOR EMULATING STATUS FLAG

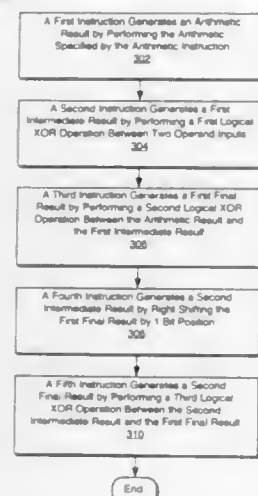
Srinivasan Murari, Fremont, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Sep. 25, 1996, Ser. No. 719,620

Int. Cl.<sup>6</sup> G06F 9/455; 9/302; 9/305

U.S. Cl. 395—500

30 Claims



1. A computer-implemented method comprising the steps of:

- decoding an arithmetic instruction executable on a first Instruction Set Architecture (ISA), the arithmetic instruction generating at least one status flag when executed on the first ISA; and
- translating the arithmetic instruction to be executable on a second ISA, wherein the arithmetic instruction is translated to perform the following steps when executed on the second ISA:
  - generating a first intermediate result by performing a first logical exclusive-or (XOR) operation between a first operand and a second operand; and
  - generating a first final result by performing a second XOR operation between the first intermediate result and an arithmetic result, the arithmetic result being generated by an arithmetic operation specified by the arithmetic instruction, said first final result having at least one bit representing a status flag of the arithmetic result.

5,774,695

## PROTOCOL INTERFACE GATEWAY AND METHOD OF CONNECTING AN EMULATOR TO A NETWORK

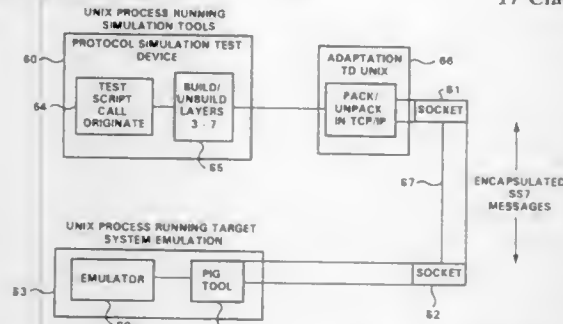
Kevin Autrey, Dallas, and Robert J. Gessel, Plano, both of Tex., assignors to Ericsson Inc., Richardson, Tex.

Filed Mar. 22, 1996, Ser. No. 620,474

Int. Cl.<sup>6</sup> H04L 1/24

U.S. Cl. 395—500

17 Claims



7. A method of connecting a telecommunication system emulator to a data network, said emulator emulating a target telecommunication node, said method comprising the steps of:

receiving data signals from said data network with a protocol interface gateway, said data signals formatted in a data network protocol;  
converting, in said protocol interface gateway, said received data signals into telecommunication signals formatted in a telecommunication network protocol;  
converting, in said protocol interface gateway, said telecommunication signals into instructions in emulator code;  
sending said instructions in emulator code from said protocol interface gateway to said emulator for processing;  
executing in said emulator, code in blocks of application software utilized in said target telecommunication node;  
receiving said processed instructions in emulator code from said emulator with said protocol interface gateway;  
converting, in said protocol interface gateway, processed instructions in emulator code into telecommunication signals in said telecommunication network protocol;  
converting, in said protocol interface gateway, said telecommunication signals into data signals formatted in said data network protocol; and  
sending said data signals in said data network protocol from said protocol interface gateway to said data network.

5,774,696

## TRIANGLE AND TETRAHEDRON MESH GENERATION METHOD

Yutaka Akiyama, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

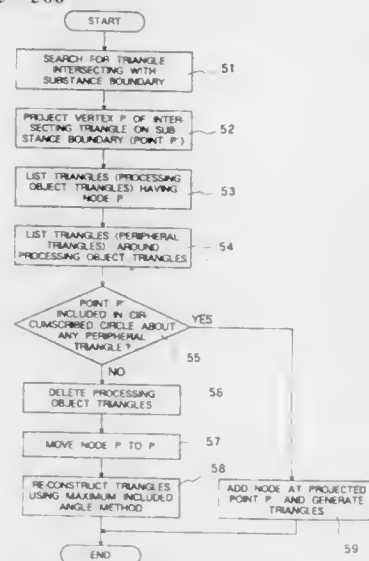
Filed May 28, 1996, Ser. No. 654,190

Claims priority, application Japan, May 29, 1995, 7-130372

Int. Cl.<sup>6</sup> G06F 17/10

U.S. Cl. 395—500

7 Claims



1. A method for analyzing a semiconductor device, the method comprising steps of:

receiving as an input a digital representation of the semiconductor device;  
generating a triangular mesh from the digital representation of the semiconductor device, the triangular mesh satisfying a condition of Delaunay partition;  
searching for triangles which are included in the triangle mesh and intersect a substance boundary, the substance boundary representing an interface between areas in the semiconductor device;

5,774,698

## MULTI-MEDIA SERIAL LINE SWITCHING ADAPTER FOR PARALLEL NETWORKS AND HETEROGENEOUS AND HOMOLOGOUS COMPUTER SYSTEM

Howard Thomas Olnowich, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 521,774, Aug. 31, 1995, abandoned,

which is a continuation of Ser. No. 178,957, Jan. 7, 1994,

abandoned, which is a division of Ser. No. 799,602, Nov. 27,

1991, abandoned, and a continuation-in-part of Ser. No.

659,199, Feb. 22, 1991, abandoned, Ser. No. 677,643, Mar. 28,

1991, Pat. No. 5,296,843, Ser. No. 748,316, Aug. 21, 1991, Pat.

No. 5,404,461, Ser. No. 748,303, Aug. 21, 1991, Pat. No.

5,365,228, Ser. No. 748,302, Aug. 21, 1991, and Ser. No.

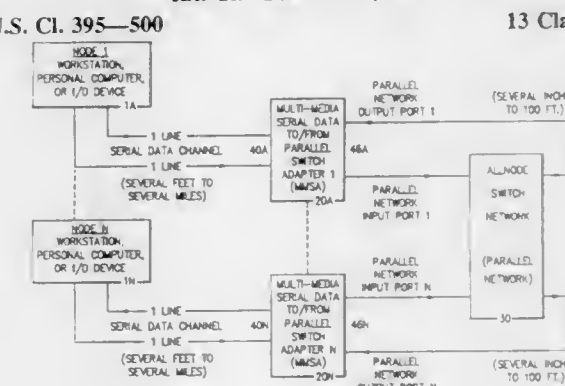
748,295, Aug. 21, 1991, Pat. No. 5,250,943. This application

Mar. 3, 1997, Ser. No. 810,270

Int. Cl.<sup>6</sup> G06F 13/00; 3/00

U.S. Cl. 395—500

13 Claims



5,774,697

DATA REALIGNMENT METHOD AND APPARATUS  
Trevor Hall, Glossop, England, assignor to International Computers Limited, London, England

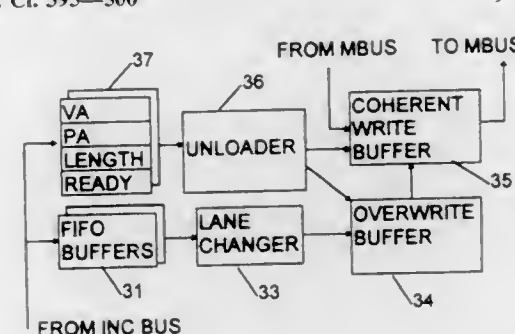
Filed Aug. 27, 1996, Ser. No. 704,393

Claims priority, application United Kingdom, Oct. 11, 1995, 9520824

Int. Cl.<sup>6</sup> G06F 9/315

U.S. Cl. 395—500

9 Claims



1. Apparatus for realigning a sequence of data bytes, the apparatus comprising:

- a FIFO buffer, having a plurality of lanes with a particular lane order, each of said lanes comprising a sequence of byte locations;
- means for writing successive groups of said data bytes in parallel into the lanes of the FIFO buffer, and for pre-skewing the bytes in each lane by a controllable number of byte locations, using a destination address value, supplied with said data, to determine said controllable number of byte locations;
- means for reading data in parallel out of the lanes of the FIFO buffer; and
- lane changing means for controllably rotating the lane order of data read from the FIFO buffer, using said destination address value to control rotation of said lane order.



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each of the adapters further including a second means for receiving said protocol of fully parallel, self-routing switch network comprised of N bit wide parallel data plus a plurality of discrete control lines, said second means for recovering the data message from the switch network, converting the data and discrete control lines to 8-to-10 bit encoding and embedding said controls with said data to couple network output port to standard serial protocol.

5,774,699

# SYSTEM CONTROLLER FOR CONTROLLING SWITCHING OPERATIONS OF VARIOUS OPERATION CLOCKS FOR CPU, DRAM, AND THE LIKE

Akihito Nagae, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

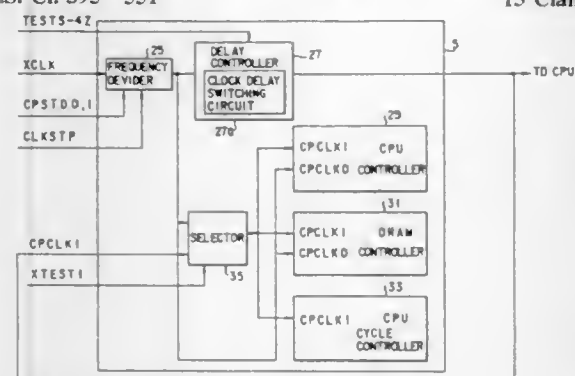
Filed Jan. 30, 1996, Ser. No. 594,336

Claims priority, application Japan, Jul. 4, 1995, 7-168837

Int. Cl.<sup>6</sup> G06F 1/04

U.S. Cl. 395—551

15 Claims



1. A computer system, comprising:
  - a central processing unit (CPU);
  - a memory circuit;
  - a system controller for controlling the CPU;
  - first clock generating means for generating a basic clock signal;
  - second clock generating means for generating a CPU clock signal and a circuit clock signal for generating a signal for each circuit within the system controller in accordance with the basic clock signal;
  - means for outputting, from the system controller to the CPU, the CPU clock signal generated by the second clock generating means;
  - means for feeding back the CPU clock signal output to the CPU to the system controller;
  - means for outputting the signal, when a signal is to be output from the system controller to the memory circuit, to the memory circuit in synchronism with the circuit clock signal for generating the signal for each said circuit within the system controller; and
  - means for operating each said circuit within the system controller, when a signal is to be output from the CPU to the system controller, by using the fed-back CPU clock signal.

5,774,700

# METHOD AND APPARATUS FOR DETERMINING THE TIMING OF SNOOP WINDOWS IN A PIPELINED BUS

Matthew A. Fisch, Beaverton, and Nitin V. Sarangdhar, Portland, both of Oreg., assignors to Intel Corporation, Santa Clara, Calif.

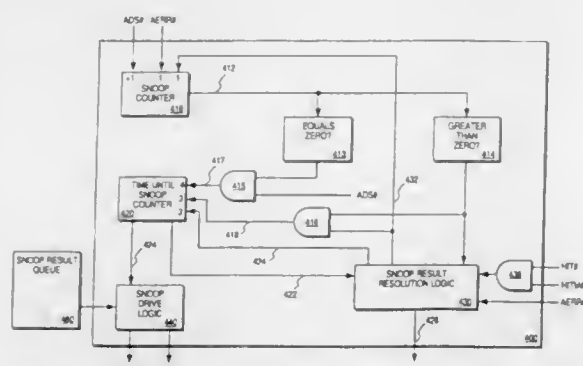
Continuation of Ser. No. 203,802, Mar. 1, 1994, Pat. No. 5,572,703. This application Apr. 20, 1995, Ser. No. 425,370

Int. Cl.<sup>6</sup> G06F 1/04

U.S. Cl. 395—555

29 Claims

1. An apparatus for determining the timing of snoop windows in a pipelined bus comprising:



- a snoop counter which indicates a number of snoop windows currently being tracked;
- a snoop timer coupled to the snoop counter which indicates a number of clock cycles until a next snoop window; and
- snoop resolution logic coupled to the snoop counter which updates the snoop counter, wherein the snoop resolution logic sets the snoop timer to a first predetermined number in response to a valid address signal issued on the pipelined bus and the number of snoop windows currently being tracked as indicated by the snoop counter is zero, to a second predetermined number in response to a valid snoop signal issued on the pipelined bus and the number of snoop windows being tracked as indicated by the snoop counter is not zero, or to a third predetermined number in response to a stall signal issued on the pipelined bus.

5,774,701

# MICROPROCESSOR OPERATING AT HIGH AND LOW CLOCK FREQUENCIES

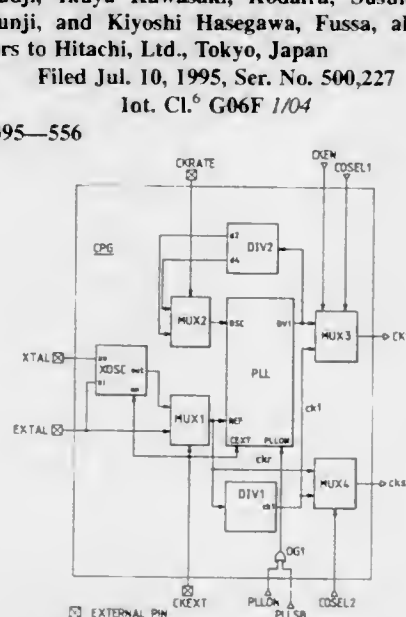
Shigezumi Matsui, Kodaira; Mitsuyoshi Yamamoto, Higashimurayama; Shinichi Yoshioka, Kodaira; Susumu Narita, Kokubunji; Ikuya Kawasaki, Kodaira; Susumu Kaneko, Kokubunji, and Kiyoshi Hasegawa, Fussa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 10, 1995, Ser. No. 500,227

Int. Cl.<sup>6</sup> G06F 1/04

U.S. Cl. 395—556

34 Claims



1. A microprocessor comprising:
  - a first internal circuit receiving a first clock signal and operating based on the first clock signal;
  - a clock generator receiving a second clock signal having a predetermined frequency and, in response to an activating signal, forming a third clock signal having a frequency higher than the predetermined frequency, the clock generator requiring a first time period from being activated to forming the third clock signal;
  - a switch circuit supplying, in response to a switching signal, the third clock signal or a fourth clock signal having a frequency

- lower than that of the third clock signal to the first internal circuit as the first clock signal; and
- a control circuit supplying the activating signal to the clock generator when the fourth clock signal is supplied to the first internal circuit as the first clock signal via the switch circuit and thereafter outputting the switching signal for switching from the fourth clock signal to the third clock signal, wherein the switch circuit stops supplying the fourth clock signal to the first internal circuit as the first clock signal for a second time period and then supplies the third clock signal to the first internal circuit as the first clock signal.

5,774,702

# INTEGRATED CIRCUIT HAVING FUNCTION BLOCKS OPERATING IN RESPONSE TO CLOCK SIGNALS

Naoki Mitsubishi, Kodaira; Kenichi Ishibashi, Higashimurayama, and Koichi Hashimura, Koganei, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

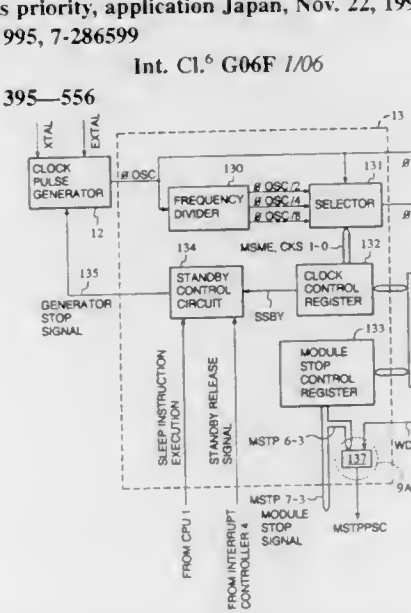
Filed Nov. 22, 1995, Ser. No. 561,728

Claims priority, application Japan, Nov. 22, 1994, 6-312430; Oct. 6, 1995, 7-286599

Int. Cl.<sup>6</sup> G06F 1/06

U.S. Cl. 395—556

29 Claims



1. A semiconductor integrated circuit comprising:
  - a first function block opening in accordance with a first supplied system clock signal;
  - a plurality of second function blocks operating in accordance with a second supplied system clock signal;
  - a clock control circuit receiving a predetermined clock signal and including a clock signal generation circuit operating with a variable frequency division ratio and generating a first system clock signal by dividing the predetermined clock signal;
  - a first clock signal line for supplying the first system clock signal as the first supplied system clock signal to the first function block; and
  - a second clock signal line for commonly supplying the second function blocks with a second system clock signal having a second frequency as the second supplied system clock signal, the second system clock signal being generated on the basis of the predetermined clock signal.

5,774,703

# DATA PROCESSING SYSTEM HAVING A REGISTER CONTROLLABLE SPEED

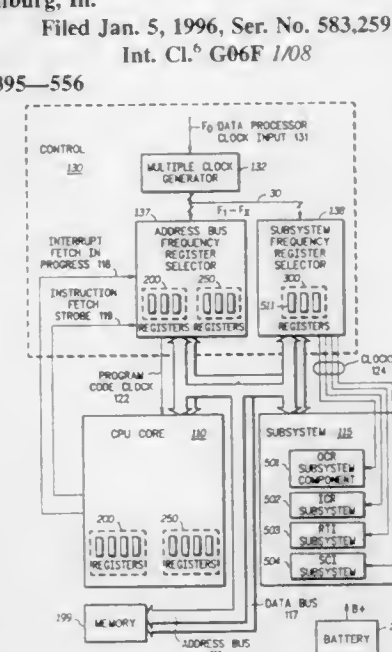
Karl Robert Weiss, Singapore, Singapore, and John Nicholas Shemelynce, Plantation, Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 5, 1996, Ser. No. 583,259

Int. Cl.<sup>6</sup> G06F 1/08

U.S. Cl. 395—556

10 Claims



1. A data processing system having register controllable processor speed, the data processing system comprising:
  - a central processor which operates at a selectable program code clock;
  - a plurality of subsystem components;
  - a plurality of subsystem clock provision conductors connected to the plurality of subsystem components for independently providing a selectable subsystem clock speed for each of the plurality of subsystem components;
  - a plurality of addressable registers for storing a plurality of optimum speed values for use as a selectable address bus clock speed and the selectable subsystem clock speed for each of the subsystem components;
  - a selector circuit for reading a first one of the plurality of addressable registers to provide the optimum speed value for use as the selectable address bus clock speed and reading a second one of the plurality of addressable registers to provide a single one of the plurality of optimum speed values for use as the selectable subsystem clock speed of a first one of the plurality of subsystem clock provision conductors for a first one of the plurality of subsystem components; and
  - a communication bus coupled to the central processor, the plurality of subsystem components, the plurality of addressable registers, and the selector circuit for communicating contents of the plurality of addressable registers for use by the selector circuit.

5,774,704

# APPARATUS AND METHOD FOR DYNAMIC PROCESSING UNIT CLOCK ADJUSTMENT

Ian Michael Williams, Sunnyvale, Calif., assignor to Silicon Graphics, Inc., Mountain View, Calif.

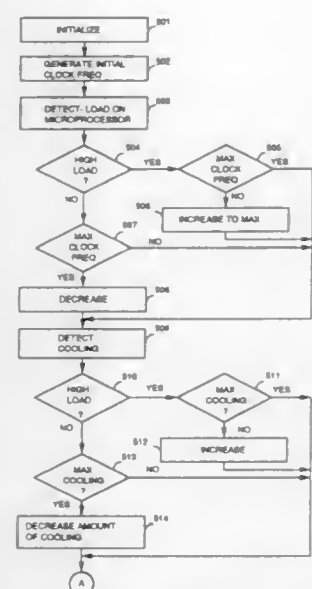
Filed Jul. 30, 1996, Ser. No. 688,501

Int. Cl.<sup>6</sup> G06F 1/08

U.S. Cl. 395—556

28 Claims

1. In a computer system having a central processing unit (cpu), a cpu clock adjustment device, comprising:
  - a clock pulse generator coupled to the cpu for generating a clock frequency, wherein the clock frequency is variable over a range;



- a controller coupled to the clock pulse generator for adjusting the clock frequency from the clock pulse generator over the range;
- an interface coupled to the controller, the interface adapted to detect a load on the cpu, the interface for communicating the load on the cpu to the controller, such that the controller adjusts the clock frequency of the clock pulse generator in response to the load on the cpu; and
- a cooling device coupled to the controller for delivering an amount of cooling to the cpu, the amount of cooling dynamically adjusted depending upon the load placed on the cpu.

5,774,705

## DUAL OSCILLATOR CLOCK PULSE GENERATOR

Eli Leshem, Brookline, Mass., assignor to EMC Corporation, Hopkinton, Mass.

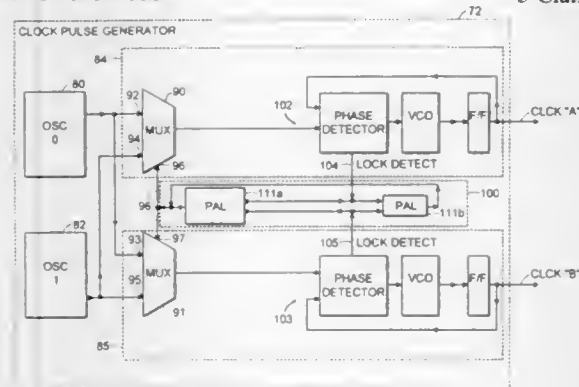
Continuation of Ser. No. 535,645, Sep. 28, 1995, abandoned.

This application Dec. 12, 1996, Ser. No. 764,129

Int. Cl.<sup>6</sup> G06F 1/10

U.S. Cl. 395—556

3 Claims



1. A system, comprising:

- (a) a pair of buses;
- (b) a resource;
- (c) a pair of logic networks,
- (i) a first one of the logic networks being responsive to first clock pulses and being adapted to enable data to be transferred between the resource and a first one of the buses;
- (ii) a second one of the logic networks being responsive to second clock pulses and being adapted to enable data to be transferred between the resource and the second one of the buses;
- (d) a clock pulse generator, comprising:
- (i) a pair of oscillators;

(ii) a network for producing the first and the second clock pulses for the pair of logic networks from one of the pair of oscillators and when such one of the pair of oscillators becomes defective, producing such first and second clock pulses for the pair of logic networks from the other one of the pair of oscillators, such network including:

- (A) a first multiplexer having: a first input fed by a first one of the oscillators; a second input fed by a second one of the oscillators; such first multiplexer feeding signals from either the first oscillator or the second oscillator to an output of the first multiplexer selectively in accordance with a control signal, such output being coupled from the network to provide the first clock pulses for the first one of the pair of logic networks;
- (B) a second multiplexer having: a first input fed by the first one of the oscillators; a second input fed by the second one of the oscillators; such second multiplexer feeding signals from either the first oscillator or the second oscillator to an output of the second multiplexer selectively in accordance with the control signal, such output being coupled from the network to provide the second clock pulses for the second one of the pair of logic networks;
- (C) a network for producing the control signal to couple the first one of the pair of oscillators to the output of the first and second multiplexers to produce the first and second clock pulses for the pair of logic networks and when such one of the first one of the pair of oscillators is defective producing the control signal to decouple the first one of the pair of oscillators from the outputs of the first and second multiplexers and couple a second one of the pair of oscillators to the outputs of the first and second multiplexers to provide the first and second clock pulses for the pair of logic networks.

5,774,706

## HIGH SPEED PCI BUS UTILIZING TTL COMPATIBLE SIGNALING

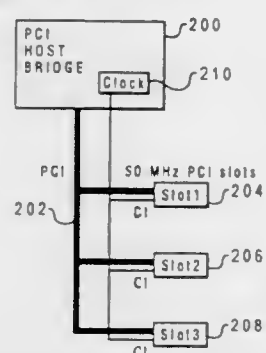
Danny M. Neal, Roundrock, Tex., and Richard A. Kelley, Apex, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 13, 1996, Ser. No. 766,914

Int. Cl.<sup>6</sup> G06F 1/08

U.S. Cl. 395—559

17 Claims



9. A data processing system bus, comprising:

- a PCI interface connecting a processor to a plurality of bus conductors;
- at least one connector for an add-in board operating in a TTL compatible signaling environment connected to said bus conductors; and
- a clock operating above 33 MHz and providing a clock signal to said bus conductors,
- wherein said clock, responsive to detection of an add-in board operating in a TTL compatible signaling environment connected to said at least one connector, provides a clock signal greater than 33 MHz to said conductors.

5,774,707

## CONTROL DEVICE AND METHOD FOR VARIABLY CONTROLLING AN OPERATION TIME OF AN OPERATION APPARATUS

Jon Kon Bae, Seoul, Rep. of Korea, assignor to LG Semicon Co., Ltd, Cheongju, Rep. of Korea

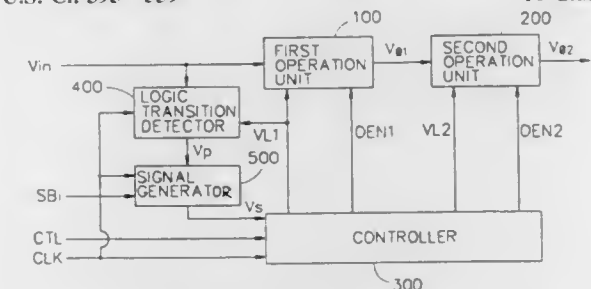
Filed Oct. 18, 1996, Ser. No. 730,900

Claims priority, application Rep. of Korea, Oct. 19, 1995, 1995-36170

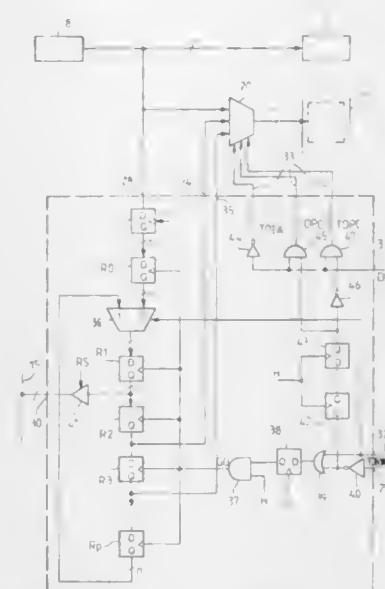
Int. Cl.<sup>6</sup> G06F 1/04

U.S. Cl. 395—559

16 Claims



1. An operation apparatus, comprising:
- operation means for logically processing an input signal in accordance with a latch signal, wherein the operation means transmits an output signal in accordance with an output enable signal;
- a controller that outputs the latch signal and the output enable signal, and wherein the controller controls an operation timing of the operation means in accordance with first and second levels of a time control signal;
- logic transition detecting means for receiving the input signal and the latch signal inputted to the operation means and detecting a number of logic transitions of the input signal in accordance with the latch signal; and
- signal generating means for outputting the time control signal having such first and second levels in accordance with a logic transition detection signal outputted from the logic transition detecting means and a transition bit selecting signal.



- decoding circuits for decoding the words by a sequencer of the central processing unit;
- execution circuits for carrying out the instruction by the central processing unit; and
- storage means arranged for storing, during the processing of each instruction, the address of a word of this instruction and may be read during the processing of this instruction;
- wherein said storage means comprises p parallel-parallel registers with n inputs and n outputs, with p as an integer, series connected so as to form a stack and connected to the address bus by means of n latch circuits and one parallel-parallel stack input register with n inputs and n outputs; and wherein at least one instruction lasts more than one cycle.

5,774,709

## ENHANCED BRANCH DELAY SLOT HANDLING WITH SINGLE EXCEPTION PROGRAM COUNTER

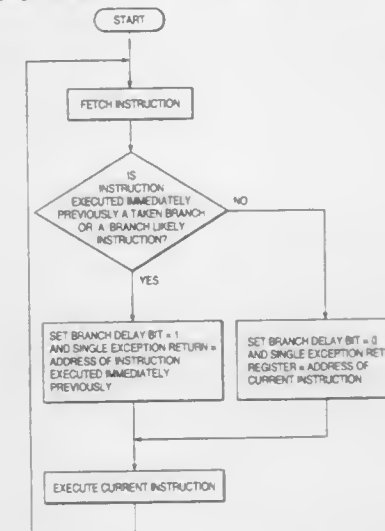
Frank Worrell, San Jose, Calif., assignor to LSI Logic Corporation, Milpitas, Calif.

Filed Dec. 6, 1995, Ser. No. 567,944

Int. Cl.<sup>6</sup> G06F 9/38

U.S. Cl. 395—580

3 Claims



1. In a microprocessor having only one exception return address register for indicating the location of an instruction to resume execution after handling an exception, and a register for holding a bit indicative of whether said exception occurred in a branch delay slot, a method of operation comprising

5,774,708

## METHOD TO TEST THE RUNNING OF A PROGRAM OF INSTRUCTIONS CARRIED OUT BY AN ASIC AND ASIC PERTAINING THERETO

Stéphan Klingler, St-Egreve, France, assignor to SGS-Thomson Microelectronics, S.A., France

Continuation of Ser. No. 443,815, May 18, 1995, abandoned.

This application Sep. 23, 1997, Ser. No. 935,522

Claims priority, application France, May 20, 1994, 94 06492

Int. Cl.<sup>6</sup> G06F 11/00; 11/22

U.S. Cl. 395—568

22 Claims

15. An applications specific integrated circuit, comprising:
- a central processing unit; and
- devices dependent on the application of the application specific circuit;
- wherein these devices include at least one program memory; wherein the program memory includes a program of instructions to be carried out, each instruction having one or more words and lasting one or more cycles, and each word being stored at an address location in the program memory;
- wherein the application specific circuit further comprises address positioning circuits for positioning, by using a program counter, the address of the word or of the successive addresses of the words of the instruction on an n-bit instruction address bus, n being an integer, connecting the central processing unit to the program memory;
- data positioning circuits for positioning, by using the program memory, after the reading of each word, this word on an instruction data bus connecting the central processing unit to the memory;





updating the mapping table such that each physical memory block associated with the compressed data is mapped to by a mapping table entry corresponding to one of the selected logical memory blocks and each of the selected logical memory blocks that is not associated with any of the physical memory blocks is mapped to a hole identifier that does not correspond to any physical memory block.

5,774,716

**COMPUTER PROGRAM PRODUCT TO ENABLE MULTIPLE COMPUTER SYSTEMS TO SHARE SINGLE SEQUENTIAL LOG**

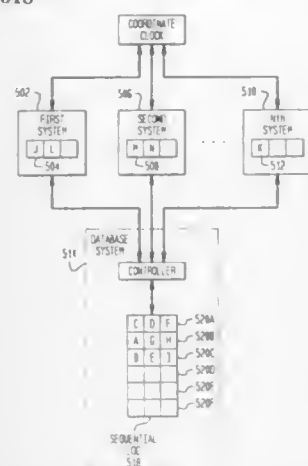
Mark Walter Harbinski, and Francis Joseph Ricchio, both of San Jose, Calif., assignors to International Business Machines Corp., Armonk, N.Y.

Division of Ser. No. 394,582, Feb. 27, 1995. This application Jun. 5, 1995, Ser. No. 462,843

Int. Cl.<sup>6</sup> G06F 17/30

U.S. Cl. 395—618

10 Claims



1. A computer program product comprising a computer readable medium having computer program logic recorded thereon for enabling a processor to share a sequential log among a plurality of computer systems including a first computer system and a second computer system, said computer program product comprising:

means for enabling said processor to receive data records from said computer systems, said data records including a first plurality of data records created by said first computer system and a second plurality of data records created by said second computer system;

means for enabling said processor to store said data records in said sequential log; and

reorganizing means for enabling said processor to periodically reorganize said data records in said sequential log such that said data records are stored in sequential physical memory locations of said sequential log by order of creation of said first plurality of data records and said second plurality of data records, irrespective of which computer system created said data records.

5,774,717

**METHOD AND ARTICLE OF MANUFACTURE FOR RESYNCHRONIZING CLIENT/SERVER FILE SYSTEMS AND RESOLVING FILE SYSTEM CONFLICTS**

Thomas Joseph Porcaro, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

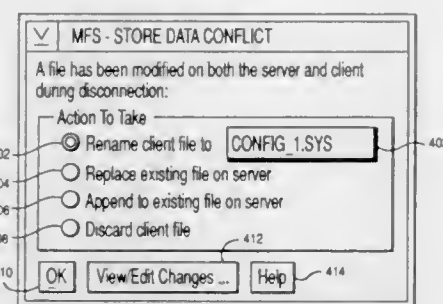
Filed Dec. 15, 1995, Ser. No. 572,926

Int. Cl.<sup>6</sup> G06F 17/30

U.S. Cl. 707—202

6 Claims

1. A method for resynchronizing a client file system with a server file system after a period of disconnection, the method comprising the steps of:



detecting a conflict between a client file system and a server file system;

testing the conflict to determine the conflict type;

presenting, for user action at the time of conflict detection a display of conflict resolution options, the display being selected in response to the conflict type;

receiving user action input selecting one or more conflict resolution options;

resolving the detected conflict in response to the conflict type and user action input; and continuing resynchronizing.

5,774,718

**PROCESS SCHEDULING SYSTEM THAT ALLOCATES CPU TIME WITH PRIORITY TO INTERACTIVE TYPE PROCESSES**

Naoto Aoshima; Haruo Kimura, and Katsuhito Minai, all of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

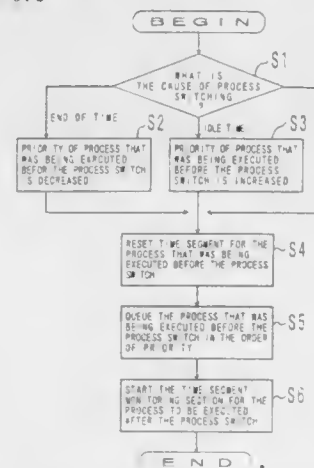
Filed Aug. 24, 1995, Ser. No. 519,087

Claims priority, application Japan, Aug. 26, 1994, 6-202421

Int. Cl.<sup>6</sup> G06F 9/00

U.S. Cl. 395—670

14 Claims



1. A computer system for processing a plurality of processes on a time-sharing basis, comprising:

means for monitoring an action status of each of said plurality of processes;

means for determining a process type by classifying each of said plurality of processes as either interactive type or non-interactive type, based on the results of monitoring by said means for monitoring the action status of each process;

means for storing the action status of each process in which the results of the monitoring of the action status of each process by said means for monitoring the action status of each process are stored; and

wherein, when said means for monitoring the action status of each process starts operation at a time of process switching, the CPU time used by the process that was being executed before said switching since the last process switching is computed, and a result of said computation is added to a value stored in a cumulative CPU time storage location, corresponding to said process within said means for storing the action

status of each process, and the result of the addition is stored in said location as a new cumulative CPU time value.

5,774,719

**METHOD FOR COMPARING DATA STRUCTURES THAT CROSS ADDRESS SPACE BOUNDARIES**

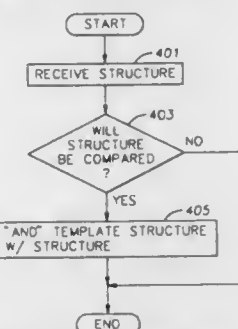
Steven J. Bowen, Littleton, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Jan. 8, 1993, Ser. No. 2,168

Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395—680

8 Claims



1. A method, executed by a first process in a first computer system, of normalizing a data structure having a first member definition structure which includes at least one member and at least one padding bit, said data structure being transmitted to the first process from a second process executing in a second computer system using a remote procedure call, comprising the steps of:

- (a) receiving, on said first computer system, the data structure;
- (b) performing, by said first process in said first computer system, a logical bitwise AND operation of the data structure with a template structure and producing a normalized data structure, said template structure having a second member definition structure equivalent to the first member definition structure and having member bits set to 1 and padding bits set to 0; and
- (c) replacing the data structure with the normalized data structure.

5,774,720

**PERSONALITY NEUTRAL GRAPHICS SUBSYSTEM**

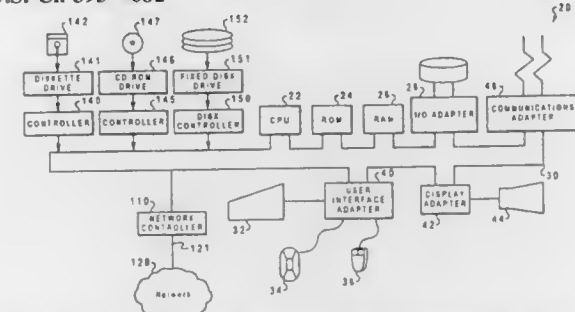
Kenneth W. Borgendale; Ian Michael Holland; Kelvin Robert Lawrence, all of Boca Raton; Colin Victor Powell, Highland Beach, all of Fla., and Richard Lee Verborg, Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 18, 1995, Ser. No. 516,578

Int. Cl.<sup>6</sup> G06F 15/163

U.S. Cl. 395—682

17 Claims



1. A computer system for executing a plurality of different application programs, each of the application programs cooperative with one of a plurality of different graphical user interfaces, the computer system comprising;

- a display;
- a central processing unit for executing at least two of the plurality of different graphical user interfaces and for provid-

ing a window on said display for each of the at least two different graphical user interfaces;

a common graphical user interface for receiving a plurality of GUI personality specific graphics application programming interface (API) calls from the application programs, wherein said plurality of GUI API calls are each associated with a different GUI, and for translating each of the received different GUI personality specific graphics API calls into translated personality neutral graphics API calls;

a graphics engine coupled to said common graphical user interface, said graphics engine responsive to said translated graphics API calls, said graphics engine for controlling the drawing into each of the windows displayed on said display regardless of the GUI personality of the window; and

a memory device for storing the application programs and said common graphical user interface.

5,774,721

**METHOD OF COMMUNICATION BETWEEN PROCESSORS IN A DISTRIBUTED PROCESSING SYSTEM HAVING A HOST PROCESSOR AND AT LEAST ONE OBJECT ORIENTED PROCESSOR**

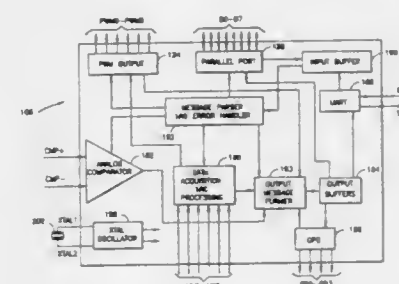
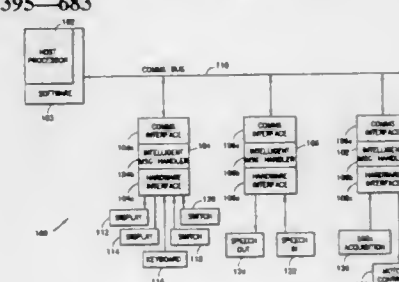
Jeffrey I. Robinson, New Fairfield, Conn., assignor to IQ Systems, Inc., Newtown, Conn.

Filed Sep. 8, 1995, Ser. No. 525,475

Int. Cl.<sup>6</sup> G06F 15/163

U.S. Cl. 395—683

13 Claims



1. A method for distributing processing tasks between a host processor and a first object oriented processor having a first task-specific functionality, said method comprising:

- a) providing a high level command language, said high level command language including a first subset of commands for use by the host processor to call on the first task-specific functionality of the first object oriented processor;
- b) programming the host processor to call on the first object oriented processor using messages composed from said first subset of commands to access the first task-specific functionality of the first object oriented processor; and
- c) programming the first object oriented processor to return results of the first task-specific functionality to the host processor using messages composed from said high level command language.

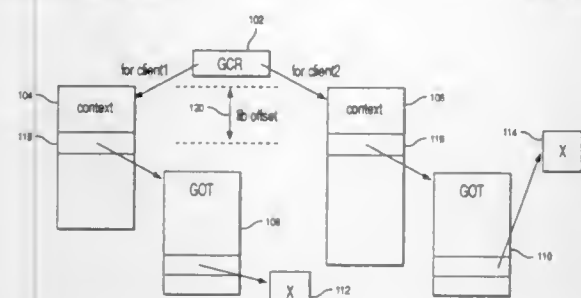


5,774,722  
METHOD FOR EFFICIENT EXTERNAL REFERENCE  
RESOLUTION IN DYNAMICALLY LINKED SHARED  
CODE LIBRARIES IN SINGLE ADDRESS SPACE  
OPERATING SYSTEMS

Ahmed Mohammed Gheith, Round Rock, Tex., assignor to  
International Business Machines Corporation, Armonk, N.Y.  
Filed Dec. 14, 1995, Ser. No. 572,470  
Int. Cl.<sup>6</sup> G06F 9/42

U.S. Cl. 395—685

8 Claims



1. A computer implemented method for determining a memory address of a library element in one of a plurality of shared libraries external to a client program executing in one of a plurality of processes, wherein each process references a plurality of shared libraries and said plurality of processes are executing in an operating system that manages memory as a single address space memory, the method comprising the steps of:

building at process load time a separate global offset table context area at an address for each said process as it is being loaded for execution;

storing the address of said global offset table context area at a first storage location;

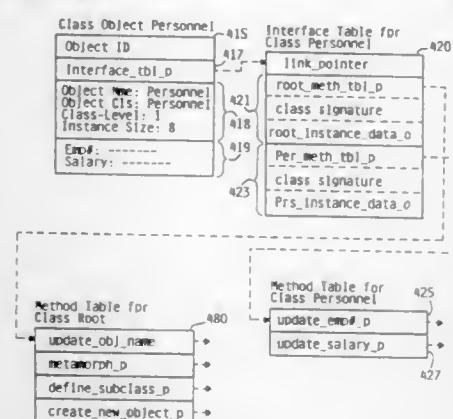
for each process, assigning a client global offset table area at a storage address for each of said plurality of shared libraries containing a library element referenced by said process and storing the client global offset table area storage address at a library offset in said global offset table context area, said library offset remain constant for all processes.

5,774,723  
EFFICIENT METHOD ROUTER THAT SUPPORTS  
MULTIPLE SIMULTANEOUS OBJECT VERSIONS

John Clarence Endicott; Steven Jay Munroe, both of Rochester, and Robert Peter Resch, Byron, all of Minn., assignors to  
International Business Machines Corporation, Armonk, N.Y.  
Division of Ser. No. 954,138, Sep. 30, 1992, Pat. No. 5,404,525.  
This application Apr. 3, 1995, Ser. No. 416,404  
Int. Cl.<sup>6</sup> G06F 7/44

U.S. Cl. 395—702

14 Claims



1. A program product comprising:  
recordable media, said recordable media having  
an object instance;

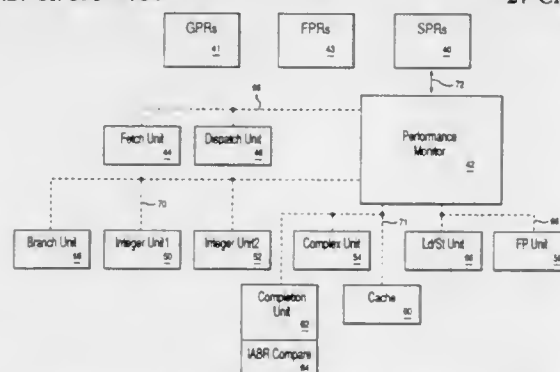
first and second method tables, said first and said second method tables each containing location information about method programs; and  
an interface table, said interface table containing location information about said first method table and said second method table, said interface table being connected to said object instance via connection information contained in said object instance;  
recorded thereon.

5,774,724  
SYSTEM AND METHOD FOR ACQUIRING HIGH  
GRANULARITY PERFORMANCE DATA IN A  
COMPUTER SYSTEM

Randall Ray Heisch, Georgetown, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.  
Filed Nov. 20, 1995, Ser. No. 560,878  
Int. Cl.<sup>6</sup> G06F 11/30

U.S. Cl. 395—704

27 Claims



1. A method for acquiring fine granularity hardware performance monitor data for a microprocessor architecture design associated with a computer program operating in a computer system, comprising:

preselecting start and stop hardware address breakpoints bounding a portion of said computer program for which said performance monitor data is desired;

executing said computer program;

hardware performance monitoring for occurrence of said start and stop address breakpoints during said execution; and

activating and deactivating said hardware performance monitoring to acquire said hardware performance monitor data at a subprocess level.

5,774,725  
METHOD AND COMPUTER PROGRAM PRODUCT FOR  
SIMPLIFYING CONSTRUCTION OF A PROGRAM FOR  
TESTING COMPUTER SOFTWARE SUBROUTINES IN  
AN APPLICATION PROGRAMMING INTERFACE

Hanamant K. Yadav, Bellevue, and Walter I. Wittel, Jr., Redmond, both of Wash., assignors to Microsoft Corporation, Redmond, Wash.

Filed Jun. 28, 1996, Ser. No. 672,647

Int. Cl.<sup>6</sup> G06F 9/45

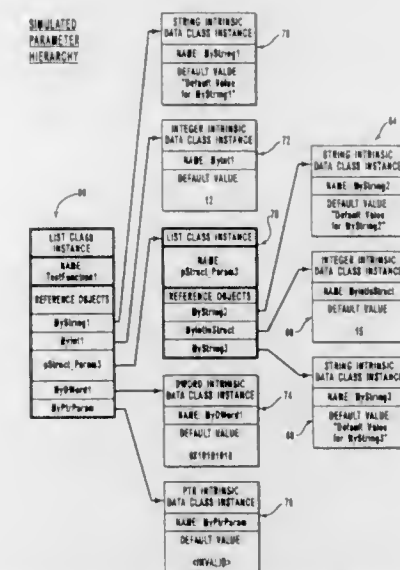
U.S. Cl. 395—704

18 Claims

1. A computer program product for testing at least one subroutine having a parameter hierarchy of base parameters and grouped parameter structures, the computer program product comprising:

a computer usable medium having computer readable program code means embodied in said medium for testing the subroutine, said computer readable program code means comprising:

means for creating an intrinsic data element object for each base parameter in the subroutine parameter hierarchy according to base parameter type, each typed intrinsic data element object comprising:



means for storing the base parameter value for each base parameter of the corresponding type; and  
means for creating a common user interface for receiving the values for the base parameters of the corresponding types;

means for creating a list data element object for the root-level parameters of the subroutine and each grouped parameter structure found in the subroutine parameter hierarchy, each list data element object comprising:

means for storing references to data element objects; and  
means for creating a common user interface for listing and selecting a particular data element object contained within a list data element object; and

means for creating interconnections between the intrinsic data element objects and the list data element objects so that the parameter hierarchy of the subroutine can be simulated.

5,774,726  
SYSTEM FOR CONTROLLED GENERATION OF  
ASSEMBLY LANGUAGE INSTRUCTIONS USING  
ASSEMBLY LANGUAGE DATA TYPES INCLUDING  
INSTRUCTION TYPES IN A COMPUTER LANGUAGE AS  
INPUT TO COMPILER

Sultan Ahmed, Santa Clara, Calif., assignor to Sun Microsystems, Inc., Palo Alto, Calif.

Filed Apr. 24, 1995, Ser. No. 427,444

Int. Cl.<sup>6</sup> G06F 7/00; 9/44

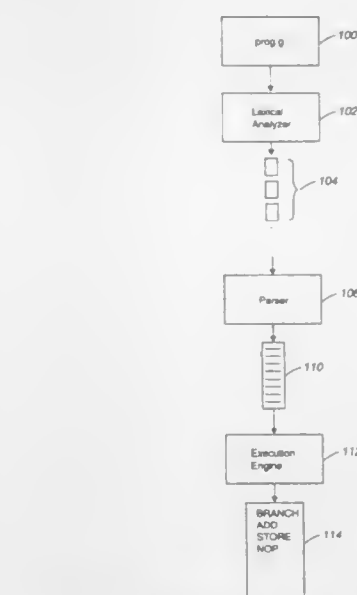
U.S. Cl. 395—705

21 Claims

1. A method, implemented on a digital computer, for controlling the generation of a sequence of assembly language instructions, the method comprising the following steps:

providing a program containing code for generating said sequence of assembly language instructions, said program being written in a language which allows declaration of variables in data types which specify assembly language syntax elements; and

compiling said program to produce said sequence of assembly language instructions, wherein said compiler is arranged to recognize the data types which specify assembly language syntax elements, wherein said data types include an instruction data type which specifies a corresponding assembly language instruction, wherein compiling said program directly



outputs said instruction data type as said corresponding assembly language instruction.

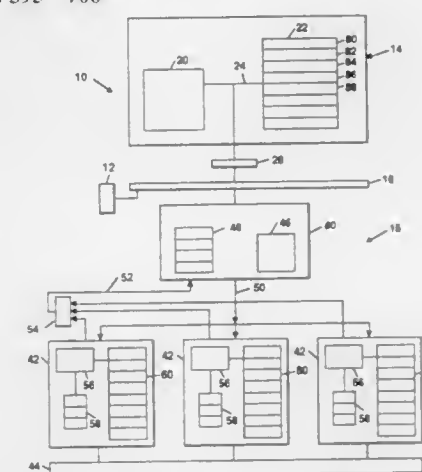
5,774,727  
PARALLEL PROCESSING SYSTEM FOR VIRTUAL  
PROCESSOR IMPLEMENTATION OF MACHINE-  
LANGUAGE INSTRUCTIONS

Robert J. Walsh, Hopkinton, and Bradley Miller, Westboro, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Continuation of Ser. No. 396,355, Feb. 28, 1995, abandoned, which is a continuation of Ser. No. 288,646, Aug. 10, 1994, which is a continuation of Ser. No. 722,072, Jun. 27, 1991, abandoned. This application Dec. 27, 1995, Ser. No. 579,457  
Int. Cl.<sup>6</sup> G06F 9/44; 9/45

U.S. Cl. 395—706

6 Claims



1. In a computer system that includes a plurality of physical processors and a control unit for supplying the physical processors with nanoinstructions for data processing operations on arrays of data, each of said arrays including a plurality of cells, and virtual processors being established within the physical processors for each cell of the array exceeding an amount of said physical processors, a parallel processing system comprising:

means for specifying at least one program statement as forming a group of said data processing operations, wherein said group of said data processing operations do not employ dependency-introduced temporary variables;

means for converting said program statement to a group of machine-language instructions;

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means for specifying the data upon which said group of machine-language instructions are performed; and means for performing iterative cycles through all virtual processors on each physical processor and, during each iteration executing the group of said machine-language instructions one after another without dependency-introduced temporary result storage during the iteration.

5,774,728  
METHOD AND SYSTEM FOR COMPILING SECTIONS  
OF A COMPUTER PROGRAM FOR MULTIPLE  
EXECUTION ENVIRONMENTS

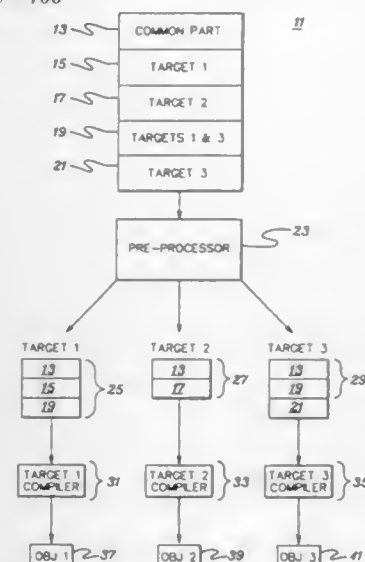
Franklin Charles Breslau, Teaneck, N.J.; Paul Gregory Greenstein, Croton-On-Hudson, and John Ted Rodell, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1995, Ser. No. 579,459

Int. Cl.<sup>6</sup> G06F 9/45

U.S. Cl. 395—706

42 Claims



1. A method of compiling a source code version ("source code") of a computer program in a computer system comprising:

- providing to said computer system, said source code, said source code comprising a plurality of sections, a first section and a second section of said plurality of sections each being delimited by a section identifier corresponding to said section, said section identifier indicating an execution environment of its corresponding section; and
- automatically compiling said first section and said second section for their corresponding execution environments using their section identifiers, regardless of whether the execution environments are the same or different.

5,774,729  
EVENT HANDLING IN A HIGH LEVEL PROGRAMMING  
LANGUAGE ENVIRONMENT

William Peter Carney, San Jose; Laurence Edward England, Morgan Hill; Gary John Hochmuth; Brian Owings, both of San Jose; Eric Lynn Porter, Fremont; Alfred William Shannon, Morgan Hill, and Robert Aaron Wilson, San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

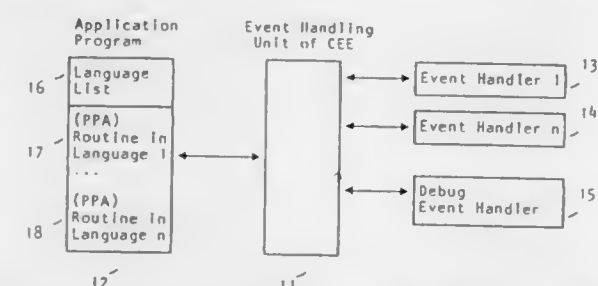
Continuation of Ser. No. 810,619, Dec. 19, 1991, abandoned.  
This application Nov. 29, 1993, Ser. No. 159,063

Int. Cl.<sup>6</sup> G06F 7/20

U.S. Cl. 395—707

17 Claims

1. A computer implemented method for managing event handling for processing events in a computer system, the events having associated parameters and occurring during the execution



of a program, the program including routines prepared in a plurality of computer programming languages, the computer system having a common execution environment including an event handling unit and an Event Handler Interface Unit, comprising the steps of:

- determining, in a language list processor portion of the event handling unit, which of a plurality of computer programming languages are used in the program from high level language member identifiers for the program;
- initializing, in an event handler initializer portion of the event handling unit, based on the step of determining, a plurality of event handling means (event handlers) such that an event handler compatible with each computer programming language used in the program is initialized;
- detecting, in an event detector portion of the event handling unit, an occurrence of a selected event during execution of the program;
- determining, in the event handler interface unit, the computer programming language used in a currently executing routine and the associated parameters for the selected event;
- invoking, using the event handler interface unit, the initialized event handler compatible with the computer programming language used in the currently executing routine and passing an identifying event code and the associated parameters to said initialized event handler to cause the event to be handled, wherein the common execution environment is a single-run time environment; and
- repeating steps (c)-(e) each time a selected event occurs.

5,774,730  
METHOD AND APPARATUS FOR IMPROVING  
COLORABILITY OF CONSTRAINED NODES IN AN  
INTERFERENCE GRAPH WITHIN A COMPUTER  
SYSTEM

Nava Arela Aizikowitz; Liviu Asnash, both of Haifa; Roy Bar-Haim, Neve Monosson; Orit Edelstein; Mircea Namolaru, both of Haifa, all of Israel; Edward Curtis Prosser, Rochester, Minn.; Robert Ralph Roediger, Rochester, Minn., and William Jon Schmidt, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 31, 1995, Ser. No. 509,637

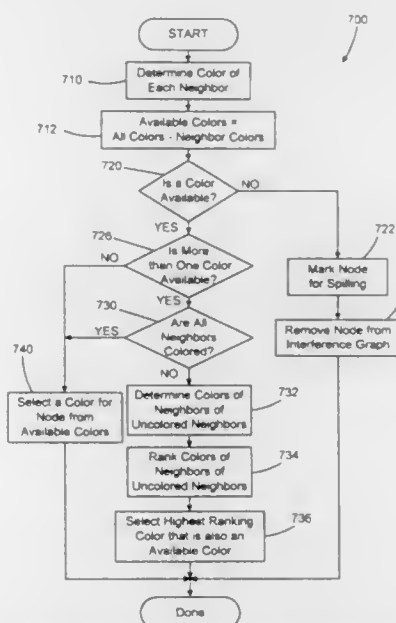
Int. Cl.<sup>6</sup> G06F 9/45

U.S. Cl. 395—709

16 Claims

1. A computer apparatus comprising:

- a central processing unit having a plurality of registers, the central processing unit executing a first instruction stream and in response to the first instruction stream, the central processing unit operates on information stored in the plurality of registers;
- a compiler for generating the first instruction stream from a second instruction stream, the second instruction stream having a plurality of variables, the compiler including:
  - a live range calculator for determining a plurality of live ranges for the plurality of variables;
  - a register allocator for assigning the plurality of registers within the central processing unit to the plurality of live ranges by building an interference graph with a plurality of nodes and a plurality of edges, each node of the interference graph representing one of the plurality of live ranges, two of the plurality of nodes being neighbors if the two nodes are connected with an edge, the interference graph



requiring that neighbors be colored with different colors and by selecting a color for each node in the interference graph according to the colors, if any, assigned to one of the plurality of nodes which are neighbors to uncolored neighbors of the node to be colored.

5,774,731  
EXCLUSIVE CONTROL METHOD WITH EACH NODE  
CONTROLLING ISSUE OF AN EXCLUSIVE USE  
REQUEST TO A SHARED RESOURCE, A COMPUTER  
SYSTEM THEREFOR AND A COMPUTER SYSTEM  
WITH A CIRCUIT FOR DETECTING WRITING OF AN  
EVENT FLAG INTO A SHARED MAIN STORAGE

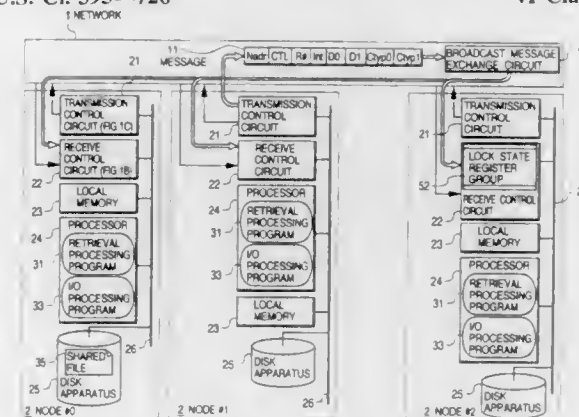
Tatsuo Higuchi, Tokyo; Toshiaki Tarui, Sagami-hara; Katsuyoshi Kitai, Tokyo; Shigeo Takeuchi, Hanno; Tatsuru Toba, Tokyo; Machiko Asaie, Koshigaya, and Yasuhiro Inagami, Tokyo, all of Japan, assignors to Hitachi, Ltd., and Hitachi ULSI Engineering Co., Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 408,561, Mar. 22, 1995. This application Jul. 5, 1996, Ser. No. 676,053

Int. Cl.<sup>6</sup> G06F 13/14

U.S. Cl. 395—726

41 Claims



1. In a computer system including a plurality of nodes each having at least one processor, at least one resource usable by said plurality of nodes, and an arbitration circuit for selecting one of a plurality of exclusive use requests issued by said plurality of nodes for said resource, an exclusive control method comprising the steps of:

storing use status information indicating exclusive use status of said resource in each node;  
judging by one of said plurality of nodes which is to issue an exclusive use request to said resource, whether said resource is in exclusive use status on the basis of the use status information of said resource stored in said one node;  
inhibiting issue of said exclusive use request from said one node, if said resource is judged to be in an exclusive use status;  
issuing said exclusive use request from said one node, if said resource is judged not to be in an exclusive use status;  
transmitting a plurality of exclusive use requests each issued by one of plural nodes, to said arbitration circuit over said network;  
selecting one of said transmitted plurality of exclusive use requests by said arbitration circuit; and  
updating said use status information stored in each node, in response to selection of said one exclusive use request by said arbitration circuit, so as to indicate that said resource is now being in an exclusive use status.

5,774,732  
DEVICE FOR MANAGING CYCLIC POLLINGS FOR  
THE SUPERVISION OF COMPUTER RESOURCES IN A  
NETWORK AND A PROCESS IMPLEMENTED BY SUCH  
A DEVICE

Raphaël Doumard, Les Clayes sous Bois, France, assignor to Bull S.A., Louveciennes, France

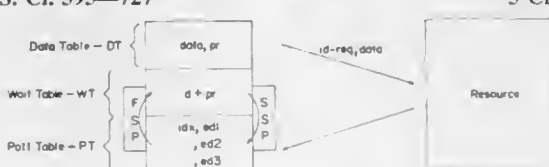
Filed Mar. 27, 1996, Ser. No. 622,304

Claims priority, application France, Apr. 6, 1995, 95 04093

Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395—727

5 Claims



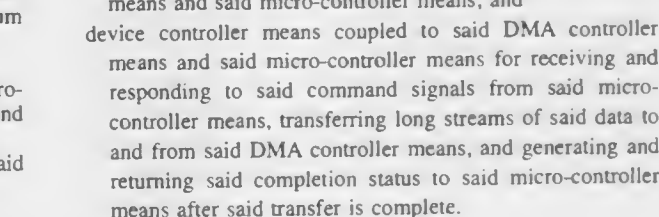
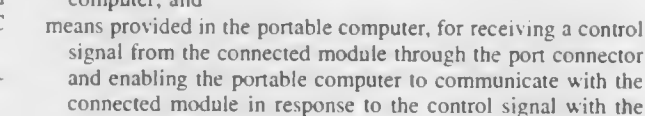
1. A device for managing cyclic pollings for the supervision of computer resources in a network, wherein, in order to execute requests for requesting information from the computer resources in the network, the device uses a single operation and a single clock, so that each request is emitted with a proper frequency, said device including a first data table (DT), said data table being indexed and containing data for each request to be emitted having an index (idx) and a theoretical emission period (pr), a second cyclic poll table (PT) containing indexes (idx) of the requests and emission dates, which cyclic poll table (PT) is sorted in ascending order by the emission dates, wherein a first line of said cyclic poll table (PT) contains a nearest emission date, and a third wait table (WT) indexed by the indexes (idx) of emitted requests waiting for responses and which contains the dates (d+pr) of a next emissions, said device further including means for implementing a process for managing cyclic pollings and executing, in parallel, a first subprocess triggered as soon as a cyclic polling is placed in the cyclic poll table (PT) by a second subprocess, which first subprocess FSP empties the cyclic poll table (PT), fills the wait table (WT) and stops when the cyclic poll table (PT) is empty, while the second subprocess SSP, triggered as soon as a response to the request in progress is received, fills the cyclic poll table (PT), empties the wait table (WT) and stops when there is no further request waiting for a response.



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providing each of said plurality of sibling state machines with respective task specific inputs at a task specific input set;

# UMI





5,774,744

**SYSTEM USING DMA AND DESCRIPTOR FOR IMPLEMENTING PERIPHERAL DEVICE BUS MASTERING VIA A UNIVERSAL SERIAL BUS CONTROLLER OR AN INFRARED DATA ASSOCIATION CONTROLLER**

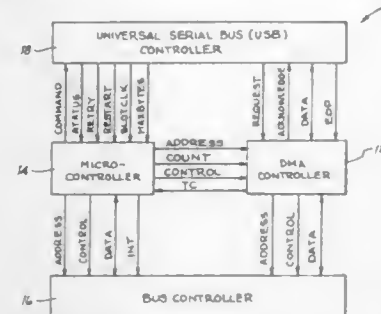
Franklyn H. Story, Chandler; David R. Evoy, Tempe; Peter Chambers, Scottsdale, and Lonnie Goff, Tempe, all of Ariz., assignors to VLSI Technology, Inc., San Jose, Calif.

Filed Apr. 8, 1996, Ser. No. 627,986

Int. Cl.<sup>6</sup> G06F 13/00

U.S. Cl. 395—847

20 Claims



1. A system for implementing peripheral device bus mastering in a mobile computer system comprising, in combination:

mobile computer system comprising:

Direct Memory Access (DMA) controller means for transferring data to and from memory of said mobile computer system;

micro-controller means coupled to said DMA controller means for programming said DMA controller means, generating and sending command signals, and receiving completion status after transfer of data is complete;

descriptor means created in said memory of said mobile computer system for describing each data transfer that said micro-controller means initiates, controls, and completes; bus controller means coupled to said DMA controller means and said micro-controller means for implementing a memory data transfer request from said DMA controller means and said micro-controller means; and

Universal Serial Bus (USB) controller means coupled to said DMA controller means and said micro-controller means for receiving and responding to said command signals from said micro-controller means, transferring said data to and from said DMA controller means, and generating and returning said completion status to said micro-controller means after said transfer of data is complete, said USB controller means further being coupled to peripheral devices wherein said USB controller means interfaces with said peripheral devices over a serial bus.

5,774,745

**METHOD AND APPARATUS FOR WRITING AND READING ENTRIES IN AN EVENT STATUS QUEUE OF A HOST MEMORY**

Peter Ecclesine, Livermore, Calif., assignor to Cirrus Logic, Inc., Fremont, Calif.

Filed Mar. 31, 1995, Ser. No. 414,467

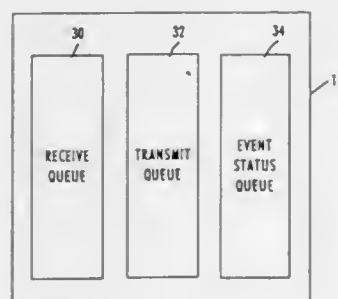
Int. Cl.<sup>6</sup> G06F 3/00

U.S. Cl. 395—872

18 Claims

1. A method of writing and reading entries of events occurring in a computer system in an event status queue divided into blocks, the method comprising the steps of:

identifying a block of the event status queue as a termination block;



writing a first set of event entries in a first direction in the event status queue in blocks starting from a block that is adjacent to the termination block;

reading the first set of event entries in the blocks of the event status queue in a second direction opposite to the first direction beginning with a previous location at which a termination block was written; and

terminating the reading of the event entries when the termination block is reached.

5,774,746

**CAMERA WITH LEARNING FUNCTION**

Tadayuki Kirigaya; Hideaki Tsuji; Isamu Hirai; Yasuyuki Haneishi; Masato Yamamoto; Masaaki Haga, all of Tokyo; Masashi Furuno, Oonojyou; Akio Takahashi, and Koji Sato, both of Tokyo, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

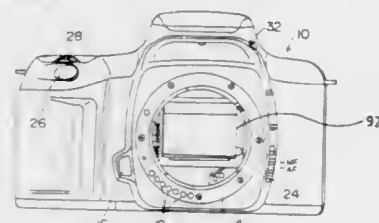
Continuation of Ser. No. 489,259, Jul. 10, 1995, abandoned, which is a continuation of Ser. No. 114,441, Aug. 31, 1993, abandoned. This application Mar. 31, 1997, Ser. No. 828,512

Claims priority, application Japan, Oct. 20, 1992, 4-78949; Oct. 20, 1992, 4-78956; Oct. 20, 1992, 7-282080; Oct. 20, 1992, 4-282081; Oct. 20, 1992, 4-282082; Oct. 20, 1992, 4-282083; Oct. 20, 1992, 4-282085; Oct. 20, 1992, 4-282086; Oct. 21, 1992, 4-73361; Oct. 21, 1992, 4-73362; Oct. 21, 1992, 4-282589

Int. Cl.<sup>6</sup> G03B 17/00

U.S. Cl. 396—49

99 Claims



1. A camera with a program controlled exposure mode in which exposure parameters are set for each exposure value according to a reference program characteristic, the camera comprising:

setting means for temporarily changing said exposure parameters corresponding to a constant exposure value, said exposure parameters being changed by an amount with respect to values predetermined by the reference program characteristic; and

control means for modifying said reference program characteristic, based upon the temporarily changed exposure parameters, when a predetermined plurality of exposure operations, changed in a same direction, have been executed in accordance with the temporarily changed exposure parameters.

5,774,747

**METHOD AND APPARATUS FOR CONTROLLING EXPOSURE OF CAMERA**

Fumio Ishihara; Mutsumi Naruse, both of Saitama; Takanori Kohno, Tokyo; Tetsuo Sakamoto, Tokyo; Kouichi Kobayashi, Tokyo; Teruyuki Tongu, Tokyo; Norifumi Nakagawa, Tokyo, and Tomio Kurosu, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Division of Ser. No. 487,846, Jun. 7, 1995, Pat. No. 5,678,098.

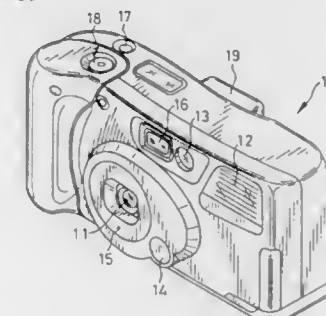
This application Apr. 4, 1997, Ser. No. 833,004

Claims priority, application Japan, Jun. 9, 1994, 6-127419; Jun. 9, 1994, 6-127876; Jun. 10, 1994, 6-129344; Jun. 10, 1994, 6-129345; Jun. 10, 1994, 6-129346

Int. Cl.<sup>6</sup> G03B 15/05

U.S. Cl. 396—61

6 Claims



1. An exposure control method for a camera using a central photometric element for detecting a central light value from a central area of a scene to be photographed and a peripheral photometric element for detecting a peripheral light value from a peripheral area of said scene, said method comprising the steps of:

- judging depending on a difference between said central and peripheral light values whether said scene is back-lighted or front-lighted;
- calculating a central exposure value proper for said central area of said scene from said central and peripheral light values using a first equation and a first coefficient;
- calculating a peripheral exposure value proper for an entire area of said scene from said central and peripheral light values using a second equation and a second coefficient;
- selecting values of said first and second coefficients depending on a result of judging step A, among from values predetermined for front-lighted scenes and values predetermined for back-lighted scenes;
- determining an effective exposure value based on said peripheral exposure value and a bias value added to said peripheral exposure value to bias said effective exposure value toward under-exposure side;
- driving a shutter device in accordance with said effective exposure value so that an amount of ambient light contributing to film exposure is lacking for a proper exposure; and
- projecting artificial light from a flash device in synchronism with the driving of said shutter device to compensate for lack of said ambient light, wherein percentage of said artificial light to be contributed to film exposure is determined depending on a difference between said effective exposure value and said central exposure value when said scene is judged to be back-lighted.

5,774,748

**ZOOM LENS BARREL AND CAMERA HAVING SUCH A BARREL**

Takayuki Ito; Hiroshi Nomura; Kazuyoshi Azegami; Takamitsu Sasaki; Yasushi Tabata; Norio Numako; Yoshinari Tanimura; Takuma Sato; Masaaki Kishimoto, and Kosel Kosako, all of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

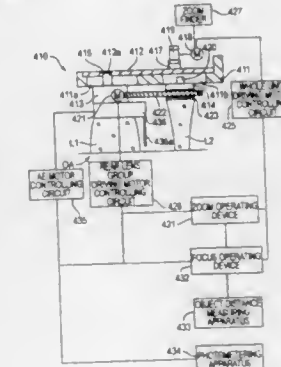
Filed Jul. 5, 1996, Ser. No. 653,369

Claims priority, application Japan, Jul. 7, 1995, 7-172216; Jan. 5, 1996, 8-365; Feb. 15, 1996, 8-38333; Feb. 20, 1996, 8-32365; Feb. 21, 1996, 8-34038; Feb. 21, 1996, 8-34039; Feb. 21, 1996, 8-34040; Feb. 21, 1996, 8-34041; Feb. 21, 1996, 8-34042; Feb. 21, 1996, 8-34062; Feb. 21, 1996, 8-34063; Feb. 21, 1996, 8-34118; Feb. 21, 1996, 8-34120; Feb. 21, 1996, 8-34125; Feb. 22, 1996, 8-34823; Feb. 29, 1996, 8-43158

Int. Cl.<sup>6</sup> G03B 5/00; 13/04; 17/04

U.S. Cl. 396—80

153 Claims



1. A zoom lens camera, comprising:

- a zoom lens system having a front lens group and a rear lens group, arranged in this order from an object side;
- means for moving said zoom lens system in an optical axis direction without varying a distance between said front lens group and said rear lens group;
- means for relatively moving one of said front lens group and said rear lens group to vary said distance between said front lens group and said rear lens group;
- means for setting a focal length of said zoom lens system;
- means for performing a focusing operation; and
- means for controlling said focusing operation, said controlling means focusing an image of an object to be photographed by controlling said zoom lens system moving means and said relative moving means upon an operation of said performing means in accordance with a focal length set by said setting means.

5,774,749

**CAMERA HAVING A MAGNIFICATION CHANGE-OVER DEVICE**

Takayuki Tsuboi, Kanagawa-ken, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 350,393, Dec. 2, 1994, abandoned, which is a continuation of Ser. No. 181,362, Jan. 13, 1994, abandoned, which is a continuation of Ser. No. 920,712, Jul. 28, 1992, abandoned, which is a division of Ser. No. 831,076, Feb. 5, 1992, abandoned, which is a division of Ser. No. 453,056, Dec. 13, 1989, abandoned, which is a continuation of Ser. No. 296,928, Jan. 11, 1989, abandoned, which is a continuation of Ser. No. 125,734, Nov. 30, 1987, abandoned, which is a continuation of Ser. No. 862,798, May 13, 1986, abandoned. This application Jun. 7, 1995, Ser. No. 484,620

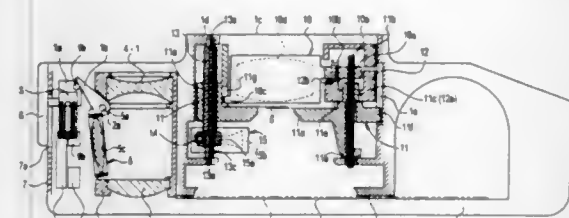
Claims priority, application Japan, May 14, 1985, 60-102436; May 14, 1985, 60-102437; Jun. 14, 1985, 60-129339; Jun. 14, 1985, 60-129340

Int. Cl.<sup>6</sup> G03B 5/00; 13/04; 13/10

U.S. Cl. 396—80

83 Claims

1. An apparatus comprising:



- (a) a detection device for detecting information related to focus adjustment;
- (b) a signal forming device for forming a signal related to magnification;
- (c) a determination device which determines a first movement amount of an optical unit in accordance with output of said detection device and a second movement amount of the optical unit in accordance with output of said signal forming device; and
- (d) a moving device for moving the optical unit in accordance with the first and second movement amount determined by said determination device in response to an operation of an operation member for starting photography.

**5,774,750  
CAMERA**

Tsutomu Honda, Sakai, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

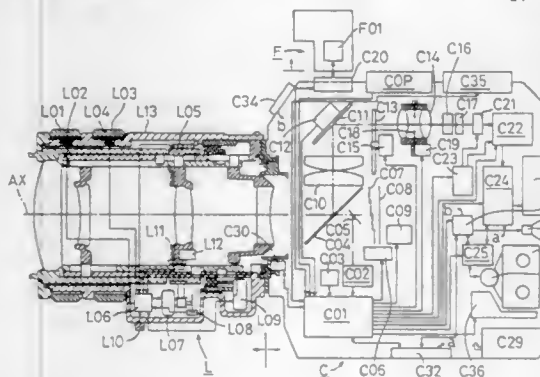
Filed May 21, 1997, Ser. No. 861,025

Claims priority, application Japan, May 22, 1996, 8-126692

Int. Cl.<sup>6</sup> G03B 15/05; H04N 7/18

U.S. Cl. 396—159

17 Claims



1. A camera system comprising:

- a silver halide film shooting mechanism that controls exposure of silver halide film by means of a mechanical shutter;
- an electronic shooting mechanism that controls exposure of a shooting device by means of an electronic shutter;
- a flash device that emits flash light to an object;
- a controller that synchronizes starting of exposure by the silver halide film shooting mechanism, starting of exposure by the electronic shooting mechanism, and starting of flash light emission by the flash device;
- a flash controller that stops the flash device from emitting flash light when exposure quantity in the silver halide film shooting mechanism reaches a predetermined light amount in shooting under flash light; and
- an exposure controller that stops exposure by the electronic shooting mechanism when exposure quantity in the electronic shooting mechanism reaches a predetermined light amount in shooting under flash light.

**5,774,751  
IMAGING SYSTEM HAVING IMAGING DEVICE FOR  
USE WITH DIFFERENT ACCESSORIES**

Hiroshi Masuda, Shinagawa-ku, and Tetsuro Goto, Furubashi, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

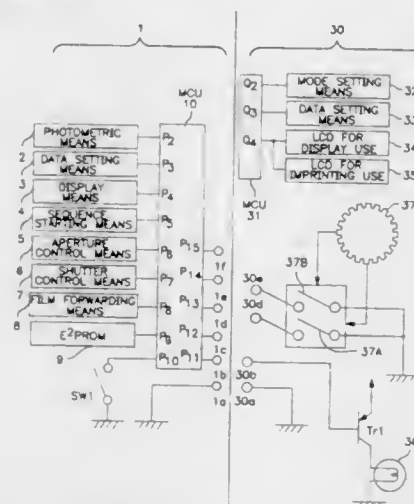
Filed Apr. 4, 1997, Ser. No. 832,964

Claims priority, application Japan, Apr. 4, 1996, 8-108416

Int. Cl.<sup>6</sup> G03B 17/00

U.S. Cl. 396—297

4 Claims



1. An imaging system, comprising:
- an imaging device;

- a first accessory or a second accessory mounted to the imaging device,
- the first accessory being capable of external operation, and having a first operating member which generates an electrical output according to the external operation of the first accessory,
- the second accessory being capable of external operation, and having a second operating member which generates an electrical output according to the external operation of the second accessory, the second accessory having a data preparation device which prepares data based on the electrical output generated by the second operating member;
- a discriminating device which determines whether the first accessory or the second accessory is mounted to the imaging device; and
- electrical receptors for receiving the electrical output from the first operating member when the discriminating device determines that the first accessory is mounted to the imaging device, and receives data prepared by the data preparation means when the discriminating device determines that the second accessory is mounted to the imaging device.

**5,774,752  
PROCESSING OF SOUND MEDIA WITH STILL IMAGE  
FILMS IN PHOTOFINISHING LABS**

David L. Patton, Webster; Stephen J. Rowan, Spencerport, and Cynthia S. Bell, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

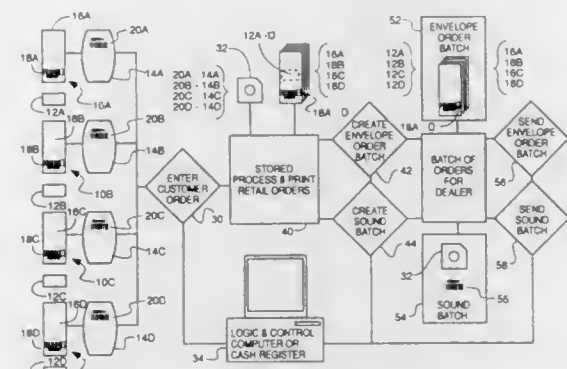
Filed Dec. 26, 1996, Ser. No. 773,158

Int. Cl.<sup>6</sup> G03B 17/24

U.S. Cl. 396—312

22 Claims

1. A method of processing customer film photofinishing orders in which a film order also includes sound information recorded in association with images captured on the film; the method comprising the steps of:
- establishing identification data in a manner which links the recorded sound information with the customer film order;
- transferring said film order to a photofinishing laboratory;
- transferring said linked recorded sound to the photofinishing laboratory;



- processing said film order at the photofinishing laboratory to produce image prints from said film images;
- transferring said recorded sound information to at least one print attachable sound recording medium using said order identification data to link said sound recording medium to its associated film order;
- attaching said sound recording medium to an image print in the associated film order to create one or more sound-on-prints from the film order; and
- returning said film order with said sound-on-prints.

**5,774,753  
FILM SHEET UNIT WHICH EASILY ACCEPTS A LID OF  
A FILM PACK**

Taro Okutsu; Yasuhiko Kitamura, and Yoshio Hara, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 591,689, Jan. 25, 1996, abandoned.

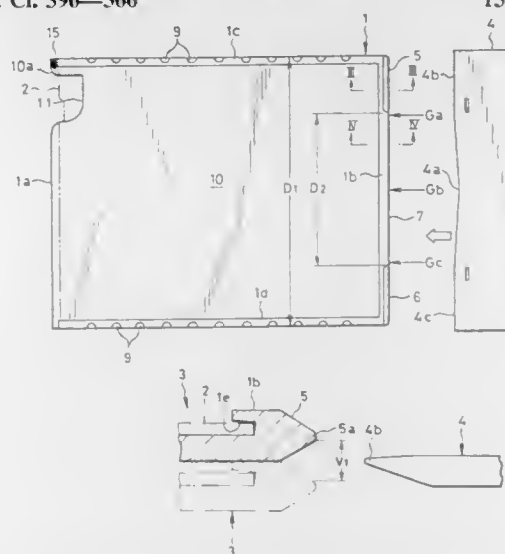
This application Jul. 25, 1997, Ser. No. 901,241

Claims priority, application Japan, Jan. 30, 1995, 7-012562

Int. Cl.<sup>6</sup> G03B 17/26; 19/10

U.S. Cl. 396—366

13 Claims



1. A film storage system having a sheet film pack and a sheet film unit comprising a film sheath holding a photographic sheet film,
- said film sheath comprising:
- a backing plate for backing a base surface of said sheet film to keep said sheet film flat;
- a framing portion formed integrally with said backing plate from a plastic resin, said framing portion comprising an end fringe, two side fringes and a groove formed between said end fringe and said backing plate and between said two side fringes and said backing plate so as to hold said sheet film

- along three margins thereof, at least a portion of said end fringe being tapered off to an end edge of said film sheath; and
- an open end disposed in opposition to said end fringe, for permitting insertion of said sheet film from said open end into said film sheath along said groove, wherein a plurality of said sheet film units are packed in said sheet film pack in a light-tight fashion, and wherein
- said sheet film pack is loaded in a pack holder for photography, and comprises:
- a pack main body for accommodating said plurality of sheet film units piled up in a stack; and
- a sliding lid slidable relative to said pack main body to open and close an opening of said pack main body, through which an uppermost one of said stack of sheet film units is moved out of said pack main body responsive to said sliding lid being drawn out to open said opening, said sliding lid being thereafter moved back to a closed position to close said opening, while being inserted between said uppermost sheet film unit and a second sheet film unit next to said uppermost sheet film unit, to set said uppermost sheet film unit in an exposure position in said pack holder.

**5,774,754  
CAMERA CAPABLE OF PREVIEWING A  
PHOTOGRAPHED IMAGE**

Hiroshi Ootsuka, Toyokawa, Japan, assignor to Minolta Co., Ltd., Osaka, Japan

Continuation of Ser. No. 427,560, Apr. 24, 1995, abandoned.

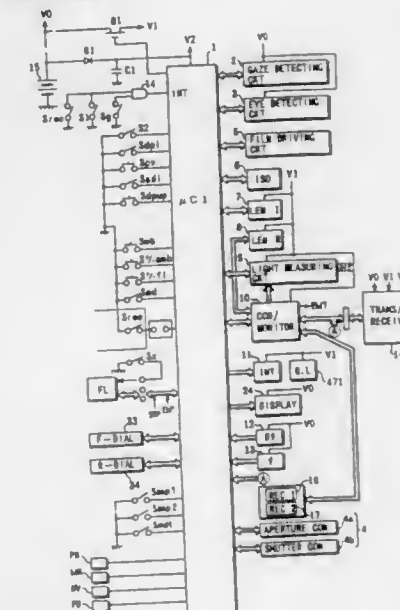
This application May 15, 1997, Ser. No. 856,728

Claims priority, application Japan, Apr. 26, 1994, 6-088650; May 24, 1994, 6-109520

Int. Cl.<sup>6</sup> G03B 29/00; 17/24; 13/02

U.S. Cl. 396—380

14 Claims



1. A camera comprising:
- a photographic recording device which records on a photosensitive recording medium an image of an object;
- an image pick-up device which picks up an image of the object to generate an image signal;
- a storage device which stores the image signal;
- a photography data writing and reading device which writes and reads photography data on and from the photosensitive recording medium;
- a photography data setting device which sets new photography data desirably;
- a first display device which processes the image signal in accordance with the photography data written on the photosensitive recording medium;



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OFFICIAL GAZETTE

JUNE 30, 1998

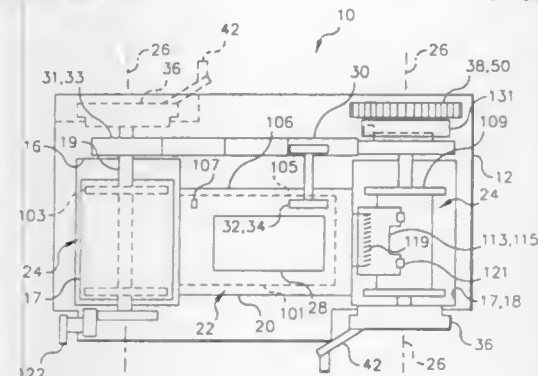
a second display device which processes the image signal in accordance with the photography data set by the setting device; and  
a renewal controller which controls the photography data writing and reading device to replace thus written photography data with the new photography data set by the setting device.

5,774,755  
CAMERA AND METHOD FOR TRANSPORTING FILM IN A CAMERA

Robert J. Stanchus, and Timothy J. Fuss, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.  
Filed Jun. 13, 1997, Ser. No. 874,841  
Int. Cl.<sup>6</sup> G03B 17/24

U.S. Cl. 396—411

17 Claims



1. A camera for use with a thrust type cartridge having a spool and a photographic filmstrip, said camera comprising:

- a body defining a cartridge chamber and a supply chamber and an exposure frame between said chambers, said cartridge chamber being adapted to receive the film cartridge;
- a spindle disposed in said cartridge chamber to engage the cartridge spool;
- a supply spool disposed in said supply chamber, said spool being rotatable about a supply spool axis;
- a cincher disposed in said supply chamber to cinch said filmstrip to said spool;
- a film drive in engagement with said supply spool and said spindle to rotate said supply spool and said spindle in opposed advance and rewind directions of rotation;
- a film winder mounted to said body, said film winder being pivotable in first and second opposite directions relative to said body through an arc of less than a full circle;
- a ratchet and pawl mechanism connecting said film winder to said film drive, said ratchet and pawl mechanism being mechanically engaged with said film drive in said first direction of pivoting of said film winder relative to said film drive, said ratchet and pawl mechanism being mechanically disengaged from said film drive in a second direction of pivoting of said film winder relative to said film drive;
- a crank mounted to said body, said crank being rotatable, relative to said body through a full circle in forward and reverse directions of rotation, said crank being engageable with said film drive in both said directions of rotation.

5,774,756  
CAMERA WITH FLEXIBLE FILM DEFLECTOR  
Dennis R. Zander, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

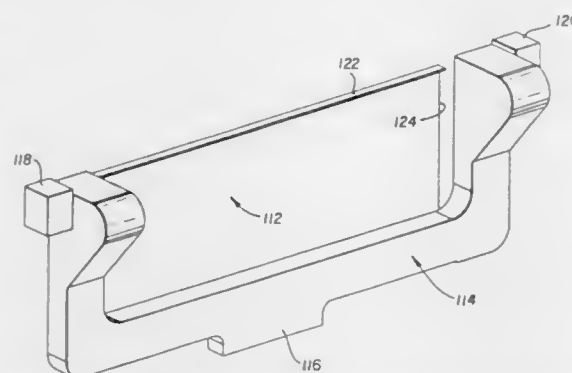
Filed Aug. 12, 1997, Ser. No. 909,602

Int. Cl.<sup>6</sup> G03B 1/00

U.S. Cl. 396—415

5 Claims

1. A camera comprising a backframe opening for exposing successive sections of a filmstrip, and a deflector supported at one



end of said backframe opening for movement to permit a leading edge of the filmstrip which is advanced against said deflector to move said deflector away from the backframe opening to allow the leading edge to be advanced over the deflector rather than become trapped in the backframe opening, is characterized in that:

said deflector is flexible and has at least one fixed peripheral side and at least two adjacent free peripheral sides to permit the deflector to be flexed away from said backframe opening at said free peripheral sides, but not at said fixed peripheral side, when the leading edge of the filmstrip is advanced against the deflector.

5,774,757  
CAMERA WITH FILM DEFLECTOR PIVOTABLE ABOUT INCLINED AXIS

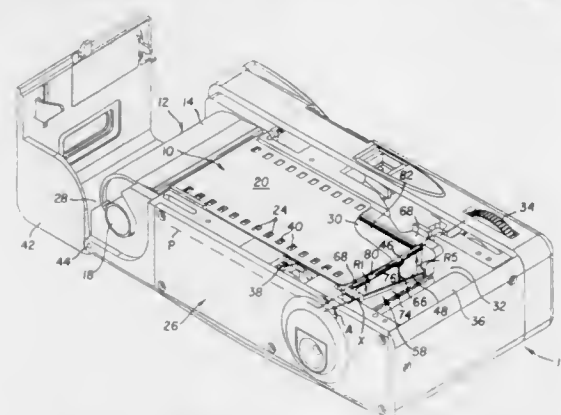
Dennis R. Zander, Penfield, and Robert L. Storey, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 12, 1997, Ser. No. 909,926

Int. Cl.<sup>6</sup> G03B 1/00

U.S. Cl. 396—415

10 Claims



1. A camera comprising a backframe opening for exposing successive sections of a filmstrip in a film exposure plane, and a deflector pivotally supported at one end of said backframe opening to permit a leading edge of the filmstrip to pivot said deflector away from the backframe opening to allow the leading edge to be advanced over the deflector rather than become trapped in the backframe opening, is characterized in that:

said deflector is supported to be pivoted about an inclined axis that extends at an acute angle with respect to the film exposure plane.

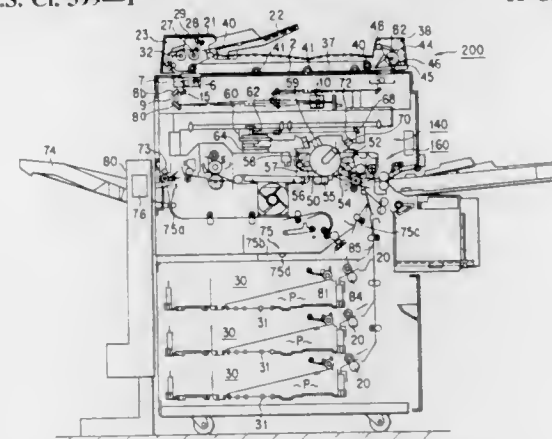
JUNE 30, 1998

ELECTRICAL

5473

5,774,758  
IMAGE FORMING APPARATUS FOR FORMING IMAGES OF ALL ORIGINAL DOCUMENT PAGES IN THE STAPLE SORTING MODE  
Toshiharu Takahashi, Kawasaki; Masako Shibaki, Yokohama, and Miki Konno, Kawasaki, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan  
Filed Aug. 26, 1996, Ser. No. 704,951  
Claims priority, application Japan, Aug. 31, 1995, 7-246984  
Int. Cl.<sup>6</sup> G03G 15/00; H04N 1/00; 1/40  
U.S. Cl. 399—1

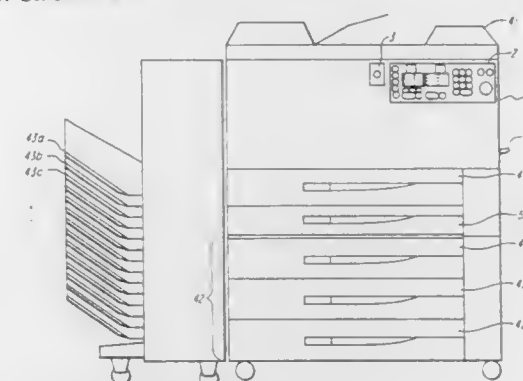
11 Claims



11. An image forming method comprising the steps of: setting image forming conditions including a mode for binding each copy when images are formed on image forming mediums from image information; and reading image information of an original document; storing read image information in a memory which has a storage capacity; forming images on paper sheets by using image information stored in said memory in such a manner that the mode for binding each copy is suspended and the image forming conditions set by said setting remain as the other conditions in a case where the mode for binding each copy has been set and image information to be stored is larger than the capacity that can be stored in said memory.

5,774,759  
CONTROL SYSTEM FOR A DIGITAL COPYING MACHINE, A FACSIMILE MACHINE AND OTHER PROCESSING APPARATUS  
Tomoki Tanaka, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan  
Filed Dec. 11, 1995, Ser. No. 570,619  
Claims priority, application Japan, Dec. 12, 1994, 6-307726  
Int. Cl.<sup>6</sup> G03G 15/00  
U.S. Cl. 399—8

5 Claims



1. A control system comprising: a processing apparatus which creates a control command on the basis of a control program previously stored in the processing

apparatus and which executes processing in accordance with the control command;  
a terminal apparatus which creates a control command on the basis of the control program stored in the apparatus;  
communication means for connecting the processing apparatus to the terminal apparatus using electromagnetic radiation so that data is transmitted and received;  
transmission means for transmitting the control program previously stored in the processing apparatus to the terminal apparatus through the communication means;  
transmission means for transmitting the control command created on the basis of the control program to the processing apparatus;  
transmission means for transmitting internal information within the processing apparatus, to the terminal apparatus through the communication means, the internal information indicating the state of the processing apparatus at the time of responding to the control command; and  
means for processing on the basis of the internal information transmitted to the terminal apparatus from the processing apparatus.

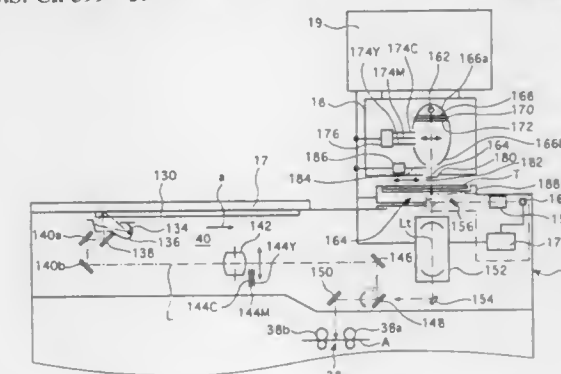
5,774,760  
METHOD OF CONTROLLING COLOR CORRECTION AND APPARATUS FOR IMAGEWISE EXPOSURE USING SAID METHOD

Kanji Nagashima, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan  
Filed Dec. 13, 1995, Ser. No. 572,175

Claims priority, application Japan, Dec. 14, 1994, 6-310888  
Int. Cl.<sup>6</sup> G03G 15/01

U.S. Cl. 399—39

8 Claims



1. A method of controlling color correction, in which three color filters of three primary colors to be inserted into an optical path of light that is issued from a source to be either reflected by a reflection-type original or transmitted through a transmission-type original and which thereafter passes through an imaging lens to reach a light-sensitive recording medium or an imaging device, are controlled in the respective amounts of insertion of said filters such as to correct the color densities of the original image which is carried by the light to be focused on said light-sensitive recording medium or said imaging device, said method comprising the steps of:

- preliminarily constructing seven tables for each of said three primary colors that represent the relationships between the amounts of insertion of the filters and the amounts of correction of one of said three primary colors, three of said tables being for the insertion of said three color filters individually into said optical path, three for the insertion of any two filters in combination, and one for the simultaneous insertion of all three filters in combination;
- calculating from at least one table for each color the initial values for the amounts of insertion of the three color filters in connection with the required amounts of correction of said three primary colors that is to be effected on the light carrying the original image;

dividing the calculated amounts of insertion of the three filters into three cases for the amount of color correction, one referring to the amount of correction of each color by inserting the combination of the three color filters and which is based on the table for said combination, the second referring to the amount of correction of each color by inserting a combination of said any two color filters and which is based on the table for said combination and the third referring to the amount of correction of each color by inserting a single color filter and which is based on the table for that single color, and performing an arithmetic addition or subtraction on said amounts of color correction to provide a calculated amount of correction of each color;

determining for each color the difference between the thus provided calculated amount of color correction and said required amount of color correction; and

using said difference for each color to change the calculated amounts of insertion of said three color filters, repeating the procedures of providing said calculated amount of correction of each color using the calculated amounts of insertion of said three color filters and determining for each color the difference between said calculated amount of color correction and said required amount of color correction, and determining the amounts of insertion of said three color filters at which said difference is less than a specified threshold.

5,774,761

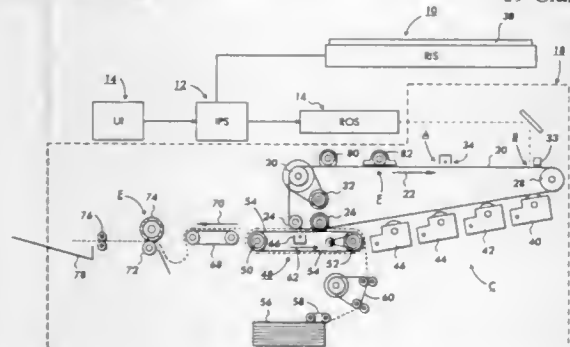
**MACHINE SET UP PROCEDURE USING MULTIVARIATE MODELING AND MULTIOBJECTIVE OPTIMIZATION**  
Sudhendu Rai, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 14, 1997, Ser. No. 950,086

Int. Cl.<sup>6</sup> G03G 15/00

U.S. Cl. 399—46

19 Claims



I. In an electrostatographic printing machine having operating components with changeable set point parameters, a method setting up the machine using multivariate modeling and multiobjective optimization comprising the steps of:

providing a discrete number of parameter settings and printing test patterns based upon said parameter settings, scanning the test patterns and producing a set of image quality values based upon the parameter settings, responding to the parameter settings and the image quality values and using a multivariate adaptive regression splines technique to provide a model of the printing machine image quality, and

determining the optimum parameter settings for the printing machine from the discrete number of parameter settings to produce consistent image quality.

5,774,762  
**IMAGE FORMING APPARATUS FOR OPTIMIZING TONER TRANSFER EFFICIENCY**

Shinichi Takemoto; Yasuyuki Inada, both of Toyokawa, and Tetsuya Sakai, Aichi-ken, all of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

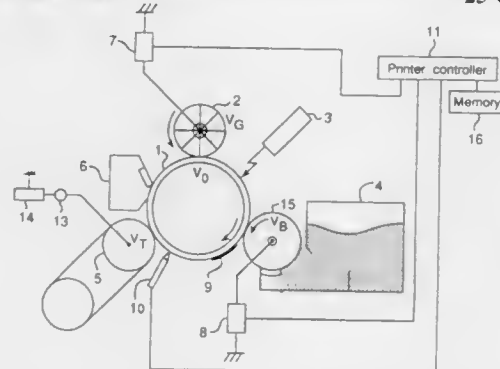
Filed Mar. 12, 1997, Ser. No. 815,767

Claims priority, application Japan, Mar. 13, 1996, 8-056050; Mar. 13, 1996, 8-056456

Int. Cl.<sup>6</sup> G03G 15/02; 15/043; 15/06

U.S. Cl. 399—50

25 Claims



I. An image forming apparatus, wherein an electrostatic latent image is formed by exposing a photoconductor and is developed to form a toner image on a photoconductor according to image data and the toner image is transferred onto a transfer material by applying a voltage thereto, the apparatus comprising:

a first detector detecting a resistance value of the transfer material;

a means for forming a standard toner image on said photoconductor in predetermined image forming conditions;

a second detector detecting an amount of toners of the standard toner image formed by said forming means; and

a controller controlling the voltage to be applied to said transfer material according to the resistance value detected by said first detector and the amount of toners detected by said second detector.

5,774,763

**ENERGY EFFICIENT FIXING DEVICE HAVING A FAST RESPONSE**

Shigeru Muramatsu, Yokohama, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 568,513, Dec. 7, 1995, abandoned.

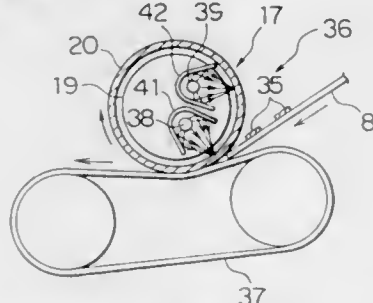
This application Jul. 16, 1997, Ser. No. 893,983

Claims priority, application Japan, Dec. 13, 1994, 6-309097; Jul. 13, 1995, 7-176988; Nov. 22, 1995, 7-304383

Int. Cl.<sup>6</sup> G03G 15/20

U.S. Cl. 399—69

38 Claims



I. A fixing device which fixes toner carried on paper processed by an electrophotographic apparatus, comprising:

at least one radiant heat source providing heat ray;

a hollow cylinder arranged around the radiant source, said hollow cylinder being transparent to the heat ray;

a film covering an outer circumferential face of the hollow cylinder, said film having a heat ray absorbing property per-

mitting the impinging heat ray transmitted by the cylinder to be absorbed to heat the film to a temperature sufficient to fix the toner;

a press contact feed member feeding the paper carrying the toner into pressing contact with the film during toner fixing by the heated film;

a heat ray concentrator operatively associated with the radiant heat source and surrounded by said hollow cylinder so as to concentrate the heat ray on an area of the film near to a nipping portion formed between the film and the press contact feed member; and

a fixing control portion providing power to the radiant heat source so as to provide the heat ray at least when the paper carrying the toner to be fixed is in pressing contact with the film.

5,774,764

**IMAGE RECORDING APPARATUS AND OPTION CONTROL APPARATUS**

Yoichi Toyokura, Kawasaki; Junichi Kimizuka, Yokohama; Shigeru Ueda, Wako; Satoshi Nagata, Tama; Akihiro Nakamura, Mishima; Satoshi Egawa; Shinichiro Maekawa, both of Kawasaki, and Yutaka Tokura, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

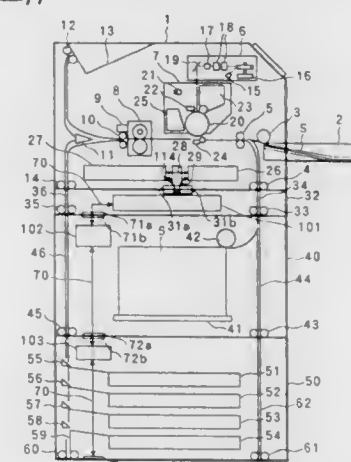
Filed Aug. 7, 1996, Ser. No. 693,704

Claims priority, application Japan, Aug. 8, 1995, 7-202462

Int. Cl.<sup>6</sup> G03F 15/00; G06F 15/00

U.S. Cl. 399—77

27 Claims



I. An image recording apparatus in which at least one optional unit can be mounted, comprising:

recording mechanism control means for controlling a recording mechanism for recording an image;

detachable option control means for controlling said optional unit and said recording mechanism control means while arbitrating between said optional unit and said recording mechanism control means; and

main control means for controlling image recording operation through a first interface for connecting said detachable option control means and a second interface for connecting said recording mechanism control means.

5,774,765  
**CLEANING DEVICE FOR REMOVING RESIDUAL TONER FROM AN IMAGE CARRIER IN AN IMAGE REPRODUCTION APPARATUS**

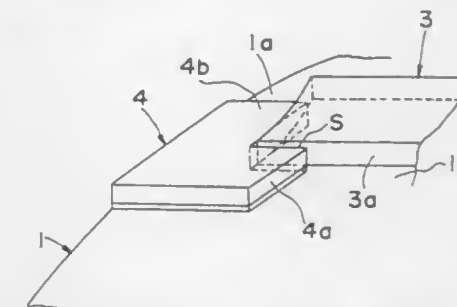
Shingo Hirota, Kobe, and Naotoshi Kawal, Aichi-ken, both of Japan, assignors to Minolta Co., Ltd., Osaka, Japan

Filed Nov. 8, 1996, Ser. No. 745,338

Claims priority, application Japan, Nov. 10, 1995, 7-292470 Int. Cl.<sup>6</sup> G03G 21/00

U.S. Cl. 399—102

14 Claims



I. A cleaning device for removing residual toner on an image bearing member having a surface, said cleaning device comprising: a cleaning blade having a cleaning edge contacting the surface of the image bearing member; and

sealing members provided on two end portions of the image bearing member, each forming a gap between itself and the cleaning edge of the cleaning blade, said gap meeting a condition whereby  $0 < (W/L) < 0.4$ , wherein W is the width of the gap and L is the length of the gap, when an average particle diameter per unit volume of toner used is between 4 μm and 15 μm and a level of condensation is between 5% and 40%.

5,774,766

**PROCESS CARTRIDGE, PROCESS CARTRIDGE ASSEMBLY METHOD, AND ELECTROPHOTOGRAPHIC IMAGE FORMING APPARATUS**

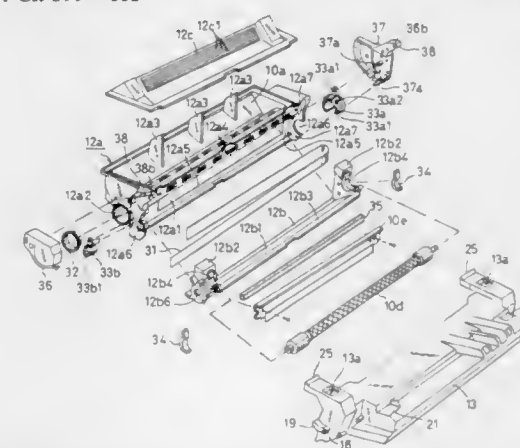
Toshiyuki Karakama, Tokyo; Isao Ikemoto, Kawasaki; Yoshikazu Sasago, Tokyo; Haruhisa Oshida, Hatogaya, and Shinya Noda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 28, 1996, Ser. No. 671,845

Claims priority, application Japan, Jun. 30, 1995, 7-165352 Int. Cl.<sup>6</sup> G03G 12/16

U.S. Cl. 399—111

45 Claims



I. A process cartridge detachably mountable to a main assembly of an electrophotographic image forming apparatus, comprising: an electrophotographic photosensitive drum; a development roller for developing a latent image formed on said electrophotographic photosensitive drum; a development frame including a toner accommodating portion for accommodating toner to be used by said development



roller for development, and a development blade for forming a toner layer over a circumferential surface of said development roller;

a photosensitive drum frame for supporting said electrophotographic photosensitive drum; and

a support frame including a first toner leakage preventing member to be positioned at one longitudinal end of said development roller and a second toner leakage preventing member to be positioned at the other longitudinal end of said development roller;

wherein said development frame and said support frame are rotatably connected about a positioning member and, in this connected state, a portion of said development frame and a portion of said support frame are welded to each other so that said development frame and said support frame are joined together.

5,774,767

# METHOD OF SUPPORTING AND DRIVING CYLINDRICAL ELECTRO-PHOTOGRAPHIC PHOTORECEPTOR AND IMAGING APPARATUS THEREOF

Junichi Shibata, and Susumu Honma, both of Minamishigara, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

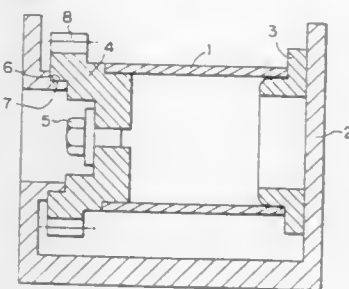
Filed Dec. 27, 1996, Ser. No. 773,419

Claims priority, application Japan, Jan. 8, 1996, 8-000854

Int. Cl.<sup>6</sup> G03G 15/00

U.S. Cl. 399—167

21 Claims



10. An imaging apparatus, comprising:  
a cylindrical photoreceptor in which a photosensitive layer is formed on a cylindrical substrate made of a rigid metal member;

a sliding bearing which is provided at an end portion of said cylindrical photoreceptor in the axial direction thereof and has a fitting portion to be fitted into an inner circumferential surface of said cylindrical photoreceptor in such a manner as to make the inner circumferential surface slidable thereabout;

a driving member which is fixed to the other end portion of said cylindrical photoreceptor in the axial direction thereof and has a fitting portion to be fitted into the inner circumferential surface of said cylindrical photoreceptor; and

a box member which supports said sliding bearing and said driving member at the end portions of said cylindrical photoreceptor,

wherein said cylindrical photoreceptor is driven freely by said driving member.

## 5,774,768 IMAGE-FORMING APPARATUS AND IMAGE-FORMING UNIT

Hiroyuki Hazama; Masaru Watanabe; Takashi Terada, and Hirotugu Ogawa, all of Chuo-ku, Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

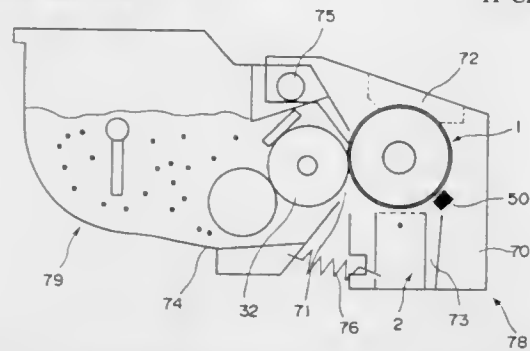
Filed Mar. 12, 1997, Ser. No. 820,354

Claims priority, application Japan, Mar. 13, 1996, 8-056243

Int. Cl.<sup>6</sup> G03G 15/02

U.S. Cl. 399—170

11 Claims



5. An image-forming apparatus including an image-forming unit,

wherein the apparatus comprises means for electric charging of a photosensitive material drum having an organic photosensitive layer, means for exposure to light, means for developing and a transfer member for transferring a toner image formed on the photosensitive material drum to a transfer paper, wherein the photosensitive material drum rotates a plurality of times in order to form the image on one transfer paper;

said image-forming unit comprising a first frame on which the photosensitive material drum and the means for electric charging are mounted, and a second frame on which the means for developing is mounted, the second frame including a toner container,

the means for electric charging is a scorotron charger which is located with  $\pm 45^\circ$  from a perpendicular downwardly drawn from a center of the photosensitive material drum and has a hole on the side opposite to an opening for charging;

the first frame and the second frame have a common fulcrum and are connected each other with a resiliently engaging means on the side opposite to the fulcrum; and

an electric field  $E_1$  between a wire and a grid in the scorotron charger is set to be stronger than an electric field  $E_2$  between the wire and a shield.

5,774,769

## CHARGING APPARATUS AND IMAGE FORMING APPARATUS

Yasunori Chigono, Susono, and Jun Hirabayashi, Numazu, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 31, 1997, Ser. No. 797,658

Claims priority, application Japan, Jan. 31, 1996, 8-037427

Int. Cl.<sup>6</sup> G03G 15/02

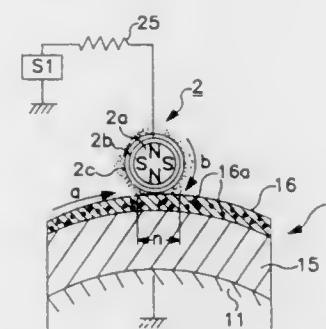
U.S. Cl. 399—176

38 Claims

1. A charging device comprising:

a charging member contactable to a member to be charged so as to charge said member to be charged, wherein a voltage is applicable to said charging member;

a resistor provided in a charging circuit for applying the voltage to said charging member;



wherein said resistor has a resistance not less than 0.5 times a resistance of said charging member;

wherein a combined resistance of said charging circuit and said charging member is not more than  $10^7 \Omega$ .

5,774,770

## IMAGE FORMING APPARATUS CAPABLE OF PREVENTING A TONER-FILMING PHENOMENON CAUSED ON DEVELOPMENT ROLLER SURFACE IN EFFECTIVE AND ECONOMICAL MANNER

Ueno Hiroshi, Atsugi, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

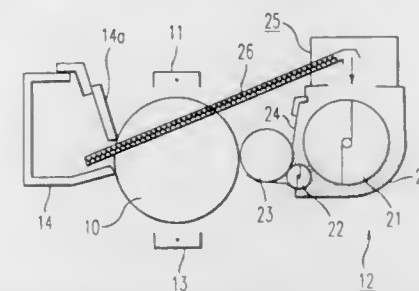
Filed Jan. 21, 1997, Ser. No. 786,652

Claims priority, application Japan, Jan. 18, 1996, 8-024761; Dec. 20, 1996, 8-355261

Int. Cl.<sup>6</sup> G03G 15/06

U.S. Cl. 399—222

73 Claims



1. An image forming apparatus with a toner freshening and returning operation in which toner is formed over an area of a toner carrying surface of a toner carrying means for carrying toner and then, without transferring said toner onto a recording material, said toner is returned to be used in an ordinary image forming operation, comprising:

toner containing means for containing toner;

image carrying means for carrying an electrostatic latent image thereon;

image writing means for writing said electrostatic latent image in at least one of said ordinary image forming operation and said toner freshening and returning operation;

high voltage power applying means for applying a high voltage power to said toner carrying means to generate a voltage gap between said toner carrying means and said image carrying means to transfer toner from said toner carrying means to said image carrying means;

toner collecting means for collecting said toner deposited on said image carrying means;

toner returning means for returning said toner collected by said toner collecting means to said toner containing means; and

toner freshening and returning control means for performing said freshening and returning operation at a predetermined timing for a predetermined time period.

5,774,771

## IMAGE FORMING METHOD AND APPARATUS USING A PARTICULAR TONER

Tsutomu Kukimoto, Yokohama; Motoo Urawa, Funabashi; Kenji Okado, Yokohama; Toshiyuki Ugai, Kawasaki; Keita Nozawa, Yokohama; Satoshi Yoshida, Tokyo, and Yuki Karaki, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

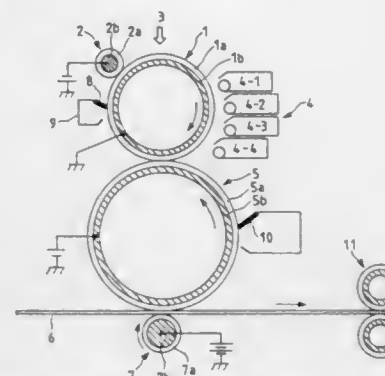
Filed Feb. 9, 1996, Ser. No. 599,375

Claims priority, application Japan, Feb. 10, 1995, 7-045059; Feb. 10, 1995, 7-045120; Mar. 28, 1995, 7-093164; Mar. 29, 1995, 7-094160

Int. Cl.<sup>6</sup> G03G 15/08; 15/14

U.S. Cl. 399—223

66 Claims



1. An image forming method comprising:

a developing step of developing an electrostatic latent image by the use of a developer to form a toner image on an electrostatic latent image bearing member;

a primary transfer step of transferring the toner image onto an intermediate transfer member to which a voltage is applied; and

a secondary transfer step of transferring onto a transfer medium the toner image held on the intermediate transfer member, while a transfer means to which a voltage is applied is pressed against the transfer medium;

wherein said developer has a toner, and the toner is a black magnetic toner, having at least i) black magnetic toner particles formed of 100 parts by weight of a binder resin with 30 to 200 parts by weight of a magnetic material dispersed therein and ii) an inorganic fine powder; said black magnetic toner having the value of shape factor SF-1 of  $120 \leq SF-1 \leq 160$ , the value of shape factor SF-2 of  $115 \leq SF-2 \leq 140$ , and the value of ratio B/A of 1.0 or less which is the ratio of a value B obtained by subtracting 100 from the value of SF-2 to a value A obtained by subtracting 100 from the value of SF-1.

5,774,772

## TONER CARTRIDGE HAVING A TONER STIRRING MEMBER

Tsukuru Kai, Fujisawa; Yoshiko Ishii, Tsukuba, and Nobuto Yokokawa, Gotenba, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Jun. 14, 1996, Ser. No. 663,667

Claims priority, application Japan, Jun. 14, 1995, 7-147623

Int. Cl.<sup>6</sup> G03G 15/08

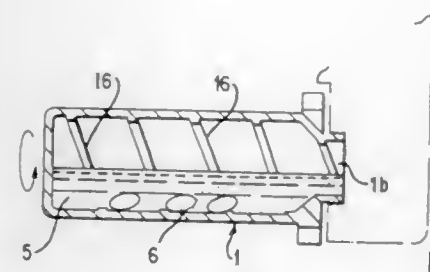
U.S. Cl. 399—260

65 Claims

1. A toner cartridge to be detachably horizontally mounted to a toner-receiving opening of a toner supply unit and rotated for discharging toner, comprising:

a cartridge container for holding toner and having an internal surface;

at least one toner stirring means for scratching off toner from the internal surface of the cartridge container and being mixed in with the held toner in the cartridge container; and



a spiral projection formed on the internal surface of the cartridge container, said spiral projection having at least one discontinuity which is larger than the toner stirring member.

5,774,773

**TONER BOTTLE AND TONER SUPPLYING APPARATUS USING THE SAME**

Shinichi Otsuka, and Hiromichi Miyoshi, both of Utsunomiya, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

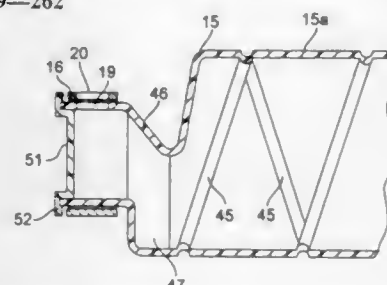
Filed Mar. 12, 1997, Ser. No. 815,761

Claims priority, application Japan, Mar. 13, 1996, 8-055736

Int. Cl.<sup>6</sup> G03G 15/08

U.S. Cl. 399—262

11 Claims



6. A toner bottle comprising:

- a bottle having a tip with an opening for toner to flow therefrom;
- a shutter having an opening, said shutter rotatably disposed over the tip for closing and opening the tip opening; and
- a lid detachably disposed on the tip of said bottle, for preventing said shutter from falling off the tip.

5,774,774

**ELECTROPHOTOGRAPHIC PRINTING METHOD FOR PRINTING ON METAL**

Yoshihiro Tamura, Tokyo; Hidetoshi Hara, and Jun Inagaki, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 307,772, Sep. 26, 1994. This application Jun. 4, 1996, Ser. No. 657,290

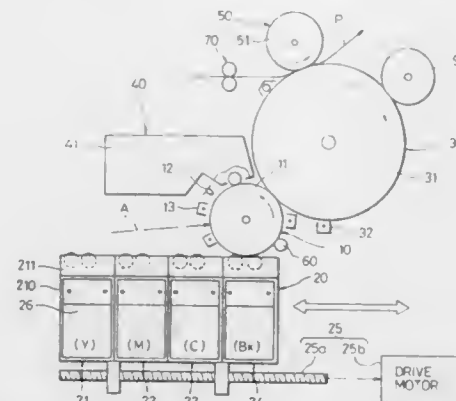
Claims priority, application Japan, Jan. 27, 1993, 5-011949; WIPO, Jan. 26, 1994, PCT/JP94/00103

Int. Cl.<sup>6</sup> G03G 15/14; 15/01

U.S. Cl. 399—302

22 Claims

1. A method for printing on a metal item comprising the steps of: forming an electrostatic latent image on a photosensitive drum based on print information; developing said electrostatic latent image into a toner image by means of a wet toner;



transferring said toner image on said photosensitive drum onto an intermediate transfer medium having a cushion layer thereon;

transferring said toner image on said intermediate transfer medium onto a surface of a metal item; and fixing said toner image on said surface of said metal item, wherein said step of transfer ring said toner image onto a metal item includes the step of pressing said intermediate transfer medium against said metal item.

5,774,775

**ELECTROPHOTOGRAPHIC IMAGE FORMING METHOD USING AN INTERMEDIATE IMAGE TRANSFER ELEMENT**

Jun Aoto, Fuji; Yasuo Hirano; Masahide Yamashita, both of Numazu; Mitsuru Seto, Kanagawa-ken, and Shigeru Fukuda, Kawasaki, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

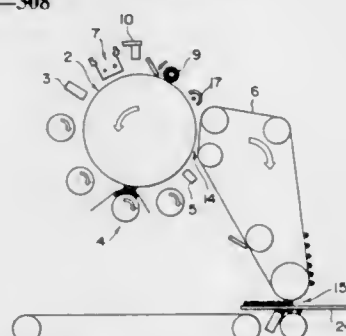
Filed Mar. 26, 1996, Ser. No. 622,590

Claims priority, application Japan, Mar. 31, 1995, 7-076743; Dec. 22, 1995, 7-335560

Int. Cl.<sup>6</sup> G03G 15/16

U.S. Cl. 399—308

13 Claims



1. An image forming method wherein a toner image developed with dry tone on an image carrier is transferred in a first transfer step to an intermediate image transfer element, the transferred toner image on said intermediate image transfer element being subsequently transferred in a second transfer step to a transfer medium, characterized in that said intermediate image transfer element has a surface whose angle of contact with water is at least 70 degrees and whose position in the triboelectric series is on a positive side with respect to the position of said toner when said toner on said image carrier is negatively charged and on a negative side with respect to the position of said toner when said toner on said image carrier is positively charged.

5,774,776

**HEATER AND IMAGE HEATING DEVICE**

Shigeaki Takada, Tokyo, and Hisaaki Senba, deceased, late of Yokohama, both of Japan, by Reiko Senba, Legal Representative, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 701,791, Aug. 26, 1996, abandoned.

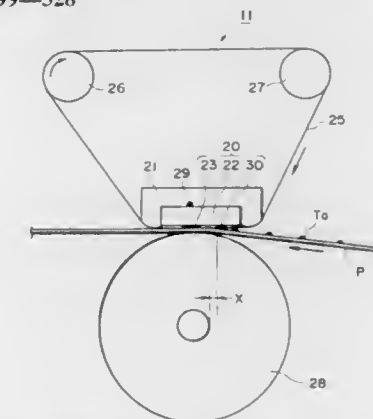
This application Jun. 30, 1997, Ser. No. 885,811

Claims priority, application Japan, Aug. 30, 1995, 7-222114

Int. Cl.<sup>6</sup> G03G 15/20

U.S. Cl. 399—328

21 Claims



1. An image heating device comprising:

- a heater in which a heat generating element and electrodes for supplying electric power to said heat generating element are provided on a longitudinal substrate;
  - a film adapted to be slid on said heater; and
  - a back-up member for forming a nip together with said heater through said film,
- wherein a recording member bearing an image is pinched and conveyed and the image is heated by heat from said heater through said film in said nip, and
- said heater has a mark in at least an end portion in the longitudinal direction of said substrate,
- wherein each of said heat generating element and said mark is formed of the same material.

5,774,777

**CONTINUOUS RECORDING MEDIUM FRICTION-CONVEYING MECHANISM IN IMAGE FORMING APPARATUS**

Hidefumi Ohtsuka, Ibaraki-ken; Shigeru Obata, Ishioka; Junichi Matsuno, Tsuchiura; Yasuyuki Tsuji, Hitachinaka; Shuho Yokokawa, Mito; Isao Nakajima; Muneyoshi Akai, both of Hitachinaka, and Yoji Hirose, Mito, all of Japan, assignors to Hitachi, Ltd., and Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed Dec. 30, 1996, Ser. No. 774,446

Claims priority, application Japan, Jan. 8, 1996, 8-000828; Jan. 10, 1996, 8-002031

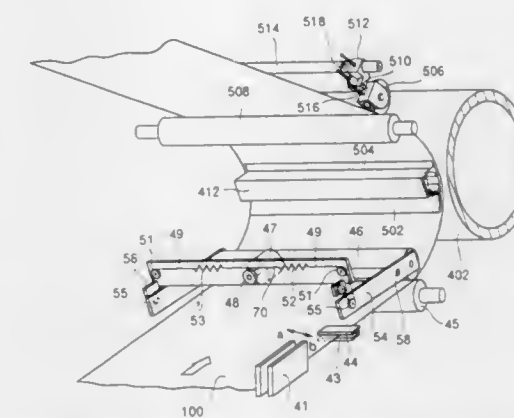
Int. Cl.<sup>6</sup> G03G 15/00

U.S. Cl. 399—384

16 Claims

2. In an image forming apparatus comprising recording medium conveying means for friction-conveying a continuous recording medium, an image recording section for forming electrostatically a toner image, and a transfer section for transferring said toner image to said recording medium,

the improvement wherein said recording medium conveying means includes friction-conveying means for interposing therebetween and conveying said recording medium, which is provided downstream of said transfer section with respect to a recording medium conveying direction and comprises two



rollers contacting only on both edges of said recording medium which are outside an image transfer area and a roller disposed on a back side of a surface of said recording medium onto which an image is to be transferred.

5,774,778

**SHEET POST-PROCESSING APPARATUS AND IMAGE FORMING APPARATUS HAVING SAME**

Seichiro Adachi, Yokohama; Katsuhito Kato, and Hitoshi Fujimoto, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 363,325, Dec. 23, 1994, abandoned.

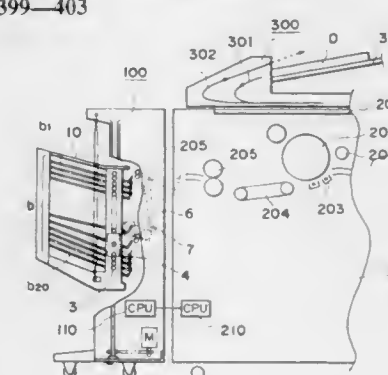
This application Jul. 30, 1997, Ser. No. 899,315

Claims priority, application Japan, Dec. 24, 1993, 5-348040

Int. Cl.<sup>6</sup> G03G 15/00

U.S. Cl. 399—403

27 Claims



1. A sheet post-processing apparatus for accommodating the sheet material discharged from an image forming apparatus on a plurality of sheet receiving trays and capable of accommodating at least two sets of sheets per sheet receiving tray, said apparatus comprising:

controlling means for determining the number of the sheet sets allowed to be accommodated per sheet receiving tray, on the basis of the number of sheets of a set of originals, the maximum number of the sheets allowed to be accommodated per sheet receiving tray and a correction coefficient,

wherein the sheet receiving trays are arranged at predetermined intervals.



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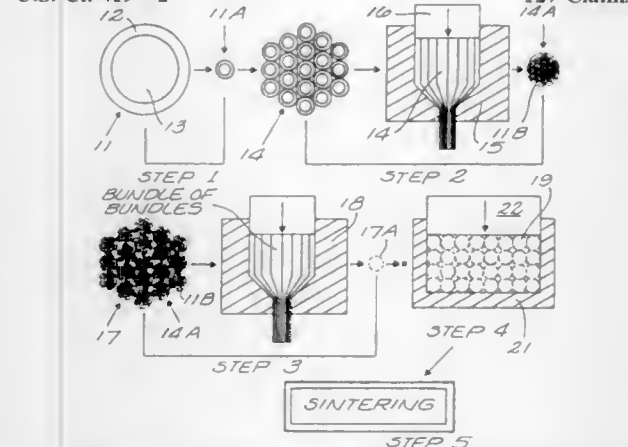
5,774,779

## MULTI-CHANNEL STRUCTURES AND PROCESSES FOR MAKING SUCH STRUCTURES

Ley J. Tuchinskiy, Tucson, Ariz., assignor to Materials and Electrochemical Research (MER) Corporation, Tucson, Ariz.  
Filed Nov. 6, 1996, Ser. No. 743,731Int. Cl.<sup>6</sup> B22F 3/12; C04B 38/04; 38/06

U.S. Cl. 419-2

127 Claims



1. A method of producing a solid multi-channelled structure formed of a structural material having a plurality of channels therein comprising the steps of:

- providing a first mixture comprised of a powdered form of said structural material and a binder material;
- providing a second mixture comprised of a powdered form of a channel forming filler material and a binder material;
- forming a composite rod comprising an outer shell formed of said first mixture and an inner core formed of said second mixture by deforming said second mixture to form said core and deforming said first mixture to form said outer shell surrounding said core;
- assembling a first bundle comprising a plurality of said composite rods in substantially parallel relationship with one another and consolidating said first bundle and reducing the diameter of the individual rods in said first bundle by deforming said bundle;
- assembling a plurality of said deformed bundles into a further bundle comprising a final assembly in the form of the desired structural configuration;
- consolidating the further bundle comprising said final assembly while maintaining the filler and binder of the composite rods of said assembly in place;
- then, removing the binder from both the core material and the shell material of the composite rods comprising the consolidated final assembly;
- then, sintering the resulting structure comprising the remaining structural material of the outer shells of the composite rods of the final assembly, and, removing the channel-forming filler material from the inner core of the composite rods comprising the consolidated final assembly; thereby producing a solid structure having a plurality of channels therein as defined by the removed filler material forming the cores of the composite rods comprising the final assembly structure.

5,774,780

## PROCESS FOR PRODUCTION OF A SHAPED PART

Oliver Praise, Munich, Germany, assignor to Bayerische Metallwerke GmbH, Dachau, Germany  
Filed Nov. 22, 1995, Ser. No. 562,028

Claims priority, application Germany, Nov. 27, 1994, 44 42 161.3

Int. Cl.<sup>6</sup> B22F 3/12

U.S. Cl. 419-12

20 Claims

1. A process for the production of a high-temperature stressed electrode, produced from a high melting point metal powder having crystalline sinter-activating additives therein, consisting essen-

18



tially of the steps of preparing, compacting and sintering the metal powder, the improvement further consisting essentially of the step of substantially shaping the metal powder to have a final contour of the high temperature stressed electrode prior to sintering.

5,774,781

Patent Not Issued For This Number

5,774,782

## TECHNETIUM-99M GENERATOR SYSTEM

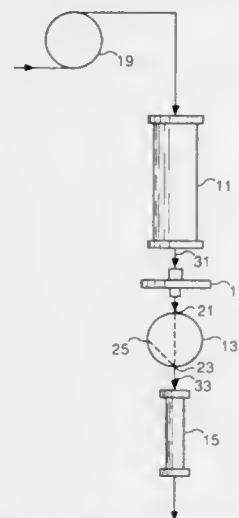
Saed Mirzadeh, Knoxville; Furn F. Knapp, Jr., Oak Ridge, and Emory D. Collins, Knoxville, all of Tenn., assignors to Lockheed Martin Energy Systems, Inc., Oak Ridge, Tenn.

Filed May 22, 1996, Ser. No. 619,376

Int. Cl.<sup>6</sup> C01G 57/00

U.S. Cl. 423-2

4 Claims



1. A method of preparing a concentrated solution of <sup>99m</sup>Tc comprising the steps of:

- providing a sorbent column loaded with a composition containing <sup>99</sup>Mo, said sorbent column having an effluent end in fluid communication with an anion-exchange column;
- eluting said sorbent column with a salt solution to elute a first eluate comprising <sup>99m</sup>Tc from said sorbent and to-trap said eluted <sup>99m</sup>Tc on said ion-exchange column;
- eluting said <sup>99m</sup>Tc from said ion-exchange column with a solution comprising a reductive complexing agent to elute a second eluate comprising said <sup>99m</sup>Tc in the form of complexed, reduced <sup>99m</sup>Tc in a concentration at least 8 times greater than the concentration of said <sup>99m</sup>Tc in said first eluate; and,
- acidifying said complexed, reduced <sup>99m</sup>Tc to produce a <sup>99m</sup>Tc product in a form which is suitable for subsequent radiopharmaceutical use.

5,774,783

## MAGNETIC RECORDING MEDIUM

Isatake Kaitsu, Iwao Okamoto, and Masayoshi Shinohara, all of Kanagawa, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

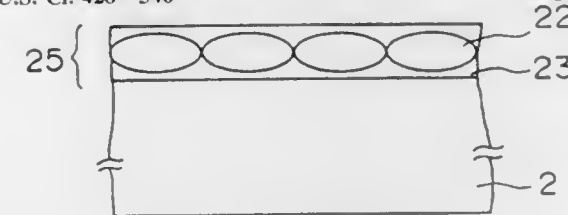
Filed Jan. 31, 1996, Ser. No. 594,762

Claims priority, application Japan, Mar. 17, 1995, 7-059012; Jun. 27, 1995, 7-160437; Nov. 17, 1995, 7-299785

Int. Cl.<sup>6</sup> G11B 5/64

U.S. Cl. 428-546

4 Claims



1. A magnetic recording medium comprising:  
a magnetic recording layer including ferromagnetic grains and a nonmagnetic substance, said ferromagnetic grains including Fe, Co, Co<sub>2</sub>, Cr<sub>100-x</sub> (x is 90 or more), Co<sub>2</sub>Pt<sub>100-y</sub> (y is 70 or more, or 40 to 50), or Co<sub>2</sub>Sm<sub>100-z</sub> (A is 77.3, or 80 or more) as a major constituent, said nonmagnetic substance including Ag or Cu as a major constituent;  
wherein said ferromagnetic grains are formed to have an average grain diameter of 50 nm and not to be isolated in the direction along a layer surface, and  
wherein a product of residual magnetization and a film thickness of said magnetic recording layer is less than or equal to 150 Gauss•μm.

5,774,784

## TEMPERATURE CONTROL SYSTEM FOR ELECTRONIC APPARATUS

Katsumaru Ohno, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

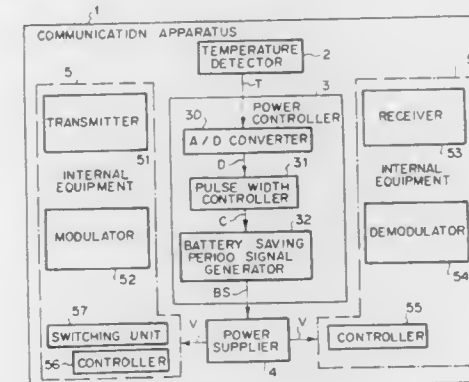
Filed Mar. 4, 1996, Ser. No. 610,412

Claims priority, application Japan, Mar. 3, 1995, 7-070844

Int. Cl.<sup>6</sup> H04B 1/16

U.S. Cl. 455-343

8 Claims



5. A temperature control system for an electronic apparatus comprising:

- temperature detecting means for detecting the temperature in the apparatus and outputting a temperature detection signal representing the detected temperature;
- power supply unit control means for generating a battery saving period signal having a pulse width which is inversely proportional to the level of the temperature detection signal from said temperature detecting means, wherein said power supply unit control means includes first, second and third battery saving period signal generators for generating battery saving period signals having different pulse widths, a switching unit for switching between the outputs of said first, second and third battery saving period signal generators, first and second

reference voltage generators having different reference voltages, and a judging unit for comparing the level of the temperature detection signal with the reference voltages of said first and second reference voltage generators to control said switching unit in accordance with the comparison result; and

a power supply unit for supplying power to an internal apparatus for only a time corresponding to the pulse width of the battery saving period signal from said power supply unit control means.

5,774,785

## ADAPTIVE QUALITY ADJUSTMENT

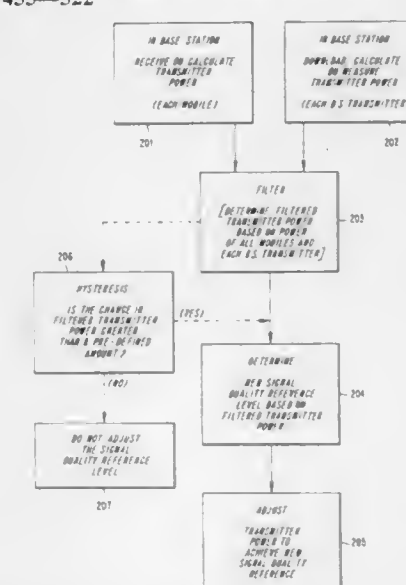
Patrik Karlsson, Ålta, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Jun. 20, 1996, Ser. No. 667,876

Int. Cl.<sup>6</sup> H04B 1/00

U.S. Cl. 455-522

26 Claims



1. In a telecommunication system, a method of controlling transmitter power level comprising the steps of:  
determining a reference transmitter power level that is representative of an amount of power being transmitted in a region of the telecommunication system;  
determining an adaptive signal quality reference level as a function of the reference transmitter power level; and  
adjusting transmitter power in the region of the telecommunication system so as to cause actual signal quality within the region of the telecommunication system to substantially equal the adaptive signal quality reference level.

5,774,786

## METHOD OF MAINTAINING CALLS SUBSEQUENT TO A SITE CONTROLLER FAILURE

Michael L. Wirtjes, Lake In The Hills, and Kristin C. Cramer, Island Lake, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 31, 1995, Ser. No. 550,584

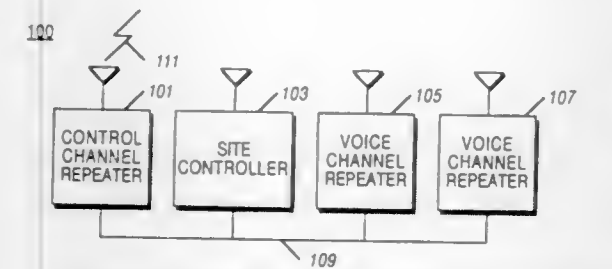
Int. Cl.<sup>6</sup> H04B 7/14

U.S. Cl. 455-8

10 Claims

1. At a communication system having a site controller and a plurality of standby repeaters, the site controller and the plurality of standby repeaters in communication via a local area network, a method of maintaining calls subsequent to a site controller failure, the method comprising the steps of:  
at the site controller:

- broadcasting, in a message, at least call information across the local area network, wherein the call information comprises



a repeater-to-controller last call controlling command and a controller-to-repeater last call controlling command; and at the plurality of standby repeaters: receiving the call information from the local area network; building a call table, the call table comprising at least a portion of the call information; and upon failure of the site controller, utilizing the call information contained in the call table to maintain calls.

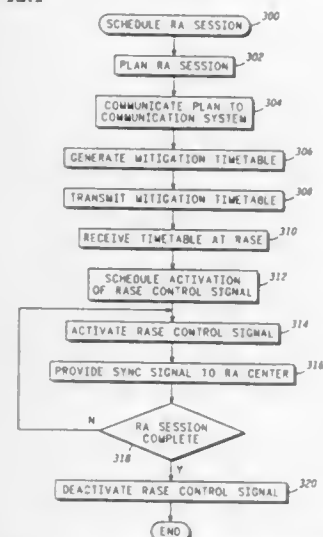
**5,774,787**  
**INTERFERENCE MITIGATION SYSTEM FOR PROTECTING RADIO ASTRONOMY AND METHOD OF USING SAME**

Raymond Joseph Leopold, Tempe; Keith Andrew Olds, Mesa, and Brian Michael Daniel, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 5, 1994, Ser. No. 349,575  
Int. Cl.<sup>6</sup> H04B 7/185

U.S. Cl. 455—12.1

7 Claims



1. A method of mitigating electromagnetic interference during a scheduled radio astronomy session as scheduled at a radio astronomy site, said electromagnetic interference created by operating a satellite-based communication system, said method comprising the steps of:

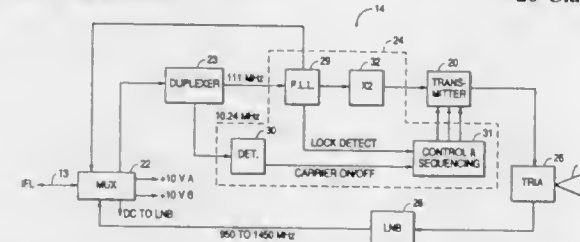
- requesting interference mitigation services for said scheduled radio astronomy session from a radio astronomy site to a ground control station;
- transmitting a mitigation timetable from said ground control station to radio astronomy special equipment;
- receiving said mitigation timetable at said radio astronomy special equipment;
- activating said radio astronomy special equipment located at said radio astronomy site according to said mitigation timetable for mitigating said electromagnetic interference during said scheduled radio astronomy session; and
- inhibiting said electromagnetic interference from a subscriber unit of said satellite-based communication system, said subscriber unit located within a protection zone encompassing said radio astronomy site.

**5,774,788**  
**REMOTE GROUND TERMINAL HAVING AN OUTDOOR UNIT WITH A FREQUENCY-MULTIPLIER**

Robert Hannah, and Nadeem Bukhari, both of Germantown, Md., assignors to Hughes Electronics, Los Angeles, Calif.  
Filed Mar. 17, 1995, Ser. No. 405,688  
Int. Cl.<sup>6</sup> H04B 7/185; 7/19; 7/195

U.S. Cl. 458—12.1

20 Claims



1. A remote ground terminal for generating and transmitting a modulated carrier signal to a satellite, said apparatus comprising: an indoor unit for generating a modulated data signal having an envelope of constant amplitude; and an outdoor unit comprising a phase-locked loop coupled to a transmitter module which are operative to receive said modulated data signal and to frequency multiply and amplify said modulated data signal so as to produce a modulated carrier signal having an envelope of constant amplitude.

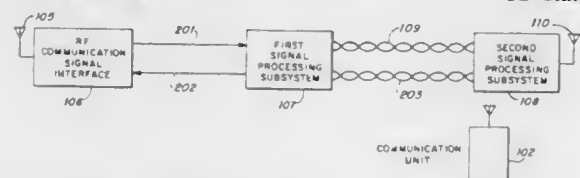
**5,774,789**  
**RF COMMUNICATION SIGNAL DISTRIBUTION SYSTEM AND METHOD**

Erik van der Kaay, Shaker Heights, Ohio, and George S. Dubovsky, Forest, Va., assignors to Allen Telecom Inc., Solon, Ohio

Filed Dec. 14, 1995, Ser. No. 572,054  
Int. Cl.<sup>6</sup> H04B 3/58

U.S. Cl. 455—16

32 Claims



1. A method for distributing RF communication signals, the method comprising the steps of:

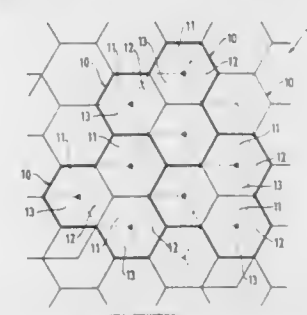
- receiving first RF communication signals;
  - downconverting said first RF communication signals to provide downconverted first RF communication signals;
  - transmitting the downconverted first RF communication signals to a second signal processing subsystem at a second location remote from the first location over a first twisted-pair cable;
  - providing operating power for the second signal processing subsystem from the first signal processing subsystem;
- at the second signal processing subsystem:
- upconverting said downconverted first RF communication signals to provide recovered first RF communication signals;
  - transmitting said recovered first RF communication signals over an antenna; and
  - determining an event occurring at said second signal processing subsystem and transmitting autonomous information signals thereabout to the first signal processing subsystem.

**5,774,790**  
**SECTORIZED CELLULAR MOBILE RADIO SYSTEM WITH SECTOR SIGNALLING AND CONTROL IN PREDETERMINED TIME SLOTS**

Pierre Dupuy, Paris, France, assignor to Alcatel N.V., Amsterdam, Netherlands  
Continuation of Ser. No. 277,976, Jul. 20, 1994, abandoned.  
This application Oct. 15, 1996, Ser. No. 729,320  
Claims priority, application France, Jul. 30, 1993, 93 09424  
Int. Cl.<sup>6</sup> H04Q 7/00

U.S. Cl. 455—33.1

8 Claims



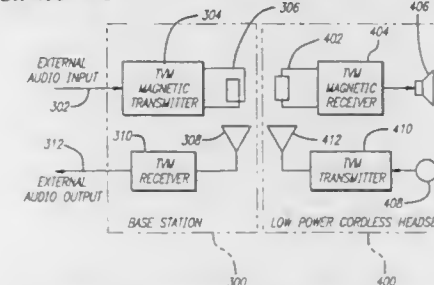
1. A cellular mobile radio system comprising cells, wherein: each of the cells is divided into P sectors; each of the P sectors has a respective timebase; the transmission of data in said cellular mobile radio system is by frames and uses a time division multiple access procedure in which each of the frames has N time slots; each of the P sectors has a different one of the N time slots reserved as a respective control channel for transmitting signalling and control data; the respective timebase of each of the P sectors is shifted a predetermined number of the N time slots relative to the respective timebase of each of the others of the P sectors within one of the cells, said predetermined number not being a multiple of N; whereby the respective control channel of each of the P sectors is conveyed at a time different from the respective control channel of each of the others of the P sectors within the one of the cells.

**5,774,791**  
**LOW POWER WIRELESS COMMUNICATION SYSTEM EMPLOYING MAGNETIC CONTROL ZONES**

Gene Michael Strohallen, Sebastopol, and Robert Francis Young, Santa Cruz, both of Calif., assignors to Phonic Ear Incorporated, Petaluma, Calif.  
Continuation of Ser. No. 316,920, Oct. 3, 1994, Pat. No. 5,568,516, which is a continuation-in-part of Ser. No. 86,823, Jul. 2, 1993. This application Oct. 18, 1996, Ser. No. 733,438  
Int. Cl.<sup>6</sup> H04B 5/06

U.S. Cl. 455—41

22 Claims



1. A wireless communication system for transmitting audio signals to a first location from a second location, the system comprising:

- first transmission means, disposed at said first location, for providing a control signal which varies in time, said first transmission means including a magnetic transmission element for transmitting said control signal;

first receiver means, disposed at said second location and including a magnetic receiving element magnetically coupled to said magnetic transmission element, for receiving said control signal;

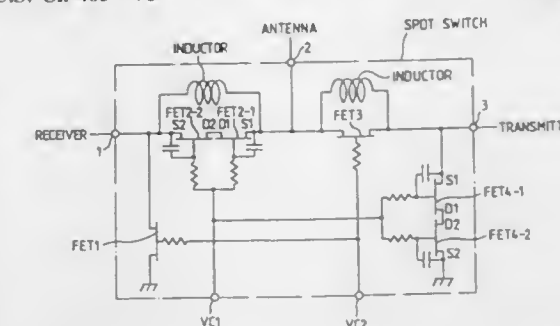
second transmission means, disposed at said second location, for receiving an audio signal, said transmission means including at least one of a radio frequency transmitter and an infrared transmitter for transmitting said audio signal simultaneously with the reception of, and under the control of, the magnetically transmitted control signal; and

second receiver means, disposed at said first location and including at least one of a radio frequency receiver and an infrared receiver, for receiving said audio signal, wherein said second location comprises a portable communication device.

**5,774,792**  
**LOW DISTORTION SWITCH**  
Satoshi Tanaka, Kokubunji; Tatsuto Okamoto; Taro Kitayama, both of Yokohama, and Masao Yamane, Takasaki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan  
Filed Aug. 11, 1995, Ser. No. 514,194  
Claims priority, application Japan, Aug. 29, 1994, 6-203190  
Int. Cl.<sup>6</sup> H04B 1/44

U.S. Cl. 485—78

12 Claims



1. An SPDT switch (single-pole double-throw switch) used in a transceiver for switching between a transmitting mode and a receiving mode, comprising:

- a first signal node for outputting a received signal to a receiver;
- a second signal node for receiving a received signal from an antenna and outputting a sending signal to the antenna;
- a third signal node for receiving a sending signal of high frequency and large power from a transmitter;
- a first switch having a first FET provided between a ground level and the first signal node;
- a second switch having a second FET and a third FET connected in series between the first signal node and the second signal node;

wherein the SPDT switch introduces the received signal from the antenna to the receiver by controlling a DC bias applied to gate metals of each FET, turning on the second and fourth switches and turning off the first and third switches; and introduces the sending signal from the transmitter to the antenna by turning off the second and fourth switches and turning on the first and third switches;

wherein the second switch has a source node of the second FET connected to the first signal node, a source node of the third FET connected to the second signal node, and drains of the second FET and the third FET connected together at a first connecting point;

wherein the fourth switch has a source node of the fifth FET connected to the third signal node, a source node of the sixth FET connected to the ground level, and drains of the fifth FET and the sixth FET connected together at a second connecting point;





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5,774,798

LOW POWER DATA RECEIVER COMBINED WITH AUDIO RECEIVER

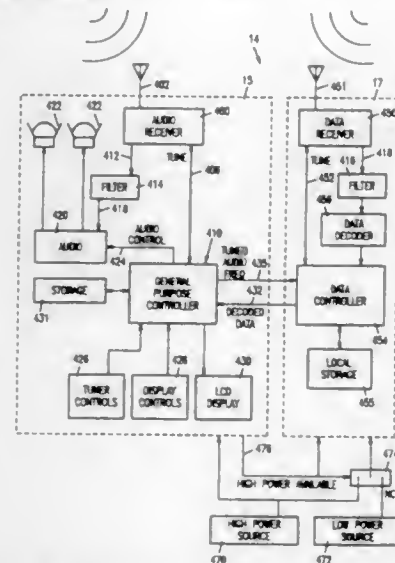
Garold B. Gaskill, Tualatin, Oreg., assignor to Selko Communications Systems, Inc., Beaverton, Oreg.

Filed Jul. 14, 1995, Ser. No. 502,807

Int. Cl.<sup>6</sup> H04B 1/18

U.S. Cl. 455—186.1

8 Claims



3. A radio signal transmission and reception system comprising: a paging system generating and making available paging data by radio signal transmission according to a paging system protocol;

at least one radio signal transmission station transmitting a radio signal including an audio portion and a data portion, the data portion including digital collateral information descriptive of said audio portion; and

at least one remote receiving device including an audio receiver and a data receiver, said audio receiver being selectively tunable and presenting said audio portion of said radio signal, said data receiver being selectively tunable to receive said paging data according to said system protocol and also tuned in response to tuning of said audio receiver to receive said digital collateral information.

5,774,799

AUTOMATIC FREQUENCY CONTROL WITH ADJACENT CHANNEL INTERFERENCE PROTECTION

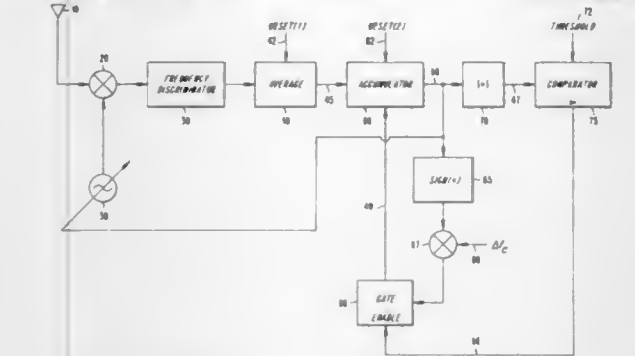
Thomas M. Croft, Gregory E. Bottomley, and Ravinder D. Koilpillai, all of Cary, N.C., assignors to Ericsson Inc., Research Triangle Park, N.C.

Filed Apr. 18, 1996, Ser. No. 634,229

Int. Cl.<sup>6</sup> H04B 1/18

U.S. Cl. 455—192.2

18 Claims



6. An automatic frequency correction (AFC) loop comprising: means for estimating a frequency error of the AFC loop;

means for accumulating the frequency errors output by said estimating means and for generating a corrected frequency error adjust signal based on the accumulated frequency error; means for determining the direction of the corrected frequency error;

means for determining if the accumulated frequency error exceeds a predetermined threshold; and

correction means for adjusting said accumulating means and the corrected frequency error adjust signal one carrier spacing in a direction opposite of the determined direction if said predetermined threshold is exceeded in order to lock to a desired frequency.

5,774,800

RADIO COMMUNICATION APPARATUS WITH REFERENCE FREQUENCY CONTROL BASED ON STORED CHARACTERISTIC CONTROL DATA

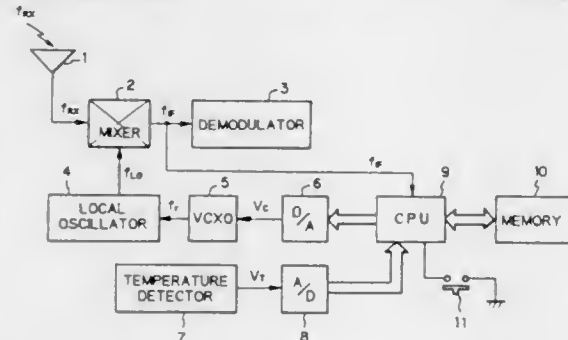
Kazubiro Mori, Tokyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1996, Ser. No. 609,173

Claims priority, application Japan, Mar. 29, 1995, 7-071264 Int. Cl.<sup>6</sup> H04B 1/06; 7/00

U.S. Cl. 455—255

9 Claims



1. A radio communication apparatus, comprising:

an antenna;

a mixer for mixing a received signal from said antenna with an externally supplied local oscillation signal to produce an intermediate-frequency signal;

a demodulator for demodulating said intermediate-frequency signal to obtain a communication signal;

a control section for detecting the frequency of said intermediate-frequency signal and outputting a control signal based on the detected frequency of said intermediate-frequency signal;

a reference signal generator for generating a reference signal under the control of said control signal; and

a local oscillation signal generator for generating said externally supplied local oscillation signal based on said reference signal;

wherein said control section receives the demodulated communication signal from said demodulator, and stores said control signal and a signal representative of a characteristic of said apparatus as a pair of data when said demodulated signal coincides with a predetermined value, said control section generating said control signal based on said pair of data.

5,774,801

HIGH DYNAMIC RANGE MIXER HAVING LOW CONVERSION LOSS, LOW LOCAL OSCILLATOR INPUT POWER, AND HIGH DYNAMIC RANGE AND A METHOD FOR DESIGNING THE SAME

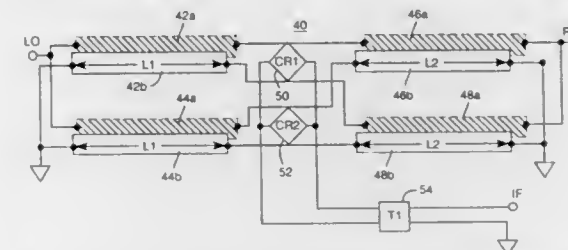
Leo L. Li, and Ellis Glazebrook, both of Lynchburg, Va., assignors to Ericsson Inc., Research Triangle Park, N.C.

Filed Aug. 23, 1995, Ser. No. 518,501

Int. Cl.<sup>6</sup> H04B 1/26

U.S. Cl. 455—326

31 Claims



10. A balanced mixer operable in the UHF through the 900 MHz frequency range, comprising:

first and second radio frequency (RF) transmission line baluns and first and second local oscillator (LO) transmission line baluns formed on a dielectric substrate and connected to one or more diode rings;

an intermediate frequency (IF) port connected to one or more diode rings;

wherein a length of the RF transmission line baluns is considerably less than one-quarter wavelength of an RF frequency of the mixer and a length of the LO transmission line baluns is considerably less than one-quarter wavelength of an LO frequency of the mixer, the lengths of the RF and LO transmission line baluns being selected to provide high dynamic range and low conversion loss.

5,774,802

APPARATUS AND METHOD FOR BILLING IN A WIRELESS COMMUNICATION SYSTEM

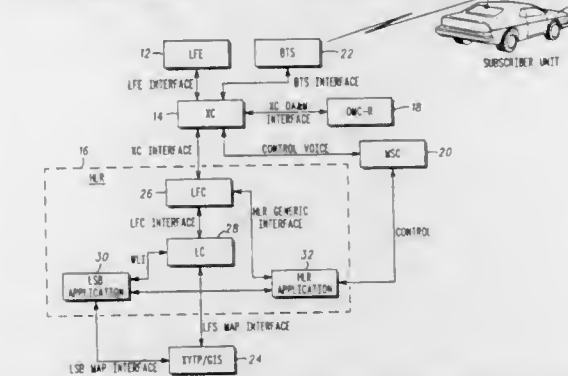
Daniel Francis Tell, Lake Forrest; John M. Scanlon, N. Barrington; Marty H. Singer, Northbrook, all of Ill.; David A. Hose, Boulder, Colo., and James A. Fitch, Edmonds, Wash., assignors to Motorola Inc., Schaumburg, Ill.

Filed Apr. 10, 1996, Ser. No. 631,688

Int. Cl.<sup>6</sup> H04Q 7/22

U.S. Cl. 455—408

12 Claims



1. A method of billing in a wireless communication system comprising the steps of:

receiving a mobile identification number identifying a mobile unit;

performing a multilateration location measurement based on a nonperiodic signal received from the mobile unit;

retrieving a location zone from a memory based on the mobile identification number, the location zone designated by a feature code which is transmitted from the mobile unit;

comparing the multilateration location measurement with the location zone; and generating a billing record for the mobile unit.

5,774,803

MOBILE DEVICE AND REGIONAL INFORMATION SYSTEM

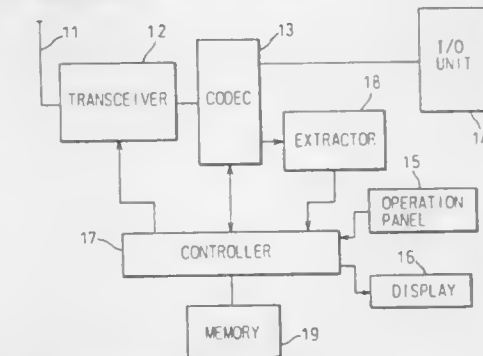
Kazuo Kariya, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 10, 1996, Ser. No. 661,010

Claims priority, application Japan, Jun. 8, 1995, 7-141473 Int. Cl.<sup>6</sup> H04B 1/00

U.S. Cl. 455—414

6 Claims



1. A mobile device, comprising:

a transceiver, a codec, an operation panel, a display and a voice/data input/output unit;

an extractor extracting the headlines of regional information out of general information received by the transceiver, the general information being transmitted in a zone where the mobile device is present;

a memory storing the extracted headlines; and

a controller displaying the stored headlines on the display, receiving, through the operation panel, an instruction to specify a piece of regional information, transmitting a request to a regional information center to provide the specified piece of regional information, receiving, from the regional information center, notice of a time which is reserved for providing the requested information and calling the regional information center at the reserved time to receive the requested information from the regional information center.

5,774,804

REMOTE ACTIVATION OF MOBILE TELEPHONE BY PAGING CHANNEL PHANTOM NUMBERS

Ian C. Williams, Hampshire, England, assignor to Nokia Mobile Phones Limited, Salo, Finland

Filed Apr. 4, 1996, Ser. No. 627,371

Int. Cl.<sup>6</sup> H04Q 7/00

U.S. Cl. 455—419

4 Claims

1. A method for activating remotely a telephone, in a system of multiple telephones, the method comprising steps of:

establishing a glossary of phantom calling numbers reserved only for encoding words of a command message, the command message providing a calling number for activation of a specific telephone of the system;

transmitting by the specific telephone a request message identifying an electronic serial number of the specific telephone and requesting a calling number for the specific telephone;

in response to the request message, providing a calling number designated for the specific telephone, the designated calling number differing from the phantom numbers of the glossary;

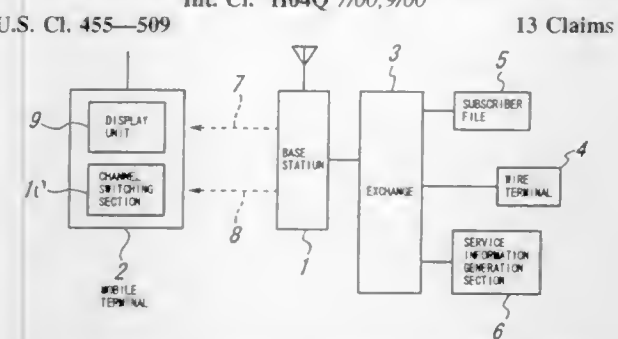
constructing the command message with the electronic serial number of the specific telephone, and including within the command message, the designated calling number of the telephone;





establish means for establishing a synchronization with the base station if the quality of the received first signal is higher than a first criterion;  
second receiving means, in response to the establish means, for receiving the second signal;  
maintain means for maintaining the established synchronization if the quality of the second received signal is higher than a second criterion which is smaller than the first criterion.

5,774,811  
**MOBILE RADIO COMMUNICATION METHOD**  
Wataru Uchida, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan  
Filed Apr. 8, 1996, Ser. No. 629,198  
Claims priority, application Japan, Apr. 6, 1995, 7-104631  
Int. Cl.<sup>6</sup> H04Q 7/00; 9/00  
U.S. Cl. 455—509

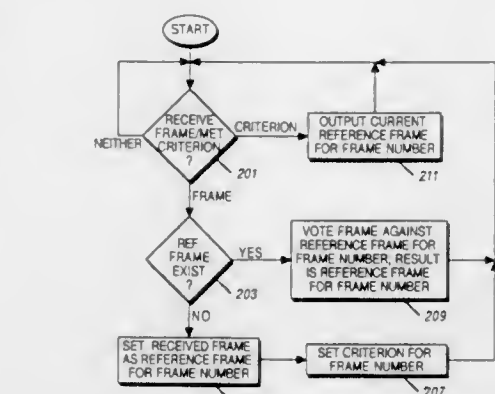


1. A mobile radio communication method wherein a communication channel or a control channel is set between a base station and any of a plurality of mobile terminals and information is transmitted from an exchange to the mobile terminal over the communication channel or the control channel via said base station, the mobile radio communication method comprising the steps of:

setting a communication channel between said base station and each of one or more of said plurality of mobile terminals;  
reading out from a subscriber file containing pre-registered subscriber information, including service information identification codes, by means of said exchange, the subscriber information corresponding to the mobile terminal to which the communication channel has been set;  
transmitting the service information identification code of the mobile terminal to the mobile terminal from said base station over the communication channel;  
switching the channel to be used from the communication channel to a control channel in the mobile terminal which receives the service information identification code; and  
transmitting service information corresponding to the service information identification code from said exchange to the mobile station via said base station over the control channel.

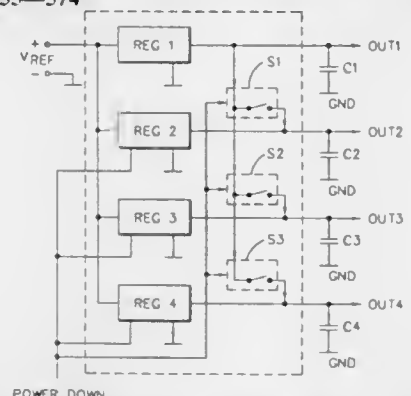
5,774,812  
**METHOD OF VOTING MULTIPLE DIGITAL FRAMES SIMULTANEOUSLY**  
Phillip C. Hargrave; Laura B. Kleinschmidt, both of Palatine, and David P. Helm, Glendale Heights, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.  
Filed Feb. 23, 1996, Ser. No. 606,700  
Int. Cl.<sup>6</sup> H04B 7/10  
U.S. Cl. 455—524

1. A method for use by a voter in a communication system comprising the steps of:  
a) receiving a frame of information, wherein the received frame has a frame number;  
b) determining if a reference frame for the frame number exists;  
c) if a reference frame for the frame number does not exist, c1) setting the received frame as a current reference frame for the frame number;



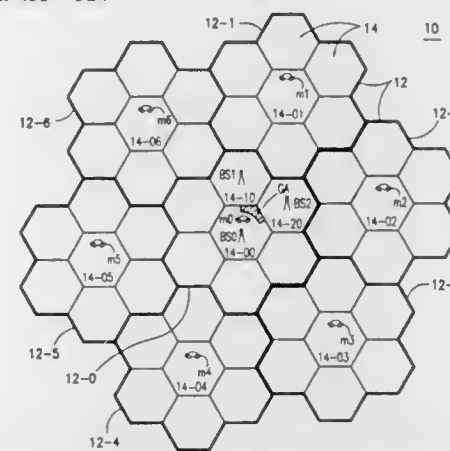
c2) setting an output criterion for the frame number;  
d) when the output criterion for the frame number is satisfied, outputting the current reference frame as the output frame for the frame number;  
e) if a reference frame for the frame number exists, voting the frame against the reference frame for the frame number, yielding the current reference frame.

5,774,813  
**METHOD AND APPARATUS FOR CONTROLLING THE POWER CONSUMPTION OF AN ELECTRONIC DEVICE**  
Harri Jokinen, Hiiisi, Finland, assignor to Nokia Mobile Phones Ltd., Salo, Finland  
Continuation of Ser. No. 484,940, Jun. 8, 1995, abandoned.  
This application Jun. 18, 1997, Ser. No. 877,940  
Claims priority, application Finland, Jun. 10, 1997, 942752  
Int. Cl.<sup>6</sup> H04B 1/38; H04M 1/00  
U.S. Cl. 455—574



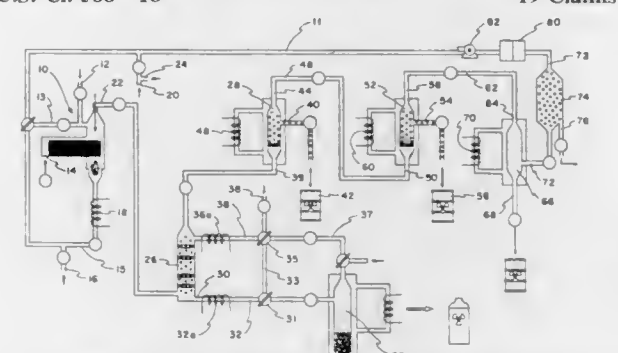
1. A method for supplying a regulated voltage to a plurality of discrete circuits in an electronic device comprising a plurality of voltage regulators, having outputs respectively connected to said plurality of discrete circuits, for providing respective regulated voltage outputs thereto, wherein during a non-power saving active state the plurality of voltage regulators provide respective regulated voltage outputs for said plurality of discrete circuits, and in a power saving down state the regulated voltage output of one of said plurality of voltage regulators is connected to the outputs of all of the other voltage regulators to provide the regulated voltage output of said one of said voltage regulators to all of said plurality of discrete circuits and the other voltage regulators have their regulated voltage outputs disconnected from their respective discrete circuits.

5,774,814  
**MULTIPLY-DETECTED MACRODIVERSITY METHOD AND SYSTEM FOR WIRELESS COMMUNICATIONS**  
Zygmunt J. Haas, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.  
Filed Mar. 22, 1996, Ser. No. 620,207  
Int. Cl.<sup>6</sup> H04Q 7/20  
U.S. Cl. 455—524



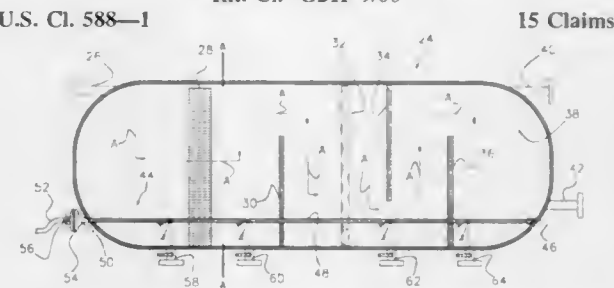
1. A method for determining the information content of a transmitted wireless communication signal comprising the steps of:  
a) detecting at least three versions of said transmitted signal, one at each of a corresponding plurality of at least three receivers;  
b) calculating the probability that the information content of each detected version of said transmitted signal is erroneous, said calculating being based at least in part on the strength of each detected version of said transmitted signal; and  
c) employing said calculated probabilities in combination with all of said detected versions of said transmitted signal to determine the information content of said transmitted signal.

5,774,815  
**DRY HALIDE METHOD FOR SEPARATING THE COMPONENTS OF SPENT NUCLEAR FUELS**  
Jerry Dale Christian, Idaho Falls; Thomas Russell Thomas, Rigby, and Glen F. Kessinger, Idaho Falls, all of Id., assignors to United States Department of Energy, Washington, D.C.  
Filed Aug. 13, 1996, Ser. No. 696,187  
Int. Cl.<sup>6</sup> G21F 9/00  
U.S. Cl. 588—18



1. A method for separating radionuclides into component products comprising the steps of:  
a) contacting the radionuclides with chlorine gas in a dry reactor to form metal chloride gas;  
b) scrubbing the metal chloride gases to remove fission product chlorides and transuranic chlorides;  
c) condensing the scrubbed gases to remove the remaining metal chlorides;  
d) regenerating and recycling the molten scrubber salts to precipitate the fission product, and transuranic chlorides; and  
e) vitrifying the fission product and transuranic precipitates.

5,774,816  
**APPARATUS AND METHOD FOR CLEANING A VESSEL**  
Chris W. Fontenot, 110 Indian Mound Rd., Lafayette, La. 70501, and Karl K. Burdette, 1011 Bonnie Dr., Lafayette, La. 70503  
Filed May 15, 1996, Ser. No. 648,415  
Int. Cl.<sup>6</sup> G21F 9/00  
U.S. Cl. 588—1



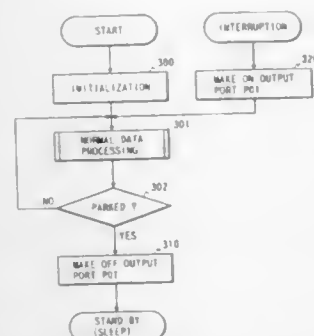
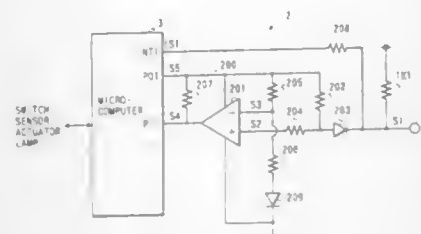
12. A method of cleaning a vessel, the vessel containing an inlet for the introduction of an effluent which was produced from a well, the effluent containing a fluid phase, a gas phase and entrained solids within said effluent, the vessel further including: means for separating said effluent into the fluid phase and gas phase; a fluid outlet means for channeling the fluid out of the vessel; a gas outlet means for channeling the gas out of the vessel; drain means, operatively associated with the bottom of said vessel, for draining the vessel; discharge means, adapted within said vessel, for discharging a liquid into the solids at the bottom of the vessel; and, intermittent pump means, operatively associated with said discharge means, for delivering the liquid into said discharge means, openings are oriented in a first orientation and a second orientation, a mixing tank, and a heating unit, the method comprising:

producing the effluent from the well;  
receiving the effluent within the vessel;  
separating the effluent into a liquid phase and a gas phase;  
segregating the solids at the bottom of the vessel;  
injecting a fluid into said vessel so that the solids are fluidized;  
cleaning said vessel by draining said fluidized solids through said drain means.  
14. The method of claim 12 wherein said vessel further contains chemical injection means, operatively associated with said fluid injection means, for injecting a radioactive dissolution treating chemical onto the solids, and wherein the vessel has associated therewith a mixing tank and a heating unit fluidly connected with said mixing tank; and, wherein the method further comprises:  
injecting the radioactive treating dissolution chemical onto the solids;  
draining said fluidized solids through said drain means;  
pumping the entrained solids to the mixing tank;  
mixing the solids and liquid within the mixing tank;  
transporting the liquid to the heating unit;  
heating the liquid in the heating unit.

5,774,817  
**COMMUNICATION CIRCUIT FOR LOCAL AREA NETWORK**  
Nobutomo Takagi, Okazaki; Yasushi Kanda, Aichi-ken; Akihiro Sasaki, Anjo; Shigeru Uehara, Toyota, and Shinji Shimoke, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan  
Filed Sep. 29, 1995, Ser. No. 536,328  
Claims priority, application Japan, Sep. 30, 1994, 6-237465; Mar. 8, 1995, 7-048852  
Int. Cl.<sup>6</sup> B60Q 1/00; H04J 3/14  
U.S. Cl. 701—1

1. A circuit arrangement disposed in a node within a local area network and connected to a communication bus within the local area network, comprising:  
an input circuit for introducing data from the communication bus into the node;  
node state detecting means for detecting whether or not the node is in a stand-by state;





power feed suspending means for suspending power feed to at least part of the input circuit when the node state detecting means detects that the node is in the stand-by state; power feed restarting means for monitoring a voltage at the communication bus, and restarting the power feed to at least part of the input circuit when the voltage at the communication bus becomes equal to a level indicating reception of data; and a protective circuit for protecting the input circuit from an abnormal current which flows from the communication bus; wherein the local area network comprises a local area network mounted on an automotive vehicle, and the node state detecting means comprises first sub means for detecting whether or not the automotive vehicle is parked, and second sub means for detecting that the node is in the stand-by state when the first sub means detects that the automotive vehicle is parked.

5,774,818

#### METHOD FOR PILOTING AN AERODYNE BY AUTOMATIC CONTROL ONTO A HORIZONTAL PATH DETERMINED FROM WAY POINTS

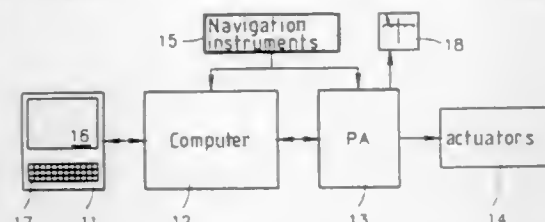
Patrick Pages, Montrouge, France, assignor to Sextant Avionique, Velizy Villacoublay, France

Filed Jan. 4, 1996, Ser. No. 582,973

Claims priority, application France, Jan. 6, 1995, 95 00555  
Int. Cl.<sup>6</sup> G06F 165/00

U.S. Cl. 701—3

11 Claims



1. A method for piloting an aerodyne between a first point and a second point, a position of each of said first and second points being defined by a latitude and a longitude and associated with a transition route constraint, said method comprising: applying to said first and second points a loxodromic lines of constant heading into straight lines, constructing an initial path joining the respective transformed positions of said first and second points while complying with said transition route constraints associated with said first and second positions, by means of two arcs of circles respectively passing through said respective transformed positions of said

first and second points and respectively tangential to said associated transition route constraints, and a segment of a straight line tangential to both of said two arcs of circles, computing respective transformed positions of intermediate points on said initial path by means of equations modeling said two arcs of circles and said straight line segment, applying to said intermediate points a reverse transformation of said first transformation, so as to determine respective positions of said intermediate points in terms of latitude and longitude, computing commands to be applied to control surfaces of the aerodyne so that the aerodyne flies over each of said intermediate points, and piloting the aerodyne in accordance to said computed commands.

5,774,819

#### VEHICLE STEERING CONTROL SYSTEM

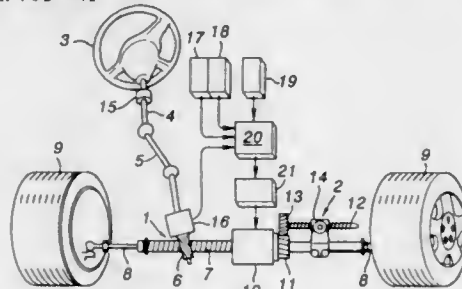
Yorihisa Yamamoto; Yutaka Nishi; Takashi Nishimori; Hiroyuki Tokunaga, and Hideki Machino, all of Saitama-ken, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 7, 1995, Ser. No. 485,484

Claims priority, application Japan, Jul. 27, 1994, 6-196065  
Int. Cl.<sup>6</sup> B62D 5/04

U.S. Cl. 701—41

7 Claims



1. A vehicle steering control system, comprising steering torque input means; powered steering control means for applying a first actuating torque to steerable wheels of a vehicle according to a steering torque applied to said steering torque input means; means for detecting a lateral dynamic condition of said vehicle; active reaction generating means for applying a second actuating torque to said steerable wheels so as to control a turning movement of said vehicle according to a signal supplied from said detecting means, said second actuating torque being determined according to a deviation of an actual lateral dynamic response of said vehicle from a reference lateral dynamic response that is computed for each given steering input; and means for detecting an understeer condition from said deviation, and suppressing said second actuating torque when an understeer condition is detected on a steady basis.

5,774,820

#### METHOD AND APPARATUS FOR LIMITING THE SPEED OF A MOTOR VEHICLE

Thomas Linden, Stuttgart; Jörg Saur, Eisligen, and Hermann Gaus, Stuttgart, all of Germany, assignors to Mercedes-Benz AG, Germany

Filed Sep. 25, 1995, Ser. No. 533,818

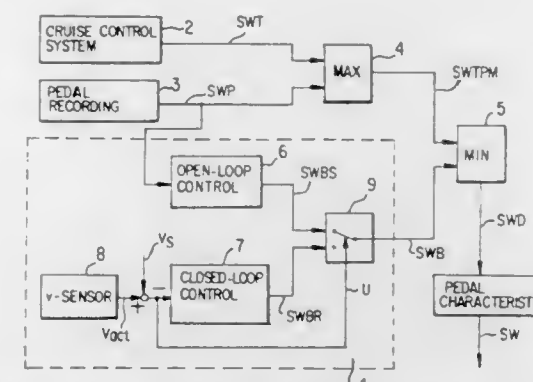
Claims priority, application Germany, Sep. 23, 1994, 44 32 022.2

Int. Cl.<sup>6</sup> B60K 31/00

U.S. Cl. 701—93

10 Claims

1. Method for limiting speed of a motor vehicle to a specified limiting speed which forms a boundary between a range of speeds



which are to be maintained and a range of speeds which are to be avoided, said method comprising the steps of: detecting actual speed of said vehicle; detecting a speed demanded by a driver of said vehicle by an input device; when the speed demanded by the driver is within the range of speeds to be maintained, controlling said actual speed of said vehicle to accord with the speed demanded by the driver; when the speed demanded by the driver is within the range of speeds to be avoided, determining whether the actual speed of the vehicle is within a first specified interval of the range of speeds to be maintained, and if so, performing open-loop control of vehicle speed in accordance with a predetermined open-loop control characteristic, based on said actual vehicle speed; and determining whether the actual vehicle speed is within a second specified interval of the range of speeds to be maintained, which second specified interval lies between said first specified interval and the specified limiting speed, and if so, performing closed-loop control of vehicle speed.

5,774,821

#### SYSTEM FOR DRIVING STABILITY CONTROL

Alfred Eckert, Bodenheim, Germany, assignor to ITT Automotive Europe GmbH, Frankfurt, Germany

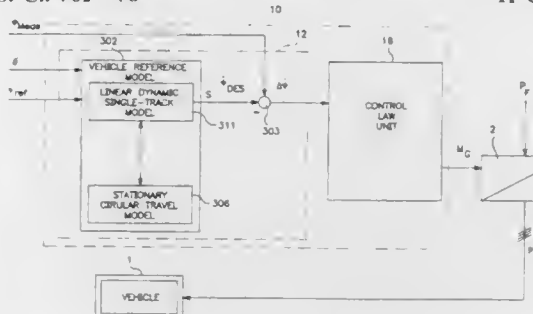
Filed Jun. 7, 1995, Ser. No. 475,389

Claims priority, application Germany, Nov. 25, 1994, 44 41 959.7; Nov. 25, 1994, 44 41 958.9; Nov. 25, 1994, 44 41 956.2; Nov. 25, 1994, 44 41 957.0; Dec. 31, 1994, 44 47 313.3; Apr. 27, 1995, 195 15 056.2; Apr. 27, 1995, 195 15 057.0; Apr. 27, 1995, 195 15 047.3; Apr. 27, 1995, 195 15 051.1; Apr. 27, 1995, 195 15 053.8; Apr. 27, 1995, 195 15 060.0; Apr. 27, 1995, 195 15 061.9; Apr. 27, 1995, 195 15 058.9; Apr. 27, 1995, 195 15 046.5; Apr. 27, 1995, 195 15 048.1

Int. Cl.<sup>6</sup> B60T 8/00; B06K 28/16; G01P 3/44

U.S. Cl. 701—78

11 Claims



1. Control circuit for controlling the driving stability of a vehicle, in which variables entered for setting the velocity of travel and the steering wheel angle are sent to a vehicle model circuit, said vehicle model circuit determining a desired value for the yaw rate on the basis of a vehicle model, wherein said vehicle model is in the vehicle model circuit and simulates the properties of the vehicle, and in which the yaw rate is compared with a measured value of the yaw rate, in a comparison unit, wherein an additional

moment is calculated in a yawing moment controller, and this additional yawing moment is used to set pressure variables, which generate, via the wheel brakes of the vehicle, an additional yawing moment, which brings the yaw rate towards the calculated rate, wherein said vehicle model circuit includes:

- a first vehicle model used to calculate the desired value of the controlled variable; and
- a second vehicle model that replaces the first vehicle model as a function of the measured velocity of travel.

5,774,822

#### FUEL METERING CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

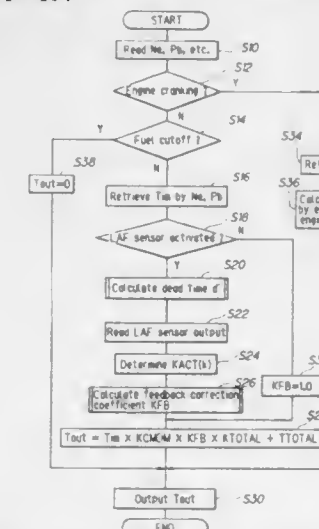
Hiidetaka Maki, and Isao Komoriya, both of Wako, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 23, 1996, Ser. No. 606,383

Claims priority, application Japan, Feb. 25, 1995, 7-061664  
Int. Cl.<sup>6</sup> G06G 7/70; F02M 23/00

U.S. Cl. 701—104

46 Claims



1. A system for controlling fuel metering for a multi-cylinder internal combustion engine, comprising: an air/fuel ratio sensor located in an exhaust system of the engine for detecting an air/fuel ratio in exhaust gas of the engine; engine operating condition detecting means for detecting engine operating conditions including at least engine speed and engine load; basic fuel injection quantity determining means coupled to said engine operating condition detecting means, for determining a basic quantity of fuel injection for a cylinder of the engine based on at least the detected engine operating conditions; a feedback loop means coupled to said fuel injection quantity determining means, and having an adaptive controller and an adaptation mechanism coupled to said adaptive controller for estimating controller parameters, said adaptive controller calculating a feedback correction coefficient using internal variables that include at least said controller parameters, to correct the basic quantity of fuel injection to bring a controlled variable obtained based at least on the detected air/fuel ratio to a desired value determined earlier by a dead time; output fuel injection quantity determining means for determining an output quantity of fuel injection, said output fuel injection quantity determining means correcting the basic quantity of fuel injection using said feedback correction coefficient when engine operation is discriminated to be in a feedback control region; and fuel injection means coupled to said output fuel injection quantity determining means, for injecting fuel into the cylinder of the engine based on the output quantity of fuel injection; wherein:

dead time determining means are operatively coupled to said feedback loop means, for determining the dead time in response to the detected engine operating conditions.

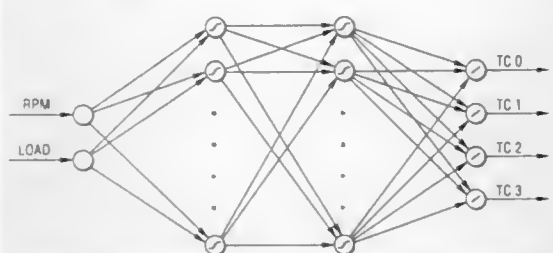
5,774,823  
METHOD OF GENERATION CORRECTION TABLES  
FOR MISFIRE DETECTION USING NEURAL  
NETWORKS

John Victor James, Walled Lake; Timothy Mark Feldkamp; Kenneth Andrew Marko, both of Ann Arbor; Lee Albert Feldkamp, Plymouth, and Gintaras Vincent Puskorius, Novi, all of Mich., assignors to Ford Global Technologies, Inc., Dearborn, Mich.

Filed Sep. 4, 1997, Ser. No. 923,670  
Int. Cl. G01M 15/00

U.S. Cl. 701—110

16 Claims



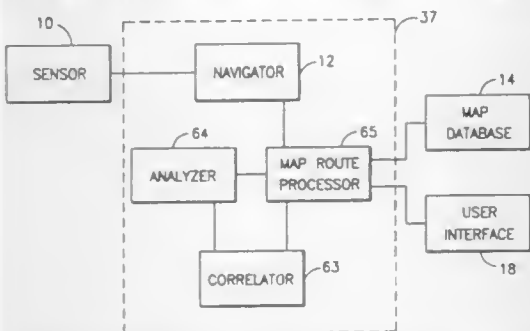
1. A method of automating the calibration of a parameter affecting the operation of a vehicle engine, comprising the steps of: training a neural network to model engine behavior, using a data set obtained from operating a representative engine over its full operating range; exercising the network to generate the calibration parameter by inputting values of engine operating condition variables; and storing the parameter in a memory device.

5,774,824  
MAP-MATCHING NAVIGATION SYSTEM  
Donald A. Strelt, State College; Brian J. Gilmore, Centre Hall; Min Lu, Harrisburg, and Michael A. Pusateri, State College, all of Pa., assignors to The Penn State Research Foundation, University Park, Pa.

Filed Aug. 24, 1995, Ser. No. 518,639  
Int. Cl. G06F 16/500; G08G 1/123

U.S. Cl. 701—207

26 Claims



1. A map matching navigation system to determine a location of a vehicle on a map route, comprising:  
a. a sensor to measure at least one vehicle state characteristic;  
b. a navigator coupled with said sensor to determine a measured point of the vehicle based upon the at least one vehicle state characteristic;  
c. a map database including a plurality of links and a plurality of nodes to define the map route;  
d. a correlator coupled with said navigator and said map database to determine a matched point of the vehicle on the map route which corresponds to the measured point; and

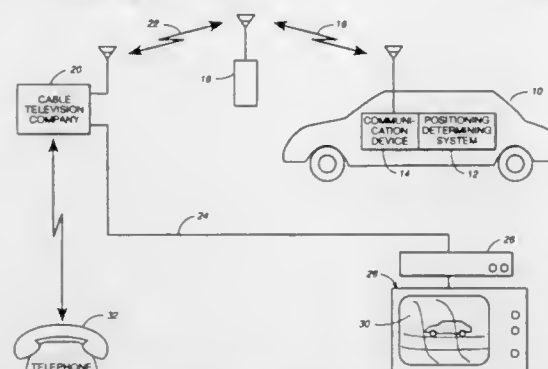
e. an analyzer coupled with said correlator to detect an end of a curve in the map route and updating the measured point and the matched point to the end of the curve.

5,774,825  
SYSTEM FOR AUTOMATIC VEHICLE LOCATION VIA  
CABLE TV  
James C. Reynolds, San Jose, Calif., assignor to Trimble Navigation Limited, Sunnyvale, Calif.

Filed Oct. 18, 1995, Ser. No. 544,556  
Int. Cl. G08G 1/123; G01S 3/02

U.S. Cl. 701—207

23 Claims



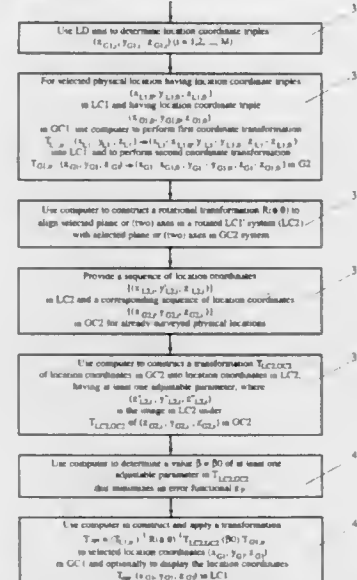
1. A system for visually providing position information representing the location of an item, said system comprising:  
a cable television service provider coupled to a receiver which, in turn, is communicatively coupled to a position determining system monitoring an item to be located, said receiver adapted to receive position information of said item, said cable television service provider further adapted to transmit said position information received at said receiver to a display device.

5,774,826  
OPTIMIZATION OF SURVEY COORDINATE  
TRANSFORMATIONS  
Kenneth W. McBride, Los Altos, Calif., assignor to Trimble Navigation Limited, Sunnyvale, Calif.

Filed Nov. 30, 1995, Ser. No. 565,589  
Int. Cl. G01S 5/02

U.S. Cl. 701—207

20 Claims



17. A method for optimally transforming location coordinates from a global system of survey coordinates to a local system of survey coordinates, the method comprising the steps of:

determining a triple of location coordinates of a first global coordinate system for each of at least two locations, where each location coordinate triple in the first global system corresponds to a triple of location coordinates in a first local coordinate system;

using a computer to determine a first transformation, of the first local system into a second local coordinate system, that translates a location coordinate triple in the first local system by first selected translation coordinates;

using the computer to determine a second transformation, of the first global system into a second global coordinate system, that translates a location coordinate triple by second selected translation coordinates;

using the computer to determine a third transformation, of the second local system into a third local coordinate system, that rotates a location coordinate triple by a selected azimuthal rotation angle and by a selected polar rotation angle;

providing a sequence of location coordinate triples, in the third local system, for physical locations that were determined in a previously-performed survey, and a corresponding sequence of location coordinate triples in the second global system, where a location coordinate triple in the third local system and a corresponding location coordinate triple in the second global system correspond to the same physical location;

using the computer to determine a fourth transformation, of the second global system into the third local system, that has at least one adjustable parameter;

choosing at least one adjustable parameter of the fourth transformation to minimize a survey transformation error, equal to a weighted sum of selected powers of magnitudes of differences between each member of the sequence of location coordinate triples in the second local system and the result of applying the fourth transformation to the corresponding member of the sequence of location coordinate triples in the third local system; and

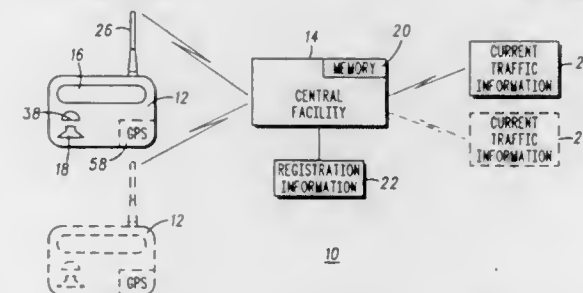
determining the result of applying a fifth transformation, of the first global system into the first local system, to at least one location coordinate triple in the first global system, where the fifth transformation is the inverse of the first transformation, applied to the inverse of the third transformation, applied to the fourth transformation, applied to the second transformation.

5,774,827  
COMMUTER ROUTE SELECTION SYSTEM  
Bernard C. Smith, Jr., Crystal Lake, Ill., and Jeanne A. Shands, Duluth, Ga., assignors to Motorola Inc., Schaumburg, Ill.

Filed Apr. 3, 1996, Ser. No. 627,307  
Int. Cl. G06F 16/500

U.S. Cl. 701—209

10 Claims



10. A commuter route selection system comprising:  
a central facility for storing a plurality of preselected commuter routes for each of a plurality of users and for obtaining current traffic information for each preselected commuter route;

a plurality of portable devices wherein each portable device is designated for a particular user for receiving a current travel time for each preselected commuter route for the particular user and disseminating the current travel time to the particular user;

wherein the central facility transmits the current travel time to one of the plurality of portable devices in response to a request from the portable device; and

wherein each portable device includes a global positioning system unit for transmitting a present location to the central facility and wherein the central facility uses each present location for determining at least a portion of the current traffic information.

5,774,828  
MAPLESS GPS NAVIGATION SYSTEM WITH USER  
MODIFIABLE DATA BASE

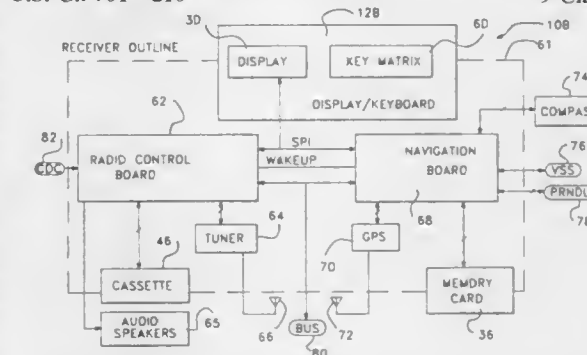
Randall T. Brunts, Carmel, and Douglas Lynn Welk, Rossville, both of Ind., assignors to Delco Electronics Corporation, Kokomo, Ind.

Continuation of Ser. No. 419,002, Apr. 7, 1995, abandoned.  
This application Apr. 21, 1997, Ser. No. 844,628

Int. Cl. G06F 16/500

U.S. Cl. 701—210

9 Claims



1. A mapless navigation system with a user modifiable data base for adding data, including coordinate data, to previously stored data and for recalling the data, said mapless navigation system comprising:

a position sensing receiver for receiving position information and determining a current position thereof;

a user modifiable destination data base internal to the navigation system with programmable memory for adding information to existing destinations to the data base and for adding coordinates of and other information regarding new destinations including said current position as a new destination to said data base;

user interface means in said system for accessing the user modifiable data base, for adding said information to the user modifiable data base, and for recalling database information, including the added information on destinations;

user selectable input means for selecting a desired destination from the user modifiable data base, including the destination added by a user of the data base;

processor means for determining a distance and a direction from the determined current position to the selected desired destination; and

a mapless display for displaying said distance from the current position to the selected desired destination, and a direction pointing indicator in said display for indicating said direction from the current position to the selected desired destination.



5,774,829

**NAVIGATION AND POSITIONING SYSTEM AND METHOD USING UNCOORDINATED BEACON SIGNALS IN CONJUNCTION WITH AN ABSOLUTE POSITIONING SYSTEM**

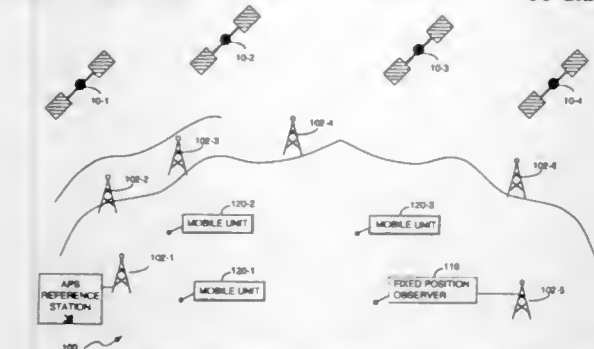
Joseph S. Cisneros, San Dimas; David C. Kelley, Covina; Michael Klang, Aliso Viejo, and Louis A. Greenbaum, Redondo Beach, all of Calif., assignors to Pinterra Corporation, Garden Grove, Calif.

Filed Dec. 12, 1995, Ser. No. 570,747

Int. Cl.<sup>6</sup> G01S 5/02; H04B 7/185

U.S. Cl. 701—213

36 Claims



1. A positioning system for determining location of a mobile unit, said system making use of a multiplicity of transmitters, at known locations, each of which transmits a beacon signal having a phase that is at least partially un-synchronized with the phases of the beacon signals of the other transmitters, each of said beacon signals being of a predetermined repetition rate, said system comprising:

an uncoordinated beacon positioning subsystem (UBS), said subsystem including a UBS receiver for receiving said beacon signals and for providing a UBS location of said mobile unit; an absolute positioning subsystem (APS) including an APS receiver for receiving APS signals and for providing an APS location of said mobile unit; and

a processor for determining uncertainty of location information provided by said beacon signal receiver and said APS receiver, and updating a current location of said mobile unit based on said UBS and APS locations and said uncertainty of said location information;

wherein the processor determines the uncertainty of location information for the APS receiver by measuring and evaluating at least one signal parameter associated with the APS signals, and determines the uncertainty of location information for the UBS receiver by measuring and evaluating at least one signal parameter associated with the received beacon signals.

5,774,830

**CAR NAVIGATION SYSTEM**

Hiroaki Tsuji, Yokohama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jan. 17, 1996, Ser. No. 586,316

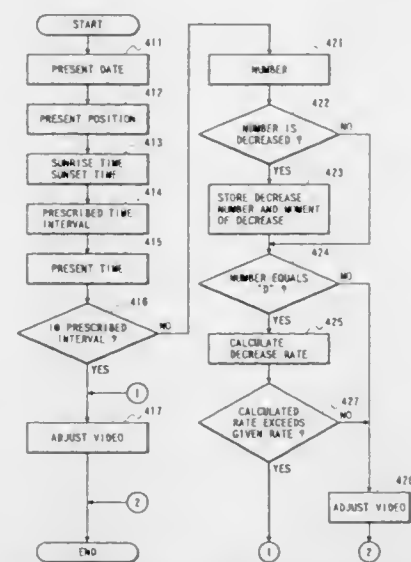
Claims priority, application Japan, Jan. 24, 1995, 7-008661

Int. Cl.<sup>6</sup> G06F 16/00

U.S. Cl. 701—213

3 Claims

3. A navigation system comprising: a GPS receiver; first means for detecting a number of GPS radio signals received by the GPS receiver; second means connected to the first means for calculating a rate of a decrease in the GPS radio signal number detected by the first means; a display for indicating a picture; third means connected to the second means and the display for controlling at least one of a color tone and a luminance of the picture indicated by the display in response to the decrease rate calculated by the second means;



fourth means for deciding whether or not a present time at a present position of the vehicle is in a prescribed time interval corresponding to a nighttime; and fifth means connected to the fourth means and the display for controlling at least one of the color tone and the luminance of the picture indicated by the display in response to a result of said deciding by the fourth means.

5,774,831

**SYSTEM FOR IMPROVING AVERAGE ACCURACY OF SIGNALS FROM GLOBAL POSITIONING SYSTEM BY USING A NEURAL NETWORK TO OBTAIN SIGNAL CORRECTION VALUES**

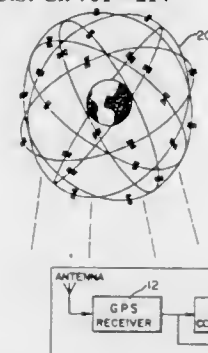
Surender Kumar Gupta, 11 Nanyang View, Singapore 639624, Singapore

Filed Dec. 6, 1996, Ser. No. 760,889

Int. Cl.<sup>6</sup> G01C 21/00

U.S. Cl. 701—214

30 Claims



1. An apparatus adapted to improve the accuracy of signals associated with a global positioning system (GPS), the apparatus including:

- a data conditioner for receiving uncorrected, measured coordinate data from a GPS receiver, processing the coordinate data, and outputting a plurality of discrete values, the plurality of discrete values being directly related to the coordinate data; and
- an artificial neural network comprising:
  - an input layer having a plurality of inputs, each input receiving one of the plurality of discrete values,
  - processing nodes, neurons and weights for mathematically manipulating the inputted values, and
  - an output layer for outputting coordinate data correction values.

5,774,832

**INERTIAL NAVIGATION WITH GRAVITY DEFLECTION COMPENSATION**

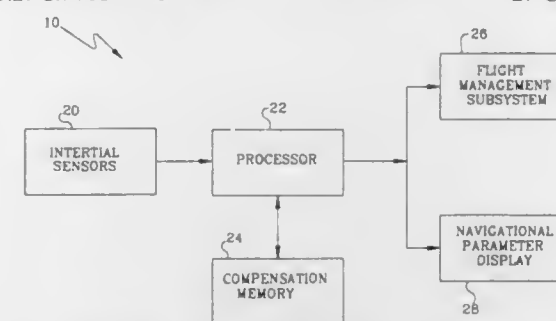
Kevin D. Vanderwerf, Hennepin, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 19, 1996, Ser. No. 633,978

Int. Cl.<sup>6</sup> G01C 21/00; 21/16

U.S. Cl. 701—220

27 Claims



1. A navigation system for mounting to a vehicle, the system comprising:  
an inertial sensor for sensing a first navigational parameter of the vehicle and outputting a sensor signal representing the first parameter;  
a memory having gravity compensation data for a geographic region; and  
a processor coupled to the inertial sensor and the memory, the processor including:  
means for accessing a subset of the gravity compensation data, based on position of the vehicle; and  
means for deriving a second navigational parameter, based on the sensor signal and the subset of gravity compensation data.

5,774,833

**METHOD FOR SYNTACTIC AND SEMANTIC ANALYSIS OF PATENT TEXT AND DRAWINGS**

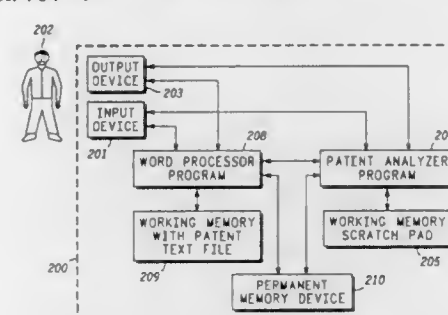
Marc Alan Newman, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 8, 1995, Ser. No. 569,053

Int. Cl.<sup>6</sup> G06F 17/28

U.S. Cl. 704—9

34 Claims



1. A method for processing patent text in a computer, the method comprising the steps of:  
identifying boundaries of a plurality of parts of the patent text;  
loading at least one of the plurality of parts of the patent text into a working memory of a computer;  
analyzing the at least one of the plurality of parts of the patent text, including the substeps of:  
recognizing patent text drawing references;  
loading drawing data from one or more computer drawing files into the working memory of the computer, wherein the one or more computer drawing files and said patent text correspond to a specific invention;  
extracting alphanumeric drawing data from the drawing data; and

comparing the patent text drawing references with the alphanumeric drawing data; and  
reporting results to a user.

5,774,834

**SYSTEM AND METHOD FOR CORRECTING A STRING OF CHARACTERS BY SKIPPING TO PSEUDO-SYLLABLE BORDERS IN A DICTIONARY**

Eric M. Visser, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

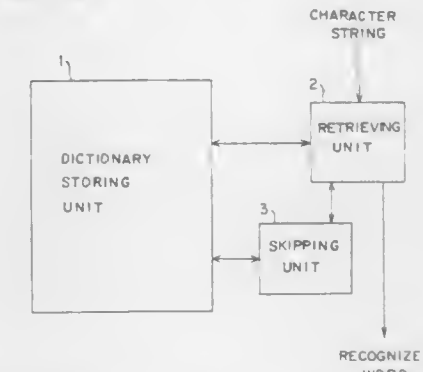
Filed Aug. 31, 1995, Ser. No. 521,725

Claims priority, application Japan, Sep. 1, 1994, 6-208307

Int. Cl.<sup>6</sup> G06F 17/20

U.S. Cl. 704—10

12 Claims



1. A character string correcting system suitable for use with an information process apparatus to conduct morphological analysis while comparing an input character string with entries in a dictionary, said system comprising:  
dictionary storing means for storing a dictionary having entries for input characters for comparison with characters of the input character string, and for storing an appropriate position in each entry of the dictionary as a pseudo-syllable border;  
retrieving means for retrieving the dictionary stored in said dictionary storing means so as to retrieve an entry of the dictionary corresponding to the input character string, and to output a recognized word resulting from the retrieval; and  
skipping means for, when a character of the input string does not coincide with an entry for input characters, skipping a part of the dictionary as well as a part of the input character string to locate a position at which a character of the input character string coincides with an entry for input characters thereby causing said retrieving means to start from the position in the input character string, said skipping means skipping to the pseudo-syllable border of the dictionary when a character of the input character string does not coincide with any of the entries for input characters.

5,774,835

**METHOD AND APPARATUS OF POSTFILTERING USING A FIRST SPECTRUM PARAMETER OF AN ENCODED SOUND SIGNAL AND A SECOND SPECTRUM PARAMETER OF A LESSER DEGREE THAN THE FIRST SPECTRUM PARAMETER**

Kazunori Ozawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Aug. 21, 1995, Ser. No. 517,357

Claims priority, application Japan, Aug. 22, 1994, 6-196563

Int. Cl.<sup>6</sup> G10L 5/00; 9/02; 7/02

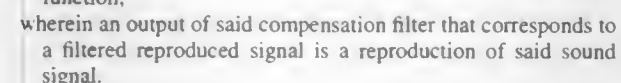
U.S. Cl. 704—205

20 Claims

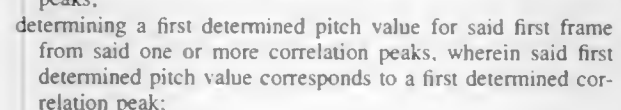
1. A postfilter for reproducing a sound signal that has been encoded with an encoder, by using a decoder and compensating a reproduced signal that was output from said decoder, said postfilter comprising:

first calculating means for calculating a second spectrum parameter based on a first spectrum parameter supplied from said

# UMI

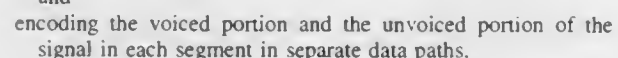


## 19 Claims



determining a new determined pitch value for said first frame from at least a subset of said one or more correlation peaks, wherein said determining said new determined pitch value does not use said first determined correlation peak, wherein said determining said new determined pitch value is performed if any pitch multiples of said first determined pitch value have missing correlation peaks.

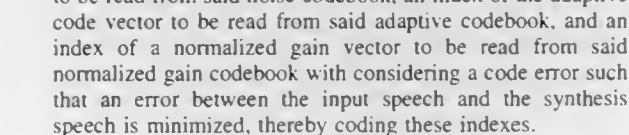
### 34 Claims



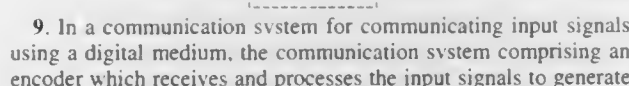
### 18 Claims

U.S. Cl. 704—222 18 Claims

14. A speech coding apparatus comprising:  
a noise codebook for storing a plurality of noise code vectors;

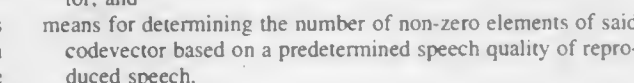


## 10 Claims



selecting one predictor out of said set of predictors from said switched prediction means and selecting, for each of said first and final stages, at least one entry from said set of tables of said vector quantization means using global decision means according to said predetermined distance measure, generating said quantized data vector.

## 10 Claims





5,774,841

REAL-TIME RECONFIGURABLE ADAPTIVE SPEECH  
RECOGNITION COMMAND AND CONTROL  
APPARATUS AND METHOD

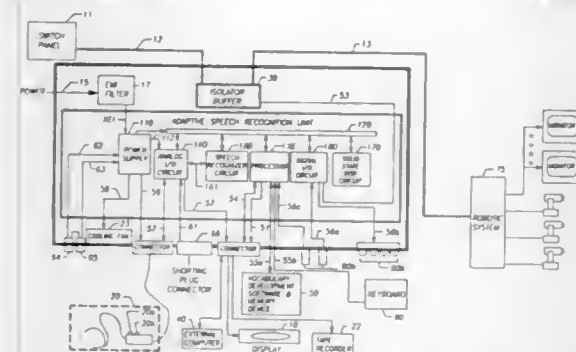
George A. Salazar, Katy; Dena S. Haynes, and Marc J. Sommers, both of League City, all of Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sep. 20, 1995, Ser. No. 536,302

Int. Cl. G10L 5/00

U.S. Cl. 704—225

20 Claims



1. An adaptive speech recognition and control system, comprising:

a speech recognition circuit section including memory means for storing a plurality of vocabulary subsets, each of the plurality of vocabulary subsets identified by a node, each subset comprising a plurality of voice templates;

a microphone;

analog circuitry associated with the microphone for processing voice commands spoken into the microphone and conducting the processed signals to the speech recognition circuitry;

processing means associated with the speech recognition circuitry for causing the speech recognition circuit section to user-selectively transition to a node which opens a memory section storing a selected vocabulary subset, corresponding to a spoken transitional command, in response to a predetermined transitional command being spoken into the microphone by an operator, and for subsequently causing the speech recognition circuitry to search the voice templates stored in the selected subset upon a vocabulary term subsequently being spoken while the speech recognition circuit is transitioned to the node corresponding to the selected vocabulary subset, and for determining, within a degree of certainty, whether the vocabulary term matches one of the voice templates in the selected subset.

5,774,842

NOISE REDUCTION METHOD AND APPARATUS  
UTILIZING FILTERING OF A DITHERED SIGNAL

Ayataka Nishio, and Tooru Sugihara, both of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 18, 1996, Ser. No. 634,394

Claims priority, application Japan, Apr. 20, 1995, 7-094942

Int. Cl. H03M 1/20; 1/00; H04N 5/21

U.S. Cl. 704—226

4 Claims

1. A noise reducing apparatus comprising:

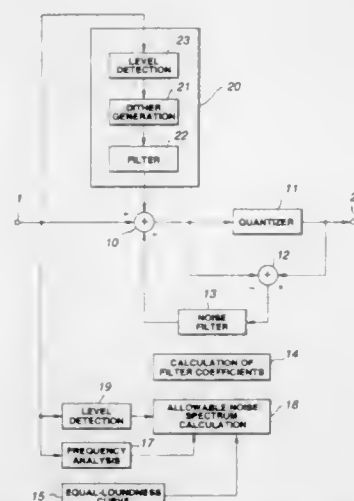
quantization means for quantizing a signal fed thereto;

subtraction means for subtracting the signal fed to said quantization means from an output signal of said quantization means;

first filter means for filtering a signal output from the subtraction means;

dither signal generating means for generating a dither signal having flat frequency characteristics;

a second filter for continuously low-pass filtering a low frequency signal to which human hearing is sensitive from said dither signal to generate a low-pass filtered signal; and



addition means for summing the low-pass filtered signal from the second filter with the signal output from the first filter and for providing a summed signal to the quantization means.

5,774,843

METHODS OF EFFICIENTLY RECORDING AN AUDIO  
SIGNAL IN SEMICONDUCTOR MEMORY

Kazuhiro Sugiyama; Yukari Ono, and Yoshinobu Ishida, all of Nagaokakyo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

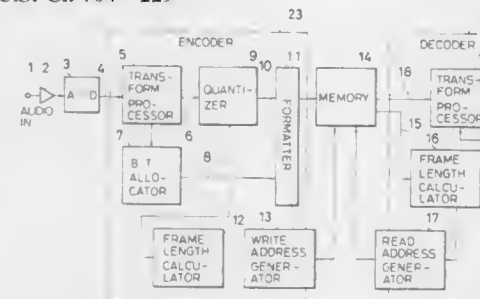
Division of Ser. No. 536,356, Sep. 29, 1995, Pat. No. 5,630,010, which is a division of Ser. No. 45,705, Apr. 14, 1993, Pat. No. 5,495,552. This application Jun. 28, 1996, Ser. No. 671,640

Claims priority, application Japan, Apr. 20, 1992, 4-099647; Jul. 24, 1992, 4-198463; Jul. 24, 1992, 4-198464

Int. Cl. G10L 5/00

U.S. Cl. 704—229

13 Claims



1. A method of hierarchically encoding an audio signal, comprising the steps of:

(a) digitizing the audio signal;

(b) hierarchically encoding the digitized audio signal, step (b) including the substeps of:

(1) encoding a relatively lowest hierarchical level with a first number of bits, from a first portion of the digitized audio signal below a first predetermined frequency, and

(2) encoding a relatively higher hierarchical level with a second number of bits, greater than the first number of bits, from a portion of the digitized audio signal below a second predetermined frequency greater than the first predetermined frequency, the encoded relatively higher hierarchical level further excluding the encoded first portion of the digitized audio signal; and

(c) separately outputting an encoded digitized audio signal of a relatively lowest hierarchical level and an encoded digitized audio signal of a relatively higher hierarchical level.

5,774,844

METHODS AND APPARATUS FOR QUANTIZING,  
ENCODING AND DECODING AND RECORDING MEDIA  
THEREFOR

Kenzo Akagiri, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP94/01888, § 371 Date Jun. 22, 1995, § 102(e) Date Jun. 22, 1995, PCT Pub. No. WO95/13660, PCT Pub. Date May 18, 1995

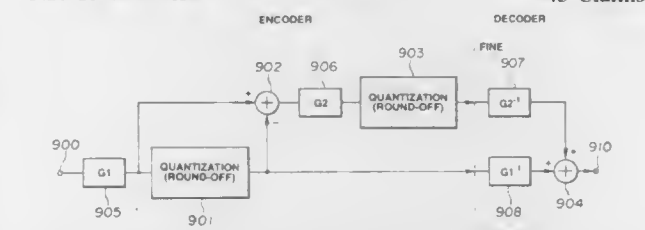
PCT Filed Nov. 9, 1994, Ser. No. 464,787

Claims priority, application Japan, Nov. 9, 1993, 5-279383; Nov. 17, 1993, 5-288096

Int. Cl. G10L 9/00

U.S. Cl. 704—230

43 Claims



1. A quantizing apparatus for quantizing time domain samples or frequency domain samples of an input signal, comprising: sample means for quantizing, individually by one sample, each quantization error at quantization of the preceding stage to thereby decompose the time region sample or the frequency region

at least one quantizing means for quantizing the samples; and means for determining a quantization error based upon the samples and the quantized samples, wherein the at least one quantizing means also quantizes the quantization error to thereby decompose the samples into at least two words.

5,774,845

## INFORMATION EXTRACTION PROCESSOR

Shinichi Ando, and Shinichi Doi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

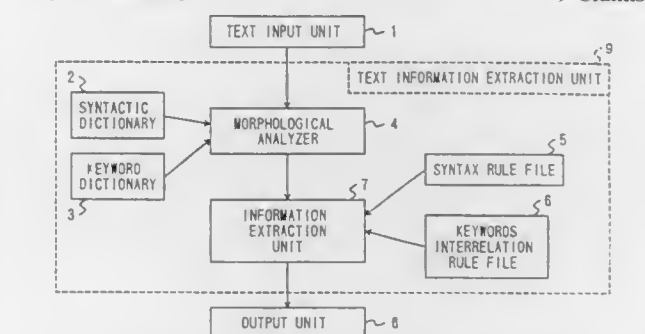
Filed Sep. 13, 1994, Ser. No. 304,945

Claims priority, application Japan, Sep. 17, 1993, 5-230701; Sep. 17, 1993, 5-230702; Dec. 27, 1993, 5-330277

Int. Cl. G06F 17/20

U.S. Cl. 704—231

9 Claims



1. An information extraction processor comprising:

a text input unit for receiving an object text described in a natural language;

a syntactic dictionary for storing morphemes with syntactic attributes;

a keyword dictionary for storing keywords of information to be extracted, and a role of each keyword to be performed by said keyword at an output stage of said information;

a morphological analyzer connected to said text input unit for dividing said text input into morphemes composing said text, and is connected to said syntactic dictionary and to said keyword dictionary for assigning contents of said syntactic dictionary and said keyword dictionary to each morpheme;

a syntax rule file for storing rules for analyzing sentence structure by using said syntactic attributes stored in said syntactic dictionary and said information stored in said keyword dictionary;

a keywords interrelation rule file for storing rules for generating a semantic structure of indicating relations between keywords through controlling the syntax rule by keyword information assigned to keywords;

an information extraction unit connected to said morphological analyzer, to said syntax rules file, and to said keywords interrelationship rule file for analyzing a sequence of morphemes received from said morphological analyzer, with syntax rules stored in said syntax rule file and with keyword interrelation rules stored in said keywords interrelation rule file, to generate a semantic structure indicating relations between keywords; and

an output unit connected to said information extraction unit for converting said semantic structure indicating relations between keywords to displayed image patterns.

5,774,846

SPEECH CODING APPARATUS, LINEAR PREDICTION  
COEFFICIENT ANALYZING APPARATUS AND NOISE  
REDUCING APPARATUS

Toshiyuki Morii, Tokyo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

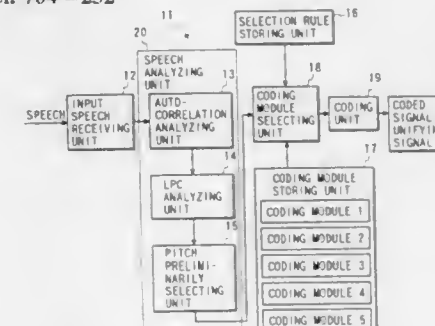
Filed Nov. 20, 1995, Ser. No. 559,667

Claims priority, application Japan, Dec. 19, 1994, 6-314483; Dec. 26, 1994, 6-322494; Dec. 26, 1994, 6-322495; Jul. 14, 1995, 7-178484

Int. Cl. G10L 5/00

U.S. Cl. 704—232

6 Claims



1. A speech coding apparatus, comprising:

coding module storing means for storing a plurality of coding modules;

speech analyzing means for analyzing a sample speech signal to obtain a plurality of sample characteristic parameters indicating sample speech characteristics of the sample speech signal, calculating a coding distortion from the sample characteristic parameters in each of the coding modules stored in the coding module storing means and analyzing a speech signal to obtain a plurality of characteristic parameters indicating speech characteristics of the speech signal;

statistic processing means for statistically processing the sample characteristic parameters and the coding distortions obtained by the speech analyzing means to obtain a coding module selecting rule;

coding module selecting means for selecting one of the coding modules stored in the coding module storing means as an appropriate coding module, in which a coding distortion for the characteristic parameters obtained by the speech analyzing means is minimized, according to the coding module selecting rule obtained by the statistic processing means; and

coding means for coding the speech signal obtained by the speech analyzing means in the appropriate coding module selected by the coding module selecting means.

**5,774,847**  
**METHODS AND APPARATUS FOR DISTINGUISHING STATIONARY SIGNALS FROM NON-STATIONARY SIGNALS**

Chung Cheung Chu, Brossard, and Rafi Rabipour, Cote St. Luc, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

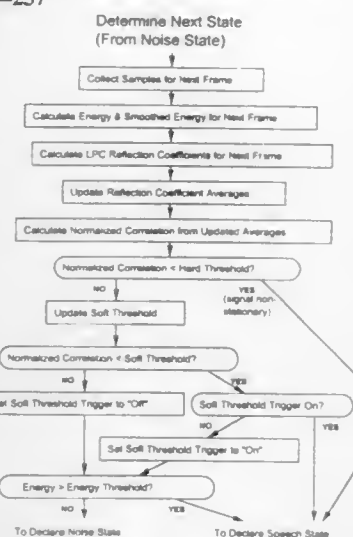
Continuation of Ser. No. 431,224, Apr. 29, 1995, abandoned.

This application Sep. 18, 1997, Ser. No. 933,531

Int. Cl.<sup>6</sup> G10L 9/14

U.S. Cl. 704—237

23 Claims



1. A method of distinguishing a stationary signal from a non-stationary signal, the method comprising:

determining a set of Linear Predictive Coding (LPC) coefficients characterizing spectral properties of the signal for each of a plurality of successive time intervals including a current time interval;

averaging the LPC coefficients over a plurality of successive time intervals preceding the current time interval; determining a cross-correlation of the LPC coefficients for the current time interval with the averaged LPC coefficients; declaring the signal to be stationary in the current time interval when the cross-correlation exceeds a threshold value; and declaring the signal to be non-stationary in the current time interval when the cross-correlation is less than the threshold value.

**5,774,848**  
**REFERENCE PATTERN TRAINING SYSTEM AND SPEECH RECOGNITION SYSTEM USING THE SAME**  
Hiroaki Hattori, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Mar. 11, 1996, Ser. No. 613,887

Claims priority, application Japan, Mar. 9, 1995, 7-050195

Int. Cl.<sup>6</sup> G10L 5/06

U.S. Cl. 704—244

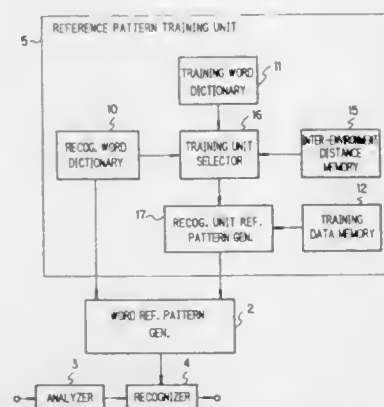
10 Claims

1. A reference pattern training system for generating recognition units smaller than a word and with preceding and succeeding phoneme context taken into consideration, comprising:

a recognition word dictionary in which recognition subject words, recognition units contained in the recognition subject words and phoneme environment data about each of the recognition units are stored;

a training word dictionary in which recognition unit training words, recognition units contained in the recognition unit training words and phoneme environment data about each of the recognition units are stored;

training data memory for storing recognition unit training data; a training unit selector for selecting a recognition unit from the recognition unit training words stored in the training word dictionary, the selected recognition unit resembling a recognition unit contained in a recognition subject word stored in the



recognition word dictionary, by taking out and comparing phoneme environment data of individual recognition units from the recognition and training word dictionaries; and a recognition unit reference pattern generator dependent on phoneme context for training the selected recognition unit by using the training unit selected by the training unit selector and recognition unit training data stored in the training data memory.

**5,774,849**  
**METHOD AND APPARATUS FOR GENERATING FRAME VOICING DECISIONS OF AN INCOMING SPEECH SIGNAL**

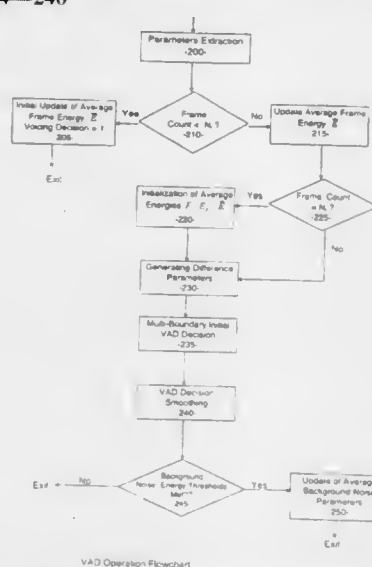
Adil Benyassine, Costa Mesa, and Eyal Shlomot, Irvine, both of Calif., assignors to Rockwell International Corporation, Newport Beach, Calif.

Filed Jan. 22, 1996, Ser. No. 589,509

Int. Cl.<sup>6</sup> G10L 5/06

U.S. Cl. 704—246

14 Claims



1. In a speech communication system comprising: (a) a speech encoder for receiving and encoding an incoming speech signal to generate a bit stream for transmission to a speech decoder; (b) a communication channel for transmission; and (c) a speech decoder for receiving the bit stream from the speech encoder to decode the bit stream to generate a reconstructed speech signal, said incoming speech signal comprising periods of active voice and non-active voice, a method for generating frame voicing decisions, comprising the steps of:

a) extracting a predetermined set of parameters from said incoming speech signal for each frame;

b) making a frame voicing decision of the incoming speech signal for each frame according to said predetermined set of parameters, wherein said predetermined set of parameters in

said Step a) comprises a spectral difference between said incoming speech signal and ambient background noise based on LSF.

**5,774,850**  
**SOUND CHARACTERISTIC ANALYZER WITH A VOICE CHARACTERISTIC CLASSIFYING TABLE, FOR ANALYZING THE VOICES OF UNSPECIFIED PERSONS**  
Ichiro Hattori, Zushi, and Akira Suzuki, Yokohama, both of Japan, assignors to Fujitsu Limited & Animo Limited, Kanagawa, Japan

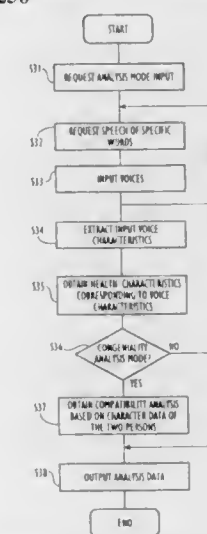
Filed Apr. 26, 1996, Ser. No. 638,295

Claims priority, application Japan, Apr. 26, 1995, 7-102631

Int. Cl.<sup>6</sup> G10L 7/08

U.S. Cl. 704—250

9 Claims



1. A sound characteristic analyzer comprising:

requesting means for requesting a user to speak predetermined words by displaying the predetermined words on a display; input means for inputting by a user of spoken sound of predetermined words;

extracting means for extracting voice characteristics of said spoken sound of predetermined words inputted by said input means;

a voice characteristics classifying table for prestoring analysis information corresponding to a plurality of voice characteristics of said predetermined words, said prestored analysis information being derived from spoken sounds of others than said user; and

an analysis information output means for outputting analysis information, based upon said voice characteristics classifying table and said voice characteristics extracted from said user spoken sound by said extracting means.

**5,774,851**  
**SPEECH RECOGNITION APPARATUS UTILIZING UTTERANCE LENGTH INFORMATION**

Koichi Miyashiba, and Yasunori Ohara, both of Atsugi, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 141,720, Oct. 26, 1993, abandoned, which is a continuation of Ser. No. 549,245, Jul. 9, 1990, abandoned, which is a continuation of Ser. No. 896,069, Aug. 13, 1986, abandoned. This application May 19, 1995, Ser. No. 446,077

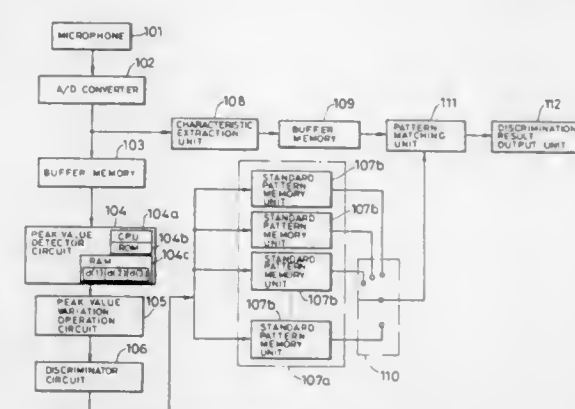
Claims priority, application Japan, Aug. 15, 1985, 60-178510; Dec. 20, 1985, 60-285792; Dec. 20, 1985, 60-285794

Int. Cl.<sup>6</sup> G10L 5/06

U.S. Cl. 704—252

10 Claims

1. An apparatus for receiving speech data input thereto, comprising:



input means for inputting speech data; detecting means for detecting a plurality of sets of maximums and minimums of adjacent peak values of different signs of the input speech data; memory means for storing the plurality of maximums and minimums detected by said detecting means; determining means for determining a ratio of stored maximums and/or minimums of adjacent peak values; operating means, using the result of the determining by said determining means, for calculating a characteristic variation over time of a correlation value of each group of the plurality of maximums stored in said memory means and calculating a characteristic variation over time of a correlation value of each group of the plurality of minimums stored in said memory means; a plurality of dictionary means for storing a plurality of standard speech data; and preliminary selecting means for preliminarily selecting one of said dictionary means in accordance with the calculated characteristic variation over time of the correlation value.

5,774,852

Patent Not Issued For This Number

**5,774,853**  
**SERIAL INTERFACE SPEECH SYNTHESIZERS**  
James Lin, Hsin Chu, Taiwan, assignor to Winbond Electronics Corporation, Hsinchu, Taiwan

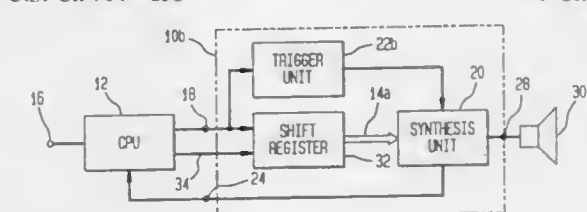
Continuation of Ser. No. 179,745, Jan. 11, 1994, abandoned.

This application Jun. 16, 1997, Ser. No. 874,442

Int. Cl.<sup>6</sup> G10L 3/00

U.S. Cl. 704—258

5 Claims



1. A serial interface speech synthesizer system, responsive to a control signal serially encoded to include information corresponding to an address location of a selected speech segment signal, said control signal comprising a series of pulses corresponding to a numerical representation of said selected speech segment signal, said system comprising:

a signal converter for converting said control signal, coupled via an input port having only a single signal path, to a corresponding multi-bit binary selection signal representing the amount of said pulses in said control signal;

a synthesis unit, responsive to a trigger signal and coupled to said signal converter, for providing the selected one of a



variety of said speech segment signals based on said binary selection signal coupled via an address bus including several parallel signal paths;

- a trigger signal generator, coupled to said synthesis unit and responsive to said control signal coupled via said input port, for processing said control signal to reduce undesired triggering effects in order to provide said trigger signal; and
- an output port, coupled to said synthesis unit, for coupling said speech segment signal from said synthesis unit to a utilization device.

5,774,854

## TEXT TO SPEECH SYSTEM

Richard Anthony Sharman, Southampton, United Kingdom, assignor to International Business Machines Corporation, Armonk, N.Y.

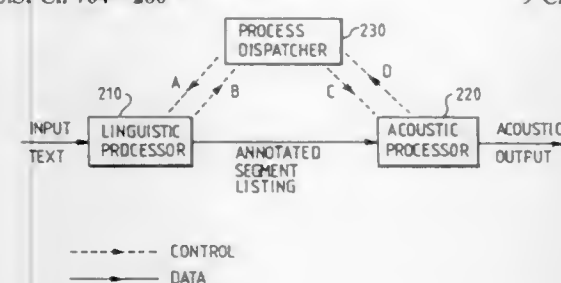
Filed Nov. 22, 1994, Ser. No. 343,304

Claims priority, application United Kingdom, Jul. 19, 1994, 9414539

Int. Cl.<sup>6</sup> G10L 5/02; 9/00

U.S. Cl. 704—260

9 Claims



1. A text to speech (TTS) system for converting input text into an output acoustic signal simulating natural speech, the text to speech system comprising: a linguistic processor for generating a listing of speech segments plus associated parameters from the input text, and an acoustic processor for generating the output acoustic waveform from said listing of speech segments plus associated parameters;

said system being characterized in that it is output driven, wherein the acoustic processor sends a request to the linguistic processor whenever it needs to obtain a further listing of speech segments plus associated parameters, the linguistic processor processing input text in response to such requests.

5,774,855

## METHOD OF SPEECH SYNTHESIS BY MEANS OF CONCENTRATION AND PARTIAL OVERLAPPING OF WAVEFORMS

Enzo Foti, Luciano Nebbia, and Stefano Sandri, all of Turin, Italy, assignors to CSELT-Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Sep. 15, 1995, Ser. No. 528,713

Claims priority, application Italy, Sep. 29, 1994, TO94A0756

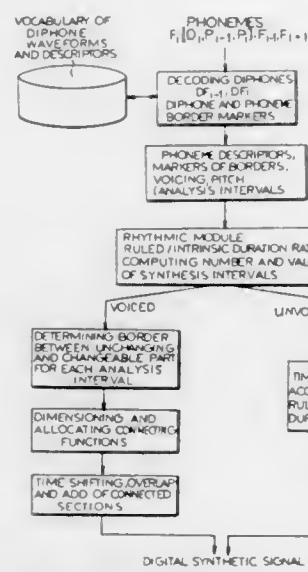
Int. Cl.<sup>6</sup> G10L 9/12

U.S. Cl. 704—267

8 Claims

1. A method for speech signal synthesis by means of time concatenation of waveforms representing elementary speech signal units, which comprises the steps of:

- (a) subdividing at least the waveforms associated with voiced sounds into a plurality of waveform intervals, corresponding to the responses of the vocal duct to a series of impulses of vocal cord excitation, synchronous with a fundamental frequency;
- (b) weighting each waveform interval to produce signals;
- (c) replacing the signals produced from the weighting of the waveform intervals upon subdivision thereof with a replica shifted in time by an amount depending on a prosodic information; and



means, a logic function memory means, a control means, and an initiating means; said method comprising the steps of:

- I. teaching said system a voice password, voice service passwords and control commands in advance by
  - (a) initializing said system by said initiating means,
  - (b) interactively entering a voice password, voice service passwords and control commands into said system, said voice service passwords including a voice changing mode service password,
  - (c) analyzing said voice password, said voice service passwords and said control commands in a text-dependent and a text-independent mode, respectively, by said user's personality voice verification means and said voice message recognition means controlled by said control means, and
  - (d) storing said voice password, said voice service passwords and said control commands in said logic function memory means;
- II. teaching said system said voice password, voice service passwords and control commands in said voice changing mode by
  - (e) entering said voice changing mode service password into said system,
  - (f) interactively entering said voice password, voice service passwords and control commands into said system in said voice changing mode,
  - (g) analyzing said entered in step (f) voice password, voice service passwords and control commands in a text-dependent and a text-independent mode, respectively, by said user's personality voice verification means and said voice message recognition means controlled by said control means,
  - (h) storing said analyzed in step (g) voice password, said voice service passwords and said control commands in said logic function memory means, to thereby allow said user whose voice has suffered a substantial change as a result of sickness or a different psychophysiological state to operate said system, and
- III. transferring said system into an operational state.

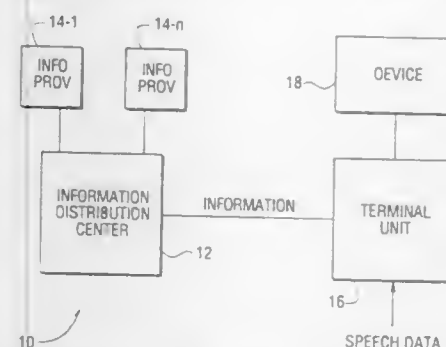
5,774,859  
INFORMATION SYSTEM HAVING A SPEECH  
INTERFACE

Peter B. Houser, Poway, Calif.; Mark E. Schutte, Sugar Hill, Ga., and Gloria J. Majid, San Diego, Calif., assignors to Scientific-Atlanta, Inc., Norcross, Ga.

Filed Jan. 3, 1995, Ser. No. 367,997  
Int. Cl.<sup>6</sup> H04N 7/00; G10L 9/00

U.S. Cl. 704-275

10 Claims



1. A subscription television system, comprising:
  - a head-end installation for transmitting vocabulary data comprising phoneme data for defining a vocabulary of spoken commands;
  - subscriber terminal apparatus coupled to a television, said subscriber terminal apparatus including:
  - a microphone for detecting spoken command data;
  - a receiver for receiving the vocabulary data transmitted from said head-end installation; and

a processor for executing a speech recognition algorithm using the vocabulary data received by said receiver to recognize spoken commands detected by said microphone and for controlling said television in accordance with the recognized spoken commands.

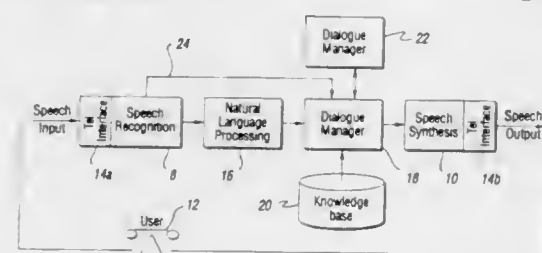
5,774,860  
ADAPTIVE KNOWLEDGE BASE OF COMPLEX  
INFORMATION THROUGH INTERACTIVE VOICE  
DIALOGUE

Aruna Bayya, Westminster, and Louis A. Cox, Jr., Denver, both of Colo., assignors to U S West Technologies, Inc., Boulder, Colo.

Continuation of Ser. No. 266,825, Jun. 27, 1994, abandoned.  
This application Oct. 30, 1996, Ser. No. 741,298  
Int. Cl.<sup>6</sup> G10L 3/00

U.S. Cl. 704-275

2 Claims



1. A computerized method for providing user access to an adaptive knowledge base of complex information through an interactive voice dialogue, comprising:

providing a memory;  
storing in memory a plurality of selected words as recognized in predetermined phrases and contexts when spoken by a user;  
storing in memory a voice template having selected information slots in corresponding frames, each of the slots and frames adapted to be continuously filled by recognized words, wherein the selected information slots comprise "current location", "destination" and "orientation", and wherein the frames corresponding to the "current location", "destination", and "orientation" slots each comprise "cross street" and "landmarks";  
initiating user speech utterances for receipt by the computer, the speech utterances requesting complex information;  
continuously receiving and comparing the user speech utterances to the stored plurality of selected words so as to fill the slots and frames of the voice template; and  
adaptably generating, based on the context of the interactive dialogue and the extent of filled slots and frames of the voice template, responsive speech segments which provide the requested complex information or, alternatively, request additional information necessary to provide a full response to the user.

5,774,861  
MIRROR AND LIGHT BOX ASSEMBLY WITH  
MOTHER'S IMAGE DISPLAY AND VOICE PLAYBACK  
ACTIVATED BY CRYING INFANT

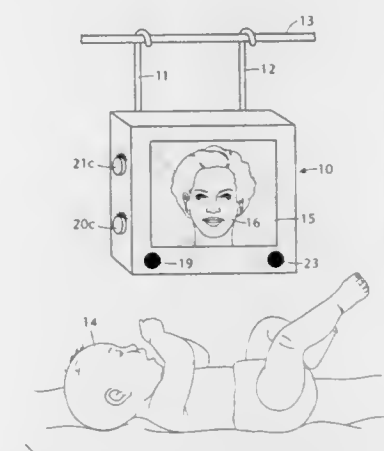
Donald Spector, 380 Mountain Rd., Union City, N.J. 07080  
Filed Jan. 9, 1997, Ser. No. 785,815

Int. Cl.<sup>6</sup> G10L 9/06; G09F 27/00

U.S. Cl. 704-275

11 Claims

1. A mirror and light box assembly installable in an enclosure occupied by an infant having a mother, said assembly comprising:
  - A. a light box having a front face on which is mounted a semi-reflecting mirror behind which is a photographic image of the mother;

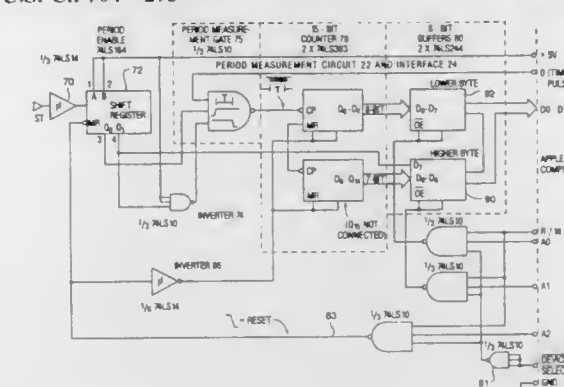


- B. a light producing means within the box which when activated then illuminates the transparency to render the image visible to the infant through the mirror which is then effectively transparent;
- C. a record playback unit associated with the box which when activated, reproduces a voice message recorded by the mother addressed to her infant; and
- D. means responsive to sounds of crying emanating from the infant to concurrently activate the light producing means and the playback unit whereby when the infant cries, it is then presented with and comforted by an image of its mother and her voice message.

5,774,862  
COMPUTER COMMUNICATION SYSTEM  
Kit-Fun Ho, P.O. Box 54504, North Point, Hong Kong  
Continuation of Ser. No. 433,245, May 2, 1995, abandoned,  
which is a continuation of Ser. No. 836,185, Feb. 13, 1992,  
abandoned, which is a continuation of Ser. No. 472,422, Jan.  
30, 1990, which is a continuation of Ser. No. 622,210, Jun. 19,  
1989. This application Jul. 3, 1997, Ser. No. 887,666  
Int. Cl.<sup>6</sup> G10L 9/12; 9/00

U.S. Cl. 704-275

24 Claims



1. A system for communication, by means of verbal inputs from human speakers tolerant of more than two zero crossings per repetitive period in the wave pattern of the speaker's voice and of the pitch range of the speaker's voice, with a computer having a series of subroutines prerecorded therein in association with different predetermined tonal intervals, comprising:

- (a) means including a transducer and a wave shaping circuit comprising an amplifying and low pass filtering circuit having an input and an output, said input being coupled to said transducer, and a comparator having an input and an output, said comparator input being coupled to said amplifying and low pass filtering circuit for converting a verbal input having a repetitive period into a signal representative of the repetitive period of said verbal input of a conversion resolution exceeding twelve musical notes per octave;

- (b) means including a period measurement means coupled to said verbal input converting means for calculating the interval between a signal representative of the repetitive period of a received verbal input and a variable reference tonal signal; and
- (c) means in said computer responsive to said converting and calculating means for selecting and running a prerecorded subroutine associated with the particular interval calculated by said interval calculating means.

5,774,863  
SPEECH INFORMATION RECORDING/REPRODUCING  
APPARATUS

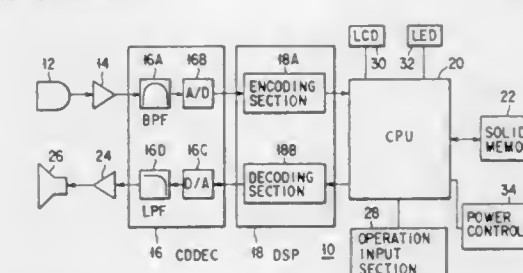
Hideo Okano, Han-no; Hisashi Suekane, Hachioji; Hisato Torii, Hachioji; Takafumi Onishi, Hachioji; Nobuo Terui, Hachioji; Hidetaka Takahashi, Hachioji, and Hiroshi Takisawa, Hoya, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 3, 1995, Ser. No. 415,341

Claims priority, application Japan, Oct. 13, 1994, 6-248100  
Int. Cl.<sup>6</sup> G10L 3/00

U.S. Cl. 704-278

23 Claims



1. A speech information recording/reproduction apparatus comprising:

- a rewritable solid memory for recording digital speech data, into which a speech signal is converted;
- erasing means for erasing the speech data from the solid memory;
- a first operation section for setting an erase range to erase the speech data from the solid memory, said first operation section including a position search operation member and a partial erasure operation member, said position search operation member being operated to search for an erasure start position, said partial erasure operation member being operated to indicate a partial erasure of the speech data, said position search operation member being operated again to search for an erasure end position, and said partial erasure operation member being operated again to set the erase range;
- delay means for delaying erasing of the speech data by a predetermined period of time after the erase range is set by said first operation section;
- a display for displaying predetermined information on erasure for the predetermined period of time;
- a second operation section for canceling the erasure; and
- a controller for preventing said erasing means from erasing the speech data when said second operation section is operated while said display is displaying the predetermined information, and for causing said erasing means to erase the speech data from said solid memory when said second operation section is not operated while said display is displaying the predetermined information.



5,774,864

## COMPOSITE DYNAMIC-CROSSTALK/PHANTOM-CENTER DECODER FOR MPEG-2 MULTICHANNEL AUDIO

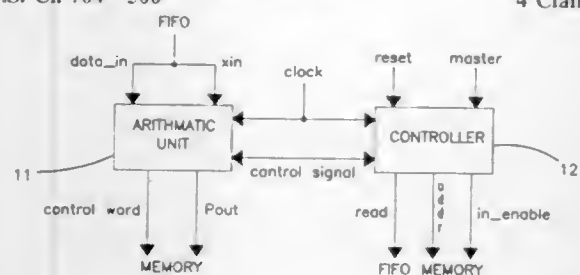
Young Tae Han; Sang Tae Choi; Jong Seog Koh, and Soon Hong Kwon, all of Taejeon, Rep. of Korea, assignors to Korea Telecommunication Authority, Seoul, Rep. of Korea  
Filed Aug. 9, 1996, Ser. No. 696,030

Claims priority, application Rep. of Korea, Aug. 9, 1995, 95-24569

U.S. Cl. 704-500

Int. Cl. H04S 3/00

4 Claims



1. A composite decoding device for a multichannel audio decoder, comprising:

arithmetic means for receiving a control word, an information and a scale factor from a first-in-first-out memory, performing an arithmetic operation with respect to the received information and scale factor on the basis of a dynamic crosstalk coding manner or a phantom coding manner determined by the received control word and outputting the arithmetic result to a dual port memory; and

control means for generating a plurality of sequential control signals in response to the control word from said first-in-first-out memory to control said arithmetic means.

5,774,865

## PATIENT COMPLIANCE AND MONITORING SYSTEM FOR MULTIPLE REGIMENS USING A MOVABLE BAR CODE READER

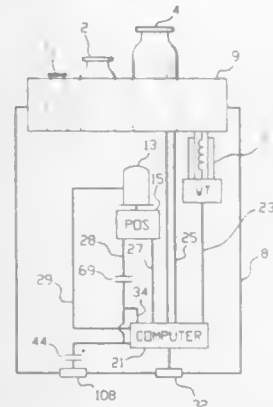
Kenneth P. Glynn, Raritan Township, N.J., assignor to Ideal Ideas, Inc., Flemington, N.J.

Filed Apr. 19, 1996, Ser. No. 635,013

Int. Cl. G06F 17/60

U.S. Cl. 705-2

20 Claims



1. A patient compliance and monitoring device for multiple medicine regimens comprising:

(a) a medicine tray for holding a plurality of medicine containers having a bottom, said medicine tray having a reciprocally attached base;

(b) a computer inside said base, said computer including:

- 1) a central processing unit;
- 2) random access memory electrically connected to said central processing unit; and,

3) read only memory electrically connected to said central processing unit, said read only memory being encoded with instruction sets;

c) a positioner inside said base, said positioner being electrically connected to said computer, said positioner being pivotable in a partially hemispherical pattern;

d) a scanner inside said base, said scanner being electrically connected to said computer;

e) a weight scale inside said base, said weight scale being electrically connected to said computer, said weight scale being attached to said medicine tray and said base so as to allow said medicine tray to reciprocally slide relative to said base;

f) input means electrically connected to said computer and fixedly attached to said base for allowing a user to initialize said computer and recall usage data from said computer;

g) output means electrically connected to said computer and mounted to exterior of said base for displaying usage data; and,

h) a switch inside said base, said switch being electrically connected to said computer, said positioner and a power supply.

5,774,866

## COMPUTERIZED PROBLEM CHECKING SYSTEM FOR ORGANIZATIONS

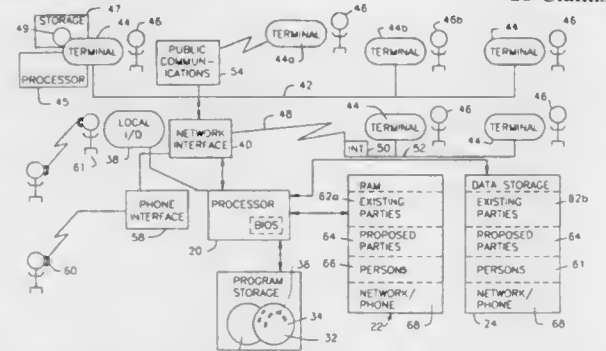
Lois Horwitz, Springfield; William J. Heller, Wyckoff; Denise Mariano, Landing; Todd M. Sahner, Middletown, all of N.J., and John Price, Glenshaw, Pa., assignors to Hannon Weisman, Roseland, N.J.

Filed Sep. 26, 1995, Ser. No. 534,011

Int. Cl. G06F 17/60

U.S. Cl. 705-7

28 Claims



1. A method of operating a computer system to check and clear relationship problems in an organization including a plurality of persons, comprising the steps of:

(a) providing computer-intelligible existing relationship data denoting one or more existing parties having existing relationships to the organization and an association between each said existing party and one or more persons within the organization;

(b) providing computer-intelligible potential relationship data denoting one or more potential matters and one or more potential parties associated with each said potential matter;

(c) actuating a computer system to compare the potential relationship data and the existing relationship data and identify a potential matter as having a match when a potential party associated with a potential matter matches an existing party;

(d) for at least some of said matches, performing a problem signaling routine in said computer system including the steps of (i) setting a potential problem status in said computer system for the potential matter having the match; (ii) using said associations demonstrated by said data, automatically selecting one or more persons associated with each existing party included in the match as evaluators for such potential problem status; and (iii) automatically sending a potential problem signal incorporating information about the match to the evaluators; and

(e) receiving problem clearance signals sent by said evaluators and automatically clearing potential problem statuses responsive to said problem clearance signals.

5,774,867

## MEETING CONFLICT RESOLUTION FOR ELECTRONIC CALENDARS

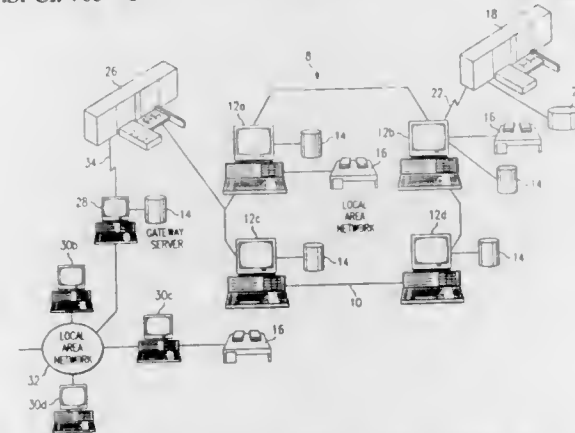
Gregory P. Fitzpatrick, Ft. Worth, and Marvin L. Williams, Lewisville, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 25, 1993, Ser. No. 37,983

Int. Cl. G06F 17/60

U.S. Cl. 705-8

18 Claims



1. A method, performed in a data processing system, for scheduling a meeting between a requester and a target on an electronic calendar maintained on the data processing system by the target, wherein said requester and said target are separate entities, the method comprising the computer implemented steps of:

determining, in response to an input, to the data processing system, of a date, a time and a duration of a proposed meeting between the requester and the target, that a conflicting event appears on the electronic calendar maintained on the data processing system by the target for the date and time and during the duration input to the data processing system;

in response to a selection, by the requester, upon the determination that a conflicting event appears on the electronic calendar maintained by the target, to monitor the electronic calendar maintained by the target for the removal of the conflicting event, and also in response to the determination that the conflicting event appears on the electronic calendar maintained by the target, monitoring the electronic calendar maintained by the target to detect the removal of the conflicting event from the electronic calendar maintained by the target; and

scheduling a meeting between the requester and the target on the electronic calendar maintained by the target, in response to the detection of the removal of the conflicting event from the electronic calendar maintained by the target.

5,774,868

## AUTOMATIC SALES PROMOTION SELECTION SYSTEM AND METHOD

Brian John Cragun; Todd Mark Kelsey, both of Rochester, Minn., and Stephen Hollis Lund, Boulder, Colo., assignors to International Business and Machines Corporation, Armonk, N.Y.

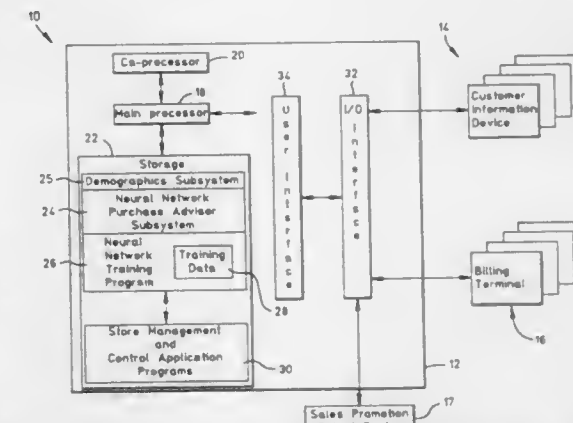
Filed Dec. 23, 1994, Ser. No. 363,053

Int. Cl. G06F 17/60

U.S. Cl. 705-10

13 Claims

1. An automated sales promotion selection system comprising: a customer information device that receives customer data relating to purchases of items by customers;



a computer system including a central processing unit and a storage unit containing a purchase advisor neural network and a plurality of item numbers that identify items available for purchase, wherein the purchase advisor neural network responds to customer data received from the customer information device and to current purchase data comprising item numbers of a current purchase of a customer by determining if one or more of the item numbers stored in the storage unit corresponds to an item likely to be purchased by the customer but not present in the current purchase data and identifies a sales promotion relating to the item;

an output device that receives the item numbers of the likely purchases determined by the purchase advisor neural network and produces the identified sales promotion; and

a customer demographics neural network that estimates buying characteristics of one or more customers most likely to be at a purchase location, and also produces item numbers comprising the estimated item purchases of the estimated customers.

5,774,869

## METHOD FOR PROVIDING SPONSOR PAID INTERNET ACCESS AND SIMULTANEOUS SPONSOR PROMOTION

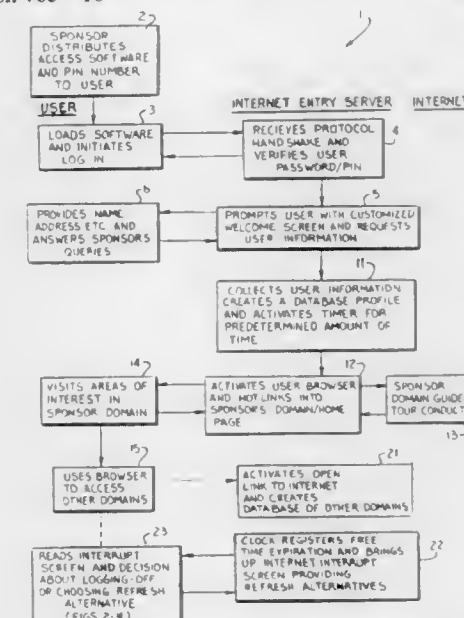
Adrian Toader, Overland Park, Kans., assignor to Interactive Media Works, LLC, Overland Park, Kans.

Filed Jun. 6, 1995, Ser. No. 471,337

Int. Cl. G06F 17/40

U.S. Cl. 705-10

30 Claims



1. A method of providing a sponsor paid Internet connect time allotment to a user while simultaneously collecting survey data for the sponsor comprising the steps of:

- a. distributing sponsor provided Internet access software to the user;
- b. providing a PIN number to the user which PIN number entitles the user to log on to an Internet Entry Server via said sponsor provided software;
- c. prompting the user to answer a series of queries, with the answers forming said survey data as the user logs on to the Internet Entry Server via said sponsor provided software; and
- d. allowing the user to access the Internet for a predetermined time via said sponsor provided software and said Internet Entry Server once the user has responded to all of the queries.

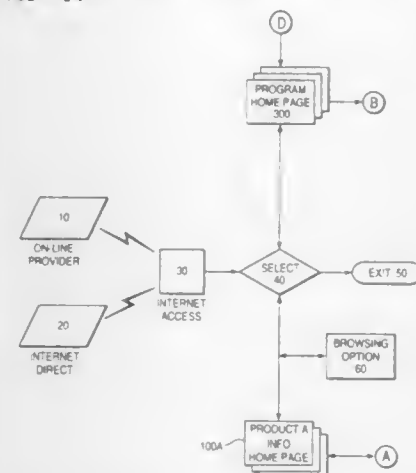
5,774,870

**FULLY INTEGRATED, ON-LINE INTERACTIVE  
FREQUENCY AND AWARD REDEMPTION PROGRAM**  
Thomas W. Storey, Scottsdale, Ariz., assignor to Netcentives,  
Inc., San Francisco, Calif.

Filed Dec. 14, 1995, Ser. No. 572,017  
Int. Cl.<sup>6</sup> G06F 7/00

U.S. Cl. 705—14

30 Claims



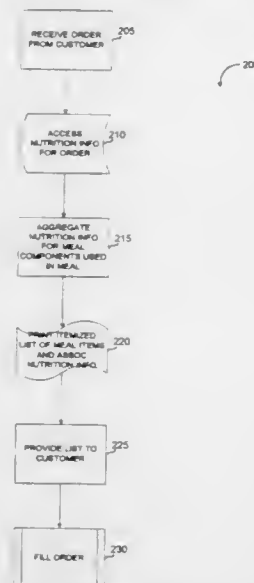
17. A method for providing an on-line shopping and frequency award program comprising the steps of:
  - maintaining a frequency database for storing award points in award accounts corresponding to subscribed users;
  - providing an on-line access to a product catalog;
  - providing an on-line purchase order form, said on-line purchase order form including at least a register for a credit account number of a credit card and a register for a product identifier;
  - allowing a user to electronically send entries for said purchase order form;
  - establishing an on-line link to a credit computer and verifying availability of funds for said user;
  - establishing an on-line link to a computer of a seller of a product identified in said product identifier and electronically communicating said purchase order form together with said entries to said seller;
  - calculating award points by a predetermined formula taking into account a price of said product, and updating an award account of said user in said frequency database;
  - providing an on-line access to an award catalog having a plurality of files corresponding to various award articles;
  - providing an on-line award redeem form;
  - receiving electronic entries corresponding to queries in said award redeem form to allow said user to electronically redeem award points towards a chosen award from said award catalog; and
  - subtracting from said award account of said user a number of points corresponding to the award points of said chosen award.

**5,774,871  
SYSTEM AND METHOD FOR CREATING A FOOD  
ORDER SALES RECEIPT IDENTIFYING NUTRITIONAL  
INFORMATION OF A CUSTOMIZED MEAL**

Jay Ferro, 6780 Trigo Rd., Goleta, Calif. 93117  
Filed Jul. 24, 1995, Ser. No. 506,441  
Int. Cl.<sup>6</sup> G06F 17/60

U.S. Cl. 705—15

18 Claims



- II. A method for reporting nutritional information of a food item served to a customer of a restaurant, comprising the steps of:
  - receiving a service order from the customer requesting a meal including a meal item wherein each said meal item includes a standard set of meal components and wherein said service order specifies a modified set of meal components different than said standard set; thereafter
  - filling said service order by assembling said meal item specified by said modified set of meal components from a plurality of standardized meal components;
  - retrieving from a database a nutritional information component for each of said plurality of standardized meal components used in said modified set of meal components;
  - aggregating, for said meal item, said nutritional information components for each of said plurality of standardized meal components included in said meal item to form an aggregated nutritional component;
  - printing an itemized list of said meal item and said aggregated nutritional component to produce a nutritional report; and
  - providing said nutritional report to the customer.

5,774,872

**AUTOMATED TAXABLE TRANSACTION REPORTING/  
COLLECTION SYSTEM**

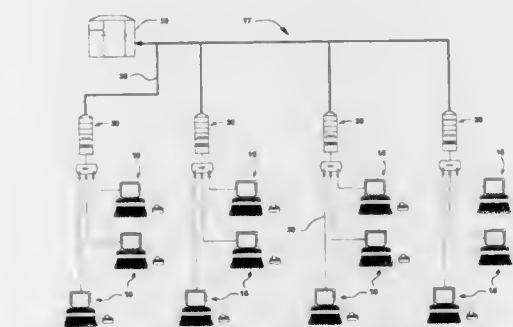
Richard Golden, 15530 Windmill Pointe, Grosse Pointe, Mich. 48320, and Joel R. Stanesa, Clawson, Mich., assignors to Richard Golden, Grosse Pointe, Mich.

Continuation of Ser. No. 414,944, Mar. 31, 1995, abandoned.  
This application Sep. 23, 1996, Ser. No. 717,977  
Int. Cl.<sup>6</sup> G06F 17/60; 157/00

U.S. Cl. 705—19

9 Claims

1. A sales tax reporting system for automatically reporting financial transactions, which are subject to sales tax, to a central location, said system comprising
  - at least one taxable transaction terminal disposed at each of a plurality of remote vendor locations for automatically recording taxable transaction occurrences on sales at said remote locations and including:
    - means for automatically inputting a first numeric value representing a price attributable to a taxable transaction into said terminal;



- means for entering a second numeric value representing sales tax due for each said taxable transaction;
- means for storing said first and second numeric values;
- means for automatically generating transmissible data representing said stored first and second numeric values; and
- means for generating a printed tax receipt in response to said means for automatically generating transmissible data, said printed receipt displaying said first and second numeric values;
- at least one data collection sub-station in electronic, two-way communication with a portion of said plurality of taxable transaction terminals and operative to contact, on a rotating periodic basis, each of said taxable transaction terminals within said portion and receive therefrom said transmissible data;

a central processing unit disposed at said central location and including a database having a data file corresponding to each said remote vendor location for storing said transmissible data generated at said remote vendor location, said central processing unit being programmed to generate on a periodic basis or when requested by an operator, a report of sales and tax due thereupon at a particular remote vendor location and stored in the respective data file; and

an electronic data link connecting each said data collection sub-station with said central processing unit for automatic transmission of said transmissible data collected by said data collection sub-station.

5,774,873

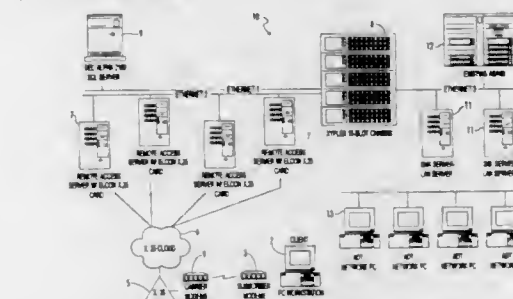
**ELECTRONIC ON-LINE MOTOR VEHICLE AUCTION  
AND INFORMATION SYSTEM**

Thomas Gerard Berent; Dennis Wayne Hurst, both of Murfreesboro; Thomas Edward Patton, LaVergne; Ty J. Tabernik, Franklin; Julie Elizabeth Warpool, College Grove; Donald C. Reig, Nashville, and William Howard Whittle, Antioch, all of Tenn., assignors to ADT Automotive, Inc., Nashville, Tenn.

Filed Mar. 29, 1996, Ser. No. 626,211  
Int. Cl.<sup>6</sup> G06F 17/60

U.S. Cl. 705—26

10 Claims



1. A system for electronic exchange of vehicle auction information between remote users and an auction service provider comprising:
  - a. a host computer network, the host computer network including a database server that electronically stores and organizes auction data and that retrieves and transmits selected portions of the auction data in response to user commands;

- b. computer workstations placed at locations associated with each user, the computer workstations including a video monitor, means to send user commands to the host computer network, and means to receive and display on the video monitor auction data retrieved and transmitted from the host computer network;
- c. a communications network electronically linking the computer workstations to the host computer network;
- d. a set of user application modules which cause the computer workstations and host computer network to generate on the video monitors a series of command options selectable by the user to generate the user commands, whereby the selected portions of the auction data stored on the host computer network are located, organized, and transmitted over the communications network to a workstation in response to one or more particular user commands and are displayed on the video monitors;
- e. the auction data including information about the geographic location and date of auctions and about an inventory of vehicles available for sale at each of the auctions, and the set of user application modules includes a sale calendar module which allows the user to search the auction data and to display on the video monitors at the workstations a list of one or more auctions by date, by location, and by vehicle sale type; and
- f. an electronic auction module associated with the workstations and host computer network whereby users may electronically place bids for vehicles being sold at an auction.

5,774,874

**MULTI-MERCHANT GIFT REGISTRY**

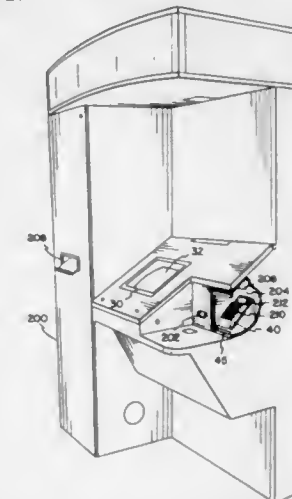
William J. Veeneman, Minneapolis; Barbara Thomas, Chanhassen, and Debra Remington, Hopkins, all of Minn., assignors to The Gift Certificate Center, Minneapolis, Minn.

Continuation-in-part of Ser. No. 132,604, Oct. 6, 1993, abandoned, which is a continuation-in-part of Ser. No. 62,470, May 14, 1993, abandoned. This application Nov. 22, 1995, Ser. No. 562,014

Int. Cl.<sup>6</sup> G06F 17/60

U.S. Cl. 705—27

14 Claims



1. A multi-merchant gift registry comprising:
  - a gift registry kiosk disposed proximate the stores of a plurality of merchants in a shopping area, each of said merchants participating in the gift registry, the gift registry kiosk having:
    - a first data entry system through which first information and inquiries about registrants in the gift registry are entered into the computer system, the first information for each registrant including at least one name for the registrant;
    - a second data entry system capable of receiving second information, the second information including a list of potential gifts which the registrant has identified and a unique identifier associated with the particular merchant having each of the desired gifts;



a database storage system that stores and retrieves the first and second information about the registrant and the unique identifier associated with the particular merchant having each of the desired gifts; and

a display system that displays the list of potential gifts for a particular registrant and information about the particular merchants the desired gifts are from, including the unique identifier associated with the particular merchant having each of the desired gifts in response to an inquiry from a prospective purchaser.

5,774,875

## PHARMACEUTICAL RECORDKEEPING SYSTEM

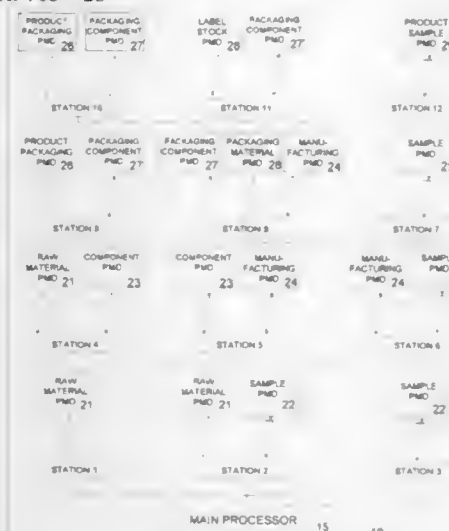
Joel E. Medeiros, Delran; Louis M. Gaburo, Madison, and Stewart E. Hartkopf, Cherry Hill, all of N.J., assignors to Base Ten Systems, Inc., Trenton, N.J.

Continuation of Ser. No. 503,408, Jul. 17, 1995, abandoned, which is a continuation of Ser. No. 109,788, Aug. 20, 1993, abandoned. This application Nov. 12, 1996, Ser. No. 747,175

Int. Cl.<sup>6</sup> G06F 19/00; 17/00; G01N 15/00; 31/00

U.S. Cl. 705—28

22 Claims



1. A method for recordkeeping comprising the steps of:

- (a1) providing a first portable memory with a unique serial number recorded therein, for a first lot of raw material to be received and tested;
- (a2) writing raw material identification and test requirements data into the first portable memory relating to the first raw material lot;
- (a3) providing a second portable memory with a unique serial number recorded therein, for a sample from the first raw material lot;
- (a4) writing said raw material identification, test requirements, and the serial number from the first portable memory into the second portable memory;
- (a5) testing the sample and writing test data into the second portable memory; and
- (a6) writing the test data and the serial number from the second portable memory into the first portable memory by first reading the identification data from the both the first and second portable memories, comparing the identification data read from the first and second portable memories and writing the test data and the serial number of the second portable memory into the first portable memory if the comparison is favorable; and
- (a7) repeating steps (a1) through (a6) using additional first and second memories, for additional lots of raw material.

5,774,876  
MANAGING ASSETS WITH ACTIVE ELECTRONIC TAGS

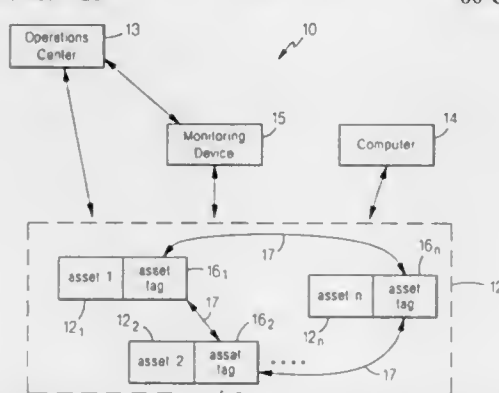
Louis A. Woolley, Clinton; Charles F. Ferrara, Sauquoit; Ian Greasley, Camden, and James H. Weimar, Minoa, all of N.Y., assignors to Par Government Systems Corporation, New Hartford, N.Y.

Filed Jun. 26, 1996, Ser. No. 671,491

Int. Cl.<sup>6</sup> G06F 17/60

U.S. Cl. 705—28

60 Claims



1. A system for use in monitoring and affecting actions on behalf of a group of objects, comprising:

- a first electronic tag attached to an object in the group, comprising:
  - circuitry for communicating with a second tag, the circuitry communicating at least information pertaining to an object in the group, and
  - a memory connected to the circuitry and capable of storing the information, and
- a second electronic tag attached to an object in the group, comprising:
  - circuitry for communicating the information with the first tag, and
  - a memory connected to the circuitry in the second tag and capable of storing the information.

5,774,877

## TWO-WAY WIRELESS SYSTEM FOR FINANCIAL INDUSTRY TRANSACTIONS

L. Thomas Patterson, Jr., Chatham, N.J.; Desmond Sean O'Neill, Norwalk, Conn., and Stephen Tyler Carroll, Chatham, N.J., assignors to Papyrus Technology Corp., New York, N.Y.

Filed Sep. 20, 1994, Ser. No. 309,337

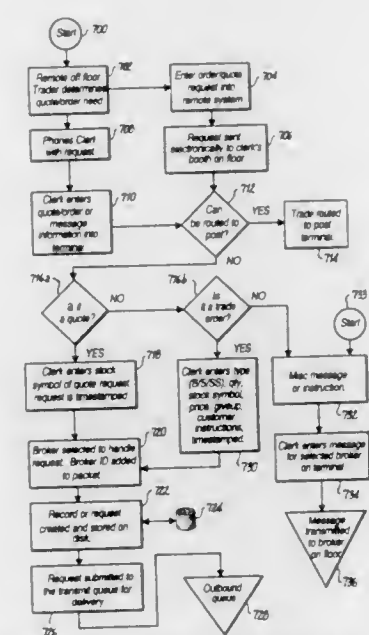
Int. Cl.<sup>6</sup> G06F 17/60; 7/52

U.S. Cl. 705—35

19 Claims

1. A method for managing one or more floor brokers situated on the floor of an exchange, comprising the steps of:

- providing each floor broker with a two-way communications device;
- transmitting an instruction from a programed computer operated by an operator to the two-way communications device provided to a floor broker, the instruction being selected from the group consisting of quotation requests, quotations, orders, partial executions, and executions;
- transmitting from each two-way communication device to the programmed computer current-status information concerning any transmitted instructions;
- calculating at the programmed computer a remaining quantity of unfilled orders to fill using current-status information transmitted to the programmed computer;



automatically and simultaneously displaying at the programmed computer in real time the current status information of at least a portion of the delegated instructions received from each two-way communication device; and selecting a floor broker to whom a further instruction is to be transmitted.

5,774,878  
VIRTUAL REALITY GENERATOR FOR USE WITH FINANCIAL INFORMATION

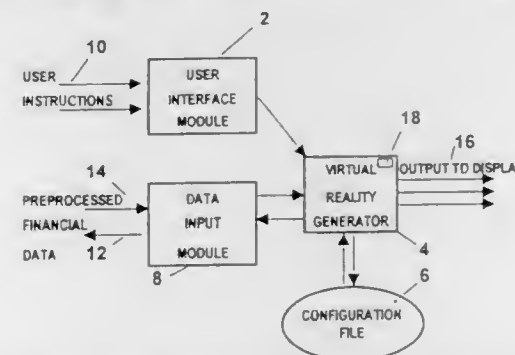
Paul Steven Marshall, 25 Fifth Ave., Apt. 6F, New York, N.Y. 10003

Continuation of Ser. No. 954,775, Sep. 30, 1992. This application Jun. 27, 1994, Ser. No. 267,108

Int. Cl.<sup>6</sup> G06F 17/00; 17/50

U.S. Cl. 705—35

42 Claims



1. A virtual reality generator to display pre-processed financial information as a virtual reality world, the virtual reality generator comprising:

- an input module receiving the pre-processed financial information from a financial data feed systems the pre-processed financial data feed system generating the pre-processed financial information as a function of predetermined financial analytics on real-time and pre-stored financial data;
- a user interface module including a first input selecting a non-integer terrain parameter for each of a first axis of a three dimensional interface and a second axis of the three dimensional interface and a second input for selecting an axis display parameter for a third axis of the three dimensional interface, the user interface module selecting a portion of the pre-processed financial information as a function of the non-integer terrain parameters and the axis display parameter; and
- a virtual reality generator module coupled to the input module and the user interface module, the virtual reality generator

generating, continuously modifying, and displaying on a display device a virtual reality world being the three dimensional interface that enables a user to simulate movement through and interact with the pre-processed financial information, the virtual reality world representing selected portion of the pre-processed financial information,

wherein when the user simulates movement through and interacts with the pre-processed financial information, a user viewing the display device has a sensation of traveling through and within the virtual reality world.

5,774,879

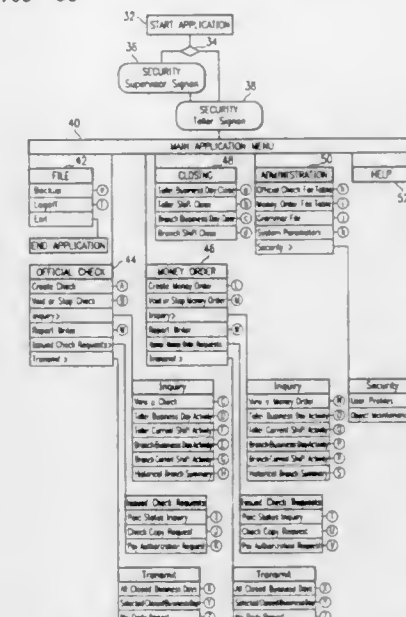
## AUTOMATED FINANCIAL INSTRUMENT PROCESSING SYSTEM

Jeanne M. Sazama; Benjamin L. Knoll, both of Denver; Shunsaku Sugiura, Golden, and Brian W. Walsh, Northglenn, all of Colo., assignors to First Data Corporation, Omaha, Nebr. Continuation of Ser. No. 173,907, Dec. 27, 1993. This application Oct. 16, 1996, Ser. No. 732,159

Int. Cl.<sup>6</sup> G06F 157/00

U.S. Cl. 705—35

19 Claims



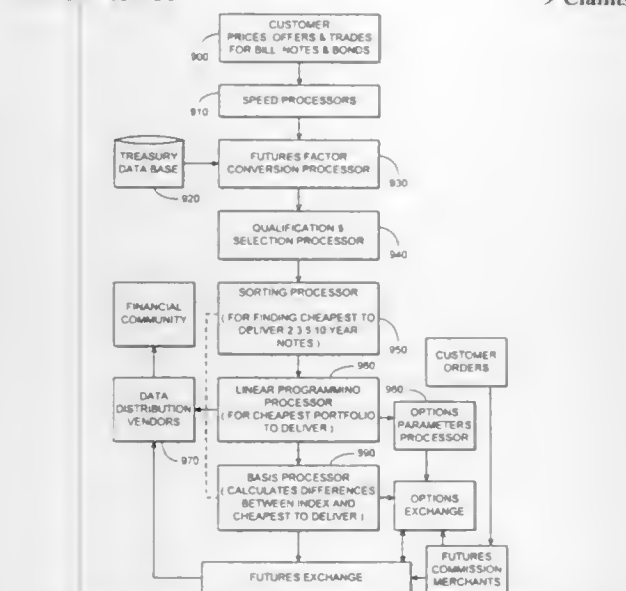
1. A data processing system operable to process financial instruments, comprising:

- a graphical user interface operable to present a plurality of options to a user of the system;
- a data base processor operable to manage a data base of information associated with financial instruments processed by the system;
- a printer operable to print financial instruments responsive to data received from the data base processor, said printer using a magnetic ink character recognition font for selected portions of the financial instruments, and further operable to transmit error codes specifying error conditions encountered during processing of financial instruments; and
- a security processor operable to restrict access to selected functions of the system, the security processor being operable to confirm an identity of a user of the system prior to allowing access to the printer for printing the financial instruments, the security processor being further operable to compare a unique identifier associated with a particular printer, to a stored identifier to confirm the identity of the particular printer and operable to automatically transmit, in response to confirming the identity of the particular printer, a password associated with the particular printer to the printer to gain access to the printer to print the financial instruments after the password is confirmed.

5,774,880  
**FIXED INCOME PORTFOLIO INDEX PROCESSOR**  
Philip Myron Ginsberg, Calabasas, Calif., assignor to Cantor Fitzgerald & Co., Inc., New York, N.Y.  
Filed Feb. 28, 1995, Ser. No. 396,422  
Int. Cl.<sup>6</sup> G06F 17/60

U.S. Cl. 705—36

9 Claims



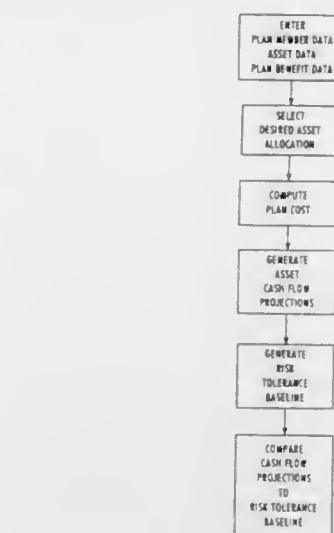
1. A system for processing disparate price data on fixed income securities in real time, comprising:  
means to provide an index value corresponding to a portfolio of pre-select generic issues expressed in terms of price, yield to maturity and duration wherein said index value is used to support a market in futures and options contracts corresponding to said portfolios;  
a means for sifting through current price data of securities corresponding to said generic issues and calculating a composition of current securities minimizing the cost of said portfolio for delivery pursuant to said futures and options contracts; and  
a means for communicating the results of said calculated composition of current securities and distributing least expensive portfolio data in said real time to market participants for supporting trades in said futures and options contracts.

5,774,881  
**METHOD OF DETERMINING OPTIMAL ASSET ALLOCATION UTILIZING ASSET CASH FLOW SIMULATION**  
Edward H. Friend, Washington, D.C., and Robert T. McCrory, Seattle, Wash., assignors to EFI Actuaries, Washington, D.C.  
Filed Oct. 30, 1995, Ser. No. 550,503  
Int. Cl.<sup>6</sup> G06F 17/60

U.S. Cl. 705—36

14 Claims

1. A computer program product storing computer instructions therein for instructing a computer to perform a process for determining a plan specific optimal asset allocation utilizing cash flow simulation, the program product comprising:  
a recording medium readable by the computer; and  
the computer instructions stored on said recording medium instructing the computer to perform the process, the instructions including:  
(a) entering plan member information including active and inactive member information, asset information, and plan benefit information including plan specific definitions of risk for a given retirement plan;  
(b) selecting a range of tolerable asset allocations for specific asset classes contained in an asset allocation list, the asset allocation list comprising a fixed class of investment and an equity class of investment, said selecting step (b) selecting maximum and minimum tolerable asset allocations for each of the fixed and equity classes of investments;

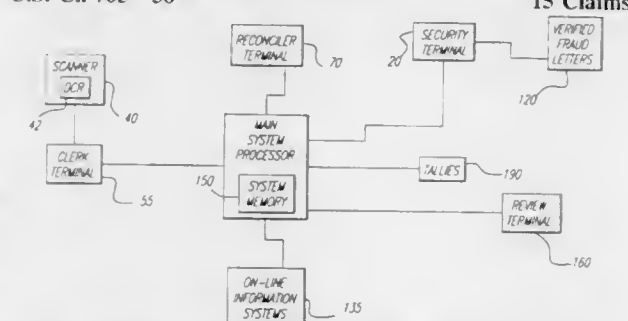


- (c) generating one or more risk tolerance baselines based on one or more user defined risk tolerance factors;  
(d) simulating benefit and asset cash flows as future financial projections based on the selected asset allocation and on the plan benefit information;  
(e) determining if risk tolerance failure events occur by comparing the future financial projections with the one or more risk tolerance baselines;  
(f) determining a performance index for the selected asset allocation based on a weighted average of the occurrence of the risk tolerance failure events and the cost of the plan; and  
(g) repetitively performing said steps (d), (e) and (f) for different asset allocations within the range of tolerable asset allocations generating a plurality of performance indices, and determining an optimum asset allocation having a best performance index from among the plurality of performance indices.

5,774,882  
**CREDIT APPROVAL SYSTEM**  
Regina D. Keen, 402 Wilson St., Laurel, Del. 19956, and Helen J. Panzullo, E. 530 Scarp Dr., Millsboro, Del. 19966  
Continuation-in-part of Ser. No. 850,028, Mar. 12, 1992, abandoned. This application Oct. 25, 1993, Ser. No. 140,489  
Int. Cl.<sup>6</sup> G06F 17/60

U.S. Cl. 705—38

15 Claims

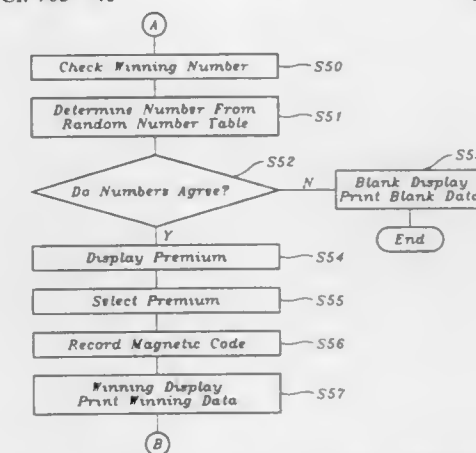


1. An automated security credit checking system comprising:  
main computer system processor means;  
computer terminal means electronically connected to said main computer processor means for receiving and scanning original credit applications and envelope postmarks from envelopes of the original credit applications wherein a scanned credit application and envelope postmark is formed when a credit application and envelope postmark is scanned;  
system memory means for storing said scanned credit application and envelope postmark that is sent to said system memory means from said computer terminal means;  
input terminal means electronically connected to said main computer system processor for allowing review of said

5,774,883  
**SERVICE METHOD USING ON-LINE SYSTEMS OF FINANCIAL INSTITUTIONS**  
Akio Watanabe, and Masakuni Terano, both of Tokyo, Japan, assignors to Moebius Corporation, Tokyo, Japan  
Filed Mar. 8, 1995, Ser. No. 400,247  
Claims priority, application Japan, Jan. 26, 1995, 7-010281  
Int. Cl.<sup>6</sup> G06F 17/60

U.S. Cl. 705—41

17 Claims

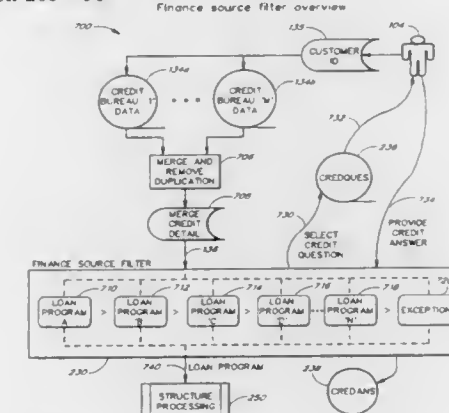


1. A service method using on-line systems of financial institutions, wherein, in executing a predetermined item of transaction by operating a dedicated terminal connected to a central computer processing system of a financial institution, the dedicated terminal is provided with an apparatus for reading a transactor recognizing medium equipped with a magnetic code;  
the central computer processing system is provided with a magnetic code lottery means; and  
in executing the predetermined item of transaction through the transactor recognizing medium by using the dedicated terminal, a lottery is automatically performed on the magnetic code of the transactor recognizing medium by the magnetic code lottery means of the central computer processing system, a predetermined advantage being imparted to the transactor recognizing medium when the lot falls upon it.

5,774,883  
**METHOD FOR SELECTING A SELLER'S MOST PROFITABLE FINANCING PROGRAM**  
Lloyd R. Andersen, 23 Ridgeline Dr., Newport Beach, Calif. 92660, and Gregory P. Smith, 3941 E. South Bristol, #374, Santa Ana, Calif. 92704  
Filed May 25, 1995, Ser. No. 450,124  
Int. Cl.<sup>6</sup> G06F 17/60

U.S. Cl. 205—38

7 Claims

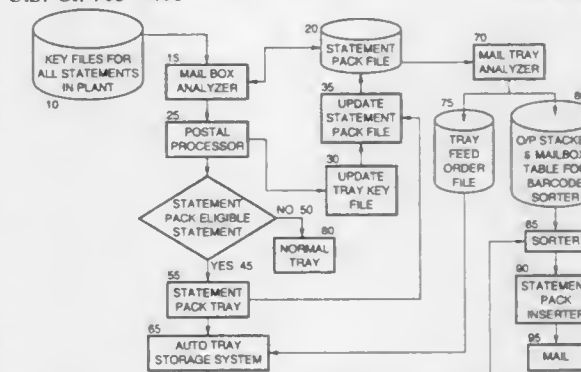


1. In a data processing unit having a memory and capable of executing software code, a method of selecting a seller's best profit financial program from a rank ordered, plurality of financial programs, comprising the steps of:  
(1) providing a sales price of an asset;  
(2) retrieving credit information unique to a customer from the memory;  
(3) retrieving one or more credit questions from the memory;  
(4) receiving a credit answer, indicative of the customer, responsive to each of the credit questions;  
(5) automatically selecting one of the predetermined rank ordered financial programs based upon the credit information and the credit answers; and  
(6) iterating steps (3) through (5) multiple times until a seller's best profit financial program is selected, wherein the selected financial program may be different than a previously selected financial program.

5,774,885  
**SYSTEM AND METHOD FOR COMBINING INDIVIDUAL STATEMENTS INTO A SINGLE MAILING ENVELOPE**  
Frank W. Delfer, III, Lebanon, N.J., assignor to International Billing Services, Inc., Rancho Cordova, Calif.  
Filed Nov. 21, 1995, Ser. No. 561,358  
Int. Cl.<sup>6</sup> G06F 17/00

U.S. Cl. 705—401

32 Claims



1. A billing system for combining, into a minimum number of master mailing envelopes, individual user billing statements, comprised of one or more constituent documents, from the same or different service providers that are to be delivered to a common mailbox, comprising:



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- a) means utilizing postal coding information for determining which user billing statements are delivered to the common mailbox and
- b) means for combining into a minimum number of master mailing envelopes a cost effective number of user billing statements being delivered to a common mailbox.

5,774,886

**SYSTEM AND METHOD FOR AUTOMATICALLY PRINTING POSTAGE ON MAIL**

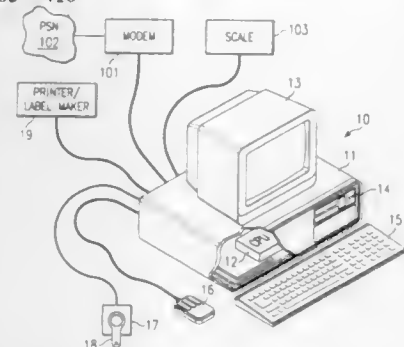
Salim G. Kara, Houston, Tex., assignor to E-Stamp Corporation, Houston, Tex.

Continuation of Ser. No. 639,847, Apr. 19, 1996, Pat. No. 5,682,318, which is a continuation of Ser. No. 176,716, Jan. 3, 1994, Pat. No. 5,510,992. This application Feb. 7, 1997, Ser. No. 796,275

Int. Cl. G07B 17/02

U.S. Cl. 705—410

21 Claims



1. A system utilizing a first personal computer of a plurality of personal computers for generating a meter stamp having a predetermined value from electronic postage credit stored within a fungible postage storage device, said system comprising:

a portable processor device having information storage capacity associated therewith, said portable processor device being permanently configured for use as a postage storage device, said permanent configuration including storing identification information identifying said portable processor device to said system in said portable processor device upon manufacture, said portable processor device having electronic postage credit information stored in said information storage capacity, said portable processor device also having information with respect to a system wide password identified with said system stored in said information storage capacity; and means for generating said meter stamp through information communication between said first personal computer and said portable processor device, said generating means depleting a portion of said postage credit stored in said information storage capacity only upon a determination said stored identification information identifies said portable processor as being associated with said system and information stored in said first personal computer matches said password information stored in said portable processor device, wherein each of said plurality of personal computers are suitable for use with the same said portable processor device and wherein said portable processor device is to be discarded once substantially all of said postage credit is depleted.

5,774,887

**CUSTOMER SERVICE ELECTRONIC FORM GENERATING SYSTEM**

Alan Scott Wolff, Boulder, and Hans Brunner, Denver, both of Colo., assignors to U S West Advanced Technologies, Inc., Boulder, Colo.

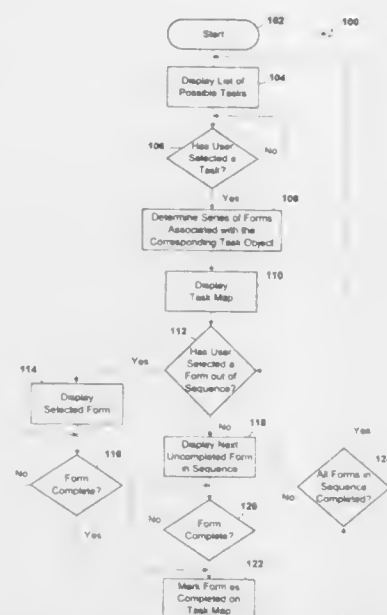
Filed Nov. 18, 1992, Ser. No. 977,982

Int. Cl. G06F 17/30

U.S. Cl. 707—1

24 Claims

1. A method of integrating an electronic customer service call-related data entry form on a computer system with a data storage



system comprising at least first and second data bases, said computer system comprising a display screen, said method comprising the steps of:

determining a plurality of fields for said electronic form to be associated with at least one predetermined customer service call, each said field corresponding with a predetermined category of data;

defining each said field by a field structure, said field structure directing a selective transfer of data entered into said field to a database destination associated with said field;

displaying said plurality of fields on said display screen;

entering data into at least one of said fields, including entering data into a first of said fields; and

transferring said data from said at least one field into at least one data base, said transferring step further comprising the step of transferring said data from said first field into each of said first and second data bases by said field structure of said first field.

5,774,888

**METHOD FOR CHARACTERIZING A DOCUMENT SET USING EVALUATION SURROGATES**

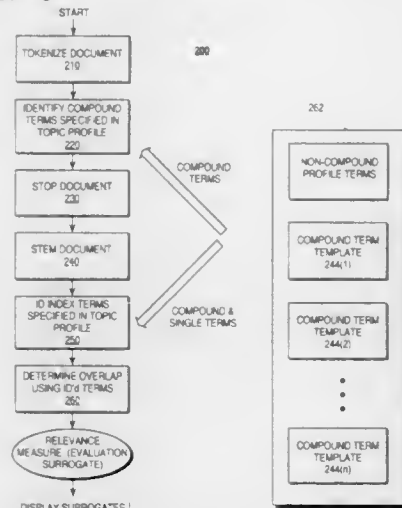
John Light, Hillsboro, Oreg., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 30, 1996, Ser. No. 778,212

Int. Cl. G06F 17/30

U.S. Cl. 707—S

12 Claims



1. A method for determining measures of relevance of a document to selected topics, wherein the document is represented as a

stream of tokens and the selected topics are represented by topic profiles, each of which includes one or more compound term templates that specify the precise forms of terms characteristic of the topic, the method comprising the steps of:

applying the topic profiles to the token stream to identify compound terms in the document;

augmenting the token stream with a compound term token for each compound term identified;

eliminating from the augmented token stream tokens representing common terms, redundant tokens that correspond to repeated instances of a term, and selected tokens representing components of compound terms to provide a compact representation of the document;

calculating a similarity function between the compact document representation of the document and the topic profiles to form an evaluation surrogate of the document for the topic profiles.

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395,535

FOOD PRODUCT

Tamara A. Reichkitzer, Battle Creek; Charles Smith, Marshall,  
and Gerry I. Johnson, Battle Creek, all of Mich., assignors to  
Kellogg Company, Battle Creek, Mich.

Filed Nov. 15, 1996, Ser. No. 62,445

Term of patent 14 years

LOC (6) Cl. 01 - 01

U.S. Cl. D1—129



395,537

SHORTS

Vladimir Vitches, Lagny, France, assignor to Odda Finance  
Internationale S.A., Luxembourg, Luxembourg

Filed Apr. 27, 1993, Ser. No. 7,583

Claims priority, application France, Nov. 5, 1992, 926849

Term of patent 14 years

LOC (6) Cl. 02 - 01

U.S. Cl. D2—712



395,536

TERRY CLOTH GLOVE

Almeda Vargas, 115 Holland Rd., So Orange, N.J. 07079

Filed Apr. 10, 1997, Ser. No. 69,158

Term of patent 14 years

LOC (6) Cl. 02 - 06

U.S. Cl. D2—617



395,538

SEAMLESS ONE PIECE BODY GARMENT

Walter H. Imboden, Burlington; Jonathan M. Myers, Winston-  
Salem, and Joel W. Marley, Sophia, all of N.C., assignors to  
Sara Lee Corporation, Winston-Salem, N.C.

Continuation of Ser. No. 34,976, Feb. 16, 1995, abandoned.

This application Sep. 24, 1996, Ser. No. 60,149

Term of patent 14 years

LOC (6) Cl. 02 - 01

U.S. Cl. D2—713





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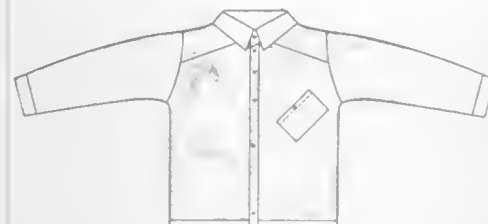
JUNE 30, 1998

395,539

## TROPIC TRAVELER SHIRT

Stephen B. DiPietro, 6345 SW. 34th St., Miami, Fla. 33155  
Continuation of Ser. No. 27,204, Aug. 16, 1994, abandoned.  
This application Jun. 18, 1996, Ser. No. 56,245  
The portion of the term of this patent subsequent to Oct. 21, 2011, has been disclaimed.  
Term of patent 14 years  
LOC (6) Cl. 02 - 02

U.S. Cl. D2—849



395,540

## SHOE OUTSOLE

Paul A. Gaudio, Lake Oswego, Oreg., assignor to Adidas AG, Germany

Filed Jun. 6, 1996, Ser. No. 55,520  
Term of patent 14 years  
LOC (6) Cl. 02 - 04

U.S. Cl. D2—954

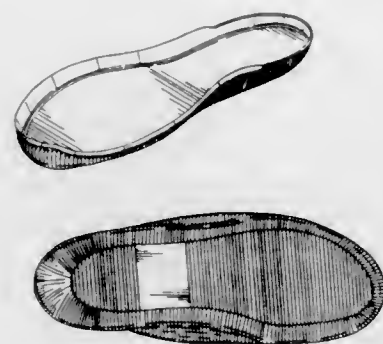


395,541

## FOOTWEAR SOLE

Walter Thomas Bray, Jr., Reynoldsburg, and Theresa Stewart, Columbus, both of Ohio, assignors to R.G. Barry Corporation, Pickerington, Ohio  
Division of Ser. No. 138,707, Oct. 18, 1993, Pat. No. 5,392,532.  
This application Feb. 27, 1995, Ser. No. 35,384  
The portion of the term of this patent subsequent to Jun. 7, 2008, has been disclaimed.  
Term of patent 14 years  
LOC (6) Cl. 02 - 04

U.S. Cl. D2—960



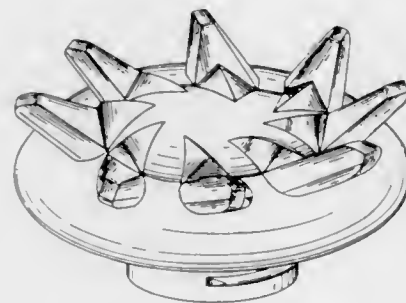
395,542

## STUD FOR FOOTWEAR

David Roy Collins, West Midlands, England, assignor to Trisport Limited, Staffordshire, England  
Filed Jul. 1, 1997, Ser. No. 73,153  
Claims priority, application United Kingdom, May 23, 1997, 2066D37

Term of patent 14 years  
LOC (6) Cl. 02 - 04

U.S. Cl. D2—962



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U.S. PATENT AND TRADEMARK OFFICE

5521

395,543

## SHOE UPPER

Dennis Dolinsky, Morristown, N.J., assignor to Sara Lee Corporation, Winston-Salem, N.C.  
Filed Jun. 4, 1996, Ser. No. 55,385  
Term of patent 14 years  
LOC (6) Cl. 02 - 04

U.S. Cl. D2—969

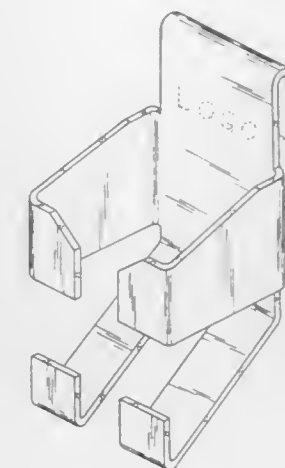


395,545

## CELLULAR PHONE HOLDER

Jesse E. Crim, Jr., 202 Fairway Estates, Greer, S.C. 29651  
Filed Dec. 4, 1996, Ser. No. 63,301  
Term of patent 14 years  
LOC (6) Cl. 03 - 01

U.S. Cl. D3—218

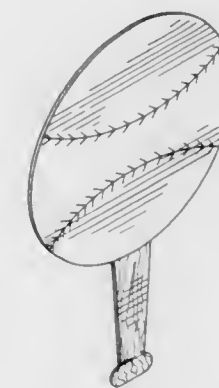


395,544

## HAND-HELD FAN

Kelly Smith, P.O. Box 387, Denton, N.C. 27239  
Filed Oct. 11, 1996, Ser. No. 61,597  
Term of patent 14 years  
LOC (6) Cl. 03 - 04

U.S. Cl. D3—4



395,546

## TWIN BELT BAG

Mina Houtan, 300 Central Ave., Linwood, N.J. 08234  
Filed Dec. 18, 1995, Ser. No. 48,026  
Term of patent 14 years  
LOC (6) Cl. 03 - 01

U.S. Cl. D3—226



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OFFICIAL GAZETTE

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395,547

COTTON SWAB ORGANIZER

Robert Sussman, 10120 Vestal Ct., Coral Springs, Fla. 33071

Filed Apr. 7, 1997, Ser. No. 68,912

Term of patent 14 years

LOC (6) Cl. 03 - 01

U.S. Cl. D3—302



395,549

TOOTHBRUSH

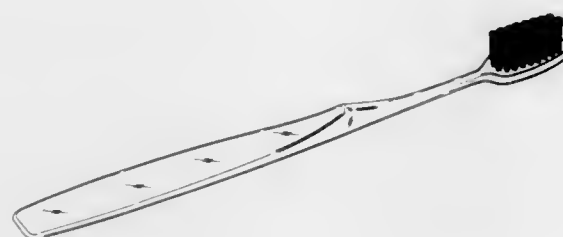
Georg Wiegner, Flat E, 14/E1, Hilton Tower, Granville Road, Tsimshatsui, Kowloon, Hong Kong

Filed Jun. 6, 1997, Ser. No. 72,060

Term of patent 14 years

LOC (6) Cl. 04 - 02

U.S. Cl. D4—104



395,548

NESTED RECEPTACLE

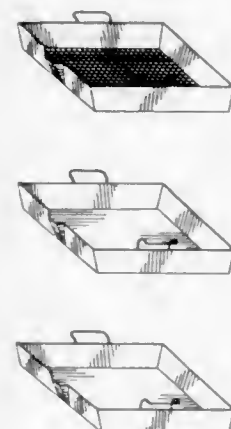
Robert Morissette, 23 Hanson Road, Mississauga, Ontario, Canada, L5B 2E3

Filed Nov. 18, 1996, Ser. No. 62,531

Term of patent 14 years

LOC (6) Cl. 03 - 01

U.S. Cl. D3—307



395,550

TOOTHBRUSH HANDLE

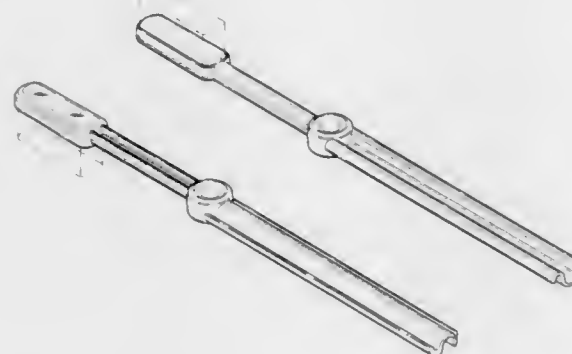
Robert Moskovich, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 52,004, Apr. 4, 1996, Pat. No. Des. 386,005. This application Jul. 31, 1997, Ser. No. 74,464

Term of patent 14 years

LOC (6) Cl. 04 - 02

U.S. Cl. D4—104



JUNE 30, 1998

U.S. PATENT AND TRADEMARK OFFICE

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395,551

PAINT BRUSH

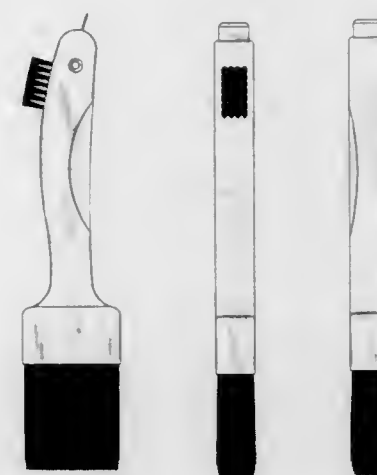
Frank D. McKittrick, 322 Thistel St. P.O. Box 3562, Mesquite, Nev. 89024

Filed Aug. 29, 1997, Ser. No. 76,014

Term of patent 14 years

LOC (6) Cl. 04 - 04

U.S. Cl. D4—119



395,553

SURFACE PATTERN FOR A PAPER PRODUCT

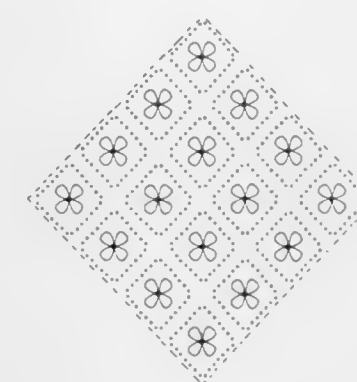
Sandra Bak, and Galyn A. Schulz, both of Appleton, Wis., assignors to Fort James Corporation, Richmond, Va.

Filed Feb. 20, 1997, Ser. No. 67,007

Term of patent 14 years

LOC (6) Cl. 05 - 06

U.S. Cl. D5—32



395,554

PICTURE FRAME

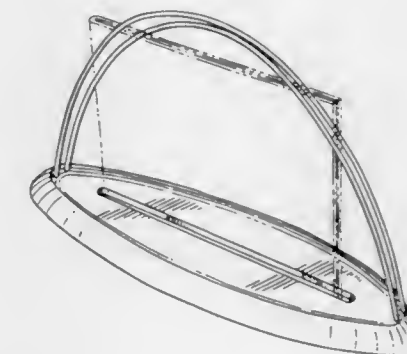
Raymond C. Perkins, Jr., 1001 W. Washington Blvd., Suite 3A, Chicago, Ill. 60607

Filed Mar. 12, 1997, Ser. No. 67,828

Term of patent 14 years

LOC (6) Cl. 06 - 07

U.S. Cl. D6—300



395,552

COSMETIC BRUSH HANDLE

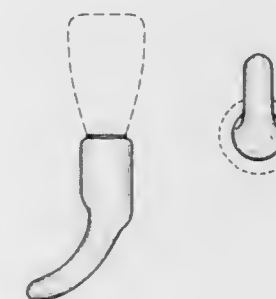
Kay Cunningham, 12995 Larch Ln., Houston, Tex. 77713

Filed Aug. 30, 1996, Ser. No. 59,656

Term of patent 14 years

LOC (6) Cl. 04 - 02

U.S. Cl. D4—138





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395,555

**CONVEYOR HOOK AND GARMENT STORAGE STRAP**  
Richard G. Ursitti, Pasadena, Calif., assignor to SDI Industries, Inc., Pacoima, Calif.Filed Oct. 18, 1996, Ser. No. 61,274  
Term of patent 14 years  
LOC (6) Cl. 06 - 08

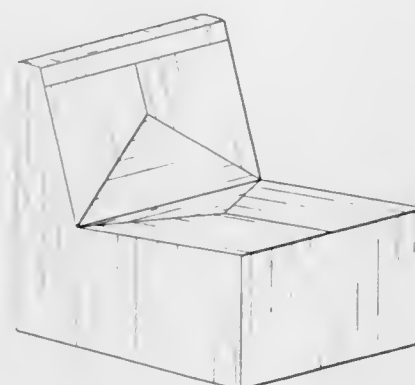
U.S. Cl. D6—328



395,557

**ARMLESS FIBREBOARD CHAIR**  
E. Dallas Smith, Indianapolis, Ind., assignor to DBX Engineering Corporation, Indianapolis, Ind.Filed Feb. 11, 1997, Ser. No. 66,328  
Term of patent 14 years  
LOC (6) Cl. 06 - 01

U.S. Cl. D6—334



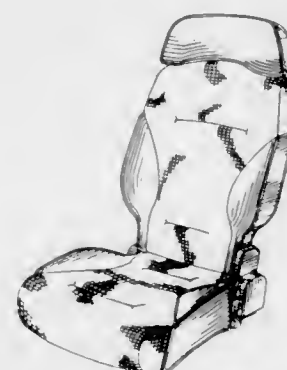
395,558

**SEAT**

Dennis Gryp, East Moline, Ill., and Edward Stulik, Roseville, Calif., assignors to Sears Manufacturing Company, Davenport, Iowa

Filed Jun. 19, 1997, Ser. No. 72,511  
Term of patent 14 years  
LOC (6) Cl. 06 - 01

U.S. Cl. D6—356



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U.S. PATENT AND TRADEMARK OFFICE

5525

395,559

**CRIB**

Stephanie Kantis Almborg, and Jens Henrik Almborg, both of Dallas, Tex., assignors to SKA! Design, Dallas, Tex.

Filed Nov. 18, 1996, Ser. No. 62,537  
Term of patent 14 years  
LOC (6) Cl. 06 - 01

U.S. Cl. D6—390



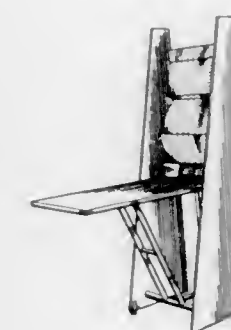
395,561

**MODULAR DISPLAY STAND**

Antonio Canton Gongora; Carlos Jesús Cruz Fernandez; José María Muñagorri Enriquez, and Juan Carlos Rayo Ortigüela, all of Madrid, Spain, assignors to Telefonica de Espana, S.A., Madrid, Spain

Filed Nov. 21, 1996, Ser. No. 62,703  
Claims priority, application Spain, May 21, 1996, 137534  
Term of patent 14 years  
LOC (6) Cl. 06 - 04

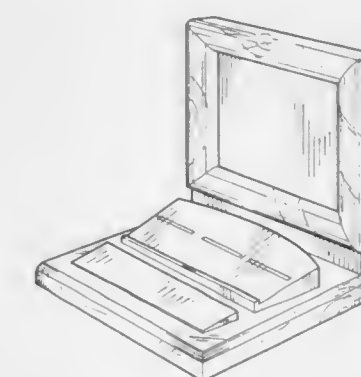
U.S. Cl. D6—449



395,562

**RACE CAR DISPLAY STAND**Fred W. Goodman, 515 Burrage Rd., Concord, N.C. 28025  
Filed Aug. 26, 1996, Ser. No. 59,638Term of patent 14 years  
LOC (6) Cl. 06 - 04

U.S. Cl. D6—450



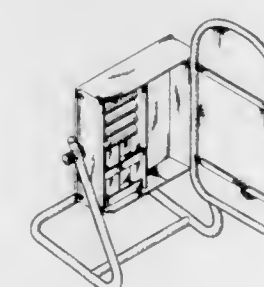
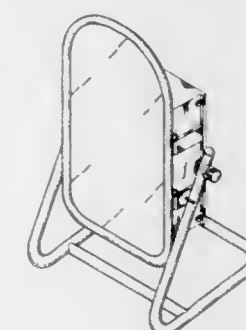
395,560

**VANITY MIRROR WITH STORAGE COMPARTMENT**

Lawrence Powell, Culver City, Calif., assignor to L. Powell Co., Inc., Culver City, Calif.

Filed May 15, 1997, Ser. No. 70,778  
Term of patent 14 years  
LOC (6) Cl. 06 - 04

U.S. Cl. D6—444



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395,563

## DISPLAY CASE

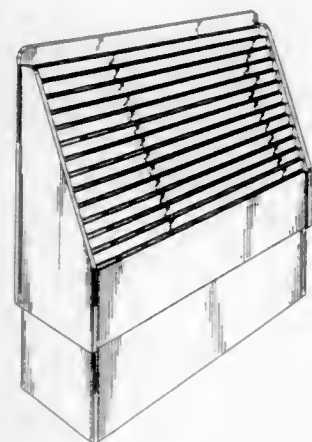
Carl Leonard Hamilton, III, 11818 Longleaf La., Houston, Tex. 77024

Filed Jul. 28, 1997, Ser. No. 74,175

Term of patent 14 years

LOC (6) Cl. 06 - 04

U.S. Cl. D6—474



395,565

## CRIB ENDBOARD FRAME

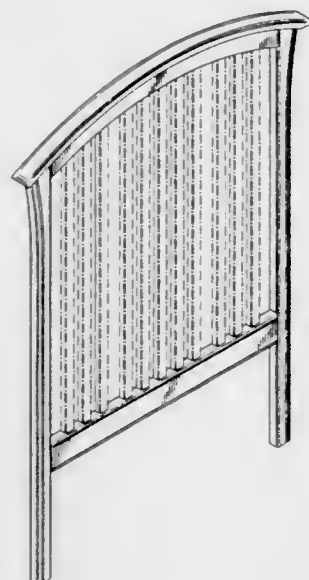
Merlin A. Brunner, Appleton, and Harvey J. Draheim, Weyauwega, both of Wis., assignors to Simmons Juvenile Products Company, Inc., New London, Wis.

Division of Ser. No. 55,093, May 29, 1996, Pat. No. Des. 380,918. This application Jun. 27, 1997, Ser. No. 73,043

Term of patent 14 years

LOC (6) Cl. 06 - 01

U.S. Cl. D6—505



395,564

## SHELVING SUPPORT SPINDLE

Raymond Grosfillex, Oyonnax, France, assignor to Grosfillex Sarl, Oyonnax, France

Filed Aug. 6, 1997, Ser. No. 74,502

Claims priority, application Hague Agreement, Feb. 10, 1997, DMA/003587

Term of patent 14 years

LOC (6) Cl. 06 - 06

U.S. Cl. D6—495



395,566

## TWIST TIE DISPENSER

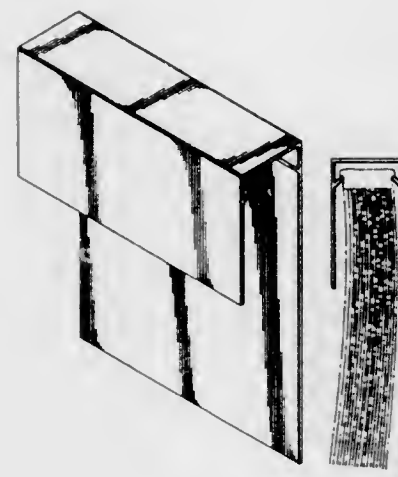
James Ray Helseth, Plymouth, Minn., assignor to Twist-Ease, Inc., Minneapolis, Minn.

Filed Jul. 26, 1996, Ser. No. 57,543

Term of patent 14 years

LOC (6) Cl. 07 - 07

U.S. Cl. D6—515



JUNE 30, 1998

U.S. PATENT AND TRADEMARK OFFICE

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395,567

## PAPER TOWEL HOLDER

Fred Hollinger, Kings Park, N.Y., assignor to KV and F Metal Products Inc., Great Neck, N.Y.

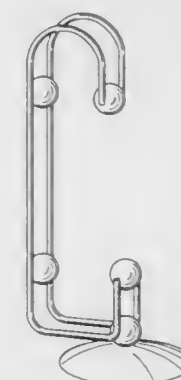
Division of Ser. No. 42,082, Jul. 31, 1995. This application

Mar. 3, 1997, Ser. No. 67,034

Term of patent 14 years

LOC (6) Cl. 07 - 07

U.S. Cl. D6—522



395,569

## PLATE-LIKE ARTICLE HOLDER

Katsutoshi Hamada, Osaka, Japan, assignor to Elecom Kabushiki Kaisha, Osaka-fu, Japan

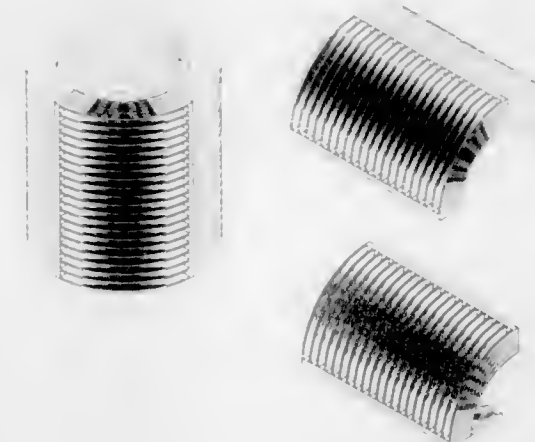
Filed Dec. 18, 1996, Ser. No. 63,884

Claims priority, application Japan, Jul. 9, 1996, 8-20527; Jul. 9, 1996, 8-20528

Term of patent 14 years

LOC (6) Cl. 06 - 04

U.S. Cl. D6—629



395,570

## CASE FOR MAGNET OPTICAL DISC

Takuya Kawagoe, and Michio Akita, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jun. 20, 1996, Ser. No. 56,041

Term of patent 14 years

LOC (6) Cl. 06 - 04

U.S. Cl. 206—308.3

395,568

## PILLOW

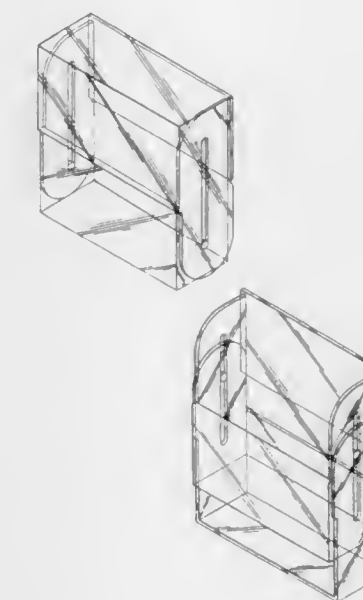
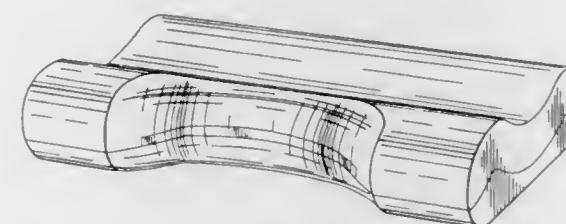
Edmund Scott Davis, Fort Lauderdale, Fla., assignor to Banyan Licensing, LLC, Ft. Lauderdale, Fla.

Filed Sep. 3, 1997, Ser. No. 75,657

Term of patent 14 years

LOC (6) Cl. 06 - 09

U.S. Cl. D6—601





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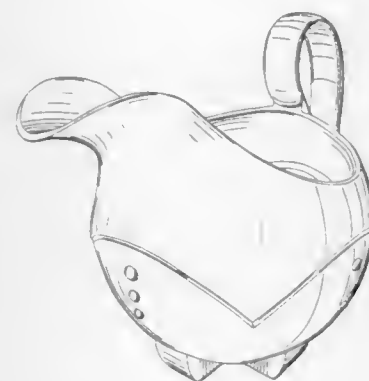
5528

OFFICIAL GAZETTE

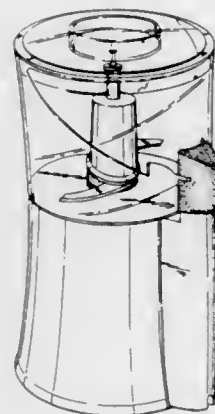
JUNE 30, 1998

395,571  
PITCHERThomas Antista, 64 Lenox Pointe, Atlanta, Ga. 30324, and  
Thomas Fairclough, 1251 Annapolis Way, Grayson, Ga.  
30221Filed Jul. 24, 1997, Ser. No. 74,097  
Term of patent 14 years  
LOC (6) Cl. 07 - 01

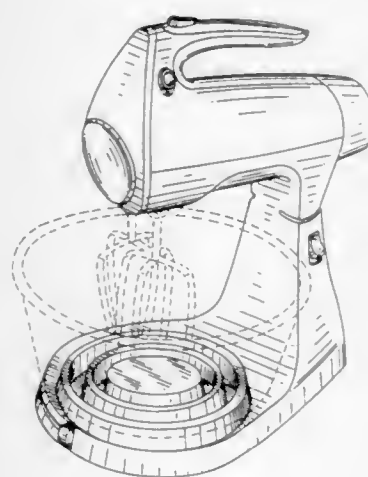
U.S. Cl. D7—303

395,573  
CHOPPERBruno Leverrier, Lassay-les-Chateaux, France, assignor to  
Robert Krups GmbH & Co. KG, Solingen, GermanyFiled May 30, 1997, Ser. No. 71,527  
Claims priority, application France, Dec. 4, 1996, 96 6840  
Term of patent 14 years  
LOC (6) Cl. 31 - 00

U.S. Cl. D7—381

395,572  
STAND MIXERMaureen Carroll, Atlanta; Kirk Charles, Austell, and Javier  
Verdura, Marietta, all of Ga., assignors to Sunbeam Prod-  
ucts, Inc., Delray Beach, Fla.Filed Apr. 25, 1997, Ser. No. 70,045  
Term of patent 14 years  
LOC (6) Cl. 31 - 00

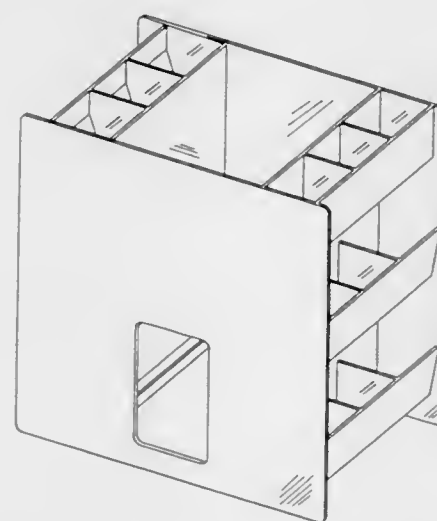
U.S. Cl. D7—379



395,574

STORAGE AND DISPLAY CASE MOUNTED ON WATER  
COOLERRobert Pope, 1177 Branham La., Ste. 279, San Jose, Calif.  
95118Filed Dec. 22, 1995, Ser. No. 48,199  
Term of patent 14 years  
LOC (6) Cl. 06 - 04

U.S. Cl. D7—397



JUNE 30, 1998

U.S. PATENT AND TRADEMARK OFFICE

5529

395,575

GOBLET WITH STEM HAVING FLAT SIDES

Peter M. Zelle, 50 N. Fourth Ave., 14B, Minneapolis, Minn.  
55401Filed Aug. 22, 1997, Ser. No. 75,829  
Term of patent 14 years  
LOC (6) Cl. 07 - 01

U.S. Cl. D7—537

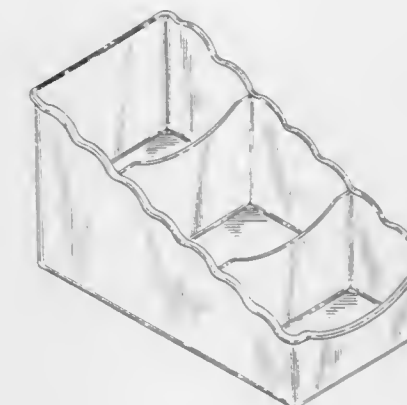


395,577

TRAY FOR FOOD PACKETS

D. Scott Miller, Orlando, Fla., assignor to Dart Industries Inc.,  
Orlando, Fla.Filed Apr. 3, 1997, Ser. No. 68,765  
Term of patent 14 years  
LOC (6) Cl. 07 - 06

U.S. Cl. D7—590



395,576

VACUUM FLASK

Frank Teh-Hsiung Huang, Suite 804, 8 Fl., No. 128, Sec. 3,  
Ming-Sheng E. Rd., Taipei, TaiwanFiled Jun. 6, 1997, Ser. No. 71,786  
Term of patent 14 years  
LOC (6) Cl. 07 - 01

U.S. Cl. D7—319



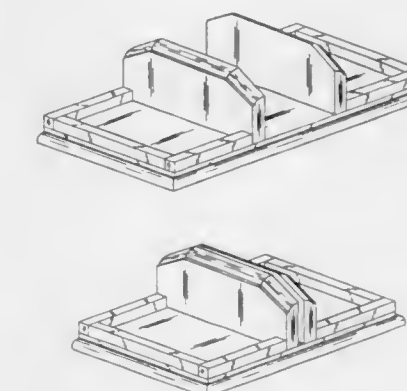
395,578

TABLE TOP ORGANIZER FOR CONDIMENT  
CONTAINERS, MENUS AND NAPKINS

Frank Pulitano, 163 Summer St., Stratford, Conn. 06497

Filed Jun. 19, 1997, Ser. No. 72,498  
Term of patent 14 years  
LOC (6) Cl. 07 - 06

U.S. Cl. D7—590



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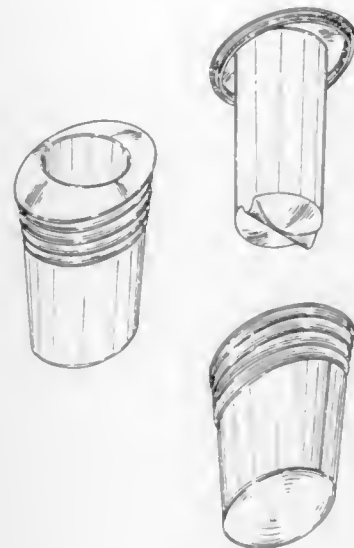
395,579  
BOTTLE COOLERHanne Dalsgaard Jeppesen, Holte; Jakob Heiberg, Charlotten-  
lund, and Stig Lillelund, Gentofte, all of Denmark, assignors  
to Dart Industries Inc., Orlando, Fla.

Filed Jan. 29, 1997, Ser. No. 65,250

Term of patent 14 years

LOC (6) Cl. 07 - 01

U.S. Cl. D7—603

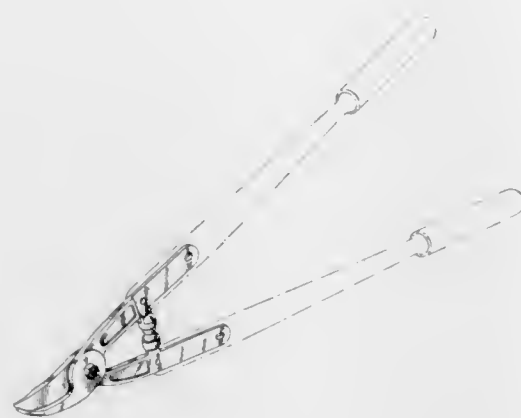
395,581  
LOPPERChiping Peter Chai, 1218 S. Devon Pl., Diamond Bar, Calif.  
91765; Nghiem Tran, 1145 Springbrook St., and Louie  
Lemus, 507 W. Kendall St., both of Corona, Calif. 91720

Filed Jun. 23, 1997, Ser. No. 73,047

Term of patent 14 years

LOC (6) Cl. 08 - 01

U.S. Cl. D8—5

395,580  
CAN CARRIER/STORAGE DEVICE

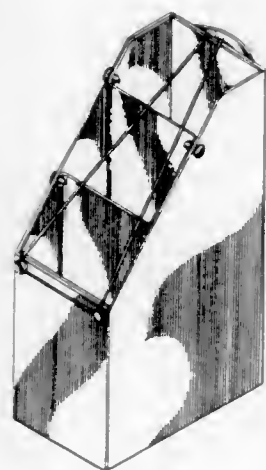
Kathleen S. Kendrick, 21 Lincoln St., Weston, Mass. 02193

Filed Jan. 27, 1997, Ser. No. 65,521

Term of patent 14 years

LOC (6) Cl. 07 - 06

U.S. Cl. D7—701

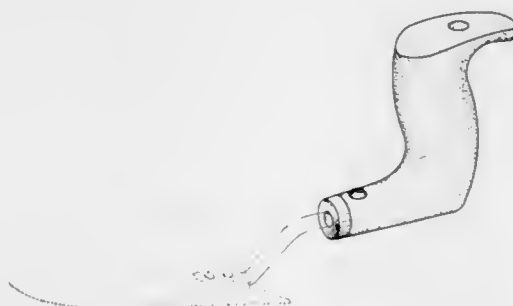
395,582  
TOOL HANDLEEarl E. Smith, 20872 Shadow Rock La., Trabuco Canyon,  
Calif. 92679

Filed Jun. 5, 1996, Ser. No. 55,406

Term of patent 14 years

LOC (6) Cl. 08 - 01

U.S. Cl. D8—10



JUNE 30, 1998

U.S. PATENT AND TRADEMARK OFFICE

5531

395,583  
SCISSORSBruno Gstalder, Poisy, France, assignor to Manufacture  
d'Articles De Precision, Et De Dessin, France

Filed Feb. 24, 1997, Ser. No. 66,696

Claims priority, application Hague Agreement, Sep. 23,  
1996, DM/037 612

Term of patent 14 years

LOC (6) Cl. 08 - 03

U.S. Cl. D8—57

395,585  
PORTABLE POWER GRINDERMalin Katarina Andersson, Stockholm, Sweden, assignor to  
Atlas Copco Tools AB, Stockholm, Sweden

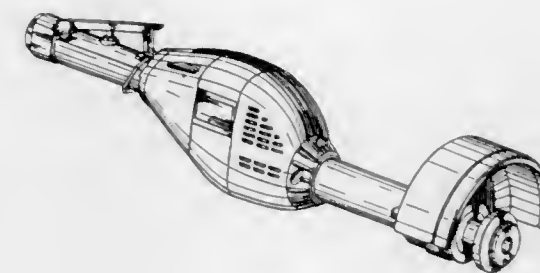
Filed Jan. 3, 1997, Ser. No. 64,536

Claims priority, application Sweden, Jul. 9, 1996, 96-1531-1

Term of patent 14 years

LOC (6) Cl. 08 - 02

U.S. Cl. D8—62

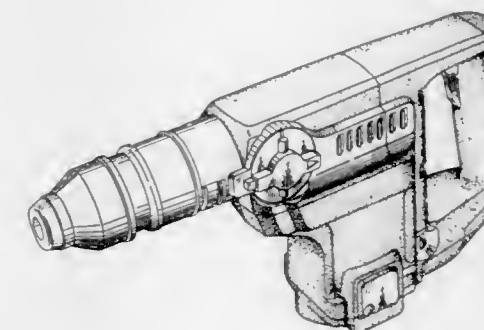
395,586  
PORTABLE ELECTRIC HAMMERTakuo Arakawa, Hekinan, and Norifumi Niwa, Chiryu, both of  
Japan, assignors to Makita Corporation, Anjo, JapanContinuation of Ser. No. 58,503, Aug. 16, 1996. This applica-  
tion Apr. 9, 1997, Ser. No. 68,894

Claims priority, application Japan, Feb. 20, 1996, 8-4455

Term of patent 14 years

LOC (6) Cl. 08 - 01

U.S. Cl. D8—69

395,584  
SCISSORSBruno Gstalder, Poisy, France, assignor to Manufacture  
d'Articles de Precision et de Dessin, France

Filed Feb. 24, 1997, Ser. No. 66,697

Term of patent 14 years

LOC (6) Cl. 08 - 03

U.S. Cl. D8—57





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395,587

## SCREWDRIVER KEY

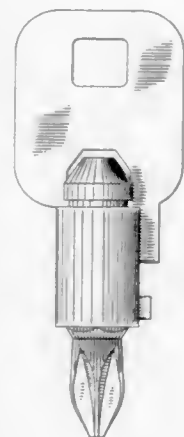
Robert J. Magers, 1835 N. Topeka Blvd., Ste. 112, Topeka, Kans. 66608; T. Douglas Schaeffer, 185 Schoolhouse Rd., Christiana, Pa. 17509

Filed Dec. 11, 1996, Ser. No. 63,595

Term of patent 14 years

LOC (6) Cl. 08 - 04

U.S. Cl. D8—82



395,589

## UTILITY KNIFE

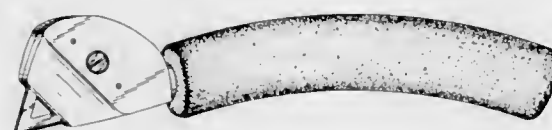
T. Douglas Schaeffer, 185 Schoolhouse Rd., Christiana, Pa. 17509

Filed Feb. 3, 1997, Ser. No. 66,205

Term of patent 14 years

LOC (6) Cl. 08 - 03

U.S. Cl. D8—98



395,588

## SAW HANDLE

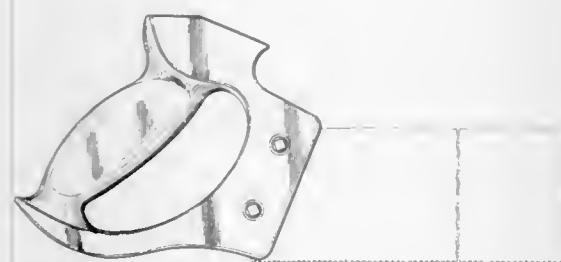
Joseph Randall Davis, 1209 Cowper Dr., Raleigh, N.C. 27608; Richard Henri Johan deNijs, 7001 Ebenezer Church Rd., Raleigh, N.C. 27612, and Thomas Alexius Davis, 4520 Kaplan Dr., Raleigh, N.C. 27606

Filed Jun. 30, 1994, Ser. No. 25,346

Term of patent 14 years

LOC (6) Cl. 08 - 03

U.S. Cl. D8—97



395,590

## HINGE

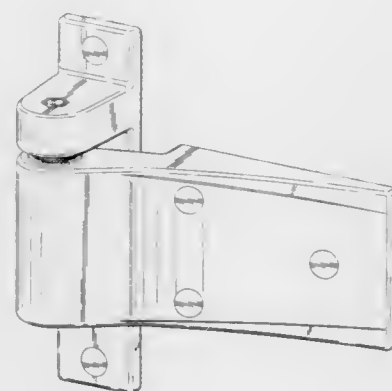
Burl Finkelstein, and Mark Kennedy, both of Newnan, Ga., assignors to Kason Industries, Inc.

Filed Aug. 7, 1995, Ser. No. 42,325

Term of patent 14 years

LOC (6) Cl. 08 - 06

U.S. Cl. D8—323



U.S. PATENT AND TRADEMARK OFFICE

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395,591

## TIE DOWN SUPPORT

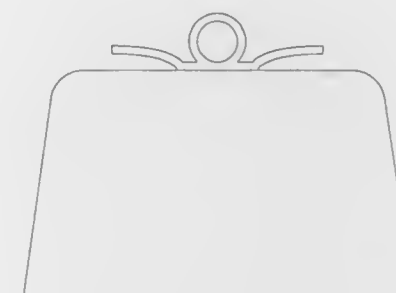
Warren Roda, Box 127, Otisville, N.Y. 10963

Filed Jul. 13, 1997, Ser. No. 74,484

Term of patent 14 years

LOC (6) Cl. 08 - 05

U.S. Cl. D8—349



395,593

## AIR HOSE WINDER

Isao Okamoto, Osaka, Japan, assignor to Nichido Kogyo

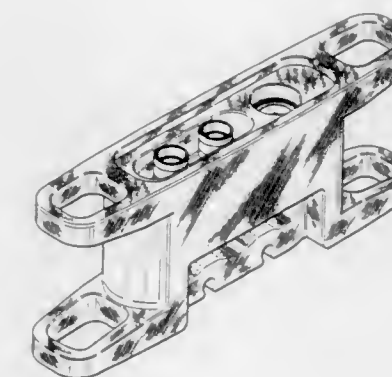
Kabushiki Kaisha, Osaka, Japan

Filed Jul. 30, 1997, Ser. No. 74,218

Term of patent 14 years

LOC (6) Cl. 08 - 05

U.S. Cl. D8—358



395,594

## PICTURE HANGER

James L. Bries, Cottage Grove; Johannes N. Gaston; Douglas J. VanOrnum, both of Minnetonka; Paul E. Raber, North Saint Paul, and Pauline A. Pieper, Saint Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 10, 1997, Ser. No. 67,480

Term of patent 14 years

LOC (6) Cl. 08 - 05

U.S. Cl. D8—367



395,592

## ENGINE MOUNTS FOR RACING KART

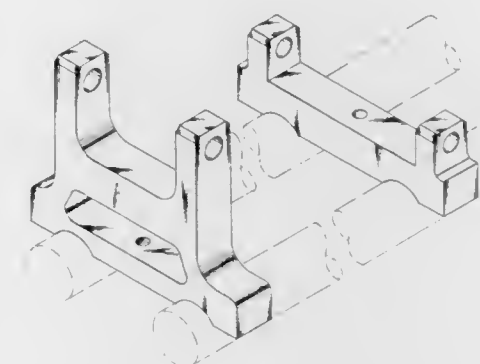
Ricardo F. Clavel, 3007 138th St. SE., Bothell, Wash. 98012, and Leon F. Clavel, Bothell, Wash., assignors to Ricardo F. Clavel, Bothell, Wash.

Filed Oct. 25, 1996, Ser. No. 61,532

Term of patent 14 years

LOC (6) Cl. 08 - 05

U.S. Cl. D8—354



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## BOLT KEEPER

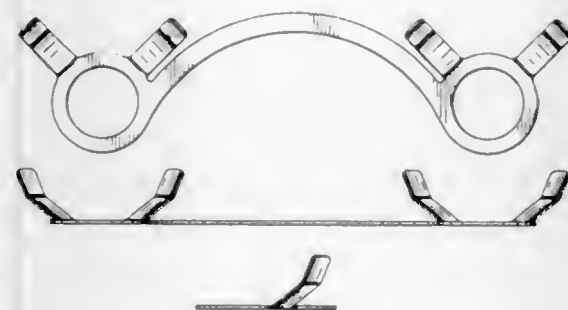
Horace A. Smith, Prairie Village, and Ralph Carroll, Olathe, both of Kans., assignors to Glaseal, Inc., Prairie Village, Kans.

Filed Oct. 22, 1996, Ser. No. 61,337

Term of patent 14 years

LOC (6) Cl. 08 - 08

U.S. Cl. D8—382



395,597

## CONTAINER WITH CAP

John David Lamb, Wiltshire, United Kingdom, assignor to Chesebrough-Pond's USA Co., Division of Conopco, Inc., Greenwich, Conn.

Filed Sep. 12, 1996, Ser. No. 59,507

Claims priority, application United Kingdom, Apr. 2, 1996, 2055320

The portion of the term of this patent subsequent to Dec. 30, 2011, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 09 - 01

U.S. Cl. D9—300



395,596

## BUCKLE TIE

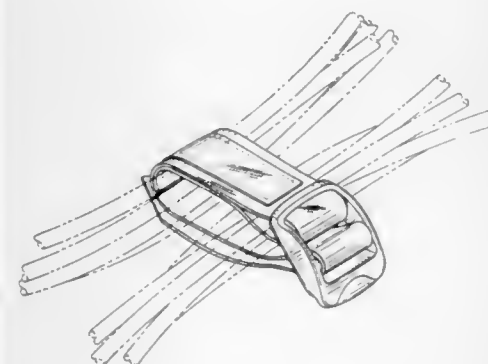
Louis L. Butera, Staten Island, N.Y., assignor to DiMarzio, Inc., Staten Island, N.Y.

Filed Aug. 19, 1997, Ser. No. 75,510

Term of patent 14 years

LOC (6) Cl. 08 - 08

U.S. Cl. D8—396



395,598

## AEROSOL DISPENSER

Klaas Johannis Van Lit, Amstelveen, Netherlands; Allen D. Miller; James R. Nielsen, both of Racine, Wis., and Guy R. Thompson, Hampshire, United Kingdom, assignors to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Feb. 28, 1997, Ser. No. 66,715

Term of patent 14 years

LOC (6) Cl. 09 - 01

U.S. Cl. D9—300



JUNE 30, 1998

U.S. PATENT AND TRADEMARK OFFICE

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395,599

## FOOD PACKAGE

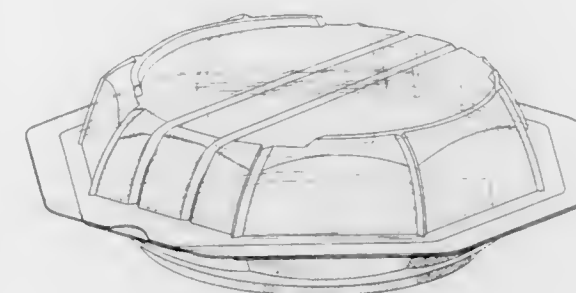
Ihor Wyslowsky, 6133 N. Forest Glen, Chicago, Ill. 60646

Filed Mar. 24, 1997, Ser. No. 69,273

Term of patent 14 years

LOC (6) Cl. 09 - 07

U.S. Cl. D9—425



395,601

## SHORT NECK BOTTLE CARTON

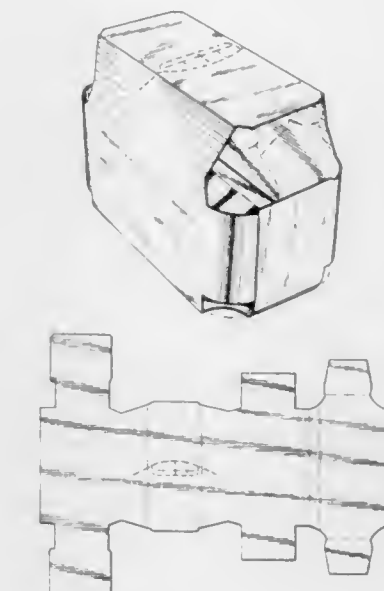
Charles A. Miller, Williamsburg, Ohio, and Norbert Hoell, Southgate, Ky., assignors to The C.W. Zumbiel Co., Cincinnati, Ohio

Filed Jan. 30, 1997, Ser. No. 65,578

Term of patent 14 years

LOC (6) Cl. 09 - 07

U.S. Cl. D9—433



395,600

## PACKAGE FOR CONTACT LENS CONTAINERS

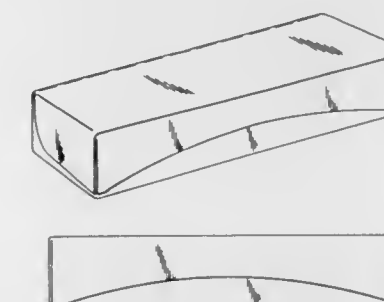
Sharla Borghorst, Breda, Netherlands; Erich Bauman, Goldbach, Germany; Peter Herbrechtsmeier, Königstein, Germany; David Pietrobon, Hofheim/Taunus, Germany; Michele De Lucchi, Angera, Italy; Torsten Fritze, and Masahiko Kubo, both of Milan, Italy, assignors to CIBA Geigy Corp., Tarrytown, N.Y.

Filed Jan. 19, 1996, Ser. No. 49,199

Term of patent 14 years

LOC (6) Cl. 09 - 07

U.S. Cl. D9—432



395,602

## TUBE PRESS AND STAND

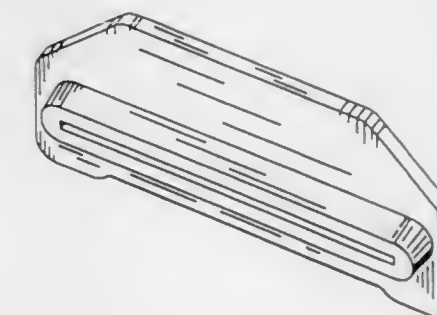
Michael W. Sakko, P.O. Box 2501, Winter Haven, Fla. 33883

Filed Oct. 24, 1996, Ser. No. 61,475

Term of patent 14 years

LOC (6) Cl. 09 - 07

U.S. Cl. D9—434





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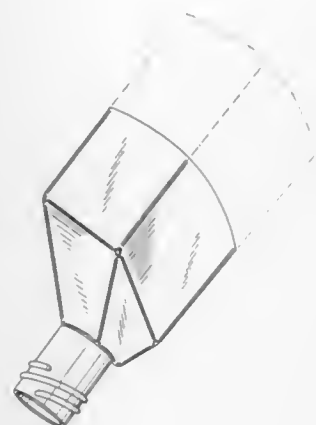
JUNE 30, 1998

395,603

OIL BOTTLE FUNNEL

Virgil Harris, P.O. Box 124, Point Marion, Pa. 15474  
Filed Nov. 1, 1996, Ser. No. 61,887  
Term of patent 14 years  
LOC (6) Cl. 09 - 07

U.S. Cl. D9—447



395,605

BOTTLE

Emily K. Kokege, Cincinnati, Ohio, assignor to The Procter  
& Gamble Company, Cincinnati, Ohio  
Filed Oct. 4, 1996, Ser. No. 60,718  
Term of patent 14 years  
LOC (6) Cl. 09 - 01

U.S. Cl. D9—571



395,604

COMBINED DECANTER AND STOPPER

Thierry Lecoule, Paris, France, assignor to Martell & Co.,  
Cognac, France  
Filed May 30, 1997, Ser. No. 71,524  
Term of patent 14 years  
LOC (6) Cl. 09 - 01

U.S. Cl. D9—522



395,606

COMBINED CONTAINER AND CAP

Ping Li Tacconelli, Los Angeles, Calif., assignor to Cosmair,  
Inc., New York, N.Y.  
Filed Sep. 2, 1997, Ser. No. 75,889  
Term of patent 14 years  
LOC (6) Cl. 09 - 01

U.S. Cl. D9—574



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U.S. PATENT AND TRADEMARK OFFICE

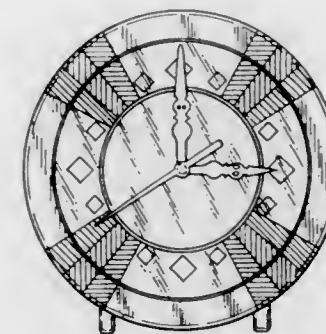
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395,607

CASINO CHIP CLOCK

Myung Joo Chae, 272-16 Kum To Dong, Su Jung Ku, Sung  
Nam City, Kyungi Ki-Do, Rep. of Korea  
Filed Nov. 8, 1996, Ser. No. 62,186  
Term of patent 14 years  
LOC (6) Cl. 10 - 01

U.S. Cl. D10—6

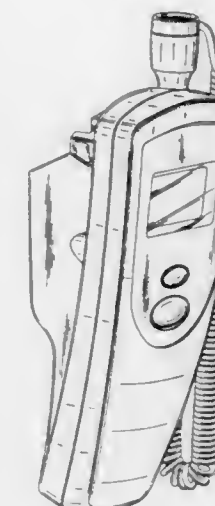


395,609

MEDICAL THERMOMETER

Alan Scott Knieriem, Baldwinsville, and Devin Glen Cooper,  
Fairport, both of N.Y., assignors to Welch Allyn, Inc., Skaneateles Falls, N.Y.  
Filed May 14, 1997, Ser. No. 71,110  
Term of patent 14 years  
LOC (6) Cl. 10 - 04

U.S. Cl. D10—57



395,610

SURVEY MARKER

Clarence E. Truax, 520 Fairground Rd., Taylorsville, Ky. 40071  
Filed Apr. 10, 1997, Ser. No. 68,380  
Term of patent 14 years  
LOC (6) Cl. 10 - 04

U.S. Cl. D10—66

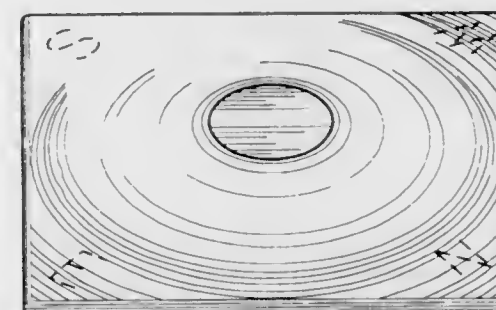


395,608

SURVEY MARKER

Clarence E. Truax, 520 Fairground Rd., Taylorsville, Ky. 40071  
Filed Apr. 10, 1997, Ser. No. 68,382  
Term of patent 14 years  
LOC (6) Cl. 10 - 04

U.S. Cl. D10—66



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OFFICIAL GAZETTE

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395,611

NOTE SPACER

Shmuel Daniel Oren, 3 Hakalanit, 44280 Kfar Saba, Israel  
Continuation-in-part of Ser. No. 48,772, Dec. 14, 1995, abandoned, and Ser. No. 48,773, Dec. 14, 1995, abandoned. This application May 5, 1997, Ser. No. 69,611  
Claims priority, application Israel, Jun. 15, 1995, 24576  
Term of patent 14 years  
LOC (6) Cl. 10 - 04

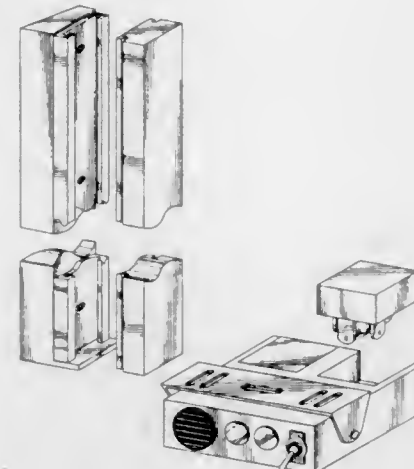
U.S. Cl. D10—71



395,613

COMBINED SAFETY SWITCH AND ALARM UNIT

Duane A. Little, 547 Tuscarawas Ave., Newcomerstown, Ohio 43832  
Filed Sep. 27, 1996, Ser. No. 60,405  
Term of patent 14 years  
LOC (6) Cl. 10 - 05  
U.S. Cl. D10—106



395,612

KITCHEN SCALE

Wolfgang Fabian, Mannheim, Germany, assignor to Soehnle-Waagen GmbH & Co., Murrhardt, Germany  
Filed Jul. 31, 1996, Ser. No. 57,756  
Claims priority, application Hague Agreement, Feb. 2, 1996, DM/035418  
Term of patent 14 years  
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U.S. Cl. D10—91

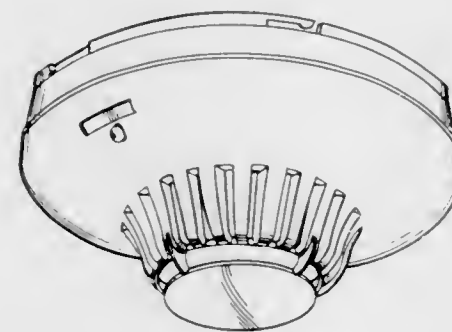


395,614

FIRE DETECTOR CASING

David Owen Denoon-Stevens, Cape Town, South Africa, assignor to Ziton SA (Proprietary) Limited, Cape Town, South Africa  
Filed Sep. 5, 1997, Ser. No. 76,128  
Claims priority, application South Africa, Mar. 12, 1997, A97/0267  
Term of patent 14 years  
LOC (6) Cl. 10 - 05

U.S. Cl. D10—106



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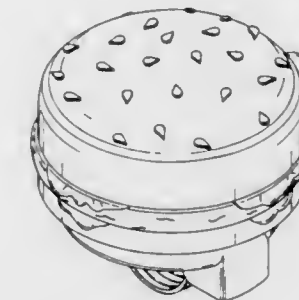
U.S. PATENT AND TRADEMARK OFFICE

5539

395,615

RINGER FOR A BICYCLE

Shen-Keng Lin, No. 387-16, Fan-Hua Rd., Hsueh-Shui Hsiang, Changhua Hsien, Taiwan  
Filed Mar. 10, 1997, Ser. No. 67,570  
Term of patent 14 years  
LOC (6) Cl. 10 - 05  
U.S. Cl. D10—116



395,617

CONFETTI

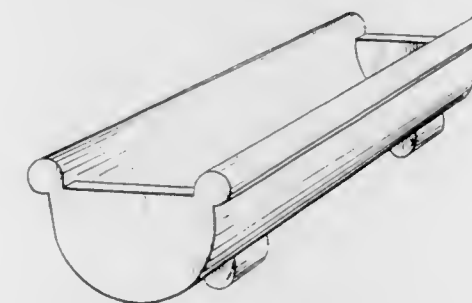
Ardina K. Sterr, Sherman Oaks, and S. Clark Bason, North Hollywood, both of Calif., assignors to Artistry in Motion Entertainment, Inc., Van Nuys, Calif.  
Filed Apr. 23, 1996, Ser. No. 53,622  
Term of patent 14 years  
LOC (6) Cl. 11 - 05  
U.S. Cl. D11—184



395,616

FLOWER CONTAINER

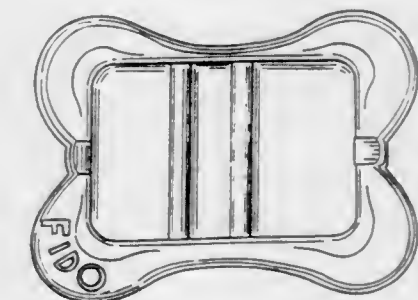
Max Egloff, Loorenstr. 16, CH-5443 Niederrohrdorf, Switzerland  
Filed May 2, 1997, Ser. No. 70,247  
Claims priority, application WIPO, Nov. 12, 1996, 007070  
Term of patent 14 years  
LOC (6) Cl. 11 - 02  
U.S. Cl. D11—156



395,618

BELT BUCKLE

William Cohen, Syosset; Tracy Roberts, Westbury, and Sonia Cohen, Irvington, all of N.Y., assignors to Fido, Inc., Syosset, N.Y.  
Filed Mar. 7, 1995, Ser. No. 35,847  
Term of patent 14 years  
LOC (6) Cl. 02 - 07  
U.S. Cl. D11—218





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395,619

AUTOMOBILE

Hang-Young Cho, Incheon, Rep. of Korea, assignor to Daewoo Motor Co., Ltd., Incheon, Rep. of Korea

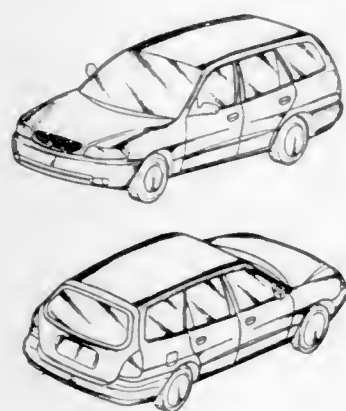
Filed Mar. 22, 1997, Ser. No. 67,849

Claims priority, application Rep. of Korea, Sep. 25, 1996, 96-20623

Term of patent 14 years

LOC (6) Cl. 12 - 08

U.S. Cl. D12—91



395,621

MOTORCYCLE

Toshiyuki Nishino, Hamamatsu, Japan, assignor to Suzuki Kabushiki Kaisha, Shizuoka-Ken, Japan

Filed Jul. 9, 1997, Ser. No. 74,249

Claims priority, application Japan, Feb. 7, 1997, 9-3591

Term of patent 14 years

LOC (6) Cl. 12 - 11

U.S. Cl. D12—110



395,620

AUTOMOBILE

Richard David Hamblin, Solihull, United Kingdom, assignor to Rolls-Royce Motor Cars Limited, Cheshire, England

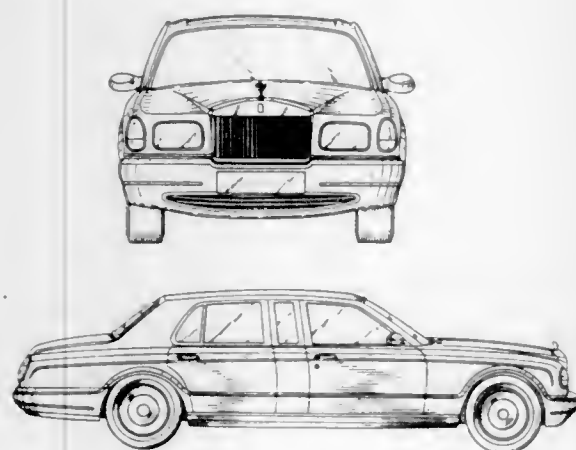
Filed Nov. 21, 1996, Ser. No. 62,700

Claims priority, application United Kingdom, May 23, 1996, 2056488

Term of patent 14 years

LOC (6) Cl. 12 - 08

U.S. Cl. D12—92



395,622

BABY STROLLER HANDLE UNIT

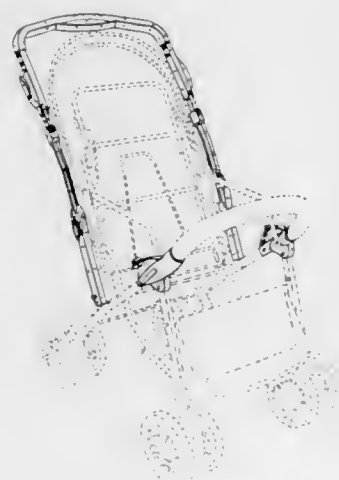
Mark A. Flannery, Shorewood, Minn., assignor to Regalo International, LLC, Minneapolis, Minn.

Filed Aug. 4, 1997, Ser. No. 74,891

Term of patent 14 years

LOC (6) Cl. 12 - 12

U.S. Cl. D12—133



395,623

MOVEMENT RESTRICTING BASE FOR A BABY WALKER

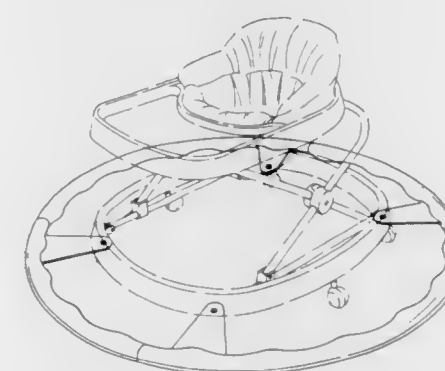
Chih-Huang Yang, 7F-1, No. 9-7, Sec. 2, Taichung-Kang Rd., Taichung City, Taiwan

Filed Aug. 25, 1997, Ser. No. 76,130

Term of patent 14 years

LOC (6) Cl. 12 - 12

U.S. Cl. D12—133



395,625

AUTOMOBILE TIRE

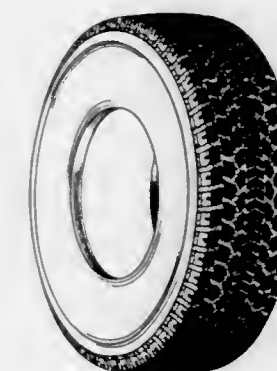
Koji Mori, Akashi, Japan, assignor to Sumitomo Rubber Industries, Ltd., Kobe, Japan

Filed Nov. 27, 1996, Ser. No. 62,833

Term of patent 14 years

LOC (6) Cl. 12 - 15

U.S. Cl. D12—147



395,626

TREAD FOR A TIRE

Jean-Michel Gillard, Mersch; Georges Gaston Feider, Bettborn, both of Luxembourg, and Christian Jean-Marie Roger Bawin, Saint-Georges Sur-Meuse, Belgium, assignors to The Goodyear Tire &amp; Rubber Company, Akron, Ohio

Filed Apr. 25, 1997, Ser. No. 70,031

Term of patent 14 years

LOC (6) Cl. 12 - 15

U.S. Cl. D12—147

395,624

TIRE TREAD

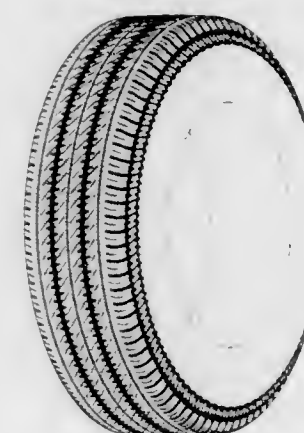
Maurice Graas, Reichlange, Luxembourg, assignor to The Goodyear Tire &amp; Rubber Company, Akron, Ohio

Filed May 13, 1997, Ser. No. 70,684

Term of patent 14 years

LOC (6) Cl. 12 - 15

U.S. Cl. D12—143



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OFFICIAL GAZETTE

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395,627

## TIRE TREAD

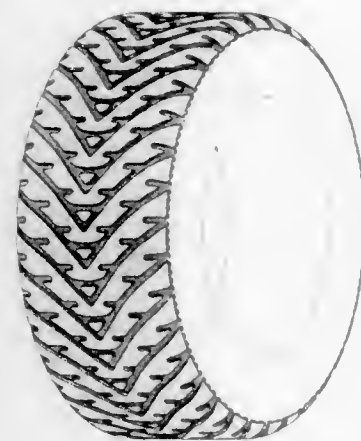
Graham Stanley Ball, Staffordshire, England; Christopher Paul Johnning, Wadsworth, Ohio; John Janis Taube, Tallmadge, Ohio; Janet Lynn Melia, and Christopher Alan Manthey, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 7, 1997, Ser. No. 68,883

Term of patent 14 years

LOC (6) Cl. 12 - 15

U.S. Cl. D12—149



395,629

## STEERING WHEEL COVER

Maurice Moore, Jr., 4518 Beaconsfield Ct., Westlake Village, Calif. 91361

Filed Apr. 4, 1997, Ser. No. 69,688

Term of patent 14 years

LOC (6) Cl. 12 - 16

U.S. Cl. D12—177



395,628

## STEERING STABILIZER

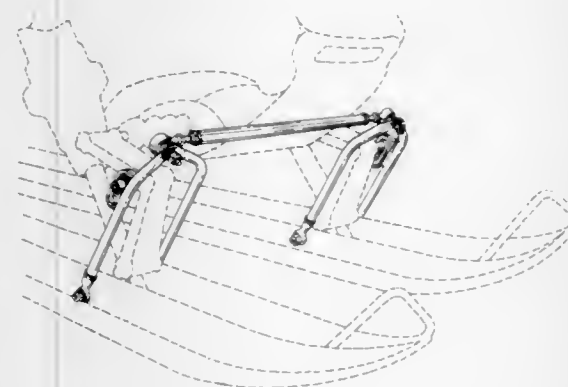
Russell A. Rougier, 81 Smith Corner Rd., Newton, N.H. 03858

Filed Dec. 5, 1996, Ser. No. 63,321

Term of patent 14 years

LOC (6) Cl. 12 - 16

U.S. Cl. D12—159



395,630

## INTEGRATED RUNNING BOARD AND MUD FLAP

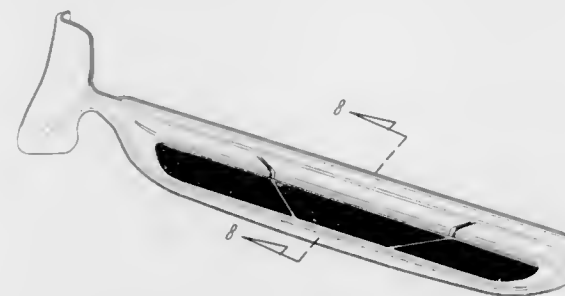
John M. Stanesic, Louisville, and Scott P. Thompson, Longmont, both of Colo., assignors to DFM Corporation, Longmont, Colo.

Filed Jul. 15, 1997, Ser. No. 73,678

Term of patent 14 years

LOC (6) Cl. 12 - 16

U.S. Cl. D12—203



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U.S. PATENT AND TRADEMARK OFFICE

5543

395,631

## VEHICLE WHEEL

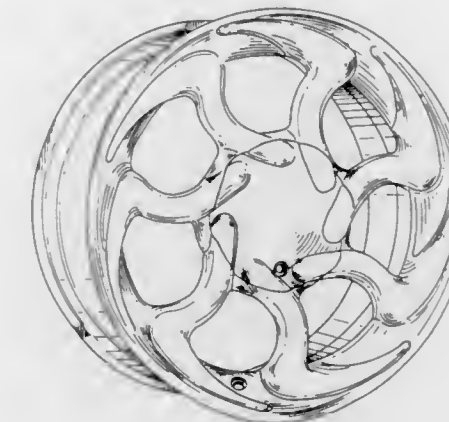
Victor C. Moreno, Whittier, Calif., assignor to Ultra Wheel Co., Buena Park, Calif.

Filed Dec. 26, 1996, Ser. No. 64,276

Term of patent 14 years

LOC (6) Cl. 12 - 16

U.S. Cl. D12—209



395,633

## SPOKE UNIT FOR VEHICLE WHEEL

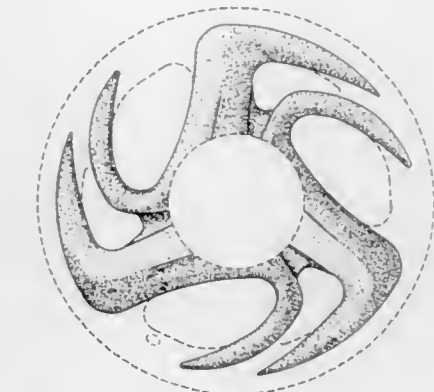
James H. Choi, 2937 E. Maria St., Rancho Dominguez, Calif. 90221

Filed Jan. 2, 1997, Ser. No. 65,291

Term of patent 14 years

LOC (6) Cl. 12 - 16

U.S. Cl. D12—209



395,632

## SPOKE UNIT FOR VEHICLE WHEEL

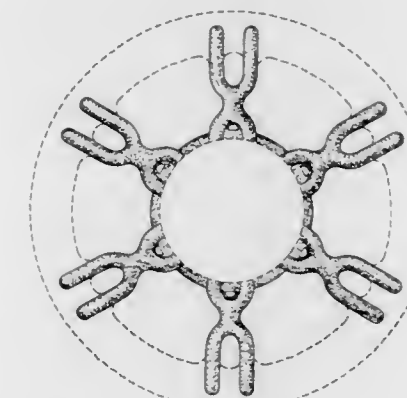
James H. Choi, 2937 E. Maria St., Rancho Dominguez, Calif. 90221

Filed Jan. 2, 1997, Ser. No. 64,473

Term of patent 14 years

LOC (6) Cl. 12 - 16

U.S. Cl. D12—209



395,634

## SPOKE UNIT FOR VEHICLE WHEEL

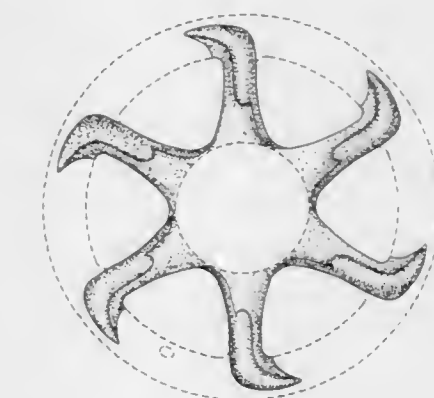
James H. Choi, 2937 E. Maria St., Rancho Dominguez, Calif. 90221

Filed Jan. 2, 1997, Ser. No. 65,292

Term of patent 14 years

LOC (6) Cl. 12 - 16

U.S. Cl. D12—209





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## WHEEL SPOKE UNIT

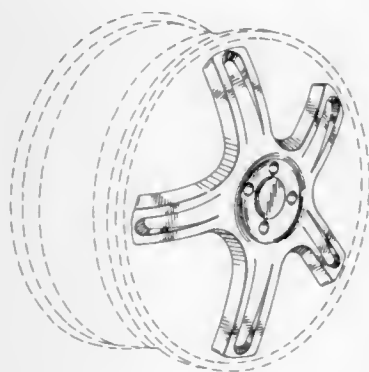
Steve Kelley, Irvine, Calif., assignor to Wheel Components, Inc., Fullerton, Calif.

Filed Apr. 14, 1997, Ser. No. 68,164

Term of patent 14 years

LOC (6) Cl. 12 - 16

U.S. Cl. D12—213



395,637

## VISOR ORGANIZER

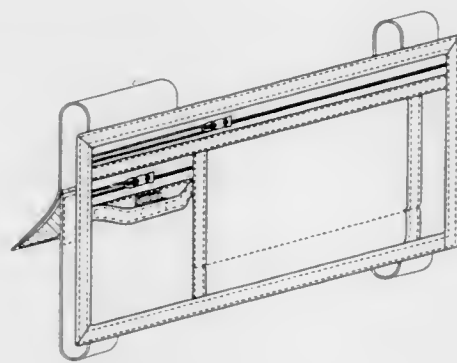
Kimberly Ann Patterson, Malibu, Calif., assignor to Auto-Shade, LLC, Moorpark, Calif.

Filed Jun. 10, 1996, Ser. No. 55,645

Term of patent 14 years

LOC (6) Cl. 12 - 16

U.S. Cl. D12—417



395,638

## SEMICONDUCTOR PACKAGE

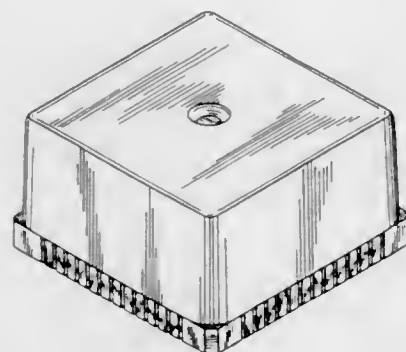
Michio Koyama, and Hajime Ohke, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jan. 30, 1997, Ser. No. 65,265

Term of patent 14 years

LOC (6) Cl. 13 - 03

U.S. Cl. D13—182



395,636

## FISHING BOAT

Richard D. Pierce, Mountain Home, Ark., assignor to Challenger Inc., Mountain Home, Ark.

Filed Mar. 12, 1997, Ser. No. 67,826

Term of patent 14 years

LOC (6) Cl. 12 - 06

U.S. Cl. D12—300



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U.S. PATENT AND TRADEMARK OFFICE

5545

395,639

## COMPUTER TABLET

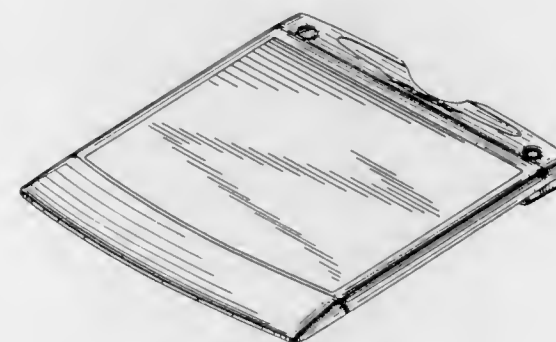
Sooyjung Ham, Providence, R.I., and John Costello, Wellesley, Mass., assignors to A.T. Cross Co., Lincoln, R.I.

Filed May 23, 1997, Ser. No. 71,234

Term of patent 14 years

LOC (6) Cl. 14 - 02

U.S. Cl. D14—100



395,641

## CIRCULAR COMPUTER TESTING AND CARRYING PALLET

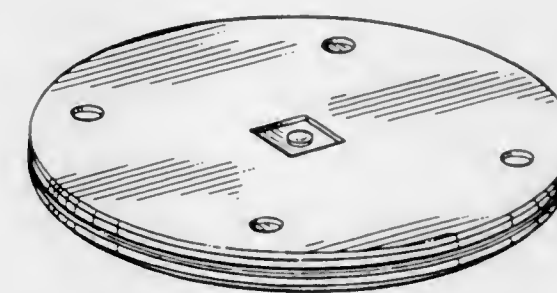
Jorge Robinson Gaete, Seabrook, Tex., assignor to PFI Vacuum Forming Inc., Houston, Tex.

Filed Dec. 2, 1996, Ser. No. 63,198

Term of patent 14 years

LOC (6) Cl. 14 - 02

U.S. Cl. D14—114



395,640

## HOLDER FOR PORTABLE COMPUTING DEVICE

Walter Adrian Goodman, Binghamton, N.Y.; Frank Vincent Grebe, Racine, Wis.; Charles Raymond Hatton, Endicott, N.Y.; David John Podmajersky, Johnson City, N.Y.; John Henry Sherman, Glen Aubrey, N.Y., and Paul Andrew Wormsbecher, Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

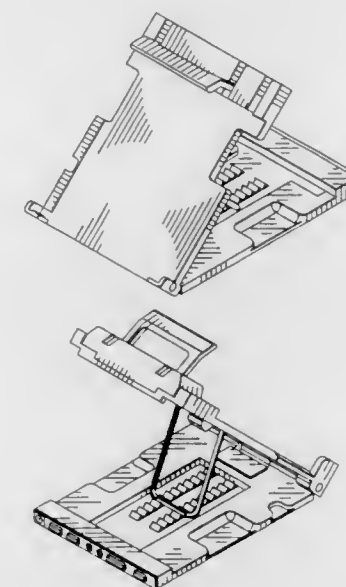
Division of Ser. No. 28,204, Sep. 9, 1994. This application Jan.

2, 1996, Ser. No. 48,513

Term of patent 14 years

LOC (6) Cl. 14 - 02

U.S. Cl. D14—114



395,642

## RADIO TELEPHONE DISPLAY ICON

Brian A. Kosek, Oak Park, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 1, 1994, Ser. No. 27,935

Term of patent 14 years

LOC (6) Cl. 14 - 99

U.S. Cl. D14—114.1



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395,643

## COMPUTER SCREEN WITH A SET OF ICONS

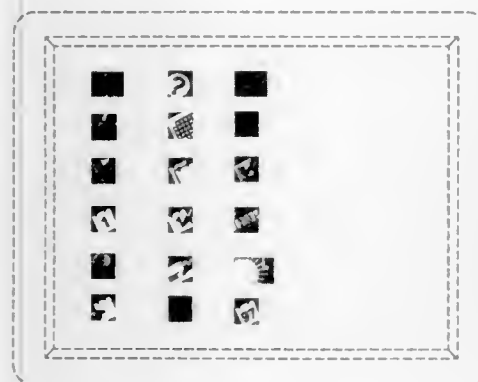
Chris Ryan, Mountain View, Calif., assignor to Sun Microsystems, Inc.

Filed Jun. 30, 1997, Ser. No. 73,099

Term of patent 14 years

LOC (6) Cl. 14 - 02

U.S. Cl. D14—114.1



395,644

Patent Not Issued For This Number

395,645

## DISPLAY SCREEN WITH AN ICON

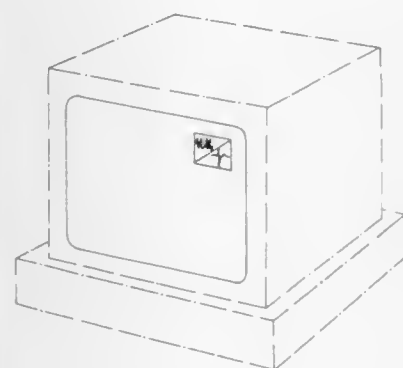
Armando M. Cappa, Reseda; Jeffrey D. Konopka, Northridge, and Warren R. Heer, La Palma, all of Calif., assignors to Pacesetter, Inc., Sylmar, Calif.

Filed Jan. 24, 1996, Ser. No. 49,408

Term of patent 14 years

LOC (6) Cl. 14 - 02

U.S. Cl. D14—114.3



395,646

## PRINTER ICON FOR A DISPLAY SCREEN

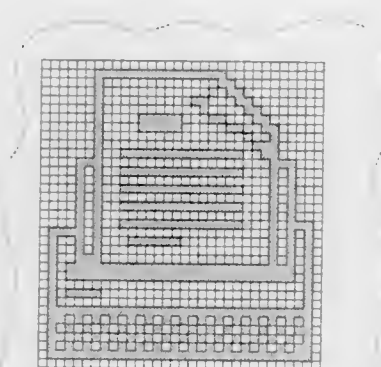
Makoto Wanishi, Tokyo; Masato Ikemori, Kawasaki; Kaeko Kariya, Inagi; Hiroshi Matsuda, Yokohama; Makoto Morioka, Kawasaki; Kazuo Hattori, Yokohama; Hiroshi Suzuki, Kawasaki, and Daisaburo Murai, Tokyo, all of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Division of Ser. No. 592,317, Oct. 1, 1990, Pat. No. Des. 386,166. This application May 27, 1997, Ser. No. 71,276

Term of patent 14 years

LOC (6) Cl. 14 - 99

U.S. Cl. D14—114.3



395,647

## "POCKET CALCULATOR ACTIVATION" ICON FOR A DISPLAY SCREEN

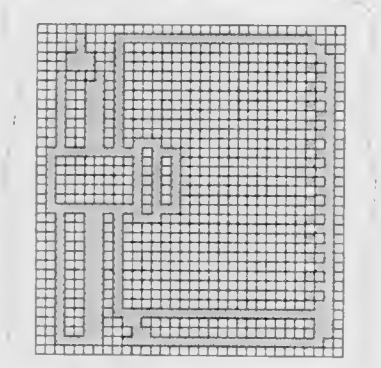
Makoto Wanishi, Tokyo; Masato Ikemori, Kawasaki; Kaeko Kariya, Inagi; Hiroshi Matsuda, Yokohama; Makoto Morioka, Kawasaki; Kazuo Hattori, Yokohama; Hiroshi Suzuki, Kawasaki, and Daisaburo Murai, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 592,317, Oct. 1, 1990, Pat. No. Des. 386,166. This application May 27, 1997, Ser. No. 71,292

Term of patent 14 years

LOC (6) Cl. 14 - 99

U.S. Cl. D14—114.3



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U.S. PATENT AND TRADEMARK OFFICE

5547

395,648

## "ACTIVATE CALENDAR APPLICATION" ICON FOR A DISPLAY SCREEN

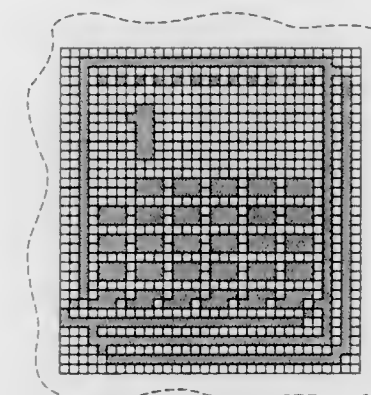
Makoto Wanishi, Tokyo; Masato Ikemori, Kawasaki; Kaeko Kariya, Inagi; Hiroshi Matsuda, Yokohama; Makoto Morioka, Kawasaki; Kazuo Hattori, Yokohama; Hiroshi Suzuki, Kawasaki, and Daisaburo Murai, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 592,317, Oct. 1, 1990, Pat. No. Des. 386,166. This application May 27, 1997, Ser. No. 71,293

Term of patent 14 years

LOC (6) Cl. 14 - 99

U.S. Cl. D14—114.3



395,649

## "ACTIVATION" ICON FOR A DISPLAY SCREEN

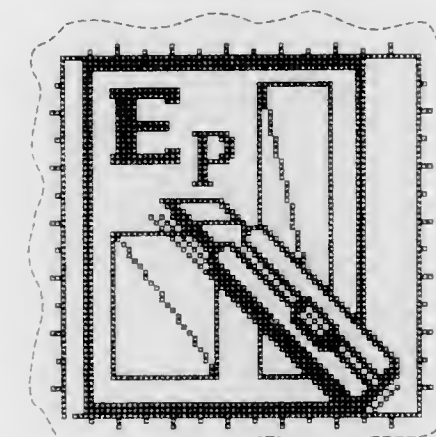
Makoto Wanishi, Tokyo; Kazuo Hattori, Yokohama, and Daisaburo Murai, Tokyo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Division of Ser. No. 588,819, Sep. 27, 1990, Pat. No. Des. 385,864. This application May 27, 1997, Ser. No. 71,328

Term of patent 14 years

LOC (6) Cl. 14 - 99

U.S. Cl. D14—114.3



395,650

## "SET THE HOURS" ICON FOR A DISPLAY SCREEN OF A PROGRAMMED COMPUTER SYSTEM

Thomas G. Levin, Northridge, and Jeffery D. Snell, Oak Park, both of Calif., assignors to Pacesetter, Inc., Sylmar, Calif.

Division of Ser. No. 7,261, Apr. 15, 1993, which is a continuation-in-part of Ser. No. 332,816, Apr. 3, 1989, abandoned. This application Jun. 19, 1997, Ser. No. 72,688

Term of patent 14 years

LOC (6) Cl. 14 - 99

U.S. Cl. D14—114.3



395,651

## PORTION OF A DISPLAY SCREEN WITH ICON

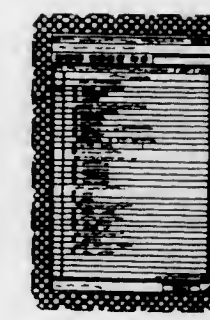
Viresh Bhatia, Schaumburg, and David M. Lapp, Carol Stream, both of Ill., assignors to Stirling Technologies, Inc., Schaumburg, Ill.

Filed Mar. 11, 1996, Ser. No. 51,435

Term of patent 14 years

LOC (6) Cl. 14 - 02

U.S. Cl. D14—114.5





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**ELECTRONIC EQUIPMENT ENCLOSURE**

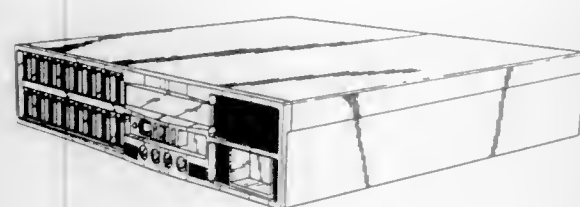
Richard A. Grimm, Cupertino, and Andrew J. Bivetto, Los Gatos, both of Calif., assignors to Brocade Communications, Inc., San Jose, Calif.

Continuation-in-part of Ser. No. 68,491, Mar. 21, 1997. This application May 30, 1997, Ser. No. 71,525

Term of patent 14 years

LOC (6) Cl. 02 - 03

U.S. Cl. D14—124



395,654

**POWER AMPLIFIER**

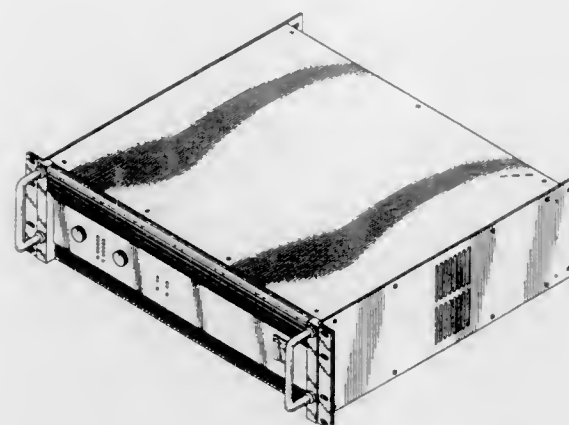
Greg C. Mackie, Kirkland, and Danilo O. Bonilla, Seattle, both of Wash., assignors to Mackie Designs Inc., Woodinville, Wash.

Filed Nov. 7, 1996, Ser. No. 62,128

Term of patent 14 years

LOC (6) Cl. 14 - 03

U.S. Cl. D14—188



395,655

**PAGER**

Hiroki Nishii; Masao Tamura; Katsumi Nagano, and Toshiro Iizuka, all of Kanagawa, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Jul. 10, 1997, Ser. No. 73,846

Claims priority, application Japan, Feb. 24, 1997, 9-5297

Term of patent 14 years

LOC (6) Cl. 14 - 03

U.S. Cl. D14—191

395,653

**TELEPHONE NECK SET**

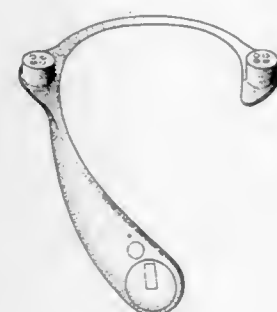
Clifford Dean Read, 78 Hobin Street, Stittsville, Ontario, Canada, K2S 1G8; Pak Jong Chu, 113 David Drive, Nepean, Ontario, Canada, K2G 2N6, and Andre John Van Schyndel, 16 Young's Pond Court, Kanata, Ontario, Canada, K2L 4B7

Filed Sep. 28, 1995, Ser. No. 44,661

Term of patent 14 years

LOC (6) Cl. 14 - 03

U.S. Cl. D14—142



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U.S. PATENT AND TRADEMARK OFFICE

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395,656

**SPEAKER**

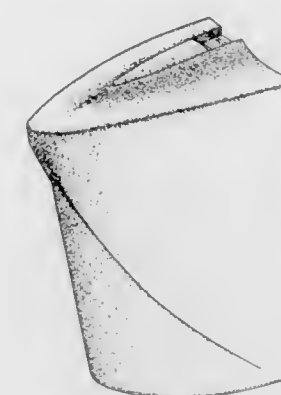
Steve Woolley, Burbank, Calif.; Peter Harries, Cambridge, England, and Roger F. Cox, Chino Hills, Calif., assignors to Fender Musical Instruments Corporation, Scottsdale, Ariz.

Filed Nov. 22, 1996, Ser. No. 62,732

Term of patent 14 years

LOC (6) Cl. 14 - 01

U.S. Cl. D14—214



395,658

**HIGH PERFORMANCE IC ENGINE IGNITION COIL**

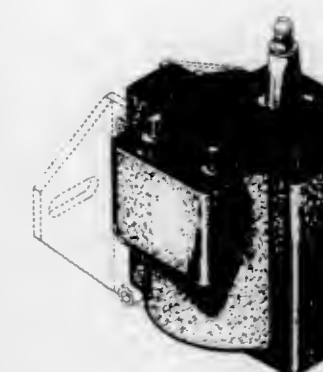
Ulf Arens, 7360 Trade St., San Diego, Calif. 92121

Filed Dec. 26, 1996, Ser. No. 64,289

Term of patent 14 years

LOC (6) Cl. 15 - 01

U.S. Cl. D15—5



395,657

**CAP FOR BANDED EARPLUG**

Howard S. Leight, 1330 Colorado Ave., Santa Monica, Calif.

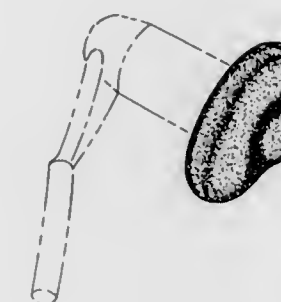
90404

Filed Jun. 3, 1993, Ser. No. 9,122

Term of patent 14 years

LOC (6) Cl. 14 - 01

U.S. Cl. D14—223



395,659

**LAWN MOWER COVER**

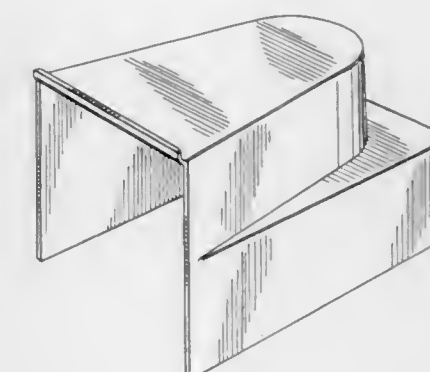
Mat Moiseve, P.O. Box 1135, Poway, Calif. 92064

Filed May 9, 1997, Ser. No. 70,513

Term of patent 14 years

LOC (6) Cl. 15 - 03

U.S. Cl. D15—17



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395,660

## SIDE MOUNT BLADE FOR RIDING LAWNMOWER

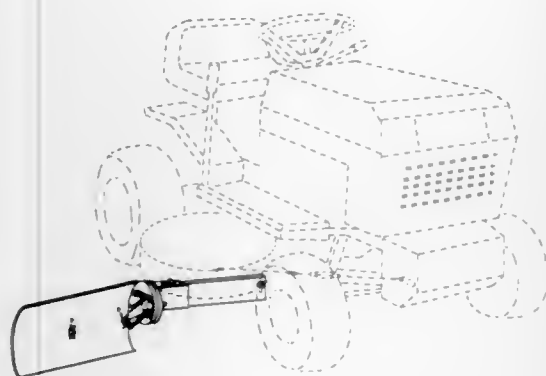
Helen B. Soeffje, P.O. Box 1835, Seguin, Tex. 78155, and Hubert G. Lovelady, 4352 Wildt Rd., San Antonio, Tex. 78222

Filed May 27, 1997, Ser. No. 71,456

Term of patent 14 years

LOC (6) Cl. 15 - 03

U.S. Cl. D15—17



395,662

## PRESS WHEEL

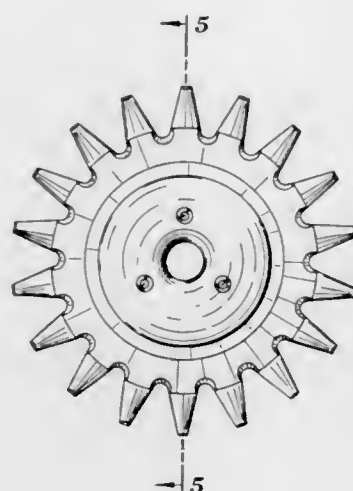
Mark W. Bruns, Gibbon, Minn., assignor to May-Wes Manufacturing, Inc., Gibbon, Minn.

Continuation-in-part of Ser. No. 45,706, Oct. 27, 1995, Pat. No. Des. 382,571, and a continuation-in-part of Ser. No. 45,705, Oct. 27, 1995. This application Mar. 18, 1997, Ser. No. 69,044

Term of patent 14 years

LOC (6) Cl. 15 - 03

U.S. Cl. D15—29



395,661

## DIGGER TOOTH

Jorge Pallas Moreno, Prima De Mar, Spain, assignor to Metalogenia S.A., Prima De Mar, Spain

Filed Jun. 14, 1996, Ser. No. 55,900

Claims priority, application Spain, Dec. 14, 1995, 136.465

Term of patent 14 years

LOC (6) Cl. 15 - 03

U.S. Cl. D15—29



395,663

## CUTTING INSERT

Sture Murén, Gävle, and Jörgen Wiman, Sandviken, both of Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

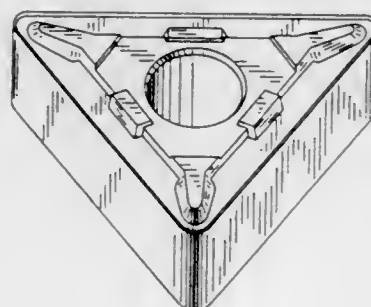
Filed Sep. 27, 1996, Ser. No. 60,379

Claims priority, application Sweden, Mar. 28, 1996, 96 0714

Term of patent 14 years

LOC (6) Cl. 15 - 09

U.S. Cl. D15—139



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U.S. PATENT AND TRADEMARK OFFICE

5551

395,664

## MICROSCOPE

Akira Nojima, Fussa, and Arata Ono, Urawa, both of Japan, assignors to Nikon Corporation, Tokyo, Japan

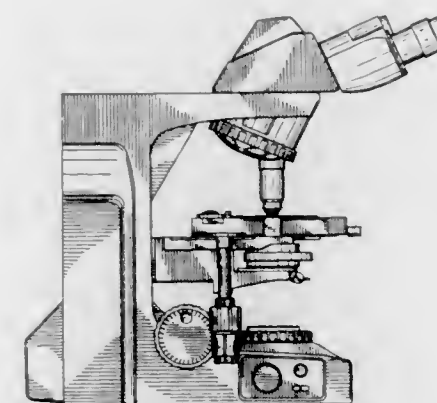
Filed Mar. 24, 1997, Ser. No. 68,641

Claims priority, application Japan, Oct. 24, 1996, 8-31886

Term of patent 14 years

LOC (6) Cl. 16 - 06

U.S. Cl. D16—131



395,666

## SWIMMING GOGGLES

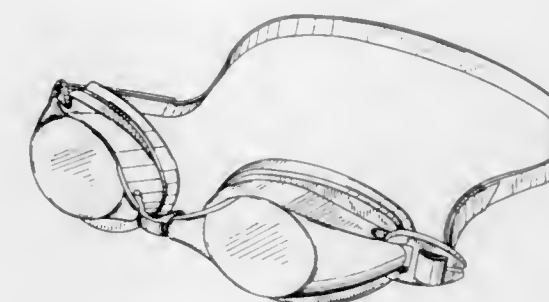
Tomoyuki Yashiro, Higashi-Osaka, Japan, assignor to Yamamoto Kogaku Co., Ltd., Higashi-Osaka, Japan

Filed Jan. 23, 1997, Ser. No. 65,185

Term of patent 14 years

LOC (6) Cl. 16 - 06

U.S. Cl. D16—303



395,665

## CAMERA

Yoshiyuki Matsumura, Yokosuka, and Akihiko Ebe, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

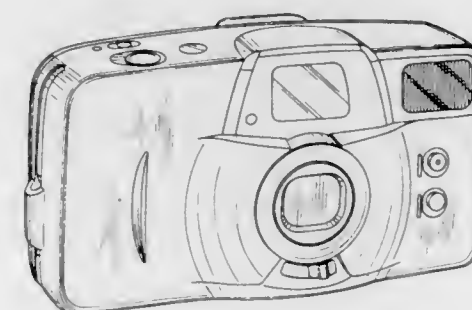
Filed Aug. 13, 1997, Ser. No. 75,145

Claims priority, application Japan, Feb. 19, 1997, 9-004720

Term of patent 14 years

LOC (6) Cl. 16 - 01

U.S. Cl. D16—209



395,667

## SUNGLASSES

Luciano Simioni, Montebelluna, Italy, assignor to Killer Loop S.p.A., Pederobba, Italy

Filed Jul. 29, 1996, Ser. No. 57,621

Claims priority, application Hague Agreement, Feb. 7, 1996, DM/035462

Term of patent 14 years

LOC (6) Cl. 16 - 06

U.S. Cl. D16—326





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395,668

## TONER CARTRIDGE

Koichi Yasuda, Yao, Japan, assignor to Mita Industrial Co., Ltd., Osaka, Japan

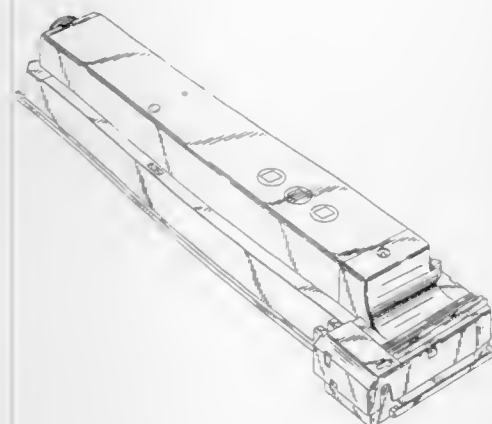
Filed Mar. 25, 1996, Ser. No. 52,112

Claims priority, application Japan, Oct. 6, 1995, 7-30049

Term of patent 14 years

LOC (6) Cl. 16 - 03

U.S. Cl. D18—43



395,670

## COMBINED INK TANK HOLDER AND PRINTING HEAD FOR PRINTER

Manabu Inoue, Yokohama; Toshiaki Hirose, Hiratsuka, and Osamu Morita, Yokosuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

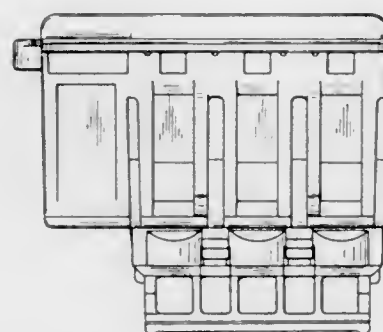
Filed Apr. 11, 1997, Ser. No. 69,122

Claims priority, application Japan, Oct. 16, 1996, 8-30933

Term of patent 14 years

LOC (6) Cl. 18 - 02

U.S. Cl. D18—56



395,671

## CALENDAR

Claude Awono, 1220 East-West Hwy., #117A, Silver Spring, Md. 20910

Filed Jan. 19, 1996, Ser. No. 49,113

Term of patent 14 years

LOC (6) Cl. 19 - 03

U.S. Cl. D19—20

395,669

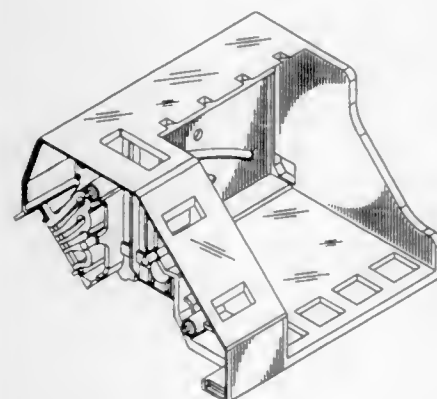
COMBINED PRINT HEAD AND INK TANK HOLDER  
Michael Carlotta, Alpharetta, Ga.; Robert K. McCubbin, Sr., Rochester, N.Y.; Richard C. Keefe, Savannah, N.Y., and Donald M. Stevens, Walworth, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 27, 1996, Ser. No. 56,363

Term of patent 14 years

LOC (6) Cl. 18 - 02

U.S. Cl. D18—56



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U.S. PATENT AND TRADEMARK OFFICE

5553

395,672

## INK STYLUS PEN

José Navarro, Hamburg, Germany, assignor to Koh-I-Noor Inc., Bloomsbury, N.J.

Filed May 27, 1997, Ser. No. 71,460

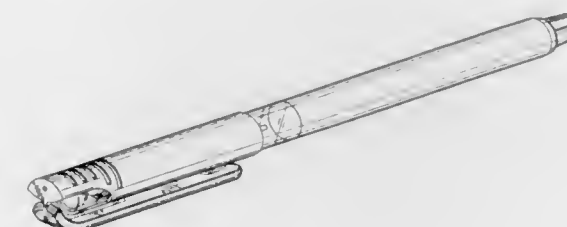
Claims priority, application Germany, Nov. 25, 1996, M 96

10 074.5

Term of patent 14 years

LOC (6) Cl. 19 - 06

U.S. Cl. D19—48



395,674

## PEN

Maria Boix Gacia, Ganduxer, 43, Barcelona, Spain, 08021

Filed Aug. 12, 1997, Ser. No. 75,053

Term of patent 14 years

LOC (6) Cl. 19 - 06

U.S. Cl. D19—51



395,675

## ARITHMETIC INSTRUCTIONAL APPARATUS

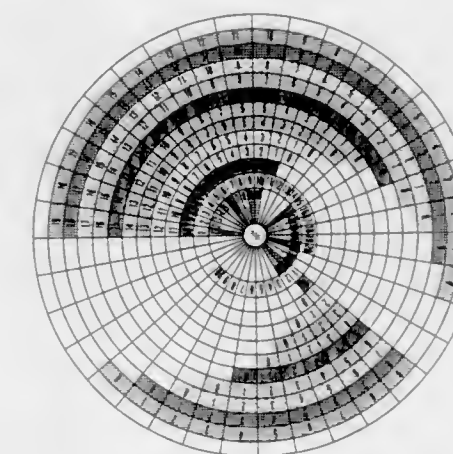
Irma Maritza Perez, 176 Montgomery St., Bloomfield, N.J. 07003

Filed Apr. 21, 1997, Ser. No. 69,487

Term of patent 14 years

LOC (6) Cl. 19 - 07

U.S. Cl. D19—59



395,673

## BALL POINT PEN

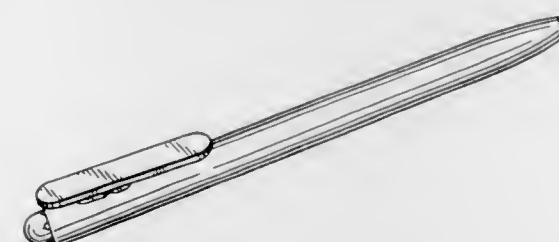
Frédéric Baubil, Valence, France, assignor to Reynolds, Valence, France

Filed Jul. 22, 1997, Ser. No. 73,994

Term of patent 14 years

LOC (6) Cl. 19 - 06

U.S. Cl. D19—51



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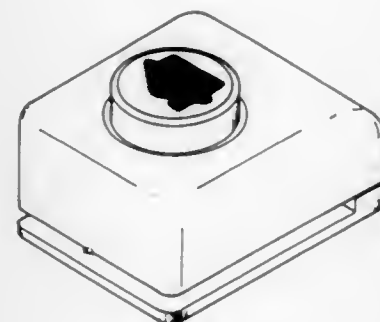
Jeng-Jong Chiou, Taipei, Taiwan, assignor to Full Create Enterprises, Ltd., Taipei, Taiwan

Filed Feb. 23, 1996, Ser. No. 50,718

Term of patent 14 years

LOC (6) Cl. 19 - 02

U.S. Cl. D19—72



395,678

ADVERTISING PANEL

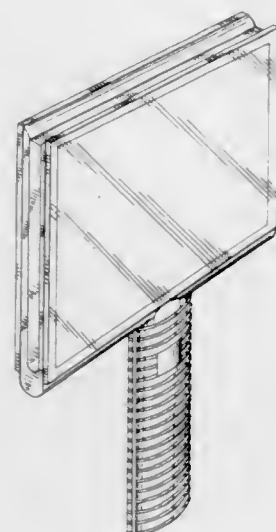
Jean-Patrice Treille, Paris, France, assignor to Avenir France, Boulogne Billancourt, France

Filed Mar. 20, 1996, Ser. No. 51,963

Term of patent 14 years

LOC (6) Cl. 20 - 02

U.S. Cl. D20—41



395,677

INFORMATION PANEL

Antonio Canton Gongora; Carlos Jesus Cruz Fernandez; José Maria Muñagorri Enriquez, and Juan Carlos Rayo Ortigüela, all of Madrid, Spain, assignors to Telefonica De Espana, s.a., Madrid, Spain

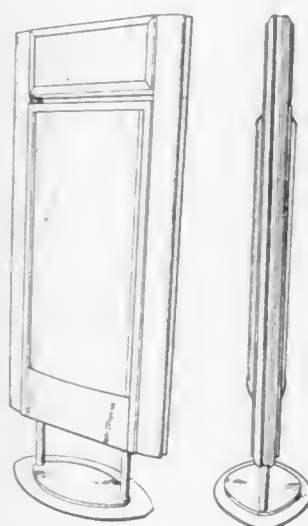
Filed Nov. 22, 1996, Ser. No. 62,762

Claims priority, application Spain, May 22, 1996, 137553

Term of patent 14 years

LOC (6) Cl. 20 - 03

U.S. Cl. D20—10



395,679

MOVABLE PANEL FOR ADVERTISING

Antonio Canton Gongora; Carlos Jesus Cruz Fernandez; José Maria Muñagorri Enriquez, and Juan Carlos Rayo Ortigüela, all of Madrid, Spain, assignors to Telefonica De Espana, S.A., Madrid, Spain

Filed Nov. 21, 1996, Ser. No. 62,708

Claims priority, application Spain, May 22, 1996, 137548

Term of patent 14 years

LOC (6) Cl. 20 - 02

U.S. Cl. D20—41



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U.S. PATENT AND TRADEMARK OFFICE

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395,680

SIGN HOLDER WITH SLOPED TOP

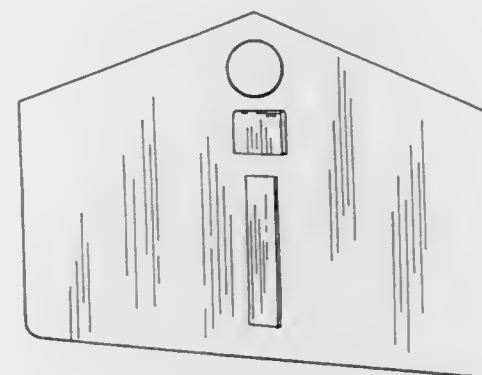
Hal Sandy, 4937 Glendale Rd., Shawnee-Mission, Kans. 66205

Filed Aug. 3, 1995, Ser. No. 42,185

Term of patent 14 years

LOC (6) Cl. 20 - 02

U.S. Cl. D20—42



395,682

TOY MERRY-GO-ROUND

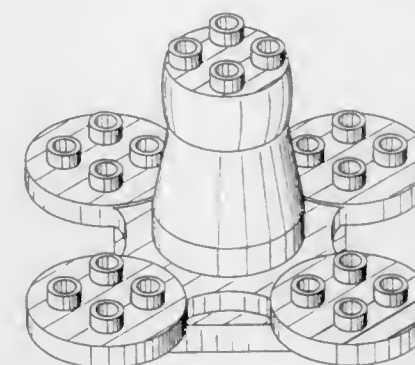
Anne Maria Bartholdy, Gentofte, and Niels Ohrwald, Helsingør, both of Denmark, assignors to INTERLEGO AG, Baar, Switzerland

Filed Sep. 18, 1997, Ser. No. 76,721

Term of patent 14 years

LOC (6) Cl. 21 - 01

U.S. Cl. D21—108



395,681

TOY BUILDING ELEMENT

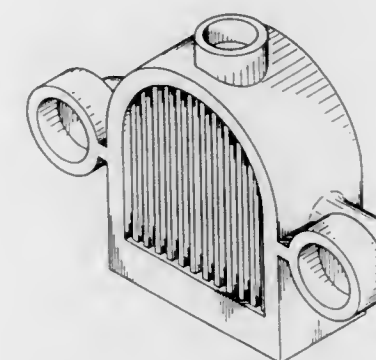
Henrik Clausen, Vildbjerg, Denmark, assignor to INTERLEGO AG, Baar, Switzerland

Filed Sep. 18, 1997, Ser. No. 76,696

Term of patent 14 years

LOC (6) Cl. 21 - 01

U.S. Cl. D21—108



395,683

COMBINED TOY HELICOPTER AND AUTOMOBILE

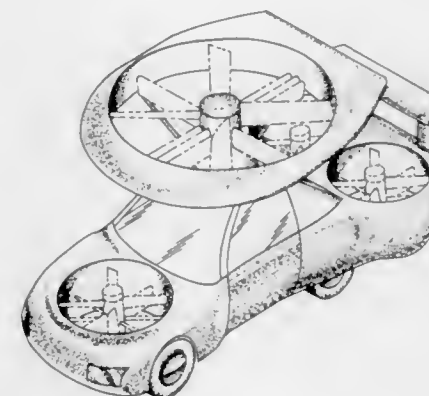
Frank Richard Chiappetta, Berwyn, Pa., assignor to Fran-Rich-Chi Associates, Berwyn, Pa.

Continuation-in-part of Ser. No. 118,966, Sep. 9, 1993, Pat. No. 5,505,407. This application Apr. 8, 1996, Ser. No. 52,908

Term of patent 14 years

LOC (6) Cl. 21 - 01

U.S. Cl. D21—128





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ROLL EXERCISE DEVICE

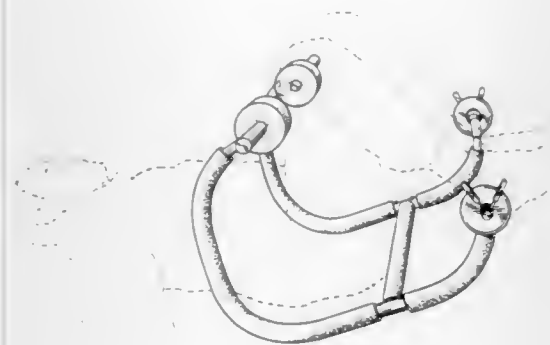
Brad Olschansky, and Scott Olschansky, both of 2003 Lake Park Dr. Apt. H, Smyrna, Ga. 30080

Filed Jan. 16, 1997, Ser. No. 64,963

Term of patent 14 years

LOC (6) Cl. 21 - 02

U.S. Cl. D21—191



395,686

HAND AND WRIST WEIGHT

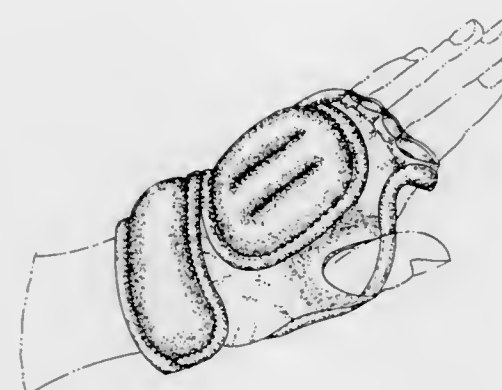
James A. Eckmann, Libertyville, Ill., assignor to Sportworks Ltd., Vernon Hills, Ill.

Filed Nov. 18, 1996, Ser. No. 62,508

Term of patent 14 years

LOC (6) Cl. 21 - 02

U.S. Cl. D21—196



395,685

ABDOMINAL EXERCISE APPARATUS

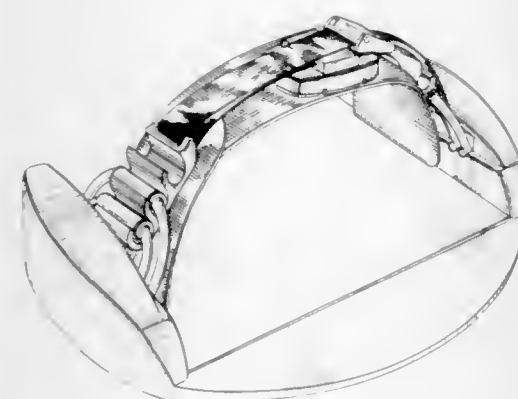
Jaeson D. Cayne, Carlsbad; Jonathan Oswaks, Westlake Village; Mingjen S. Huang, Arcadia, and Jean Pierre Durrand, Los Angeles, all of Calif., assignors to Martin A. Van Der Hoeven, Del Mar, Calif.

Filed Feb. 13, 1997, Ser. No. 66,500

Term of patent 14 years

LOC (6) Cl. 21 - 02

U.S. Cl. D21—191



395,687

WRIST SUPPORTING WEIGHT TRAINING CABLE HANDGRIP

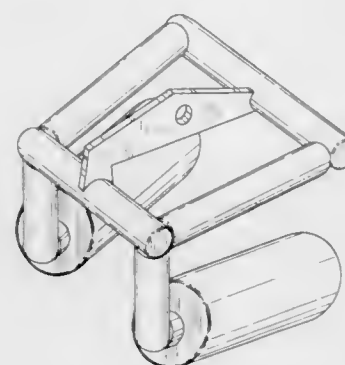
Marvin Marney, 188 Wilton Dr., #2, Campbell, Calif. 95008

Continuation-in-part of Ser. No. 603,443, Feb. 20, 1996, abandoned. This application Jan. 10, 1997, Ser. No. 64,797

Term of patent 14 years

LOC (6) Cl. 21 - 02

U.S. Cl. D21—198



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U.S. PATENT AND TRADEMARK OFFICE

5557

395,688

INTERIOR SURFACE FOR A SQUASH COURT

Christopher Martin Hadden, Squash Academy Switzerland, Gartenstr. 28, CH-8707 Uetikon Am See, Switzerland

Filed Nov. 12, 1996, Ser. No. 62,216

Term of patent 14 years

LOC (6) Cl. 21 - 99

U.S. Cl. D21—199



395,691

GOLF CLUB HEAD

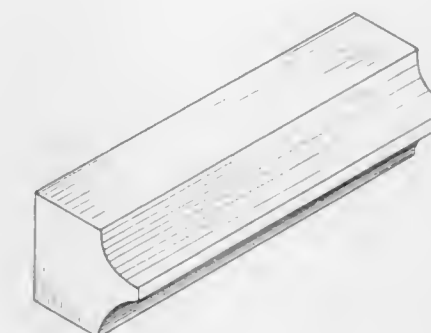
Joseph L. Spano, 120 Fairview Dr., Madisonville, La. 70447

Filed Jun. 11, 1997, Ser. No. 72,248

Term of patent 14 years

LOC (6) Cl. 21 - 02

U.S. Cl. D21—217



395,689

Patent Not Issued For This Number

395,690

INSTRUCTIONAL SOCCER BALL

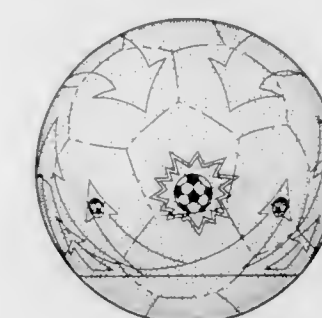
Luis Villavicencio, 12037 Cedar Creek Dr., Cincinnati, Ohio 45240

Filed Apr. 18, 1997, Ser. No. 69,837

Term of patent 14 years

LOC (6) Cl. 21 - 02

U.S. Cl. D21—204



395,692

GOLF CLUB PUTTER HEAD

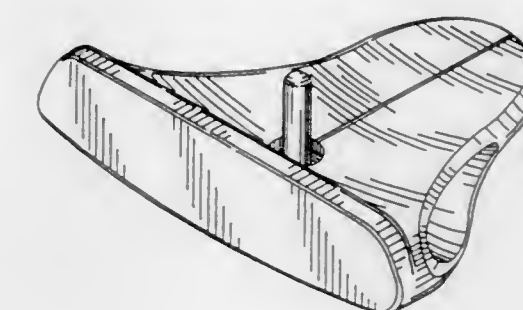
Byron Butler, 2 Siega, Rancho Santa Margarita, Calif. 92688

Filed Dec. 20, 1996, Ser. No. 64,036

Term of patent 14 years

LOC (6) Cl. 21 - 02

U.S. Cl. D21—219



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395,693

## PULL TAB OF SLIDE FASTENER

Kenji Yuki, Toyama, Japan, assignor to YKK Corporation, Tokyo, Japan

Filed Dec. 20, 1996, Ser. No. 64,053

Claims priority, application Japan, Jun. 28, 1996, 8-19269

Term of patent 14 years

LOC (6) Cl. 02 - 07

U.S. Cl. D21—221



395,695

## LINE GUIDE FOR FISHING ROD

Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Shizuoka-ken, Japan

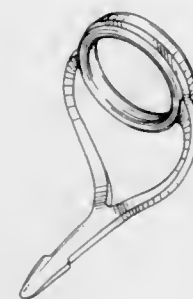
Filed Dec. 9, 1996, Ser. No. 63,474

Claims priority, application Japan, Jun. 21, 1996, 8-18546

Term of patent 14 years

LOC (6) Cl. 22 - 05

U.S. Cl. D22—143



395,694

## GOLF CLUB COVER

Jeffrey R. Perry, Scottsdale, Ariz., and John C. Welch, Rochester Hills, Mich., assignors to Tour Gear Limited, Scottsdale, Ariz.

Continuation-in-part of Ser. No. 39,346, May 25, 1995, which is a continuation-in-part of Ser. No. 18,041, Jan. 26, 1994, abandoned. This application Sep. 2, 1997, Ser. No. 75,528

Term of patent 14 years

LOC (6) Cl. 21 - 02

U.S. Cl. D21—221



395,696

## DOWNSPOUT NOISE ELIMINATOR

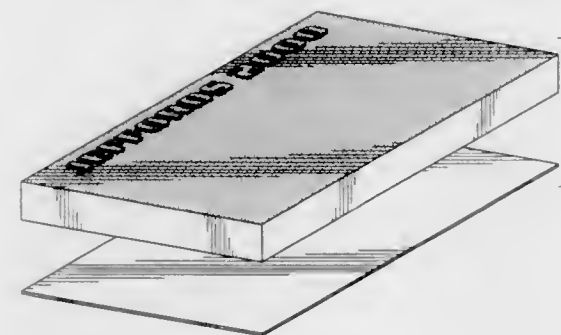
Kevin Jeffords, 1508 Kentfields Ave., Redwood City, Calif. 94061

Filed Aug. 16, 1996, Ser. No. 58,535

Term of patent 14 years

LOC (6) Cl. 23 - 01

U.S. Cl. D23—267



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U.S. PATENT AND TRADEMARK OFFICE

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395,697

Patent Not Issued For This Number

395,698

## BATHTUB

Jaime Singla Palacin, Gava, Spain, assignor to Compania Roca Radiadores, S.A., Gava, Spain

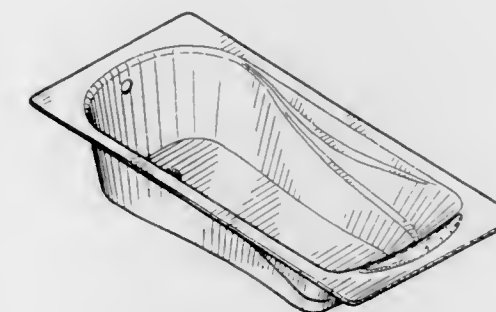
Filed Nov. 22, 1996, Ser. No. 62,750

Claims priority, application Spain, May 23, 1996, 137556

Term of patent 14 years

LOC (6) Cl. 23 - 02

U.S. Cl. D23—280.1



395,700

## GLOW-IN-THE-DARK TOILET SEAT

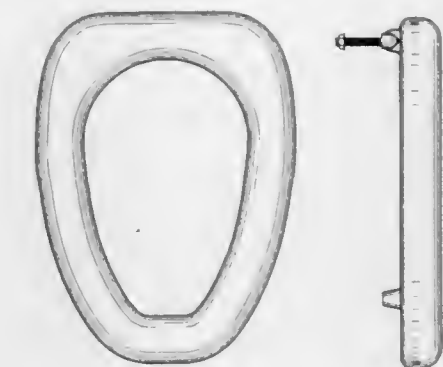
Kimberly Sadé Butler, and Linda Butler, both of 3 Hoover Ave., West Orange, N.J. 07052

Filed Aug. 8, 1996, Ser. No. 58,109

Term of patent 14 years

LOC (6) Cl. 23 - 02

U.S. Cl. D23—311



395,701

## COMBINED PORTABLE FAN AND SPRAY MISTING DEVICE

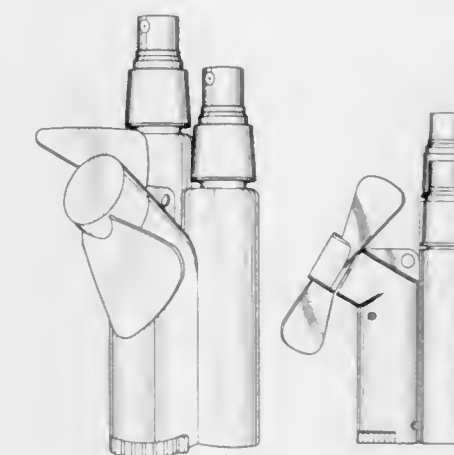
Lee Radtke, Lake Zurich; Linda M. Usher, Chicago, and Eric F. Junkel, Des Plaines, all of Ill., assignors to Circular, Inc., Niles, Ill.

Filed Apr. 29, 1997, Ser. No. 69,929

Term of patent 14 years

LOC (6) Cl. 23 - 04

U.S. Cl. D23—328



395,699

## SINK

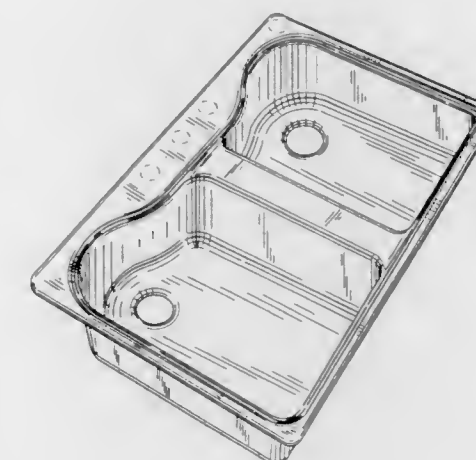
Jill E. Hundley, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.

Filed Mar. 1, 1997, Ser. No. 68,748

Term of patent 14 years

LOC (6) Cl. 23 - 02

U.S. Cl. D23—290





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395,702

## TIMED LIGHTBULB HEATING DEVICE

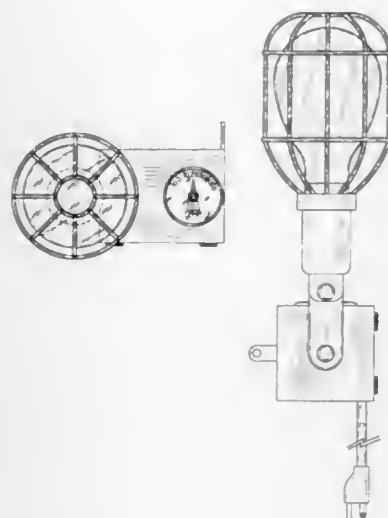
Rayburn Flatt, 121 Cathys Ln., Huntland, Tenn. 37345

Filed Aug. 14, 1997, Ser. No. 75,094

Term of patent 14 years

LOC (6) Cl. 23 - 03

U.S. Cl. D23—335



395,704

## AIR PURIFIER

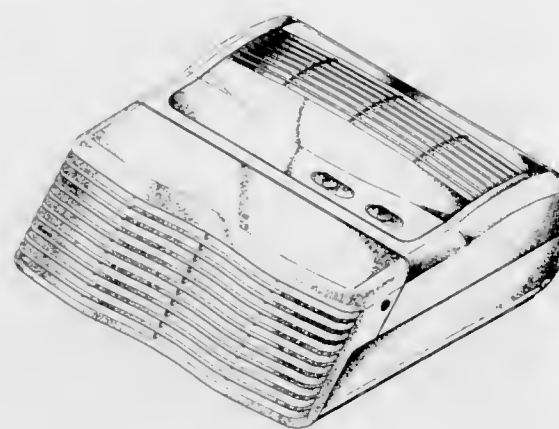
James Thomas, Memphis, and Masao Tsuji, Germantown, both of Tenn., assignors to Hunter Fan Company, Memphis, Tenn.

Filed Jan. 8, 1997, Ser. No. 64,679

Term of patent 14 years

LOC (6) Cl. 23 - 04

U.S. Cl. D23—364



395,703

## AIR CLEANER

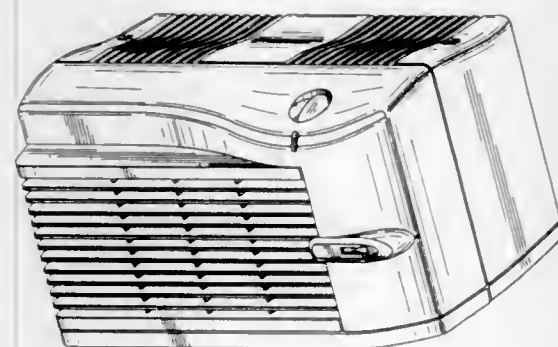
Rodney Jané, Westboro; Andrew Parker, Framingham, both of Mass.; Robert Marvin, Farmington; Richard O'Grady, Southington, both of Conn.; Brian Graves, Framingham, Mass.; Bernard Chiu, Wellesley, Mass., and Diane Allen, Marlborough, Mass., assignors to Honeywell Consumer Products, Inc., Southborough, Mass.

Filed Jan. 16, 1996, Ser. No. 48,893

Term of patent 14 years

LOC (6) Cl. 23 - 04

U.S. Cl. D23—364



395,705

## AIR FILTER

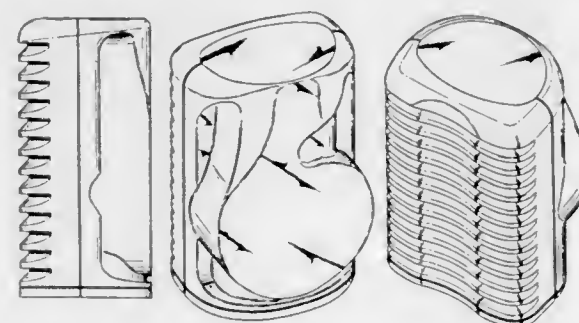
Glen W. Ediger, North Newton, and Gary P. Israel, Andover, both of Kans., assignors to Vornado Air Circulation Systems, Inc., Wichita, Kans.

Filed Aug. 6, 1997, Ser. No. 75,553

Term of patent 14 years

LOC (6) Cl. 23 - 04

U.S. Cl. D23—365



395,706

## OVERCAP FOR A NASAL INHALATION DEVICE

Stephen John Minshull, Haslington, Isle of Man, assignor to Fisons plc, Ipswich, England

Filed Aug. 9, 1996, Ser. No. 58,215

Claims priority, application United Kingdom, Feb. 8, 1996, 2053928

Term of patent 14 years

LOC (6) Cl. 24 - 04

U.S. Cl. D24—110



395,708

## HOLDER FOR RECEIVING ONE COVETTE

Robert J. Shartle, Livermore, and Phillip H. Gooding, Mountain View, both of Calif., assignors to Biometric Imaging, Inc., Mountain View, Calif.

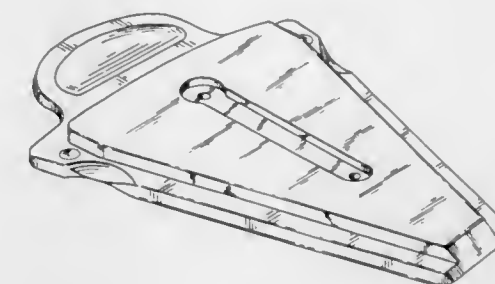
Filed Apr. 4, 1996, Ser. No. 52,758

The portion of the term of this patent subsequent to Aug. 19, 2011, has been disclaimed.

Term of patent 14 years

LOC (6) Cl. 24 - 02

U.S. Cl. D24—224



395,707

## SURGICAL INSTRUMENT HANDLE

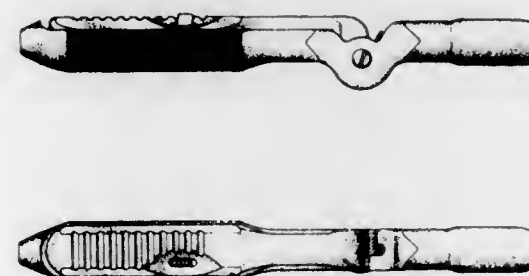
Gregory R. Furnish, Lawrenceville, and W. Michael Hipps, Roswell, both of Ga., assignors to Snowden-Pencer, Inc., Tucker, Ga.

Continuation-in-part of Ser. No. 540,472, Oct. 10, 1995. This application Apr. 26, 1996, Ser. No. 53,707

Term of patent 14 years

LOC (6) Cl. 24 - 02

U.S. Cl. D24—133



395,709

## HOUSE FACADE

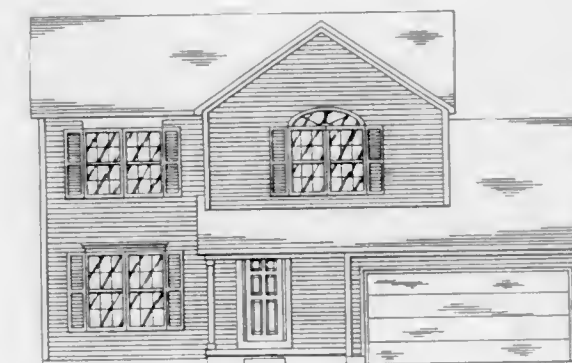
William J. Riat, Dublin, Ohio, assignor to Dominion Homes, Inc., Dublin, Ohio

Filed Jun. 30, 1995, Ser. No. 40,994

Term of patent 14 years

LOC (6) Cl. 25 - 02

U.S. Cl. D25—59



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395,710

## PET DOOR FLAP FRAME

George N. Davlantes, 21457 Iglesia Dr., Woodlawn Hills, Calif. 91364

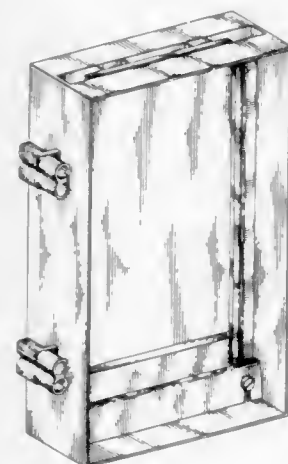
Continuation-in-part of Ser. No. 49,391, Jan. 24, 1996, Pat. No. Des. 378,543. This application Jun. 26, 1996, Ser. No.

59,664

Term of patent 14 years

LOC (6) Cl. 25 - 02

U.S. Cl. D25—60



395,712

## FENCE POST MADE FROM TWO PIECES OF CAST CONCRETE

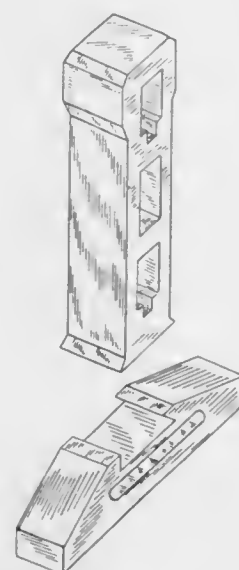
Michael V. Orton, 302 W. 100 So., Manti, Utah 84642, and David S. Orton, 301 S. 6th Ave., Princeton, Minn. 55371

Filed Mar. 24, 1997, Ser. No. 68,540

Term of patent 14 years

LOC (6) Cl. 25 - 01

U.S. Cl. D25—132



395,711

## STRUCTURAL MEMBER

Peter Anthony Boyce, Barton Hall, Dunstall Road, Barton under Needwood, Staffordshire, DE13 8AD, United Kingdom

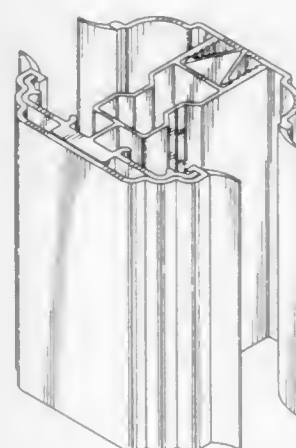
Filed Aug. 21, 1996, Ser. No. 58,696

Claims priority, application United Kingdom, Feb. 23, 1996, 2054381

Term of patent 14 years

LOC (6) Cl. 25 - 01

U.S. Cl. D25—123



395,713

## FLOOR PANEL

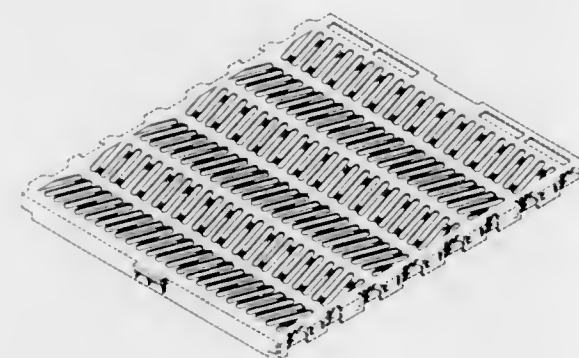
Richard L. Schrottenboer, 9900 Lake Michigan Dr., West Olive, Mich. 49460-9645

Filed Mar. 8, 1996, Ser. No. 51,868

Term of patent 14 years

LOC (6) Cl. 25 - 01

U.S. Cl. D25—152



JUNE 30, 1998

U.S. PATENT AND TRADEMARK OFFICE

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395,714

## LAMP

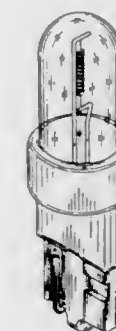
Kazuaki Murata, Tokyo, Japan, assignor to Mariyama Sangyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1997, Ser. No. 75,495

Term of patent 14 years

LOC (6) Cl. 26 - 04

U.S. Cl. D26—2



395,716

## LAMP

Kazuaki Murata, Tokyo, Japan, assignor to Moriyama Sangyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 15, 1997, Ser. No. 75,496

Term of patent 14 years

LOC (6) Cl. 26 - 04

U.S. Cl. D26—2



395,715

## STROBE LIGHT CASING

Lorne Queen, RR#1, Kcawatin, Ontario, Canada, P0X 1C0

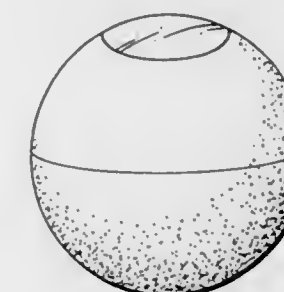
Filed Jan. 11, 1996, Ser. No. 49,629

Claims priority, application Canada, Jul. 11, 1995, 1995-1521

Term of patent 14 years

LOC (6) Cl. 26 - 05

U.S. Cl. D26—24



395,717

## BICYCLE LIGHT

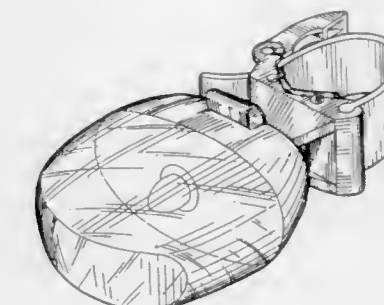
David R. Dalton, Westlake, Ohio, and Gregory M. Martens, Marsfield, Australia, assignors to Eveready Battery Company, Inc., St. Louis, Mo.

Filed Feb. 4, 1997, Ser. No. 66,247

Term of patent 14 years

LOC (6) Cl. 26 - 06

U.S. Cl. D26—28





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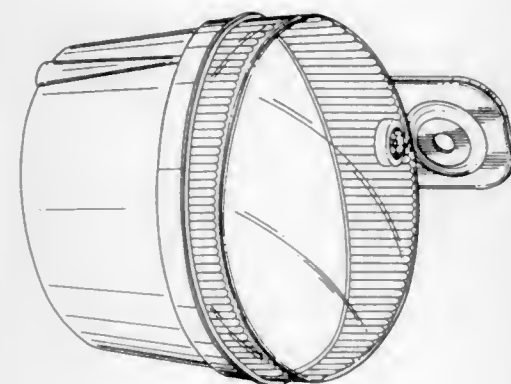
395,718  
VEHICLE LAMPAndrew J. Ponton, and Mark A. Singleton, both of Seymour, Robert Galli, 8176 Horseshoe Bend La., Las Vegas, Nev. 89113  
Ind., assignors to Osram Sylvania Inc., Danvers, Mass.

Filed Aug. 21, 1997, Ser. No. 75,453

Term of patent 14 years

LOC (6) Cl. 29 - 06

U.S. Cl. D26—28

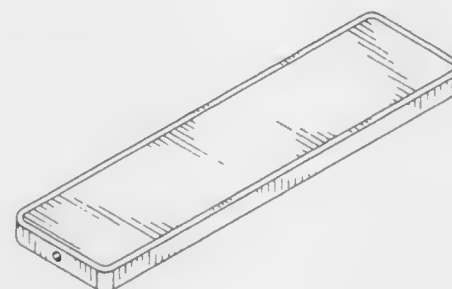
395,720  
LASER POINTER

Filed Oct. 21, 1997, Ser. No. 78,196

Term of patent 14 years

LOC (6) Cl. 26 - 02

U.S. Cl. D26—37

395,719  
FLASHLIGHT

Gabriel Eduardo Concari, Eldersburg, Md., assignor to Black &amp; Decker Inc., Newark, Del.

Filed Jul. 8, 1997, Ser. No. 73,350

Term of patent 14 years

LOC (6) Cl. 26 - 02

U.S. Cl. D26—37

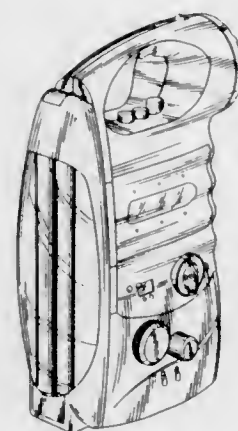
395,721  
COMBINED LIGHTING DEVICE, RADIO AND  
CASSETTE PLAYERYiu Kwong Wan, Hong Kong, Hong Kong, assignor to Fee Tat Holdings (H.K.) Limited, Hong Kong, Hong Kong  
Filed May 12, 1997, Ser. No. 70,921

Claims priority, application United Kingdom, Nov. 11, 1996, 2060720

Term of patent 14 years

LOC (6) Cl. 26 - 02

U.S. Cl. D26—38



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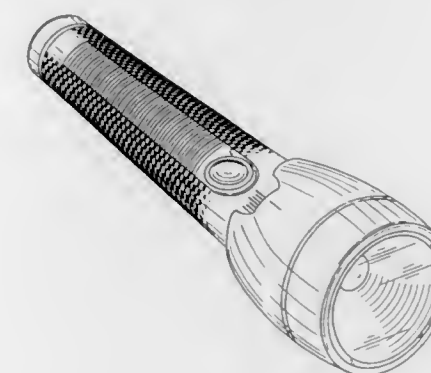
395,722  
FLASHLIGHTJohn Donaldson Howard, Brewster, N.Y., and Gary Evan van Wayne W. Compton, Chino Hills, Calif., assignor to Kim Light-  
Deursen, Evergreen, Colo., assignors to The Coleman Com- ing Inc., City of Industry, Calif.

Filed Jun. 2, 1997, Ser. No. 71,567

Term of patent 14 years

LOC (6) Cl. 26 - 06

U.S. Cl. D26—49

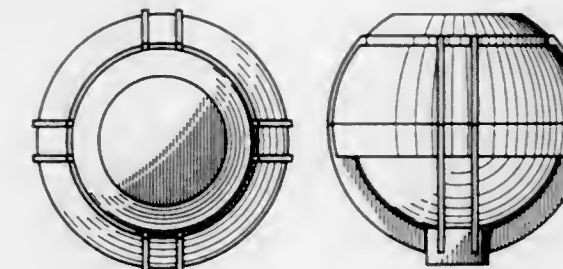
395,724  
LUMINAIRE

Filed Oct. 16, 1996, Ser. No. 61,125

Term of patent 14 years

LOC (6) Cl. 26 - 03

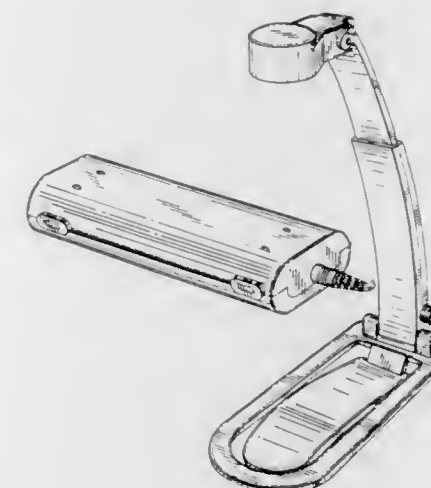
U.S. Cl. D26—67

395,723  
BOOK LIGHTNoel E. Zeller, 65 Haven Ave., Mount Vernon, N.Y. 10553  
Filed Jul. 28, 1997, Ser. No. 74,193

Term of patent 14 years

LOC (6) Cl. 26 - 05

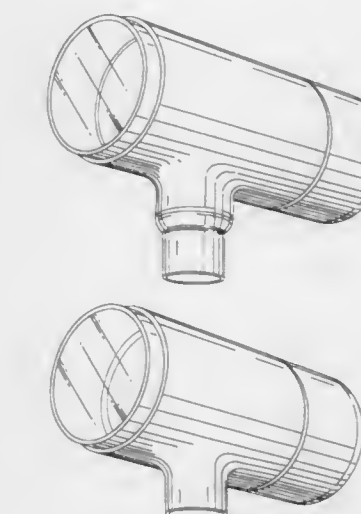
U.S. Cl. D26—60

395,725  
GARDEN LIGHTING FIXTUREMark West, 1388 Calle Violeta, Thousand Oaks, Calif. 91360  
Filed Feb. 21, 1997, Ser. No. 66,781

Term of patent 14 years

LOC (6) Cl. 26 - 05

U.S. Cl. D26—67



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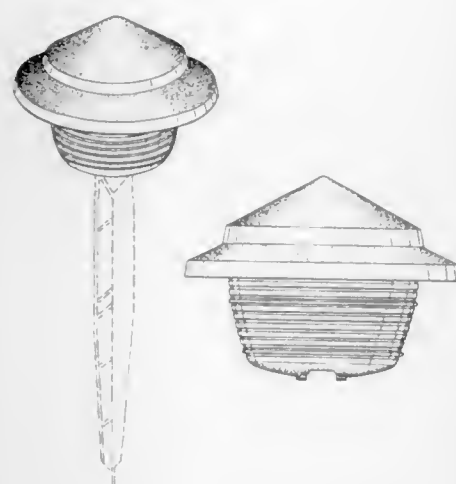
395,726

## OUTDOOR LIGHT FIXTURE

Anthony N. Pink, Shorewood, and Steven T. O'Brien, Brooklyn Park, both of Minn., assignors to The Toro Company, Bloomington, Minn.

Filed Jun. 12, 1997, Ser. No. 72,300  
Term of patent 14 years  
LOC (6) Cl. 26 - 05

U.S. Cl. D26—68



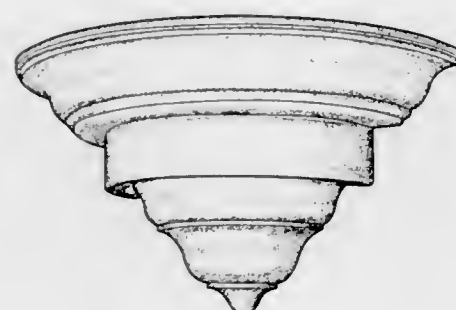
395,728

## WALL MOUNTED LIGHT FIXTURE

Patrick S. Dolan, 1901 NW. Upshur, Portland, Oreg. 97209

Filed Jun. 24, 1997, Ser. No. 72,847  
Term of patent 14 years  
LOC (6) Cl. 26 - 05

U.S. Cl. D26—85



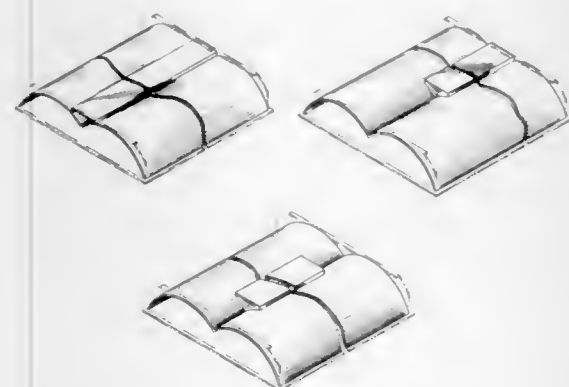
395,727

## FLUORESCENT LIGHTING FIXTURE

Peter F. Thorton, Jr., Hinsdale, Ill., assignor to Focal Point Lighting, Alsip, Ill.

Filed Apr. 24, 1997, Ser. No. 69,909  
Term of patent 14 years  
LOC (6) Cl. 26 - 05

U.S. Cl. D26—76



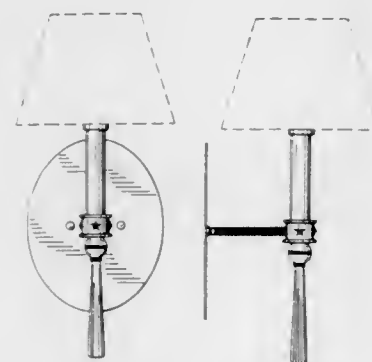
395,729

## LIGHTING FIXTURE

Sandra E. Littman, and Kirina S. Kaufman, both of New York, N.Y., assignors to Sandy Littman, Inc., New York, N.Y.

Division of Ser. No. 48,317, Dec. 26, 1995, Pat. No. Des. 389,265. This application Aug. 12, 1997, Ser. No. 75,073  
Term of patent 14 years  
LOC (6) Cl. 26 - 05

U.S. Cl. D26—87



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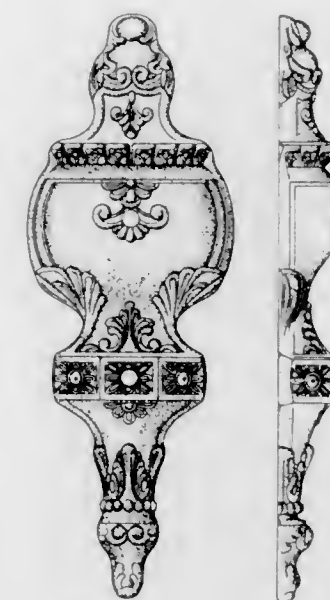
395,730

## BACK PLATE FOR LIGHT FIXTURE

Luis Esteban Lopez Fraile, Valencia, Spain, assignor to Quorum International, Fort Worth, Tex.

Filed Jul. 11, 1997, Ser. No. 73,281  
Term of patent 14 years  
LOC (6) Cl. 26 - 99

U.S. Cl. D26—142



395,732

## LOTION APPLICATOR

Joy A. Tomlinson, R.R. 1, Box 21, Astorville, Ontario, Canada, P0H 1B0, and Lance Tomlinson, 4432 Bowness Road, N.W., Calgary, Alberta, Canada, T3B 0A8

Filed Nov. 18, 1996, Ser. No. 62,514  
Claims priority, application Canada, Oct. 3, 1996, 1996-2286  
Term of patent 14 years  
LOC (6) Cl. 28 - 02

U.S. Cl. D28—7



395,731

## CIGAR HOLDER

Kevin Otis, 320 Circle Dr., Algonquin, Ill. 60102

Filed Jun. 27, 1997, Ser. No. 73,039  
Term of patent 14 years  
LOC (6) Cl. 27 - 06

U.S. Cl. D27—192



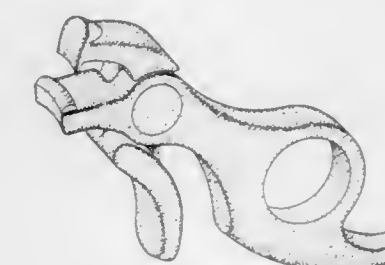
395,733

## EYELASH CURLER

Kiyoshi Ishida, Osaka, Japan, assignor to Green Bell Co., Ltd., Osaka, Japan

Filed Feb. 9, 1996, Ser. No. 50,134  
Term of patent 14 years  
LOC (6) Cl. 28 - 03

U.S. Cl. D28—36





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HAIR CLASP

Kai Mou Tsai, 4F., No. 2, Lane 135, Tao-Hsiang Rd., Peitou  
Dist., Taipei, Taiwan

Filed Aug. 20, 1996, Ser. No. 58,669

Term of patent 14 years

LOC (6) Cl. 28 - 03

U.S. Cl. D28—41



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TO WHOM

PATENTS WERE ISSUED ON THE 30th DAY OF JUNE, 1998

NOTE— Arranged in accordance with the first significant character or word of the name  
(in accordance with city and telephone directory practice).

- A&B Stabilizer, Inc.: *See—*  
Lay, Bonita S., 5,772,617, Cl. 602-4.000.
- A.E. Staley Manufacturing Company: *See—*  
Liaw, Gin C.; Lutz, Eric H.; and Cheryan, Munir, 5,773,076, Cl. 426-656.000.
- Abaunza, John T.; and Donnangelo, Nicholas C. Aircraft icing sensors. 5,772,153, Cl. 244-134.00F.
- ABB Power T&D Company, Inc.: *See—*  
Yang, Lifeng, 5,773,980, Cl. 324-525.000.
- ABB Research Ltd.: *See—*  
Harris, Christopher; Bakowski, Mietek; Gustafsson, Ulf; and Andersson, Mats, 5,773,849, Cl. 257-77.000.
- Abbott Laboratories: *See—*  
Alder, Lisa A.; Jackson, Marianna; Burres, Neal S.; McAlpine, James B.; Hochlowski, Jill E.; Klein, Larry L.; Lartey, Paul A.; and Yeung, Clinton, 5,773,421, Cl. 514-25.000.
- Figard, Steve David, 5,773,212, Cl. 435-5.000.
- Kim, Young Ran; and Kantor, Johanna, 5,773,299, Cl. 436-63.000.
- Langridge, Denton C., 5,773,625, Cl. 548-203.000.
- Osborne, Robert Scott; Piontek, Carl Joseph; Clegg, Robert Donald; Buck, Bradford Lynn; Fleming, Matthew Scott; Juratovac, Joseph Anthony; Patton, William Edward; and Alexander, Kathryn Elizabeth, 5,772,255, Cl. 285-38.000.
- Shih, Jessie W.; Burczak, John D.; Lee, Helen H.; and O'Donnell, Debra L., 5,773,211, Cl. 435-5.000.
- Abdelnour, Ghassan M.: *See—*  
Kassab, Roger J.; and Abdelnour, Ghassan M., 5,774,285, Cl. 360-31.000.
- Abe, Akira: *See—*  
Yoshida, Kiyohide; Abe, Akira; Miyadera, Tatsuo; and Irite, Naoko, 5,772,973, Cl. 423-239.100.
- Abe, Masanori; and Ozawa, Kazuo, to Sony Corporation. Tape cassette. 5,774,312, Cl. 360-132.000.
- Abe, Mitsutaka, to Sökkia Co., Ltd. Coaxial electro-optical distance meter. 5,774,208, Cl. 356-4.010.
- Abe, Naomichi: *See—*  
Fujimura, Shuzo; Shinagawa, Keisuke; and Abe, Naomichi, 5,773,201, Cl. 430-329.000.
- Abe, Nobunori: *See—*  
Oie, Masayuki; Tanaka, Hideyuki; and Abe, Nobunori, 5,773,190, Cl. 430-270.100.
- Abe, Takeshi: *See—*  
Reed, Michael L.; and Abe, Takeshi, 5,772,902, Cl. 216-2.000.
- Abe, Tsutomu; and Miyake, Hiroyuki, to Fujii Xerox Co., Ltd. Image sensor capable of producing an image signal free from an afterimage. 5,774,180, Cl. 348-241.000.
- Abel Ice, Inc.: *See—*  
Abel, Thomas H., 5,771,698, Cl. 62-66.000.
- Abel, Thomas H., to Abel Ice, Inc. Apparatus and method for creating and resurfacing ice. 5,771,698, Cl. 62-66.000.
- Abeta, Satoshi: *See—*  
Sakakura, Moriaki; Hotta, Takayuki; and Abeta, Satoshi, 5,773,731, Cl. 73-865.800.
- Abis, Luigi: *See—*  
Tanaglia, Tiziano; Prevati, Silvia; Abis, Luigi; and Gila, Liliana, 5,773,539, Cl. 526-169.200.
- Ábrahám, György; Wenzel, Gutfriedné; and Szappanos, Janos, to Coloryte Hungary Optikai Kutató, Fejlesztő és Gyártó Reszvénytársaság. Method and optical means for improving or modifying color vision and method for making said optical means. 5,774,202, Cl. 351-177.000.
- Abraham, Susan C., to LAM Research Corporation. Mechanism for uniform etching by minimizing effects of etch rate loading. 5,772,906, Cl. 216-72.000.
- Abrams, Fredric L.: *See—*  
Moore, Dennis A.; Freund, Robert F.; and Abrams, Fredric L., 5,771,654, Cl. 52-742.140.
- Abrams, Mark Allen: *See—*  
Bauer, S. Christopher; Abrams, Mark Allen; Bradford-Goldberg, Sarah Ruth; Caparon, Maire Helena; Easton, Alan Michael; Klein, Barbara Kure; McKearn, John Patrick; Olins, Peter O.; Paik, Kumnan; and Thomas, John Warren, 5,772,992, Cl. 424-85.200.
- Accuride Corporation: *See—*  
Cvijanovic, Ratko, 5,772,288, Cl. 301-63.100.
- Acerbi, Daniela: *See—*  
Chiesi, Paolo; Ventura, Paolo; Del Canale, Maurizio; Redenti, Maurizio; Acerbi, Daniela; Pasini, Massimo; Szejtli, József; Vikmon, Maria; and Fenyesi, Eva, 5,773,029, Cl. 424-488.000.
- Acetex Chimie: *See—*  
Denis, Philippe; Nobel, Dominique; Perron, Robert; Perrona, Philippe; and Schwartz, Joel, 5,773,642, Cl. 560-232.000.
- Achterholt, Rainer, to Alpha-Beta Electronics AG. Valve having means for generating a wireless transmittable indicating signal in case of a pressure drop within vehicle tires. 5,774,048, Cl. 340-447.000.
- Ackerman, David, to Bridport-Gundry plc. Cargo nets and fittings therefor. 5,772,371, Cl. 410-118.000.
- Ackley, Robert W.: *See—*  
Orr, Henry C.; Dokoupil, James R.; Ackley, Robert W.; Lewis, Linda; Dubos, Jerome A.; Crispin, Donald J.; and Lindridge, Robert D., 5,772,055, Cl. 211-186.000.
- Aclis Pty Ltd: *See—*  
Sims, Anthony McGregor, 5,772,362, Cl. 405-232.000.
- Acosta, George M.; and Daw, Derek J., to Neuro Navigational Corp. Ultrasonic tissue resector for neurosurgery. 5,772,627, Cl. 604-22.000.
- ACTV, Inc.: *See—*  
Hidary, Jack D.; Ullman, Craig; and Spivack, Nova T., 5,774,664, Cl. 395-200.480.
- Acuson Corporation: *See—*  
Sliwa, John W., Jr.; Cooper, Thomas Grosvenor; and Ayter, Sevig, 5,771,896, Cl. 128-662.060.
- Adachi, Michiaki: *See—*  
Osuka, Satoshi; Ishikawa, Noboru; Adachi, Michiaki; Hamano, Terufumi; Kimura, Youichi; and Hanagasaki, Hiroshi, 5,772,096, Cl. 227-5.000.
- Adachi, Rensuke: *See—*  
Utsui, Tetsuya; Sano, Hiroshi; and Adachi, Rensuke, 5,772,580, Cl. 600-160.000.
- Adachi, Seichiro; Kato, Katsuhito; and Fujimoto, Hitoshi, to Canon Kabushiki Kaisha. Sheet post-processing apparatus and image forming apparatus having same. 5,774,778, Cl. 399-403.000.
- Adalsteinsson, Orn: *See—*  
Greenblatt, Hellen Chaya; Adalsteinsson, Orn; Brodie, David Alan; and Fitzpatrick-McElligott, Sandra G., 5,772,999, Cl. 424-187.100.
- Adam, John D.; Stitzer, Steven N.; Painter, Carol J.; Daniel, Michael R.; Parlow, Deborah P.; and Piloto, Andrew J., to Northrop Grumman Corporation. Planar phase shifters using low coercive force and fast switching, multilayerable ferrite. 5,774,025, Cl. 333-24.100.
- Adams, Anthony Dennis, to Goodyear Tire & Rubber Company. The Radial arc fabric splice for fabric conveyor belts. 5,773,114, Cl. 428-57.000.
- Adams Mfg. Corp.: *See—*  
Adams, William E., 5,772,166, Cl. 248-231.810.
- Adams, Paul Ernest, to Lubrizol Corporation. The Oil compositions useful in hydraulic fluids. 5,773,393, Cl. 508-551.000.
- Adams, Ronald W.: *See—*  
Anderson, Preston L.; Boyd, Allen D.; Gayetty, Joseph F.; Taylor, Robert A.; and Adams, Ronald W., 5,771,993, Cl. 182-239.000.
- Adams, William E., to Adams Mfg. Corp. Mounting clip. 5,772,166, Cl. 248-231.810.
- Adaptive Networks, Inc.: *See—*  
Propp, Michael B.; Propp, David L.; and Ladas, Christopher P., 5,774,526, Cl. 379-90.010.
- Adar, Aharon, to Anadigics, Inc. Multiple-band amplifier. 5,774,017, Cl. 330-51.000.
- ADI Limited: *See—*  
Benson, Richard Lynn; McKelvie, Ian Donald; Stuart, Alan David; and Hamilton, Ian Campton, 5,773,297, Cl. 430-52.000.
- ADT Automotive, Inc.: *See—*  
Berent, Thomas Gerard; Hurst, Dennis Wayne; Patton, Thomas Edward; Tabernik, Ty J.; Warpool, Julie Elizabeth; Reig, Donald C.; and Whittle, William Howard, 5,774,873, Cl. 705-26.000.
- Adtran, Inc.: *See—*  
McGary, John S.; Zitting, Barry C.; and Robinson, Steven M., 5,774,316, Cl. 361-42.000.
- Advanced Cardiovascular Systems, Inc.: *See—*  
Chen, Ziyun; Cheng, Tai C.; Lee, Jeong S.; Muni, Ketan P.; Patel, Udayan; and Saltman, Robert P., 5,773,514, Cl. 525-166.000.
- Advanced Laundry Devices: *See—*  
Bogner, Douglas J.; and Memick, Jason H., 5,774,528, Cl. 379-106.010.
- Advanced Mechanical Technology, Inc.: *See—*  
Gerstmann, Joseph; and Swenson, Paul F., 5,772,113, Cl. 237-8.00R.
- Advanced Micro Devices, Inc.: *See—*  
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- Chung, Shine, 5,774,710, Cl. 395-585.000.
- Gulick, Dale E., 5,774,683, Cl. 395-309.000.
- Jarvis, Richard W., 5,773,315, Cl. 438-14.000.

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Alarcón-López, Manuel; Román-Gómez, Lenin; Rojas-Cortes, Rafael Jorge; Enciso-Aguilar, Victor; Islas-Sánchez, Severino; and Montes-Juárez, José Carlos, to Vidrio Plano de Mexico, S.A. de C.V. System for detecting and adjusting the position of a burner during the annealing process of a glass sheet, 5,772,719, Cl. 65-158.000.  
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Albert Einstein Healthcare Network: *See—*  
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Alcatel Alsthom Compagnie Generale d'Electricite: *See—*  
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Allen, Donald Eugene; Stringer, Steven Ray; and Coyne, Richard Dale, to Motorola Inc. Acoustic wave device and manufacturing method, 5,771,556, Cl. 29-25.350.  
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- AMCOL International Corporation: *See—*  
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- Amekawa, Yoshihide: *See—*  
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- American Allsafe Company: *See—*  
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- American BioMed, Inc.: *See—*  
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- American Cyanamid Company: *See—*  
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- Hamann, Philip Ross; Hinman, Lois; Hollander, Irwin; Holcomb, Ryan; Hallett, William; Tsou, Hwei-Rui; and Weiss, Martin J., 5,773,001, Cl. 424-181,100.
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- Sabb, Annmarie L.; and Stein, Reinhardt P., 5,773,458, Cl. 514-413,000.
- American Standard Inc.: *See—*  
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- Mehta, Pravinchandra C.; and Smiley, William A., III, 5,772,399, Cl. 415-148,000.
- American Technology, Inc.: *See—*  
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- Amersham Pharmacia Biotech AB: *See—*  
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- Amgen Inc.: *See—*  
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- Amiel, Marie-Sophie: *See—*  
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- Kobayashi, Junichi; Murai, Keiichi; Toganoh, Shigeo; Sasaki, Toshiaki; and Yamamoto, Hajime, to Canon Kabushiki Kaisha. Method for manufacturing ink jet head, ink jet head manufactured by such a method, and ink jet apparatus provided with such a head, 5,774,150, Cl. 347-63.000.
- Kobayashi, Katsuhiko: *See—*  
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- Kobayashi, Masaru: *See—*  
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- Kobayashi, Miki: *See—*  
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- Kobayashi, Yoshihito: *See—*  
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- Kobori, Takashi: *See—*  
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- Koch, Asmus: *See—*  
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- Koch Industries, Inc.: *See—*  
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- Koch, Michael; Demmig, Detlev; Uhlendorf, Rüdiger; and Reich, Sebastian, to Heraeus Instruments GmbH & Co. KG. Laboratory centrifuge having a casing cover and rotor chamber adapted to exhaust circulated air, 5,772,572, Cl. 494-14.000.
- Koch, Michael: *See—*  
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- Kohara, Masanobu: *See—*  
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- Kohira, Yasuaki: *See—*  
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- Kohl, Bernhard, to BYK Gulden Lomberg Chemische Fabrik GmbH. Substituted arylthioalkylthiopyridines, 5,773,451, Cl. 514-338.000.
- Kohler, Ludwig. Clay target traps, 5,771,874, Cl. 124-8.000.
- Kohlhase, Armin: *See—*  
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- Kohn, Harold, to Research Corporation Technologies, Inc. Anticonvulsant enantiomeric amino acid derivatives, 5,773,475, Cl. 514-616.000.
- Köhn, Heinz-Gerhard; Martens, Jörg Peter; Laubstein, Michael; Tischer, Carsten; Graf, Winfried; and Bieri, Eduard, to Sartorius AG. Balance with scale on top, 5,771,986, Cl. 177-210.0EM.
- Kohno, Michio: *See—*  
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- Kohrt, Jens-Peter: *See—*  
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- Koike, Ayumi; Obata, Shusei; Ogura, Kyozo; and Koyama, Tanetsoshi, to Toyota Jidosha Kabushiki Kaisha. DNA encoding heptaprenyl diphosphate synthetase, 5,773,265, Cl. 435-131.000.
- Koilpillai, Ravinder D.: *See—*  
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- Koizumi, Yutaka: *See—*  
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- Konwitz, Ellie, to Laser Industries, Ltd. Side-emitting optical fibers for lasers, 5,772,658, Cl. 606-15.000.
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- Ruhoff, Jürgen: *See—*  
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- Ruminski, Peter G.: *See—*  
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- Ruth, Michael J.: *See—*  
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- Gruber, Patrick Richard; Kolstad, Jeffrey John; Ryan, Christopher M.; Hall, Eric Stanley; and Eichen Conn, Robin Sue, 5,773,562, Cl. 528-354.000.
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- Tanaka, Shinichiro; Wada, Sigeru; and Kusunose, Haruhiko, 5,772,842, Cl. 156-584.000.
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- Scherer, Henry W., 5,773,777, Cl. 218-1.000.
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- Nelson, Kurt D., 5,773,016, Cl. 424-405.000.
- S.E.M.T. Peilstick: *See—*
- Bastenhof, Dirk, 5,771,848, Cl. 123-25.00C.
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- Lerman, Shmuel; Freedman, Oded; and Shargil, Adi, 5,772,369, Cl. 410-96.000.
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- Kirschner, Mark J.; Kozlu, Hamdi; and Sahm, Michael K., 5,772,717, Cl. 65-104.000.
- Sahner, Todd M.: *See—*
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- Saint-Gobain Vitrage, S.A.: *See—*
- Rehfeld, Marc, 5,773,102, Cl. 428-34.000.
- Saint-Gobain/Norton Industrial Ceramics Corp.: *See—*
- Lu, Grant; and Cann, Gordon L., 5,773,830, Cl. 250-370.010.
- Sundberg, Glenn J., 5,773,147, Cl. 428-408.000.
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- Lin, Chia-Shun, 5,771,944, Cl. 139-457.000.
- Sain, Louis University: *See—*
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- Saito, Hideki, to Fujitsu Limited. Graphic display device having function of displaying transfer area, 5,774,134, Cl. 345-509.000.
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- Matsumoto, Akihiro; Niki, Toru; Nakatsuka, Tadanori; and Saito, Kazuyuki, 5,774,584, Cl. 382-194.000.
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- Saitoh, Shigeru. Incinerating furnace, 5,771,819, Cl. 110-267.000.
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- Sakamoto, Tadashi: *See—*

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- Sakamoto, Yasuyoshi; and Hatano, Akira, to Seikoh Giken Co., Ltd.; and Sumitomo Heavy Industries, Ltd. Disc molding die, 5,773,040, Cl. 425-192.00R.
- Sakashita, Keiichi: *See—*
- Ozaki, Eiji; Uragaki, Toshitaka; Sakashita, Keiichi; Ikemoto, Tetsuya; Kobayashi, Yoshimasa; and Sakimae, Akihiro, 5,773,240, Cl. 435-41.000.
- Sakata, Minoru: *See—*
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- Sakaue, Shigeki: *See—*
- Kagano, Hirokazu; Goda, Hiroshi; Yoshida, Katsuhiko; Yamamoto, Mikio; and Sakaue, Shigeki, 5,773,626, Cl. 548-209.000.
- Sakimae, Akihiro: *See—*
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- Ono, Makoto; Suzuki, Akinori; Isogai, Akira; and Sakuda, Shouhei, 5,773,263, Cl. 435-118.000.
- Sakuma, Isamu: *See—*
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- Sakurada, Yusi: *See—*
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- Nevo, Igal; Salah, Maher; and Dagalur, Srinivas S., 5,772,599, Cl. 600-483.000.
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- Salim, Udin: *See—*
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- Salinas, Irma C.; and Potter, Kenyon D. Adjustable filter assembly, 5,772,713, Cl. 55-496.000.
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- Salkild, Jonathan David, deceased (by David Joseph Salkild, heir): *See—*
- Neave, John Walter; Trevett, Neil F.; Salkild, Jonathan David, deceased; and MacNaughton, Iain Stuart, 5,774,133, Cl. 345-505.000.
- Salmon, John K., deceased (by Lucy Mary Salmon, legal representative): *See—*
- McCarthy, Richard C.; Bittar, Joseph; Barker, Frederick H.; Powell, Bruce A.; Wan, Samuel C.; Bennett, Paul; Cooney, Anthony; Salmon, John K., deceased, 5,773,772, Cl. 187-289.000.
- Salmon, Lucy Mary, legal representative: *See—*
- McCarthy, Richard C.; Bittar, Joseph; Barker, Frederick H.; Powell, Bruce A.; Wan, Samuel C.; Bennett, Paul; Cooney, Anthony; Salmon, John K., deceased, 5,773,772, Cl. 187-289.000.
- Salome, Jean-Paul: *See—*
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- Salomon S.A.: *See—*
- Messmer, Karl, 5,771,609, Cl. 36-89.000.
- Salter, Robert M., III: *See—*
- Peng, Jack Zezhong; Salter, Robert M., III; and Lipp, Robert J., 5,773,862, Cl. 257-316.000.
- Saltman, Robert P.: *See—*
- Chen, Ziyun; Cheng, Tai C.; Lee, Jeong S.; Muni, Ketan P.; Patel, Udayan; and Saltman, Robert P., 5,773,514, Cl. 525-166.000.
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- Salviato, Tiziano: *See—*
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- Salzer, Mark L.; Taylor, Bret K.; and Donley, Allan D., to Hewlett-Packard Company. Vertical axis service station adjustment device and method, 5,774,133, Cl. 347-32.000.
- Sam Jung Co., Ltd.: *See—*
- Gweon, Dae-Gab; Cho, Young-Bin; and Moon, Hee Hyeong, 5,774,210, Cl. 356-139.100.
- Samar, Vipin: *See—*
- Wu, Tajen R.; Shannon, William A.; Fronberg, Paul; Stephenson, Donald R.; and Samar, Vipin, 5,774,551, Cl. 380-25.000.
- Sambrook, Rodney Martin; and Smith, Robert Terence, to Dytech Corporation, Ltd. Production of ceramic articles, 5,772,953, Cl. 264-638.000.
- Sames S.A.: *See—*
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- Sampas, Nicholas M.: *See—*
- Trebino, Rick P.; Sampas, Nicholas M.; and Gustafson, Eric K., 5,774,213, Cl. 356-320.000.
- Sampath, Lester: *See—*
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- Sampedro, Pablo S.; and Ritchie, Gordon L., to Lockheed Martin Corporation. Rotating roadside light pole assembly, 5,772,172, Cl. 248-415.000.
- Sams, Philip John: *See—*
- Hag, Ziya; Khan-Lodhi, Abid Nadim; and Sams, Philip John, 5,773,409, Cl. 510-521.000.
- Samsung Display Devices Co., Ltd.: *See—*
- Choi, Sun-jung; Park, Cheol-woo; and Oh, Choon-yul, 5,774,103, Cl. 345-94.000.
- Kim, Jong-min, 5,772,904, Cl. 216-24.000.
- Lee, Kwang-Min; Joo, Kyu-Nam; Choi, Jong-Seo; Kim, Geun-Bae; and Choi, Kwi-Seuk, 5,773,922, Cl. 313-346.00R.
- Lee, Seong-ho, 5,772,487, Cl. 445-26.000.
- Samsung Electro-Mechanics: *See—*
- Kim, Chang Sik, 5,774,028, Cl. 333-181.000.
- Samsung Electronics Co., Ltd.: *See—*
- Ahn, Se-Jin, 5,773,930, Cl. 313-506.000.
- Baik, In-Seong, 5,773,804, Cl. 235-379.000.
- Chi, Kyeong-koo, 5,772,772, Cl. 118-723.0MA.
- Choi, Jae-Chun, 5,774,741, Cl. 395-822.000.
- Choi, Myoung-Taek, 5,772,700, Cl. 29-25.010.
- Eum, Jae-yong, 5,774,300, Cl. 360-85.000.
- Goh, Young-ok, 5,774,649, Cl. 395-185.080.
- Gu, Bon-Youl, 5,773,336, Cl. 438-199.000.
- Ham, Seog-Heon, 5,773,349, Cl. 438-348.000.
- Hwang, Jae-Sik, 5,774,483, Cl. 371-62.000.
- Im, Heung-Soo, 5,774,012, Cl. 327-536.000.
- Jeong, Chang-Rae, 5,774,507, Cl. 375-354.000.
- Jeong, Jong-Sik, 5,774,436, Cl. 369-50.000.
- Joung, Geum-Suk, 5,772,869, Cl. 210-149.000.
- Keun Sik, Chang, 5,772,410, Cl. 417-363.000.
- Kim, Joon-Bae; and Park, Sung-Yeoul, 5,773,948, Cl. 318-561.000.
- Kim, Su-Seok, 5,774,537, Cl. 379-157.000.
- Kim, Yong-Ho; and Jo, Hyun-Min, 5,773,945, Cl. 318-434.000.
- Kim, Yong-Ho; and Lee, Young-Sik, 5,774,321, Cl. 361-94.000.
- Kwon, Jung wook; and Oh, Chan-seob, 5,771,753, Cl. 74-526.000.
- Lee, Cheol-Ha, 5,774,402, Cl. 365-191.000.
- Lee, Jae-Bong; and Kim, Ji-Hyun, 5,774,630, Cl. 395-13.000.
- Lee, Jeoung-in; and Kim, Yank-gyun, 5,774,555, Cl. 381-4.000.
- Park, Moon-Kyeong, 5,774,536, Cl. 379-156.000.
- Park, Soon-oh, 5,774,327, Cl. 361-321.500.
- Seong, Goan-soo; Kim, Young-hun; and Ha, In-joong, 5,773,938, Cl. 318-6.000.
- Suh, Kook Jung, 5,771,701, Cl. 62-179.000.
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- DiPede, Sandro; and Gould, Russell J., 5,772,944, Cl. 264-211.130.
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- Takeuchi, Tomio; Umezawa, Sumio; Tsuchiya, Tsutomu; and Takahashi, Yoshiaki, 5,773,607, Cl. 536-124.000.
- Zaitz, Michael Joseph: *See—*
- Bell, David John; Morse, James Allen; Zaitz, Michael Joseph; Londeck, Bernard Thomas; and Ingham, Derek, 5,771,750, Cl. 74-502.600.
- Zalesinski, Jerzy M.: *See—*
- Tonti, William R.; Mandelman, Jack A.; Zalesinski, Jerzy M.; Furukawa, Toshiharu; Nguyen, Son V.; and Chidambharao, Dureseti, 5,773,362, Cl. 438-665.000.
- Zaluzec, Matthew John: *See—*
- Evans, Timothy Van; Mehraban, Henry; Zaluzec, Matthew John; and Grab, Gerry A., 5,771,962, Cl. 165-133.000.
- Zambrano, Raffaele, to Consorzio per la Ricerca sulla Microelettronica nel Mezzogiorno. Bonding pad for a semiconductor chip, 5,773,899, Cl. 257-784.000.
- Zanarini, Bruno, to Macofar S.p.A. Selector for badly-filled capsules, 5,772,045, Cl. 209-643.000.
- Zander, Dennis R., to Eastman Kodak Company. Camera with flexible film deflector, 5,774,756, Cl. 396-415.000.
- Zander, Dennis R.; and Storey, Robert L., to Eastman Kodak Company. Camera with film deflector pivotable about inclined axis, 5,774,757, Cl. 396-415.000.
- Zansky, Zoltan: *See—*
- Szepesi, Thomas S.; Buxton, Joseph C.; Zansky, Zoltan; and Bowers, Derek F., 5,774,021, Cl. 330-257.000.
- Zaslavsky, Ella: *See—*
- DeSatnick, Allen H.; Zaslavsky, Ella; and Marcus, Herbert, 5,772,664, Cl. 606-80.000.
- Zehavi, Ephraim: *See—*
- Butler, Brian K.; Padovani, Roberto; and Zehavi, Ephraim, 5,774,496, Cl. 375-225.000.
- Zembower, David E.: *See—*
- Lin, Yuh-Meei; Flavin, Michael T.; Schure, Ralph; Zembower, David E.; and Zhao, Gen-Xian, 5,773,462, Cl. 514-456.000.
- Zen Research N.V.: *See—*
- Alon, Amir; Finkelstein, Jacob; Katz, Itzhak; Naor, Michael; and Shapira, Shlomo, 5,774,432, Cl. 369-44.230.
- Zeneca Limited: *See—*
- Broekaert, Willem Frans; Cammue, Bruno Philippe Angelo; and Rees, Sarah Bronwen, 5,773,694, Cl. 800-205.000.
- Camble, Roger; Timms, David; and Wilkinson, Anthony James, 5,773,581, Cl. 530-351.000.
- Gregory, Peter; Kenyon, Ronald Wynford; and Wight, Paul, 5,772,745, Cl. 106-31.480.
- Gregory, Peter; Kenyon, Ronald Wynford; and Wight, Paul, 5,773,593, Cl. 534-796.000.
- Zenyaku Kogyo Kabushiki Kaisha: *See—*
- Konishi, Masataka; Fukuda, Naoki; Oku, Yukio; Yamazaki, Hiroaki; Imaizumi, Kazuhiro; and Kobayashi, Hideshi, 5,773,449, Cl. 514-312.000.
- Zepic, Janez; and Vizjak, Kilijan, to LPKF D.O.O. Rotary slide valve for selective application of pressurized air or vacuum to an apparatus, 5,771,928, Cl. 137-625.220.
- Zhadanovsky, Igor. Method of continuous extraction of plasticizer from battery separator membranes and the like during their manufacture, and extractor apparatus therefor, 5,772,935, Cl. 264-48.000.
- Zhang, Bing, to Seagate Technology, Inc. Method of manufacturing CoCrTa/CoCrTaP bi-layer magnetic thin films, 5,772,857, Cl. 204-192.200.
- Zhang, Hong J.; Ellis, Edward J.; Wrobel, Stanley J.; and Potini, Chimpiramma, to Polymer Technology Corporation. Contact lens cleaning and wetting solutions containing a non-amine polyethyleneoxy adduct having a HLB value of at least about 18, a surface active agent having a HLB of less than 18, and wetting agent, 5,773,396, Cl. 510-115.000.
- Zhang, Hongyong; Takayama, Toru; and Takemura, Yasuhiko, to Semiconductor Energy Laboratory Co., Ltd. Transistor and process for fabricating the same, 5,773,846, Cl. 257-66.000.
- Zhang, Hongyong: *See—*
- Yamazaki, Shunpei; Zhang, Hongyong; and Takemura, Yasuhiko, 5,773,327, Cl. 438-154.000.
- Zhang, Xia: *See—*
- Potter, Timothy J.; Zhang, Xia; Vassell, William; Rigley, Michael R.; and Hetrick, Robert E., 5,771,873, Cl. 123-668.000.
- Zhao, Gen-Xian: *See—*
- Lin, Yuh-Meei; Flavin, Michael T.; Schure, Ralph; Zembower, David E.; and Zhao, Gen-Xian, 5,773,462, Cl. 514-456.000.
- Zhaog, Yee-Lu: *See—*
- Chen, Mao-Jin; Zhaog, Yee-Lu; Hu, Robert; and Chen, Yen-Chen, 5,774,178, Cl. 348-206.000.
- Zheng, Wenxin, to Telefonaktiebolaget LM Ericsson. Automatic fusion-temperature control for optical fiber splicers, 5,772,327, Cl. 374-160.000.
- Zhou, Jingyu: *See—*
- O'Sullivan, Maurice Stephen; Hui, Rongqing; and Zhou, Jingyu, 5,774,242, Cl. 359-110.000.
- Zhou, Qiang: *See—*
- Xiao, Jiaqi; and Zhou, Qiang, 5,774,360, Cl. 702-6.000.
- Zhou, Xiangmin: *See—*
- Wahlstedt, David; and Zhou, Xiangmin, 5,771,539, Cl. 16-285.000.
- Zhuravsky, Gennady Ivanovich; Mulyarchik, Valery Vladimirovich; Marchenko, Vladimir Alexeevich; Kukharev, Anatoly Vasilievich; Vinogradov, Leonid Mikhailovich; Grebenkov, Anatoly Zhoresovich; Drozdov, Vladimir Nikolaevich; Konstantinov, Valery Grigorievich; Stetsjurenko, Vitaly Ivanovich; Khomich, Ivan Ivanovich; and Chemetiev, Valery Vladimirovich, to Science-Technical and Product-Innovative Center "Tokema"; and Small State Enterprise "Ekores". Method of treating plastic waste, 5,771,821, Cl. 110-346.000.
- Ziady, Ghosn S.: *See—*
- Hendrich, Ronald D.; and Ziady, Ghosn S., 5,772,294, Cl. 312-221.000.
- Zick, Gregory L.; and Liu, Hain-Ching H., to University of Washington. Automatic scene decomposition and optimization of MPEG compressed video, 5,774,593, Cl. 382-236.000.
- Zicker, Robert G., to GTE Mobile Communications Service Corporation. Multi-mode communication network with handset-selected channel assignments, 5,774,805, Cl. 455-426.000.
- Ziegler, Kelly W.: *See—*
- Olson, Allen L.; Ziegler, Kelly W.; and Lashyro, Jeffrey A., 5,771,658, Cl. 53-157.000.
- Ziegler, Robert P.: *See—*
- Gupta, Bhupendra K.; Ziegler, Robert P.; and Scheidt, Wilbur D., 5,771,577, Cl. 29-889.721.
- Ziegler, Werner, to AVL Medical Instruments AG. Method for optically determining total hemoglobin concentration, 5,773,301, Cl. 436-66.000.
- Zielinski, Peter M., to Comar, Inc. Stab cap for a vial having a puncturable seal, 5,772,652, Cl. 604-411.000.
- Zimet-Sternberg, Lilian; and Sternberg, Alberto. Method for making permanent dental acrylic parts without the use of a dental flask, 5,773,794, Cl. 219-440.000.
- Zimlich, David A., to Micon Display Technology, Inc. Field emission display device with focusing electrodes at the anode and method for constructing same, 5,773,927, Cl. 313-495.000.
- Zimmer, Detlef; Ahlers, Michael; and Stuhmann, Dirk, to Phoenix Aktiengesellschaft. Device and method for extrusion-coating tubes or compound tubular connection fittings with rubber or plastic, 5,773,036, Cl. 425-125.000.
- Zimmer, Inc.: *See—*
- Atkinson, Robert W., 5,772,634, Cl. 604-118.000.
- Landis, Larry R., 5,772,031, Cl. 206-438.000.
- Zimmer, Sabine: *See—*
- Beutler, Petra; Zimmer, Sabine; Gerke, Dieter; Nad, Ferenc; and Mössner, Frank, 5,772,472, Cl. 439-608.000.
- Zimmerman, Frank R.: *See—*
- McKeehnie, Timothy N.; Holmes, Richard R.; Zimmerman, Frank R.; and Power, Chris A., 5,773,104, Cl. 428-34.600.
- Zimmerman, Jeffrey A.: *See—*
- Johannsen, James; and Zimmerman, Jeffrey A., 5,774,529, Cl. 379-106.030.
- Zimmermann, Johann. Solar generator, 5,772,792, Cl. 136-248.000.
- Zingg, Jürg: *See—*
- Nesvadba, Peter; Evans, Samuel; Kröhnke, Christoph; and Zingg, Jürg, 5,773,631, Cl. 549-43.000.
- Zircon Corporation: *See—*
- Tavernetti, Russell E., 5,773,971, Cl. 324-67.000.

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- Zirngibl, Wolfram, to U.S. Phillips Corporation. Circuit arrangement for converting a serial data signal into a parallel data signal, 5,774,079, Cl. 341-100.000.
- Zitting, Barry C.: *See—*
- McGary, John S.; Zitting, Barry C.; and Robinson, Steven M., 5,774,316, Cl. 361-42.000.
- Zoccoli, Michael Anthony: *See—*
- Birch, David Edward; Laird, Walter Joseph; and Zoccoli, Michael Anthony, 5,773,258, Cl. 435-91.200.
- Zogakis, T. Nicholas; and Cioffi, John M., to Board of Trustees, The Leland Stanford Jr., University. Multi-channel trellis shaper, 5,774,500, Cl. 375-261.000.
- Zoldak, John T.: *See—*
- Czachowski, John B.; and Zoldak, John T., 5,774,449, Cl. 364-506.000.
- Zolk, Ralf: *See—*
- Mueller, Patrik; Hungenberg, Klaus-Dieter; Kerth, Juergen; and Zolk, Ralf, 5,773,537, Cl. 526-125.300.
- Zomorodi, Mehrdad: *See—*
- Yazdy, Mostafa R.; Zomorodi, Mehrdad; McIntyre, Harry J.; and Werner, Alan J., Jr., 5,773,827, Cl. 250-341.800.
- ZSK Stickmaschinen GmbH: *See—*
- Degen, Manfred; Günther, Ludwig; Heinrich, Hans-Jürgen; Thieme, Roland; Haffmans, Franz-Josef; Nüsser, Willibert; Weidlich, Manfred; and Wiemer, Peter, 5,771,825, Cl. 112-80.700.
- Zucker, Arnold: *See—*
- Handelman, Doron; Kranc, Moshe; Fink, David; Zucker, Arnold; Smith, Perry; and Bar-on, Gerson, 5,774,546, Cl. 380-4.000.
- Zuehlke, Timothy R.: *See—*
- Baer, Kurt R.; Loeffler, John M.; Willford, George A.; and Zuehlke, Timothy R., 5,771,746, Cl. 74-473.250.
- Zufrin, Alexander. Method of and apparatus for quantitative evaluation of current changes in a functional state of human organism, 5,771,897, Cl. 128-670.000.
- Zuk, John: *See—*
- Lockyer, Robert T.; Zuk, John; and Haslim, Leonard A., 5,772,912, Cl. 252-70.000.
- Zurcher, Peter: *See—*
- Jiang, Bo; Zurcher, Peter; Jones, Robert E.; and White, Bruce E., 5,773,314, Cl. 438-3.000.
- zur Megede, Detlef: *See—*
- Wiesheu, Norbert; zur Megede, Detlef; and Autenrieth, Rainer, 5,772,707, Cl. 48-197.00R.
- Zuzulock, George T., Jr.: *See—*
- Sim, Richard J.; and Zuzulock, George T., Jr., 5,772,222, Cl. 280-30.000.
- Zweig, Peter J., to Monotech International, Inc. Concrete monocoque building construction, 5,771,649, Cl. 52-405.100.
- Zweig, Stephen E.: *See—*
- Matzinger, David P.; Zweig, Stephen E.; and Yu, Yeung S., 5,773,302, Cl. 436-169.000.
- Zycad Corporation: *See—*
- Peng, Jack Zezhong; Salter, Robert M., III; and Lipp, Robert J., 5,773,862, Cl. 257-316.000.
- Zysman, Alexandre; Vanlerberghe, Guy; and Semeria, Didier, to L'Oreal Ceramides, process for their preparation and their applications in the cosmetic and dermopharmaceutical fields, 5,773,611, Cl. 424-401.000.
- Zytynski, Zbigniew Janusz, to Shurflo Limited. Pump incorporating pressure-regulated venting means, 5,772,412, Cl. 417-393.000.
- 3D Displays Pty. Ltd.: *See—*
- Welldon, Kenneth George; Thornton, Kenneth John; Staples, Colin John; Daly, Keith Michael; and Davidson, Rodney David, 5,771,615, Cl. 40-406.000.
- 3Dlabs Ltd.: *See—*
- Neave, John Walter; Trevett, Neil F.; Salkild, Jonathan David, deceased; and MacNaughton, Iain Stuart, 5,774,133, Cl. 345-505.000.
- 9010-7210 Quebec Inc.: *See—*
- Roy, Eddy; Hamel, Michel; Gosselin, Claude; and Laflamme, Benoit, 5,774,263, Cl. 359-469.000.



## LIST OF REISSUE PATENTEEES

TO WHOM

PATENTS WERE ISSUED ON THE 30th DAY OF JUNE, 1998

NOTE— Arranged in accordance with the first significant character or word of the name  
(in accordance with city and telephone directory practice).Insul-Air Holdings, Inc.: *See—*  
Sadlier, Claus E., RE. 35,830, Cl. 220-441.000.ITT Corporation: *See—*  
Perkins, Carl C., RE. 35,832, Cl. 361-220.000.Miller, Jay: *See—*  
Wright, H. Burk, deceased; and Miller, Jay, RE. 35,831, Cl. 244-1.00R.  
Perkins, Carl C., to ITT Corporation: Electrostatically protected IC card. RE. 35,832, Cl. 361-220.000.Sadlier, Claus E., to Insul-Air Holdings, Inc. Multi-layered insulated cup  
formed of one continuous sheet. RE. 35,830, Cl. 220-441.000.Western Filament, Inc.: *See—*

Wright, H. Burk, deceased; and Miller, Jay, RE. 35,831, Cl. 244-1.00R.

Wright, H. Burk, deceased (by Jacquelyn L. Wright, personal representative);  
and Miller, Jay, to Western Filament, Inc. Pitot static tube cover. RE.  
35,831, Cl. 244-1.00R.Wright, Jacquelyn L., personal representative: *See—*

Wright, H. Burk, deceased; and Miller, Jay, RE. 35,831, Cl. 244-1.00R.

## LIST OF REEXAMINATION PATENTEEES

TO WHOM

CERTIFICATES WERE ISSUED

Baker, Richard W.: *See—*

Blume, Ingo; and Baker, Richard W., B1 030,356, Cl. 210-640.000.

Batts, Paul R.: *See—*LaMarca, Louis J., II; and Batts, Paul R., B1 456,976, Cl. 442-221.000.  
Bellos, Thomas J.; Greenlee, Roy W.; and Welge, Frederick T., to Petrolite  
Corporation. Method of removing water soluble organics from oil process  
water. B1 818,410, Cl. 210-639.000.Blume, Ingo; and Baker, Richard W., to Membrane Technology & Research,  
Inc. Process for recovering organic components from liquid streams. B1  
030,356, Cl. 210-640.000.DeKalb Genetics Corp.: *See—*

Johnson, Richard, B1 492,547, Cl. 47-58.000.

Greenlee, Roy W.: *See—*Bellos, Thomas J.; Greenlee, Roy W.; and Welge, Frederick T., B1  
818,410, Cl. 210-639.000.Haartz Corporation, The: *See—*LaMarca, Louis J., II; and Batts, Paul R., B1 456,976, Cl. 442-221.000.  
Horwitz, Marcus A., to University of California, The Regents of the.  
Tuberculosis and Legionellosis vaccines and methods for their production.  
B1 108,745, Cl. 424-234.100.Johnson, Richard, to DeKalb Genetics Corp. Process for predicting the  
phenotypic trait of yield in maize. B1 492,547, Cl. 47-58.000.LaMarca, Louis J., II; and Batts, Paul R., to Haartz Corporation, The.  
Resiliently padded laminate construction and injection molded thermo-  
plastic articles faced therewith. B1 456,976, Cl. 442-221.000.Membrane Technology & Research, Inc.: *See—*

Blume, Ingo; and Baker, Richard W., B1 030,356, Cl. 210-640.000.

Petrolite Corporation: *See—*Bellos, Thomas J.; Greenlee, Roy W.; and Welge, Frederick T., B1  
818,410, Cl. 210-639.000.Ross, Gilbert B.; and Stevens, Theodore E., to Spectrum 21 Licensing Corp.  
Cultured onyx products and methods therefor. B1 544,584, Cl. 428-15.000.  
Spectrum 21 Licensing Corp.: *See—*

Ross, Gilbert B.; and Stevens, Theodore E., B1 544,584, Cl. 428-15.000.

Stevens, Theodore E.: *See—*

Ross, Gilbert B.; and Stevens, Theodore E., B1 544,584, Cl. 428-15.000.

University of California, The Regents of the: *See—*

Horwitz, Marcus A., B1 108,745, Cl. 424-234.100.

Welge, Frederick T.: *See—*Bellos, Thomas J.; Greenlee, Roy W.; and Welge, Frederick T., B1  
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A.T. Cross Co.: *See—*

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Adidas AG: *See—*

Gaudio, Paul A., 395,540, Cl. D2-954.000.

Akita, Michio: *See—*

Kawagoi, Takuya; and Akita, Michio, 395,570, Cl. 206-308.300.

Allen, Diane: *See—*Jané , Rodney; Parker, Andrew; Marvin, Robert; O'Grady, Richard;  
Graves, Brian; Chiu, Bernard; and Allen, Diane, 395,703, Cl. D23-  
364.000.Almborg, Jens Henrik: *See—*Almborg, Stephanie Kantis; and Almborg, Jens Hennk, 395,559, Cl.  
D6-390.000.Almborg, Stephanie Kantis; and Almborg, Jens Henrik, to SKA! Design.  
Crib. 395,559, Cl. D6-390.000.Alvimar Manufacturing Co., Inc.: *See—*

Lieberman, Marvin S., 395,556, Cl. D6-334.000.

Andersson, Malin Katarina, to Atlas Copco Tools AB. Portable power grinder.  
395,585, Cl. D8-62.000.Antista, Thomas; and Fairclough, Thomas. Pitcher. 395,571, Cl. D7-303.000.  
Arakawa, Takuo; and Niwa, Norifumi, to Makita Corporation. Portable  
electric hammer. 395,586, Cl. D8-69.000.Arens, Ulf. High performance IC engine ignition coil. 395,658, Cl. D15-  
5.000.Artistry in Motion Entertainment, Inc.: *See—*

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Atlas Copco Tools AB: *See—*

Andersson, Malin Katarina, 395,585, Cl. D8-62.000.

Auto-Shade, LLC: *See—*

Patterson, Kimberly Ann, 395,637, Cl. D12-417.000.

Avenir France: *See—*

Treille, Jean-Patrice, 395,678, Cl. D20-41.000.

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pattern for a paper product. 395,553, Cl. D5-32.000.Ball, Graham Stanley; Jochenning, Christopher Paul; Taube, John Janis; Melia,  
Janet Lynn; and Mantheij, Christopher Alan, to Goodyear Tire & Rubber  
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Bauman, Erich: *See—*Borghorst, Sharla; Bauman, Erich; Herbrechtsmeier, Peter; Pietrobon,  
David; De Lucchi, Michele; Fritze, Torsten; and Kubo, Masahiko,  
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De Lucchi, Michele; Fritze, Torsten; and Kubo, Masahiko, to CIBA Geigy  
Corp. Package for contact lens containers. 395,600, Cl. D9-432.000.

Boyce, Peter Anthony. Structural member. 395,711, Cl. D25-123.000.

Bray, Walter Thomas, Jr.; and Stewart, Theresa, to R.G. Barry Corporation.  
Footwear sole. 395,541, Cl. D2-960.000.Bries, James L.; Gaston, Johannes N.; VanOrnum, Douglas J.; Raber, Paul E.;  
and Pieper, Pauline A., to Minnesota Mining and Manufacturing Company.  
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Butera, Louis L., to DiMarzio, Inc. Buckle tie. 395,596, Cl. D8-396.000.

Butler, Byron. Golf club putter head. 395,692, Cl. D21-219.000.

Butler, Kimberly Sadé; and Butler, Linda. Glow-in-the-dark toilet seat.  
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Cappa, Armando M.; Konopka, Jeffrey D.; and Heer, Warren R., to Pacesetter,  
Inc. Display screen with an icon. 395,645, Cl. D14-114.300.Carlotta, Michael; McCubbin, Robert K., Sr.; Keefe, Richard C.; and Stevens,  
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holder. 395,669, Cl. D18-56.000.Carroll, Maureen; Charles, Kirk; and Verdura, Javier, to Sunbeam Products,  
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Smith, Horace A.; and Carroll, Ralph, 395,595, Cl. D8-382.000.

Cayne, Jaeson D.; Oswaks, Jonathan; Huang, Mingjen S.; and Durrand, Jean  
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395,685, Cl. D21-191.000.

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Chai, Chipping Peter; Tran, Nghiem; and Lemus, Louie. Lopper. 395,581, Cl.  
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Choi, James H. Spoke unit for vehicle wheel. 395,633, Cl. D12-209.000.

Choi, James H. Spoke unit for vehicle wheel. 395,634, Cl. D12-209.000.

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395,653, Cl. D14-142.000.CIBA Geigy Corp.: *See—*Borghorst, Sharla; Bauman, Erich; Herbrechtsmeier, Peter; Pietrobon,  
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Carroll, Maureen; Charles, Ki-k; and Verdura, Javier, 395,572, Cl. D7-379,000.  
Villavicencio, Luis. Instructional soccer ball, 395,690, Cl. D21-204,000.  
Vitches, Vladimir, to Odda Finance Internationale S.A. Shorts, 395,537, Cl. D2-712,000.  
Vornado Air Circulation Systems, Inc.: *See—*  
Ediger, Glen W.; and Israel, Gary P., 395,705, Cl. D23-365,000.  
Wan, Yiu Kwong, to Fee Tat Holdings (H.K.) Limited. Combined lighting device, radio and cassette player, 395,721, Cl. D26-38,000.  
Wanishi, Makoto; Ikemori, Masato; Kariya, Kaeko; Matsuda, Hiroshi; Morioka, Makoto; Hattori, Kazuo; Suzuki, Hiroshi; and Murai, Daisaburo, to Fujitsu Ltd. Printer icon for a display screen, 395,646, Cl. D14-114,300.  
Wanishi, Makoto; Ikemori, Masato; Kariya, Kaeko; Matsuda, Hiroshi; Morioka, Makoto; Hattori, Kazuo; Suzuki, Hiroshi; and Murai, Daisaburo, to Fujitsu Limited. "Pocket calculator activation" icon for a display screen, 395,647, Cl. D14-114,300.  
Wanishi, Makoto; Ikemori, Masato; Kariya, Kaeko; Matsuda, Hiroshi; Morioka, Makoto; Hattori, Kazuo; Suzuki, Hiroshi; and Murai, Daisaburo, to Fujitsu Limited. "Activate calendar application" icon for a display screen, 395,648, Cl. D14-114,300.  
Wanishi, Makoto; Hattori, Kazuo; and Murai, Daisaburo, to Fujitsu Limited. "Activation" icon for a display screen, 395,649, Cl. D14-114,300.  
Welch Allyn, Inc.: *See—*  
Knieriem, Alan Scott; and Cooper, Devin Glen, 395,609, Cl. D10-57,000.  
Welch, John C.: *See—*  
Perry, Jeffrey R.; and Welch, John C., 395,694, Cl. D21-221,000.  
West, Mark. Garden lighting fixture, 395,725, Cl. D26-67,000.  
Wheel Components, Inc.: *See—*  
Kelley, Steve, 395,635, Cl. D12-213,000.  
Wiegner, Georg. Toothbrush, 395,549, Cl. D4-104,000.  
Wiman, Jürgen: *See—*  
Murén, Sture; and Wiman, Jürgen, 395,663, Cl. D15-139,000.  
Woolley, Steve; Harries, Peter; and Cox, Roger F., to Fender Musical Instruments Corporation. Speaker, 395,656, Cl. D14-214,000.  
Wormsbecher, Paul Andrew: *See—*  
Goodman, Walter Adrian; Grebe, Frank Vincent; Hatton, Charles Raymond; Podmajersky, David John; Sherman, John Henry; and Wormsbecher, Paul Andrew, 395,640, Cl. D14-114,000.  
Wysłotsky, Ihor. Food package, 395,599, Cl. D9-425,000.  
Xerox Corporation: *See—*  
Carlotta, Michael; McCubbin, Robert K., Sr.; Keefe, Richard C.; and Stevens, Donald M., 395,669, Cl. D18-56,000.  
Yamamoto Kogaku Co., Ltd.: *See—*  
Yashiro, Tomoyuki, 395,666, Cl. D16-303,000.  
Yang, Chih-Huang. Movement restricting base for a baby walker, 395,623, Cl. D12-133,000.  
Yashiro, Tomoyuki, to Yamamoto Kogaku Co., Ltd. Swimming goggles, 395,666, Cl. D16-303,000.  
Yasuda, Koichi, to Mita Industrial Co., Ltd. Toner cartridge, 395,668, Cl. D18-43,000.  
YKK Corporation: *See—*  
Yuki, Kenji, 395,693, Cl. D21-221,000.  
Yuki, Kenji, to YKK Corporation. Pull tab of slide fastener, 395,693, Cl. D21-221,000.  
Zelle, Peter M. Goblet with stem having flat sides, 395,575, Cl. D7-537,000.  
Zeller, Noel E. Book light, 395,723, Cl. D26-60,000.  
Ziton SA (Proprietary) Limited: *See—*  
Denoon-Stevens, David Owen, 395,614, Cl. D10-106,000.

LIST OF PLANT PATENTEES

Bloom, Adrian, to Blooms of Bressingham Ltd. Geranium plant named Bressingham's Delight, 10,474, Cl. Plt.-87,120.  
Blooms of Bressingham Ltd.: *See—*  
Bloom, Adrian, 10,474, Cl. Plt.-87,120.  
John Bodger & Sons Company: *See—*  
Lemon, David, 10,471, Cl. Plt.-87,120.  
Lemon, David, 10,472, Cl. Plt.-87,120.  
Lemon, David, 10,473, Cl. Plt.-87,120.  
Johnson, Elizabeth T. Azalea plant named 'Calvary's Love', 10,467, Cl. Plt.-55,000.  
Koppe, Lubbertus H., to M. Koppe B.V. Begonia plant named 'Betulia', 10,475, Cl. Plt.-87,180.  
Koppe, Lubbertus H., to M. Koppe B.V. Begonia plant named 'Bellona', 10,476, Cl. Plt.-87,180.  
Lemon, David, to John Bodger & Sons Company. Variety of geranium plant named 'Patriot Salmon Blush', 10,471, Cl. Plt.-87,120.  
Lemon, David, to John Bodger & Sons Company. Variety of geranium plant named 'Raspberry Ice', 10,472, Cl. Plt.-87,120.  
Lemon, David, to John Bodger & Sons Company. Variety of geranium plant named 'Bubble Gum', 10,473, Cl. Plt.-87,120.  
M. Koppe B.V.: *See—*  
Koppe, Lubbertus H., 10,475, Cl. Plt.-87,180.  
Koppe, Lubbertus H., 10,476, Cl. Plt.-87,180.  
Van Staaveren B.V.: *See—*  
van Andel, Jacob, 10,468, Cl. Plt.-83,000.  
van Andel, Jacob, 10,470, Cl. Plt.-83,000.  
Van Straaveren B.V.: *See—*  
van Andel, Jacob, 10,469, Cl. Plt.-83,000.  
van Andel, Jacob, to Van Staaveren B.V. Freesia plant variety named 'Varayel', 10,468, Cl. Plt.-83,000.  
van Andel, Jacob, to Van Staaveren B.V. Freesia plant variety named 'Varatwino', 10,469, Cl. Plt.-83,000.  
van Andel, Jacob, to Van Staaveren B.V. Freesia plant variety named 'Varablue', 10,470, Cl. Plt.-83,000.



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CLASSIFICATION OF PATENTS

ISSUED JUNE 30, 1998

NOTE—First number, class; second number, subclass; third number, patent number

CLASS 2			CLASS 44			CLASS 62			CLASS 96			
2.5	5,771.488	243.54	5,771.551	266	5,773.706	288	5,771.690	596	5,773.721	98	5,772.737	
12.5	5,771.489	402.11	5,771.557	389	5,772.705	345	5,771.691	826	5,773.722	241	5,772.739	
20	5,771.490	407.09	5,771.553	395	5,772.706	384	5,771.692	861.12	5,773.723	CLASS 99		
98	5,771.491	407.1	5,771.552			407	5,771.693		5,773.724	CLASS 99		
161.2	5,771.492	430	5,771.554	CLASS 47			517	5,771.694	861.355	129	5,772.738	
209.13	5,771.493	453	5,771.559	26	5,771.630	608	5,771.695	861.65	5,773.726	CLASS 99		
211	5,771.494	527.7	5,771.560	33	5,771.631	739	5,771.696	862.382	5,773.729	323	5,771.777	
239	5,771.495	563	5,771.561	57.6	5,771.632	CLASS 62			863.83	323.6	5,771.778	
248	5,771.496	592.1	5,771.562	58	5,771.633	50.1	5,771.697	865.8	5,773.730	323.7	5,771.779	
422	5,771.497	596	5,771.563	CLASS 48			66	5,771.698	866.1	327	5,771.780	
	5,771.498		5,771.565	62	5,771.634	81	5,771.699			336	5,771.781	
428	5,771.499	598	5,771.566	CLASS 49			117	5,771.700		340	5,771.782	
452	5,771.500	600	5,771.567	76	5,772.708	179	5,771.701	2	5,771.742	343	5,771.783	
CLASS 4			603.03	197 R	5,772.707	203	5,771.702	116	5,771.743	348	5,771.784	
313	5,771.501	603.06	5,771.570			204	5,771.703	411	5,771.744	404	5,771.786	
405	5,771.502	603.12	5,771.571	CLASS 49			228.4	5,771.704	440	5,771.745	426	5,771.787
524	5,771.503	623.1	5,772.702	25	5,771.635	229	5,771.705	473.25	5,771.746	468	5,771.788	
558	5,771.504	623.5	5,772.703	139	5,771.636	235	5,771.706	490.01	5,771.747	476	5,771.789	
559	5,771.505	701	5,771.572	416	5,771.637	271	5,771.707	490.12	5,771.748	492	5,771.790	
575.1	5,771.506	730	5,772.704	CLASS 52			389	5,771.709	502.6	5,771.750	536	5,771.792
680	5,771.507	825	5,771.573	71	5,771.639	494	5,771.710		5,771.751	CLASS 100		
CLASS 5			861	167.1	5,771.642	497	5,771.711	512	5,771.752	47	5,771.793	
53.2	5,771.508	868	5,771.574	90.1	5,771.640	621	5,771.712	526	5,771.753	80	5,771.794	
181	5,771.510		5,771.575	101	5,771.641	639	5,771.713	534.4	5,771.754	CLASS 101		
600	5,771.511	889.721	5,771.577	167.1	5,771.642		5,771.714	574	5,771.755	22	5,771.796	
623	5,771.512	890.01	5,771.579	169.5	5,771.643	14.1	5,771.715	594.2	5,771.756	37	5,771.797	
625	5,771.513	CLASS 30			213	5,771.644	CLASS 63			38.1	5,771.798	
644	5,771.514	43.92	5,771.580	220.2	5,771.645	32.1	5,772.715	596 R	5,771.758	108	5,771.799	
660	5,771.515	263	5,771.646	302.1	5,771.647	60.2	5,772.716	CLASS 75			119	5,771.800
CLASS 7			302.67	309.7	5,771.648	104	5,772.717	10.13	5,772.724	127.1	5,771.801	
100	5,771.516	405.1	5,771.649	405.1	5,771.649	133	5,772.718	10.18	5,772.725	183	5,771.803	
CLASS 8			568	5,771.650	641	5,771.651	158	5,772.719	10.22	5,772.726	248	5,771.805
151	5,771.517	251	5,771.584	641	5,771.651	168	5,773.529	240	5,773.735	333	5,771.806	
440	5,772.696	293	5,771.586	716.5	5,771.652	175	5,772.720	243	5,773.734	375	5,771.807	
543	5,772.697	308.2	5,771.587	737.6	5,771.653	387		430	5,772.727	401.1	5,771.808	
549	5,772.698	346.58	5,771.588	742.14	5,771.654	195	5,771.716	3.09	5,771.759	483	5,771.809	
	5,772.699	360	5,771.590	745.14	5,771.655	12.26	5,771.717	62	5,771.760	486	5,771.811	
CLASS 14			527	CLASS 53			CLASS 66			CLASS 102		
73.1	5,771.518	540	5,771.592	55	5,771.657	142	5,771.718	99	5,771.761	205	5,773.748	
CLASS 15			1 PT	157	5,771.658	183	5,771.719			217	5,773.749	
104.001	5,771.519	370.7	5,771.659	374.5	5,771.660	1	5,772.721	1.11	5,771.762	302	5,773.750	
184	5,771.521	374.5	5,771.660	382.1	5,771.661	21	5,772.722			473	5,773.751	
208	5,771.522	403	5,771.663	403	5,771.663	27	5,772.723	13	5,771.764	513	5,773.752	
209.1	5,771.523	417	5,771.664	459	5,771.665	93	5,771.720	168	5,771.765	CLASS 105		
	5,771.524	494	5,771.598	466	5,771.666	209	5,771.721	241	5,771.766	458	5,771.812	
244.1	5,771.525	657	5,771.599	469	5,771.667	360	5,771.722	435.13	5,771.767	CLASS 106		
250.19	5,771.526	CLASS 34			466	5,771.666	278	5,771.723	571	5,772.740	31.25	5,772.741
250.202	5,771.527	63	5,771.600	469	5,771.667	11	5,772.721	13	5,771.764	31.27	5,772.742	
311	5,771.528	314	5,771.601	CLASS 54			21	5,772.722	449	5,772.743		
339	5,771.529	420	5,771.602	1	5,771.668	27	5,772.723	608.61	5,771.771	31.43	5,772.744	
	5,771.530	446	5,771.603	399	5,771.662	11.8	5,771.724	882		31.48	5,772.745	
344	5,771.531	603	5,771.604	CLASS 55			17.3	5,771.725	168	5,771.765	31.86	5,772.746
352	5,771.532	CLASS 36			222	5,772.709	20.2	5,771.726	241	5,771.766	33	5,772.747
CLASS 16			25 R	244	5,773.621	11.8	5,771.724	277	5,771.767	38.27	5,772.748	
82	5,771.533	29	5,771.605	269	5,772.710	41	5,771.728	449	5,771.768	413	5,772.750	
93 R	5,771.534	72 B	5,771.606	274	5,772.711	53	5,771.729	605	5,773.740	679	5,772.751	
110 R	5,771.535	89	5,771.607	367	5,772.712	58	5,771.730	609	5,773.741	705	5,772.752	
114 R	5,771.536	116	5,771.608	496	5,772.713	200	5,771.731		5,773.742	810	5,772.753	
125	5,771.537	137	5,771.610	CLASS 56			202	5,771.732	5,773.743	CLASS 108		
274	5,771.538	6	5,771.669	12.1	5,771.670	235	5,771.733	5,773.744		CLASS 110		
285	5,771.539	12.1	5,771.670	15.4	5,771.672	273	5,771.734			50.011	5,771.813	
308	5,771.540	142.5	5,771.612	CLASS 57			307	5,771.735	93	5,771.814		
CLASS 19			235	235	5,771.733	339	5,771.736	1.11	5,773.745	93	5,771.815	
200	5,771.541	CLASS 38			284	5,771.674	307	5,771.737	4.1	5,771.772	97	5,771.816
239	5,771.542	339	5,771.675	CLASS 40			367	5,771.738	14.4	5,773.746	147	5,771.817
CLASS 24			339	339	5,771.675	391.8	5,771.739	47	5,773.747	CLASS 91		
71 J	5,771.543	124.06	5,771.614	78.1	5,771.676	452.5	5,771.740	369.2	5,771.773	238	5,771.817	
171	5,771.544	406	5,771.615	39.02	5,771.677	1.03	5,773.707	98 D	5,771.774	250	5,771.818	
351	5,771.545	452	5,771.616	39.55	5,771.678	25.01	5,773.709	165 PR	5,771.775	267	5,771.819	
429	5,771.546	544	5,771.617	219	5,771.679	28.01	5,773.710			346	5,771.820	
CLASS 26			600	226.1	5,771.680	52	5,773.711	CLASS 92				
93	5,771.547	55	5,771.620	262	5,771.681	54.28	5,773.712	CLASS 95				
CLASS 27			74	5,771.622	274	5,771.682	61.41	5,773.713	CLASS 112			
2	5,771.548	101	5,771.623	CLASS 60			105	5,773.714	8	5,772.731	80.7	5,771.825
19	5,771.550	CLASS 43			5,771.683	119 A	5,773.716	25	5,772.732	102.5	5,771.826	
CLASS 29			17	5,771.624	5,771.685	146	5,773.717	39	5,772.733	470.01	5,771.828	
25.01	5,772.700	42.74	5,771.625	167	5,771.686	167	5,773.718	42	5,772.734	470.15	5,771.830	
25.03	5,772.701	100	5,771.627	252	5,771.687	252	5,773.719	45	5,772.735	475.04	5,771.829	
25.35	5,771.555	121	5,771.628	276	5,771.688	487	5,773.719	46	5,772.736			
		120		286	5,771.689	493	5,773.720					

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106	CLASS 114	653.1	5,771,894	561	5,772,803	73	5,772,864	CLASS 218	
221 A		653.3	5,771,895	564	5,772,804	261	5,772,865		
	CLASS 116	670	5,771,896						
34 R		697	5,771,898	36	5,773,754	17 VA	5,773,755	CLASS 206	
209		830	5,771,899			37	5,773,756		
	CLASS 117	878	5,771,900	108	5,771,951	53	5,773,757	CLASS 219	
		897	5,771,901			65 R	5,773,758		
5		898	5,771,903				5,773,759		
	CLASS 132	159	5,771,904	158	5,772,805	66	5,773,760		
68		21	5,771,906	209 R	5,772,806	84 C	5,771,983		
79		207	5,771,907			113 R	5,773,761		
84		247	5,771,908	454	5,772,808	117 M	5,773,762		
85		275		527	5,772,809	135	5,773,763		
103				531	5,772,810	250	5,773,764		
104				540	5,772,811				
206									
	CLASS 118	2	5,772,776			14	5,771,984	CLASS 175	
203		6	5,772,777	62.4	5,772,813	55	5,771,985		
213		7	5,772,778	64	5,772,814			CLASS 177	
319		10	5,772,779	71	5,772,815	25.12	5,773,765		
405		12	5,772,780	73.1	5,772,816	25.13	5,773,766		
413		21	5,772,781		5,772,817	126	5,773,767		
428		25.2	5,772,782	82	5,772,818	136	5,773,768		
688			5,772,783	89	5,772,819	210 EM	5,771,986		
712			5,772,784	93	5,772,820				
719			5,772,785	108	5,772,821				
723			5,772,786		5,772,822				
723 MA			5,772,787		5,772,823	104	5,773,769	CLASS 178	
729			5,772,788		5,772,824				
	CLASS 119	57 D	5,772,789	158	5,772,825				
			5,772,790	164	5,772,826				
14.02			5,771,837	245	5,772,827	6.66	5,771,987	CLASS 180	
52.2			5,771,838	246	5,772,828	65.5	5,771,988		
			5,771,839	247	5,772,829	423	5,771,989		
452			5,771,840	291	5,772,830			CLASS 209	
			5,771,841	292	5,772,831	3.3	5,772,040		
772			5,771,843	293	5,772,832	11	5,772,041		
	CLASS 122	246		309.3	5,772,833	166	5,772,042		
		248	5,772,791	345	5,772,834	208	5,772,043		
366		253	5,772,792	351	5,772,835	268	5,773,770		
451 R			5,772,793	358	5,772,836				
			5,771,846	400	5,772,837				
	CLASS 123	1	5,771,914	497	5,772,838				
1 A		67	5,771,916	512	5,772,839			CLASS 210	
25 C		238	5,771,917	522	5,772,840	90	5,772,867		
73 R		269	5,771,918	540	5,772,841	120	5,772,868		
143 C		454.6	5,771,919	555	5,772,842	149	5,772,869		
184.57		460	5,771,920	584	5,772,843	150	5,772,870		
188.3		505	5,771,921			168	5,772,871		
196 R		513.5	5,771,922			169	5,772,872		
		522	5,771,923			192	5,772,873		
198 D		546	5,771,924			198.2	5,772,874		
		552.7	5,771,925						
305		554	5,771,926						
306		614.04	5,771,927						
330.11		625.22	5,771,928						
352		625.32	5,771,929						
357		625.47	5,771,930						
425		625.66	5,771,931						
456		625.69	5,771,932						
		627.5	5,771,933						
467		801	5,771,934						
531		859	5,771,935						
569									
570									
571									
635									
655									
661									
668									
	CLASS 124	149	5,771,941						
8									
72									
	CLASS 125	11	5,771,942						
		406	5,771,943						
21		457	5,771,944						
	CLASS 126	123	5,771,945						
29									
42									
49 R									
299									
414									
	CLASS 127	130	5,772,774						
		135.2	5,772,775						
203.12									
205.24									
205.27									
207.11									
207.15									
	CLASS 128	108	5,772,794						
		221	5,772,795						
		303	5,772,796						
		306	5,772,797						
		421	5,772,798						
		439	5,772,799						
		502	5,772,800						
		551	5,772,801						
		552	5,772,802						
642									

44	CLASS 232	281	5,773,822	728	5,773,887	491.3	5,772,230	CLASS 312	108	5,773,999	
		288	5,773,823		5,773,888	638	5,772,233		110	5,774,000	
		306	5,773,824		5,773,889	642	5,772,234		141	5,774,001	
	CLASS 235	339.11	5,773,825	753	5,773,890	643	5,772,235		165	5,774,002	
375		339.15	5,773,826	754	5,773,891	651	5,772,236		202	5,774,003	
379		341.8	5,773,827	758	5,773,892	704	5,772,237		205	5,774,004	
441		345	5,773,828	760	5,773,893	728.2	5,772,238		210	5,774,005	
462		367	5,773,829	764	5,773,894	728.3	5,772,239		291	5,774,006	
		370.01	5,773,830	778	5,773,895	741	5,772,240		292	5,774,007	
		370.06	5,773,831	779	5,773,896		5,772,241		356	5,774,010	
		370.09	5,773,832	783	5,773,897		5,772,242		361	5,774,011	
472		382	5,773,833	784	5,773,898		5,772,243		399	5,774,009	
		412.23	5,773,833			780	5,772,244		399	5,774,010	
492		423 F	5,773,834			784	5,772,245		346 R	5,774,011	
	CLASS 237	462.1	5,773,835	67	5,772,927	806	5,772,246		371	5,774,012	
		492.23	5,773,836		5,772,928				402	5,774,013	
		559.31	5,773,840	CLASS 264	31	5,772,247			414	5,774,015	
	CLASS 239	573	5,773,841	4.1	5,772,929				495	5,773,927	
		580	5,773,839	15	5,772,930	CLASS 283	504	5,772,249	504	5,773,929	
67		5,772,114		40.5	5,772,931	93	5,772,250	506	5,773,930		
69		5,772,115	CLASS 251	30	5,772,932	114	5,772,251	509	5,773,931		
124		5,772,116	95	5,772,177	40	5,772,933	639	5,773,932	52	5,774,018	
240		5,772,117	127	5,772,178	42	5,772,934			252	5,774,019	
276		5,772,118	129.06	5,772,181	48	5,772,935				5,774,020	
315		5,772,119	129.1	5,772,179	51	5,772,936	CLASS 285	CLASS 315	25	5,774,021	
391		5,772,120	129.15	5,772,180	117	5,772,937	4	5,773,933		CLASS 331	
394		5,772,121	325	5,772,182	137	5,772,938	15	5,773,934	1 A	5,774,022	
408		5,772,122			145	5,772,939	16	5,773,935	17	5,774,023	
533.12		5,772,123	CLASS 252	167	5,772,940	38	5,772,255	246	5,773,937		
533.2		5,772,124	1	5,772,940	175	5,772,941	61	5,773,938		CLASS 333	
694		5,772,125	8.84	5,772,910	184	5,772,942	112	5,773,938	1.1	5,774,024	
	CLASS 241	67	5,772,911	211.13	5,772,943	114	5,772,258	51	5,773,939	24.1	5,774,025
19		5,772,126	70	5,772,912	258	5,772,944	145.1	5,772,259	59	5,774,026	
21		5,772,127	180	5,772,913	313	5,772,946	256	5,772,261	354	5,774,027	
30		5,772,128	299.6	5,772,914	401	5,772,947	257	5,772,262	280	5,774,028	
31		5,772,129	301.4 H	5,772,915	444	5,772,948	319	5,772,263	432	5,774,030	
46.17		5,772,130	301.4 R	5,772,916	450	5,772,949			573	5,774,044	
60		5,772,131		5,772,917	510	5,772,950	CLASS 292	434	5,773,945	CLASS 335	
74		5,772,132	301.45	5,772,918	537	5,772,951	130	5,772,264	460	5,773,946	
79.1		5,772,133	403	5,772,919	555	5,772,952	207	5,772,265	561	5,773,947	
264		5,772,134	404	5,772,920	638	5,772,953	259 R	5,772,266	568.11	5,773,949	
	CLASS 242	478	5,772,922	CLASS 266	48	5,772,954	133	5,772,267	568.19	5,773,950	
42		5,772,136	519	5,773,566	182	5,772,955	CLASS 293	625	5,773,951	CLASS 336	
231		5,772,137	520.1	5,772,954	241	5,772,957	687	5,773,952	173	5,774,035	
261		5,772,138	582	5,772,925			CLASS 294	687	5,773,953	192	5,774,036
279		5,772,139	769.026	5,772,923	69	5,772,188	67.22	5,772,268	2	5,773,954	
334.6		5,772,140	806	5,772,923	140.13	5,772,189		5,772,269	21	5,773,955	
	CLASS 254	324	5,772,183	141	5,772,190	141	5,772,190	26	5,773,956	248	5,774,037
346		5,772,143	361	5,772,184	287	5,772,191	32	5,773,957	113.957	5,773,958	
379.1		5,772,144			CLASS 269	97.5	5,772,272	120	5,773,958	286.05	5,774,038
382.2		5,772,145	59	5,772,185	37	5,772,192	100	5,772,273	127	5,773,959	
388		5,772,146	65	5,772,186	228	5,772,193	121	5,772,275	132	5,773,960	
418.1		5,772,147			CLASS 257	45	5,772,194	181	5,772,276	396.1	5,774,041
423.1		5,772,148	25	5,773,842	52.16	5,772,195	201	5,772,277	145	5,773,962	
533.2		5,772,149	30	5,773,843	58.08	5,772,197	707	5,772,274	CLASS 322	436	5,774,043
554.1		5,772,150	37	5,773,844	58.12	5,772,198	85	5,772,278	20	5,773,964	
573		5,772,151	66	5,773,845	CLASS 271	10.06	5,772,199	130	5,772,279	438	5,774,044
597		5,772,152	72	5,773,846	11.1 A	5,772,200	216.12	5,772,280	222	5,773,965	
	CLASS 244	59	5,773,847	124.5	5,772,201	302.3	5,772,281	304.4	5,772,282	476	5,774,045
1 R		RE 35,831	77	5,773,849	220	5,772,202	452.38	5,772,283	316	5,773,967	
134 F		5,772,153	78	5,773,850	246	5,772,202	CLASS 299	330	5,773,968	540	5,774,046
158 A		5,772,154	139	5,773,852	139	5,772,203	340	5,773,969	330	5,774,050	
199		5,772,155	192	5,773,853	CLASS 273	108.1	5,772,204	341	5,773,970	573	5,774,051
209		5,772,156	202	5,773,854	108.1 A	5,772,205	6.8	5,772,285	161	5,773,971	
	CLASS 246	206	5,773,855	129.5	5,772,206	124.5	5,772,207	235	5,773,972	825.21	5,774,052
257		5,772,157	207	5,773,856	237	5,772,208	37.1	5,772,286	258	5,773,973	
	CLASS 248	207	5,773,857	268	5,772,209	299	5,772,211	306	5,773,974	573,975	5,774,055
49		5,772,158	211	5,773,859	268	5,772,210	63.1	5,772,288	418	5,773,976	
68.1		5,772,160	294	5,773,860	299	5,772,212	9.69	5,772,289	429	5,773,977	
74.2		5,772,161	316	5,773,862	308	5,772,213	113.4	5,772,290	546	5,773,978	
121		5,772,162			CLASS 277	28	5,772,214	551	5,773,981	825.72	5,774,056
139		5,772,163	344	5,773,863	235 B	5,772,215	10.1	5,773,980	555	5,773,982	
170		5,772,164	347	5,773,864	318	5,772,216	125	5,773,981	635	5,773,983	
188.5		5,772,165	349	5,773,865	383.17	5,772,217	68 D	5,773,982	754	5,773,984	
218.1		5,772,166	390	5,773,867	516	5,772,218	92	5,773,983	757	5,773,985	
284.1		5,772,167	319	5,773,868	156	5,772,219	201	5,773,984	765	5,773,986	
300		5,772,168	514	5,773,869	7.1	5,772,220	232	5,773,985	772	5,773,987	
333		5,772,169	529	5,773,870	11.2	5,772,221	248	5,773,986		5,773,988	
363		5,772,170	532	5,773,871	47.131	5,772,222	261	5,773,987	27	5,773,992	
378		5,772,171			112.2	5,772,223	266	5,773,988	38	5,773,993	
415		5,772,172			348	5,772,224	318	5,773,989	101	5,773,994	
430		5,772,173			250.1	5,772,225	344	5,773,990	108	5,773,995	
447.1		5,772,174			375	5,772,227	348	5,773,991	135	5,773,996	
638		5,772,176			384	5,772,228	357	5,773,992	118	5,774,000	
	CLASS 250	666	5,773,877	CLASS 279	92	5,772,229	364	5,773,993	53	5,773,997	
206.2		5,773,878	676	5,773,878	156	5,772,229	375	5,773,994	91	5,773,998	
208.1		5,773,879	678	5,773,879	7.1	5,772,220	254	5,773,995	CLASS 326	30	5,774,017
214 A		5,773,880	679	5,773,880	11.2	5,772,221	261	5,773,996	27	5,773,992	
214 R		5,773,881	685	5,773,881	47.131	5,772,222	266	5,773,997	38	5,773,993	
226		5,773,882	692	5,773,882	112.2	5,772,223	318	5,773,998	101	5,773,994	
228		5,773,883	698	5,773,883	348	5,772,225	348	5,773,999	108	5,773,995	
231.14		5,773,884	707	5,773,884	250.1	5,772,226	344	5,774,000	135	5,773,996	
253		5,773,885	710	5,773,885	375	5,772,227	348	5,774,001	118	5,774,002	
		5,773,886	718	5,773,886	384	5,772,228	364	5,774,002	152	5,774,003	
									155	5,774,004	
									159	5,774,005	



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13	5,774,087	553	5,774,186	665	5,774,273	103	5,774,443	CLASS 379
22	5,774,088	558	5,774,187	666	5,774,274	109	5,774,444	1
25	5,774,089	563	5,774,188	687	5,774,275	270	5,774,445	11
372	5,774,090		5,774,189	699	5,774,276	274	5,774,446	88
387	5,774,091		5,774,190	702	5,774,277	291	5,774,447	90.01
			5,774,191	723	5,774,278		5,774,448	93.07
			5,774,192	753	5,774,279			106.01
756	5,774,093		5,774,193	819	5,774,280	424.034	5,774,361	106.03
770	5,774,094		5,774,194	822	5,774,281	443	5,774,362	112
895	5,774,095		5,774,195	823	5,774,282	468.03	5,774,363	113
			5,774,196	838	5,774,283	468.24	5,774,364	127
						479.67	5,774,365	134
							5,774,366	144
8	5,774,096	117	5,774,197	1	5,774,284	487	5,774,367	144
83	5,774,098	128	5,774,198	31	5,774,285	488	5,774,368	156
87	5,774,099	149	5,774,199	46	5,774,286	489	5,774,369	157
89	5,774,100			48	5,774,287		5,774,370	201
94	5,774,102	47	5,774,200	51	5,774,288	491	5,774,371	207
96	5,774,103	159	5,774,201	67	5,774,289	506	5,774,372	310
97	5,774,104	177	5,774,202	73.03	5,774,290	508	5,774,373	329
98	5,774,106	205	5,772,298	75	5,774,291	550	5,774,374	355
104	5,774,107				5,774,292	551.01	5,774,375	390
123	5,774,108	20	5,772,299	77.03	5,774,293	559	5,774,376	416
124	5,774,109	57	5,772,300	77.04	5,774,294	561	5,774,377	428
131	5,774,110	122	5,772,301	77.08	5,774,295	571.01	5,774,378	445
145	5,774,111				5,774,296	571.02	5,774,379	473
153	5,774,112				5,774,297	576	5,774,380	
156	5,774,113	27	5,774,203	85	5,774,298	578	5,774,381	
157	5,774,114		5,774,204	98.07	5,774,299		5,774,382	3
172	5,774,115	67	5,774,205	103	5,774,300	708.1	5,774,383	10.3
211	5,774,116				5,774,301		5,774,384	21.1
330	5,774,117				5,774,302		5,774,385	22.3
337	5,774,118	3.09	5,774,207	104	5,774,303	715.02	5,774,386	22.31
340	5,774,119	4.01	5,774,208	107	5,774,304	723	5,774,387	
348	5,774,120	73	5,774,209	113	5,774,305	724.011	5,774,388	
354	5,774,121	139.1	5,774,210	119	5,774,306	726	5,774,389	22.32
355	5,774,122	141.2	5,774,211	125	5,774,307	736	5,774,390	31
357	5,774,123	237	5,774,212	126	5,774,308	746.1	5,774,391	33
419	5,772,297	320	5,774,213	132	5,774,309	807	5,774,392	37.1
423	5,774,124	344	5,774,214	135	5,774,310		5,774,393	40.1
430	5,774,125	346	5,774,215	137	5,774,311		5,774,394	40.2
431	5,774,126	350	5,774,216		5,774,312	145	5,774,395	62
440	5,774,128		5,774,217		5,774,313	156	5,774,396	
441	5,774,129	356	5,774,218	18	5,774,314	158.09	5,774,397	
503	5,774,130	376	5,774,219	42	5,774,315	185.18	5,774,398	6
505	5,774,131		5,774,220	56	5,774,316	185.19	5,774,399	20
509	5,774,132		5,774,221	93	5,774,317	185.2	5,774,400	31
516	5,774,133	394	5,774,222	93	5,774,318	185.3	5,774,401	45
	5,774,134		5,774,223		5,774,319	189.02	5,774,402	69
	5,774,135		5,774,224		5,774,320	191	5,774,403	70
7	5,774,136	402	5,774,225	94	5,774,321	194	5,774,404	89
14	5,774,137	418	5,774,226	170	5,774,322	222	5,774,405	98
32	5,774,138	430	5,774,227	187	5,774,323	226	5,774,406	
33	5,774,139	432	5,774,228	200	5,774,324		5,774,407	44
34	5,774,140			225	5,774,325	230.03	5,774,408	118
35	5,774,141	298	5,774,229	231.5	5,774,326		5,774,409	127
36	5,774,142		5,774,230		5,774,327		5,774,410	140
40	5,774,143	434	5,774,231	667	5,774,328	230.05	5,774,411	142
41	5,774,144	448	5,774,232	680	5,774,329	230.06	5,774,412	160
43	5,774,145	451	5,774,233	683	5,774,330		5,774,413	162
59	5,774,146		5,774,234	686	5,774,331	244	5,774,414	179
63	5,774,147	453	5,774,235	687	5,774,332			
	5,774,148	459	5,774,236	688	5,774,333			
	5,774,149	471	5,774,237	689	5,774,334			
	5,774,150	529	5,774,238	699	5,774,335			
	5,774,151			704	5,774,336			
65	5,774,152			725	5,774,337			
85	5,774,153			730	5,774,338			
102	5,774,154	9	5,774,239	737	5,774,339			
116	5,774,155	12	5,774,240	771	5,774,340			
129	5,774,156	15	5,774,241	774	5,774,341			
131	5,774,157	110	5,774,242		5,774,342			
141	5,774,158	125	5,774,243	796	5,774,343			
151	5,774,159	128	5,774,244	800	5,774,344			
171	5,774,160	139	5,774,245					
175	5,774,161	152	5,774,246					
200	5,774,162	204	5,774,247	3				
211	5,774,163	204	5,774,248	31	5,772,302			
221	5,774,164	205	5,774,249	33	5,772,303			
236	5,774,165		5,774,250	61	5,772,304			
248	5,774,166	216	5,774,251	86	5,772,305			
254	5,774,167	224	5,774,252	119	5,772,306			
262	5,774,168	226	5,774,253	183	5,772,307			
		259	5,774,254	225	5,772,308			
		267	5,774,255	238	5,772,309			
		291	5,774,256	249	5,772,310			
9	5,774,170		5,774,257	298	5,772,311			
13	5,774,172	315	5,774,258	360	5,772,312			
38	5,774,173	451	5,774,259	396	5,772,313			
55	5,774,174	464	5,774,260	400	5,772,314			
83	5,774,175		5,774,261		5,772,315			
88	5,774,176	469	5,774,262		5,772,316			
206	5,774,177	497	5,774,263	17	5,774,345			
218	5,774,178	539	5,774,264		5,774,346			
241	5,774,179	554	5,774,265	21	5,774,347			
300	5,774,180	557	5,774,266	60	5,774,348			
311	5,774,181	630	5,774,267	68	5,774,349			
416	5,774,182	636	5,774,268	89	5,774,350			
506	5,774,183	644	5,774,269	132	5,774,351			
531	5,774,184	649	5,774,270	133	5,774,352			
		660	5,774,271	146	5,774,353			
			5,774,272					

24	5,774,606		5,774,704	343	5,772,356		5,773,576	129	5,773,059	611	5,773,156
33	5,774,607		5,774,705		5,772,357	18	5,772,965	281	5,773,060	694 BP	5,773,157
39	5,774,608	559	5,774,706		5,772,358	100	5,772,966	300.3	5,773,061	699	5,773,158
49	5,774,609		5,774,707	7	5,772,359	102	5,772,967	335	5,773,062		
52	5,774,610	568	5,774,708	19	5,772,358	106	5,772,968	335	5,773,063		CLASS 429
58	5,774,611	580	5,774,709	94	5,772,359	189	5,772,968	420	5,773,064	7	5,773,159
72	5,774,612	585	5,774,710			191	5,772,970	466	5,773,065	13	5,773,160
84	5,774,613	591	5,774,711		CLASS 405	292	5,772,971	483	5,773,066	34	5,773,161
88	5,774,614	595	5,774,712	3	5,772,360			506	5,773,067	39	5,773,162
89	5,774,616	601	5,774,713	36	5,772,361		CLASS 423	551	5,773,068	60	5,773,163
128	5,774,610	611	5,774,714	232	5,772,362	2	5,774,782	557	5,773,069	161	5,773,164
134	5,774,617	612	5,774,715		5,772,363	213.5	5,772,972	573	5,773,070	197	5,773,165
135	5,774,618	618	5,774,716			239.1	5,772,973	577	5,773,071	212	5,773,166
137	5,774,619	670	5,774,718		CLASS 407	447.7	5,772,974	589	5,773,072	218	5,773,167
141	5,774,620	680	5,774,719	42	5,772,364	417.1	5,772,975	615	5,773,073	223	5,773,168
		682	5,774,720		5,772,365	579.6	5,772,976	638	5,773,074		5,773,169
		685	5,774,721	119	5,772,366	608	5,772,977	656	5,773,075	231	5,773,176
68	5,774,622	683	5,774,722			586	5,772,978				
98	5,774,623	702	5,774,723		CLASS 408	705	5,772,979				CLASS 430
111	5,774,624	704	5,774,724	67	5,772,367	705	5,772,980			5	5,773,170
		705	5,774,725		CLASS 409			126.3	5,773,078		5,773,171
		706	5,774,726				CLASS 424	155	5,773,079		5,773,177
812	5,774,625		5,774,727	182	5,772,368	149	5,772,981	155	5,773,077	7	5,773,172
815	5,774,626		5,774,728			173	5,772,982	208.6	5,773,080	20	5,773,178
		707	5,774,729		CLASS 410	9.2	5,772,983	211	5,773,081		5,773,179
		709	5,774,730	96	5,772,369	9.52	5,772,984	240	5,773,082	22	5,773,180
	CLASS 392	726	5,774,731	100	5,772,370	45	5,772,985	255.2	5,773,083	30	5,773,183
		727	5,774,732	118	5,772,371	53	5,772,986	255.3	5,773,084	32	5,773,184
	CLASS 395	750.01	5,774,733			61	5,772,987	255.3	5,773,085	52	5,773,197
			5,774,734		CLASS 411	69	5,772,988	292	5,773,087	56	5,773,175
2.64	5,774,628	750.03	5,774,735	55	5,772,372	70.1	5,772,990	294	5,773,088	78	5,773,181
10	5,774,629	750.07	5,774,736	120	5,772,373	85.2	5,772,992	304	5,773,089	106	5,773,182
13	5,774,630	783.01	5,774,644	386	5,772,374	93.21	5,772,995	307	5,773,090		5,773,183
22	5,774,631	800.01	5,774,738	399	5,772,375	96	5,772,993	327	5,773,090	135	5,773,184
	5,774,632	800.27	5,774,739	396	5,772,376	93.94	5,772,994	384	5,773,091	137	5,773,185
23	5,774,633	800.34	5,774,739	429	5,772,377	94.4	5,772,996	385.5	5,773,092	138	5,773,186
106	5,774,635	800.42	5,774,740	432	5,772,378	130.1	5,772,997	420	5,773,093	162	5,773,187
109	5,774,634	822	5,774,741	442	5,772,379	133.1	5,772,998		5,773,094	201	5,773,188
	5,774,636	828	5,774,742	508	5,772,380	167.1	5,773,000	424	5,773,095	203	5,773,189
114	5,774,637	842	5,774,743	533	5,772,381	184.1	5,773,002	436	5,773,096		5,773,190
	5,774,638	847	5,774,744			187.1	5,772,999	459	5,773,097	270.1	5,773,191
115	5,774,639	872	5,774,745		CLASS 414	187.1	5,773,000	529	5,773,099		5,773,192
182.02	5,774,640			339	5,772,382	193.1	5,773,003	579	5,773,100		5,773,193
182.04	5,774,641		CLASS 396	403	5,772,383	195.1	5,773,004	529	5,773,100	270.16	5,773,193
182.11	5,774,642	49	5,774,746	408	5,772,384		5,773,005			284.1	5,773,194
182.18	5,774,643	61	5,774,747		5,772,385	195.11	5,773,006		CLASS 428	312	5,773,195
183.01	5,774,645	80	5,774,748	411	5,772,386	197.11	5,773,007	15	BI 544,584	313	5,773,197
183.18	5,774,646		5,774,749	416	5,772,387	201.1	5,773,008	17	5,773,101		5,773,198
185.01	5,774,647	159	5,774,750	484	5,772,388	215.1	5,773,009	34.6	5,773,102	316	5,773,199
	5,774,648	297	5,774,751	499	5,772,389	234.1	5,773,010		5,773,103	321	5,773,200
185.08	5,774,649	312	5,774,752	786	5,772,390	276.1	5,773,011		5,773,104	329	5,773,201
186	5,774,650	366	5,774,753	790.9	5,772,391	278.1	5,773,011	34.7	5,773,105	331	5,773,202
	5,774,651	380	5,774,754	797.9	5,772,392	401	5,773,015	35.7	5,773,106	442	5,773,203
	5,774,652	411	5,774,755			405	5,773,016	35.9	5,773,107	449	5,773,204
200.06	5,774,656	415	5,774,756		CLASS 415	405	5,773,016	36.9	5,773,108	501	5,773,205
200.3	5,774,653		5,774,757	55.4	5,772,393	405	5,773,017	40.1	5,773,109	510	5,773,206
	5,774,654			56.1	5,772,394	409	5,773,017		5,773,110	567	5,773,206
200.31	5,774,660		CLASS 399	90	5,772,395	423	5,773,019		5,773,111	607	5,773,207
200.33	5,774,661	1	5,774,758	112	5,772,396	426	5,773,020		5,773,112		5,773,208
	5,774,662	8	5,774,759	115	5,772,397	427	5,773,021	41.8	5,773,113		CLASS 431
200.34	5,774,663	39	5,774,760		5,772,398	443	5,773,022	57	5,773,114		5,773,211
200.48	5,774,664	46	5,774,761	148	5,772,399	449	5,773,023		5,773,115	8	5,772,421
	5,774,665	50	5,774,762	173.1	5,772,400	450	5,773,024	64.1	5,773,116	184	5,772,422
	5,774,666	69	5,774,763	189	5,772,401		5,773,026	75	5,773,117	185	5,772,422
200.5	5,774,665	77	5,774,764		CLASS 417	458	5,773,025	85	5,773,118	254	5,772,423
200.52	5,774,667	102	5,774,765	44.2	5,772,402	487	5,773,027	85	5,773,119	291	5,772,424
200.53	5,774,668	111	5,774,766		5,772,403	487	5,773,028	85	5,773,120	319	5,772,425
200.54	5,774,669	167	5,774,767	51	5,772,404	490	5,773,029	117	5,773,121		CLASS 432
200.57	5,774,670	170	5,774,768	118	5,772,405	490	5,773,030	119	5,773,122	23	5,772,428
200.6	5,774,671	222	5,774,769	269	5,772,406	501	5,773,031	137	5,773,123	162	5,772,429
	5,774,672	223	5,774,770		5,772,407	530	5,773,032	141	5,773,124	238	5,772,430
200.66	5,774,673	260	5,774,771	313	5,772,408	547	5,773,034	143	5,773,125	254.2	5,772,431
200.67	5,774,674	262	5,774,772	360	5,772,409			158	5,773,126		CLASS 433
200.76	5,774,675	302	5,774,773	363	5,772,410		CLASS 425	195	5,773,128	37	5,772,432
200.77	5,774,676	308	5,774,775	368	5,772,411	67	5,773,035		5,773,130	80	5,772,433
	5,774,677	328	5,774,776	393	5,772,412	125	5,773,036	201	5,773,131	119	5,772,434
	5,774,678	343	5,774,777	470	5,772,413	132	5,773,037	209	5,773,132	126	5,772,435
280	5,774,679	384	5,774,778	542	5,772,414	145	5,773,038	216	5,773,133		5,772,436
285	5,774,680					192 R	5,773,039	216	5,773,134	174	5,772,437
290	5,774,681		CLASS 400	186	5,772,415	195	5,773,040	220	5,773,135	181	5,772,438
308	5,774,682	55	5,772,339	14	5,772,416	207	5,773,041	304.4	5,773,136	201.1	5,772,439
309	5,774,683	70	5,772,340	55.6	5,772,417	307	5,773,042	307.3	5,773,137		
	5,774,684	234	5,772,341	61.3	5,772,418	311	5,773,043	323	5,773,138		CLASS 434
	5,774,685	615.2	5,772,342	86.5	5,772,419	371	5,773,044	326	5,773,139	114	5,772,440
381	5,774,686	624	5,772,343	206.5	5,772,420	387.1	5,773,045	332	5,773,140	236	5,772,441
385	5,774,687				5,772,421		5,773,046	336	5,773,141	265	5,772,442
387	5,774,688		CLASS 401		5,772,422	393	5,773,047	335	5,773,142	272	5,772,443
500	5,774,689	48	5,772,345	2	5,774,779	403	5,773,048	349	5,773,143	300	5,772,444
	5,774,690	132	5,772,346	12	5,774,780	556	5,773,049	368	5,773,144	301	5,772,445
	5,774,691	263	5,772,347		CLASS 420	589	5,772,956	389	5,773,145	307 R	5,772,446
	5,774,692			108	5,772,956	589	5,772,957	392	5,773,146		CLASS 435
	5,774,693	36	5,772,348	40	5,772,957		CLASS 426	410	5,773,147	5	5,773,210
	5,774,694	79	5,772,349					413	5,773,148		5,773,211
	5,774,695		CLASS 403	1	5,772,958	1	5,773,051	429	5,773,149		5,773,212
	5,774,696			5	5,772,959	2	5,773,052	426	5,773,150		5,773,213
	5,774,697	78	5,772,350	5	5,772,960	36	5,773,053	442	5,773,151	6	5,773,214
551	5,774,699	111	5,772,351	41	5,772,961	44	5,773,054	447	5,773,152		5,773,215
555	5,774,700	144	5,772,352	67	5,772,962	45	5,773,055	458			

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7.2	5,773,221	33	5,773,318	328	5,773,374	407	5,772,534	426	5,773,406	14
7.21	5,773,222	39	5,773,319	340	5,773,375	415	5,772,535	466	5,773,407	52
	5,773,223	107	5,773,320			417	5,772,536	519	5,773,408	68
7.21	5,773,224	109	5,773,321			435	5,772,537	520	5,773,409	99
	5,773,227	117	5,773,322	24	5,772,485	446	5,772,538	521	5,773,409	119
	5,773,228	123	5,773,323			499	5,772,539			394
7.23	5,773,229	144	5,773,324	26	5,772,487	519	5,772,540			410
7.24	5,773,230	151	5,773,325	50	5,772,488	520	5,772,541			411
	5,773,231		5,773,326			576	5,772,542	23	5,773,410	
	5,773,232		5,773,327			594	5,772,543			445
7.32	5,773,233	162	5,773,328	14	5,772,489	598	5,772,544			455
7.36	5,773,234	164	5,773,329	71	5,772,490	605	5,772,545	11	5,773,411	492
7.8	5,773,225		5,773,330	475	5,772,491				5,773,412	505
7.9	5,773,226	179	5,773,333						5,773,413	538
7.92	5,773,235	182	5,773,334	30	5,772,492	77	5,772,547	17	5,773,414	549
15	5,773,236	199	5,773,335			135	5,772,549	21	5,773,416	600
21	5,773,237		5,773,336			256	5,772,551		5,773,417	
29	5,773,239		5,773,337	5	5,772,493				5,773,418	
41	5,773,238	202	5,773,338	52	5,772,494				5,773,419	
	5,773,240	210	5,773,339	69	5,772,495	44	5,772,548	25	5,773,420	
	5,773,241	234	5,773,340	296	5,772,496	120	5,772,550		5,773,421	
	5,773,243	253	5,773,341	350	5,772,497	281	5,772,552	30	5,773,422	
	5,773,244	255	5,773,342	357	5,772,498			45	5,773,423	
	5,773,245	259	5,773,343					46	5,773,424	
	5,773,246	281	5,773,344					54	5,773,425	
	5,773,247	286	5,773,345					55	5,773,426	
	5,773,248	297	5,773,346					80	5,773,427	
	5,773,249	302	5,773,347					102	5,773,428	
	5,773,250	305	5,773,348	184	5,772,500	162	5,772,557	152	5,773,429	
69.2	5,773,251	348	5,773,349	256	5,772,501			177	5,773,431	
69.4	5,773,252	364	5,773,350	365	5,772,502			182	5,773,432	
69.7	5,773,253	406	5,773,351					51	5,773,433	
70.3	5,773,255	426	5,773,352					52	5,773,434	
74	5,773,256	429	5,773,353					54	5,773,435	
91.1	5,773,257	459	5,773,354	8	5,774,786	54	5,772,560	211	5,773,436	
91.2	5,773,258		5,773,355	12	5,774,787	104	5,772,561	212	5,773,437	
	5,773,259	473	5,773,356	16	5,774,788	140	5,772,562	214	5,773,438	
	5,773,260	479	5,773,357	33.1	5,774,790				5,773,439	
91.31	5,773,260	564	5,773,358	41	5,774,791				5,773,440	
106	5,773,261	614	5,773,359	97	5,774,792				5,773,441	
118	5,773,262	626	5,773,360	106	5,774,793				5,773,442	
	5,773,263	637	5,773,361	115	5,774,795				5,773,443	
	5,773,264	665	5,773,362	127	5,774,797				5,773,444	
	5,773,265	672	5,773,363	186.1	5,774,798				5,773,445	
131	5,773,266	692	5,773,364	192.2	5,774,799				5,773,446	
134	5,773,267	699	5,773,365	255	5,774,800				5,773,447	
172.1	5,773,268	718	5,773,366	326	5,774,801	54	5,772,567	269	5,773,448	
172.3	5,773,269	734	5,773,367	343	5,774,802				5,773,449	
	5,773,270	742	5,773,368	408	5,774,803				5,773,450	
177	5,773,271	746	5,773,369	414	5,774,804				5,773,451	
188	5,773,272			419	5,774,805	8	5,772,568	323	5,773,452	
189	5,773,273			424	5,774,806	116	5,772,569	329	5,773,453	
	5,773,274			427	5,774,807	333	5,772,570	331	5,773,454	
	5,773,275			434	5,774,808	405	5,772,571	340	5,773,455	
193	5,773,276	31	5,772,447	426	5,772,571			356	5,773,456	
	5,773,277	60	5,772,448	432	5,772,572			364	5,773,457	
	5,773,278	66	5,772,449	436	5,772,573			365	5,773,458	
232	5,773,279	67	5,772,450	437	5,772,574			373	5,773,459	
240.27	5,773,280	70	5,772,451	438	5,772,575	14	5,772,576	397	5,773,460	
243	5,773,281	73	5,772,452	502	5,774,810	15	5,772,577	413	5,773,461	
252.3	5,773,282	79	5,772,453	522	5,774,811			413	5,773,462	
260	5,773,283	83	5,772,454	524	5,774,812			445	5,773,463	
282	5,773,284	100	5,772,455	574	5,774,814	84	5,773,376	449	5,773,464	
286.5	5,773,285	164	5,772,456			98.4	5,773,377	454	5,773,465	
290.2	5,773,286	201	5,772,457					456	5,773,466	
297.1	5,773,287	310	5,772,458					467	5,773,467	
303.1	5,773,288	341	5,772,459					473	5,773,468	
320.1	5,773,289	344	5,773,332	12.1	5,774,788	41	5,773,378	475	5,773,469	
	5,773,290	352	5,772,460			43	5,773,379	478	5,773,470	
325	5,773,291	367	5,772,461	70	5,772,503	62	5,773,380		5,773,471	
332	5,773,292	374	5,772,462			74	5,773,381		5,773,472	
334	5,773,293	395	5,772,463			209	5,773,382		5,773,473	
348	5,773,294	418	5,772,464			328	5,773,383		5,773,474	
	5,773,278	489	5,772,465			355	5,773,384		5,773,475	
		493	5,772,466	12	5,772,504	402	5,773,385		5,773,476	
		506	5,772,467	16	5,772,505	465	5,773,386		5,773,477	
		549	5,772,468	17	5,772,506				5,773,478	
		582	5,772,469	17	5,772,507				5,773,479	
		607	5,772,470	16	5,772,508				5,773,480	
		628	5,772,471	6	5,772,512				5,773,481	
		631	5,772,472	40	5,772,513				5,773,482	
		650	5,772,473						5,773,483	
		660	5,772,474						5,773,484	
		701.5	5,772,475						5,773,485	
161	5,773,315	717	5,772,476						5,773,486	
169	5,773,302	752	5,772,477	20	5,772,514				5,773,487	
172	5,773,303	805	5,772,478	67	5,772,515				5,773,488	
174	5,773,304	801	5,772,479	68	5,772,516				5,773,489	
177	5,773,305	885	5,772,480	111	5,772,517				5,773,490	
518.06				160	5,772,518				5,773,491	
526	5,773,307			172	5,772,519				5,773,492	
	5,773,308			160	5,772,521				5,773,493	
				170	5,772,521				5,773,494	
				222	5,772,522				5,773,495	
				227	5,772,523				5,773,496	
				300	5,772,524				5,773,497	
				314	5,772,525				5,773,498	
				323	5,772,526				5,773,499	
				327	5,772,527				5,773,500	
				364	5,772,528				5,773,501	
				366	5,772,529				5,773,502	
				376	5,772,530				5,773,503	
				380	5,772,531				5,773,504	
				381	5,772,532				5,773,505	
				384	5,772,533				5,773,506	
				385	5,772,534				5,773,507	
				386	5,772,535				5,773,508	
				387	5,772,536				5,773,509	
				388	5,772,537				5,773,510	
				389	5,772,538				5,773,511	
				390	5,772,539				5,773,512	
				391	5,772,540				5,773,513	
				392	5,772,541				5,773,514	
				393	5,772,542				5,773,515	
				394	5,772,543				5,773,516	
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	395,720	60	395,723	395,726	87	395,729	D28—	7	395,732	308.3	395,570
38	395,721	67	395,724	395,727	142	395,730		36	395,733		

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P—	55	10,467	10,469	87.12	10,471	10,473	87.18	10,475
	83	10,468	10,470	10,472	10,474	10,476		

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	5,772,272	5,774,486	5,772,001	5,772,631	5,773,108	5,773,770
	5,772,723	5,774,508	5,772,019	5,772,635	5,773,110	5,773,780
	5,773,104	5,774,682	5,772,059	5,772,642	5,773,159	5,773,799
	5,773,248	5,774,733	5,772,072	5,772,645	5,773,162	5,773,825
	5,773,424	5,774,743	5,772,084	5,772,657	5,773,197	5,773,826
	5,773,564	5,774,744	5,772,094	5,772,661	5,773,223	5,773,827
	5,774,253	5,774,779	5,772,105	5,772,662	5,773,224	5,773,829
	5,774,316	5,774,787	5,772,115	5,772,666	5,773,226	5,773,832
	5,774,338	5,774,806	5,772,132	5,772,667	5,773,234	5,773,833
	5,772,188	5,774,833	5,772,133	5,772,678	5,773,237	5,773,841
02	5,771,556	5,774,856	5,772,154	5,772,680	5,773,244	5,773,854
04	5,771,562	5,774,870	5,772,157	5,772,689	5,773,249	5,773,855
	5,771,663	5,772,502	5,772,169	5,772,690	5,773,257	5,773,861
	5,771,754	5,773,276	5,772,171	5,772,713	5,773,258	5,773,862
	5,771,767	RE: 35,830	5,772,172	5,772,720	5,773,268	5,773,863
	5,771,836	RE: 35,831	5,772,174	5,772,733	5,773,294	5,773,864
	5,771,838	RE: 35,832	5,772,179	5,772,734	5,773,299	5,773,875
	5,772,066	5,771,492	5,772,211	5,772,736	5,773,302	5,773,876
	5,772,090	5,771,505	5,772,212	5,772,758	5,773,309	5,773,886
	5,772,110	5,771,523	5,772,220	5,772,771	5,773,328	5,773,889
	5,772,208	5,771,526	5,772,228	5,772,773	5,773,350	5,773,897
	5,772,325	5,771,567	5,772,248	5,772,784	5,773,367	5,773,951
	5,772,397	5,771,570	5,772,293	5,772,791	5,773,369	5,773,959
	5,772,529	5,771,573	5,772,304	5,772,799	5,773,412	5,773,963
	5,772,783	5,771,579	5,772,309	5,772,802	5,773,416	5,773,971
	5,772,966	5,771,581	5,772,316	5,772,803	5,773,432	5,773,974
	5,773,024	5,771,588	5,772,345	5,772,804	5,773,434	5,773,985
	5,773,083	5,771,608	5,772,356	5,772,805	5,773,438	5,773,991
	5,773,130	5,771,613	5,772,363	5,772,817	5,773,440	5,773,993
	5,773,160	5,771,619	5,772,432	5,772,832	5,773,459	5,773,994
	5,773,359	5,771,620	5,772,453	5,772,838	5,773,476	5,774,003
	5,773,368	5,771,628	5,772,459	5,772,843	5,773,514	5,774,005
	5,773,377	5,771,636	5,772,466	5,772,857	5,773,518	5,774,013
	5,773,887	5,771,695	5,772,471	5,772,858	5,773,530	5,774,018
	5,773,895	5,771,742	5,772,493	5,772,889	5,773,569	5,774,021
	5,773,929	5,771,748	5,772,501	5,772,890	5,773,570	5,774,030
	5,773,931	5,771,777	5,772,510	5,772,903	5,773,574	5,774,052
	5,773,986	5,771,835	5,772,524	5,772,906	5,773,577	5,774,081
	5,774,084	5,771,875	5,772,533	5,772,912	5,773,580	5,774,082
	5,774,121	5,771,884	5,772,541	5,772,939	5,773,586	5,774,091
	5,774,128	5,771,890	5,772,590	5,772,947	5,773,594	5,774,094
	5,774,135	5,771,896	5,772,591	5,772,967	5,773,600	5,774,112
	5,774,214	5,771,902	5,772,609	5,772,995	5,773,609	5,774,113
	5,774,255	5,771,907	5,772,615	5,772,998	5,773,654	5,774,115
	5,774,367	5,771,908	5,772,618	5,773,033	5,773,675	5,774,123
	5,774,368	5,771,921	5,772,619	5,773,056	5,773,680	5,774,133
	5,774,382	5,771,937	5,772,627	5,773,077	5,773,693	5,774,142
		5,771,975	5,772,628	5,773,096	5,773,707	5,774,156

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5,774.181	5,772.597	5,771.591	5,771.586	5,772.871	5,772.610
5,774.185	5,772.659	5,771.700	5,771.640	5,772.928	5,772.616
5,774.188	5,772.695	5,771.807	5,771.648	5,773.214	5,772.656
5,774.201	5,772.747	5,771.813	5,771.650	5,773.441	5,772.664
5,774.206	5,773.088	5,771.841	5,771.664	5,773.452	5,772.818
5,774.213	5,773.101	5,771.916	5,771.758	5,773.633	5,772.874
5,774.227	5,773.184	5,771.968	5,771.809	5,773.734	5,772.888
5,774.241	5,773.422	5,772.086	5,771.811	5,773.789	5,772.935
5,774.254	5,773.503	5,772.118	5,771.860	5,773.885	5,772.971
5,774.257	5,773.598	5,772.182	5,771.867	5,773.964	5,772.983
5,774.260	5,773.726	5,772.204	5,771.914	5,773.983	5,773.003
5,774.291	5,773.814	5,772.225	5,771.930	5,774.342	5,773.019
5,774.293	5,773.988	5,772.317	5,771.945	5,774.828	5,773.091
5,774.295	5,774.119	5,772.360	5,771.946	5,771.604	5,773.112
5,774.298	5,774.120	5,772.391	5,771.947	5,771.717	5,773.147
5,774.303	5,774.287	5,772.405	5,771.948	5,771.996	5,773.188
5,774.311	5,774.299	5,772.441	5,772.009	5,772.270	5,773.213
5,774.318	5,774.301	5,772.442	5,772.479	5,772.479	5,773.217
5,774.330	5,774.392	5,772.443	5,772.047	5,773.038	5,773.228
5,774.331	5,774.406	5,772.457	5,772.058	5,773.060	5,773.270
5,774.333	5,774.458	5,772.534	5,772.065	5,773.288	5,773.286
5,774.337	5,774.532	5,772.579	5,772.070	5,773.396	5,773.396
5,774.344	5,774.544	5,772.614	5,772.074	5,773.687	5,773.455
5,774.348	5,774.860	5,772.654	5,772.076	5,773.697	5,773.583
5,774.370	5,774.879	5,772.675	5,772.078	5,773.714	5,773.601
5,774.373	5,774.887	5,772.693	5,772.095	5,774.056	5,773.723
5,774.374	5,771.528	5,772.815	5,772.104	5,771.531	5,773.830
5,774.376	5,771.592	5,772.835	5,772.202	5,771.641	5,773.835
5,774.377	5,771.614	5,772.872	5,772.205	5,772.024	5,773.919
5,774.396	5,771.721	5,772.886	5,772.206	5,772.102	5,773.933
5,774.401	5,771.722	5,773.123	5,772.217	5,772.420	5,773.926
5,774.406	5,771.761	5,773.151	5,772.251	5,772.500	5,774.110
5,774.431	5,771.995	5,773.198	5,772.279	5,772.617	5,774.129
5,774.432	5,772.099	5,773.419	5,772.367	5,772.621	5,774.221
5,774.440	5,772.100	5,773.551	5,772.377	5,773.557	5,774.221
5,774.456	5,772.147	5,773.379	5,772.379	5,773.752	5,774.336
5,774.471	5,772.219	5,773.745	5,772.381	5,773.903	5,774.343
5,774.474	5,772.223	5,773.760	5,772.383	5,774.869	5,774.385
5,774.475	5,772.259	5,773.824	5,772.388	5,772.036	5,774.386
5,774.480	5,772.326	5,773.891	5,772.414	5,772.288	5,774.463
5,774.482	5,772.354	5,773.980	5,772.427	5,772.291	5,774.479
5,774.488	5,772.361	5,773.989	5,772.468	5,772.382	5,774.489
5,774.496	5,772.450	5,774.055	5,772.469	5,772.496	5,774.519
5,774.500	5,772.455	5,774.224	5,772.503	5,772.968	5,774.526
5,774.505	5,772.490	5,774.315	5,772.585	5,773.427	5,774.542
5,774.516	5,772.506	5,774.317	5,772.587	5,773.544	5,774.598
5,774.521	5,772.573	5,774.341	5,772.684	5,773.790	5,774.626
5,774.522	5,772.673	5,774.366	5,772.740	5,774.148	5,774.667
5,774.528	5,772.814	5,774.501	5,772.863	5,774.705	5,774.663
5,774.541	5,772.959	5,774.703	5,772.880	5,774.719	5,774.719
5,774.544	5,773.023	5,774.720	5,772.881	5,772.152	5,774.727
5,774.549	5,773.055	5,771.653	5,772.893	5,772.007	5,774.739
5,774.551	5,773.097	5,771.699	5,772.894	5,773.064	5,774.739
5,774.552	5,773.161	5,771.739	5,772.898	5,773.672	5,771.534
5,774.558	5,773.176	5,772.026	5,772.944	5,773.672	5,771.535
5,774.567	5,773.305	5,772.030	5,773.035	5,773.704	5,771.645
5,774.579	5,773.435	5,772.108	5,773.043	5,774.816	5,771.685
5,774.591	5,773.443	5,772.276	5,773.052	5,771.691	5,771.691
5,774.597	5,773.450	5,772.286	5,773.053	5,771.677	5,771.694
5,774.619	5,773.461	5,772.561	5,773.054	5,772.402	5,771.750
5,774.647	5,773.464	5,772.604	5,773.057	5,773.122	5,771.752
5,774.658	5,773.493	5,772.622	5,773.076	5,771.531	5,771.774
5,774.660	5,773.523	5,772.646	5,773.150	5,771.816	5,771.816
5,774.666	5,773.616	5,772.763	5,773.211	5,771.709	5,771.853
5,774.669	5,773.647	5,772.819	5,773.212	5,771.710	5,771.863
5,774.670	5,773.756	5,772.952	5,773.212	5,771.720	5,771.873
5,774.676	5,773.772	5,772.954	5,773.245	5,771.967	5,772.184
5,774.678	5,773.778	5,773.009	5,773.261	5,772.254	5,771.952
5,774.684	5,774.320	5,773.095	5,773.280	5,772.254	5,771.954
5,774.686	5,774.322	5,773.120	5,773.421	5,772.613	5,771.955
5,774.692	5,774.350	5,773.182	5,773.462	5,772.649	5,771.958
5,774.694	5,774.422	5,773.209	5,773.546	5,772.911	5,771.977
5,774.704	5,774.465	5,773.231	5,773.549	5,773.747	5,773.747
5,774.709	5,774.513	5,773.500	5,773.625	5,773.801	5,773.801
5,774.710	5,774.563	5,773.531	5,773.644	5,773.839	5,773.839
5,774.714	5,774.588	5,773.552	5,773.646	5,773.883	5,773.883
5,774.715	5,774.721	5,773.608	5,773.777	5,772.116	5,772.116
5,774.716	5,771.547	5,773.729	5,773.796	5,772.159	5,772.159
5,774.726	5,771.923	5,773.767	5,773.796	5,772.160	5,772.160
5,774.729	5,772.261	5,774.533	5,774.423	5,772.184	5,772.184
5,774.734	5,772.261	5,774.543	5,774.443	5,774.305	5,773.486
5,774.738	5,772.429	5,774.605	5,774.557	5,773.383	5,773.505
5,774.738	5,772.667	5,774.610	5,774.612	5,772.239	5,773.520
5,774.745	5,772.672	5,774.618	5,774.612	5,774.529	5,773.534
5,774.745	5,772.741	5,774.805	5,774.786	5,774.601	5,773.575
5,774.791	5,772.755	5,773.020	5,774.802	5,774.627	5,773.614
5,774.825	5,772.999	5,771.624	5,774.812	5,774.723	5,773.679
5,774.826	5,773.219	5,771.768	5,771.632	5,774.730	5,773.706
5,774.829	5,773.411	5,772.114	5,772.827	5,774.832	5,773.769
5,774.839	5,773.538	5,772.488	5,774.857	5,771.655	5,773.817
5,774.849	5,773.593	5,772.887	5,771.726	5,771.726	5,773.874
5,774.859	5,773.587	5,773.808	5,771.891	5,771.891	5,771.891
5,774.871	5,773.637	5,773.341	5,771.829	5,771.898	5,772.336
5,774.880	5,773.691	5,773.346	5,771.857	5,771.899	5,772.338
5,774.883	5,773.699	5,773.356	5,771.861	5,771.899	5,772.342
B1 544.584	5,774.882	5,773.363	5,771.961	5,771.899	5,772.342
B1 030.356	5,774.186	5,773.363	5,771.961	5,771.899	5,772.342
B1 108.745	5,774.881	5,773.927	5,772.021	5,772.021	5,772.342
5,771.595	5,771.501	5,774.408	5,772.031	5,772.031	5,772.342
5,771.798	5,771.525	5,772.176	5,772.176	5,772.176	5,772.342
5,771.843	5,771.530	5,774.815	5,772.294	5,772.294	5,772.342
5,772.048	5,771.538	5,771.519	5,772.319	5,772.319	5,772.342
5,772.221	5,771.557	5,771.536	5,772.349	5,772.349	5,772.342
5,772.583	5,771.576	5,771.552	5,772.822	5,772.822	5,772.342

	5,773.164	5,772.706	5,774.728	5,773.431	5,771.654	5,771.607
	5,773.414	5,772.710	5,774.837	5,773.456	5,771.680	5,771.674
	5,773.444	5,772.992	5,774.861	5,773.502	5,771.696	5,771.771
	5,773.527	5,773.068	5,774.865	5,773.528	5,771.703	5,771.789
	5,773.610	5,773.251	5,774.866	5,773.553	5,771.715	5,771.801
	5,773.615	5,773.382	5,774.875	5,773.561	5,771.729	5,771.839
	5,773.628	5,773.389	5,774.877	5,773.567	5,771.746	5,771.854
	5,773.702	5,773.454	5,774.885	5,773.668	5,771.823	5,771.877
	5,773.735	5,773.588	5,771.612	5,773.671	5,771.852	5,771.949
	5,773.737	5,773.599	5,771.678	5,773.673	5,771.938	5,771.991
	5,773.773	5,773.696	5,771.984	5,773.806	5,771.998	5,771.993
	5,773.776	5,773.701	5,772.007	5,773.807	5,772.028	5,772.103
	5,773.777	5,773.791	5,772.735	5,773.810	5,772.091	5,772.128
	5,773.795	5,774.037	5,773.105	5,773.815	5,772.098	5,772.166
	5,774.038	5,774.053	5,773.116	5,773.816	5,772.112	5,772.181
	5,774.041	5,774.361	5,774.011	5,773.818	5,772.255	5,772.222
	5,774.064	5,774.599	5,774.419	5,773.836	5,772.323	5,772.232
	5,774.075	BI 818.410	5,774.490	5,773.869	5,772.337	5,772.271
	5,774.203	5,772.264	5,771.499	5,773.884	5,772.341	5,772.321
	5,774.359	5,772.853	5,771.500	5,773.908	5,772.353	5,772.489
	5,774.559	5,772.049	5,771.502	5,773.941	5,772.415	5,772.505
	5,774.823	5,772.229	5,771.559	5,773.966	5,772.416	5,772.507
	5,774.872	5,773.473	5,771.589	5,773.973	5,772.565	5,772.522
	5,771.539	5,773.682	5,771.640	5,774.049	5,772.570	5,772.523
	5,771.568	5,771.490	5,771.622	5,774.032	5,772.575	5,772.539
	5,771.631	5,772.311	5,771.643	5,774.033	5,772.582	5,772.599
	5,771.658	5,772.385	5,771.684	5,774.051	5,772.634	5,772.674
	5,771.662	5,772.509	5,771.713	5,774.067	5,772.699	5,772.699
	5,771.667	5,772.702	5,771.714	5,774.163	5,772.715	5,772.725
	5,771.682	5,772.703	5,771.716	5,774.170	5,772.718	5,772.726
	5,771.901	5,772.938	5,771.764	5,774.183	5,772.816	5,772.740
	5,771.925	5,771.966	5,771.769	5,774.209	5,772.846	5,772.748
	5,771.980	5,772.177	5,771.779	5,774.212	5,772.885	5,772.787
	5,772.035	5,772.396	5,771.810	5,774.236	5,773.041	5,772.795
	5,772.085	5,772.551	5,771.885	5,774.271	5,773.068	5,772.796
	5,772.143	5,772.637	5,771.934	5,774.278	5,773.063	5,772.820
	5,772.190	5,772.841	5,771.951	5,774.292	5,773.071	5,772.852
	5,772.266	5,773.788	5,772.017	5,774.326	5,773.080	5,772.877
	5,772.282	5,774.153	5,772.022	5,774.357	5,773.081	5,772.902
	5,772.286	5,774.193	5,772.054	5,774.369	5,773.086	5,772.913
	5,772.295	5,774.328	5,772.055	5,774.411	5,773.114	5,772.916
	5,772.312	BI 456.976	5,772.158	5,774.447	5,773.121	5,772.937
	5,772.322	5,771.489	5,772.213	5,774.448	5,773.140	5,772.994
	5,772.330	5,771.491	5,772.214	5,774.481	5,773.143	5,773.047
	5,772.359	5,771.522	5,772.250	5,774.492	5,773.391	5,773.089
	5,772.409	5,771.599	5,772.335	5,774.493	5,773.393	5,773.103
	5,772.444	5,771.605	5,772.428	5,774.525	5,773.401	5,773.127
	5,772.462	5,771.642	5,772.434	5,774.535	5,773.408	5,773.146
	5,772.463	5,771.657	5,772.437	5,774.553	5,773.487	5,773.220
	5,772.576	5,771.844	5,772.445	5,774.569	5,773.504	5,773.250
	5,772.600	5,772.057	5,772.525	5,774.631	5,773.717	5,773.259
	5,772.626	5,772.087	5,772.559	5,774.639	5,773.721	5,773.306
	5,772.632	5,772.207	5,772.595	5,774.644	5,773.779	5,773.338
	5,772.669	5,772.238	5,772.608	5,774.664	5,773.786	5,773.406
	5,772.711	5,772.262	5,772.623	5,774.685	5,773.787	5,773.420
	5,772.721	5,772.640	5,772.641	5,774.698	5,773.808	5,773.457
	5,772.782	5,772.652	5,772.660	5,774.735	5,773.819	5,773.492
	5,772.861	5,772.679	5,772.677	5,774.752	5,773.954	5,773.496
	5,772.883	5,772.708	5,772.709	5,774.755	5,773.965	5,773.507
	5,772.905	5,772.712	5,772.743	5,774.756	5,774.608	5,773.512
	5,772.978	5,772.717	5,772.744	5,774.757	5,774.663	5,773.524
	5,773.000	5,772.752	5,772.767	5,774.761	5,774.789	5,773.525
	5,773.006	5,772.789	5,772.779	5,774.814	5,772.003	5,773.568
	5,773.070	5,772.909	5,772.793	5,774.876	5,772.269	5,773.592
	5,773.138	5,772.949	5,772.837	5,774.878	5,772.511	5,773.627
	5,773.269	5,772.981	5,772.848	5,771.496	5,773.676	5,773.665
	5,773.275	5,772.988	5,772.895	5,771.524	5,773.757	5,773.867
	5,773.311	5,773.015	5,772.923	5,771.670	5,774.245	5,774.025
	5,773.374	5,773.062	5,772.951	5,771.879	5,774.294	5,774.047
	5,773.375	5,773.144	5,772.963	5,771.910	5,774.297	5,774.088
	5,773.506	5,773.210	5,772.964	5,771.920	5,774.381	5,774.122
	5,773.562	5,773.279	5,772.976	5,772.012	5,771.610	5,774.689
	5,773.747	5,773.283	5,772.986	5,772.126	5,771.627	5,774.824
	5,773.801	5,773.318	5,773.001	5,772.278	5,772.000	5,771.741
	5,773.839	5,773.322	5,773.025	5,772.365	5,772.037	5,771.796
	5,773.990	5,773.383	5,773.078	5,772.454	5,772.373	5,772.014
	5,774.216	5,773.458	5,773.111	5,772.697	5,772.465	5,771.847
	5,774.265	5,773.469	5,773.118	5,772.790	5,772.742	5,772.896
	5,774.304	5,773.474	5,773.132	5,772.920	5,772.829	5,773.477
	5,774.305	5,773.486	5,773.178	5,773.246	5,772.855	5,773.335
	5,774.383	5,773.505	5,773.181	5,773.289	5,772.957	5,774.421
	5,774.487	5,773.520	5,773.193	5,773.413	5,772.997	5,774.690
	5,774.529	5,773.534	5,773.195	5,773.417	5,773.227	5,772.109
	5,774.601	5,773.575	5,773.202	5,773.689	5,773.329	5,772.307
	5,774.627	5,773.614	5,773.205	5,773.695	5,773.336	5,772.328
	5,774.723	5,773.679	5,773.206	5,773.722	5,773.255	5,772.425
	5,774.730	5,773.706	5,773.208	5,773.901	5,773.939	5,772.482
	5,774.832	5,773.769	5,773.225	5,774.239	5,774.042	5,772.732
	5,774.868	5,773.817	5,773.260	5,774.319	5,774.049	5,772.749
	5,774.874	5,773.874	5,773.265	5,774.323	5,774.117	5,772.850
	5,771.878	5,774.016	5,774.641	5,774.641	5,774.140	5,773.107
	5,771.964	5,774.017	5,773.278	5,774.648	5,774.144	5,773.405
	5,772.236	5,774.109	5,773.291	5,774.799	5,774.191	5,773.563
	5,774.413	5,774.467	5,773.292	5,771.330	5,774.403	5,773.762
	5,771.578	5,774.504	5,773.296	5,771.511	5,774.674	5,774.000
	5,771.759	5,774.512	5,773.329	5,771.513	5,774.677	5,774.177
	5,771.992	5,774.519	5,773.331	5,771.545	5,774.700	5,771.514
	5,772.069	5,774.534	5,773.371	5,771.550	5,774.798	5,771.894
	5,772.209	5,774.540	5,773.386	5,771.566	5,774.888	5,771.959
	5,772.331	5,774.565	5,773.392	5,771.572	5,771.504	5,772.052
	5,772.433	5,774.576	5,773.407	5,771.577	5,771.507	5,772.134
	5,772.663	5,774.586	5,773.428	5,771.644	5,771.548	5,772.134
	5,772.696	5,774.606	5,773.430	5,771.646	5,771.565	5,772.155



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	5,772,390	5,772,403	5,773,831	5,774,836	5,771,782	55	5,771,551
	5,772,399	5,772,422	5,773,856	5,774,841	5,771,814		5,771,647
	5,772,592	5,772,435	5,773,987	5,774,867	5,771,900		5,771,668
	5,772,685	5,772,448	5,773,995	5,774,886	5,771,985		5,771,698
	5,772,701	5,772,451	5,773,997	5,771,493	5,772,004		5,771,747
	5,772,873	5,772,481	5,774,023	5,772,163	5,772,063		5,771,760
	5,772,977	5,772,485	5,774,039	5,772,185	5,772,107		5,771,762
	5,773,453	5,772,492	5,774,058	5,772,243	5,772,156		5,771,778
	5,773,554	5,772,512	5,774,059	5,772,560	5,772,268		5,771,866
	5,773,746	5,772,514	5,774,063	5,772,636	5,772,343		5,771,912
	5,773,811	5,772,558	5,774,196	5,772,639	5,772,380		5,771,917
	5,774,449	5,772,668	5,774,200	5,772,643	5,772,537		5,771,926
	5,774,502	5,772,691	5,774,252	5,773,332	5,772,624		5,772,015
	5,774,782	5,772,692	5,774,273	5,773,821	5,772,638		5,772,046
	5,774,873	5,772,694	5,774,274	5,774,022	5,772,798		5,772,089
48	5,771,494	5,772,769	5,774,332	5,774,446	5,772,847		5,772,111
	5,771,506	5,772,854	5,774,340	5,771,571	5,772,919		5,772,149
	5,771,518	5,772,866	5,774,358	5,773,141	5,772,945		5,772,199
	5,771,598	5,772,899	5,774,360	5,772,950	5,772,950		5,772,215
	5,771,621	5,772,901	5,774,372	5,773,362	5,772,985		5,772,258
	5,771,649	5,773,106	5,774,384	5,774,202	5,773,218		5,772,314
	5,771,656	5,773,155	5,774,387	5,774,380	5,773,230		5,772,324
	5,771,683	5,773,215	5,774,395	5,771,515	5,773,253		5,772,389
	5,771,712	5,773,241	5,774,415	5,771,736	5,773,293		5,772,411
	5,771,786	5,773,314	5,774,416	5,771,783	5,773,300		5,772,625
	5,771,868	5,773,315	5,774,417	5,772,067	5,773,540		5,772,644
	5,771,892	5,773,317	5,774,420	5,772,153	5,773,741		5,772,671
	5,771,922	5,773,326	5,774,423	5,772,401	5,773,742		5,772,722
	5,771,927	5,773,364	5,774,476	5,772,581	5,773,961		5,772,823
	5,771,931	5,773,373	5,774,510	5,772,594	5,774,070		5,772,845
	5,771,972	5,773,378	5,774,511	5,772,993	5,774,074		5,773,016
	5,771,976	5,773,390	5,774,531	5,773,119	5,774,126		5,773,113
	5,772,035	5,773,425	5,774,600	5,773,221	5,774,136		5,773,290
	5,772,075	5,773,475	5,774,604	5,773,243	5,774,139		5,773,485
	5,772,077	5,773,515	5,774,628	5,773,308	5,774,141		5,773,705
	5,772,106	5,773,521	5,774,640	5,773,370	5,774,154		5,773,771
	5,772,161	5,773,579	5,774,680	5,773,429	5,774,155		5,773,909
	5,772,183	5,773,590	5,774,683	5,773,920	5,774,172		5,773,977
	5,772,186	5,773,591	5,774,695	5,773,933	5,774,491		5,773,978
	5,772,216	5,773,634	5,774,706	5,774,087	5,774,518		5,774,353
	5,772,237	5,773,638	5,774,711	5,774,176	5,774,593		5,774,796
	5,772,252	5,773,661	5,774,712	5,774,530	5,774,668		
	5,772,256	5,773,670	5,774,717	5,774,661	5,774,725		
	5,772,265	5,773,674	5,774,722	5,774,801	5,772,936		
	5,772,284	5,773,749	5,774,724	5,771,665	5,773,484		
	5,772,346	5,773,764	5,774,736	5,771,681	5,773,498		

DESIGN PATENTS

04	395,694	395,658	395,707	395,703	395,609	395,683
05	395,636	395,659	395,554	395,535	395,618	395,639
06	395,555	395,685	395,558	395,713	395,640	395,545
	395,560	395,687	395,599	395,566	395,722	395,702
	395,574	395,692	395,642	395,575	395,723	395,704
	395,581	395,696	395,651	395,594	395,729	395,552
	395,582	395,708	395,686	395,622	395,538	395,559
	395,606	395,710	395,701	395,662	395,544	395,563
	395,617	395,724	395,727	395,726	395,562	395,641
	395,629	395,725	395,731	395,551	395,588	395,660
	395,631	395,630	395,557	395,720	395,541	395,712
	395,632	395,578	395,718	395,628	395,601	395,592
	395,633	395,539	395,587	395,536	395,605	395,654
	395,634	395,547	395,595	395,543	395,613	395,553
	395,635	395,568	395,680	395,546	395,677	395,565
	395,637	395,577	395,705	395,550	395,690	395,598
	395,643	395,602	395,608	395,675	395,709	395,699
	395,645	395,571	395,610	395,700	395,717	
	395,650	395,572	395,691	395,556	395,540	
	395,652	395,590	395,671	395,567	395,728	
	395,656	395,669	395,719	395,591	395,589	
	395,657	395,684	395,580	395,596	395,603	

PLANT PATENTS

06	10,471	10,472	10,473	45	10,467	
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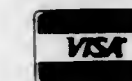
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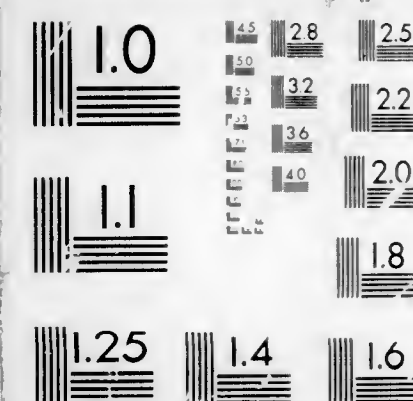
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